989 Somerset Street

TIA Strategy Report

prepared for:
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Ottawa ON, K2A 0E7

prepared by:
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July 23, 2019

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Document Control Page

CLIENT:	Domicile Development Inc
PROJECT NAME:	989 Somerset Street W
REPORT TITLE:	Strategy Report
PARSONS PROJECT NO:	477039-01000
VERSION:	Draft
DIGITAL MASTER:	\\XCCAN57FS01\Data\ISO\477039\1000\DOCS\4 - Strategy\Strategy_989 Somerset_2019 July.docx
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HISTORY:	TIA Step 1 Screening Form – January 18, 2019 TIA Step 2 Scoping Report – March 5, 2019 TIA Step 3 Forecasting Report – May 4, 2019 TIA Step 4 Strategy Report – July 23, 2019

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TIA Strategy Report

The following Strategy Report has been prepared in support of a Site Plan application for a proposed residential development located at 989 Somerset Street W. This document incorporated all comments from all previous steps in the TIA process, as outlined in the City Transportation Impact Assessment (TIA) Guidelines (2017). City comments from the previous submission have been provided in Appendix A.

1. SCREENING FORM

The Screening Form included as Appendix B confirmed the need for a TIA based on the 'Trip Generation' and 'Location' triggers, given that the proposed development consists of a residential building with a total of approximately 195 units and is located in a Design Priority Area (DPA) and transit-oriented development (TOD) zone. The 'Safety' trigger was not met.

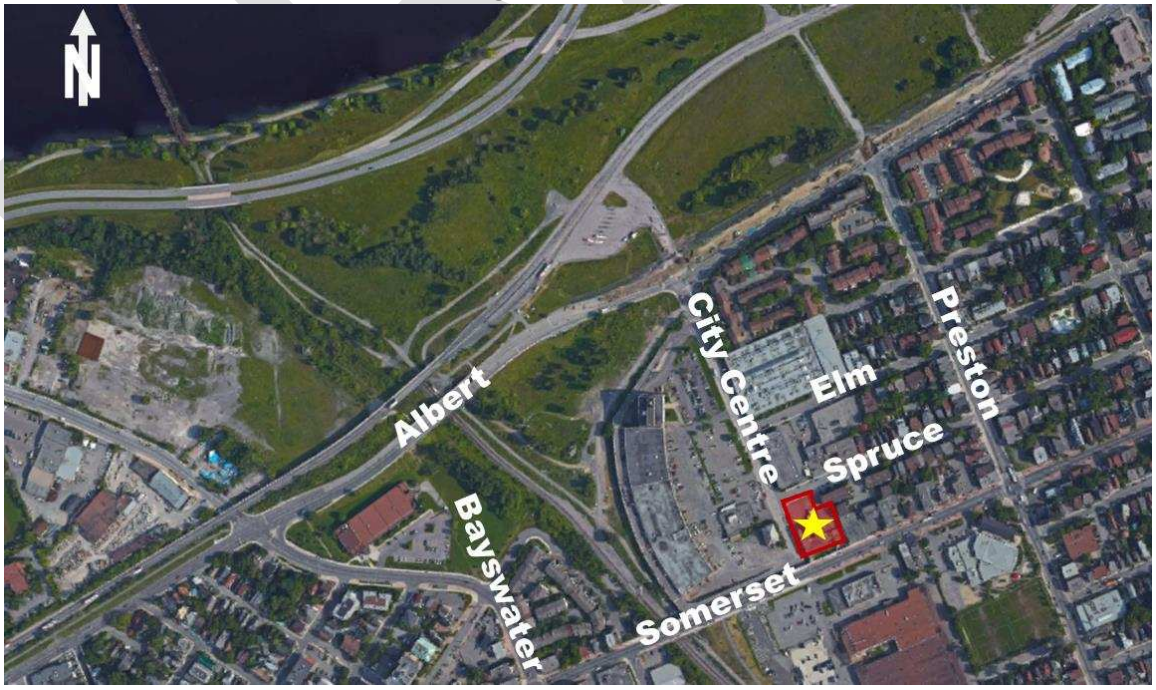
2. SCOPING REPORT

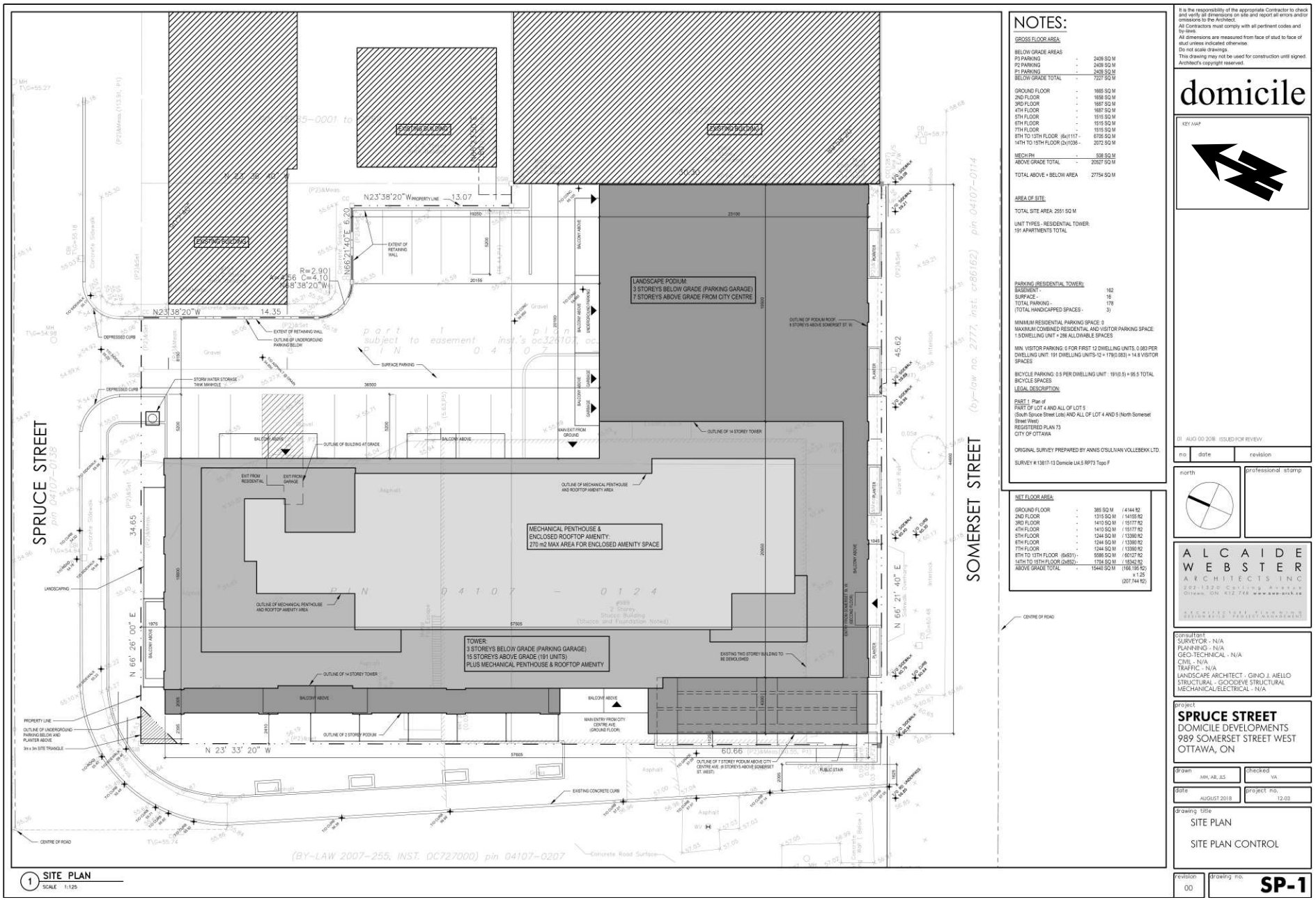
2.1. EXISTING AND PLANNED CONDITIONS

2.1.1. PROPOSED DEVELOPMENT

Based on the proposed Site Plan provided by Domicile Development Inc, it is our understanding that the proponent is proposing a single-phase residential development consisting of a 15-storey building, totalling approximately 195 units with underground and surface parking. The main access to the site is proposed via a driveway connection to Spruce Street. The site is currently occupied by a furniture and antiques store, and a lighting store below. The site is zoned as MC – Mixed-Use Centre Zone. The site's local context is provided as **Figure 1** and the proposed Site Plan is provided as **Figure 2**.

Figure 1: Local Context





1 SITE PLAN
SCALE 1:125

DEC 15, 2017

NOTES:

GROSS FLOOR AREA:

BELOW GRADE AREAS		
P3 PARKING	-	2409 SQ M
P2 PARKING	-	2409 SQ M
P1 PARKING	-	2409 SQ M
BELOW GRADE TOTAL	-	7227 SQ M
GROUND FLOOR	-	1665 SQ M
2ND FLOOR	-	1658 SQ M
3RD FLOOR	-	1687 SQ M
4TH FLOOR	-	1687 SQ M
5TH FLOOR	-	1515 SQ M
6TH FLOOR	-	1515 SQ M
7TH FLOOR	-	1515 SQ M
8TH TO 13TH FLOOR (6x1117	-	6705 SQ M
14TH TO 15TH FLOOR (2x1036	-	2072 SQ M
MECH PH	-	538 SQ M
ABOVE GRADE TOTAL	-	20527 SQ M
TOTAL ABOVE + BELOW AREA		27754 SQ M

AREA OF SITE:

TOTAL SITE AREA: 2551 SQ M

UNIT TYPES - RESIDENTIAL TOWER:
191 APARTMENTS TOTAL

PARKING (RESIDENTIAL TOWER):

BASEMENT -		162
SURFACE -		16
TOTAL PARKING -		178
(TOTAL HANDICAPPED SPACES -		3)

MINIMUM RESIDENTIAL PARKING SPACE: 0
MAXIMUM COMBINED RESIDENTIAL AND VISITOR PARKING SPACE:
1.5/DWELLING UNIT = 286 ALLOWABLE SPACES

MIN. VISITOR PARKING: 0 FOR FIRST 12 DWELLING UNITS, 0.083 PER DWELLING UNIT: 191 DWELLING UNITS-12 = 179(0.083) = 14.8 VISITOR SPACES

BICYCLE PARKING: 0.5 PER DWELLING UNIT : 191(0.5) = 96.5 TOTAL BICYCLE SPACES

LEGAL DESCRIPTION:

PART 1 Plan of
PART OF LOT 4 AND ALL OF LOT 5
(South Spruce Street Lots) AND ALL OF LOT 4 AND 5 (North Somerset Street West)
REGISTERED PLAN 73
CITY OF OTTAWA

ORIGINAL SURVEY PREPARED BY ANNIS O'SULIVAN VOLLEBEKK LTD.

SURVEY # 13617-13 Domicile Lt4,5 RP73 Topo F

NET FLOOR AREA:

GROUND FLOOR	-	385 SQ M	/ 4144 ft2
2ND FLOOR	-	1315 SQ M	/ 14155 ft2
3RD FLOOR	-	1410 SQ M	/ 15177 ft2
4TH FLOOR	-	1410 SQ M	/ 15177 ft2
5TH FLOOR	-	1244 SQ M	/ 13390 ft2
6TH FLOOR	-	1244 SQ M	/ 13390 ft2
7TH FLOOR	-	1244 SQ M	/ 13390 ft2
8TH TO 13TH FLOOR (6x931)	-	5586 SQ M	/ 60127 ft2
14TH TO 15TH FLOOR (2x852)	-	1704 SQ M	/ 18342 ft2
ABOVE GRADE TOTAL	-	15448 SQ M	(166,196 ft2) x 1.25 (207,744 ft2)

It is the responsibility of the appropriate Contractor to check and verify all dimensions on site and report all errors and/or omissions to the Architect.
All Contractors must comply with all pertinent codes and by-laws.
All dimensions are measured from face of stud to face of stud unless indicated otherwise.
Do not scale drawings.
This drawing may not be used for construction until signed.
Architect's copyright reserved.

domicile

KEY MAP

01 AUG 00 2018 ISSUED FOR REVIEW

no	date	revision

north

professional stamp

ALCAIDE WEBSTER ARCHITECTS INC
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architecture planning design build project management

consultant
SURVEYOR - N/A
PLANNING - N/A
GEO-TECHNICAL - N/A
CIVIL - N/A
TRAFFIC - N/A
LANDSCAPE ARCHITECT - GINO J. AIELLO
STRUCTURAL - GOODEVE STRUCTURAL
MECHANICAL/ELECTRICAL - N/A

project
SPRUCE STREET
DOMICILE DEVELOPMENTS
989 SOMERSET STREET WEST
OTTAWA, ON

drawn	checked
MH, AB, JLS	VA
date	project no.
AUGUST 2018	12-03

drawing title
SITE PLAN
SITE PLAN CONTROL

revision	drawing no.
00	SP-1

PARSONS

Figure 2: Proposed Site Plan

2.2. EXISTING CONDITIONS

2.2.1. AREA ROAD NETWORK

Albert Street is an east-west arterial roadway with a 4-lane cross-section and auxiliary turn lanes at major intersections. It extends from Elgin Street in the east to Bayview Road in the west. West of Bayview Road, Albert Street continues as Scott Street, and east of Elgin Street, it continues as Mackenzie King Bridge. Within the study area, the posted speed limit is 50 km/h.

City Centre Avenue is a north-south local roadway with a 2-lane cross section that extends south from Albert Street. There is no vehicular access to Somerset Street W. The unposted speed limit is understood to be 50 km/h.

Spruce Street is an east-west local roadway extending from City Centre Avenue in the west to Booth Street in the east. Vehicle access to Preston Street is closed. Within the study area, it has a two-lane cross-section. The unposted speed limit is understood to be 50 km/h.

Elm Street is an east-west local roadway extending from City Centre Avenue in the west to Booth Street in the east. Vehicle access to Preston Street is closed. Within the study area, it has a two-lane cross-section. The unposted speed limit is understood to be 50 km/h.

Preston Street is a north-south arterial roadway with a 2-lane cross section that extends from Albert Street in the north to Queen Elizabeth Drive in the south. Auxiliary turn lanes are provided at signalized intersection. The unposted speed limit is understood to be 50 km/h.

Somerset Street W is an east-west arterial roadway with a 2-lane cross section extending from Queen Elizabeth Drive in the east to Wellington Street in the west. Auxiliary turn lanes are provided at signalized intersection. Somerset Street W has wide sidewalks with on road parking bays and bus bays. The unposted speed limit is understood to be 50 km/h.

Bayswater Avenue is a north-south collector roadway extending from Somerset Street W in the north to Carling Avenue in the south (Bayswater further north of Somerset becomes Bayview Road which extends north to the Burnside/Slidell roundabout). The unposted speed limit is understood to be 50 km/h.

2.2.2. PEDESTRIAN/CYCLING NETWORK

Figure 3 illustrates the existing pathway and cycling network in the study area, obtained from the GeoOttawa website.

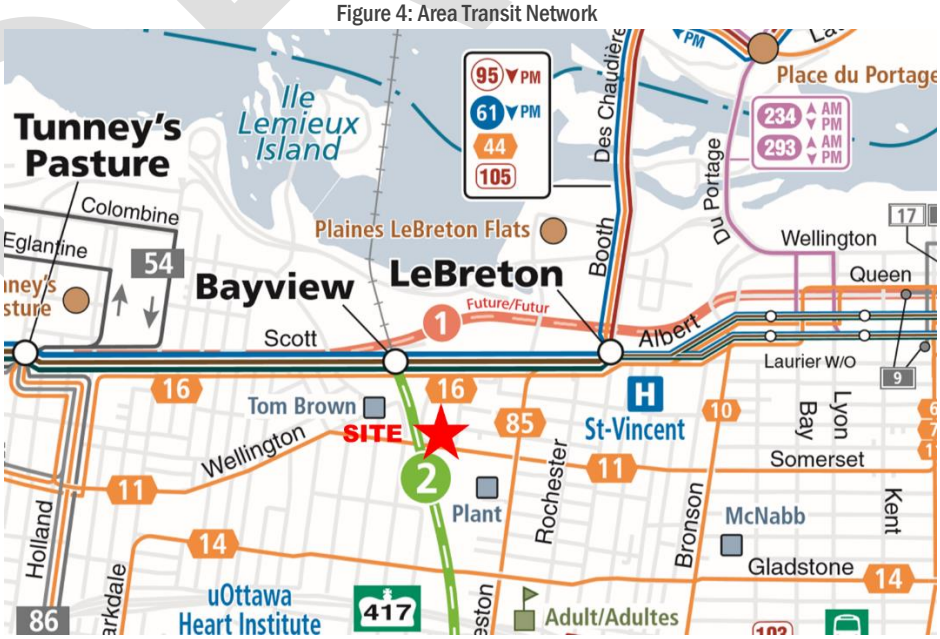
Within 500m radius of the proposed site, there are north-south as well as east-west multiuse pathways (MUPs). The Trillium Pathway serves as a major pathway to connect north-south cycling and walking paths, located 150 meters west of the project alongside the east of the Trillium Light Rail Tracks and accessible via a local passage way. The Trillium Pathway offers the shortest walking route to pedestrians going to Bayview Station and offers off-grade crossing at Albert Street, promoting safety. On the north side of Albert Street, there is an east-west major cycling and walking pathways which connects to the Trillium Pathway at Bayview Station. Somerset Street W provides on road spine route bike lane, and sidewalks on both sides of the street which will be accessed at grade once the building is finished. City Centre Avenue provides a sidewalk on the east side of the roadway only with short interruptions in sidewalk. It is assumed that a large percentage of pedestrians will use the Trillium Pathway to access public transit and other facilities north of site.

Figure 3: Cycling Network Study Area

2.2.3. TRANSIT NETWORK

Transit service within the vicinity of the site is currently provided by OC Transpo. Multiple routes serve this location as it is located less than 500m walk from Bayview Station, a major transit station which serves both north-south (Trillium Line) and east-west (Confederation Line). Currently, Albert Street has an east-west bus only priority lane. There is 24-hr transit service on weekday and weekend at Bayview Station. Bayview Station on Albert Street currently serves 34 different bus routes, while Somerset Street W adjacent to the project serves bus Route #11. The current transit area network is provided as **Figure 4**.

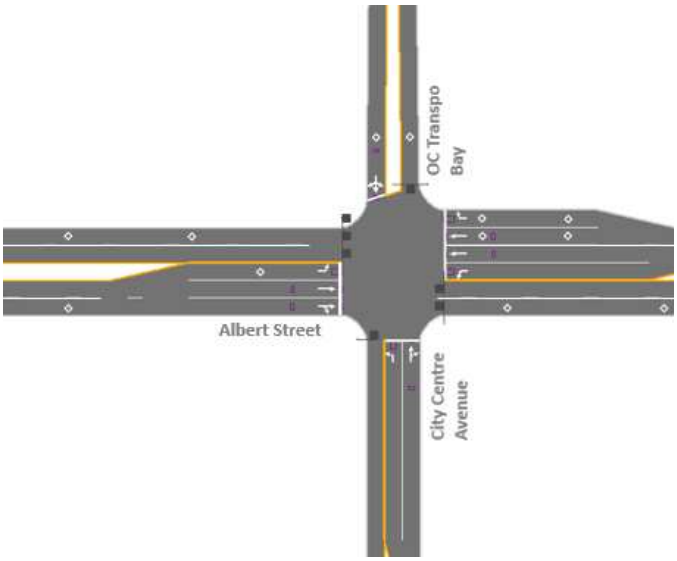
Figure 4: Area Transit Network



2.2.4. EXISTING STUDY AREA INTERSECTIONS

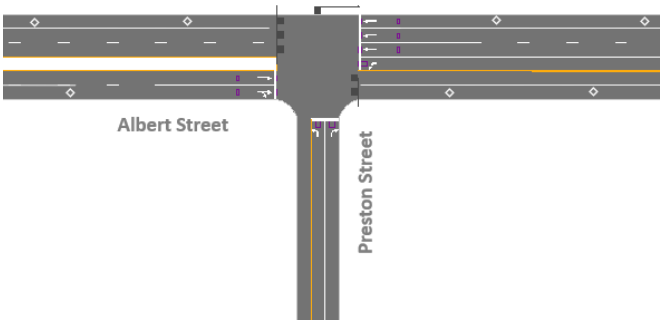
Albert/City Centre

The Albert/City Centre intersection is a signalized four-legged intersection. The eastbound approach consists of a transit only auxiliary left-turn lane, a general purpose through lane and a general-purpose auxiliary right-turn lane which doubles as a transit through lane. The westbound approach consists of a general-purpose left-turn lane and through lane and a transit through lane and auxiliary right-turn lane. The northbound approach consists of an auxiliary left turn lane and a right turn lane. The southbound approach consists of a single all movement lane. The northbound through and southbound movements are permitted by authorized vehicles only.



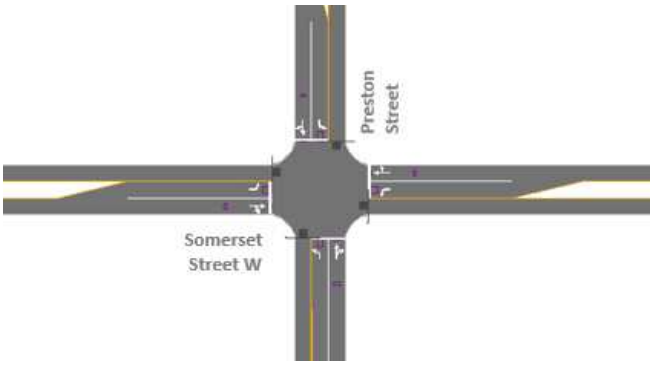
Albert/Preston

The Albert/Preston intersection is a signalized three-legged intersection. The eastbound approach consists of a general-purpose through lane and a general-purpose auxiliary right-turn lane which doubles as a transit through lane. The westbound approach consists of an auxiliary left-turn lane, two through lanes and a transit only through lane. The northbound approach consists of a left-turn lane and a right-turn lane. All movements are permitted at this location.



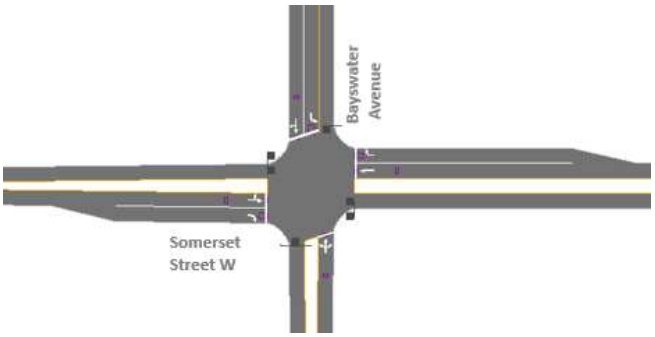
Somerset W/Preston

The Somerset/Preston intersection is a signalized four-legged intersection. All approaches consist of an auxiliary left-turn lane and a shared through-right lane. The right-turn-on-red is prohibited for all movements from 7am to 7pm.



Somerset W/Bayswater

The Somerset/Bayswater intersection is a signalized four-legged intersection. The east, west, and southbound approaches consist of an auxiliary left-turn lane and a shared through-right lane. The northbound approach consists of an all movement lane. All movements are permitted at this location.



2.2.5. EXISTING INTERSECTION VOLUMES

The existing peak hour traffic volumes within the study area were obtained from the City of Ottawa and are illustrated in Figure 5. All counts are the most recent data obtained from the City with the exception of Albert/Preston intersection. Year 2014 counts were used as they resemble the current layout of the intersection, a three-legged intersection, as opposed to the 2016 four-legged intersection used for the Booth Bridge work detour. The peak hour traffic volume count data is included as Appendix C. Note that all vehicular traffic to/from the site must use the City Centre/Albert intersection, and that Spruce Street does not provide vehicular connectivity to Preston Street. The Synchro model outputs for existing conditions for Albert/City Centre are summarized in Table 1 and are provided in Appendix D.

Figure 5: Existing Peak Hour Traffic Volumes

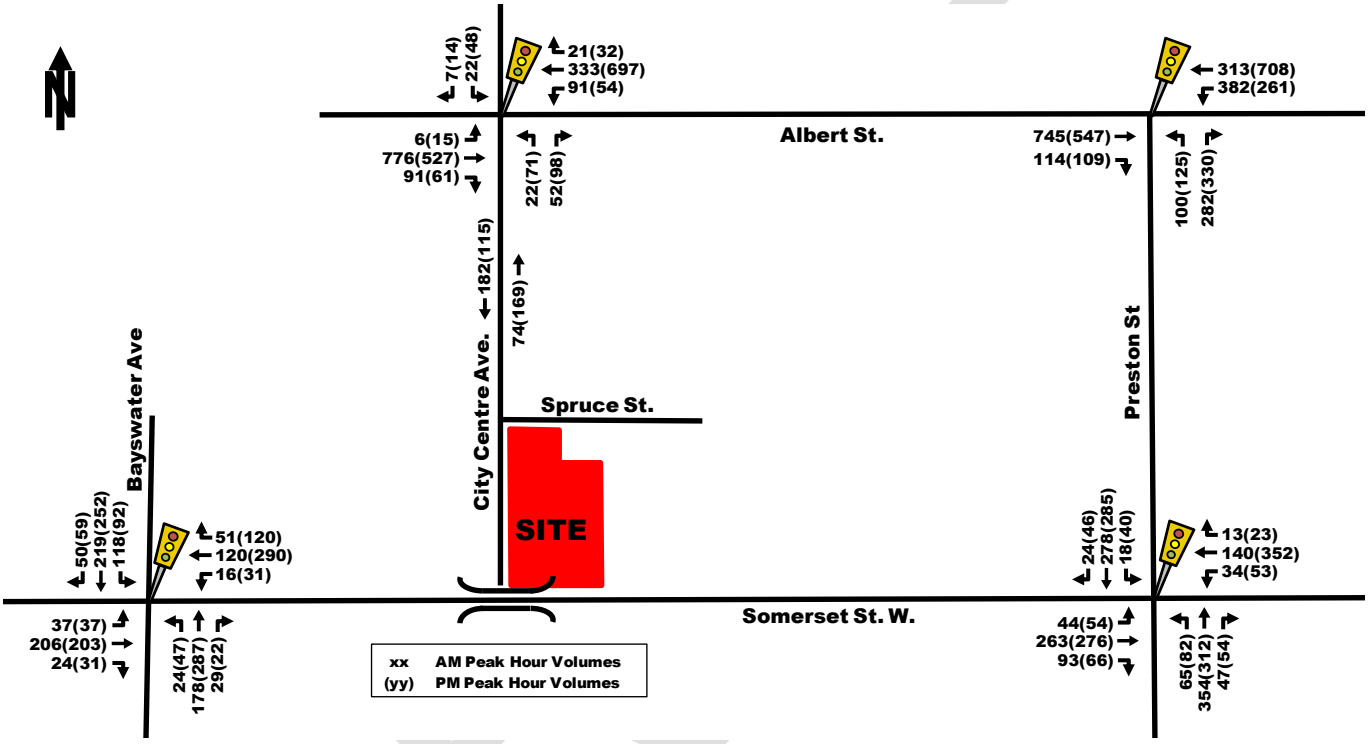


Table 1: Existing Performance at Albert/City Centre

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Albert/City Centre	A(A)	0.58(0.60)	EBT(WBT)	5.4(10.4)	A(A)	0.52(0.57)
Note: Analysis of signalized intersections assumes a PHF of 0.90 and a saturation flow rate of 1800 veh/h/lane.						

As seen in Table 1 the Albert/City Centre intersection overall operates at good Level of Service 'A' with modest delays.

2.2.6. EXISTING ROAD SAFETY CONDITIONS

Collision history for study area intersections and roads (2013 to 2017, inclusive) was obtained from the City of Ottawa. A total of 7 collisions were recorded in the 5 years of study. Most collisions (86%) involved only property damage, indicating low impact speeds, and 14% (one collision) involved personal injuries. The primary causes of collisions cited by police include; angle (43%) and turning movement (29%).

A standard unit of measure for assessing collisions at an intersection is based on the number collisions per million entering vehicles (MEV). At intersections within the study area, reported collisions have historically take place at a rate of:

- 0.15/MEV at the Albert/City Centre intersection;
- 0.28 /MEV at City Centre between Elm and Spruce; and,
- 0.88/MEV at City Centre between Spruce and end of road.

It is noteworthy that within the five-years of recorded collision data there were no collisions involving pedestrians or cyclists. The source collision data as provided by the City of Ottawa and related analysis is provided as Appendix E.

2.2.7. EXISTING DRIVEWAYS TO ADJACENT DEVELOPMENTS

There is a private driveway located 37m from the east property limit on Spruce that provides access to a condominium building with 21 surface parking spaces. Across the street from the proposed site are five driveways, two of which provide access to small commercial buildings with surface parking, while the remaining are private driveways. The small business on the north side of Spruce Street has parking for approximately 14 vehicles.

2.3. PLANNED CONDITIONS

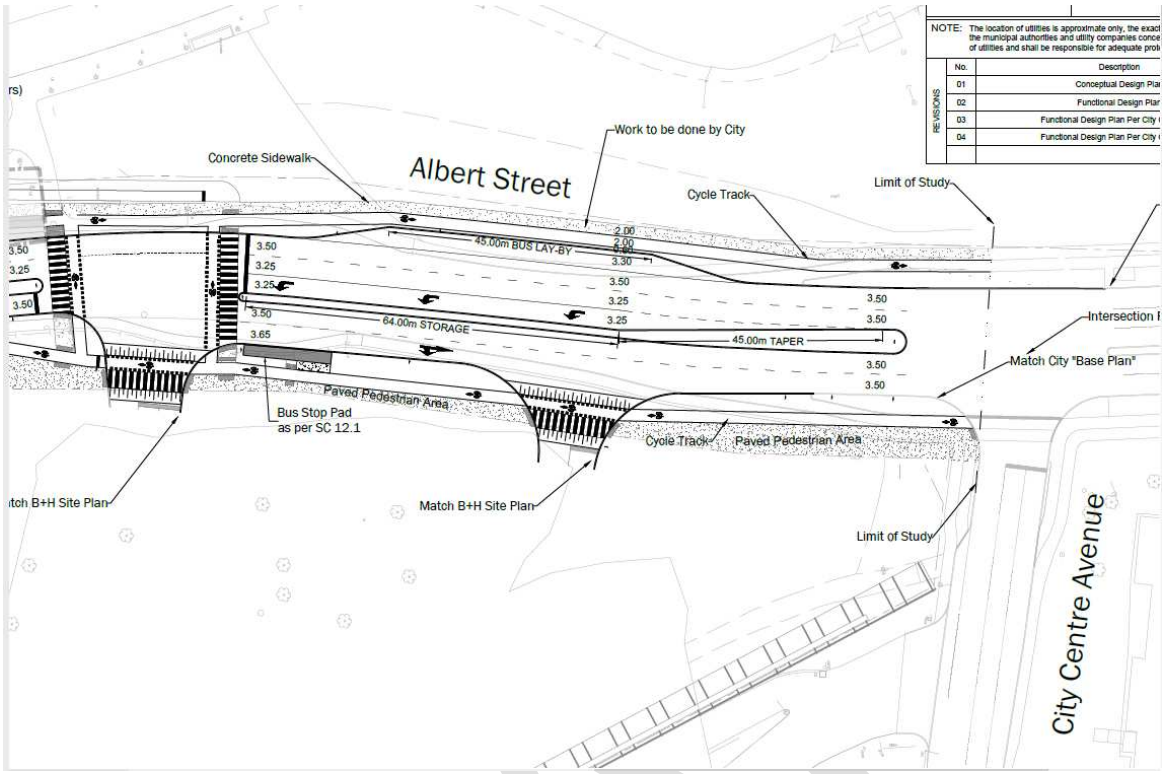
2.3.1. PLANNED STUDY AREA TRANSPORTATION NETWORK CHANGES

The City has recently prepared a "complete street" plan for Albert Street within the vicinity of the site. This plan is part of the Stage 1 LRT construction handover to accommodate active modes of travelling to/from the Bayview LRT station expected to be in operation before construction of this project begins. The bus only lanes will be converted to general vehicular traffic due to the opening of the Confederation Light Rail Transit Line which will remove most buses operating on Albert Street. The plan includes the following features:

- Cycle tracks along both sides of Albert Street;
- Paved pedestrian sidewalks on both sides of Albert Street
- Cross-rides and textured cross-walks at intersections;
- Addition of bus lay-by bay area and channelized left-turn lanes;
- Fully-protected intersections; and
- Double east-west through lanes for vehicle traffic at the Albert/City Centre intersection.

The proposed Albert Street intersection design is provided as **Figure 6**. Review of the City's design and the proposed Site Plan indicates that no changes to the City design are required.

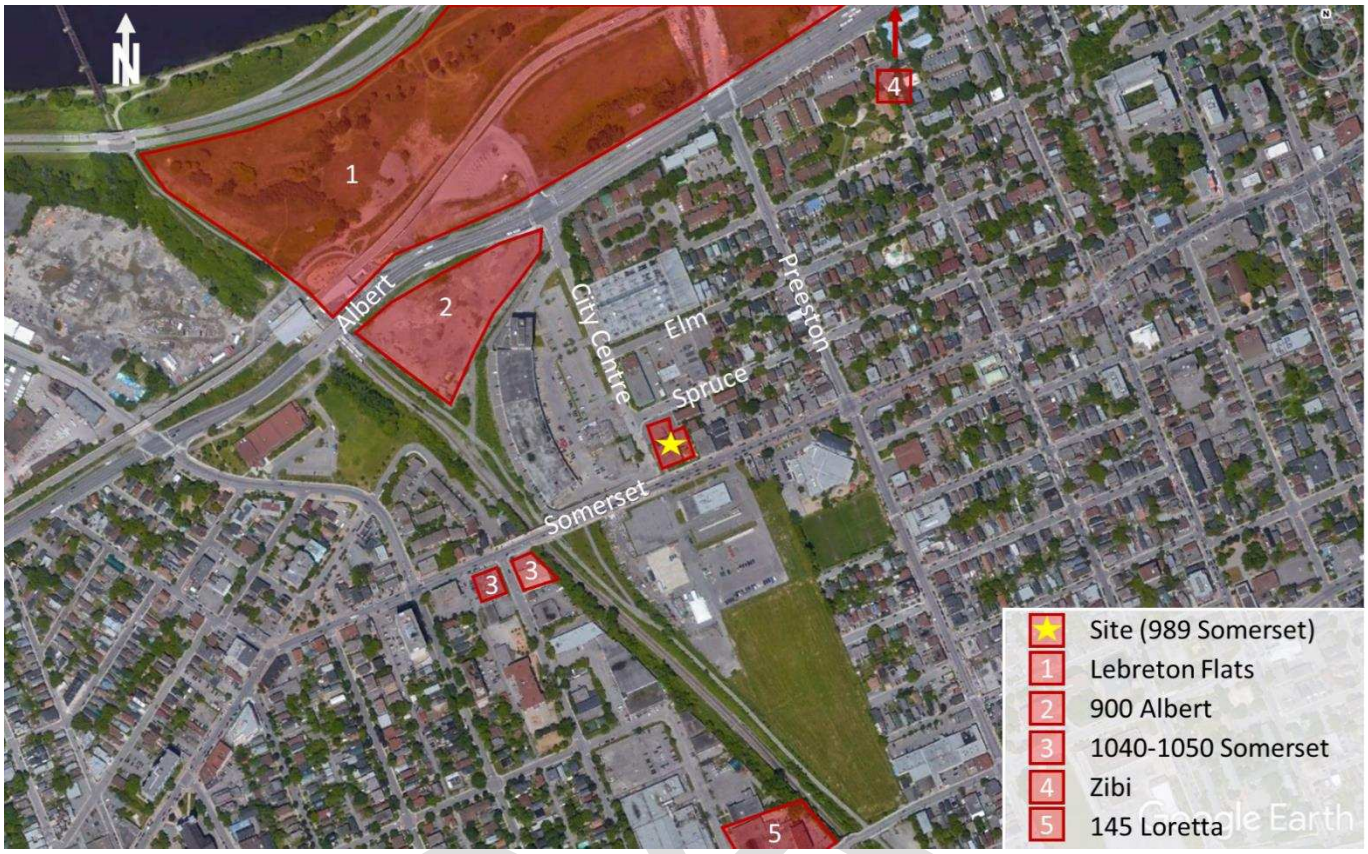
Figure 6: Albert Street Modifications



2.3.2. OTHER AREA DEVELOPMENT

According to the City's development application search tool, the following developments are planned within the vicinity of the subject site and are illustrated in **Figure 7**.

Figure 7: Other Area Developments



900 Albert Street

Three mixed-use residential, office and retail towers have been proposed at 900 Albert Street that are at 65, 56, and 27 storeys high. The Transportation Impact Assessment (prepared by Parsons) projected an increase in vehicle traffic of approximately 204 and 273 veh/h during both the morning and afternoon peak hours. The project will have direct access to Albert Street.

1040-1050 Somerset Street

Located 200 meters west of the site will be two new mixed-use developments composed of 609 residential units and 771 m^2 of commercial retail. Vehicle traffic from this development is not expected to affect traffic circulation within the study area as they would use Somerset as their main point of access.

Lebreton Flats

Until recently, the NCC was negotiating with the RendezVous LeBreton Group (RLG) to transform the 21-hectare site just west of the Parliament Buildings along the historic Ottawa River. The NCC ended discussions with RLG as of February 2019, and the future of this project is unknown at this time.

Zibi/Chaudière Islands

Windmill Development's proposed redevelopment plans of the former Domtar lands, called Zibi, entails approximately 1M ft^2 of mixed-use development on the Ontario side of the provincial border and approximately 2M ft^2 of mixed-use development on the Quebec side. The redevelopment is expected to occur in multiple phases over the next 15 to 20 years. Zibi is located approximately 1.5km to the northeast of the site, located just north of the Lebreton Flats community development.

Parsons completed a Multi-Modal Transportation Impact Study for the proposed development in April 2014. The study addressed the form and function of the adjacent arterial roads, identified the broad impacts of proposed reduced road capacity and increased traffic demand on interprovincial travel, confirmed the site vehicle access points and their functional requirements, and highlighted the importance of achieving increased transit, bike and walk mode splits and recommended the facilities needed to achieve. At full build-out, the redevelopment is expected to generate between 3,000 and 3,500 person-trips during the morning and afternoon peak hours. The estimated 900 new vehicle trips during the critical afternoon peak hour will be distributed in all directions within both provinces, and traffic volumes on the street network near 989 Somerset Street are likely to be impacted to a small degree as a result.

145 Loretta/951 Gladstone

Three mixed use residential, office and retail towers have been proposed at 145 Loretta/951 Gladstone that are at 41, 35, and 30 storeys high. Vehicle traffic from this development is not expected to affect traffic circulation within the study area as it is located over 1.6km by driving means.

2.4. STUDY AREA

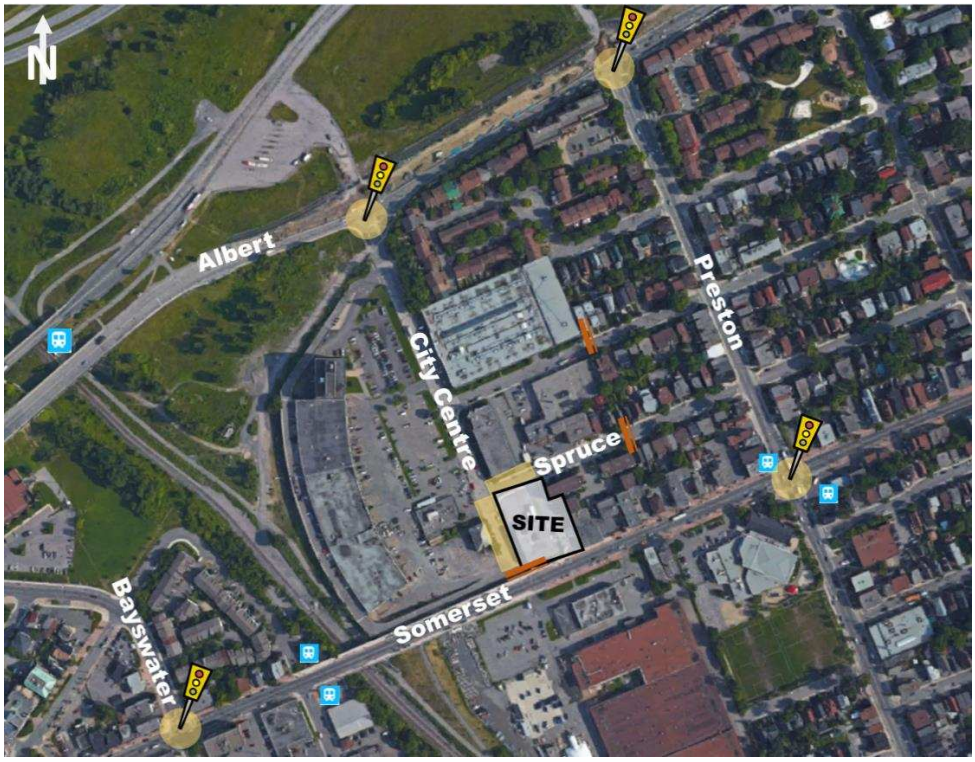
2.4.1. TRANSIT

As mentioned previously, transit will be served within the area with a light rail transit system, Confederation Line for east-west trips and Trillium Line for southbound trips. Additionally, Somerset Street W will be served by Route #11.

2.4.2. INTERSECTION DESIGN

Due to the proximity of the subject development to rapid transit and cycling facilities, it is expected that site traffic generation will be low, thereby reducing the requirements for analysis and design of study area intersections. The proposed study area is depicted in **Figure 8**.

Figure 8: Study Area



- Albert/City Centre;
- Albert/Preston;
- Somerset/Preston;
- Somerset/Bayswater;
- City Centre adjacent to site; and,
- Spruce Street adjacent to site

2.5. TIME PERIODS

Primarily residential trips will be generated by the proposed development; therefore, the appropriate time periods to be assessed were weekday morning and afternoon commuter peak hours.

2.6. HORIZON YEARS

For the purposes of the operational analysis it is assumed that the subject development will be fully built and occupied by 2020. This will require the analysis of 2020 and 2025 horizon years.

2.7. EXEMPTION REVIEW

Based on the City's TIA guidelines and the subject site, the following modules/elements of the TIA process, summarized in **Table 2**, are recommended to be exempt in the subsequent steps of the TIA process:

Table 2: Exemptions Review Summary

Module	Element	Exemption Consideration
4.1 Development Design	4.1.3 New Streets Network	Not required for applications involving site plans.
4.2 Parking	4.2.2 Spillover Parking	The on-site parking is expected to meet By-Law requirements.
4.8 Review of Network Concept	All elements	The site is not expected to generate 200 trips more than the established zoning. This will be confirmed in Step 3.
4.4 Access Intersection Design	4.4.3 Intersection Design	Intersection MMLoS and Synchro analysis will only be completed for existing conditions as there is only 20 new veh/h generated by the proposed development, which is considered negligible. Background traffic associated with the 900 Albert development has already been analyzed within its associated TIA.
4.9 Intersection Design	4.9.2 Intersection Design	Intersection MMLoS and Synchro analysis will only be completed for existing conditions as there is only 20 new veh/h generated by the proposed development which is considered negligible. Background traffic associated with the 900 Albert development has already been analyzed within its associated TIA.

3. FORECASTING REPORT

3.1. DEVELOPMENT GENERATED TRAVEL DEMAND

3.1.1. TRIP GENERATION AND MODE SHARES

Appropriate trip generation rate for the proposed development consisting of approximately 195 residential units[1] was obtained from the City's 2009 TRANS Trip Generation – Residential Trip Rates. **Table 3** summarizes the trip generation rates.

Table 3: TRANS Residential Trip Rates

Land Use	Data Source	Trip Rates	
		AM Peak	PM Peak
High Rise Apartment	222	T = 0.17(du)	T = 0.16(du)
Note: T = Average Vehicle Trip Ends; du = dwelling units			

[1] The most current site plan reflects 191 units. The ensuing analysis is based on a slightly higher unit count of 195 units.

Using the TRANS Trip Generation Rates for apartment and townhouse uses, the initial estimate of vehicle trips generated by the proposed residential development was projected. The results are summarized in **Table 4**.

Table 4: Projected Vehicle Trip Generation – TRANS Model

Land Use	Area	AM Peak (Veh/h)			PM Peak (Veh/h)		
		In	Out	Total	In	Out	Total
High Rise Apartments	195 units	7	26	33	19	12	31
Total 'New' Auto Trips		**7**	**26**	**33**	**19**	**12**	**31**

As shown in **Table 4**, a total of approximately 30 to 35 veh/h are projected to travel to/from the proposed development during both the weekday morning and afternoon commuter peak hours prior to site-specific adjustments. The vehicle trips shown in **Table 4** for the proposed site were converted to total person trips using the auto modal share values in Table 3.6 of the TRANS report. Total person-trip generation values were then reduced to non-auto modal shares for a site within a transit-oriented development (TOD) zone. The modal share values for the apartment and townhouse land uses within the proposed development are summarized in **Table 5**.

Table 5: TRANS Modal Site Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	15%	4	15	19	12	8	20
Auto Passenger	5%	2	4	6	3	3	6
Transit	65%	18	61	79	54	34	88
Non-motorized	15%	4	14	18	13	8	21
Total Person Trips	100%	28	94	122	82	53	135
Total 'New' Auto Trips		**4**	**15**	**19**	**12**	**8**	**20**

As shown in **Table 5**, based on TRANS Trip Generation and TOD mode shares, the proposed site is projected to generate approximately 120 to 135 new person-trips in the weekday morning and afternoon peak hours respectively. The increase in new two-way transit trips is estimated to be 80 to 90 trips per hour, and the new bike/walk trips is approximately 20 trips per hour.

The total amount of 'new' vehicle traffic to the study area is projected to be 20 veh/h two-way total during the AM and PM peak hours. This amount of traffic equates to approximately 1 new vehicle every 3 minutes during peak hours and is not considered a significant increase in traffic. Its impact on the operation of study area intersections will be negligible. Even if TOD mode share goals are not reached, it is anticipated that approximately 1 vehicle will leave or enter the site every 2 minutes during the peak hours, which is also not considered a significant increase in traffic.

3.1.2. MODE SHARES

Due to the site's proximity to the Bayview Station (less than 600m), TOD mode shares are applied. The mode shares for a development located in a TOD are illustrated in **Table 6**. These mode shares will also be used for the 2025 horizon year.

Table 6: Mode Share Targets for Development in TOD

Travel Mode	Mode Share Target	Rationale
Transit	65%	Development is located within 600 m of a future LRT station, making it a Transit-Oriented Development (TOD) which have transit targets of 65%.
Walking	10%	This is consistent with the City's TMP, TOD areas and the existing TRANS trip-generation report.
Biking	5%	This is consistent with the City's TMP, TOD areas and the existing TRANS trip-generation report.
Auto Passenger	5%	This is consistent with TOD targets.
Auto Driver	15%	This is consistent with TOD targets.

3.1.3. TRIP DISTRIBUTION AND TRIP ASSIGNMENT

Given the low projected number of vehicle trips (20 veh/h two-way total) projected to be generated by the proposed development, the future impact on the existing roadway network is considered negligible. All vehicular traffic will go through Albert/City Centre intersection which currently operates at good LoS 'A' and has capacity available. As such, no further traffic assessment is included herein.

3.2. BACKGROUND NETWORK TRAVEL DEMANDS

3.2.1. TRANSPORTATION NETWORK PLANS

See Section 2.3.1.

3.2.2. BACKGROUND GROWTH

The following background traffic growth (summarized in **Table 7**) was calculated based on historical traffic count data (years 2009, 2013 and 2014) provided by the City of Ottawa at the Albert/Booth intersection east of the site. Detailed background traffic growth analysis is included as Appendix F.

Table 7: Albert/Booth Historical Background Growth (2009-2014)

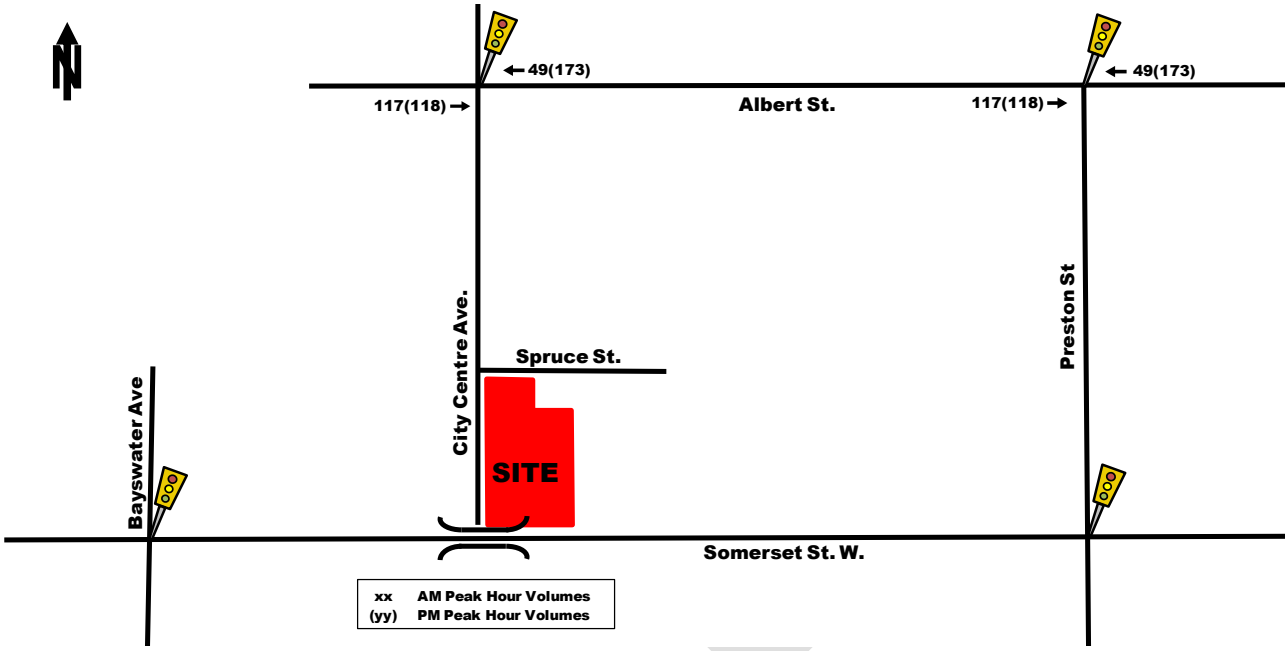
Time Period	Percent Annual Change				
	North Leg	South Leg	East Leg	West Leg	Overall
8 hrs	-5.27%	-8.92%	-9.20%	-0.09%	**-5.30%**
AM Peak	-3.72%	-6.47%	-3.24%	3.37%	**-2.20%**
PM Peak	-9.47%	-10.91%	-11.59%	-4.83%	**-8.95%**

As shown in **Table 7**, Albert Street, at the Albert/Booth intersection, has experienced approximately 2 to 9% overall annual decrease in traffic within recent years. This is consistent with the decline in vehicular traffic outline in the TMP. Rather than use a negative growth rate, a more conservative growth rate of 0% was assumed as advised by the City of Ottawa Modelling Group.

3.2.3. OTHER DEVELOPMENTS

As described in Section 2.3.2, the future 900 Albert development proposes accesses to Albert Street in the vicinity of the study area intersections. As such, the expected site generated traffic volumes associated with this development are shown in **Figure 9** below and will be included in the Strategy Report.

Figure 9: 900 Albert Site Generated Traffic



3.3. DEMAND RATIONALIZATION

Based on the foregoing analysis of trip-generation and background traffic growth, the site-generated traffic volumes are considered negligible as only 1 vehicle two-way total is projected every 3 minutes during the peak hours. As such, and as the existing Albert/City Centre intersection operates at a very good Level of Service 'A', no further traffic assessment is included herein.

4. STRATEGY REPORT

4.1. DEVELOPMENT DESIGN

Location of Transit Facilities

The subject site is approximately 200m walking distance from bus stops located on Somerset Street and Preston Street and approximately 500m walking distance from the Bayview LRT Station, where the Trillium and the Confederation Lines meet.

Pedestrian Routes and Facilities

The building will have at-grade accesses directly on to City Centre Avenue from the first floor and Somerset Street from the second floor. Sidewalks are located on both sides of Somerset Street (east-west arterial). There are no sidewalks on the west side of City Centre Drive and the sidewalks on the east side are not continuous. However, the Trillium Pathway is located 150m to the west of the building and provides a grade separated north-south paved multi-use pathway. Pedestrians are more likely to access Bayview Station via the Trillium Pathway compared to City Centre Avenue as it is a shorter walking distance and eliminates road crossings. No internal walkways or site circulation is required.

Bicycle Parking

The proponent is providing bicycle parking spaces at a rate of 0.5 per unit which equates to 98 parking spaces, meeting the City's By-Law requirements. The majority of bicycle parking spaces are provided indoors in a secure, well-lit area located in the underground parking garage.

Vehicle Access

The proposed development access will utilize the existing curb depression used by the existing building on Spruce Street.

With regard to on-site circulation, the proposed parking lot is laid out such that two-way traffic can be efficiently accommodated. A Site Plan of the underground parking has been provided and meets the City's minimum By-Law requirements. The ramp width to the underground parking lot is 6m, meeting the minimum requirement. Drive aisle widths accommodating the 2-way vehicle traffic meet the minimum width of 6m. The ramp providing access to the lower level parking has proper transition grades and a ramp grade between 10% to 15%. The ramp access does not exceed a 2% or less transition grade within 6m from the property line.

Garbage pick up will take place on-site. The garbage bins are located at ground level in a garbage room with access to/from Spruce Street.

4.2. PARKING SUPPLY

The subject site is located within 600 meters walking distance to the Bayview LRT transit station. Considering Sections 101(2), 102(5), 103(1) and 103(2) of the Zoning By-Law 2008-250-Consolidation-Part 4, the vehicle parking requirements have been estimated and summarized in **Table 8**. **Table 9** summarizes the bicycle parking requirements as per City of Ottawa Zoning By-Law-Part 4, sections 100-114.

Table 8: Vehicle Parking Space Supply

Land Use		Rate per Unit		Required Vehicle Spaces			Proposed Spaces
		Residential	Visitor	Residential	Visitors	Total	
Residential	195 units	0	0.1	0	20	20	178

Table 9: Bicycle Parking Requirements

Land Use		Rate per Units	Bicycle Spaces	
			Required	Proposed
Residential	195 units	0.5	98	98

As shown in **Table 8** and **Table 9**, the proposed development is required to provide a minimum of 20 vehicle parking spaces and 98 bicycle parking spaces. With a total of 178 proposed underground and surface parking spaces and 98 bicycle parking spaces, the proposed development is meeting City requirements.

4.3. BOUNDARY STREET DESIGN

The boundary streets for the development are City Centre Avenue, Somerset Street, and Spruce Street. The existing roadways, geometry consists of the following features.

- City Centre Avenue:
  - 1 vehicle travel lane in each direction;
  - 1.8m sidewalk on east side of the roadway only; and,
  - Less than 3,000 vehicles per day.
- Somerset Street
  - 1 vehicle travel lane in each direction;
  - 1.8 - 3m sidewalks on both sides of the roadway;
  - On-road parking bays; and,
  - More than 3,000 vehicles per day.
- Spruce Street
  - 1 vehicle travel lane in each direction;
  - 1.8m sidewalks on both sides of the roadway; and,

- Less than 3,000 vehicles per day along Spruce Street.

The multi-modal Level of Service analysis for the subject road segments adjacent to the site is summarized in **Table 10** with detail analysis provided in Appendix G.

Table 10: MMLOS – Boundary Street Segment

Road Segment	Level of Service							
	Pedestrian		Bicycle (BLoS)		Transit (TLoS)		Truck (TkLoS)	
	PLoS	Target	BLoS	Target	TLoS	Target	TkLoS	Target
City Centre between Spruce and Somerset	F	A	A	B	-	N/A	-	N/A
Somerset between Preston and Breeze Hill	B	A	C	B	D	D	C	D
Spruce between City Centre and Preston	B	A	A	B	-	N/A	-	N/A

Given the development's proximity to a future LRT Station, the target levels of service for pedestrians and cyclists are high ('A' to 'B'). The transit Level of Service is met on Somerset Street. As there is no transit service on Spruce Street and City Centre Avenue, there is no TLoS. The truck Level of Service is met given the existing geometry and lane widths.

Pedestrian PLoS targets were not met on any boundary street. The triggers were different in each case: high volumes on Somerset, the absence of a boulevard on Spruce, and the lack of a west side sidewalk on City Centre. MMLOS targets would be met if these constraints/triggers were resolved, but they may not be feasible in the context of this development. In this case, the proponent is planning to accommodate pedestrians by building a sidewalk along the site frontage on City Centre Avenue, which improves the PLoS to 'B'.

Cyclist BLoS targets were met on City Centre Avenue and Spruce Street. Increasing the bike lane width by 0.25m on Somerset Street would improve the Level of Service to BLoS 'B', thus meeting the target. This can be considered at the time of roadway reconstruction, if feasible.

4.4. ACCESS INTERSECTION DESIGN

Site access will use an existing 6.5m driveway to Spruce Street located approximately 300m south of the Albert/City Centre intersection. This location is acceptable with respect to the City's Private Approach By-Law. Regarding the design, the proposed surface and underground parking lot is laid out such that two-way traffic can be efficiently accommodated. As there are only approximately 20 two-way vehicle trips projected in both peak hours, no significant changes to existing intersection operations are expected.

4.5. TRANSPORTATION DEMAND MANAGEMENT

The TDM checklist is attached as Appendix H. Some of the TDM measures that the proponent is providing/considering are as follows:

- Sidewalks provided along the site's street frontage;
- The amount of bicycle parking meets the By-Law minimum requirement;
- Interior bike storage provided with access provided adjacent to the surface parking lot;
- Safe and direct connections for pedestrians to nearby transit stops and Bayview LRT Transit Station using multi-use pathways.

Given the type of development and its location, a high amount of non-auto trips is expected to be generated by the proposed development and that transit shares will increase, and auto shares will decrease over time for the subject site.

4.6. ROUTE CAPACITY

It is projected that 80 and 90 'new' two-way transit passenger trips will be generated for the AM and PM peak hours, respectively. Considering the envisioned Confederation LRT Line is projected to operate with a capacity of 600 passengers per train and 12 trains per hour per direction during peak hours, it is anticipated that the future transit network will have sufficient capacity to accommodate the projected transit demand.

4.7. INTERSECTION DESIGN

There are only approximately 20 two-way vehicle trips projected in both peak hours which equates to approximately one vehicle every 3 minutes. Given the low number of vehicle trips projected to be generated by the proposed development, combined with the very good Level of Service operations at the Albert/City Centre intersection, the future roadway network and intersection impact is considered negligible. As such, no further traffic assessment is included herein.

4.7.1. MULTI-MODAL LEVEL OF SERVICE

The Albert/City Centre intersection is within 600 meters of high-frequency transit. The applicable target levels of service for pedestrians and cyclists is PLoS 'A' and BLoS 'B', respectively. The MMLOS analysis for the existing signalized intersection Albert/City Centre within the study area is summarized in **Table 11**, with detailed analyses provided in Appendix I. As stated in the MMLoS Guidelines, only signalized or roundabout intersections are considered for the intersection Level of Service measures.

Table 11: MMLOS – Albert/City Centre

Intersection	Level of Service			
	Pedestrian (PLoS)		Bicycle (BLoS)	
	PLoS	Target	BLoS	Target
Albert/City Centre	D	A	A	B

As shown in **Table 11**, the bicycle target Level of Service is met at the Albert/City Centre intersection. However, the pedestrian target Level of Service is not met. Pedestrians have to cross 4 to 5 lanes of traffic when crossing Albert Street resulting in the poor PLoS. Pedestrians are encouraged to use the grade separated multi-use Trillium Pathway which would eliminate a road crossing at Albert Street. Furthermore, it provides shorter walking distances from site to Bayview Station and to connecting multi-use pathways and sidewalks on Albert Street.

5. FINDINGS AND RECOMMENDATIONS

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

- A residential development comprised of approximately 195 units in a 15-storey apartment is being proposed at 989 Somerset Street W with an estimated build-out in year 2020 replacing an existing furniture and antiques store and a lighting store;
- The proposed development is projected to generate 'new' vehicle volumes of approximately 20 veh/h two-way total during the weekday morning and afternoon peak hours. As the increase in vehicle traffic is minimal, and the existing Level of Service at the Albert/City Centre intersection is an excellent LoS 'A', no adverse off-site impacts are expected;
- A total of 178 parking spaces are proposed which meet the City's minimum and maximum parking requirements for a development located in Area Z;
- 98 bicycle parking spaces are proposed which meets the minimum bicycle parking spaces outlined in the City's By-Law requirements;

- Site access is proposed via the existing driveway connection to Spruce Street located 300m south of the Albert/City Centre intersection;
- TDM measures being implemented with the development include:
    - 98 bicycle parking spaces, the majority of which are within the building; and
    - A sidewalk along the site frontage on City Centre Avenue which increases the PLoS to a 'B' from current PLoS 'F'.
- The MMLOS road segment analysis shows that future conditions on boundary streets do not meet MMLOS area targets for pedestrians. Providing wider sidewalks if feasible, with a boulevard would improve the Level of Service to PLoS 'A' for Spruce Street and City Centre Avenue. Increasing the width of the bike lane on Somerset Street by 0.25m if feasible would improve the cycling Level of Service BLoS 'B', thus meeting the targets; and
- The MMLOS intersection analysis shows that Albert/City Centre intersection does not meet MMLOS area targets for pedestrians with PLoS of 'D' and target of 'A'. Pedestrians are encouraged to use the grade separated multi-use Trillium Pathway which eliminates a road crossing at Albert Street and provides shorter walking distances from the site to each of the Bayview Station, to connecting multi-use pathways, and to sidewalks on Albert Street.

Based on the foregoing findings, this report satisfies the TIA requirements for 989 Somerset and the Site Plan is recommended from a transportation perspective.

Prepared By:

Juan Lavin, E.I.T.

Reviewed By:

Ronald Jack, P.Eng.
Senior Transportation Engineer

Appendix A

City Comments

Comments from Wally – 989 Somerset Forecasting

Transportation Engineering Services

Development address appears to also encompass 158 Spruce Street West - which is not mentioned in the report and should be included.

We confirmed with land management that 158 Spruce will not be part of this project and there is likely an error on City's Development Application website.

The proposed development at 145 Loretta Avenue North / 951 Gladstone Avenue does not appear to have been considered as a neighbouring development that could impact future background traffic. This development should be included in the report.

The development has been included in section 2.3.2. Note: this development will be 1.67kms away for those driving.

In Section 3.2.1 there is a small error, it mentions Section 2.2 when it should be referring to Section 2.3.1 instead.

Noted, corrections made.

Traffic Signal Operations

Given the site is accessible to vehicles only through the intersection of Albert Street and City Centre, total traffic analysis should be provided for this intersection for both signalized and un-signalized scenarios. Although the impacts due to vehicle volumes are quite low, the Transit trips are high and most users would be accessing the Station on Albert St. This would increase pedestrian activity at Albert & City Centre (if still signalized) and/or the 900 Albert proposed signal. A high number of pedestrian actuations would in fact have a greater effect on operations (vs the signal cycling to service ~ 33 veh per hour).

Sensitivity tests were completed in Synchro with Albert/City Centre or 900 Albert access as a signalized intersection, and the results showed no significant change in level of operation when maxing out ped calls. Even if a higher percentage of pedestrians was assumed to use City Centre for a more conservative sensitivity test, the number of pedestrians in the existing traffic counts (13 in AM, 26 in PM), plus development generated were not shown to create any significant level of service changes.

Furthermore, the site is only expected to generate approximately 80 and 90 transit users in the AM and PM respectively. It is anticipated that most transit users will use the Trillium Pathway located approximately 150 meters west of the site, which offers grade separated crossing at Albert Street and a more direct route to the LRT Station (more than 100m shorter route than walking via City Centre).

An additional traffic analysis scenario, based on non-TOD mode shares, should be included in the submission along with the TOD projected modal share scenario. This would help to identify any interim measures required to improve on operations/safety until high transit and active modes are achieved. It would also help to identify locations

that require close monitoring in the interim until/or if high transit shares are not achieved.

Noted, revisions made to section 3.1.1. Note: Even with non-TOD mode shares, less than one vehicle trip will be generated per minute during peak hours.

The stated decline in traffic at Albert Street and Booth Street should be reviewed in more detail. The background traffic analysis is questionable with the use of a count conducted on a Friday (August 29th, 2014) and the exclusion of an August 16th, 2012 count in the analysis. Include all traffic counts in Appendix B.

A background growth rate of 0% will be used as advised by the Transportation Modelling Group at the City.

While the more recent 2017 count does not reflect typical east/west traffic due to the current Scott Street / Albert Street detour, north/south volumes are significantly higher in this count than the 2014 count and in line with 2009, 2012 and 2013 counts.

Noted, volumes updated accordingly.

Considering the low use of vehicles assumed to and from the site, during Analysis clarify pedestrian and cycling connections to the MUP and Somerset Street West from the site within the TIA document. Note - east side sidewalk on City Centre is not continuous from the site to the intersection of Albert Street and City Centre.

Noted, revisions made in section 2.2.2.

Section 2.2.1 should also address Elm Street where vehicle access to Preston Street is also closed.

Noted, section 2.2.1 updated accordingly.

General

Somerset Street W is designated as an Arterial road within the City's Official Plan with a ROW protection of 20.0 metres. Note: Maximum land requirement from property abutting existing ROW (0.90 m). Subject to widening/easement policy.

A 3.0 metres x 3.0 metres sight triangle is required at the intersection of City Centre Avenue and Spruce Street and is to be shown on all drawings.

The concrete sidewalk is to meet City standards and be 1.8 metres minimum in width and be continuous along property frontage and depressed through the proposed access (please refer to the City's sidewalk and curb standard drawing SC7.1).

Ensure that the driveway grade does not exceed 2-6% within the private property for a distance of 9.0 metres from the highway line; see Section 25 (t) of the Private Approach By-Law #2003-447. Any grade exceeding 6% will require a subsurface melting device.

Underground access ramp shall be minimum 6.7 metres wide for 2-way traffic.

Acknowledged.

Appendix B

Screening Form

PARSONS

1223 Michael Street, Suite 100, Ottawa, Ontario, K1J 7T2
P: +1 613.738.4160 I F: +1 613.739.7105 I www.parsons.com

City of Ottawa 2017 TIA Guidelines

TIA Screening Form

Date	18-Jan-19
Project	989 Somerset Street W TIA
Project Number	477039

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

Module 1.1 - Description of Proposed Development	
Municipal Address	989 Somerset Street
Description of location	Located on the north side of Somerset Street, at the corner of City Centre Avenue and Spruce Street
Land Use	Residential building
Development Size	15 storey residential building totalling 191 units; underground and surface parking provided
Number of Accesses and Locations	Vehicle access proposed to Spruce Street with additional pedestrian access to Somerset Street W.
Development Phasing	Single Phase
Buildout Year	2020
Sketch Plan / Site Plan	See attached

Module 1.2 - Trip Generation Trigger		
Land Use Type	Townhomes or Apartments	
Development Size	191	Units
Trip Generation Trigger Met?	Yes	

Module 1.3 - Location Triggers		
Development Proposes a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit, or Spine Bicycle Networks (See Sheet 3)	No	Pedestrian access on Somerset Street and Spruce Street. Vehicle access on Spruce Street only.
Development is in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone. (See Sheet 3)	Yes	
Location Trigger Met?	Yes	

Module 1.4 - Safety Triggers		
Posted Speed Limit on any boundary road	<80	km/h
Horizontal / Vertical Curvature on a boundary street limits sight lines at a proposed driveway	No	
A proposed driveway is within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions) or within auxiliary lanes of an intersection;	No	Albert/City Centre intersection 250m north of proposed driveway on Spruce Street
A proposed driveway makes use of an existing median break that serves an existing site	No	
There is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development	No	
The development includes a drive-thru facility	No	
Safety Trigger Met?	No	

Appendix C

Traffic Counts

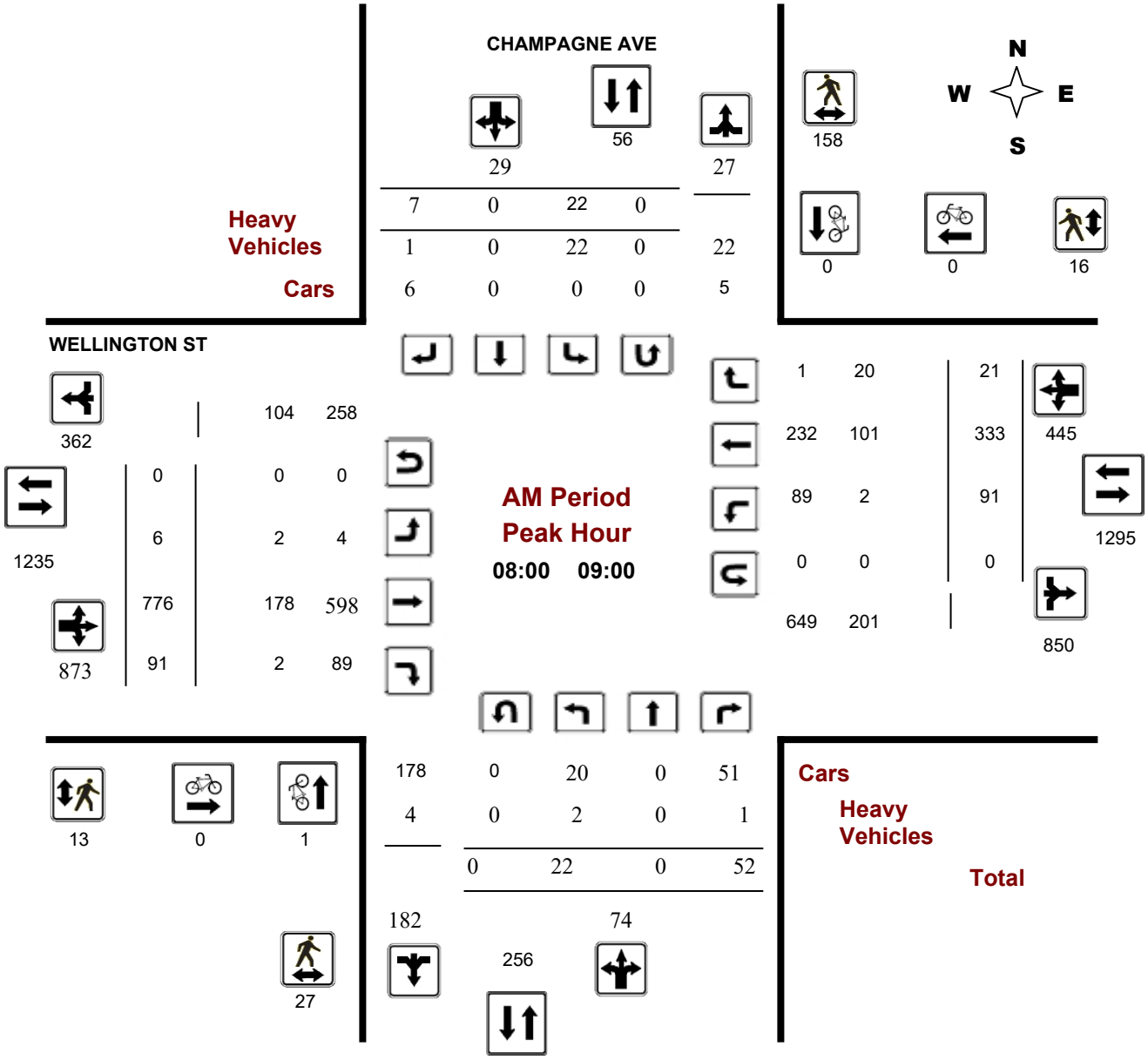
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CHAMPAGNE AVE @ WELLINGTON ST

Survey Date: Wednesday, September 07, 2016 **WO No:** 36275

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



Comments ALBERT ST AND CITY CENTRE DR

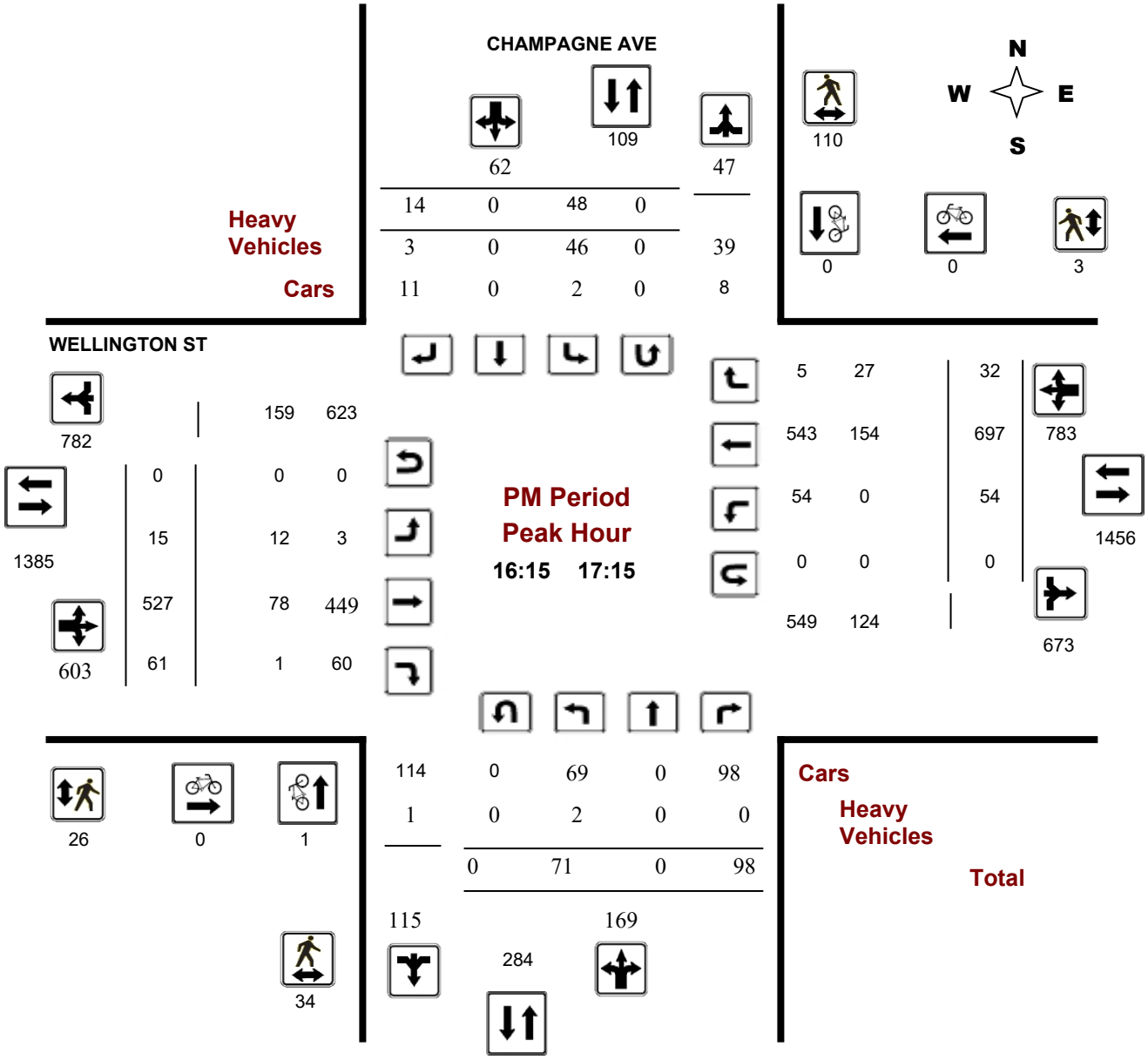
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CHAMPAGNE AVE @ WELLINGTON ST

Survey Date: Wednesday, September 07, 2016 **WO No:** 36275

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



Comments ALBERT ST AND CITY CENTRE DR

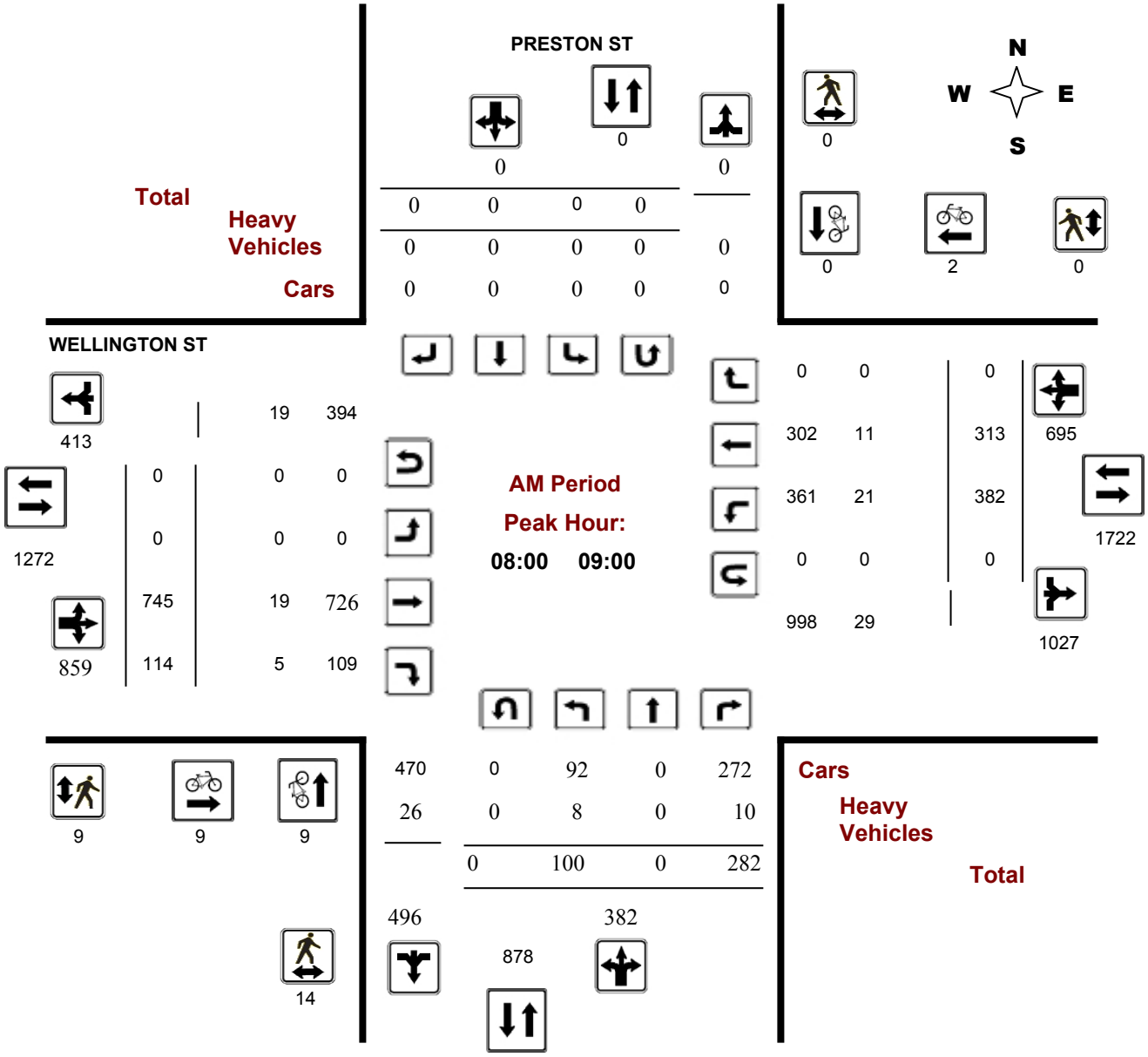
Public Works - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

PRESTON ST @ WELLINGTON ST

Survey Date: Wednesday, April 02, 2014
Start Time: 07:00

WO No: 29661
Device: Miovision



Comments

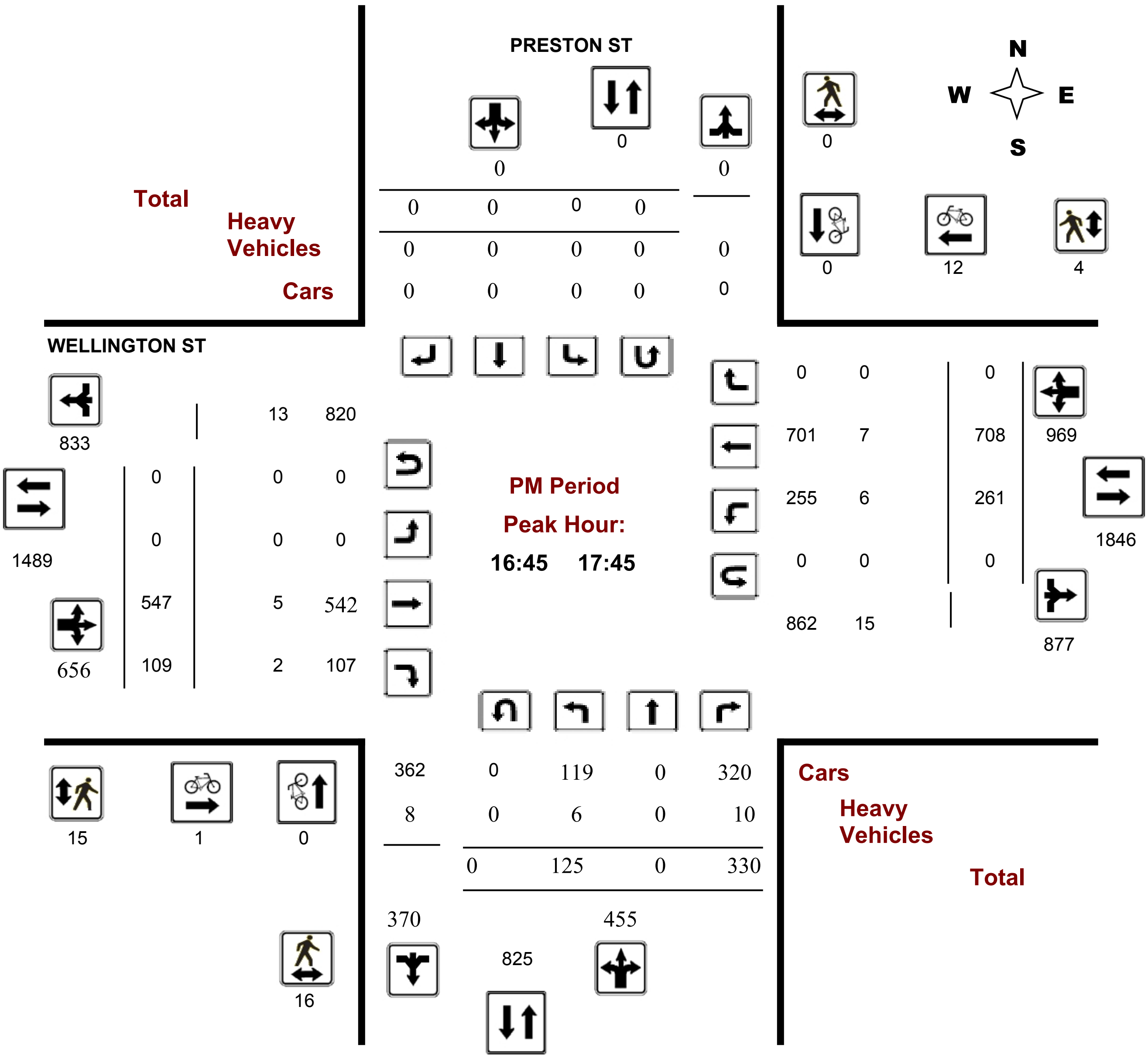
Public Works - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

PRESTON ST @ WELLINGTON ST

Survey Date: Wednesday, April 02, 2014 **WO No:** 29661

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



Comments

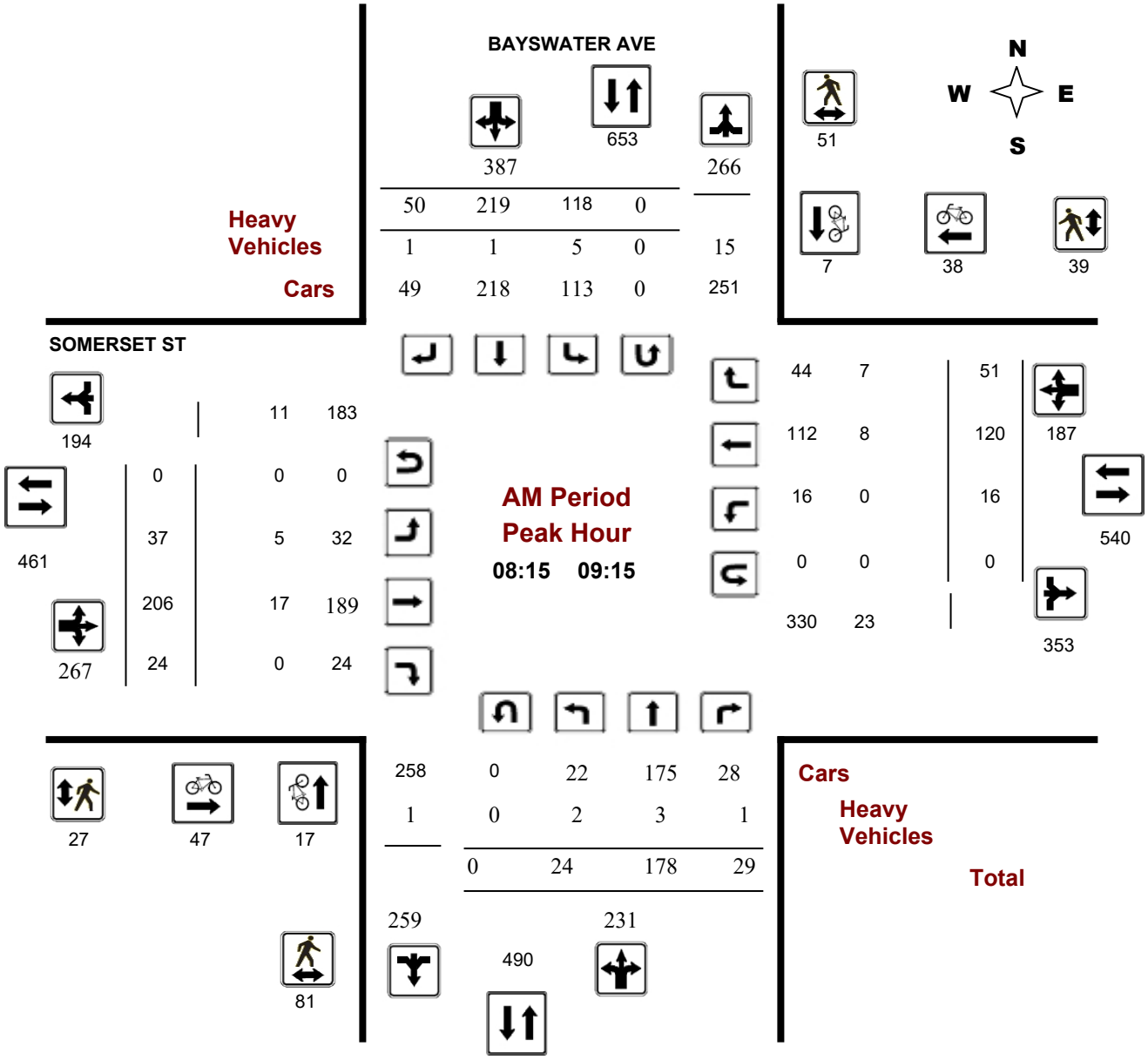
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BAYSWATER AVE @ SOMERSET ST

Survey Date: Wednesday, September 07, 2016 **WO No:** 36276

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



Comments

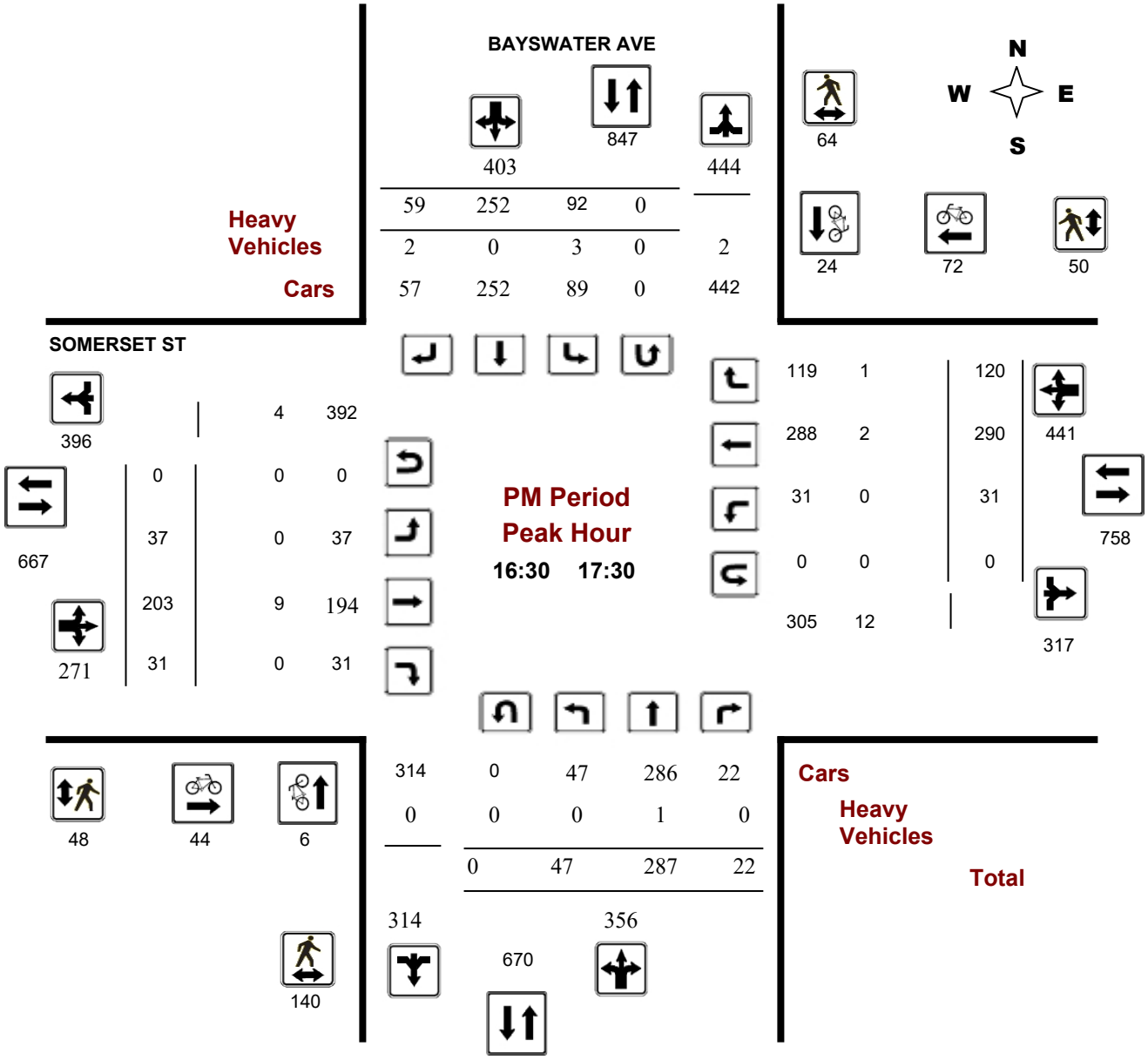
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BAYSWATER AVE @ SOMERSET ST

Survey Date: Wednesday, September 07, 2016 **WO No:** 36276

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



Comments

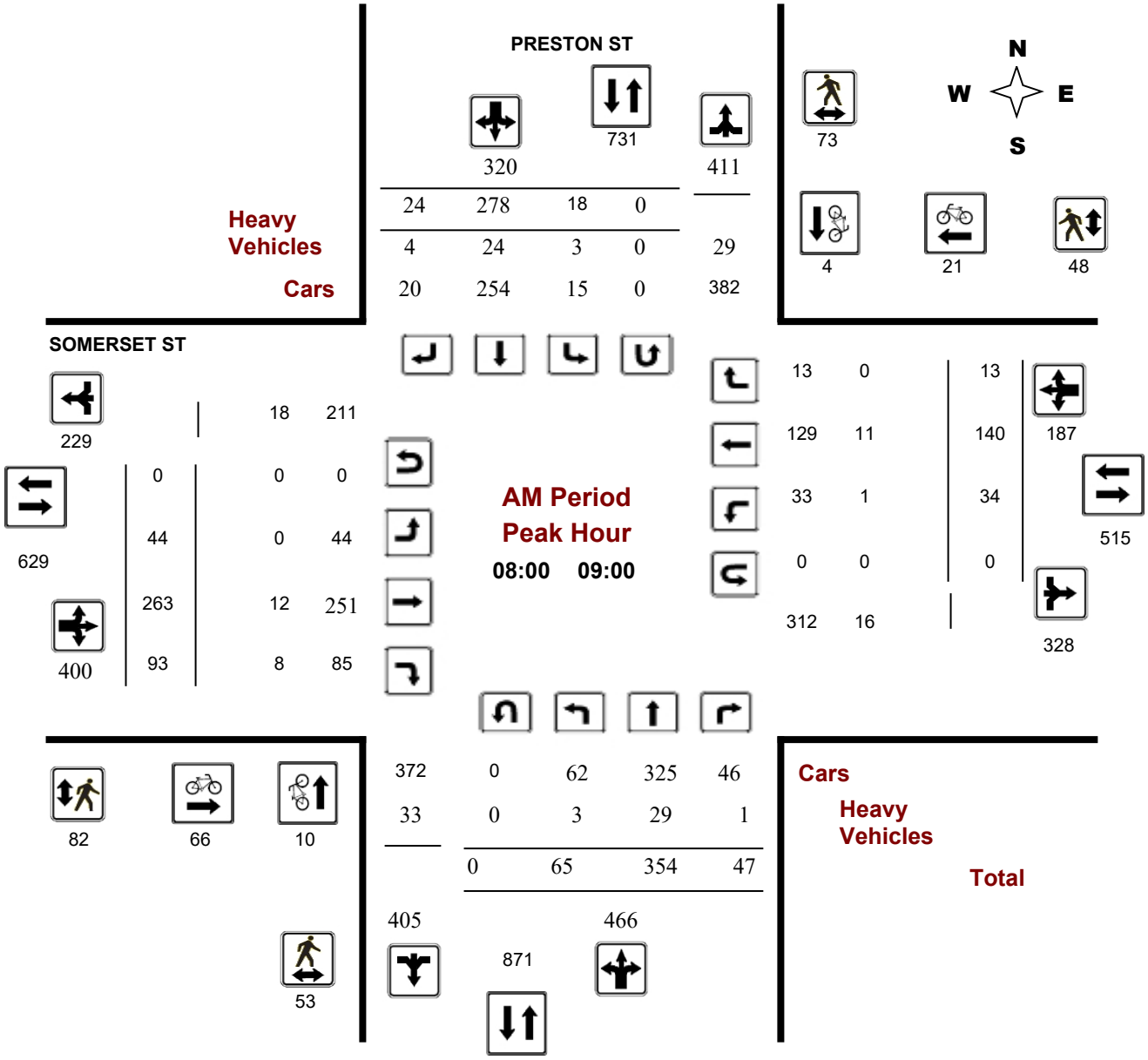
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

PRESTON ST @ SOMERSET ST

Survey Date: Tuesday, June 20, 2017
Start Time: 07:00

WO No: 37133
Device: Miovision



Comments

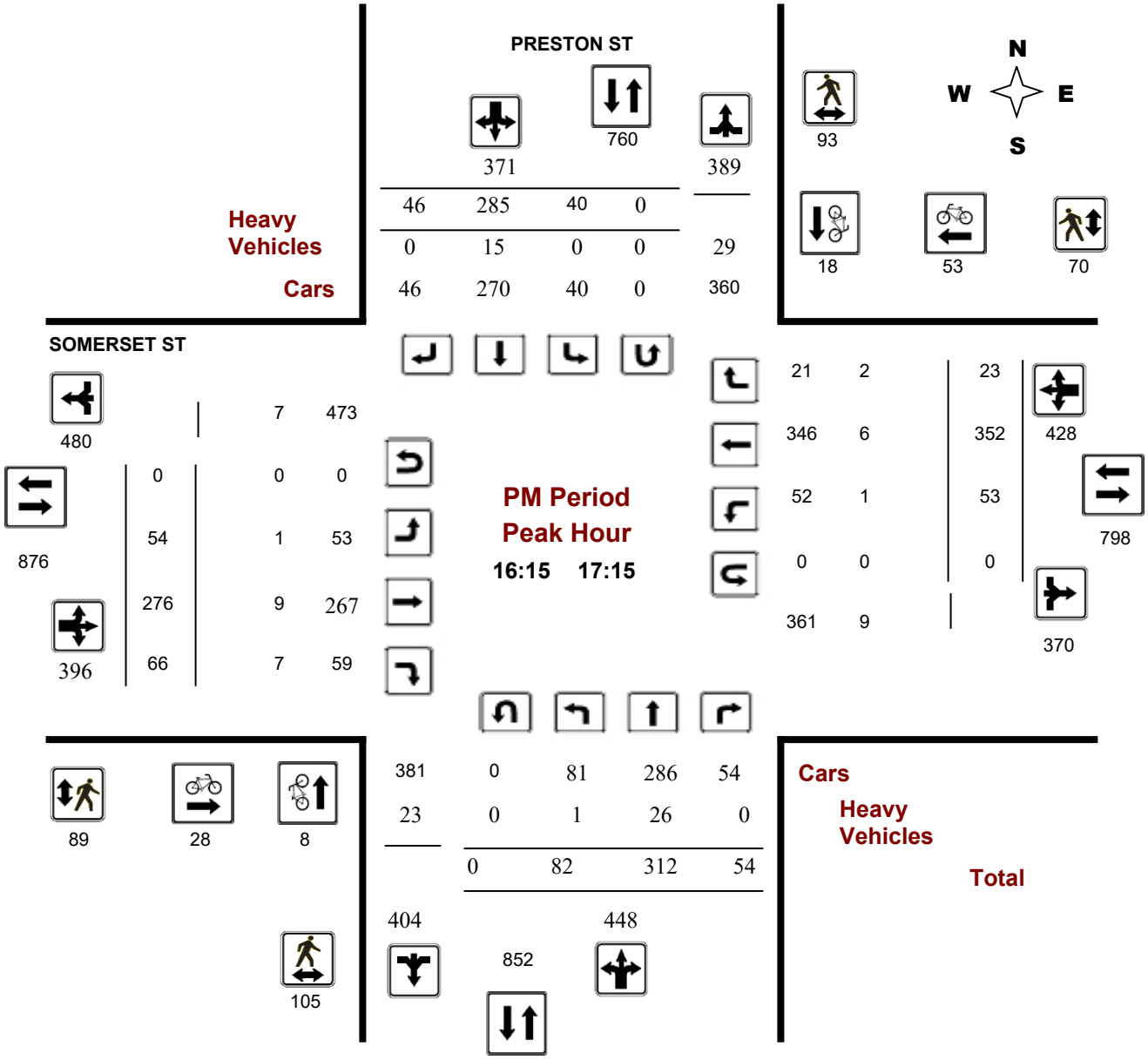
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

PRESTON ST @ SOMERSET ST

Survey Date: Tuesday, June 20, 2017
Start Time: 07:00

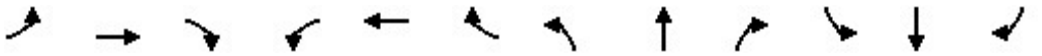
WO No: 37133
Device: Miovision



Comments

Appendix D

Synchro Analysis: Existing Conditions



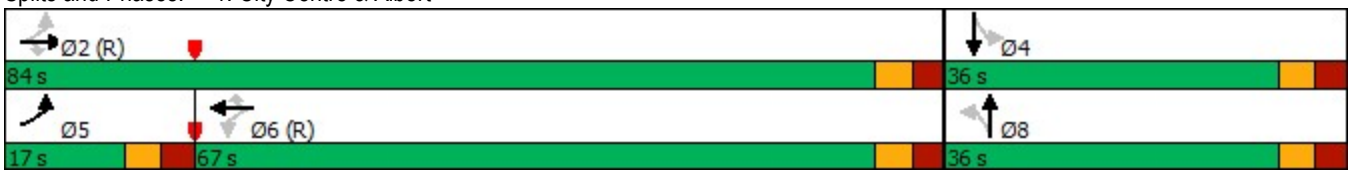
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	776	91	91	333	21	22	0	52	22	0	7
Future Volume (vph)	6	776	91	91	333	21	22	0	52	22	0	7
Satd. Flow (prot)	1658	1745	1483	1658	1745	1483	1658	1483	0	0	1625	0
Flt Permitted	0.501			0.323			0.736				0.742	
Satd. Flow (perm)	874	1745	1483	564	1745	1483	1284	1483	0	0	1251	0
Satd. Flow (RTOR)			76			87		191			87	
Lane Group Flow (vph)	7	862	101	101	370	23	24	58	0	0	32	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	5	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	11.3	27.3	27.3	27.3	27.3	27.3	29.3	29.3		29.3	29.3	
Total Split (s)	17.0	84.0	84.0	67.0	67.0	67.0	36.0	36.0		36.0	36.0	
Total Split (%)	14.2%	70.0%	70.0%	55.8%	55.8%	55.8%	30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Total Lost Time (s)	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3			6.3	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	100.5	101.8	101.8	99.3	99.3	99.3	10.2	10.2			10.2	
Actuated g/C Ratio	0.84	0.85	0.85	0.83	0.83	0.83	0.08	0.08			0.08	
v/c Ratio	0.01	0.58	0.08	0.22	0.26	0.02	0.22	0.19			0.17	
Control Delay	2.3	5.7	0.9	5.2	4.1	0.0	56.4	1.4			2.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Total Delay	2.3	5.7	0.9	5.2	4.1	0.0	56.4	1.4			2.0	
LOS	A	A	A	A	A	A	E	A			A	
Approach Delay		5.2			4.1			17.5			2.0	
Approach LOS		A			A			B			A	
Queue Length 50th (m)	0.3	59.8	0.9	4.3	16.4	0.0	5.4	0.0			0.0	
Queue Length 95th (m)	1.1	89.2	3.8	15.6	42.4	0.0	14.0	0.0			0.0	
Internal Link Dist (m)		330.0			569.4			245.5			144.5	
Turn Bay Length (m)	30.0		50.0	40.0		30.0	40.0					
Base Capacity (vph)	802	1479	1269	466	1444	1243	317	510			375	
Starvation Cap Reductn	0	0	0	0	0	0	0	0			0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0			0	
Storage Cap Reductn	0	0	0	0	0	0	0	0			0	
Reduced v/c Ratio	0.01	0.58	0.08	0.22	0.26	0.02	0.08	0.11			0.09	

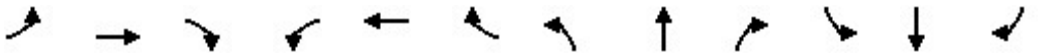
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 5.4	Intersection LOS: A
Intersection Capacity Utilization 75.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: City Centre & Albert





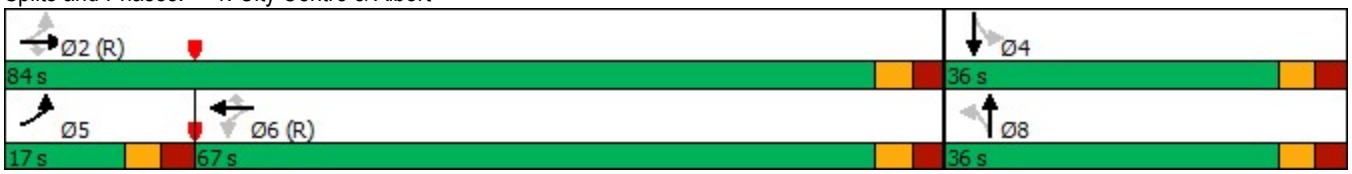
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	527	61	54	697	32	71	0	98	48	0	14
Future Volume (vph)	15	527	61	54	697	32	71	0	98	48	0	14
Satd. Flow (prot)	1658	1745	1483	1658	1745	1483	1658	1483	0	0	1628	0
Flt Permitted	0.266			0.443			0.756				0.675	
Satd. Flow (perm)	464	1745	1483	773	1745	1483	1319	1483	0	0	1141	0
Satd. Flow (RTOR)			68			87		337			87	
Lane Group Flow (vph)	17	586	68	60	774	36	79	109	0	0	69	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	5	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	11.3	27.3	27.3	27.3	27.3	27.3	29.3	29.3		29.3	29.3	
Total Split (s)	17.0	84.0	84.0	67.0	67.0	67.0	36.0	36.0		36.0	36.0	
Total Split (%)	14.2%	70.0%	70.0%	55.8%	55.8%	55.8%	30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Total Lost Time (s)	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3			6.3	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	94.1	94.1	94.1	89.1	89.1	89.1	13.3	13.3			13.3	
Actuated g/C Ratio	0.78	0.78	0.78	0.74	0.74	0.74	0.11	0.11			0.11	
v/c Ratio	0.04	0.43	0.06	0.10	0.60	0.03	0.54	0.23			0.34	
Control Delay	3.7	5.7	1.0	6.9	11.5	0.1	63.5	1.2			10.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Total Delay	3.7	5.7	1.0	6.9	11.5	0.1	63.5	1.2			10.5	
LOS	A	A	A	A	B	A	E	A			B	
Approach Delay		5.2			10.7			27.4			10.5	
Approach LOS		A			B			C			B	
Queue Length 50th (m)	0.7	35.9	0.0	2.7	56.8	0.0	18.0	0.0			0.0	
Queue Length 95th (m)	2.7	65.7	3.3	11.0	156.2	0.0	32.3	0.0			9.0	
Internal Link Dist (m)		330.0			569.4			245.5			144.5	
Turn Bay Length (m)	30.0		50.0	40.0		30.0	40.0					
Base Capacity (vph)	470	1368	1177	574	1295	1123	326	620			347	
Starvation Cap Reductn	0	0	0	0	0	0	0	0			0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0			0	
Storage Cap Reductn	0	0	0	0	0	0	0	0			0	
Reduced v/c Ratio	0.04	0.43	0.06	0.10	0.60	0.03	0.24	0.18			0.20	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 10.4	Intersection LOS: B
Intersection Capacity Utilization 68.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: City Centre & Albert



Appendix E

Collision Data

City Operations - Transportation Services

Collision Details Report - Public Version

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

Location: CHAMPAGNE AVE @ WELLINGTON ST

Traffic Control: Stop sign

Total Collisions: 5

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Apr-25, Fri,12:55	Clear	Angle	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Aug-27, Wed,15:37	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	
					North	Turning right	Pick-up truck	Other motor vehicle	
2016-Jul-09, Sat,20:30	Rain	Sideswipe	P.D. only	Wet	West	Changing lanes	Automobile, station wagon	Other motor vehicle	
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2017-Apr-26, Wed,16:36	Clear	Turning movement	Non-fatal injury	Dry	West	Turning left	Pick-up truck	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2013-Oct-16, Wed,10:30	Clear	Angle	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: CITY CENTRE AVE btwn ELM ST & SPRUCE ST

Traffic Control: No control

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2013-Aug-27, Tue,15:30	Clear	Angle	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: CITY CENTRE AVE btwn SPRUCE ST & END

Traffic Control: No control

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2017-Feb-22, Wed,09:30	Clear	SMV unattended vehicle	P.D. only	Wet	South	Turning right	Truck and trailer	Unattended vehicle	

Appendix F

Background Traffic Growth Analysis

Time Period	Percent Annual Change				
	North Leg	South Leg	East Leg	West Leg	Overall
8 hrs	-5.27%	-8.92%	-9.20%	-0.09%	**-5.30%**
AM Peak	-3.72%	-6.47%	-3.24%	3.37%	**-2.20%**
PM Peak	-9.47%	-10.91%	-11.59%	-4.83%	**-8.95%**

Road/Road
8 hrs

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2009	Tuesday Aug 11	4644	6831	4419	3546	4274	3396	3553	3117	33780
2013	Thursday May 9	4213	5464	3575	2618	2846	3105	5350	3791	30962
2014	Friday Aug 29	3435	5109	2462	2171	2508	1851	3057	2331	22924

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2009	6831	4644	11475	33780				
2013	5464	4213	9677	30962	-20.0%	-9.3%	-15.7%	-8.3%
2014	5109	3435	8544	22924	-6.5%	-18.5%	-11.7%	-26.0%

Regression Estimate	2009	6832	4708	11540	
Regression Estimate	2014	5114	3690	8804	
Average Annual Change		**-5.63%**	**-4.75%**	**-5.27%**	

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2009	3553	3117	6670	33780				
2013	5350	3791	9141	30962	50.6%	21.6%	37.0%	-8.3%
2014	3057	2331	5388	22924	-42.9%	-38.5%	-41.1%	-26.0%

Regression Estimate	2009	3814	3272	7086	
Regression Estimate	2014	4102	2951	7053	
Average Annual Change		**1.46%**	**-2.04%**	**-0.09%**	

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2009	3396	4274	7670	33780				
2013	3105	2846	5951	30962	-8.6%	-33.4%	-22.4%	-8.3%
2014	1851	2508	4359	22924	-40.4%	-11.9%	-26.8%	-26.0%

Regression Estimate	2009	3509	4272	7781	
Regression Estimate	2014	2301	2501	4802	
Average Annual Change		**-8.09%**	**-10.16%**	**-9.20%**	

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2009	4419	3546	7965	33780				
2013	3575	2618	6193	30962	-19.1%	-26.2%	-22.2%	-8.3%
2014	2462	2171	4633	22924	-31.1%	-17.1%	-25.2%	-26.0%

Regression Estimate	2009	4505	3566	8071	
Regression Estimate	2014	2806	2253	5059	
Average Annual Change		**-9.04%**	**-8.78%**	**-8.92%**	

Road/Road
AM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2009	Tuesday Aug 11	1013	796	558	625	357	667	566	406	4988
2013	Thursday May 9	928	768	534	497	262	1042	1109	526	5666
2014	Friday Aug 29	745	678	371	409	222	430	543	364	3762

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2009	796	1013	1809	4988				
2013	768	928	1696	5666	-3.5%	-8.4%	-6.2%	13.6%
2014	678	745	1423	3762	-11.7%	-19.7%	-16.1%	-33.6%

Regression Estimate	2009	804	1028	1832
Regression Estimate	2014	710	807	1516
Average Annual Change		**-2.46%**	**-4.74%**	**-3.72%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2009	566	406	972	4988				
2013	1109	526	1635	5666	95.9%	29.6%	68.2%	13.6%
2014	543	364	907	3762	-51.0%	-30.8%	-44.5%	-33.6%

Regression Estimate	2009	633	424	1057
Regression Estimate	2014	810	437	1247
Average Annual Change		**5.07%**	**0.60%**	**3.37%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2009	667	357	1024	4988				
2013	1042	262	1304	5666	56.2%	-26.6%	27.3%	13.6%
2014	430	222	652	3762	-58.7%	-15.3%	-50.0%	-33.6%

Regression Estimate	2009	734	359	1093
Regression Estimate	2014	699	228	927
Average Annual Change		**-0.98%**	**-8.64%**	**-3.24%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2009	558	625	1183	4988				
2013	534	497	1031	5666	-4.3%	-20.5%	-12.8%	13.6%
2014	371	409	780	3762	-30.5%	-17.7%	-24.3%	-33.6%

Regression Estimate	2009	573	630	1203
Regression Estimate	2014	431	430	861
Average Annual Change		**-5.54%**	**-7.35%**	**-6.47%**

Road/Road
PM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2009	Tuesday Aug 11	593	1190	647	496	965	432	533	620	5476
2013	Thursday May 9	390	874	578	321	572	408	662	599	4404
2014	Friday Aug 29	403	657	240	306	480	215	392	337	3030

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2009	1190	593	1783	5476				
2013	874	390	1264	4404	-26.6%	-34.2%	-29.1%	-19.6%
2014	657	403	1060	3030	-24.8%	3.3%	-16.1%	-31.2%

Regression Estimate	2009	1203	587	1790
Regression Estimate	2014	710	379	1088
Average Annual Change		**-10.02%**	**-8.39%**	**-9.47%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2009	533	620	1153	5476				
2013	662	599	1261	4404	24.2%	-3.4%	9.4%	-19.6%
2014	392	337	729	3030	-40.8%	-43.7%	-42.2%	-31.2%

Regression Estimate	2009	562	644	1206
Regression Estimate	2014	507	435	942
Average Annual Change		**-2.03%**	**-7.57%**	**-4.83%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2009	432	965	1397	5476				
2013	408	572	980	4404	-5.6%	-40.7%	-29.8%	-19.6%
2014	215	480	695	3030	-47.3%	-16.1%	-29.1%	-31.2%

Regression Estimate	2009	450	964	1414
Regression Estimate	2014	286	478	764
Average Annual Change		**-8.64%**	**-13.11%**	**-11.59%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2009	647	496	1143	5476				
2013	578	321	899	4404	-10.7%	-35.3%	-21.3%	-19.6%
2014	240	306	546	3030	-58.5%	-4.7%	-39.3%	-31.2%

Regression Estimate	2009	678	493	1171
Regression Estimate	2014	362	295	657
Average Annual Change		**-11.77%**	**-9.77%**	**-10.91%**

Appendix G

Multimodal Level of Service Analysis: Segments

Multi-Modal Level of Service - Segments Form

Consultant	Parsons	**Project**	989 Somerset
Scenario		**Date**	
Comments			

SEGMENTS		Street A	City Centre	Somerset	Spruce	Section	Section	Section	Section	Section	Section
			1	2	3	4	5	6	7	8	9
Pedestrian	Sidewalk Width Boulevard Width	-	no sidewalk n/a	≥ 2 m 0.5 - 2 m	≥ 2 m < 0.5						
	Avg Daily Curb Lane Traffic Volume		≤ 3000	> 3000	≤ 3000						
	Operating Speed On-Street Parking		> 30 to 50 km/h yes	> 30 to 50 km/h yes	> 30 to 50 km/h yes						
	Exposure to Traffic PLoS		**F**	**B**	**B**	-	-	-	-	-	-
	Effective Sidewalk Width										
	Pedestrian Volume										
	Crowding PLoS		-	-	-	-	-	-	-	-	-
	Level of Service		-	-	-	-	-	-	-	-	-
Bicycle	Type of Cycling Facility	C	Mixed Traffic	Parking beside Bike Lane	Mixed Traffic						
	Number of Travel Lanes		≤ 2 (no centreline)	1 each direction	≤ 2 (no centreline)						
	Operating Speed		≤ 40 km/h	>40 to 50 km/h	≤ 40 km/h						
	# of Lanes & Operating Speed LoS		**A**	**B**	**A**	-	-	-	-	-	-
	Bike Lane (+ Parking Lane) Width			≤ 4 m biking + parking width							
	Bike Lane Width LoS		-	**C**	-	-	-	-	-	-	-
	Bike Lane Blockages			Rare							
	Blockage LoS		-	**A**	-	-	-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge	< 1.8 m refuge	< 1.8 m refuge						
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes	≤ 3 lanes	≤ 3 lanes						
	Sidestreet Operating Speed		≤ 40 km/h	>40 to 50 km/h	≤ 40 km/h						
	Unsignalized Crossing - Lowest LoS		**A**	**A**	**A**	-	-	-	-	-	-
	Level of Service		**A**	**C**	**A**	-	-	-	-	-	-
Transit	Facility Type	D		Mixed Traffic							
	Friction or Ratio Transit:Posted Speed			Vt/Vp ≥ 0.8							
	Level of Service		-	**D**	-	-	-	-	-	-	-
Truck	Truck Lane Width	C		≤ 3.5 m							
	Travel Lanes per Direction			1							
	Level of Service		-	**C**	-	-	-	-	-	-	-

Appendix H

TDM Checklist

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

Legend

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

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

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

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

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

Appendix I

Multimodal Level of Service Analysis: Intersections

Multi-Modal Level of Service - Intersections Form

Consultant	Parsons	**Project**	989 Somerset TIS
Scenario	Projected 2025	**Date**	4/16/2019
Comments			

INTERSECTIONS		Albert / City Centre			
	Crossing Side	**NORTH**	**SOUTH**	**EAST**	**WEST**
Pedestrian	Lanes		3	5	4
	Median		No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns		Protected/ Permissive	No left turn / Prohib.	Permissive
	Conflicting Right Turns		Permissive or yield control	Permissive or yield control	No right turn
	Right Turns on Red (RToR) ?		RTOR allowed	RTOR prohibited	RTOR allowed
	Ped Signal Leading Interval?		No	Yes	Yes
	Right Turn Channel		No Channel	No Channel	No Channel
	Corner Radius		5-10m	10-15m	0-3m
	Crosswalk Type		Raised crosswalk	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings
	PETSI Score		**78**	**53**	**66**
	Ped. Exposure to Traffic LoS	**-**	**B**	**D**	**C**
	Cycle Length		120	120	120
	Effective Walk Time		39	25	25
	Average Pedestrian Delay		**27**	**38**	**38**
	Pedestrian Delay LoS	**-**	**C**	**D**	**D**
	Level of Service	**-**	**C**	**D**	**D**
		D			
	Approach From	**NORTH**	**SOUTH**	**EAST**	**WEST**
Bicycle	Bicycle Lane Arrangement on Approach	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP
	Right Turn Lane Configuration	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Right Turning Speed	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Cyclist relative to RT motorists	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**
	Separated or Mixed Traffic	**Separated**	**Separated**	**Separated**	**Separated**
	Left Turn Approach	2-stage, LT box	2-stage, LT box	2-stage, LT box	2-stage, LT box
	Operating Speed	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h
	Left Turning Cyclist	**A**	**A**	**A**	**A**
	Level of Service	**A**	**A**	**A**	**A**
		A			
Transit	Average Signal Delay		≤ 30 sec	≤ 30 sec	≤ 30 sec
	Level of Service	**-**	**D**	**D**	**D**
		D			
Truck	Effective Corner Radius		10 - 15 m		< 10 m
	Number of Receiving Lanes on Departure from Intersection		≥ 2		1
	Level of Service	**-**	**B**	**-**	**F**
		F			
Auto	Volume to Capacity Ratio		0.71 - 0.80		
	Level of Service		**C**		