Upscale Homes

July 2019

341 Gloucester Street

TIA Strategy Report

PARSONS

341 Gloucester Street

TIA Strategy Report

prepared for:
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July 17, 2019

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TIA Plan Reports

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

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

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

CERTIFICATION

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

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

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Dated at _____Ottawa_____ this ___17___ day of _____July____, 201_9__.
(City)

Name: ____Austin Shih_____
(Please Print)

Professional Title: _____Senior Project Manager_____

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

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TIA Strategy Report

1. SCREENING FORM

The screening form is provided as Appendix A. The trip generation trigger was met based on the development size, the location trigger was met based on the location within a Transit-oriented Development (TOD) zone, and the safety trigger was met based on the proposed site driveway's proximity to the signalized Gloucester/Lyon intersection. As triggers have been met, the Scoping Report has been prepared and is provided herein.

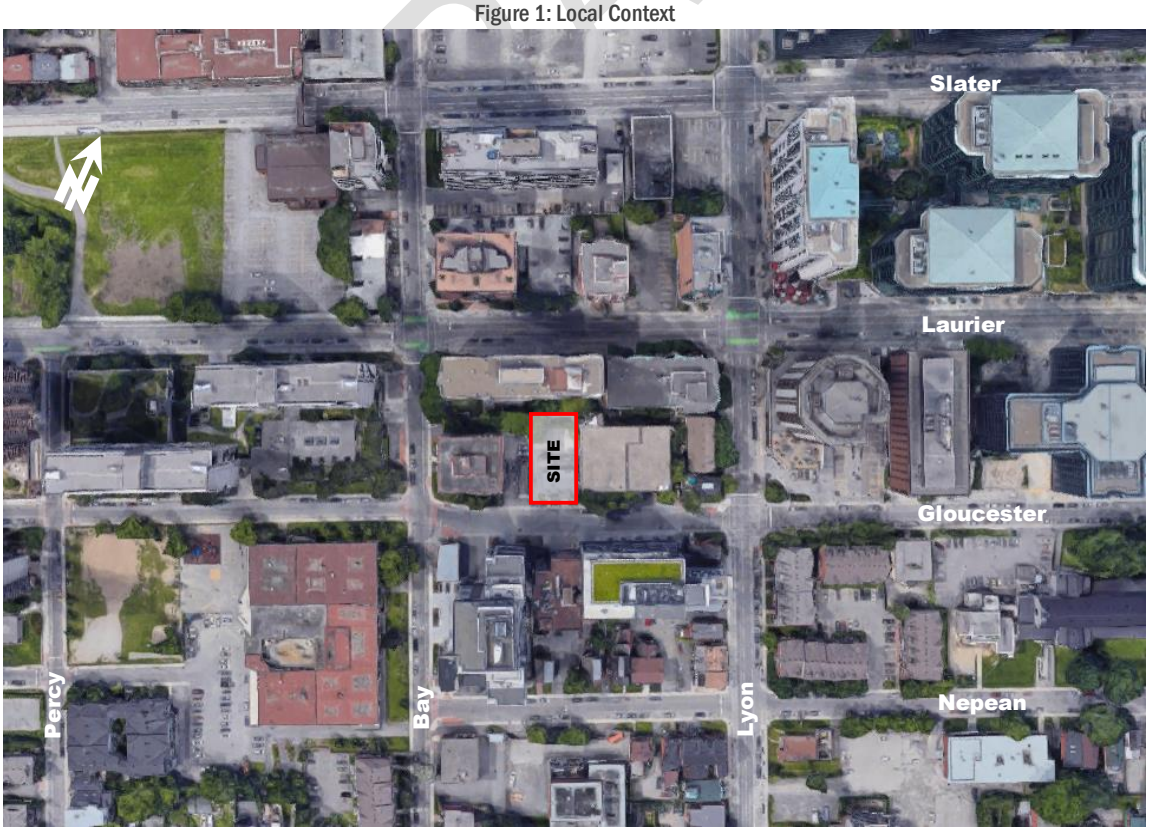
2. SCOPING REPORT

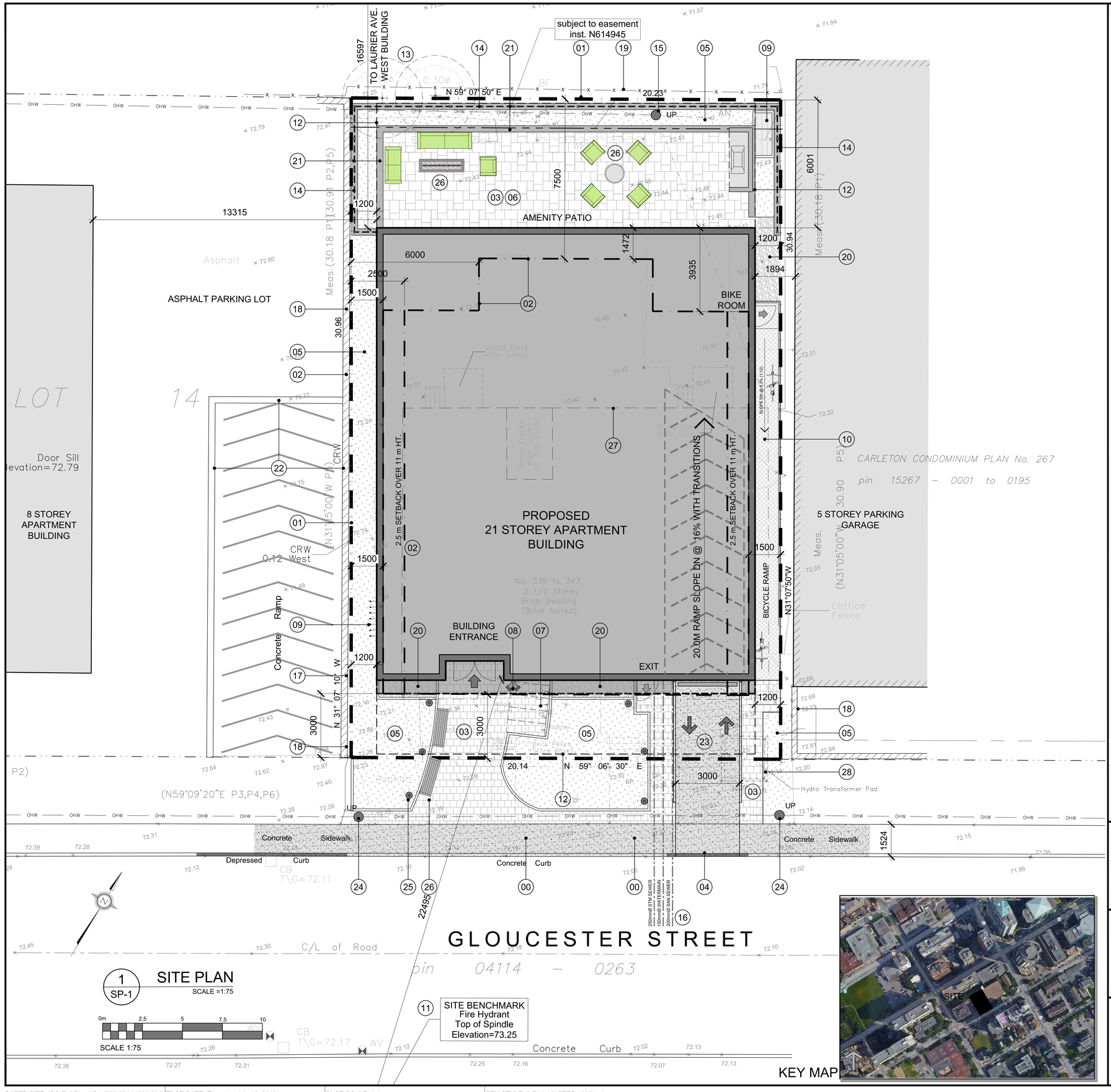
2.1. EXISTING AND PLANNED CONDITIONS

2.1.1. PROPOSED DEVELOPMENT

From the information provided, it is our understanding that the proponent is proposing to construct a 21-storey residential apartment building located at 341 Gloucester Street. The development consists of 116 residential units and approximately 12 underground parking spots are proposed for the site. The site is currently occupied by a residential development and is zoned as R5Q H(64). The expected build-out date for the proposed development is assumed to be 2021. Depending on the growth rate of the study area, the horizon year 2026 will be assessed for 5-years beyond site build out. The local context of the site is provided as Figure 1 and the proposed Site Plan is provided as Figure 2.

Figure 1: Local Context





1 SITE PLAN
SP-1
SCALE =1:75

0m 2.5 5 7.5 10
SCALE 1:75

KEY MAP

DRAWING NOTES

1. PROPERTY LINE
2. EXISTING BUILDING SETBACKS
3. HARD SURFACE PAVING, SEE LANDSCAPE PLAN FOR PATTERN AND TYPE
4. DEPRESSED CURB AND SIDEWALK TO CITY OF OTTAWA STANDARD DETAIL
5. SOFT LANDSCAPING, SEE LANDSCAPE PLAN
6. PRIVATE PATIOS OVER UNDERGROUND PARKING LEVEL
7. BICYCLE PARKING SPACES
8. SIAMESE CONNECTION
9. AIR INTAKE / EXHAUST GRILL
10. 1100mm WIDE ACCESS WALK TO BICYCLE ROOM, HANDRAILS AS REQUIRED
11. EXISTING FIRE HYDRANT
12. OUTLINE OF UNDERGROUND PARKING LEVELS
13. EXISTING TREE TO BE REMOVED
14. 1800mm HT. PRIVACY SCREEN
15. RELOCATE EXISTING UTILITY POLE AND GUIDE CABLES
16. PROPOSED LOCATION OF UNDERGROUND UTILITIES
17. GAS REGULATOR AND OR METERS
18. EXISTING PRECAST CONCRETE UNIT WALL ON ADJACENT PROPERTY
19. EXISTING ±1800mm HT. BOARD FENCE ON ADJACENT PROPERTY
20. WASHED RIVER STONE SURFACE
21. LOW LANDSCAPE WALL
22. EXISTING RAMP AND RETAINING WALL TO U/G PARKING
23. ENTRY DRIVEWAY TO U/G PARKING GARAGE
24. EXISTING UTILITY POLE
25. BOLLARD LIGHTING
26. SITE / PATIO FURNITURE
27. EXISTING 2½ STOREY BUILDING TO BE REMOVED
28. EXISTING HYDRO TRANSFORMER TO BE REMOVED

SITE PLAN SYMBOLS

- CONCRETE UNIT PAVERS SURFACE
- PROPOSED CONCRETE SURFACE
- EXISTING CONCRETE CITY SIDEWALK
- SOFT LANDSCAPING
- BIKE RACK
- TWO WAY VEHICLE CIRCULATION
- MAIN ENTRANCE
- UNIT BALCONY DOOR / FIRE EXIT
- PROPERTY LINE
- ZONING SETBACKS

PROJECT INFORMATION

ZONING BY-LAW 2008-250	R5Q H(64)
SITE AREA	623.8 sq. m. 6,715 sq. ft.
GRADE (GEODETIC ELEVATION)	72.40 m.
BUILDING HEIGHT	64.0 m.
AMENITY AREA (6m²)	696.0 sq. m.
LANDSCAPE AREA	30%
FRONT YARD SETBACK	3.0 m
INTERIOR SIDE YARD SETBACK UNDER 11m HT.	1.5 m
INTERIOR SIDE YARD SETBACK OVER 11m HT.	2.5 m
INTERIOR SIDE YARD SETBACK OVER 21 m BACK	6.0 m
REAR YARD SETBACK	7.5 m

PROJECT STATISTICS

BUILDING HEIGHT	64.0 m.
FRONT YARD SETBACK	3.0 m
INTERIOR SIDE YARD SETBACK	1.2 m
REAR YARD SETBACK	6.0 m

AMENITY SPACE

EXTERIOR AT GRADE =	174.3 sq. m.
1st FLOOR COMMUNAL INTERIOR =	80.8 sq. m.
6th FLOOR EXTERIOR PATIO =	45.6 sq. m.
6th FLOOR COMMUNAL INTERIOR =	155.2 sq. m.
22nd LEVEL EXTERIOR PATIO =	114.2 sq. m.
ROOF LEVEL EXTERIOR PATIO =	144.5 sq. m.
(ALL COMMUNAL) TOTAL =	714.6 sq. m.

SITE COVERAGE

BUILDING FOOTPRINT =	60.0%	374.6 sq. m.
DRIVING SURFACE =	2.3%	14.4 sq. m.
LANDSCAPE AREA =	37.7%	243.2 sq. m.
TOTAL =	100.0%	623.8 sq. m.

GROSS BUILDING FLOOR AREA
(OTTAWA ZONING DEFINITION)

BELOW GRADE LEVELS (3)		0.0 sq. m. 0.0 sq. ft.
GROUND FLOOR		0.0 sq. m. 0.0 sq. ft.
2nd TO 5th FLOOR	4 x 291.3 sq. m. 4 x 3,136 sq. ft.	1,165.4 sq. m. 12,544 sq. ft.
6th FLOOR		151.0 sq. m. 1,625 sq. ft.
7th TO 21st FLOOR	15 x 291.3 sq. m. 15 x 3,136 sq. ft.	4,370.2 sq. m. 47,040 sq. ft.
MECHANICAL LEVEL		0.0 sq. m. 0.0 sq. ft.
TOTAL AREA ABOVE GRADE		5,686.6 sq. m. 61,210 sq. ft.

UNIT STATISTICS

1 BEDROOM UNIT	97
2 BEDROOM UNIT	19
TOTAL	116

CAR PARKING

REQUIRED

RESIDENCE	- AREA Z - NON REQUIRED	0
VISITOR	- 0.1 PER UNIT (AFTER 12 UNITS)	10
TOTAL		10

PROVIDED

RESIDENCE	- 0.017 PER UNIT (116 UNITS)	2
VISITOR	- 0.1 PER UNIT (104 UNITS)	10
TOTAL		12

BICYCLE PARKING

REQUIRED	- 0.5 PER UNIT (116 UNITS)	58

PROVIDED

GROUND FLOOR - ABOVE RAMP	22
PARKING LEVEL P3	116
EXTERIOR	4
TOTAL	142

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT.

ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS.

THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED BY THE ARCHITECT.

DO NOT SCALE DRAWINGS.

NOTATION SYMBOLS:

- (00) INDICATES DRAWING NOTES, LISTED ON EACH SHEET,
- (00) INDICATES ASSEMBLIE TYPE; REFER TO TYPICAL ASSEMBLIES SCHEDUAL.
- (00) INDICATES WINDOW TYPE; REFER TO WINDOW ELEVATIONS AND DETAILS ON A900 SERIES.
- (000) INDICATES DOOR TYPE; REFER TO DOOR SCHEDULE AND DETAILS ON A900 SERIES.
- 00 TITLE / SCALE — DETAIL NUMBER, TITLE, SCALE, DETAIL REFERENCE PAGE, DETAIL CROSS REFERENCE PAGE

No.	DESCRIPTION	DATE
2	ISSUED FOR SPC & ZONING AMENDMENT	July 16, 19
1	ISSUED FOR DESIGN CONCEPT	Feb.15, 18

REVISIONS:

ARCHITECT SEAL: ONTARIO ASSOCIATION OF ARCHITECTS — RODERICK J. LAHEY LICENCE 4375
SEAL DATE: STAMP DATE

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PROJECT TITLE:
341 GLOUCESTER AVENUE
OTTAWA ONTARIO

SHEET TITLE:
SITE PLAN

DRAWN: RV
CHECKED: R.V.
SCALE: 1:75
SHEET No. SP-1
PROJECT No. 1735

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Tel.: (613) 730-5709
Fax: (613) 730-1136
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K1K 1M5
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LANDSCAPE ARCHITECT
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Landscape Architects
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Ottawa, Ontario K2H 5A8
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Fax: 1-866-343-3942
Email: JL@jbla.ca

LEGAL DESCRIPTION
SURVEYOR'S REAL PROPERTY REPORT
PART 1 Plan of **LOT 15**
(North Gloucester Street)
REGISTERED PLAN 2996
CITY OF OTTAWA
Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

CIVIL ENGINEER
David Schaeffer Engineering ltd.
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Stittsville, ON K2S 1E9
Tel: (613) 836-0856
Fax: (613) 836-7183
Email: rfreel@DSEL.ca

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Ontario Land Surveyors
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Nepean, Ontario K2E 7S6
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Fax: (613) 727-1079
E-Mail: EdL@aovltd.com

2.1.2. EXISTING CONDITIONS

Area Road Network

Lyon Street is a southbound arterial roadway, which extends from Wellington Street in the north to HWY-417 in the south. Within the study area, Lyon Street has a three-lane cross section with on-street parking provided along the east side of the roadway from 9:30am to 3:30pm. The unposted speed limit is understood to be 50 km/h.

Gloucester Street is a local roadway that operates as a one-way in the westbound direction. Within the study area, Gloucester Street has a two-lane cross section. It extends from Catherine Street in the south to Wellington Street in the north. The unposted speed limit is understood to be 50 km/h.

Bay Street is a local roadway that operates as a one-way in the northbound direction. Within the study area, Bay Street has a two-lane cross section. It extends from Catherine Street in the south to Wellington Street in the north. The unposted speed limit is understood to be 50 km/h.

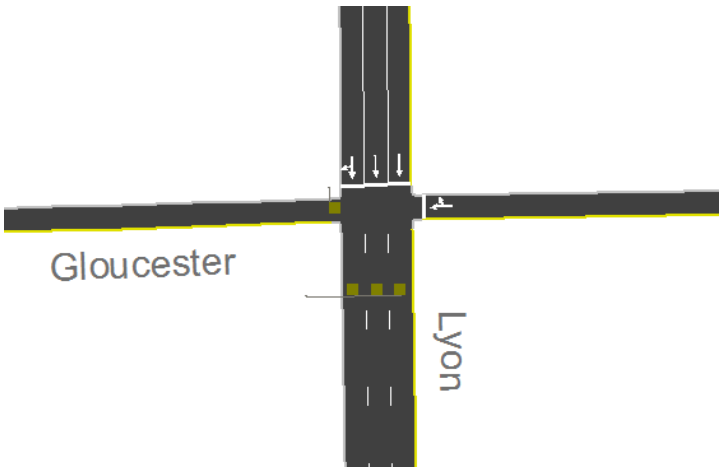
Existing Study Area Intersections

Bay/Gloucester

The Bay/Gloucester intersection is an unsignalized four-legged intersection with STOP control on the minor approach (Gloucester Street). The westbound approach consists of a single through/right-turn lane. The northbound approach consists of a single shared though/left-turn lane. Southbound and eastbound movements are prohibited at this location as Bay Street operates as a one-way in the northbound direction and Gloucester Street operates as a one-way in the westbound direction.

Lyon/Gloucester

The Lyon/Gloucester intersection is a signalized four-legged intersection. The westbound approach consists of a shared through/left-turn lane. The southbound approach consists of a shared through/right-turn lane and two through lanes. Northbound and eastbound movements are prohibited at this location as Lyon Street operates as a one-way in the southbound direction and Gloucester Street operates as a one-way in the westbound direction.



Existing Driveways to Adjacent Developments

On the north side of Gloucester Street there are three existing driveways to adjacent developments, two for apartment complexes and one for a private residence. On the south side there are four existing driveways, two for apartment complexes, one for a private residence and one for a corner store.

Pedestrian/Cycling Network

With respect to pedestrians, sidewalk facilities in the vicinity of the site are provided along both sides of Gloucester Street, Lyon Street, Bay Street.

With respect to cyclists, according to the Ottawa Cycling Plan, Bay Street, and Lyon Street are classified as Spine Routes. Northbound bicycle lanes are currently provided along the east side of Bay Street. Southbound bicycle lanes are currently provided along the west side of Lyon Street.

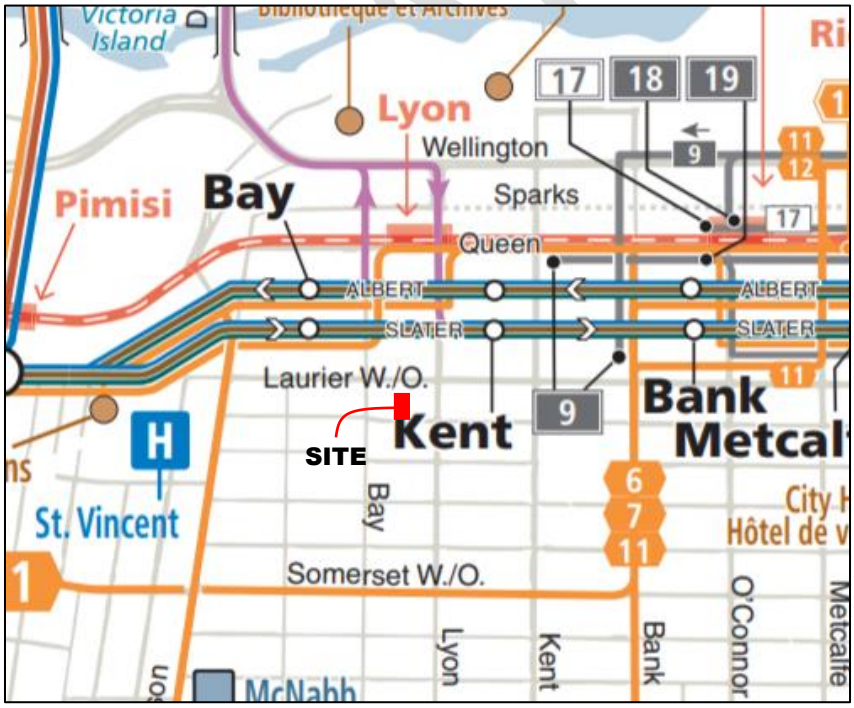
Transit Network

Transit service within the vicinity of the site is currently provided along Albert Street and Slater Street. These streets are the primary corridors for Bus Rapid Transit (BRT) through the downtown core, accommodating 16 all-day bus routes, 26 express routes and 9 peak hour routes. These routes are listed below:

- Black Regular/All-Day Routes
  - Routes 4, 8, 16, 85, 86, 87, 91, 92, 94, 95, 96, 97, 98, 99, 106, 176
- Green Express/Rural Express Routes
  - Routes 38, 64, 221, 222, 228, 231, 232, 233, 234, 235, 237, 252, 256, 261, 262, 263, 265, 267, 268, 269, 270, 271, 272, 273, 277, 283
- Red Peak Hours Routes
  - Routes 22, 30, 33, 34, 63, 224, 264, 282, 293

The closest westbound transit station is located on Albert Street approximately 415m walking distance north of the site and the closest eastbound transit station is on Slater Street approximately 350m walking distance north of the site.

Figure 3: Area Transit Network



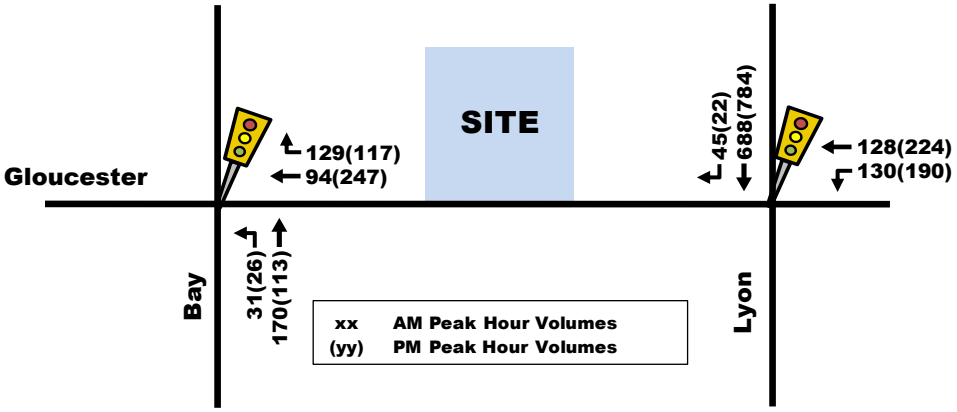
Existing Area Traffic Management Measures

Existing area traffic management measures on Gloucester Street include a speed hump, on-street parking, and intersection narrowings at the Bay/Gloucester and Lyon/Gloucester intersections.

Existing Peak Hour Volumes

Illustrated as Figure 4 are the most recent weekday morning and afternoon peak hour traffic volumes obtained from the City of Ottawa at the study area intersections. These peak hour traffic volumes are included as Appendix B.

Figure 4: Existing Peak Hour Traffic Volumes



2.2. EXISTING ROAD SAFETY CONDITIONS

Collision history for the study area intersections (2013 to 2017, inclusive) was obtained from the City of Ottawa and most collisions (78%) involved only property damage, indicating low impact speeds, and 22% involved personal injuries. The primary causes of collisions cited by police include; angle (36%), single vehicle (unattended or other) (28%), sideswipe (21%) type collisions.

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:

- 0.33/MEV at the Bay/Gloucester intersection (representing 3 collisions); and,
- 0.48/MEV at the Lyon/Gloucester intersection (representing 10 collisions).

It is noteworthy that within the 5-years of recorded collision data there was one collision involving a pedestrian and none involving cyclists. The collision involving the pedestrian occurred at the Gloucester/Lyon intersection and resulted in non-fatal injuries. The source collision data as provided by the City of Ottawa and related analysis is provided as Appendix C.

2.2.1. PLANNED CONDITIONS

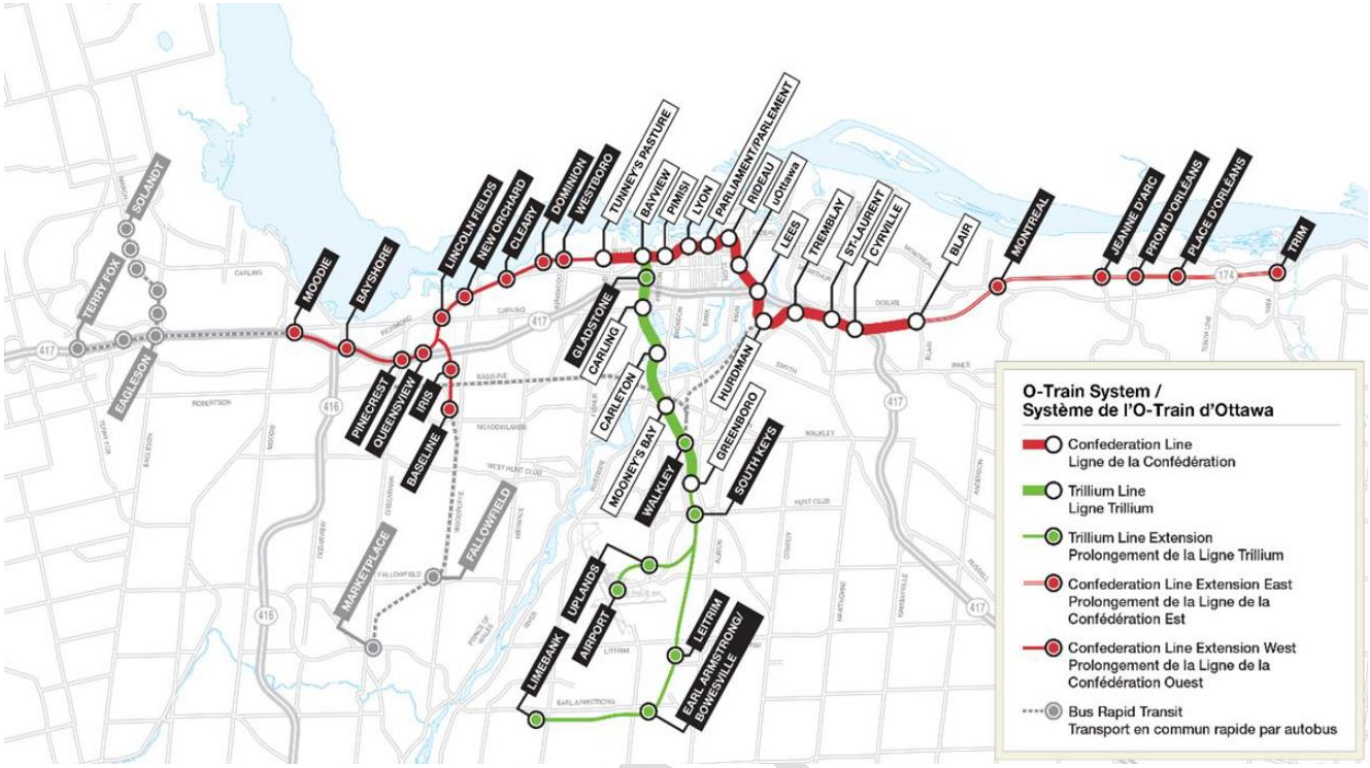
Planned Study Area Transportation Network Changes

LRT Phase I and II Construction

A notable transportation network change within the study area is the Phase I construction of the east-west LRT, which is the conversion of the City's existing BRT corridor to LRT between the current Blair transit station and the Tunney's Pasture station which includes a tunnel through the City's Downtown. Currently, this phase of construction is underway and is expected to be completed by end of 2019.

Phase II of the LRT construction, which will extend the City's LRT further east, west and south (further improving transit within the vicinity of the site), is expected to begin by 2020 and be completed by 2025. The following Figure 5 illustrates the planned Phases I and II of the future Confederation/Trillium Lines. The proposed site is approximately 340 m walking distance from the closest future LRT station at Queen and Lyon.

Figure 5: Planned LRT Phase II



Albert and Slater Streets Improvement Project

Once the LRT is open and transit facilities are removed from Albert Street and Slater Street, the City is planning to implement cycling facilities, refurbish watermains and resurface Albert Street. This project is currently in the detailed design phase which is expected to be completed by Winter 2020. The start of construction for this project has yet to be determined.

Bay Street Cycling Facility

The City of Ottawa is planning on upgrading the existing cycling facilities on Bay Street from Laurier Avenue to Wellington Street. A northbound cycle track is provided on the east side of the roadway and a southbound cycle track is provided on the west side of the roadway. Construction is expected to start in late Summer 2019 and be completed by 2020.

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 expected to have a notable impact on the surrounding transportation network.

350 Sparks Street, 137 Bay Street

Morguard Real Estate Investment Trust is proposing the construction of a hotel and residential development at the above-noted address, which is located approximately 375m northwest of the subject development. The Transportation Brief Update (prepared by BA Group) projected an increase in vehicle traffic of approximately 220 veh/h during the morning and afternoon peak hours.

412 Sparks Street

Reichman Seniors Housing Development Corps. is proposing the construction of a retirement residential development consisting of approximately 152 residential units, located at the above-noted address, which is located approximately 410m northwest of the subject development. The TIA Study (prepared by Parsons) projected an increase in vehicle traffic of approximately 15 to 20 veh/h during the morning and afternoon peak hours.

550 Albert Street, 557 Wellington Street, 584 Wellington Street
The City of Ottawa is proposing a new Ottawa Central Library at the above address, located approximately 450m west of the subject development. The concept plans include a mixed-used development of mid and high-rise buildings. There is no transportation study completed at the time of this submission.

340 Queen Street, 383 Albert Street
Claridge Homes is proposing the construction of two residential towers totaling 558 units with a ground-floor supermarket, located at the above-noted address, which is located approximately 265m north of the subject development. The TIA Study (prepared by Novatech) projected an increase in vehicle traffic of approximately 40 to 70 veh/h during the morning and afternoon peak hours.

400 Albert Street
Broccolini is proposing the construction of a multi-use development consisting of approximately 300 residential units and 8,000 ft^2 of retail development, located at the above-noted address, which is located approximately 175m north of the subject development. The Transportation Brief (prepared by Parsons) projected an increase in vehicle traffic of approximately 40 to 50 veh/h during the morning and afternoon peak hours.

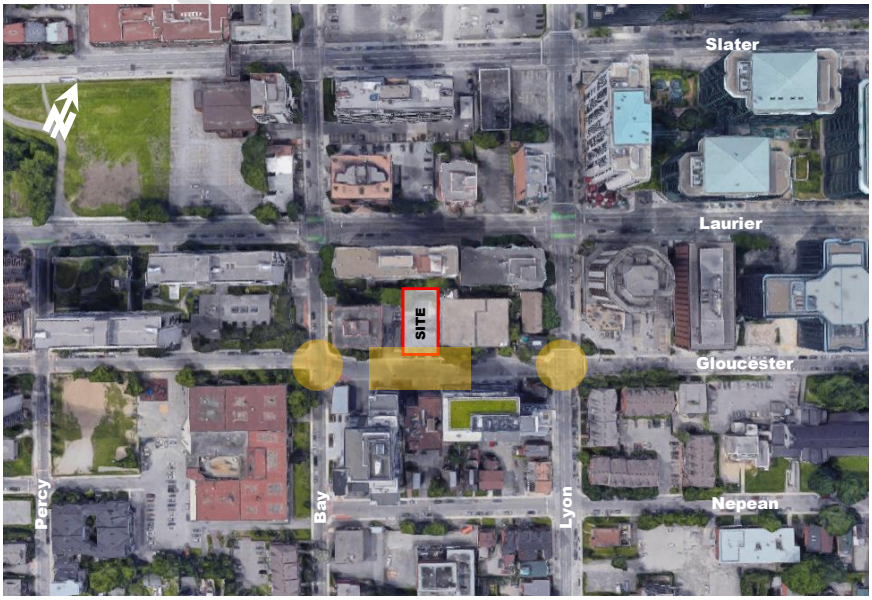
152-160 Bank Street, 153-157 Bank Street, 333 Laurier Avenue
Morguard Real Estate Investment Trust is proposing the construction of a multi-use development with 18 floors of office space and ground-floor retail, located at the above-noted address, which is located approximately 430m northeast of the subject development. The Transportation Impact Study (prepared by BA Group Transportation Consultants) projected an increase in vehicle traffic of approximately 155 to 165 veh/h during the morning and afternoon peak hours.

2.3. STUDY AREA AND TIME PERIODS

The proposed study area is outlined below and highlighted in Figure 6. Given the trips expected to be generated by this development will be residential trips, the time periods to be assessed are the weekday morning and afternoon commuter peak hours.

- Bay/Gloucester intersection;
- Lyon/Gloucester intersection; and,
- Gloucester Street – adjacent to the site.

Figure 6: Study Area



2.4. EXEMPTION REVIEW

Based on the City's TIA guidelines and the subject site, the following sections of the TIA process will be exempt, unless otherwise directed.

Module	Element	Exemption Consideration
4.1 Development Design	4.1.3 New Street Networks	Not required for applications involving site plans.
4.2 Parking	4.2.2 Spillover Parking	The proposed number of parking stalls is lower than the anticipated demand.
4.8 Review of Network Concept	All elements	This development is not expected to generate 200 person-trips more than the permitted zoning for the site.

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 116 residential units was obtained from the City's 2009 TRANS Trip Generation – Residential Trip Rates. Table 1 summarizes the trip generation rates.

Table 1: 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
du = dwelling units

Using the TRANS Trip Generation Rates for apartment use, the total amount of vehicle trips generated by the proposed residential development was projected. The results are summarized in Table 2.

Table 2: 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	116 units	4	16	20	11	8	19
Total 'New' Auto Trips		**4**	**16**	**20**	**11**	**8**	**19**

As shown in Table 2, a total of approximately 20 veh/h are projected to travel to/from the proposed development during both the weekday morning and afternoon commuter peak hours. The vehicle trips shown in Table 2 for the proposed site were converted to total person trips using the auto modal share values in Table 3.13 of the TRANS report. Total person-trip generation values were then reduced to non-auto modal shares consistent for a site within a transit-oriented development (TOD) zone. The modal share values for the apartment land use within the proposed development are summarized in Table 3.

Table 3: 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%	2	10	12	7	5	12
Auto Passenger	5%	1	2	3	2	2	4
Transit	65%	11	37	48	33	21	54
Non-motorized	15%	2	9	11	8	5	13
Total Person Trips	100%	16	58	74	50	33	83
Total 'New' Auto Trips		**2**	**10**	**12**	**7**	**5**	**12**

As shown in Table 3, based on TRANS Trip Generation method, the proposed site is projected to generate approximately 75-85 person-trips per hour in the weekday commute peak hours. The increase in two-way transit trips is estimated to be approximately 50-55 person per hour, and the increase in bike/walk trips is approximately 10-15 persons per hour.

The total amount of 'new' vehicle traffic to the study area is projected to be approximately 12 veh/h during the morning and afternoon peak hours. This amount of traffic equates to approximately 1 new vehicle every 5 minutes during peak hours and is not considered a significant increase in traffic.

3.1.2. MODE SHARES

Due to the site's proximity to the Lyon Station (less than 600m), TOD mode shares are applied. The mode shares for a development located in a TOD are illustrated in Table 4. These mode shares will also be used for the 2025 horizon year.

Table 4: Mode Share Targets for Development in TOD

Travel Mode	Mode Share Target	Rationale
Transit	65%	Development is located within 600m of the future Lyon LRT station.
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

Given the low projected number of vehicle trips projected to be generated by the proposed development, the future roadway network impact is considered negligible. As such, no further traffic assessment is included herein.

3.1.4. TRIP ASSIGNMENT

Given the low projected number of vehicle trips projected to be generated by the proposed development, the future roadway network impact is considered negligible. Because of this and the foregoing rationale, 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 5) was calculated based on historical traffic count data (years 2007, 2009 and 2015) provided by the City of Ottawa at the Lyon/Gloucester intersection east of the site. Detailed background traffic growth analysis is included as Appendix D.

Table 5: Lyon/Gloucester Historical Background Growth (2007-2015)

Time Period	Percent Annual Change				
	North Leg	South Leg	East Leg	West Leg	Overall
8 hrs	-0.91%	-0.65%	-1.36%	-2.81%	**-1.02%**
AM Peak	-0.17%	0.26%	-0.30%	-2.19%	**-0.18%**
PM Peak	-3.03%	-2.46%	-1.26%	-2.52%	**-2.46%**

As shown in Table 5, the Lyon/Gloucester intersection has experienced approximately 0 to 2.5% 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 will be used of 0% annual growth as advised by City of Ottawa transportation strategic planner, Jennifer Armstrong, on April 11th, 2019.

3.2.3. OTHER DEVELOPMENTS

See Section 2.1.4.

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 is projected every 15 minutes during the peak hours. As such, no projected vehicle LOS is required for this analysis.

4. STRATEGY REPORT

4.1. DEVELOPMENT DESIGN

4.1.1. DESIGN FOR SUSTAINABLE MODES

Vehicle and Bicycle Parking

Vehicle parking is proposed in an underground parking garage for residential and visitor use. A total of 12 parking spaces are proposed for with 10 of those designated for visitor use, meeting the City's minimum Bylaw requirements. With regard to bicycle parking, it is located within the underground parking structure and a total of 142 bicycle parking spaces are proposed.

Transit and Pedestrians

Transit service within the vicinity of the site is currently provided by OC Transpo Rapid transit service (in the form of BRT) is provided via Albert Street and Slater Street, located approximately 225 metres northwest of the proposed development, which provides convenient access to multiple routes along the Transitway. Additionally, the future Confederation LRT line will provide additional transit capacity.

Sidewalk facilities within the vicinity of the site are provided along both sides of Lyon Street, Bay Street and Gloucester Street. Northbound bicycle lanes are currently provided along the east side of Bay Street. Southbound bicycle lanes are currently provided along the west side of Lyon Street.

4.1.2. CIRCULATION AND ACCESS

A full-movement driveway to Gloucester Street is proposed as the access to the underground parking garage. The width of the driveway is noted to be 3.6m, and the drive aisles within the parking garage are also noted to be 6 to 6.3m wide. The aisle and ramp width meet the City's By-Law requirements as a 3.6m driveway width is only permitted if the access leads to 20 spaces or fewer.

4.2. PARKING

4.2.1. PARKING SUPPLY

Vehicle Parking

A total of 2 underground parking spaces are proposed to serve the residents of the proposed development and 10 visitor parking spaces are proposed underground. This amount of residential parking meets the City's minimum By-Law requirements for 10 units within Area Z, identified on the City's Schedule 1A. The total amount of residential and visitor parking does not exceed the City's maximum number of parking spaces for a development of this size within close proximity to rapid transit. The parking spaces are noted to be 5.2 m in length and 2.6 m in width meeting the City's By-Law requirements.

Bicycle Parking

A total of 142 bicycle parking spaces are proposed to serve the site with 116 located in the underground parking lot, 22 located on the ground level (interior) and 4 located on the exterior. This amount of bicycle parking exceeds the City's minimum requirement with respect to the By-Laws.

4.3. BOUNDARY STREET DESIGN

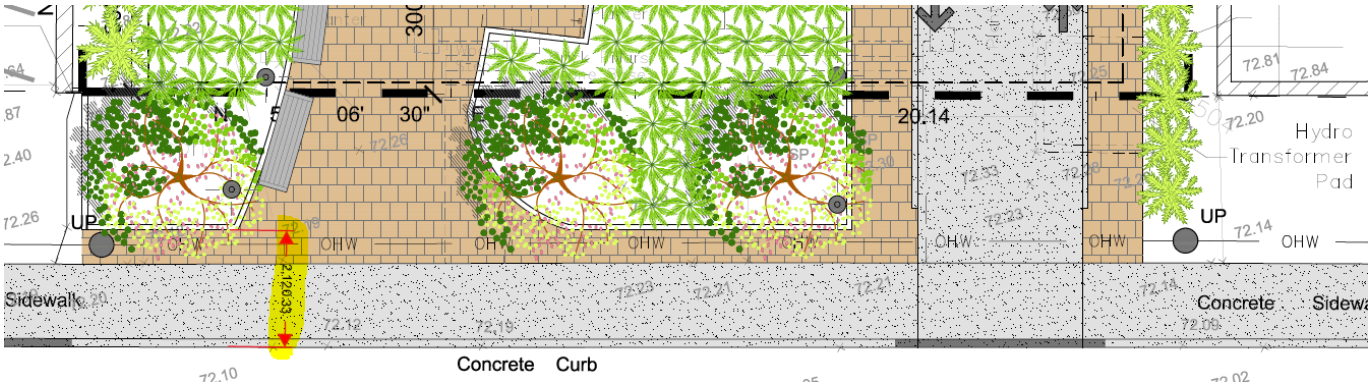
At this time, there has not been any complete street concept prepared for Gloucester Street. The multi-modal level of service analysis for the road segments along the boundary street is provided in Table 6, with detailed analyses provided in Appendix E.

Table 6: MMLOS – Existing Boundary Road Segments

Road Segment	Level of Service							
	Pedestrian (PLoS)		Bicycle (BLoS)		Transit (TLoS)		Truck (TkLoS)	
	PLoS	Target	BLoS	Target	TLoS	Target	TkLoS	Target
Gloucester Street	D	A	D	D	D	No Target	D	No Target

Given the development's proximity to the future Queen LRT Station, the target level of service for pedestrians is high ('A'). As there are no transit or truck routes on Gloucester Street, there are no target levels of service for transit or trucks. The target bicycle level of service is met as Gloucester Street is three lanes wide. With regard to pedestrians, the small sidewalk and boulevard width results in a level of service 'D'. However, the proponent is providing interlock adjacent to the sidewalk increasing the width from 1.5m to 2.1m. This would improve the level of service to PLoS 'A', achieving the target for this location. This treatment is shown below in Figure 7.

Figure 7: Proposed Sidewalk Treatment Along Site Frontage



4.4. ACCESS INTERSECTION DESIGN

4.4.1. LOCATION AND DESIGN OF ACCESS

The site access driveway is proposed to Gloucester Street, approximately 60m west of the Gloucester/Lyon signalized intersection and 60m east of the Gloucester/Bay unsignalized intersection. This location is acceptable with respect to the City's Private Approach By-Law. The driveway is located approximately 1.8 m from the property line, which is considered acceptable given the adjacent driveways are located approximately 15m from the proposed driveway and projected vehicle traffic traveling to/from the proposed development is low.

The driveway width is noted to be 3.6m wide which meets the minimum width outlined in the City's Private Approach By-as the it provides access to only 12 parking spaces.

The ramp grade to the parking area is noted to be 12% and starts approximately 8.2m from the edge of the sidewalk. The Private Approach By-Law requires a distance of 6m from the property line to the start of the ramp at a grade of 2% or less and as such, the proposed ramp meet the Bylaw.

4.4.2. INTERSECTION CONTROL

Based on the projected number of vehicles traveling to/from the site's driveway, STOP control on the minor approach (site driveway) only is recommended. No further traffic control or turn lanes are warranted at this site driveway.

4.5. TRANSPORTATION DEMAND MANAGEMENT

The proposed residential development is located within walking distance to transit stops located along Albert Street and Slater Street, and the future Lyon LRT Station. As such, the development is expected to attract significant transit ridership. Sidewalks are currently provided along adjacent City roadways and cycle lanes are provided on Bay Street and Lyon Street. As such, the location of the site is ideal in promoting non-auto travel during the weekday peak hours and outside peak hours. The Transportation Demand Management (TDM) checklist is provided as Appendix F and highlighted below:

- Provide pedestrian connections to existing City sidewalks;
- Provide secure underground bicycle parking;
- Number of bicycle parking spaces exceed City's minimum requirements according to the By-Law; and
- Number of vehicle parking spaces does not exceed the City's By-Law maximum.

Given the type of development and its location adjacent to rapid transit, within the urban inner area, and given the existing and future cycling and pedestrian facilities within the area, the development is well positioned to promote travel via transit and active modes.

4.6. NEIGHBOURHOOD TRAFFIC MANAGEMENT

The following section discusses the development's impact on the surrounding neighbourhood and local access route. Table 7 summarizes Gloucester Street's roadway classification, the TIA Guideline's roadway threshold, and the approximate existing and projected traffic on main access route to the site.

Table 7: Roadway Classification Analysis of Site Access Routes

Roadway	Classification	Daily Threshold (veh/day)	Peak Hour Peak Direction Threshold (veh/h)	Peak Hour Peak Direction Volumes AM Peak (PM Peak)	
				Existing	Projected
Gloucester Street - *Bay Street to Lyon Street*	Local	1,000	120	220 (360)	225 (365)

As shown in Table 7, the existing peak hour peak directional volumes exceed the suggested thresholds on Gloucester Street during both peak hours. The addition of development related traffic does not increase the peak hour volume significantly as there are only 5 veh/h projected during both peak hours.

4.7. TRANSIT

As shown in Section 3.1, the total "new" two-way transit trips for the proposed development are approximately 50-55 persons/h during the weekday peak hours. This amount of person trips can be accommodated by the existing Transitways located on Albert Street and Slater Street and the future Lyon LRT Station.

4.8. REVIEW OF NETWORK CONCEPT

Exempt – See Section 2.3.

4.9. INTERSECTION DESIGN

4.9.1. EXISTING CONDITIONS

The following Table 7 provides a summary of the existing traffic operations at the study area intersections based on the SYNCHRO (V9) traffic analysis software and the existing traffic volumes (Figure 4). The subject signalized intersection was assessed in terms of the volume-to-capacity (v/c) ratio and the corresponding Level of Service (LoS) for the critical movement(s). The subject signalized intersection 'as a whole' was assessed based on weighted v/c ratio. The SYNCHRO model output of existing conditions is provided within Appendix G.

Table 8: Existing Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Lyon/Gloucester	A(D)	0.50(0.84)	WBT(WBT)	9.7(18.6)	A(A)	0.34(0.48)
Bay/Gloucester (unsignalized)	B(B)	10.7(11.5)	WBT(WBT)	10.7(11.5)	B(B)	-
Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

As shown in Table 8, the study area intersections 'as a whole' are currently operate at an excellent LoS 'B' or better during the morning and afternoon peak hours. With regard to 'critical movements' at study area intersections, they are operating at an acceptable LoS 'D' or better during peak hours with regard to City of Ottawa operating standards.

Multi-Modal Level of Service – Existing Conditions

The MMLoS analysis for the Lyon/Gloucester signalized study area intersection is summarized in Table 9. The existing detailed MMLoS analysis is provided as Appendix E.

Table 9: MMLoS – Signalized Lyon/Gloucester Intersection, Existing Conditions

Intersection	Level of Service									
	Pedestrian (PLoS)		Bicycle (BLoS)		Transit (TLoS)		Truck (TkLoS)		Vehicle (LoS)	
	PLoS	Target	BLoS	Target	TLoS	Target	TkLoS	Target	LoS	Target
Lyon/Gloucester	C	A	B	C	E	No target	E	No target	A	E

Given the development's location within close proximity to existing and future rapid transit and its location adjacent to a cross-town bikeway, the target levels of service for pedestrians and cyclists are high ('A'). As there is no transit along Lyon Street and Gloucester Street within the study area, there is no transit level of service target. As Gloucester Street and Lyon Street are not part of the truck route there is no truck level of service target. As shown in Table 9, the bicycle and vehicle level of service targets are met.

With regard to pedestrians, the PLoS is not met due to the pedestrian delay on the north and south crosswalks. Should the effective walk time be increased for these crossings, the PLoS will increase to a "B". This could be completed by the City when the signal timing is updated at this location.

4.9.2. TOTAL PROJECTED 2021 CONDITIONS – FULL BUILD-OUT

There are only approximately 12 two-way vehicle trips projected in both peak hours which equates to approximately 1 vehicle every 5 minutes. Given the low projected number of vehicle trips projected to be generated by the proposed development, the future roadway network and intersection impact is considered negligible. As such, no further traffic assessment is included herein.

Multi-Modal Level of Service –Projected Build-Out Conditions

As there are no planned changes to the Lyon/Gladstone intersection, the projected MMLoS is expected to be the same as the existing MMLoS in Section 4.9.1.

4.9.3. TOTAL PROJECTED 2026 CONDITIONS – FULL BUILD-OUT + 5 YEARS

There are only approximately 12 two-way vehicle trips projected in both peak hours which equates to approximately 1 vehicle every 5 minutes. Given the low projected number of vehicle trips projected to be generated by the proposed development, the future roadway network and intersection impact is considered negligible. As such, no further traffic assessment is included herein.

Multi-Modal Level of Service –Projected Build-Out Conditions + 5 Years

As there are no planned changes to the Lyon/Gladstone intersection, the projected MMLoS is expected to be the same as the existing MMLoS in Section 4.9.1.

5. FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis herein, the following conclusions are provided:

Proposed Site

- The development will include 116 apartment units with 2 proposed underground residential parking spaces and 10 visitor parking spaces;

- A total of 142 bicycle parking spaces are proposed with 138 spaces located on the ground floor or within the underground parking structure and 4 located on the exterior;
- The proposed development will consist of one phase, with the build-out year assumed to be 2021;
- The proposed development is projected to generate 'new' two-way vehicle volumes of approximately 12 veh/h during the weekday morning and afternoon peak hours at build-out year;
- The development is located approximately 350 to 450m walking distance from the Albert and Slater Transit Stations and approximately 385m walking distance from the future Lyon LRT Station; and
- Vehicle access to the development is proposed via a new full-movement driveway to Gloucester Street.

Existing and Projected Conditions

- The signalized Lyon/Gloucester intersection and unsignalized Bay/Gloucester intersection are operate 'as a whole' with a LoS 'B' or better during peak hours and are projected to continue operating similar to existing conditions as there are minimal auto trips generated by the development; and
- The boundary road and intersection MMLoS targets are met with the exception of the PLoS at the Lyon/Gloucester intersection;
    - The pedestrian level of service 'A' is not achieved due to low effective walk time for pedestrians crossing on the north and south legs at the intersection.

Site Plan

- Cycling facilities are provided on Lyon Street and Bay Street in the form of on-street cycle lanes;
- Pedestrian facilities include pathways connecting the building entrances/exits to the public sidewalks along Gloucester Street;
- The proposed residential development is in a desirable location to promote active and transit modes given the type of development, its location adjacent to rapid transit, and the existing and future cycling and pedestrian facilities within the area; and
- The number of vehicle and bicycle parking spaces meets the City's minimum By-Law requirement for residents.

Based on the foregoing, the proposed development fits well into the context of the surrounding area, and its location and design serve to promote use of walking, cycling, and transit modes, thus supporting City of Ottawa policies, goals and objectives with respect to redevelopment, intensification and modal share. Therefore, approval from a transportation perspective of the proposed 341 Gloucester Street development is recommended.

Prepared By:	Reviewed by:
Rani Nahas, E.I.T. Transportation Analyst	Austin Shih, P.Eng. Transportation Engineer

Appendix A

Screening Form

PARSONS

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

City of Ottawa 2017 TIA Guidelines

TIA Screening Form

Date	13-May-19
Project	341 Gloucester St
Project Number	908489-50003

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

Module 1.1 - Description of Proposed Development	
Municipal Address	341 Gloucester St
Description of location	Mid-block along Gloucester St between Bay St and Lyon St
Land Use	High Density Residential
Development Size	116 apartment units
Number of Accesses and Locations	One full-movement access to Gloucester St
Development Phasing	none
Buildout Year	Estimated 2021
Sketch Plan / Site Plan	See attached

Module 1.2 - Trip Generation Trigger		
Land Use Type	Townhomes or Apartments	
Development Size	116	Units
Trip Generation Trigger Met?	Yes	But not based on number of trips

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	
Development is in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone. (See Sheet 3)	Yes	TOD
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;	Yes	
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?	Yes	

Appendix B

Traffic Count Data

Intersection Peak Hour

08:00 - 09:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	1	1	2	99	142	31	324	1	1	0	0	602
Factor	0.00	0.25	0.25	0.25	0.73	0.79	0.52	0.84	0.25	0.25	0.00	0.00	0.91
Approach Factor	0.50			0.83			0.89			0.25			

Peak Hour Vehicle Summary

Vehicle	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Car	0	0	0	2	94	129	31	170	1	0	0	0	427
Truck	0	0	0	0	5	5	0	2	0	0	0	0	12
Bicycle	0	1	1	0	0	8	0	152	0	1	0	0	163

Peak Hour Pedestrians

	NE			NW			SW			SE			Total
	Left	Right	Total	Left	Right	Total	Left	Right	Total	Left	Right	Total	
Pedestrians	21	28	49	100	56	156	60	65	125	26	83	109	439

Intersection Peak Hour

16:15 - 17:15

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	1	3	1	2	259	137	26	134	2	0	0	0	565
Factor	0.25	0.75	0.25	0.50	0.90	0.90	0.65	0.91	0.25	0.00	0.00	0.00	0.92
Approach Factor	0.62			0.95			0.84			0.00			

Peak Hour Vehicle Summary

Vehicle	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Car	0	0	0	1	247	117	26	113	0	0	0	0	504
Truck	0	0	0	0	2	0	0	0	0	0	0	0	2
Bicycle	1	3	1	1	10	20	0	21	2	0	0	0	59

Peak Hour Pedestrians

	NE			NW			SW			SE			Total
	Left	Right	Total	Left	Right	Total	Left	Right	Total	Left	Right	Total	
Pedestrians	73	65	138	14	66	80	33	28	61	51	28	79	358

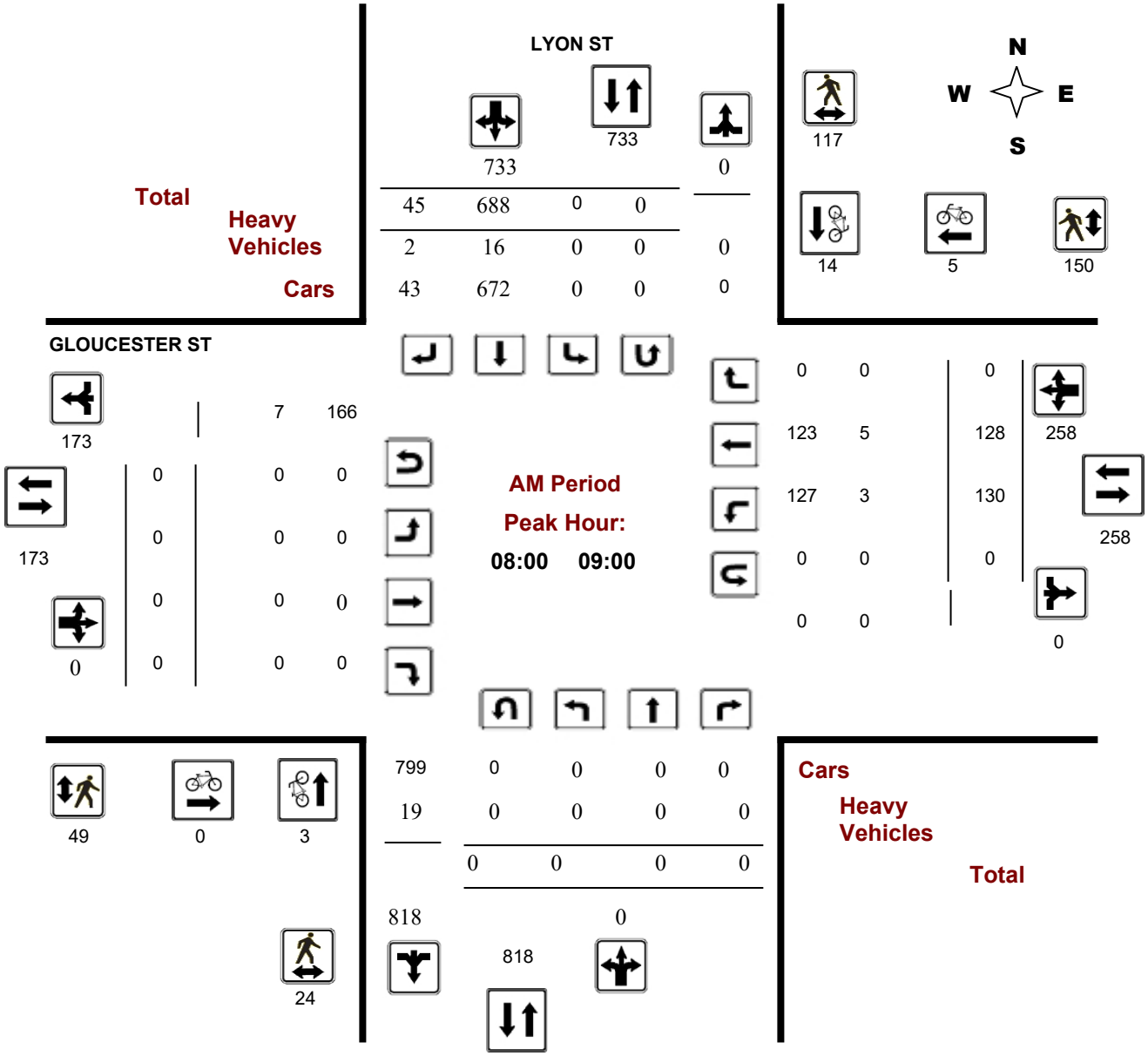
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GLOUCESTER ST @ LYON ST

Survey Date: Friday, June 12, 2015
Start Time: 07:00

WO No: 34687
Device: Jamar Technologies, Inc



Comments

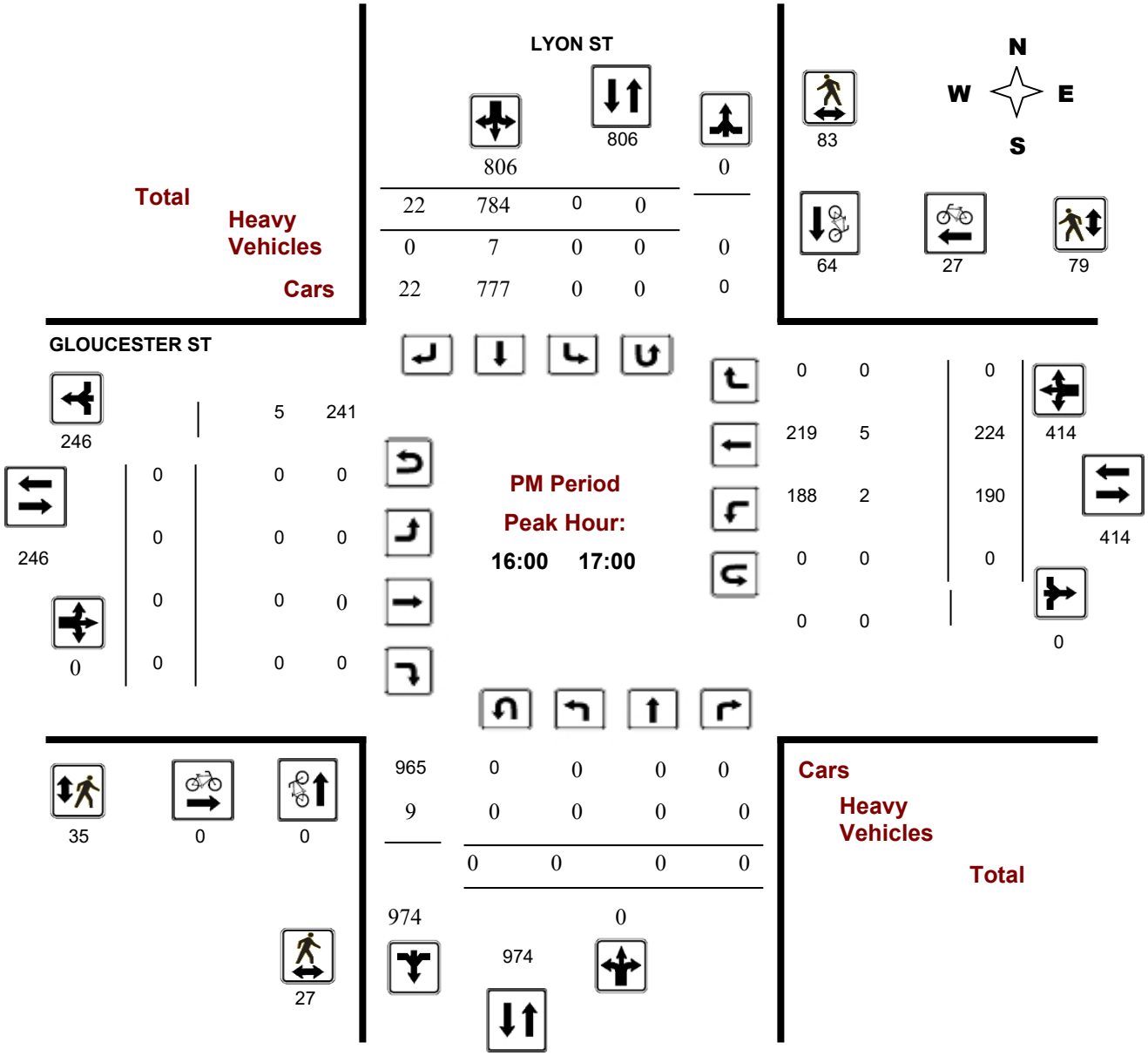
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GLOUCESTER ST @ LYON ST

Survey Date: Friday, June 12, 2015
Start Time: 07:00

WO No: 34687
Device: Jamar Technologies, Inc



Comments

Appendix C

Collision Data and Analysis

City Operations - Transportation Services

Collision Details Report - Public Version

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

Location: BAY ST @ GLOUCESTER ST

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

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Mar-17, Tue,13:36	Clear	Sideswipe	P.D. only	Dry	North	Turning left	Truck - dump	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Nov-01, Tue,11:58	Rain	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Jun-12, Mon,15:45	Clear	Angle	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: GLOUCESTER ST @ LYON ST

Traffic Control: Traffic signal **Total Collisions:** 10

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2013-Jan-06, Sun,12:03	Snow	Angle	P.D. only	Loose snow	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2013-Nov-05, Tue,22:15	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	

					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-May-18, Sun,17:35	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Jun-12, Thu,15:17	Rain	Angle	Non-fatal injury	Wet	South	Going ahead	Pick-up truck	Other motor vehicle	
					West	Going ahead	Pick-up truck	Other motor vehicle	
2014-Dec-12, Fri,11:21	Snow	SMV other	P.D. only	Slush	South	Turning right	Truck and trailer	Pole (utility, power)	
2014-Dec-17, Wed,12:50	Clear	Turning movement	P.D. only	Wet	West	Going ahead	Truck - dump	Other motor vehicle	
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2015-Feb-11, Wed,13:12	Clear	SMV other	P.D. only	Wet	South	Turning right	Truck - open	Pole (utility, power)	
2016-Jan-26, Tue,13:42	Clear	SMV other	Non-fatal injury	Wet	West	Turning left	Automobile, station wagon	Pedestrian	1
2017-Feb-24, Fri,22:29	Clear	Sideswipe	P.D. only	Wet	South	Changing lanes	Pick-up truck	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Mar-14, Tue,11:59	Snow	Sideswipe	P.D. only	Slush	South	Changing lanes	Delivery van	Other motor vehicle	

					South	Going ahead	Pick-up truck	Other motor vehicle	

Location: GLOUCESTER ST btwn BAY ST & LYON ST N

Traffic Control: No control

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-May-07, Thu,17:23	Clear	SMV unattended vehicle	P.D. only	Dry	North	Reversing	Pick-up truck	Unattended vehicle	

Appendix D

Background Traffic Analysis

Gloucester / Lyon
8 hrs

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2007	Thursday 28 June	6094			6836	2379			1637	16946
2009	Friday 22 May	6011			6826	2287			1470	16594
2015	Friday June 12	5672			6508	2124			1286	15590

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2007		6094		16946				
2009		6011		16594		-1.4%		-2.1%
2015		5672		15590		-5.6%		-6.1%

Regression Estimate 2007 6104
Regression Estimate 2015 5675
Average Annual Change **-0.91%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2007		1637		16946				
2009		1470		16594		-10.2%		-2.1%
2015		1286		15590		-12.5%		-6.1%

Regression Estimate 2007 1600
Regression Estimate 2015 1274
Average Annual Change **-2.81%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2007		2379		16946				
2009		2287		16594		-3.9%		-2.1%
2015		2124		15590		-7.1%		-6.1%

Regression Estimate 2007 2366
Regression Estimate 2015 2120
Average Annual Change **-1.36%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2007		6836		16946				
2009		6826		16594		-0.1%		-2.1%
2015		6508		15590		-4.7%		-6.1%

Regression Estimate 2007 6869
Regression Estimate 2015 6519
Average Annual Change **-0.65%**

Gloucester / Lyon
AM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2007	Thursday 28 June	746			803	265			208	2022
2009	Friday 22 May	733			800	261			194	1988
2015	Friday June 12	733			818	258			173	1982

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2007		746		2022				
2009		733		1988		-1.7%		-1.7%
2015		733		1982		0.0%		-0.3%

Regression Estimate 2007 742
Regression Estimate 2015 732
Average Annual Change **-0.17%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2007		208		2022				
2009		194		1988		-6.7%		-1.7%
2015		173		1982		-10.8%		-0.3%

Regression Estimate 2007 206
Regression Estimate 2015 172
Average Annual Change **-2.19%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2007		265		2022				
2009		261		1988		-1.5%		-1.7%
2015		258		1982		-1.1%		-0.3%

Regression Estimate 2007 264
Regression Estimate 2015 258
Average Annual Change **-0.30%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2007		803		2022				
2009		800		1988		-0.4%		-1.7%
2015		818		1982		2.3%		-0.3%

Regression Estimate 2007 800
Regression Estimate 2015 817
Average Annual Change **0.26%**

Gloucester / Lyon
PM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2007	Thursday 28 June	1017			1178	464			303	2962
2009	Friday 22 May	1018			1166	432			284	2900
2015	Friday June 12	806			974	414			246	2440

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2007		1017		2962				
2009		1018		2900		0.1%		-2.1%
2015		806		2440		-20.8%		-15.9%

Regression Estimate 2007 1042
Regression Estimate 2015 814
Average Annual Change **-3.03%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2007		303		2962				
2009		284		2900		-6.3%		-2.1%
2015		246		2440		-13.4%		-15.9%

Regression Estimate 2007 301
Regression Estimate 2015 245
Average Annual Change **-2.52%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2007		464		2962				
2009		432		2900		-6.9%		-2.1%
2015		414		2440		-4.2%		-15.9%

Regression Estimate 2007 455
Regression Estimate 2015 411
Average Annual Change **-1.26%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2007		1178		2962				
2009		1166		2900		-1.0%		-2.1%
2015		974		2440		-16.5%		-15.9%

Regression Estimate 2007 1196
Regression Estimate 2015 980
Average Annual Change **-2.46%**

Appendix E

MMLoS Analysis

Multi-Modal Level of Service - Intersections Form

Consultant	**PARSONS**	**Project**	**477158-01000**
Scenario	**341 Gloucester TIA**	**Date**	**Jun-19**
Comments			

INTERSECTIONS		Intersection A			
	Crossing Side	**NORTH**	**SOUTH**	**EAST**	**WEST**
Pedestrian	Lanes	3	3	3	0 - 2
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns	No left turn / Prohib.	Permissive	No left turn / Prohib.	No left turn / Prohib.
	Conflicting Right Turns	Permissive or yield control	No right turn	No right turn	Permissive or yield control
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR prohibited	RTOR prohibited	RTOR allowed
	Ped Signal Leading Interval?	No	No	No	No
	Right Turn Channel	No Channel	No Right Turn	No Right Turn	No Channel
	Corner Radius	3-5m	3-5m	No Right Turn	5-10m
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings
	PETSI Score	**80**	**84**	**96**	**94**
	Ped. Exposure to Traffic LoS	**B**	**B**	**A**	**A**
	Cycle Length	60	60	60	60
	Effective Walk Time	8	8	26	26
	Average Pedestrian Delay	**23**	**23**	**10**	**10**
	Pedestrian Delay LoS	**C**	**C**	**B**	**B**
	Level of Service	**C**	**C**	**B**	**B**
		C			
	Approach From	**NORTH**	**SOUTH**	**EAST**	**WEST**
Bicycle	Bicycle Lane Arrangement on Approach	Curb Bike Lane, Cycletrack or MUP		Mixed Traffic	
	Right Turn Lane Configuration	Not Applicable			
	Right Turning Speed	Not Applicable			
	Cyclist relative to RT motorists	**Not Applicable**	**-**	**#N/A**	**-**
	Separated or Mixed Traffic	**Separated**	**-**	**Mixed Traffic**	**-**
	Left Turn Approach			No lane crossed	
	Operating Speed			≤ 40 km/h	
	Left Turning Cyclist	**-**	**-**	**B**	**-**
	Level of Service	**-**	**-**	**#N/A**	**-**
		#N/A			
Transit	Average Signal Delay	≤ 10 sec		≤ 40 sec	
	Level of Service	**B**	**-**	**E**	**-**
		E			
Truck	Effective Corner Radius				
	Number of Receiving Lanes on Departure from Intersection				
	Level of Service	**-**	**-**	**-**	**-**
		-			
Auto	Volume to Capacity Ratio	0.0 - 0.60			
	Level of Service	**A**			

Multi-Modal Level of Service - Segments Form

Consultant	**PARSONS**	**Project**	**4771578-01000**
Scenario	**341 Gloucester TIA**	**Date**	**Jun-19**
Comments			

SEGMENTS		**Street A**	Gloucester (north side)	Section 2	Section 3
Pedestrian	Sidewalk Width Boulevard Width	-	1.5 m < 0.5 m		
	Avg Daily Curb Lane Traffic Volume		≤ 3000		
	Operating Speed On-Street Parking		≤ 30 km/h yes		
	Exposure to Traffic PLoS		**D**	-	-
	Effective Sidewalk Width				
	Pedestrian Volume				
	Crowding PLoS		-	-	-
	Level of Service		**-**	**-**	**-**
Bicycle	Type of Cycling Facility	**A**	Mixed Traffic		
	Number of Travel Lanes		≤ 2 (no centreline)		
	Operating Speed		≤ 40 km/h		
	# of Lanes & Operating Speed LoS		**A**	-	-
	Bike Lane (+ Parking Lane) Width				
	Bike Lane Width LoS		-	-	-
	Bike Lane Blockages				
	Blockage LoS		-	-	-
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge		
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes		
	Sidestreet Operating Speed		≤ 40 km/h		
	Unsignalized Crossing - Lowest LoS		**A**	-	-
	Level of Service		**A**	**-**	**-**
Transit	Facility Type	-			
	Friction or Ratio Transit:Posted Speed				
	Level of Service		**-**	**-**	**-**
Truck	Truck Lane Width	-			
	Travel Lanes per Direction				
	Level of Service		**-**	**-**	**-**

Appendix F

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)*	☐ More than 50% of provided spaces are vertical.
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)*	☑ 154 of the 158 spaces are proposed indoors.
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	☐
	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)	☐

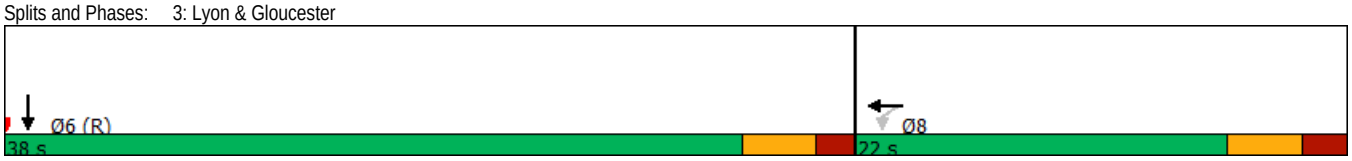
Appendix G

Synchro Analysis

Lane Group	WBT	SBT
Lane Configurations		
Traffic Volume (vph)	128	688
Future Volume (vph)	128	688
Lane Group Flow (vph)	272	771
Turn Type	NA	NA
Protected Phases	8	6
Permitted Phases		
Minimum Split (s)	21.4	27.1
Total Split (s)	22.0	38.0
Total Split (%)	36.7%	63.3%
Yellow Time (s)	3.3	3.3
All-Red Time (s)	2.1	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.4	5.1
Lead/Lag		
Lead-Lag Optimize?		
Act Effct Green (s)	16.6	32.9
Actuated g/C Ratio	0.28	0.55
v/c Ratio	0.50	0.29
Control Delay	16.2	7.4
Queue Delay	0.0	0.0
Total Delay	16.2	7.4
LOS	B	A
Approach Delay	16.2	7.4
Approach LOS	B	A
Queue Length 50th (m)	16.7	14.3
Queue Length 95th (m)	35.4	20.2
Internal Link Dist (m)	169.1	108.1
Turn Bay Length (m)		
Base Capacity (vph)	542	2659
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.50	0.29

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 52 (87%), Referenced to phase 6:SBT, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 38.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Lyon & Gloucester



Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	94	129	31	170	0	0	0	0
Future Vol, veh/h	0	0	0	0	94	129	31	170	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	99	136	33	179	0	0	0	0

Major/Minor	Minor1			Major1		
Conflicting Flow All	-	245	179	0	0	-
Stage 1	-	245	-	-	-	-
Stage 2	-	0	-	-	-	-
Critical Hdwy	-	6.52	6.22	4.12	-	-
Critical Hdwy Stg 1	-	5.52	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	4.018	3.318	2.218	-	-
Pot Cap-1 Maneuver	0	657	864	-	-	0
Stage 1	0	703	-	-	-	0
Stage 2	0	-	-	-	-	0
Platoon blocked, %					-	
Mov Cap-1 Maneuver	-	0	864	-	-	-
Mov Cap-2 Maneuver	-	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	-	0	-	-	-	-

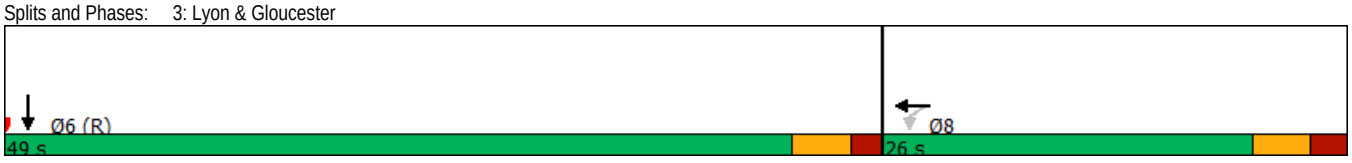
Approach	WB	NB
HCM Control Delay, s	10.7	
HCM LOS	B	

Minor Lane/Major Mvmt	NBL	NBT	WBLn1
Capacity (veh/h)	-	-	864
HCM Lane V/C Ratio	-	-	0.272
HCM Control Delay (s)	-	-	10.7
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	1.1

Lane Group	WBT	SBT
Lane Configurations		
Traffic Volume (vph)	224	784
Future Volume (vph)	224	784
Lane Group Flow (vph)	436	848
Turn Type	NA	NA
Protected Phases	8	6
Permitted Phases		
Minimum Split (s)	21.4	27.1
Total Split (s)	26.0	49.0
Total Split (%)	34.7%	65.3%
Yellow Time (s)	3.3	3.3
All-Red Time (s)	2.1	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.4	5.1
Lead/Lag		
Lead-Lag Optimize?		
Act Effct Green (s)	20.6	43.9
Actuated g/C Ratio	0.27	0.59
v/c Ratio	0.84	0.30
Control Delay	39.1	8.1
Queue Delay	0.0	0.0
Total Delay	39.1	8.1
LOS	D	A
Approach Delay	39.1	8.1
Approach LOS	D	A
Queue Length 50th (m)	50.8	19.7
Queue Length 95th (m)	#98.4	26.1
Internal Link Dist (m)	169.1	108.1
Turn Bay Length (m)		
Base Capacity (vph)	519	2843
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.84	0.30

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 42 (56%), Referenced to phase 6:SBT, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 18.6	Intersection LOS: B
Intersection Capacity Utilization 48.8%	ICU Level of Service A
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 3: Lyon & Gloucester



Intersection	
Int Delay, s/veh	8.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	247	117	26	113	0	0	0	0
Future Vol, veh/h	0	0	0	0	247	117	26	113	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	260	123	27	119	0	0	0	0

Major/Minor	Minor1			Major1		
Conflicting Flow All	-	173	119	0	0	-
Stage 1	-	173	-	-	-	-
Stage 2	-	0	-	-	-	-
Critical Hdwy	-	6.52	6.22	4.12	-	-
Critical Hdwy Stg 1	-	5.52	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	4.018	3.318	2.218	-	-
Pot Cap-1 Maneuver	0	720	933	-	-	0
Stage 1	0	756	-	-	-	0
Stage 2	0	-	-	-	-	0
Platoon blocked, %					-	
Mov Cap-1 Maneuver	-	0	933	-	-	-
Mov Cap-2 Maneuver	-	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	-	0	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	11.5	
HCM LOS	B	

Minor Lane/Major Mvmt	NBL	NBT	WBLn1
Capacity (veh/h)	-	-	933
HCM Lane V/C Ratio	-	-	0.411
HCM Control Delay (s)	-	-	11.5
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	2