398 – 406 Roosevelt Avenue

TIA Addendum #1

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December 13, 2021

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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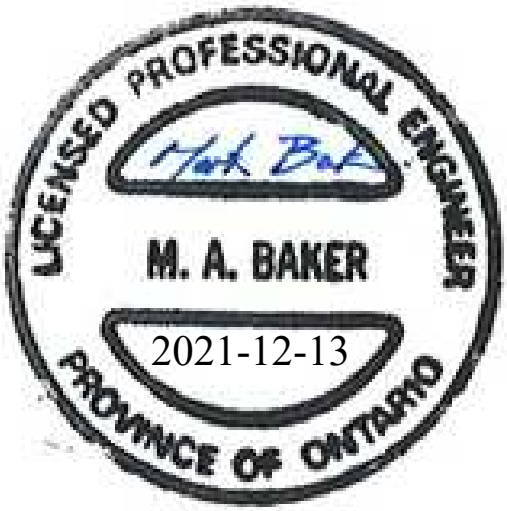

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TABLE OF CONTENTS

DOCUMENT CONTROL PAGE I
1. INTRODUCTION 1
2. SCOPING REPORT 1
2.1. BACKGROUND 1
2.1.1. PROPOSED DEVELOPMENT 1
2.1.2. KEY ANALYTICAL ASSUMPTIONS 2
2.1.3. EXISTING CONDITIONS 2
2.1.4. PLANNED CONDITIONS 5
2.2. STUDY AREA AND TIME PERIODS 7
2.3. EXEMPTION REVIEW 7
3. FORECASTING REPORT 8
3.1. DEVELOPMENT GENERATED TRAVEL DEMAND 8
3.2. BACKGROUND NETWORK TRAVEL DEMANDS 8
3.2.1. TRANSPORTATION NETWORK PLANS 8
3.2.2. BACKGROUND GROWTH 8
3.2.3. OTHER AREA DEVELOPMENTS 8
3.3. DEMAND RATIONALIZATION 10
4. STRATEGY REPORT 10
4.1. DEVELOPMENT DESIGN 10
4.1.1. DESIGN FOR SUSTAINABLE MODES 10
4.1.2. CIRCULATION AND ACCESS 10
4.1.3. NEW STREETS NETWORK 11
4.2. PARKING 11
4.2.1. PARKING SUPPLY 11
4.2.2. SPILLOVER PARKING 12
4.3. BOUNDARY STREET DESIGN 12
4.3.1. EXISTING AND FUTURE CONDITIONS 12
4.4. ACCESS INTERSECTION DESIGN 13
4.4.1. LOCATION AND DESIGN OF ACCESS 13
4.4.2. INTERSECTION CONTROL 13
4.4.3. INTERSECTION DESIGN 13
4.5. TRANSPORTATION DEMAND MANAGEMENT 13
4.6. NEIGHBORHOOD TRAFFIC MANAGEMENT 13
4.6.1. ADJACENT NEIGHBORHOODS 13
4.7. TRANSIT 13
4.7.1. ROUTE CAPACITY 13
4.7.2. TRANSIT PRIORITY 14
4.8. REVIEW OF NETWORK CONCEPT 14
4.9. INTERSECTION DESIGN 14
5. FINDINGS AND RECOMMENDATIONS 14

LIST OF FIGURES

FIGURE 1: LOCAL CONTEXT 1
FIGURE 2: UPDATED SITE PLAN 2
FIGURE 3: AREA TRANSIT NETWORK 3
FIGURE 4: 2020 PEAK HOUR TRAFFIC VOLUMES 3
FIGURE 5: DIFFERENCE IN PEAK HOUR VOLUMES (2015 MINUS 2020) 4
FIGURE 6: PLANNED LRT STAGE 2 5
FIGURE 7: OTHER AREA DEVELOPMENT (REFRESHED) 6
FIGURE 8: 335 ROOSEVELT PROJECTED PEAK HOUR TRAFFIC VOLUMES – FULL BUILD OUT 8
FIGURE 9: 397 WINSTON PROJECTED PEAK HOUR TRAFFIC VOLUMES – FULL BUILD OUT 9
FIGURE 10: 325 RICHMOND PROJECTED TRAFFIC VOLUMES – FULL BUILD OUT 9
FIGURE 11: 435 CHURCHILL PROJECTED PEAK HOUR TRAFFIC VOLUMES – FULL BUILD OUT 9
FIGURE 12: TOTAL SITE TRAFFIC 'OTHER AREA DEVELOPMENTS' 10
FIGURE 13: PROPOSED PARKING GARAGE RAMP DESIGN 11

LIST OF TABLES

TABLE 1: EXEMPTIONS REVIEW SUMMARY 7
TABLE 2: VEHICLE PARKING SPACE SUPPLY 11
TABLE 3: BICYCLE PARKING REQUIREMENTS 12
TABLE 4: MMLOS – BOUNDARY STREET SEGMENTS EXISTING AND FUTURE PROPOSED 12

LIST OF APPENDICES

APPENDIX A – PREVIOUS TIA REPORT AND RMA SUBMITTED
APPENDIX B – TRAFFIC COUNT DATA
APPENDIX C – COLLISION DATA
APPENDIX D – PREVIOUS SCREENING FORM AND EXEMPT SECTION CORRESPONDANCE
APPENDIX E – PROJECTED BACKGROUND GROWTH
APPENDIX F – MMLOS: BOUNDARY STREET ROAD SEGMENTS

1. Introduction

A Transportation Impact Assessment (TIA) was prepared by Parsons in December 2017 in support of a Zoning By-Law Amendment (ZBLA) and Site Plan Application (SPA) for Domicile's proposed residential development located at 398 – 406 Roosevelt Avenue. The concept at the time proposed a 6-storey mixed use building with 35 residential units and 500 m^2 of ground floor retail. A Roadway Modification Approval (RMA) was also prepared in December 2018 for the proposed curb and sidewalk along the site's frontage. Since that time, the property has changed ownership to MLDevco Westboro Realty Investments Inc, and several refinements have been made to the Site Plan, namely a reduction to 28 residential condo units and no commercial uses, as well as a modification to the site access from two driveways to a single driveway to underground parking.

Based in recent correspondence with the City of Ottawa (Wally Dubyk, Transportation Manager – Transportation Approvals, Development Review), the ensuing addendum has been prepared to address updated background conditions and minor changes proposed in the Site Plan. The addendum provides a refreshed section on existing conditions, including more current traffic counts, collision data, and reference to nearby proposed developments. The original TIA and RMA package prepared by Parsons has been provided in **Appendix A.**

2. Scoping Report

2.1. Background

2.1.1. PROPOSED DEVELOPMENT

The site is located at 398 – 406 Roosevelt Avenue, near the intersection of Roosevelt/Richmond. The site is within 100 meters of bus stops on Richmond Road and within 475 meters walk of the future Dominion LRT Station. The site context has been illustrated in **Figure 1**, whereas the updated Site Plan is provided in **Figure 2**.

Figure 1: Local Context

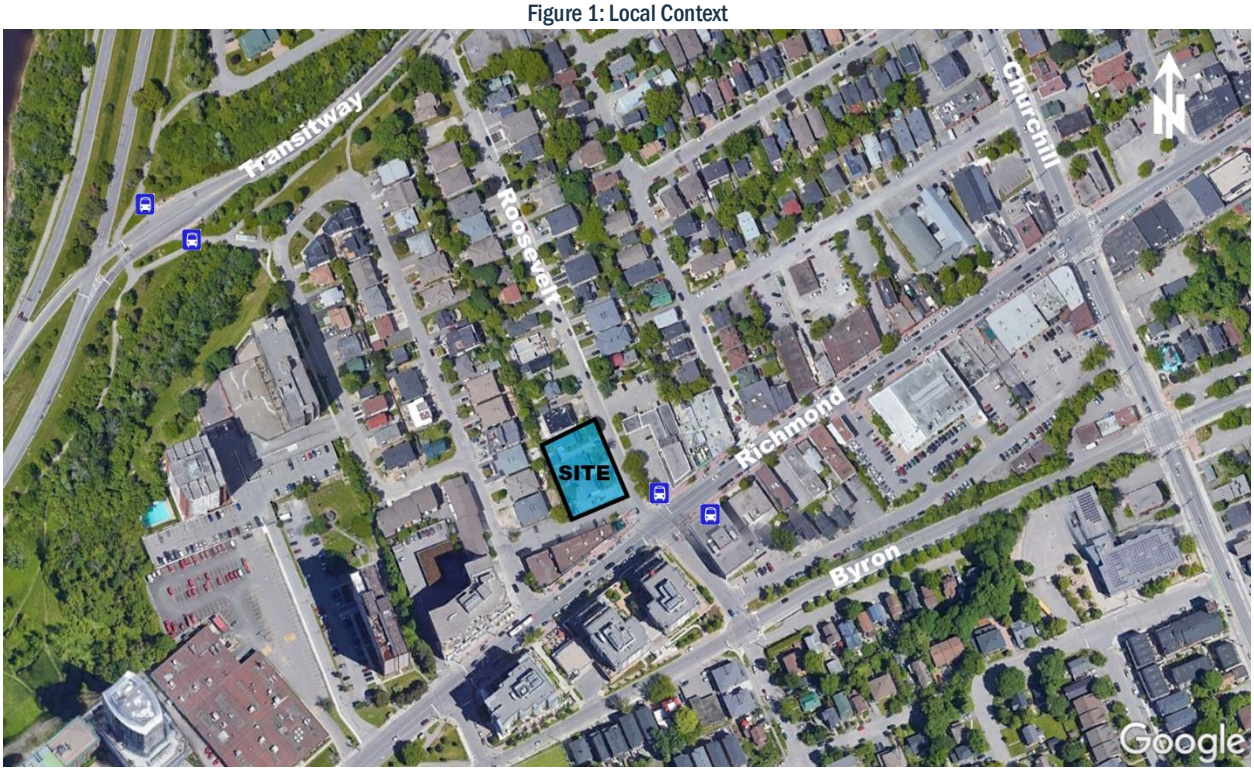
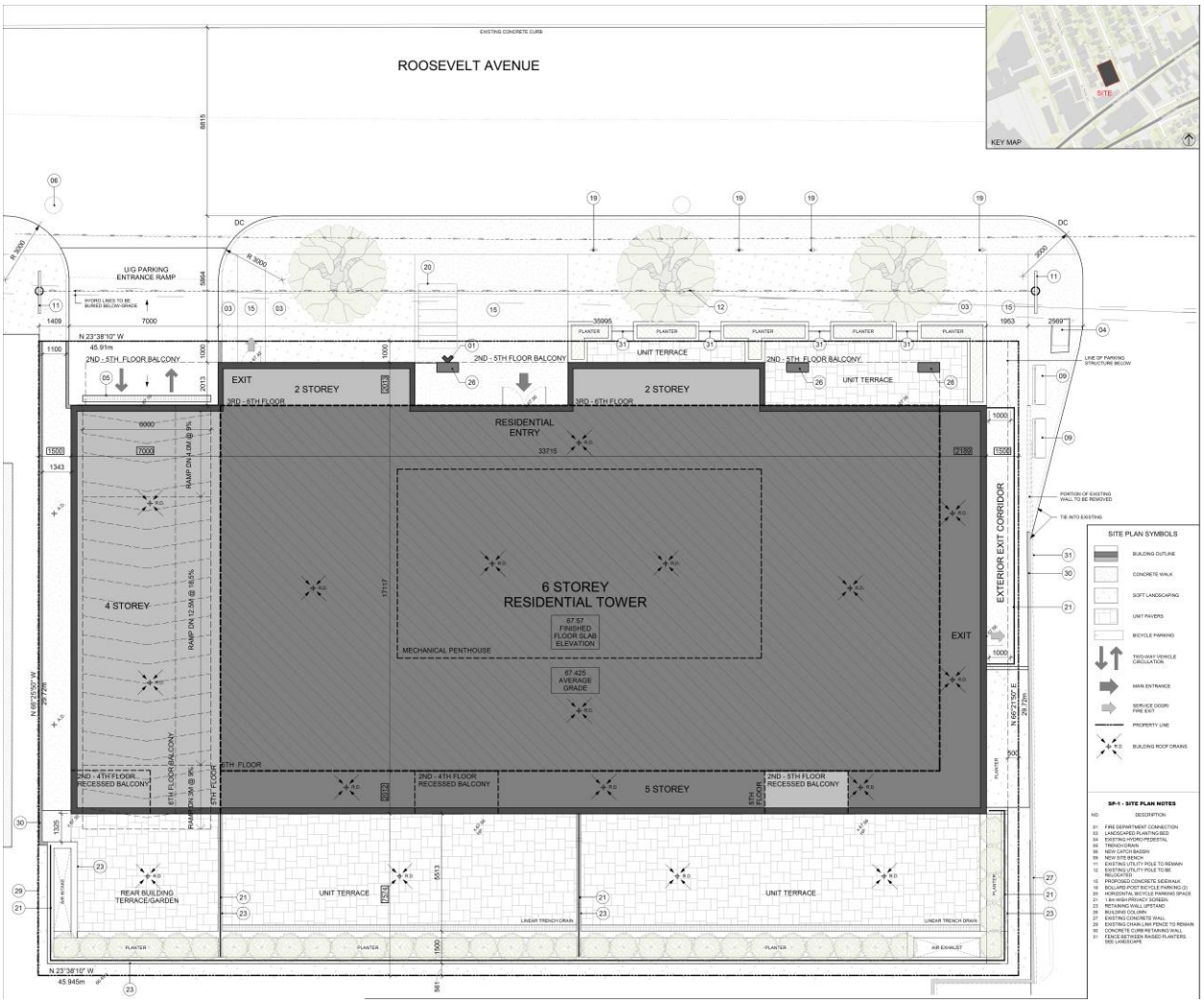


Figure 2: Updated Site Plan



Source: RLA Architecture

2.1.2. KEY ANALYTICAL ASSUMPTIONS

The following is a summary of the key analytical assumptions used in preparing this Addendum. The context and implications of the individual assumptions will be discussed in further detail throughout this report.

- A 6-storey building is still being proposed with a similar footprint. The new development proposes a reduction in residential unit counts from 35 to 28 units, and no longer proposes commercial uses.
- A site driveway connection to Roosevelt Avenue is still being proposed and remains located at the northern extent of the site. The former Site Plan proposed two side-by-side driveways – one to a single level of underground parking, and another to surface parking. The updated Site Plan proposes a single driveway to two levels of underground parking.
- An update will be completed of planned conditions and nearby proposed developments.
- The analysis will be updated to include 2020 traffic volumes and more recent 5-year collision history.

2.1.3. EXISTING CONDITIONS

Within Section 3 of the original TIA submission prepared by Parsons in December 2017 (see **Appendix A**), the following sub-sections continue are considered current:

- Section 3.1: Area Road Network
- Section 3.2: Pedestrian/Cycling Network

- Section 3.4: Existing Study Area Intersection

The remaining sections within Section 3 of the original TIA have been updated as follows:

Section 3.3 within Original TIA: Transit Network

Minor route changes have occurred near the site, including the introduction of the Confederation LRT Line from Tunney's Pasture to Blair Station. Near the site, rapid transit routes have been removed from the Transitway at Westboro and Dominion Stations to facilitate construction of the Confederation LRT Line West Expansion. These routes now operate of Scott Street, and Route #11 continues to operate adjacent to the site (see **Figure 3**).

Figure 3: Area Transit Network

Source: OC Transpo website

Section 3.5 within Original TIA: Existing Intersection Performance

New traffic counts have been provided by the City of Ottawa. The former counts were conducted on June 12, 2015. The new counts were completed January 23, 2020. A comparison of the two counts shows a decrease in traffic at all legs between 2015 and 2020 counts, notably in the PM peak hour. It is possible that some of the reductions in vehicular traffic are linked to the watermain construction that occurred on Richmond Road between Redwood Avenue and Fraser Avenue. The raw traffic counts have been provided in **Appendix B.**

Figure 4: 2020 Peak Hour Traffic Volumes

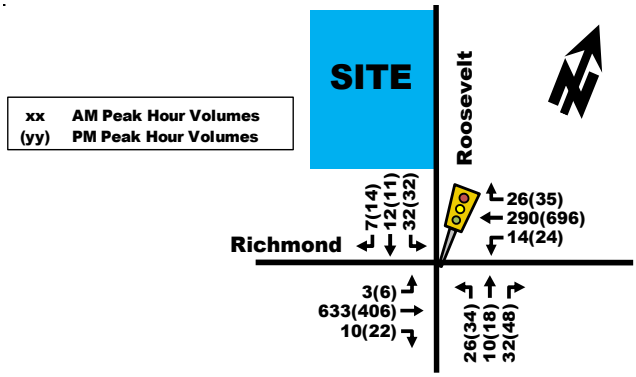
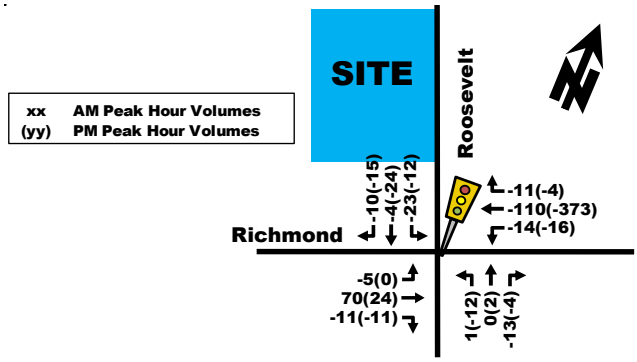


Figure 5: Difference in Peak Hour Volumes (2015 minus 2020)



Section 3.6 within Original TIA: Existing Road Safety Conditions

A five-year collision history data (2015-2019, inclusive) was requested and obtained from the City of Ottawa for all intersections and road segments within the study area. Upon analyzing the collision data, the total number of collisions observed within the study area was determined to be 31 collisions within the past five-years. Within the study area, the number of collisions at each location is summarized below:

- Roosevelt/Richmond intersection: 7
- Mid-block Roosevelt: 4
- Mid-Block Richmond E of Roosevelt: 6
- Mid-block Richmond W of Roosevelt: 14

To help quantify the relative safety risk at intersections within the study area, an industry standard unit of measure for assessing collisions at an intersection was used based on the number collisions per million entering vehicles (MEV). An MEV value greater than 1.00 indicates a relatively high frequency of collisions; however, it does not explain the type or severity of collision. A secondary analysis is done to determine the severity of collision by representing the number of personal injuries (%PIR) as a percentage of the total number of collisions at a given intersection.

A high propensity (MEV > 1.00 or %PIR > 30%) would signal a potential intersection design deficiency or other contributing factor, such as poor intersection geometry, blind spots, poor lighting, excessive speeds, high amount of entry/exit driveways etc.

Intersections that met the MEV or PIR threshold include:

- none

Intersections that did not meet the MEV or PIR threshold and do not warrant further analysis include:

- Roosevelt/Richmond – 0.24 Collisions/MEV with 29% causing injury. Total of 7 collisions with 5 (71%) of all collisions involving rear end. No strong trend was determined.

Other collisions within the study area include:

- There was a total of 24 collisions between intersections (mid-block segments), with the majority, 14 (58%) of them occurring on Richmond Road from west of Roosevelt Avenue to Golden Avenue. Of the 14 collisions, 6 involved single vehicle unattended, possibly linked with vehicles leaving or entering a parking spot and colliding with a parked vehicle or object.
- A collision with a cyclist was recorded on a mid-block segment between Golden Avenue and Berkley Avenue on Richmond Road from a vehicle pulling on to a shoulder or towards a curb. Another cyclist collision was recorded between Richmond Road and Danforth Avenue on Roosevelt Avenue, involving a vehicle reversing and hitting a cyclist on an angle.
- There were no other collisions registered with pedestrians or cyclists within the study area.

The source collision data as provided by the City of Ottawa and related analysis is provided as **Appendix C**.

2.1.4. PLANNED CONDITIONS

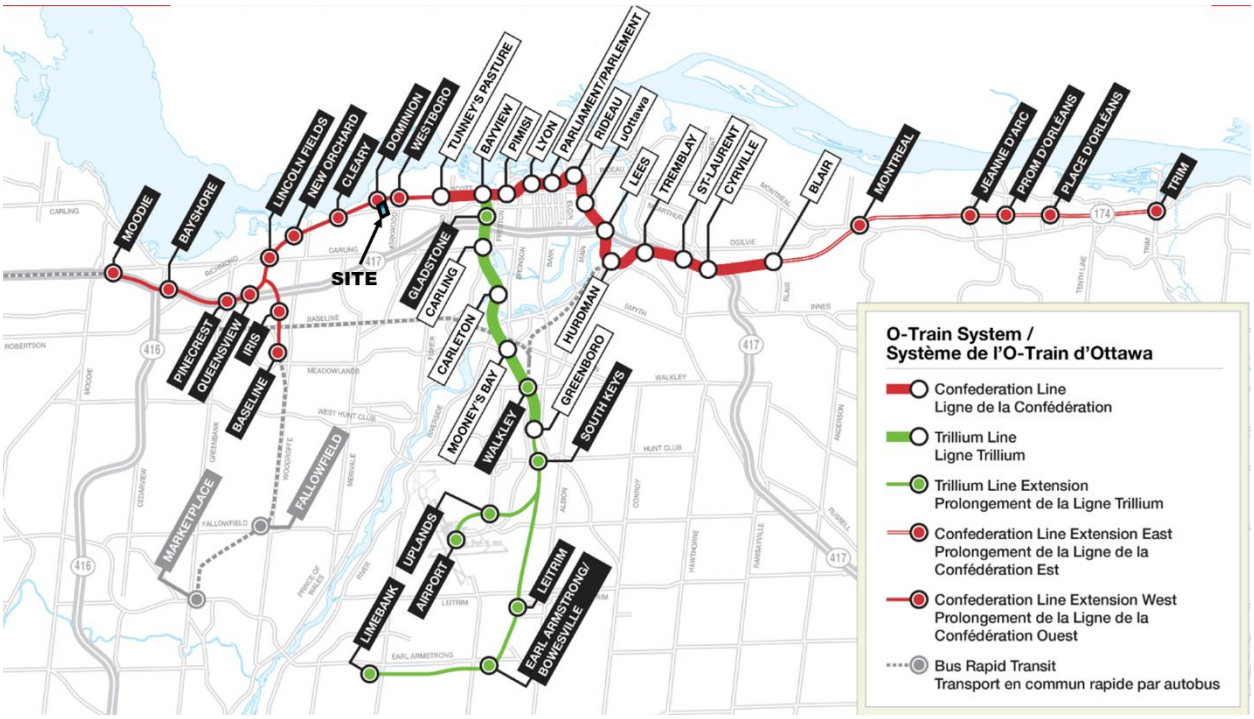
Section 4 of the original TIA submission prepared by Parsons in December 2017 is no current. It has been updated in the following sub-sections.

Section 4.1 within Original TIA: Planned Study Area Transportation Network Changes

Since the writing of this report, the Confederation Line Stage 1 has been complete and is fully operational between Tunney's Pasture Station and Blair Station.

Stage 2 consists of the southern expansion of the Trillium LRT Line and the east and west expansions of the Confederation LRT Line. The Trillium LRT Line will add 16 kms of rail track and will be complete by 2022. The Confederation Line is being expanded in both east and west directions, to include 15 km of additional rail and 11 new stations to the west and 12 km of additional rail and 5 new stations to the east, anticipated to be operational by the year 2025 and 2024 respectively. The subject site will be located within 475 m of Dominion Station on the Confederation Line west expansion, as shown in **Figure 6**.

Figure 6: Planned LRT Stage 2

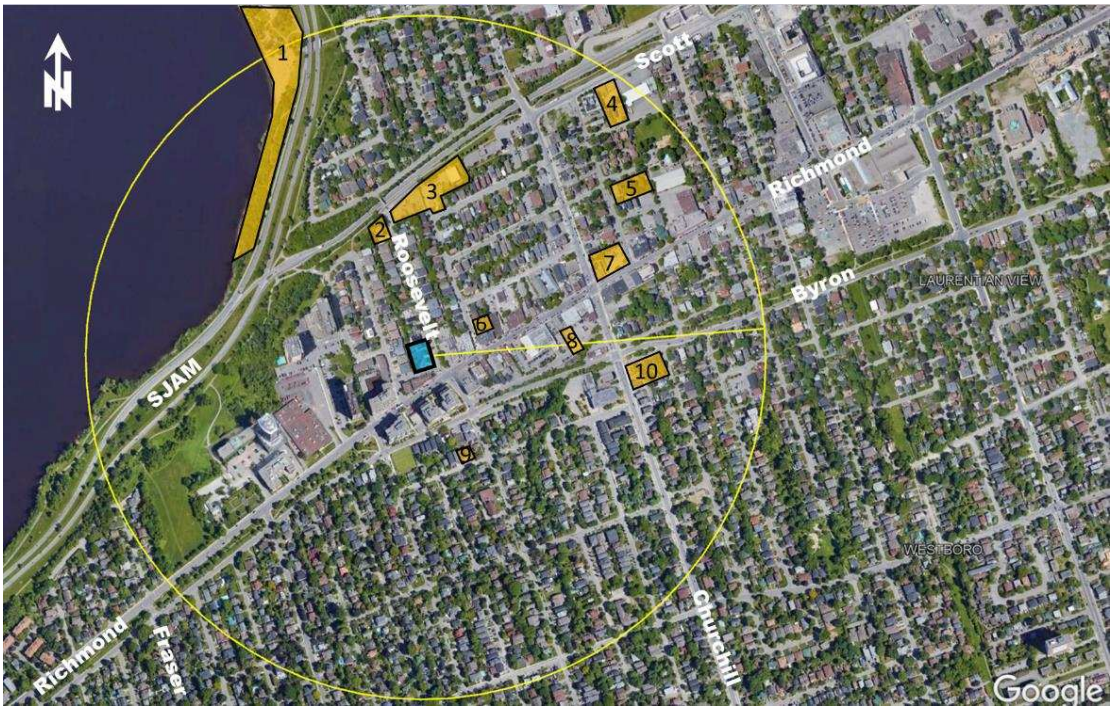


Source: City of Ottawa website

Section 4.2 within Original TIA: Other Area Development

According to the City's development application search tool, accessed October 26, 2021, the following developments are planned within the vicinity of the subject site and have been shown in a map in **Figure 7**.

Figure 7: Other Area Development (Refreshed)



1 – 234 Atlantis/745 Sir John A.

The proposed development plans on changing parking numbers for the Westboro Beach from 24 spots to 19. The beach amenities will be reduced and no changes to the transportation network are anticipated.

2 – 342 Roosevelt

The proposed development is a 3-storey residential building. A total of 25 units are proposed. No transportation analysis was found, and it is anticipated that the development will have negligible impacts considering the size.

3 – 335 Roosevelt

The proposed development is an 18- and 21-storey residential building. A total of 361 units are proposed. The Transportation Impact Study (prepared by Novatech) projects an increase in two-way traffic volumes of approximately 35 to 40 veh/h during peak hours. These volumes will be added to background volumes.

4 – 2050 Scott

The proposed development is a 30-storey residential building. A total of 353 units are proposed. The Transportation Impact Study (prepared by Parsons) projects an increase in two-way traffic volumes of approximately 35 veh/h during peak hours. These volumes are not anticipated to impact the study area given its location.

5 – 300 Elmgrove

The proposed development is four triplex residential buildings. A total of 12 units are proposed. No transportation analysis was found, and it is anticipated that the development will have negligible impacts considering the size and location.

6 – 397 Winston

The proposed development is a 7-storey residential building with ground floor commercial. A total of 42 units are proposed. The Transportation Impact Study (prepared by Novatech) projects an increase in two-way traffic volumes of approximately 15 to 20 veh/h during peak hours. These volumes will be added to background volumes.

7 – 325 Richmond

The proposed development is a 9-storey residential building with ground floor commercial. A total of 185 units are proposed. The Transportation Impact Study (prepared by CGH) projects an increase in two-way traffic volumes of approximately 20 to 30 veh/h during peak hours. These volumes will be added to background volumes.

8 – 349 Danforth

The proposed development is a 3-storey mixed use building. A total of 13 residential units and 2 ground floor commercial units are proposed. No transportation analysis was found, and it is anticipated that the development will have negligible impacts considering the size and location.

9 – 411 Ravenhill

The proposed development will add a basement unit to two triplex residential buildings. No transportation analysis was found, and it is anticipated that the development will have negligible impacts considering the size and location.

10 – 435 Churchill

The proposed development is a 6-storey residential building with ground floor commercial. A total of 75 units are proposed. The Transportation Impact Study (prepared by Novatech) projects an increase in two-way traffic volumes of approximately 25 to 30 veh/h during peak hours. These volumes will be added to background volumes.

2.2. Study Area and Time Periods

The study area and time periods will remain the same as the previous TIA report, with the new horizon year for full buildout assumed for 2023.

2.3. Exemption Review

Based on the City's TIA guidelines and exemptions recommended by City Staff due to the small number of units proposed (refer to **Appendix D**), the following sections have been exempted:

Table 1: Exemptions Review Summary

Module	Element	Exemption Consideration
3.1 Development-generated Travel Demand	All Elements	Minimal auto share anticipated given only 28 residential units on site, and negligible impact anticipated on road network.
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	Expected to meet City's minimum parking by-laws
4.4 Access Intersection Design	4.4.2 Intersection Control	Site access will operate at a private approach and will not require an intersection screening for a signal or roundabout.
	4.4.3 Intersection Design	Site access will operate at a private approach and will not require an intersection screening for a signal or roundabout.
4.5 Transportation Demand Management	All elements	Minimal auto share anticipated given only 28 residential units on site, and negligible impact anticipated on road network.
4.7 Transit	4.7.2 Transit Priority	Minimal auto share anticipated given only 28 residential units on site, and negligible impact anticipated on road network.
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.
4.9 Intersection Design	All Elements	Minimal auto share anticipated given only 28 residential units on site, and negligible impact anticipated on road network.

3. Forecasting Report

3.1. Development Generated Travel Demand

Exempt, see **Table 1**. Given the low number of units proposed, 28, this section was previously exempt and has been exempt in this submission as well as it will have negligible impacts to the study area network.

3.2. Background Network Travel Demands

3.2.1. TRANSPORTATION NETWORK PLANS

Refer to **Section 2.1.3** Planned Conditions – Planned Study Area Transportation Network Changes.

3.2.2. BACKGROUND GROWTH

The background traffic growth was projected to increase by approximately 0.25% to 0.80% in the previous TIA (Section 10 of that report, with further details provided in **Appendix E**), which led to the assumption of 1% annual growth for a more conservative analysis. The most recent count from January 23, 2020 showed a total decrease in traffic volumes of 12% for the AM over 5 years and 33% for the PM over 5 years. Given the recent counts available, it will be assumed that a very conservative 0% annual growth will occur in future years. The known other area developments proposed will be layered on individually.

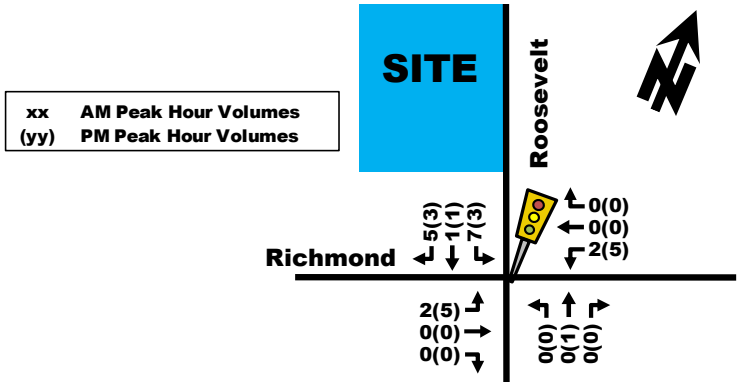
3.2.3. OTHER AREA DEVELOPMENTS

Trips generated by other area developments were accounted within the study area. A summary of each development was provided in **Section 2.1.4**.

335 Roosevelt

Figure 8 illustrates the projected traffic volumes for 335 Roosevelt at full build-out, obtained from the TIA Report completed by Novatech.

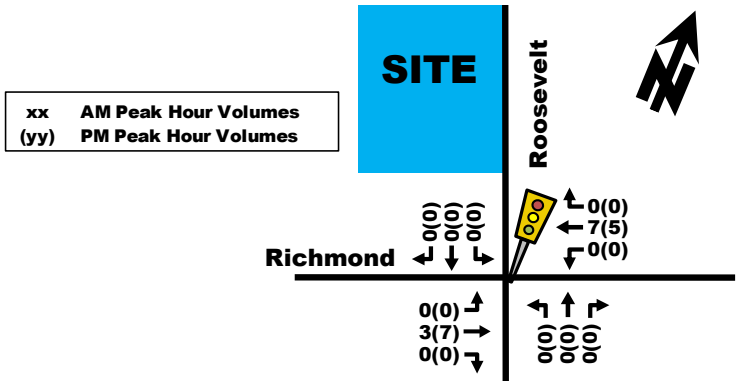
Figure 8: 335 Roosevelt Projected Peak Hour Traffic Volumes – Full Build Out



397 Winston

Figure 9 illustrates the projected traffic volumes for 397 Winston at full build-out, obtained from the TIA Report completed by Novatech. Note that these volumes were estimates based on the projected number of vehicles generated within the TIA report.

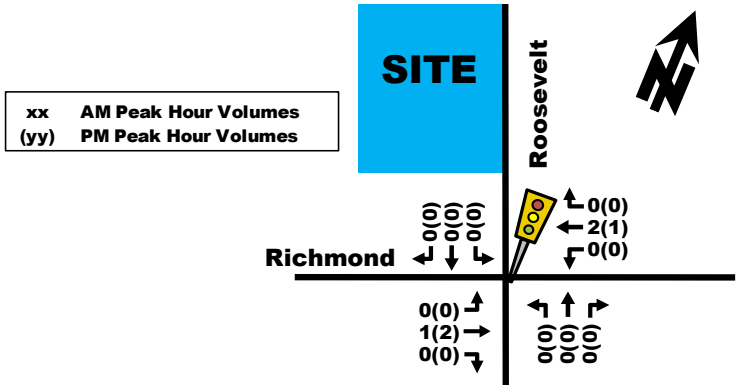
Figure 9: 397 Winston Projected Peak Hour Traffic Volumes – Full Build Out



325 Richmond

Figure 10 illustrates the projected traffic volumes for 325 Richmond at full build-out, obtained from the TIA Report completed by CGH.

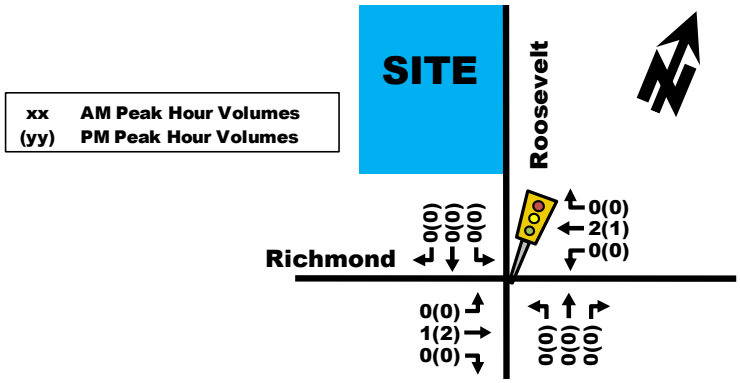
Figure 10: 325 Richmond Projected Traffic Volumes – Full Build Out



435 Churchill

Figure 11 illustrates the projected traffic volumes for 435 Churchill at full build-out, obtained from the TIA Report completed by CGH.

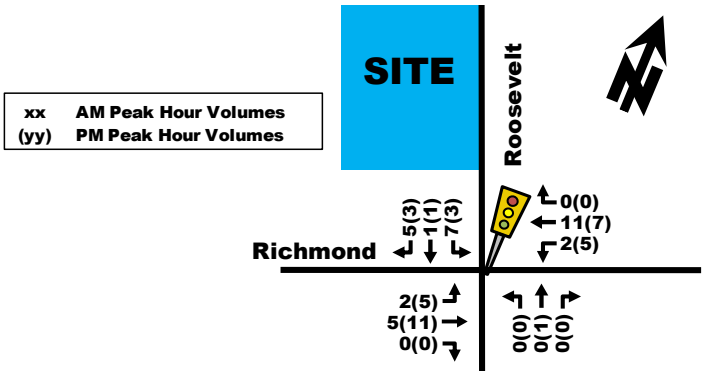
Figure 11: 435 Churchill Projected Peak Hour Traffic Volumes – Full Build Out



Combined All Area Developments

The combined trips generated by other area developments has been illustrated in Figure 12.

Figure 12: Total Site Traffic 'Other Area Developments'



3.3. Demand Rationalization

As discussed in Section 2.2.2, the latest peak hour traffic volumes show a noticeable reduction in vehicles at the study intersection. The background network travel demands as discussed in Section 3.2 project very minor increases in vehicle trips to the study area intersection and combined with the reduction in existing volumes from the 2015 counts to the newer 2020 counts, it is anticipated that Roosevelt/Richmond will operate better now and, in the future, compared to 2015 count volumes.

The proposed development is expected to have negligible impact on the intersection of Roosevelt/Richmond given the anticipated low auto usage during the peak hours from being located in close proximity to the future Dominion LRT station and low unit count. No further intersection analysis is recommended.

4. Strategy Report

4.1. Development Design

4.1.1. DESIGN FOR SUSTAINABLE MODES

Location of Transit Facilities

The subject site is approximately 475m walking distance from the Dominion BRT Station and future LRT Station. Additionally, there are eastbound and westbound transit stops located 95m and 65m to the south of the site, respectively.

Pedestrian/Cycling Routes and Facilities

The building will have a single at-grade access directly on to Roosevelt Avenue, with existing sidewalk located across the street on the east side and a new proposed sidewalk on the west side of Roosevelt Avenue connecting the site to sidewalk facilities on Richmond Road. No internal walkways or site circulation is required.

Bicycle Parking

Bicycle parking is expected to meet the minimum City By-Law requirements as discussed in Section 4.2. Bicycle parking will be provided below grade within the parking garage, located indoors in a secure, well-lit area located or near the main entrance at grade level.

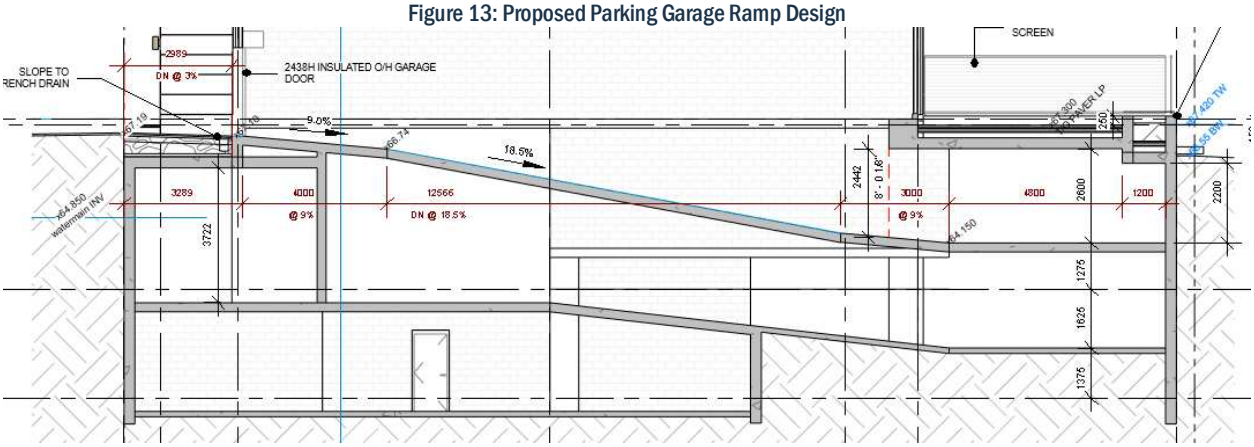
4.1.2. CIRCULATION AND ACCESS

The proposed development driveway, located at the northernmost extent the site, will provide a two-way access to a ramp serving two levels of underground parking. The proposed driveway width is 7m and the garage door

is shown as 6m wide[1], whereas the distance between the proposed edge of roadway and property line is 5.9m (with an additional 3m to the placement of the garage door within the property line). This configuration, combined with the fact that the property line is located at/near the building face, is understood to satisfy the requirements of the City's Private approach By-law (for sites having less than 50 parking spaces). The proposed ramp grades within the site are shown in **Figure 13,** and generally satisfy the guidelines established within the Ontario Building Code (OBC) for vehicle ramp design:

- although slightly exceeding the theoretical maximum of 15%, the proposed maximum ramp grade of 18.5% is not unreasonable given this segment is weather-protected;
- the 4m segment upon approach to the garage door from the garage interior (9%) should accommodate the wheelbase of standard vehicle (although 6m is preferred); and
- the transitions between grades slightly exceed the acceptable limits of approximately 7.5% differential, and therefore there is a small risk of very low-riding vehicles bottoming out (front/back or middle).

Figure 13: Proposed Parking Garage Ramp Design



Source: RLA Architecture

4.1.3. NEW STREETS NETWORK

Exempt, see **Table 1**.

4.2. Parking

4.2.1. PARKING SUPPLY

According to the City of Ottawa Zoning By-law, the proposed development is located in Area B in Schedule 1 and Area X in Schedule 1A, within 600m walk to Dominion Rapid Transit Station according to Schedule 2A. **Table 2** summarizes the vehicle parking minimum and maximums allowed within the parking by-law. **Table** 3 summarizes the bicycle parking requirements as per City of Ottawa Zoning By-law-Part 4, Sections 100-114.

Table 2: Vehicle Parking Space Supply

Land Use		Rate per Unit		Required Vehicle Spaces				Proposed Spaces
		Base	Visitor	Base	Visitors	Min	Max[2]	
Condos	28 units	0.5 per unit[1]	0.1 per unit[1]	8	2	10	49	49
1) no off-street motor vehicle parking is required for the first 12 dwelling units 2) maximum parking allowed is at a rate of 1.75 parking stalls per unit (combined base and visitor)								

[1] It is understood that By-law would permit a garage door as narrow as 4.5m, however 6m has been recommended to minimize the potential for vehicle spillback onto Roosevelt Avenue given the close proximity of the door to the street.

Table 3: Bicycle Parking Requirements

Land Use		Rate	Required Bicycle Spaces	Proposed Spaces
			Required	
Residential Tower	28 units	0.5 per unit	14	14

The proposed number of vehicle parking spaces meet City By-law requirements. The site will provide 49 parking spaces that will be located within a 2-storey underground parking structure, including 2 visitor parking spaces.

Regarding bicycle parking, the development will meet the minimum by-law, including 5 exterior ground level spaces near the main entrance and 9 interior bike parking spaces to be located in P1 near the main elevators and with access to the main lobby at ground floor. Bike parking will be provided in a secure, well-lit parking area.

4.2.2. SPILLOVER PARKING

Exempt, see **Table 1**.

4.3. Boundary Street Design

4.3.1. EXISTING AND FUTURE CONDITIONS

The boundary street for the development is Roosevelt Avenue.

- *Roosevelt Avenue:*
  - 1 vehicle travel lane in each direction;
  - 1.6m sidewalk without boulevard on east side, no sidewalk on west side;
  - Future sidewalk on west side proposed as 1.8m with no boulevard;
  - Less than 3,000 vehicles per day;
  - Posted speed limit 40km/h (used 50km/h) with parking on east side of road;
  - Classified as local roadway;
  - Local bike route; and,
  - Not identified as a Truck Route.

The proposed site is located within 600m of Dominion rapid transit station. Multi-modal Level of Service analysis for the subject road segments adjacent to the site is summarized in **Table 4** with detail analysis provided in **Appendix F**.

Table 4: MMLOS – Boundary Street Segments Existing and Future Proposed

Road Segment	Level of Service							
	Pedestrian (PLoS)		Bicycle (BLoS)		Transit (TLoS)		Truck (TkLoS)	
	PLoS	Target	BLoS	Target	TLoS	Target	TkLoS	Target
Roosevelt between Richmond & end of road – east side	E	A	B	B	-	N/A	-	N/A
Roosevelt between Richmond & end of road – west side	F	A	B	B	-	N/A	-	N/A
Roosevelt between Richmond & end of road – west side (future)	B	A	B	B	-	N/A	-	N/A

<u>Pedestrian</u>

- The pedestrian PLoS was not met on either side of the road for existing conditions. The west side lacks a sidewalk altogether, while the east side does not provide sufficient sidewalk width and boulevard

separation. A sidewalk of 2m or greater width, with a boulevard of 0.5m or greater separating the road and sidewalk would meet the desired PLoS target.

- In the future, the 1.8m sidewalk proposed by the developer on the west side of Roosevelt will improve the PLoS from 'F' to 'B'. To achieve the target PLoS 'A', a sidewalk width of at least 2m combined with a boulevard width of 0.5m is required.

Bicycle

- The cycling BLoS desirable targets were met for both sides of the road.

Transit

- There are no transit routes on Roosevelt Avenue.

Truck

- Roosevelt Avenue is not a truck route.

4.4. Access Intersection Design

4.4.1. LOCATION AND DESIGN OF ACCESS

The proposed vehicular access to the site relies on a single two-way driveway to Roosevelt Avenue. The driveway is proposed on the northernmost edge of the site, bordering the neighboring lot and away from the Roosevelt/Richmond signalized intersection. Given that Roosevelt Avenue is a local roadway, there are no minimum distance separation between the site access and nearest signalized intersection.

4.4.2. INTERSECTION CONTROL

Exempt, see Table 1. Roosevelt/Richmond intersection will continue to be signalized.

4.4.3. INTERSECTION DESIGN

Exempt, see Table 1.

4.5. Transportation Demand Management

Exempt, see Table 1.

4.6. Neighborhood Traffic Management

4.6.1. ADJACENT NEIGHBORHOODS

The volumes forecasted to be generated by the proposed development and other area developments such as 335 Roosevelt will have a negligible impact to the already low traffic volumes on Roosevelt/Richmond at the north leg. Both AM and PM total vehicle trips including existing volumes plus new site generated trips and other area development is forecasted to be below 100 veh/h during the peak hours at the north leg of Roosevelt/Richmond intersection. Given that Roosevelt Avenue is a dead-end street (cul-de-sac) and bound by the Transitway, it is not foreseeable that traffic volumes would significantly increase in this road segment. The anticipated future traffic volumes on Roosevelt Avenue are consistent with a local roadway classification.

4.7. Transit

4.7.1. ROUTE CAPACITY

The site is anticipated to produce negligible site generated traffic by all travel modes given the small size of the development. Considering the envisioned LRT West extension line is projected to begin operation in 2025 and assuming a similar capacity to that of the Confederation Line (OC Transpo site suggests 600 passengers per

train and 12 trains per hour during peaks), it is anticipated that the future transit network will have sufficient capacity to accommodate the subject development transit demand. Interim BRT is provided at Dominion Station. Additionally, added capacity is available on local bus routes on Richmond Road.

4.7.2. TRANSIT PRIORITY

Exempt, see Table 1.

4.8. Review of Network Concept

Exempt, see Table 1.

4.9. Intersection Design

Exempt, see Table 1.

5. Findings and Recommendations

This report was prepared as an addendum to the previously submitted TIA Report for 308 – 406 Roosevelt Avenue by Parsons in December of 2017. Since then, the property has changed ownership and minor adjustments to the Site Plan have occurred, namely the surface commercial uses and surface parking was removed, reducing the number of site driveway connections from two to one.

Existing Conditions

As part of this addendum, City Staff asked that base background data be updated to reflect current conditions. The following deductions were observed:

- 2020 peak hour vehicular volumes: showed a notable decrease in overall traffic volumes of 12% for the AM peak over 5 years and 33% for the PM peak over 5 years compared to the previous counts conducted in 2015.
- 2015-2019 collision data: overall, most intersections and mid-block segments showed no specific areas of concern. It was noted that a higher than usual propensity of collisions with single unattended vehicles occurred between west of Roosevelt Avenue and Golden Avenue on Richmond Road. It is possible that these collisions occurred with parked vehicles. No segment showed high propensity to causing non-fatal injuries.
- Planned transportation network: the Confederation Line Stage 1 has now been complete and is operational. Stage 2 is currently under construction, including nearby Dominion LRT Station expected to be operational by 2025.
- Other area developments: updated in Section 2.1.4 and 3.2.3, with the combined all other area developments generating less than 40 new vehicle trips using Roosevelt/Richmond intersection in the AM and PM peak hours. Future background volumes are not anticipated to grow beyond the volumes identified by the 2015 traffic counts.

Proposed Development

- MLDevco Westboro Realty Investments Inc is proposing a 6-storey residential building with 28 units.
- The site is anticipated to generate negligible new vehicle trips given the low number of units proposed and close proximity to future LRT and walkable commercial destinations nearby.
- The site proposes a single driveway to a two-way ramp to underground parking, located on the northernmost edge of the site and away from the Roosevelt/Richmond signalized intersection. This reduction of driveways from two to one reduces conflict points on Roosevelt Avenue.

- The site proposes sufficient bike parking to meet the City By-law. Nine spaces are proposed indoors, within the underground parking garage, located in secured storage rooms and near elevators. Five spaces are proposed at ground level near the main entrance.
- Vehicle parking meets the City's Parking By-law, providing 47 residential parking and 2 visitor parking spaces for a combined 49 spaces to be located within an underground parking garage.

Network Considerations

- Intersection performance is anticipated to operate similarly to existing conditions.
- Roosevelt Avenue will be a key link for residents to and from the future Dominion LRT Station. There are currently sidewalks on the east side of Roosevelt Avenue only.
    - The MMLOS pedestrian PLoS target goals were not met for either side of Roosevelt Avenue given the lack of sidewalk on the west side of road and the lack of boulevard separation and existing sidewalk on east side being too narrow. Increasing the sidewalk width to be 2m or wider, plus introducing a boulevard, would result in PLoS targets being met.
    - The future sidewalk proposed on the site's frontage will connect the development to sidewalk facilities on Richmond Road and improve the MMLOS PLoS from 'F' to 'B'. To achieve PLoS 'A', a 2m wide sidewalk with greater than a 0.5m boulevard is required.
    - The bike BLoS targets were met for both directions on Roosevelt Avenue

Based on the preceding report, the proposed MLDevco Westboro Realty Investments Inc Development located at 398 – 406 Roosevelt Avenue is recommended from a transportation perspective.

Prepared By:

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Reviewed By:

Mark Baker, P.Eng.
Senior Transportation Engineer

APPENDIX A

PREVIOUS TIA REPORT AND RMA SUBMITTED

December
2017

398 – 406 Roosevelt Avenue

TIA Strategy Report

Prepared for:

domicile

Prepared by:

PARSONS

398 – 406 Roosevelt Avenue

TIA Strategy Report

prepared for:
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December 22, 2017

476577 – 01000

PARSONS

envision more

Table of Contents

1. SCREENING FORM 1
2. DESCRIPTION OF PROPOSED DEVELOPMENT 1
3. EXISTING CONDITIONS 4
   - 3.1. AREA ROAD NETWORK 4
   - 3.2. PEDESTRIAN/CYCLING NETWORK 4
   - 3.3. TRANSIT NETWORK 4
   - 3.4. EXISTING STUDY AREA INTERSECTION 5
   - 3.5. EXISTING INTERSECTION OPERATIONS 5
   - 3.6. EXISTING ROAD SAFETY CONDITIONS 6
4. PLANNED CONDITIONS 6
   - 4.1. PLANNED STUDY AREA TRANSPORTATION NETWORK CHANGES 6
   - 4.2. OTHER AREA DEVELOPMENT 7
5. STUDY AREA 8
   - 5.1. TRANSIT 8
   - 5.2. NETWORK CONCEPT 8
   - 5.3. INTERSECTION DESIGN 8
6. TIME PERIODS 8
7. HORIZON YEARS 8
8. EXEMPTION REVIEW 9
9. DEVELOPMENT GENERATED TRAVEL DEMAND 9
   - 9.1. TRIP GENERATION 9
     - 9.1.1. Residential Trips 10
     - 9.1.2. Retail Trips 10
     - 9.1.3. Mode Shares 12
10. BACKGROUND NETWORK TRAVEL DEMANDS 12
    - 10.1. HISTORIC TRAFFIC GROWTH 12
11. DEVELOPMENT DESIGN 13
    - 11.1. DESIGN FOR SUSTAINABLE MODES 13
    - 11.2. CIRCULATION AND ACCESS 13
12. PARKING SUPPLY 14
13. BOUNDARY STREET DESIGN 14
14. ACCESS INTERSECTION DESIGN 14
    - 14.1. LOCATION AND DESIGN OF ACCESS 14
15. NEIGHBOURHOOD TRAFFIC MANAGEMENT 14
    - 15.1. ADJACENT NEIGHBOURHOODS 14
16. TRANSIT 14
    - 16.1. ROUTE CAPACITY 14

17. CONCLUSIONS AND NEXT STEPS 14

List of Figures

Figure 1: Local Context 2
Figure 2: Proposed Site Plan 3
Figure 3: Area Transit Network 5
Figure 4: Existing Peak Hour Traffic Volumes 6
Figure 5: Planned LRT Phase II 7
Figure 6: 2019 Background Traffic Volumes 12
Figure 7: 2022 Background Traffic Volumes 13

List of Tables

Table 1: Exemptions Review Summary 9
Table 2: Additional Recommended Exemptions Summary 9
Table 3: 2009 TRANS and ITE Trip Generation Rates 10
Table 4: Projected Vehicle Trip Generation – TRANS Model 10
Table 5: TRANS Model Site Trip Generation – Residential Use 10
Table 6: Modified Person Trip Generation - Retail 11
Table 7: Retail Modal Site Trip Generation 11
Table 8: Total Site Trip Generation 11
Table 9: Richmond/Churchill Historical Background Growth (2003 – 2016) 12

List of Appendices

APPENDIX A – Screening Form
APPENDIX B – Intersection Turning Movement Counts
APPENDIX C – Collision Data and Analysis
APPENDIX D – Background Traffic Growth

Strategy Report

1. SCREENING FORM

The screening form was submitted for the subject development on December 1st, 2017 to City of Ottawa staff for review and confirmation of the need for a Transportation Impact Assessment (TIA). The Location and Safety triggers were met based on the proximity to the Richmond Road corridor and adjacent intersection of Roosevelt Avenue and Richmond Road. City staff provided confirmation to proceed with Step 2 – Scoping Report on December 4th, 2017.

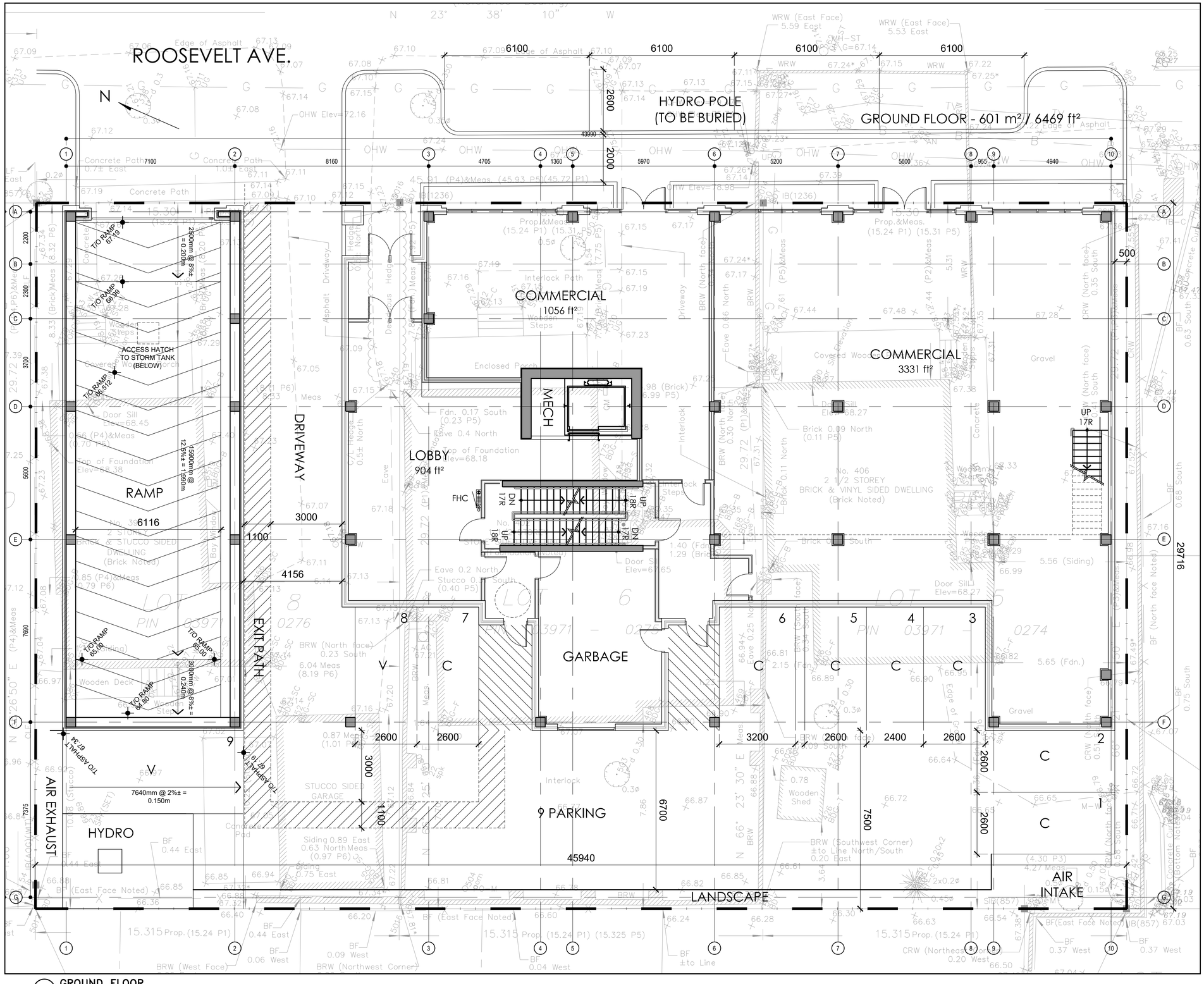
The Screening and Scoping Report was submitted on December 8th, 2017 to City of Ottawa staff for review and confirmation of the study area scope, trip generation requirements, and exemptions review for the future steps of the TIA process. It was recommended that Module 3.1 Elements 3.1.2 Trip Distribution and 3.1.3 Trip Assignment be excluded from the forecasting report. City staff provided confirmation on December 15th to exclude Step 3 – Forecasting and proceed with Step 4 – Analysis, excluding Module 4.1 Element 4.1.3 New Street Networks, Module 4.2 Element 4.2.2 Spillover Parking, Module 4.4 Elements 4.4.2 Intersection Control and 4.4.3 Intersection Design, and the Network Impact Components, Modules 4.5 through 4.9

The Screening Form, Exemptions Review, and City Responses are provided in Appendix A.

2. DESCRIPTION OF PROPOSED DEVELOPMENT

From the information provided, it is our understanding that the proponent is proposing to construct a multi-use development located at 398-406 Roosevelt Avenue. The development will consist of 33 residential apartment units and approximately 555m^2 of ground floor retail. The site is currently occupied by three residential houses. Surface and underground parking is proposed for the site. The local context of the site is provided as Figure 1 and the proposed Site Plan is provided as Figure 2. The site is currently zoned for a townhouse development and a Zoning By-Law Amendment will need to be completed.

Figure 1: Local Context



1 GROUND FLOOR
SCALE 1:75

FEBRUARY 14, 2017

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.

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01	NOV 29 2017	ISSUED FOR REVIEW

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drawn	checked
MH	VA
date	project no.
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drawing title
GROUND FLOOR PLAN

revision	drawing no.
01	**A110**

3. EXISTING CONDITIONS

3.1. AREA ROAD NETWORK

Roosevelt Avenue is a north-south local roadway that extends from the Transitway in the north to Cole Avenue in the south. The roadway has a two-lane cross section of approximately 8.5-9m and a sidewalk located on the east side. The west side of the road does not have a curb. On-street parking is permitted on the east side of the roadway, north of the subject site. The unposted speed limit is assumed to be 50 km/h.

Richmond Road is an east-west arterial roadway, which extends from Baseline Road in the west to Island Park Road in the east, where it continues as Wellington Street. Within the study area, its cross-section consists of a single travel lane and on-street parking in each direction. The unposted speed limit assumed to be 50 km/h.

3.2. PEDESTRIAN/CYCLING NETWORK

With respect to pedestrians, sidewalk facilities in the vicinity of the site are provided along both sides of Richmond Road and the east side of Roosevelt Avenue. A multi-use pathway is located along the south side of the Transitway and a pedestrian overpass allows crossing to Workman Avenue on the northside of the transit corridor.

With respect to cyclists, according to the Ottawa Cycling Plan, Richmond Road is classified as a “spine” cycling route and Roosevelt Avenue is classified as a “local” cycling route. Within the study area, no formal cycling facilities are currently provided and cyclists operate in mixed traffic.

3.3. TRANSIT NETWORK

Transit service within the vicinity of the site is currently provided by OC Transpo Route #11. Bus stops for this route is located along Richmond Road approximately 100m walking distance from the site. Route #11 provides frequent all-day service.

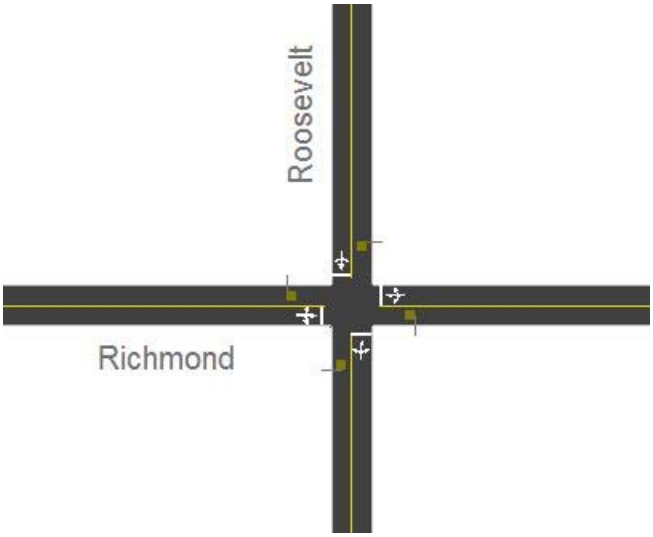
Access to the Transitway is provided by the Dominion Station located north of Roosevelt Avenue, approximately 475m walking distance to the north of the site. As the site is located within 600m radius of Dominion Station, the development is considered a Transit-Oriented Development (TOD).

Figure 3: Area Transit Network

3.4. EXISTING STUDY AREA INTERSECTION

Richmond/Roosevelt

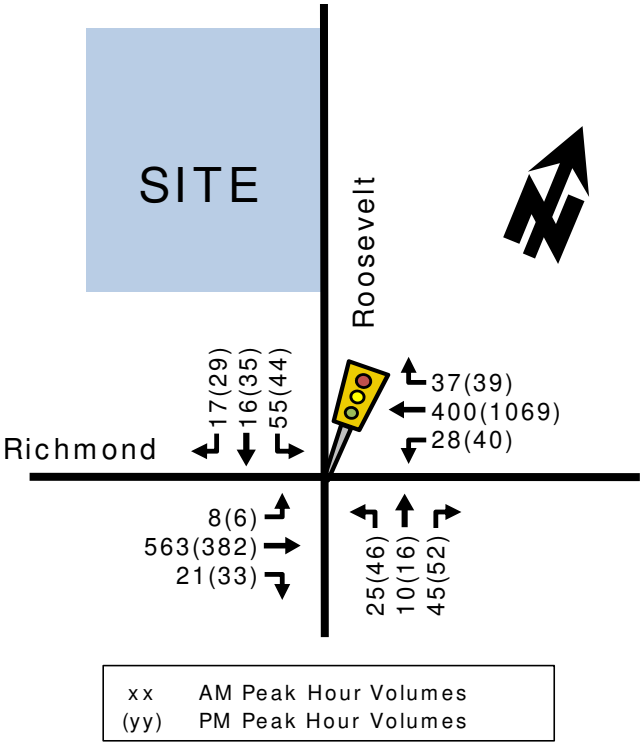
The Richmond/Roosevelt intersection is a signalized four-legged intersection. The north, south, east and westbound approaches consist of a single shared through-right-left lane each. All movements are permitted at this location.



3.5. EXISTING INTERSECTION OPERATIONS

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. The full traffic counts are provided in Appendix B.

Figure 4: Existing Peak Hour Traffic Volumes



3.6. EXISTING ROAD SAFETY CONDITIONS

Collision history for the Richmond/Roosevelt intersection and mid-block on Roosevelt Avenue between Richmond Road and the end of Roosevelt Avenue (2012 to 2016, inclusive) was obtained from the City of Ottawa. Most collisions (67% or 4 vehicles) involved only property damage, indicating low impact speeds, and 33% involved personal injuries. The primary causes of collisions cited by police include; turning movement (33% or 2 vehicles), single vehicle/other (17% or 1 vehicle), sideswipe (17%), angle (17%), and rear end (17%) 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 the Richmond/Roosevelt intersection, there were a total of 5 collisions in a 5-year period, which equates to a rate of 0.18/MEV. Only 1 collision in a 5-year period was noted along Roosevelt north of Richmond, which equates to a rate of 0.34/MEV.

It is noteworthy that within the 5-years of recorded collision data there was one collision that involved a pedestrian (non-fatal injury) and none involving cyclists. The source collision data as provided by the City of Ottawa and related analysis is provided as Appendix C.

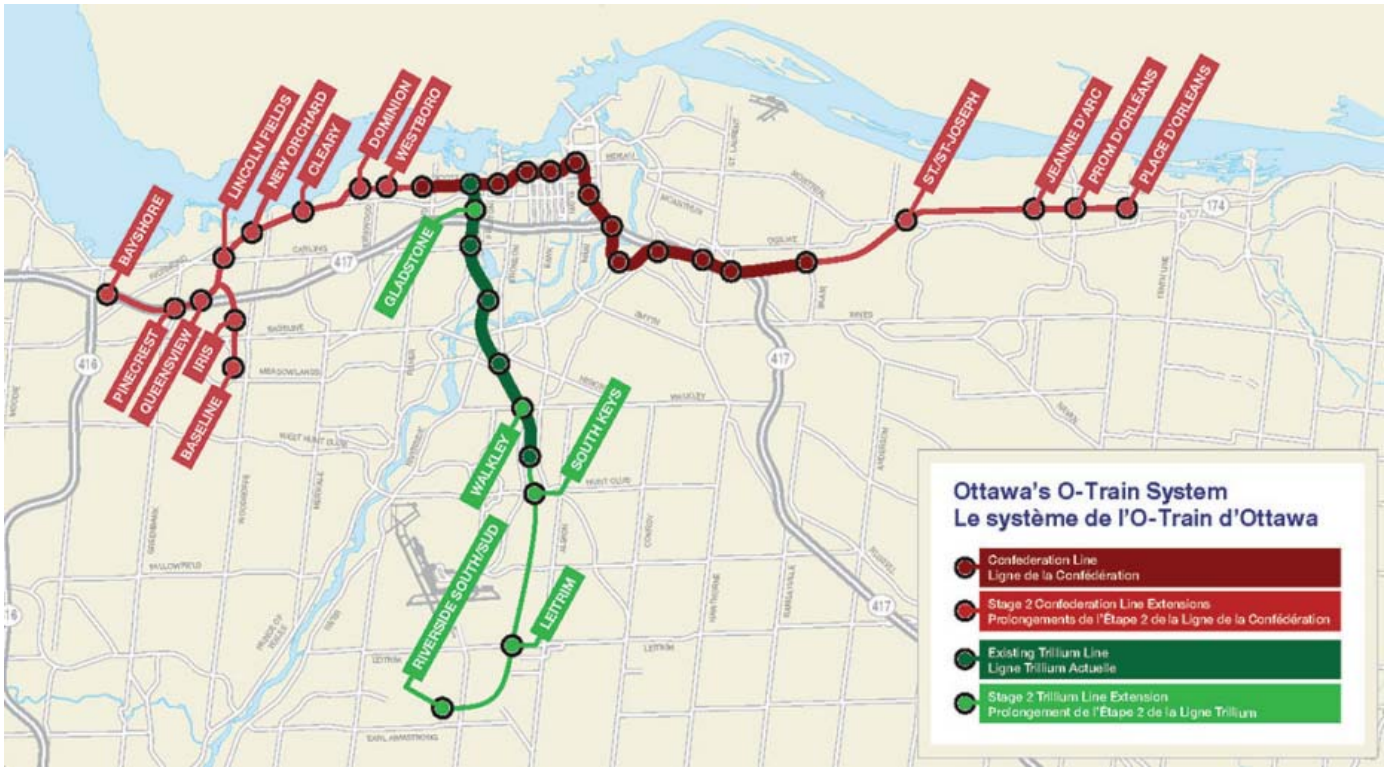
4. PLANNED CONDITIONS

4.1. PLANNED STUDY AREA TRANSPORTATION NETWORK CHANGES

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 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 2019 and be completed by 2024. The following Figure 5 illustrates the planned Phases I and II of the future Confederation/Trillium Lines. As mentioned previously, the subject development is located within an approximate walking distance of 475m from the future Dominion LRT Station.

Figure 5: Planned LRT Phase II



4.2. OTHER AREA DEVELOPMENT

According to the City's development application search tool, the following developments are planned within the vicinity of the subject site.

335 Roosevelt Avenue
Uniform Urban Developments is proposing the construction of two high-rise condominium apartment buildings approximately 325m north of the subject development. A Transportation Impact Study has not been completed to date.

348 Whitby Avenue
The Westboro Animal Hospital at 364 Churchill Ave is proposing to demolish the existing dwelling at 348 Whitby Avenue to construct parking accessory to the Animal hospital

371 Richmond Road
Domicile is proposing the construction of a condominium development at the above-noted address, which is located approximately 125m east of the subject development. The Transportation Brief (prepared by Parsons) projected approximately 30 veh/h during the peak hours.

386 Richmond Road
Nrml Group Inc. is proposing the construction of a mixed-use development at the above-noted address, which is located approximately 125m east of the subject development. The Transportation Impact Assessment (prepared by Parsons) projected negligible vehicle traffic during the peak hours.

485 Richmond Road
Minto Communities is proposing the construction of a condominium development at the above-noted address, which is located approximately 300m west of the subject development. The Transportation Brief (prepared by Delcan) projected approximately 60 veh/h during the peak hours.

404 Eden Avenue
A 13-unit low-rise apartment building is being proposed at the above address approximately 320m northeast of the site. The Transportation Brief (prepared by Parsons) projected negligible vehicle traffic during the peak hours.

450 Churchill Avenue
Springcress Properties Inc. is proposing the construction of a mixed-used development at the above-noted address, which is located approximately 350m southeast of the subject development. The Transportation Brief (prepared by Delcan) projected fewer than 25 veh/h during the peak hours, however, a parking review was undertaken.

5. STUDY AREA

5.1. Transit

As mentioned previously, transit is served within the area with bus stops for Route #11 located approximately 100m from the site. In addition, access to the Transitway is provided by Dominion Station located north of the Roosevelt, an approximate walking distance of 475m to the north of the site. The trip generation will need to consider the TOD targets during the Forecasting Report and associated demand rationalization analysis.

5.2. NETWORK CONCEPT

The nearest Screenline is SL24 (Western Parkway). Given the proposed land use is mixed-use, including residential and ground floor retail, the development is understood to fit into the zoning for this area and is not projected to generate 200 person-per-hour trips more than permitted by the established zoning.

5.3. INTERSECTION DESIGN

The study area consists of the proposed private approach to the site and the existing signalized Richmond/Roosevelt intersection, reducing the requirements for analysis and design of study area intersections in the Forecasting Report and Strategy Report.

6. TIME PERIODS

Given the majority of 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.

7. HORIZON YEARS

The expected build-out date for the proposed development is assumed to be 2019. Depending on the growth rate of the study area, the horizon year 2024 will be assessed for 5-years beyond site build out.

8. EXEMPTION REVIEW

Based on the City's TIA guidelines and the subject site, the following modules/elements of the TIA process, summarized in Table 1, are recommended to be exempt in the subsequent steps of the TIA process:

Table 1: Exemptions Review Summary

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 site's residential parking rate is noted to meet the City's minimum By-Law for residential parking (13 stalls) and commercial parking (7 stalls). As such, parking is not expected to spill out of the site.
4.5 Transportation Demand Management	All elements	Residential development with less than 60 students/employees.
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.

In addition to the above recommendations of the Exemptions Review, the following exemptions are also proposed for both Step 3 – Forecasting and Step 4 – Analysis, and are summarized in Table 2.

Table 2: Additional Recommended Exemptions Summary

Module	Element	Exemption Consideration
3.1 Development-generated Travel Demand	3.1.2 Trip Distribution	Minimal auto share anticipated given only 33 residential units on site, and negligible impact anticipated on road network.
	3.1.3 Trip Assignment	Minimal auto share anticipated given only 33 residential units on site, and negligible impact anticipated on road network.
4..4 Access Intersection Design	4.4.2 Intersection Control	Site access will operate at a private approach and will not require an intersection screening for a signal or roundabout.
	4.4.3 Intersection Design	Site access will operate at a private approach and will not require an intersection screening for a signal or roundabout.
4.7 Transit	4.7.2 Transit Priority	Site access will operate at a private approach and will not require an intersection screening for a signal or roundabout.
4.9 Intersection Design	All Elements	Site access will operate at a private approach and will not require an intersection screening for a signal or roundabout.

9. DEVELOPMENT GENERATED TRAVEL DEMAND

9.1. TRIP GENERATION

Appropriate trip generation rates for the proposed development consisting of approximately 33 residential units and approximately 555m^2 of ground floor retail were obtained from the City's 2009 TRANS Trip Generation – Residential Trip Rates and the ITE Trip Generation Manual (9th Edition). These rates are summarized in Table 3.

Table 3: 2009 TRANS and ITE Trip Generation Rates

Land Use	ITE Land Use Code	Trip Rates	
		AM Peak	PM Peak
Mid-Rise Apartments	ITE 223	T = 0.17(du)	T = 0.16(du)
Specialty Retail	ITE 826	T = 1.36(X) T = 1.20(X) + 10.74	T = 2.71(X) T = 2.40(X) + 21.48

Notes: T = Average Vehicle Trip Ends
du = Dwelling units
X = 1000 ft² Gross Floor Area
Specialty Retail AM Peak is assumed to be 50% of the PM Peak

9.1.1. RESIDENTIAL TRIPS

Using the TRANS Trip Generation rates for the residential component of the site, the total amount of vehicle trips generated by the proposed 33 residential units 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
Mid-Rise Apartments	33 units	1	5	6	3	2	5

As shown in Table 4, a total of 6 and 5 veh/h are projected to travel to/from the proposed development during the weekday morning and afternoon commuter peak hours. Using the TRANS Auto Trips projected in Table 4 and the mode share percentages outline in Table 3.13 of the TRANS Trip Generation Study, the modal share for the residential land use within the proposed development are summarized in Table 5.

Table 5: TRANS Model Site Trip Generation – Residential Use

Travel Mode	Mode Share	AM Peak (Person Trips/h)			Mode Share	PM Peak (Person Trips/h)		
		In	Out	Total		In	Out	Total
Auto Driver	27%	1	5	6	23%	3	2	5
Auto Passenger	3%	0	0	0	6%	0	0	0
Transit	27%	1	5	6	29%	3	3	6
Non-motorized	43%	2	8	10	42%	5	4	9
Total Person Trips	**100%**	**4**	**18**	**22**	**100%**	**11**	**9**	**20**

As shown in Table 5, based on the TRANS Trip Generation method, the proposed site is projected to generate approximately 20 to 25 person-trips per hour during the weekday commuter peak hours. The increase in two-way transit trips is estimated to be 10 persons per hour, and the increase in bike/walk trips is approximately 10 persons per hour.

9.1.2. RETAIL TRIPS

The retail trip generation is based on the ITE trip generation rates, outline in Table 3. As ITE trip generation surveys only record vehicle trips and typically reflect highly suburban locations (with little to no access by travel modes other than private automobiles), adjustment factors appropriate to the more urban study area context were applied to attain estimates of person trips for the proposed development.

To convert ITE vehicle trip rates to person trips, an auto occupancy factor and a non-auto trip factor were applied to the ITE vehicle trip rates. Based on the TIA Guidelines and our review of available literature, a combined factor of approximately 1.28 is considered reasonable to account for typical North American auto occupancy values of approximately 1.15 and

combined transit/non-motorized modal shares of 10%. As such, the person trip generation for the proposed retail development is summarized in Table 6.

Table 6: Modified Person Trip Generation - Retail

Land Use	Area	AM Peak (Person Trip/h)			PM Peak (Person Trip/h)		
		In	Out	Total	In	Out	Total
Specialty Retail	555 m²	12	11	23	20	27	47

The person trips shown in Table 6 for the proposed retail development were then reduced by modal share values based on the site's location and proximity to adjacent communities, employment, shopping uses and transit availability. Modal share values for the retail component of the proposed development are summarized in Table 7.

Table 7: Retail 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	35%	5	4	9	7	10	17
Auto Passenger	5%	1	1	2	1	2	3
Transit	40%	4	4	8	8	10	18
Non-motorized	20%	2	2	4	4	5	9
Total Person Trips	**100%**	**12**	**11**	**23**	**20**	**27**	**47**
Less Retail Pass-by (30%)		-1	-1	-2	-3	-3	-6
Total 'New' Auto Trips		**4**	**3**	**7**	**4**	**7**	**11**

The following Table 8 summarizes the foregoing people trip generations for the residential and retail components of the proposed development.

Table 8: Total Site Trip Generation

Travel Mode	Approximate Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	30%	5	9	14	9	11	20
Auto Passenger	5%	1	1	2	1	2	3
Transit	34%	5	10	15	11	12	23
Non-motorized	31%	5	9	14	10	11	21
Total Person Trips	**100%**	**16**	**29**	**45**	**31**	**36**	**67**
Less Retail Pass-by (30%)		-1	-1	-2	-2	-2	-4
Total 'New' Auto Trips		**4**	**8**	**12**	**7**	**9**	**16**

As shown in Table 8, the total number of person trips expected to be generated by this development is approximately 45 and 70 persons/h during the weekday commuter peak hours. The total amount of 'new' vehicle traffic to the study area is projected to be 15 to 20 veh/h during the peak hours. This amount of traffic equates to less than 1 new vehicle every 2 to 3 minutes and is not considered a significant increase in traffic. As such, no future vehicle capacity analysis related to the development's vehicle impact is expected to be required.

9.1.3. MODE SHARES

Given the existing modal share values reflect high non-motorized (~35%) and transit (~30%) mode splits that are appropriate for a site located in the Inner Area with good access to transit, the future mode shares for this development are assumed to be the same as existing.

10. BACKGROUND NETWORK TRAVEL DEMANDS

10.1. HISTORIC TRAFFIC GROWTH

The following background traffic growth through the immediate study area (summarized in Table 9) was calculated based on historical traffic count data (years 2003, 2019, and 2016) provided by the City of Ottawa at the Richmond/Churchill intersection. Detailed background traffic growth analysis is included as Appendix D.

Table 9: Richmond/Churchill Historical Background Growth (2003 – 2016)

Time Period	Percent Annual Change				
	North Leg	South Leg	East Leg	West Leg	Overall
8 hrs	-0.13%	0.29%	1.97%	0.91%	**0.78%**
AM Peak	-0.33%	0.45%	1.34%	0.18%	**0.34%**
PM Peak	-1.27%	-0.22%	2.24%	0.25%	**0.28%**

As shown in Table 10, the Richmond/Churchill intersection has experienced approximately 0.25% to 0.80% annual growth within recent years (calculated as a weighted average). To account for the historic and future increases in traffic volumes and to account for the traffic generated by the previously identified area developments, a 1% per annum growth factor was applied to existing traffic volumes along Richmond Road to obtain background traffic volumes for the 2019 built-out horizon year and 2024 (5-years beyond site build-out). The resultant 2019 and 2024 background traffic volumes are depicted as Figures 6 and 7, respectively.

Figure 6: 2019 Background Traffic Volumes

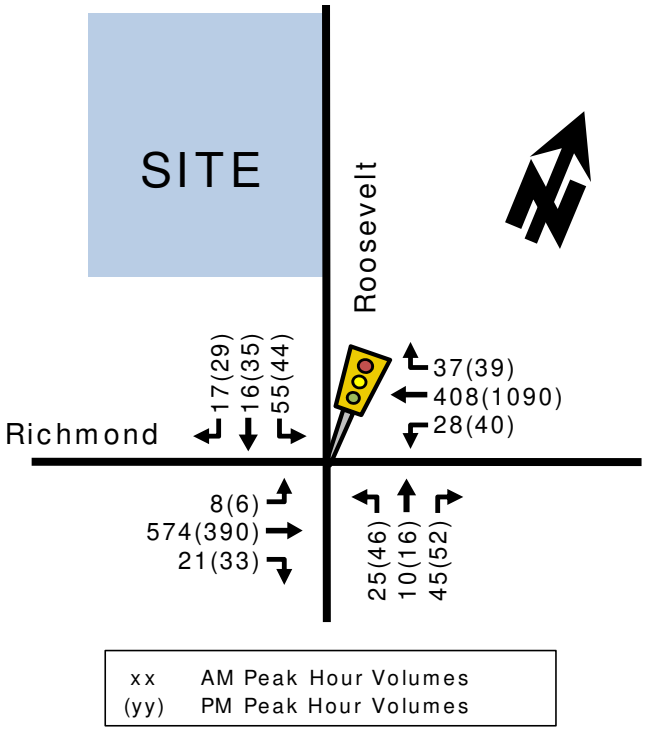
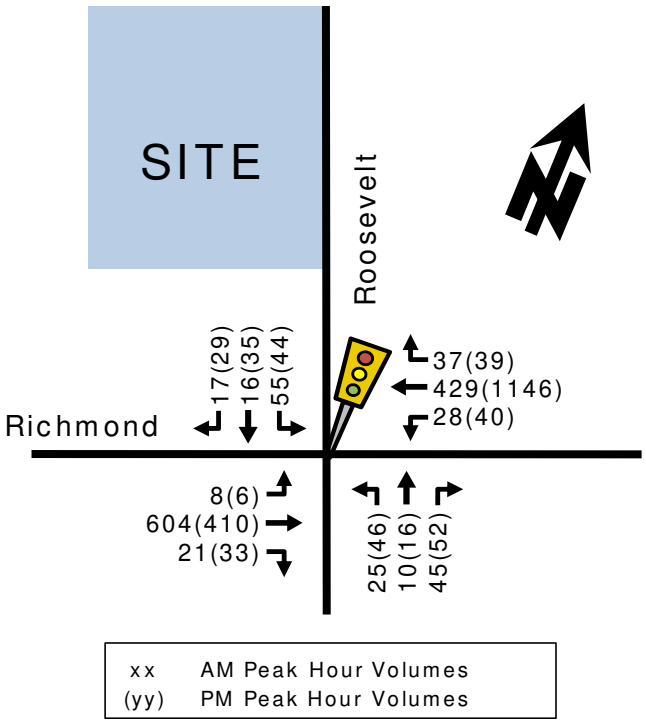


Figure 7: 2022 Background Traffic Volumes



11. DEVELOPMENT DESIGN

11.1. DESIGN FOR SUSTAINABLE MODES

Location of Transit Facilities

The subject site is approximately 475m walking distance from the Dominion BRT Station. Additionally, there are eastbound and westbound transit stops located 95m and 65m to the south of the site, respectively.

Pedestrian Routes and Facilities

The building will have at-grade accesses directly on to Roosevelt Avenue, with sidewalks located across on the street on the east side. No internal walkways or site circulation is required.

Bicycle Parking

Currently the site does not provide bicycle parking. Based on the City's By-Law requirements, a minimum of 16 bicycle parking spaces are needed.

11.2. CIRCULATION AND ACCESS

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 not been provided and as such, the following by-laws apply. According to the City's By-Law requirements, drive aisle widths accommodating 2-way vehicle traffic should have a minimum width of 6.7 m. The ramp providing access to the lower level parking should have proper transition grades and a ramp grade between 10% to 15%. The ramp access should not exceed a 2% or less transition grade from the property line.

12. PARKING SUPPLY

We are advised that the proponent wished to provide a rate of approximately 0.9 parking spaces for the 22 residential units and 555m^2 of commercial development. This would provide approximately 31 parking spaces for residents and visitors of the proposed development. This amount of parking is sufficient according to the City's By-Law requirements as the development is within 600m of the Dominion Rapid Transit Station. The parking space dimensions are noted as 5.2m in length and 2.6m in width, which meet the City's minimum By-Law requirement.

13. BOUNDARY STREET DESIGN

There is no complete street design for the boundary street, Roosevelt Avenue. Planned changes for the boundary street include the construction of 3 parallel parking spaces on the west side of Roosevelt and a sidewalk connection to Richmond Road, directly adjacent to the site.

14. ACCESS INTERSECTION DESIGN

14.1. LOCATION AND DESIGN OF ACCESS

There is one two-way drive aisle connection proposed to Roosevelt Avenue, which is located approximately 45m north of Richmond Road. The driveway provides access to the parking garage ramp and a rear customer parking lot with a loading area for moving trucks/vans. The driveway width is noted to be approximately 11m wide. While this is larger than the 9m maximum permitted width, this driveway serves as both the surface parking and underground access and is therefore acceptable.

15. NEIGHBOURHOOD TRAFFIC MANAGEMENT

15.1. ADJACENT NEIGHBOURHOODS

Existing volumes on Roosevelt Avenue range from 20 – 60 veh/h in the morning and afternoon peaks. With only 15 – 20 new vehicle trips generated for the development, it is unlikely that Roosevelt Avenue will experience capacity issues as it is well under its capacity limit outlined in the TIA Guidelines – a maximum of 1,000 vehicles per day, or 120 vehicles in the peak hour.

16. TRANSIT

16.1. ROUTE CAPACITY

The Dominion Transit Station within close proximity to the proposed site will be able to accommodate the increase in transit ridership associated with this development. The construction of the Stage 2 LRT at Dominion Station will also provide additional transit capacity.

"New" two-way transit trips are approximately 15 (5 in, 10 out) and 23 (11 in, 12 out) persons/h in the AM and PM peaks, respectively. During the PM peak, this represents approximately 20-22% of a single bus (55 passengers), approximately 15-16% of an articulated bus (75 passengers), and approximately 12-13% of a double decker bus (90 passengers).

17. CONCLUSIONS AND NEXT STEPS

Based on the results summarized herein the following conclusions are offered:

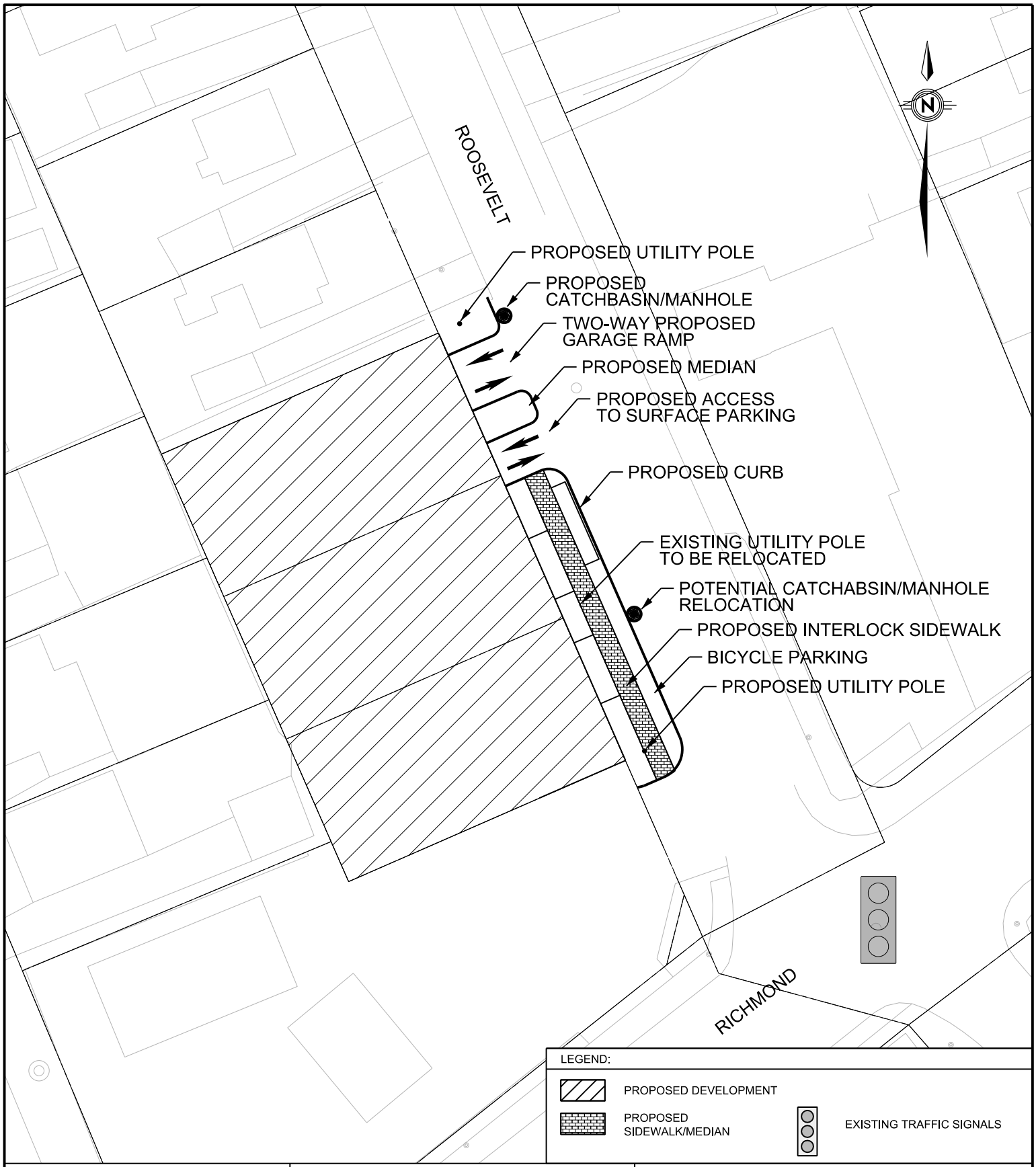
- A total of 31 parking spaces on one underground parking level and a small surface parking lot are proposed to serve the subject development. This amount of parking meets the City's minimum and maximum parking requirements;
- A minimum of 16 bicycle parking spaces is needed to meet the City's By-Law requirements; and,
- One vehicle access is proposed at the north side of the site. It is located on Roosevelt Avenue, as far from the signalized Richmond/Roosevelt intersection as possible given the site's location. While the access is wider than the maximum wider stated in the Private Approach By-Law requirements, it is acceptable as it serves as the main access to the underground parking and rear surface lot.

Based on the foregoing conclusions, this report satisfies the TIA requirements for Domicile's 398-406 Roosevelt Avenue, redevelopment and is recommended to proceed from a transportation perspective.

Prepared By:

Rani Nahas, B.Eng. EIT
Transportation Analyst

Andrew Harte, P.Eng.
Senior Transportation Engineer



Ottawa

TRANSPORTATION SERVICES DEPARTMENT

PROPOSED ROADWAY MODIFICATIONS

398-406 ROOSEVELT AVE

Transportation Engineering Services Branch

Approved By: N.PAUDEL	Drawing No.: RMA-2018-TPD-XXX-B
Completed By: PARSONS	
Scale: N.T.S.	Date: DEC 2018

APPENDIX B

TRAFFIC COUNT DATA

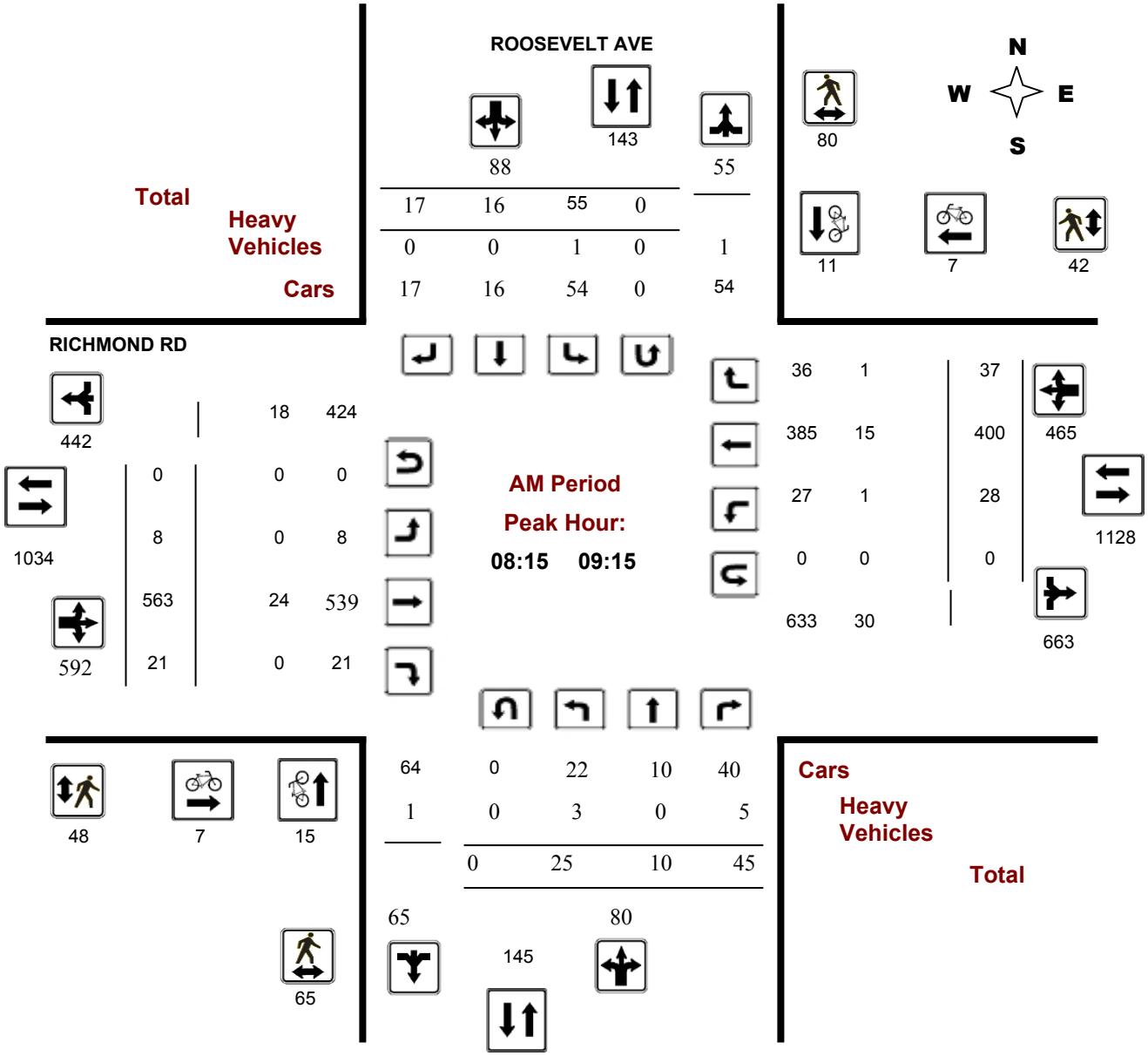
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

ROOSEVELT AVE @ RICHMOND RD

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

WO No: 34683
Device: Jamar Technologies, Inc



Comments

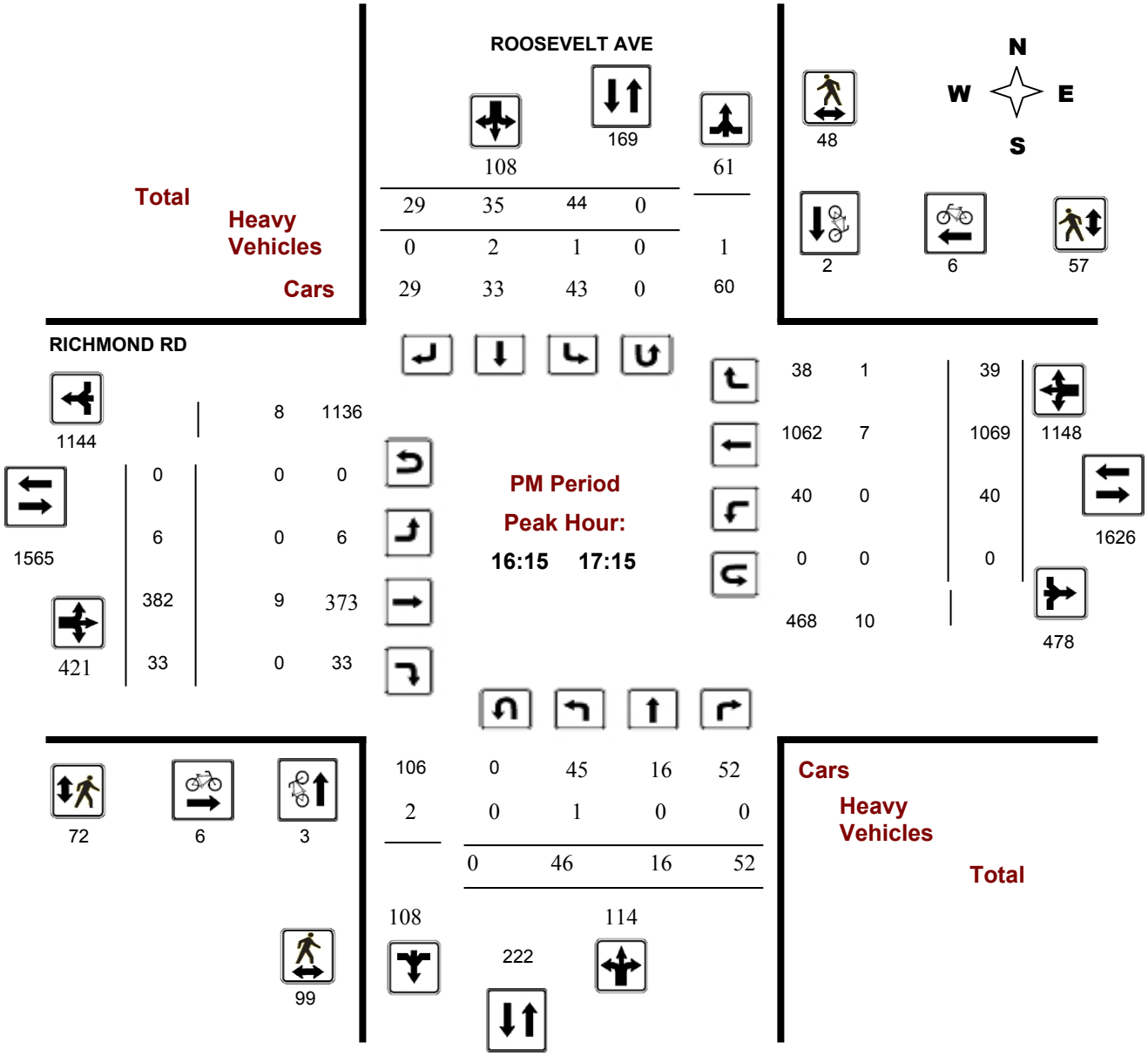
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

ROOSEVELT AVE @ RICHMOND RD

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

WO No: 34683
Device: Jamar Technologies, Inc



Comments

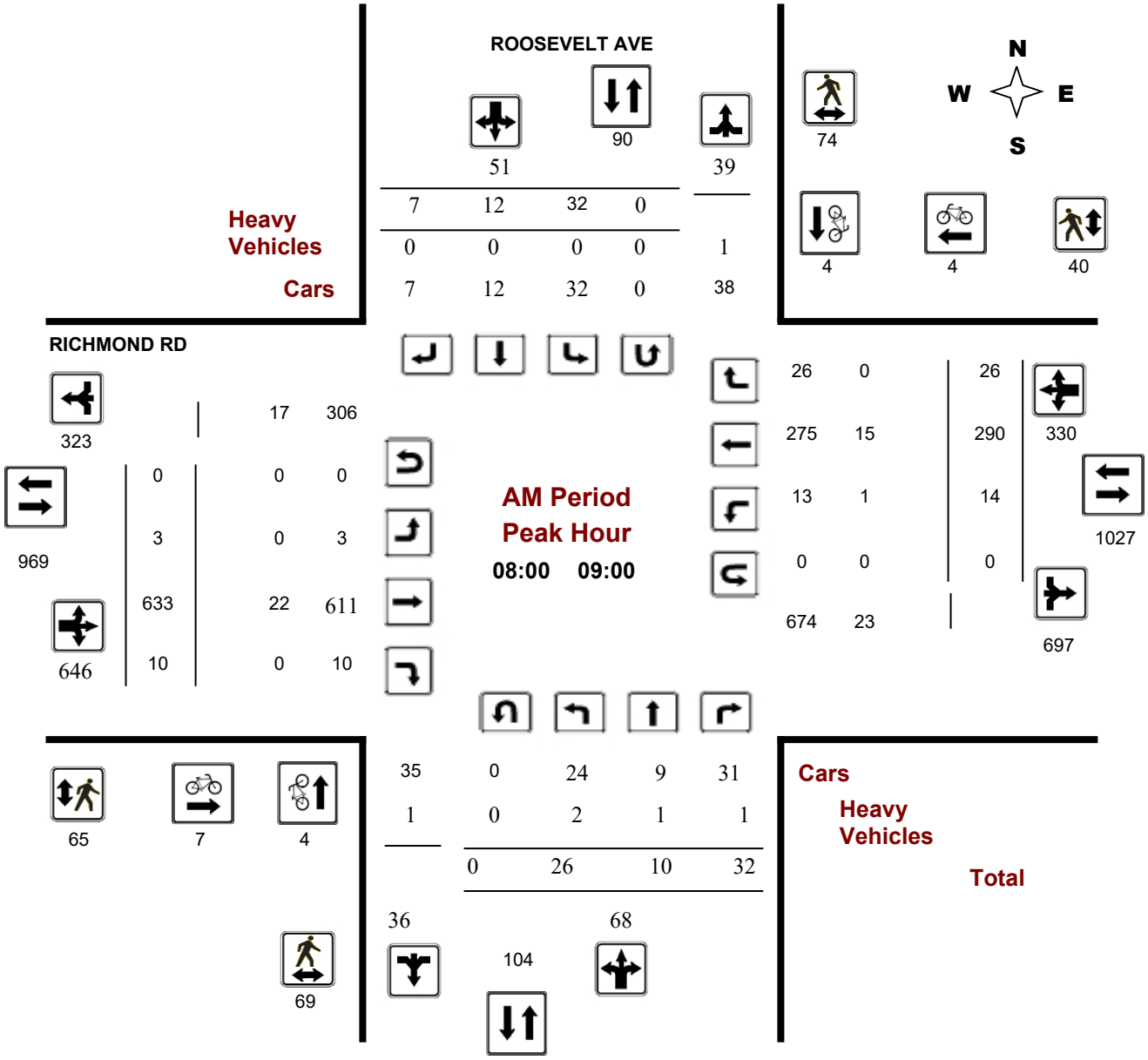
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ROOSEVELT AVE @ RICHMOND RD

Survey Date: Thursday, January 23, 2020 **WO No:** 39385

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



Comments 5472203 - THU JAN 23, 2020 - 8HRS - LORETTA

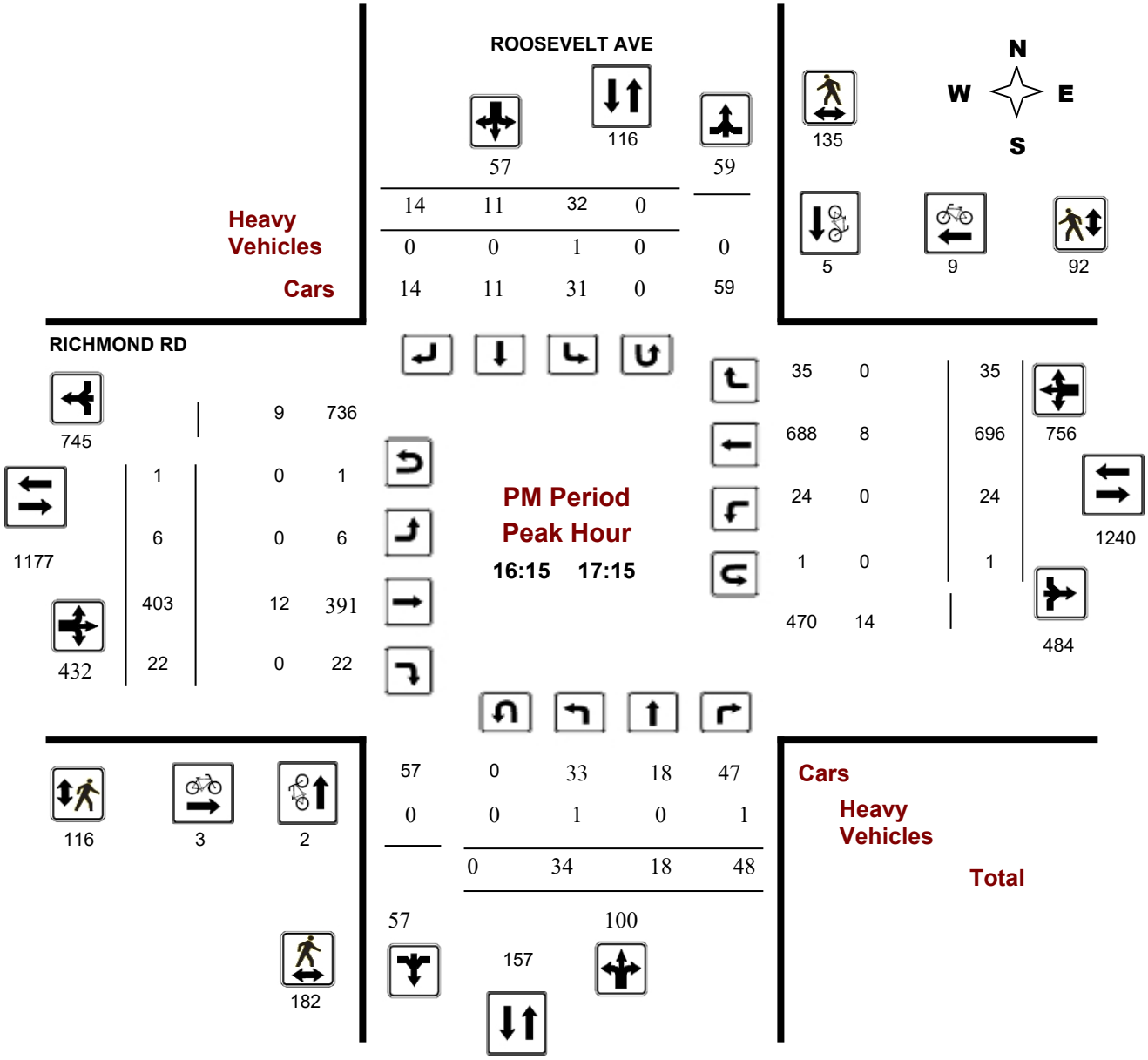
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ROOSEVELT AVE @ RICHMOND RD

Survey Date: Thursday, January 23, 2020 **WO No:** 39385

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



Comments 5472203 - THU JAN 23, 2020 - 8HRS - LORETTA

APPENDIX C

COLLISION DATA

Total Area

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	6	1	5	0	1	1	11	1	26	84%
Non-fatal injury	3	1	0	1	0	0	0	0	5	16%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**9**	**2**	**5**	**1**	**1**	**1**	**11**	**1**	**31**	100%
	#2 or 29%	#4 or 6%	#3 or 16%	#5 or 3%	#5 or 3%	#5 or 3%	#1 or 35%	#5 or 3%		

RICHMOND RD, BERKLEY AVE to ROOSEVELT AVE

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2015-2019	11	n/a	1825	**n/a**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	1	0	3	0	0	0	5	1	10	91%
Non-fatal injury	1	0	0	0	0	0	0	0	1	9%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**2**	**0**	**3**	**0**	**0**	**0**	**5**	**1**	**11**	100%
	18%	0%	27%	0%	0%	0%	45%	9%		

RICHMOND RD, GOLDEN AVE to BERKLEY AVE

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2015-2019	3	n/a	1825	**n/a**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	0	1	0	0	0	0	1	0	2	67%
Non-fatal injury	1	0	0	0	0	0	0	0	1	33%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**1**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**3**	100%
	33%	33%	0%	0%	0%	0%	33%	0%		

RICHMOND RD, ROOSEVELT AVE to WINSTON AVE

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2015-2019	6	n/a	1825	**n/a**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	1	0	0	0	1	1	3	0	6	100%
Non-fatal injury	0	0	0	0	0	0	0	0	0	0%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**1**	**0**	**0**	**0**	**1**	**1**	**3**	**0**	**6**	100%
	17%	0%	0%	0%	17%	17%	50%	0%		

ROOSEVELT AVE/RICHMOND RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2015-2019	7	15,991	1825	**0.24**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	4	0	1	0	0	0	0	0	5	71%
Non-fatal injury	1	1	0	0	0	0	0	0	2	29%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**5**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**7**	100%
	71%	14%	14%	0%	0%	0%	0%	0%		

ROOSEVELT AVE, RICHMOND RD to DANFORTH AVE

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2015-2019	1	n/a	1825	**n/a**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	0	0	0	0	0	0	1	0	1	100%
Non-fatal injury	0	0	0	0	0	0	0	0	0	0%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	100%
	0%	0%	0%	0%	0%	0%	100%	0%		

ROOSEVELT AVE, RICHMOND RD to END

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2015-2019	3	n/a	1825	**n/a**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	0	0	1	0	0	0	1	0	2	67%
Non-fatal injury	0	0	0	1	0	0	0	0	1	33%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**3**	100%
	0%	0%	33%	33%	0%	0%	33%	0%		

APPENDIX D

PREVIOUS SCREENING FORM AND EXEMPT SECTION CORRESPONDANCE

PARSONS

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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 12/1/2017

Project 398-406 Roosevelt Ave

Project Number -

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

Module 1.1 - Description of Proposed Development	
Municipal Address	406 Roosevelt Avenue
Description of location	PART 1 of LOTS 5, 6 AND 8 REGISTERED PLAN 114 OTTAWA
Land Use	Residential and Commercial
Development Size	554 sq m commerical, 33 residential appartment units
Number of Accesses and Locations	1, approx. 65m north of Richmond
Development Phasing	Single Phase
Buildout Year	2019
Sketch Plan / Site Plan	See attached

Module 1.2 - Trip Generation Trigger		
Land Use Type	Townhomes or Apartments	
Development Size	33	Units
Trip Generation Trigger Met?	No	

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
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	

8. EXEMPTION REVIEW

Based on the City's TIA guidelines and the subject site, the following modules/elements of the TIA process, summarized in Table 1, are recommended to be exempt in the subsequent steps of the TIA process:

Table 1: Exemptions Review Summary

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 site's residential parking rate is noted to meet the City's minimum By-Law for residential parking (13 stalls) and commercial parking (7 stalls). As such, parking is not expected to spill out of the site.
4.5 Transportation Demand Management	All elements	Residential development with less than 60 students/employees.
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.

In addition to the above recommendations of the Exemptions Review, the following exemptions are also proposed for both Step 3 – Forecasting and Step 4 – Analysis, and are summarized in Table 2.

Table 2: Additional Recommended Exemptions Summary

Module	Element	Exemption Consideration
3.1 Development-generated Travel Demand	3.1.2 Trip Distribution	Minimal auto share anticipated given only 33 residential units on site, and negligible impact anticipated on road network.
	3.1.3 Trip Assignment	Minimal auto share anticipated given only 33 residential units on site, and negligible impact anticipated on road network.
4..4 Access Intersection Design	4.4.2 Intersection Control	Site access will operate at a private approach and will not require an intersection screening for a signal or roundabout.
	4.4.3 Intersection Design	Site access will operate at a private approach and will not require an intersection screening for a signal or roundabout.
4.7 Transit	4.7.2 Transit Priority	Site access will operate at a private approach and will not require an intersection screening for a signal or roundabout.
4.9 Intersection Design	All Elements	Site access will operate at a private approach and will not require an intersection screening for a signal or roundabout.

9. NEXT STEPS

After discussion and review of the Screening and Scoping Report with City Staff, the next step is to complete the Forecasting Report.

From:	Dubyk, Wally
To:	Harte, Andrew
Cc:	Gordon, Christopher; David Renfroe; Nahas, Rani
Subject:	RE: 398-406 Roosevelt Ave - TIA Screening Form for Residential Infill Development
Date:	Friday, December 15, 2017 6:58:43 AM

Andrew,

Given the outcome of the Screening report (trip generation trigger not met), no Forecasting report is required and the modules under the Network Impact Component of Step 4 Analysis are not required.

Therefore, we agree with the recommendations outlined in the Exemption section of the Scoping Report.

Wally Dubyk
Project Manager - Transportation Approvals
Development Review, Central & South Branches
613-580-2424 x13783

From: Harte, Andrew [mailto:Andrew.Harte@parsons.com]
Sent: Friday, December 08, 2017 2:12 PM
To: Dubyk, Wally <Wally.Dubyk@ottawa.ca>
Cc: Gordon, Christopher <Christopher.Gordon@parsons.com>; David Renfroe <renfroe@domicile.ca>; Nahas, Rani <Rani.Nahas@parsons.com>
Subject: RE: 398-406 Roosevelt Ave - TIA Screening Form for Residential Infill Development

Wally,

Please find attached the Scoping Report for Domicile's infill development at 398-406 Roosevelt Avenue. If you require any physical copies, please let me know how many and I will send them in.

If you have any questions or wish to discuss, feel free to give me a call or let me know a good time to call you.

Regards,

Andrew Harte, P.Eng.
Senior Transportation Engineer
1223 Michael Street, Suite 100, Ottawa, Ontario, K1J 7T2
andrew.harte@parsons.com – P: +1 613.691.1527
PARSONS - Envision More
www.parsons.com | LinkedIn | Twitter | Facebook

From: Dubyk, Wally [mailto:Wally.Dubyk@ottawa.ca]
Sent: Monday, December 04, 2017 8:05 AM
To: Harte, Andrew <Andrew.Harte@parsons.com>
Subject: RE: 398-406 Roosevelt Ave - TIA Screening Form for Residential Infill Development

Andrew,

The Screening Form has identified that Triggers have been met. Please proceed with the Scoping Form.

Thank you,

Wally Dubyk
Project Manager - Transportation Approvals
Development Review, Central & South Branches
613-580-2424 x13783

From: Harte, Andrew [mailto:Andrew.Harte@parsons.com]
Sent: Friday, December 01, 2017 12:43 PM
To: Dubyk, Wally <Wally.Dubyk@ottawa.ca>
Cc: Gordon, Christopher <Christopher.Gordon@parsons.com>; Nahas, Rani <Rani.Nahas@parsons.com>
Subject: 398-406 Roosevelt Ave - TIA Screening Form for Residential Infill Development

Wally,

Please find the attached the TIA Screening Form for the proposed Domicile infill development at 398-406 Roosevelt Avenue, including the concept plan for the development.

The screening form indicates that the Location Trigger is met due to a minor overlap with the Richmond Traditional Mainstreet corridor, and the Safety Trigger is met due to the proximity to the Richmond/Roosevelt signalized intersection. My interpretation of this screening is that we can skip right to Step 4 and review the following:

- Module 4.1 Development Design – Elements 4.1.1 Design for Sustainable Modes, 4.1.2 Circulation and Access
- Module 4.2 Parking – All elements
- Module 4.3 Boundary Street Design (due to layby proposed) – All Elements
- Module 4.7 Transit – Element 4.7.1 Route Capacity
- Exclude all Modules/Elements not listed above

Please provide your acknowledgement/direction with regards to Screening Form and proposed scope of Step 4, and any additional area concerns or *exemptions* for the preparation of the next submission.

I am free to discuss at you earliest convenience if you need any clarification and await your confirmation of the Screening.

Regards,
Andrew Harte, P.Eng.
Senior Transportation Engineer
1223 Michael Street, Suite 100, Ottawa, Ontario, K1J 7T2
andrew.harte@parsons.com – P: +1 613.691.1527
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'

APPENDIX E

PROJECTED BACKGROUND GROWTH

Richmond/Churchill
8 hrs

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2003	Monday 16 June	4021	3247	2421	3069	2554	2582	3789	3887	25570
2009	Friday 7 August	3677	3243	2441	3128	3189	3145	4361	4152	27336
2016	Wednesday 26 October	3662	3468	2693	3007	3444	3248	4299	4375	28196

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2003	3247	4021	7268	25570				
2009	3243	3677	6920	27336	-0.1%	-8.6%	-4.8%	6.9%
2016	3468	3662	7130	28196	6.9%	-0.4%	3.0%	3.1%

Regression Estimate	2003	3209	3957	7166
Regression Estimate	2016	3435	3607	7043
Average Annual Change		**0.53%**	**-0.71%**	**-0.13%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2003	3789	3887	7676	25570				
2009	4361	4152	8513	27336	15.1%	6.8%	10.9%	6.9%
2016	4299	4375	8674	28196	-1.4%	5.4%	1.9%	3.1%

Regression Estimate	2003	3910	3901	7811
Regression Estimate	2016	4402	4387	8790
Average Annual Change		**0.92%**	**0.91%**	**0.91%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2003	2582	2554	5136	25570				
2009	3145	3189	6334	27336	21.8%	24.9%	23.3%	6.9%
2016	3248	3444	6692	28196	3.3%	8.0%	5.7%	3.1%

Regression Estimate	2003	2674	2634	5308
Regression Estimate	2016	3326	3513	6839
Average Annual Change		**1.69%**	**2.24%**	**1.97%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2003	2421	3069	5490	25570				
2009	2441	3128	5569	27336	0.8%	1.9%	1.4%	6.9%
2016	2693	3007	5700	28196	10.3%	-3.9%	2.4%	3.1%

Regression Estimate	2003	2383	3100	5484
Regression Estimate	2016	2661	3034	5694
Average Annual Change		**0.85%**	**-0.17%**	**0.29%**

Richmond/Churchill
AM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2003	Monday 16 June	515	584	352	398	227	428	698	382	3584
2009	Friday 7 August	471	529	321	374	310	379	603	423	3410
2016	Wednesday 26 October	470	580	413	377	282	494	694	408	3718

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2003	584	515	1099	3584				
2009	529	471	1000	3410	-9.4%	-8.5%	-9.0%	-4.9%
2016	580	470	1050	3718	9.6%	-0.2%	5.0%	9.0%

Regression Estimate	2003	565	507	1072
Regression Estimate	2016	564	463	1027
Average Annual Change		**-0.02%**	**-0.69%**	**-0.33%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2003	698	382	1080	3584				
2009	603	423	1026	3410	-13.6%	10.7%	-5.0%	-4.9%
2016	694	408	1102	3718	15.1%	-3.5%	7.4%	9.0%

Regression Estimate	2003	665	392	1057
Regression Estimate	2016	665	417	1082
Average Annual Change		**0.01%**	**0.47%**	**0.18%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2003	428	227	655	3584				
2009	379	310	689	3410	-11.4%	36.6%	5.2%	-4.9%
2016	494	282	776	3718	30.3%	-9.0%	12.6%	9.0%

Regression Estimate	2003	400	248	647
Regression Estimate	2016	470	300	769
Average Annual Change		**1.25%**	**1.48%**	**1.34%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2003	352	398	750	3584				
2009	321	374	695	3410	-8.8%	-6.0%	-7.3%	-4.9%
2016	413	377	790	3718	28.7%	0.8%	13.7%	9.0%

Regression Estimate	2003	331	393	724
Regression Estimate	2016	395	373	767
Average Annual Change		**1.37%**	**-0.41%**	**0.45%**

Richmond/Churchill
PM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2003	Monday 16 June	780	455	347	547	463	286	455	757	4090
2009	Friday 7 August	642	336	244	482	482	436	578	692	3892
2016	Wednesday 26 October	569	478	400	462	646	361	470	784	4170

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2003	455	780	1235	4090				
2009	336	642	978	3892	-26.2%	-17.7%	-20.8%	-4.8%
2016	478	569	1047	4170	42.3%	-11.4%	7.1%	7.1%

Regression Estimate	2003	409	765	1174
Regression Estimate	2016	438	557	995
Average Annual Change		**0.54%**	**-2.42%**	**-1.27%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2003	455	757	1212	4090				
2009	578	692	1270	3892	27.0%	-8.6%	4.8%	-4.8%
2016	470	784	1254	4170	-18.7%	13.3%	-1.3%	7.1%

Regression Estimate	2003	497	729	1226
Regression Estimate	2016	506	760	1266
Average Annual Change		**0.14%**	**0.32%**	**0.25%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2003	286	463	749	4090				
2009	436	482	918	3892	52.4%	4.1%	22.6%	-4.8%
2016	361	646	1007	4170	-17.2%	34.0%	9.7%	7.1%

Regression Estimate	2003	327	440	767
Regression Estimate	2016	396	626	1022
Average Annual Change		**1.48%**	**2.76%**	**2.24%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2003	347	547	894	4090				
2009	244	482	726	3892	-29.7%	-11.9%	-18.8%	-4.8%
2016	400	462	862	4170	63.9%	-4.1%	18.7%	7.1%

Regression Estimate	2003	301	538	839
Regression Estimate	2016	361	454	815
Average Annual Change		**1.40%**	**-1.29%**	**-0.22%**

APPENDIX F

MMLOS: BOUNDARY STREETS ROAD SEGMENTS

Multi-Modal Level of Service - Segments Form

Consultant	Parsons	**Project**	476577
Scenario	406 Roosevelt	**Date**	1-Nov-21
Comments			

SEGMENTS		Street A	Roosevelt West Side	Roosevelt East Side	Roosevelt West Future	Mitigation	Section 5	Section 6	Section 7	Section 8	Section 9
Pedestrian	Sidewalk Width Boulevard Width	-	no sidewalk n/a	1.5 m < 0.5 m	1.8 m < 0.5 m	≥ 2 m 0.5 - 2 m					
	Avg Daily Curb Lane Traffic Volume		≤ 3000	≤ 3000	≤ 3000	≤ 3000					
	Operating Speed On-Street Parking		> 30 to 50 km/h no	> 30 to 50 km/h yes	> 30 to 50 km/h no	> 30 to 50 km/h no					
	Exposure to Traffic PLoS		**F**	**E**	**B**	**A**	-	-	-	-	-
	Effective Sidewalk Width										
	Pedestrian Volume										
	Crowding PLoS		-	-	-	-	-	-	-	-	-
	Level of Service		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Bicycle	Type of Cycling Facility	B	Mixed Traffic	Mixed Traffic							
	Number of Travel Lanes		≤ 2 (no centreline)	≤ 2 (no centreline)							
	Operating Speed		>40 to <50 km/h	>40 to <50 km/h							
	# of Lanes & Operating Speed LoS		**B**	**B**	-	-	-	-	-	-	-
	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	< 1.8 m refuge							
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes	≤ 3 lanes							
	Sidestreet Operating Speed		>40 to 50 km/h	>40 to 50 km/h							
	Unsignalized Crossing - Lowest LoS		**B**	**B**	-	-	-	-	-	-	-
	Level of Service		**B**	**B**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Transit	Facility Type	-									
	Friction or Ratio Transit:Posted Speed										
	Level of Service		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Truck	Truck Lane Width	-									
	Travel Lanes per Direction										
	Level of Service		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**