NOVATECH

Engineers, Planners & Landscape Architects

Engineering

- Land / Site Development
- Municipal Infrastructure
- Environmental / Water Resources
- Traffic / Transportation
- Structural
- Recreational

Planning

- Land / Site Development
- Planning Application Management
- Municipal Planning Documents & Studies
- Expert Witness (OMB)
- Wireless Industry

Landscape Architecture

- Urban Design & Streetscapes
- Open Space, Parks & Recreation Planning
- Community & Residential Developments
- Commercial & Institutional Sites
- Environmental Restoration

36 Years

Proposed 2 Tower High-Rise Development

383 Albert Street & 340 Queen Street

Claridge Homes

Transportation Impact Assessment

Engineering excellence. Planning precision. Inspired landscapes.

Proposed 2 Tower High-Rise Development
383 Albert Street
340 Queen Street

Transportation Impact Assessment – Addendum 3

Prepared By:

NOVATECH
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
K2M 1P6

Dated: August 2018
Revised: February 2019
Revised: May 2, 2019
Revised: May 13, 2019

Novatech File: 109111
Ref: R-2018-031

May 13, 2019

City of Ottawa
Planning and Growth Management Department
110 Laurier Ave. W., 4th Floor,
Ottawa, Ontario K1P 1J1

Attention: Mr. Wally Dubyk
Project Manager, Infrastructure Approvals

Dear Mr. Dubyk:

Reference: 383 Albert Street & 340 Queen Street
Revised Transportation Impact Assessment (TIA) Addendum 3
Novatech File No. 109111

We are pleased to submit the following Revised Transportation Impact Assessment Addendum 3 in support of a Zoning By-Law Amendment and Site Plan Control application for 383 Albert Street and 340 Queen Street, for your review and signoff. The structure and format of this report is in accordance with the City of Ottawa Transportation Impact Assessment Guidelines (June 2017).

TIA Addendum 2 was submitted to the City of Ottawa in August 2018 in support of a Zoning By-Law Amendment and Site Plan Control application, and a revision was submitted dated February 27, 2019.

A TIA Addendum 3 was submitted on May 2, 2019 in a response letter format to address City comments, and reflect changes to the site plan since February 27, 2019. This revised TIA Addendum 3 has been submitted as a full update of the study, in accordance with the 2017 TIA Guidelines. A response letter to transportation comments and RMA support documents have been submitted under separate cover, concurrently with this report.

If you have any questions or comments regarding this report, please feel free to contact Jennifer Luong, or the undersigned.

Yours truly,

NOVATECH

Joshua Audia, B.Sc.
E.I.T. | Transportation/Traffic

Suite 200, 240 Michael Cowpland Drive, Ottawa ON K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

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.

City Of Ottawa
Infrastructure Services and Community Sustainability
Planning and Growth Management
110 Laurier Avenue West, 4th fl.
Ottawa, ON K1P 1J1
Tel. : 613-580-2424
Fax: 613-560-6006

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

Dated at Ottawa (City) this 13 day of May, 2019.

Name: Jennifer Luong, P.Eng.
(Please Print)

Professional Title: Senior Project Manager, Transportation/Traffic

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

Office Contact Information (Please Print)	
Address:	240 Michael Cowpland Drive, Suite 200
City / Postal Code:	Ottawa, ON, K2M 1P6
Telephone / Extension:	613-254-9643 x 254
E-Mail Address:	j.luong@novatech-eng.com

TABLE OF CONTENTS

Figures

Tables

Appendices

1.0 INTRODUCTION

This Transportation Impact Assessment (TIA) Addendum 3 has been prepared in support of a Zoning By-Law Amendment and Site Plan Control application for the properties located at 383 Albert Street and 340 Queen Street. A previous Transportation Impact Study (TIS) was completed in October 2013 and updated with Addendum 1 in March 2017 in support of a Zoning By-Law Amendment and Site Plan application for the properties previously listed. The proposed development at that time consisted of the following:

- Tower A - 28 storeys yielding a total of 259 dwelling units and 9,100 ft^2 of commercial floor space, with 175 underground parking spaces on eight levels;
- Tower B - 28 storeys yielding a total of 213 dwelling units and 10,700 ft^2 of commercial floor space, with 175 underground parking spaces on eight levels;
- Tower C - 22 storeys yielding a total of 118 dwelling units and 6,700 ft^2 of commercial floor space, with 118 underground parking spaces on eight levels.

In total, the entire development consisted of 590 dwelling units, 26,500 ft^2 of commercial floor space and 468 parking spaces.

TIA Addendum 2 was completed in August 2018 and revised February 27, 2019, and considered 572 dwellings, 25,080 ft^2 of supermarket floor space, and 288 underground parking spaces on four levels, including public parking approximately equal to the existing surface parking lot (130 spaces).

The revised concept for the proposed development consists of 588 dwelling units, approximately 20,830 ft^2 of supermarket floor space, and 359 underground parking spaces on five levels, which are organized as follows:

- Tower A – 27 storeys yielding a total of 267 dwelling units;
- Tower C – 9/27 storeys yielding a total of 321 dwelling units;
- Ground floor – Approximately 20,830 ft^2 of supermarket floor space.

The eastern section of Tower C will only be nine storeys before being stepped back, and continuing another 18 storeys with a smaller footprint.

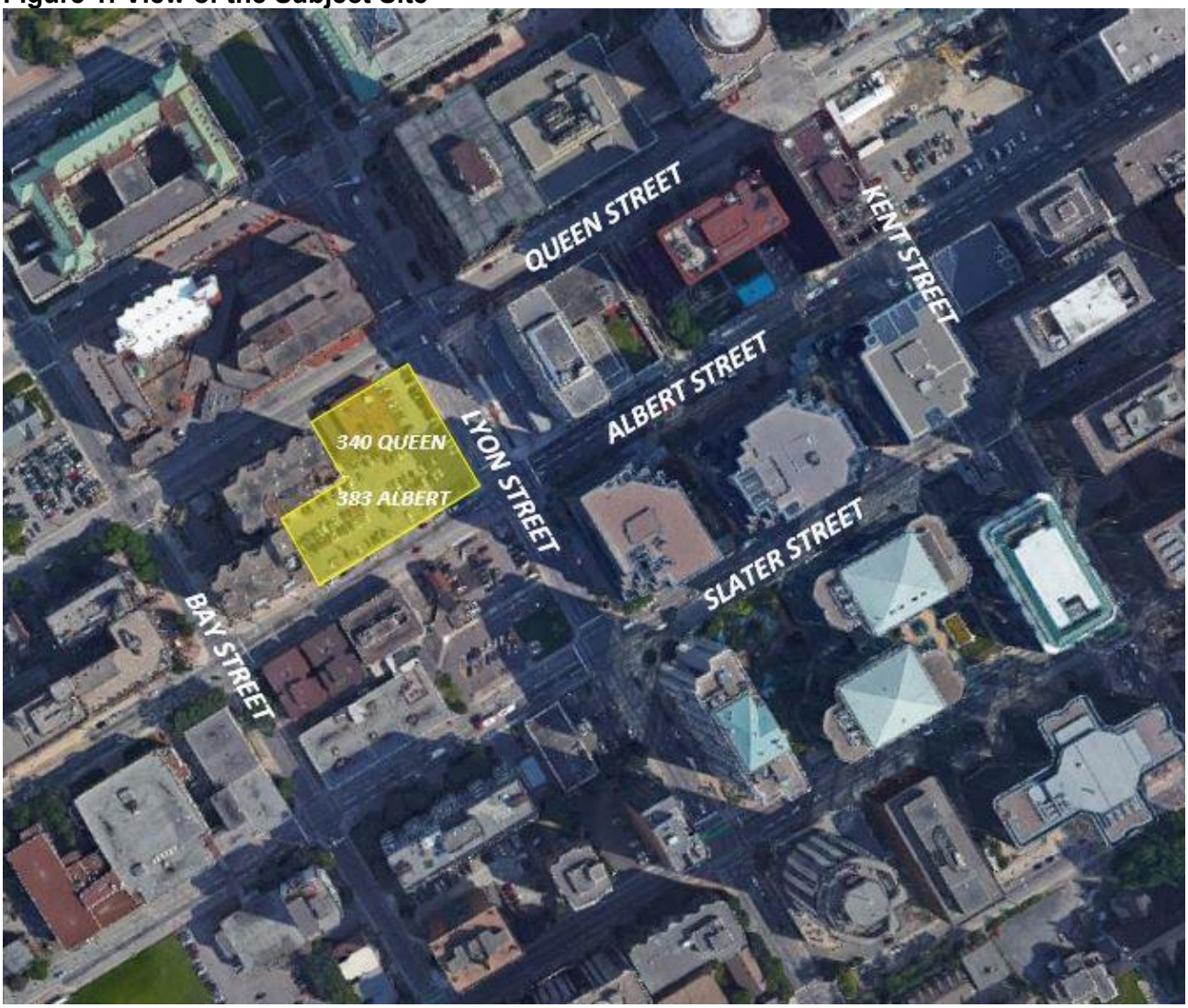
The proposed residential and supermarket uses are permitted under the current zoning. Up to two levels of the underground parking garage are proposed to potentially operate as public parking, a use which is not permitted under the current zoning. The proposed number of spaces designated as 'public parking' will be approximately equal to the number of parking spaces provided within the subject site, prior to construction of the Lyon Street LRT (light rail transit) station, which is approximately 130 spaces.

The subject site is surrounded by the following:

- Queen Street and office buildings to the north;
- Lyon Street and the Delta Ottawa Hotel to the east;
- Albert Street and surface parking to the south; and
- Bay Street, the Albert at Bay Suite Hotel, and the Radisson Hotel to the west.

A view of the subject site is provided in **Figure 1**.

Figure 1: View of the Subject Site



2.0 PROPOSED DEVELOPMENT

The revised concept for the proposed development consists of 588 dwelling units, approximately 20,830 ft^2 of supermarket floor space, and 359 underground parking spaces on five levels.

The existing access serving the surface parking lot at 383 Albert Street will be removed as part of the proposed development. One two-way ramp access to the underground parking garage will be located on Albert Street, approximately 40m east of Bay Street. A proposed loading area for the retail space is located on Albert Street, adjacent to the ramp access to the underground parking garage, and a lay-by is proposed on the north side of Albert Street, east of the loading access.

The proposed development is anticipated to be constructed in a single phase over a four-year period, starting in 2019. A copy of the site plan is included in **Appendix A**.

3.0 SCREENING AND SCOPING

3.1 Screening Form

The City's 2017 TIA Guidelines identify three triggers for completing a TIA report, including trip generation, location, and safety. The criteria for each trigger are outlined in the City's TIA Screening Form. A copy of the TIA Screening Form is included in **Appendix B**.

The net difference between the previous proposal and the new proposal is approximately 139 person trips, which is more than the trip generation trigger of 60 person trips. The subject application also satisfies the location and safety triggers for completing a TIA study. As the number of vehicle trips generated by the proposed development is generally consistent with the assumed development in the previous TIS, dated October 2013, the intersection analysis presented in the previous TIS is representative of the projected intersection operations following the build-out of the subject site.

3.2 Existing Conditions

The Right of Way (ROW) protections for Albert Street and Lyon Street are identified in the City's Official Plan. Annex 1 of the Official Plan indicates a variable ROW for Albert Street (18.0m within the study area), with a maximum land requirement of 1.25m. The Pedestrian Easement Policy, outlined in the Official Plan, Annex 1, Policy 4, identifies a 1.5m setback for pedestrians as measured from any proposed ROW widening. The City has confirmed that the 1.5m pedestrian easement may be measured from the existing ROW, resulting in a 0.25m setback from the required 1.25m widening. Annex 1 indicates a ROW of 20m for Lyon Street, with a maximum land requirement of 0.90m. Right-of-way requirements will be verified by a legal surveyor.

As mentioned in Section 1.0, a previous TIS was prepared by Novatech in October 2013 in support of a Zoning By-Law Amendment and Site Plan Control application, with a subsequent addendum prepared in March 2017. This study provided a review of the existing and planned conditions in the vicinity of the subject site, and performed intersection analysis for the study area intersections. Count data used for the previous analysis of the study area intersections is summarized as follows:

- Queen Street/Kent Street — May 1, 2013
- Queen Street/Lyon Street — May 2, 2013
- Queen Street/Bay Street — May 1, 2013
- Albert Street/Kent Street — May 3, 2013
- Albert Street/Lyon Street — August 21, 2012
- Albert Street/Bay Street — August 11, 2011
- Slater Street/Kent Street — May 3, 2013
- Slater Street/Lyon Street — July 4, 2012
- Slater Street/Bay Street — August 9, 2011

More recent counts were requested for this addendum, in order to identify any notable changes in the traffic volumes patterns. The existing traffic volumes from the previous TIS are shown in **Figure 2**, and the existing traffic volumes based on the newer traffic counts are shown in **Figure 3**. The results of this comparison are included in **Table 1**.

Peak hour summary sheets of the recent count data are included in **Appendix C**.

Figure 2: Existing Traffic – 2011-2013 Counts

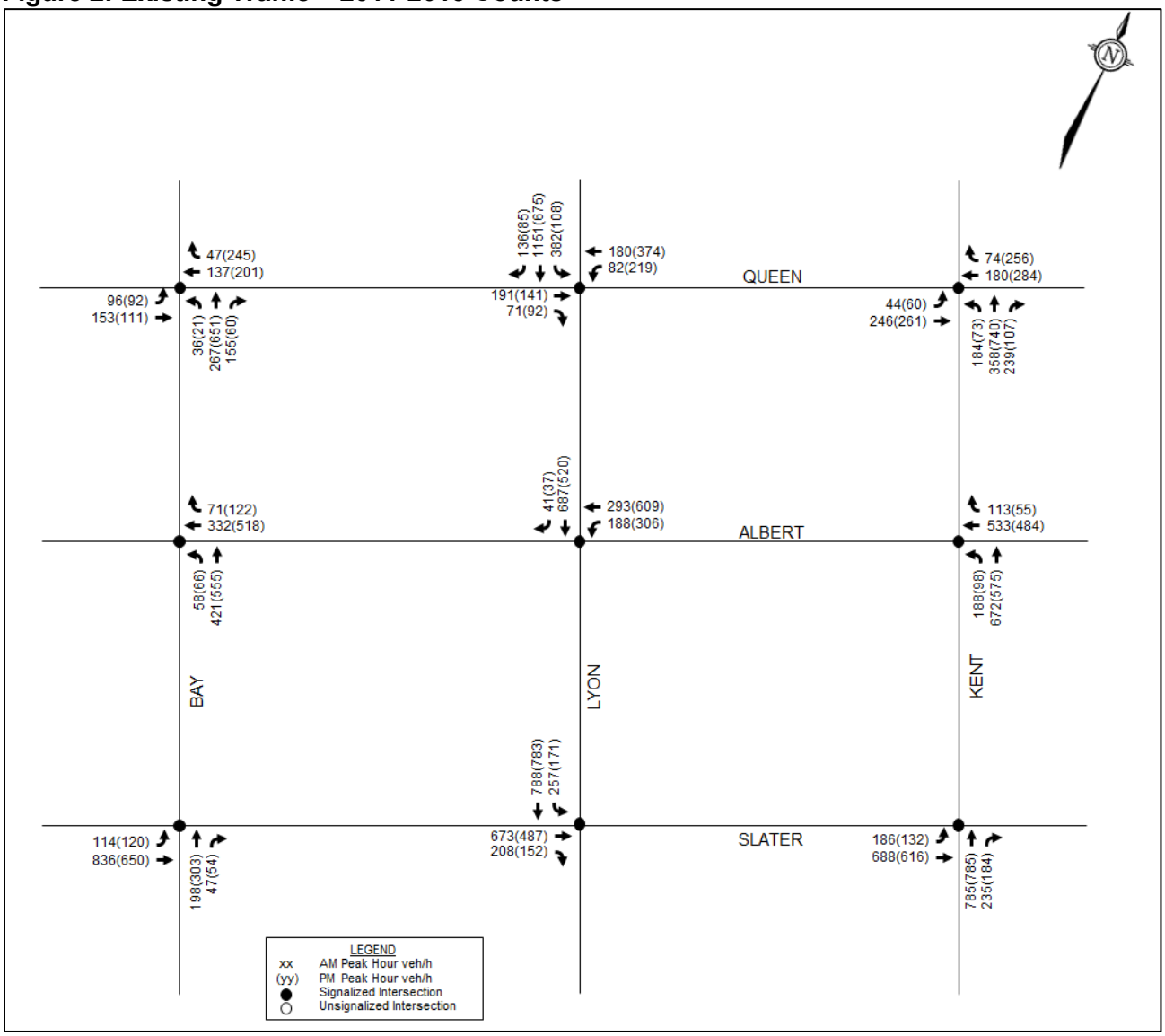


Figure 3: Existing Traffic – 2014-2017 Counts

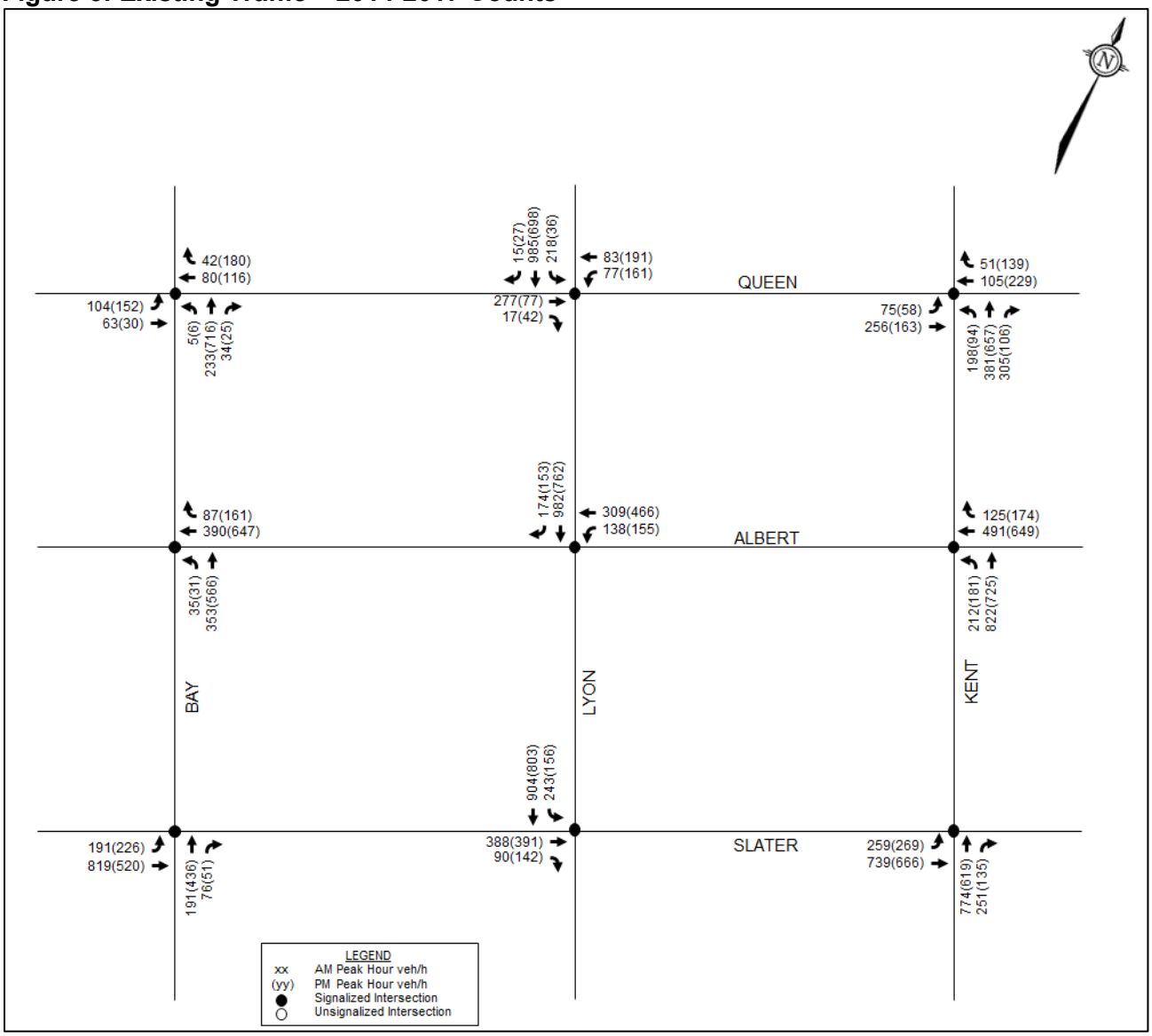


Table 1: Study Area Intersections

Intersection	Previous Count		New Count		Net Change
	AM	PM	AM	PM	
Queen Street/ Kent Street	*May 2013*		*August 2014*[1]		10% - 20% decrease
	1,325	1,781	1,143	1,267	
Queen Street/ Lyon Street	*May 2013*		*June 2015*		
	2,193	1,694	1,676	1,232	
Queen Street/ Bay Street	*May 2013*		*August 2015*		
	891	1,381	561	1,225	
Albert Street/ Kent Street	*May 2013*		*March 2017*		15% - 20% increase
	1,506	1,212	1,650	1,729	
Albert Street/ Lyon Street	*August 2012*		*June 2015*		
	1,209	1,472	1,604	1,542	
Albert Street/ Bay Street	*August 2011*		*June 2015*		
	882	1,261	865	1,405	
Slater Street/ Kent Street/	*May 2013*		*March 2017*		No significant change
	1,894	1,717	2,023	1,689	
Slater Street/ Lyon Street	*July 2012*		*June 2015*		
	1,926	1,593	1,625	1,492	
Slater Street/ Bay Street	*August 2011*		*June 2015*		
	1,195	1,127	1,282	1,237	

1. A traffic count was conducted for this intersection in March 2017, however road closures were in effect for eastbound traffic on Queen Street

LRT construction for the Confederation Line is currently ongoing. The construction of the LRT tunnel directly beneath Queen Street has disrupted traffic patterns in the study area, and the most recent traffic count at Queen Street/Kent Street was performed when Queen Street was closed to eastbound traffic. Traffic counts will always encounter seasonal and day-to-day variations, however given the lack of a consistent pattern of growth within the network, the conclusions made in the previous TIS are believed to be valid.

3.3 Planned Conditions

The addendum from March 2017 included an update of planned conditions and other developments. Planned network changes that were reviewed as part of Addendum 1 include the Confederation Line LRT project and the Lyon Street LRT station, as well as segregated bike facilities and a future NCC pathway along Wellington Street from Mackenzie Avenue to the Portage Bridge. A sensitivity analysis of the roadways running east-west throughout the study area was undertaken to assess the large developments that had been approved since the previous TIS submission. These developments, all of which are located west of the study area, included the Zibi Development at Chaudiere Crossing, Rendezvous Lebreton in Lebreton Flats, and a development at 900 Albert Street.

The addendum concluded that the intersections along Queen Street will have minimal capacity to accommodate future development traffic, but that Albert Street and Slater Street have capacity for a substantial increase in traffic during the peak periods. Additionally, the addendum concludes that the proposed access to this development will operate acceptably, even if the upstream and downstream intersections operate at capacity.

In addition to the developments outlined in the 2017 addendum, Claridge has proposed a development at the southeast corner of Booth Street/Fleet Street. This proposal consists of five buildings, including approximately 350 residential units, a 21,500 ft^2 (GFA) food store (or other retail uses), and 43,000 ft^2 (GFA) of institutional development. Underground parking is proposed with accesses on Lett Street and Lloyd Street. The estimated completion date is 2023. The *East Lebreton Flats Lands – Phase 1 Transportation Impact Study* (July 2018) indicates that the development will generate between 20 and 35 peak hour vehicle trips along Wellington Street in the peak direction. Excerpts from the TIS including the concept plan and projected site traffic are included in **Appendix D**. Some of the development traffic will pass through the subject study area for travel to/from Wellington Street. The analysis presented in the 2017 Addendum identifies the residual intersection capacity that will be available to accommodate the East Lebreton Flats development and others.

The *Albert-Slater Post LRT Repurposing Functional Design Study & Slater Street and Bronson Avenue Environmental Assessment Study* is being conducted by the City to explore opportunities to improve walking, cycling, transit and vehicular traffic once the Transitway is decommissioned along these roadways. Renewals along Albert and Slater Street will implement the vision established in the City's 2013 *Downtown Moves Study*.

While the Albert-Slater repurposing will be implemented in phases over several years, discussions with City staff have identified that the modifications to Albert Street between Bay Street and Lyon Street may be completed in the early stages to allow for coordination with new bus routing. There is a possibility that modifications to Albert Street may be constructed before or concurrently with construction of the proposed redevelopment. The preliminary plan for the section adjacent to the subject site is shown in **Figure 4**.

The *Bay Street Cycling Facility Functional Design* has been completed by the City to rehabilitate existing sidewalks and pavement, and implement new raised cycle tracks between Wellington Street and Laurier Avenue West. Pending project coordination, construction is anticipated to occur in the summer and fall of 2019. The implementation of northbound and southbound cycle tracks was identified by the City as an important link to existing cycling network and future extensions. The preliminary plan for the section west of the subject site is shown in **Figure 5**.

3.4 Study Area and Time Periods

The study area for this report includes all accesses to the proposed development and the adjacent boundary streets. The selected time periods for the analysis are the weekday AM and PM peak hours, which represent the 'worst case' combination of site-generated traffic and adjacent street traffic. The proposed development is anticipated to be constructed in a single phase, with build-out anticipated to start in 2019 and complete in 2023.

Figure 4: Albert-Slater Post-LRT Repurposing

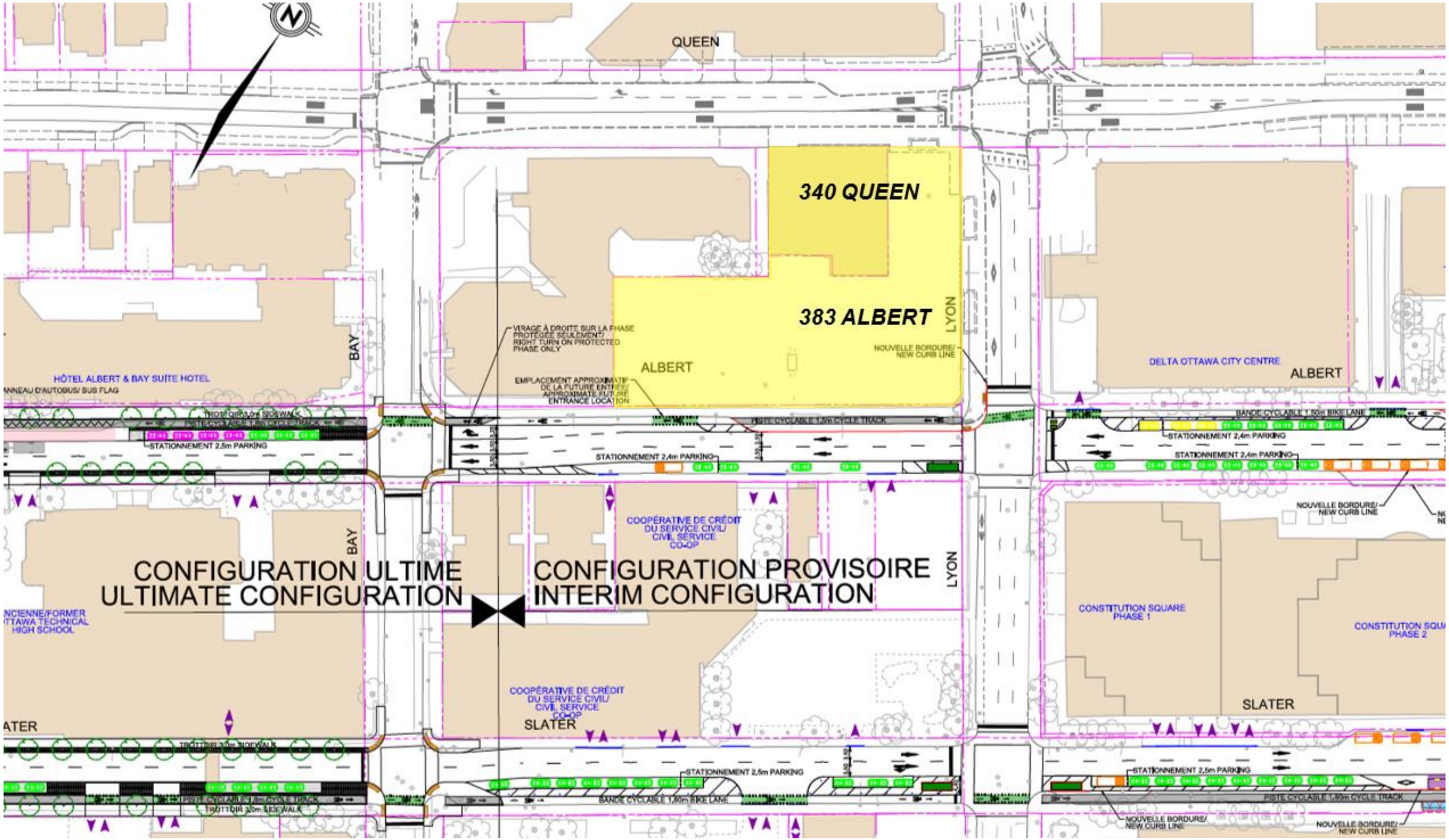
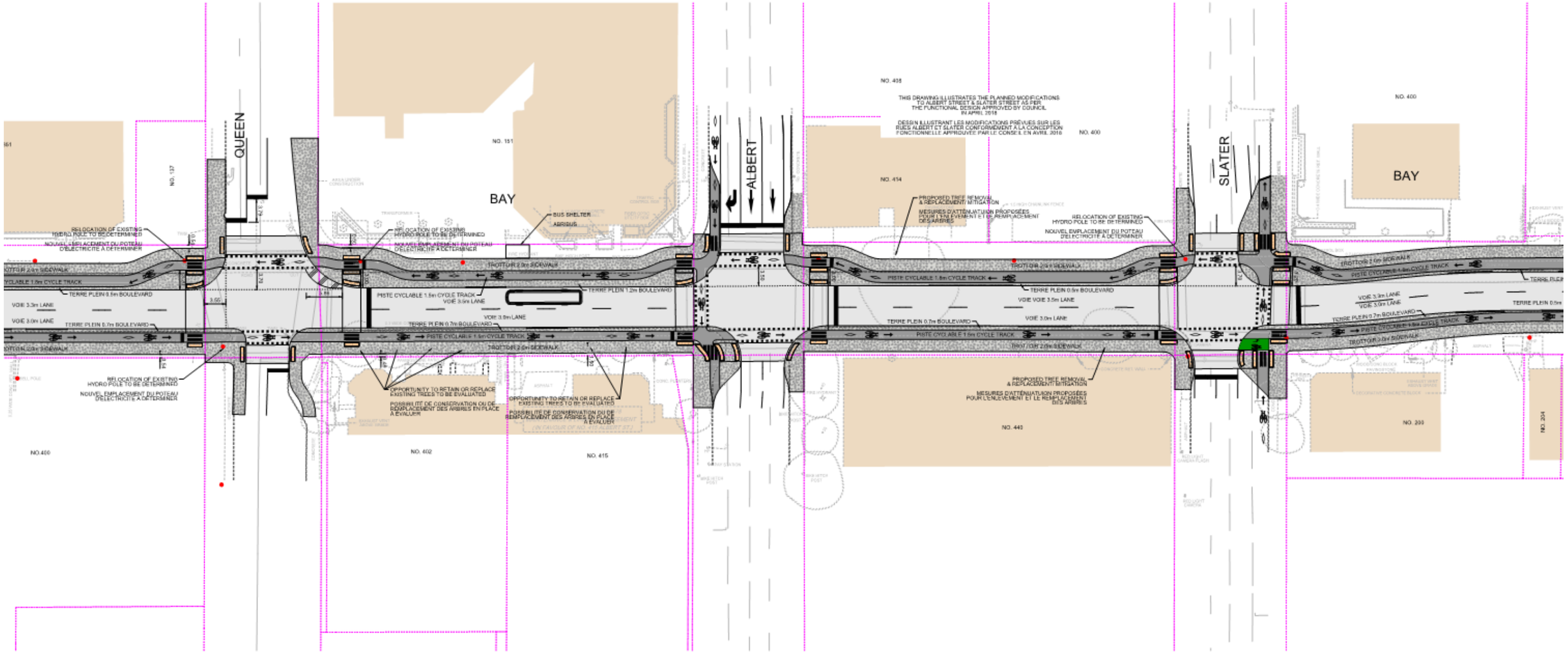


Figure 5: Bay Street Cycling Facilities



3.5 Exemptions Review

Module 4.6 – Neighbourhood Traffic Management will not be reviewed, as the subject site does not rely on local or collector roadways for access. Module 4.8 – Network Concept will not be reviewed, as the proposed development is not anticipated to generate more than 200 person trips during the peak hour in excess of the equivalent volume permitted by the established zoning.

The net difference in trips generated by the proposed development is 139 person trips, compared to the assumed development in the previous TIS. As shown in Section 4.0, the projected number of vehicle trips generated by the subject site is less than the projections made in the previous TIS. The network analysis presented in the previous TIS is therefore representative of the projected operations following the build-out of the subject site. As such, intersection auto analysis is exempt from further analysis. However, the study area intersections will still be evaluated based on the multi-modal levels of service.

The following modules are included in the TIA report:

- Module 4.1 – Development Design
- Module 4.2 – Parking
- Module 4.3 – Boundary Streets
- Module 4.4 – Access Intersections
- Module 4.5 – Transportation Demand Management
- Module 4.7 – Transit
- Module 4.9 – Intersection Design

4.0 FORECASTING

The 2013 TIS and 2017 Addendum 1 assessed a development consisting of 590 dwelling units and approximately 26,500 ft^2 of commercial space, which was assumed specialty retail. The concept plan now includes 588 dwelling units, and approximately 20,830 ft^2 of supermarket floor space. This equates to an increase of 20,830 ft^2 of supermarket space, a decrease of two dwelling units, and a decrease of 26,500 ft^2 of specialty retail.

The previous TIS did not consider the number of trips generated by the existing surface public parking lot, and the proposed number of underground public parking spaces will be approximately equal to the number of parking spaces provided on-site, prior to construction of the Lyon Street LRT station. As the trips generated by the existing parking use were not subtracted from the background traffic volumes in the previous TIS analysis, it can be assumed that the inclusion of the proposed public parking garage (with an approximately equal number of parking spaces as the existing lot) will not impact the study area network. The public parking trips generated by the proposed development will therefore only be added to the traffic volumes shown at the proposed access.

The number of vehicle trips generated by the public parking use has been estimated using typical peak hour rates presented in Table 14-1 of the *ITE Traffic Engineering Handbook, 5th Edition*. Table 14-1 is included in **Appendix E**. Aerial photography of the subject site prior to any LRT construction shows approximately 130 parking spaces were provided, and this number of parking spaces has been carried forward to determine the number of trips generated.

Table 14-1 of the *ITE Traffic Engineering Handbook* suggests the number of vehicle trips generated by a parking facility serving central business district activities in the AM peak hour typically range from 40% to 60% of the total parking spaces for inbound trips, and 10% to 20% of the total parking spaces for outbound trips. A peak hour rate of 70% for inbound trips and 30% for outbound trips has been assumed, resulting in 92 inbound trips and 40 outbound trips during the AM peak hour.

In the PM peak hour, the number of vehicle trips generated typically range from 10% to 30% of the total parking spaces for inbound trips, and 40% to 60% of the total parking for outbound trips. A peak hour rate of 40% for inbound trips and 70% for outbound trips has been assumed, resulting in 53 inbound trips and 92 outbound trips during the PM peak hour.

The person trips generated by the residential and supermarket uses of the proposed development, compared to the assumed trip generation for the subject site in the 2013 TIS and 2017 Addendum 1, is summarized in **Table 2**. All trip generation values were calculated using the *ITE Trip Generation Manual, 9th Edition*.

Table 2: Person Trip Generation

Land Use	ITE Code	Units/GFA	AM Peak (PPH[1])			PM Peak (PPH)		
			IN	OUT	TOT	IN	OUT	TOT
Previous TIS								
High-Rise Residential Condominiums	232	590 units	52	219	271	188	115	303
Specialty Retail	826	26,500 ft^2	0	0	0	48	49	97
		Total	**52**	**219**	**271**	**236**	**164**	**400**
Proposed Development								
High-Rise Residential Condominiums	232	588 units	49	207	256	177	109	286
Supermarket	850	20,830 ft^2	55	35	90	129	124	253
		Total	**104**	**242**	**346**	**306**	**233**	**539**
		Difference	**52**	**23**	**75**	**70**	**69**	**139**

1) PPH = Persons Per Hour – Calculated in the previous TIS using an ITE Trip to Person Trip factor of 1.35, accepted by the City at the time of that study. For the Proposed Development, PPH has been calculated using an ITE Trip to Person Trip Factor of 1.28, consistent with the 2017 TIA Guidelines.

Based on the previous table, the proposed development is anticipated to generate an additional 75 person trips during the AM peak hour and 139 person trips during the PM peak hour, compared to the assumed development in the previous TIS.

The modal shares outlined in the previous TIS overestimate the vehicle trips generated by the proposed development, as the Confederation Line LRT will provide improved transit service by the buildout year. Per discussions with City staff, the modal shares have been adjusted from those used in the previous TIS to better reflect the subject site as a transit-oriented development, and to reflect the new land uses. The modal shares assigned to the residential land use assume a higher transit modal share and lower non-auto modal share when compared to the modal shares assigned to the supermarket land use.

The projected person trips by modal share, compared to the assumed trip generation for the subject site in the previous TIS is summarized in **Table 3**.

Table 3: Person Trips by Modal Share

Travel Mode	Modal Share		AM Peak			PM Peak		
	AM	PM	IN	OUT	TOT	IN	OUT	TOT
Previous TIS								
Residential Person Trips			*52*	*219*	*271*	*188*	*115*	*303*
Auto Driver	35%	26%	18	77	95	49	30	79
Auto Passenger	3%	10%	3	6	9	19	11	30
Transit	19%	26%	9	42	51	49	30	79
Non-Auto	43%	38%	22	94	116	71	44	115
Commercial Person Trips			*0*	*0*	*0*	*48*	*49*	*97*
Auto Driver	35%	26%	0	0	0	12	13	25
Auto Passenger	3%	10%	0	0	0	5	5	10
Transit	19%	26%	0	0	0	13	13	26
Non-Auto	43%	38%	0	0	0	18	18	38
Auto Driver (Total)			**18**	**77**	**95**	**61**	**43**	**104**
Auto Passenger (Total)			**3**	**6**	**9**	**24**	**16**	**40**
Transit (Total)			**9**	**42**	**51**	**62**	**43**	**105**
Non-Auto (Total)			**22**	**94**	**116**	**89**	**62**	**151**
Proposed Development								
Residential Person Trips			*49*	*207*	*256*	*177*	*109*	*286*
Auto Driver	10%		5	20	25	19	11	30
Auto Passenger	5%		2	11	13	10	6	16
Transit	60%		30	124	154	105	65	170
Non-Auto	25%		12	52	64	43	27	70
Supermarket Person Trips			*55*	*35*	*90*	*129*	*124*	*253*
Auto Driver	15%		10	5	15	20	20	40
Auto Passenger	5%		3	2	5	7	6	13
Transit	40%		21	14	35	51	49	100
Non-Auto	40%		21	14	35	51	49	100
Auto Driver (Total)			**15**	**25**	**40**	**39**	**31**	**70**
Auto Passenger (Total)			**5**	**13**	**18**	**17**	**12**	**29**
Transit (Total)			**51**	**138**	**189**	**156**	**114**	**270**
Non-Auto (Total)			**33**	**66**	**99**	**94**	**76**	**170**
Auto Driver (Difference)			-3	-52	-55	-22	-12	-34
Auto Pass. (Difference)			2	7	9	-7	-4	-11
Transit (Difference)			42	96	138	94	71	165
Non-Auto (Difference)			11	-28	-17	5	14	19

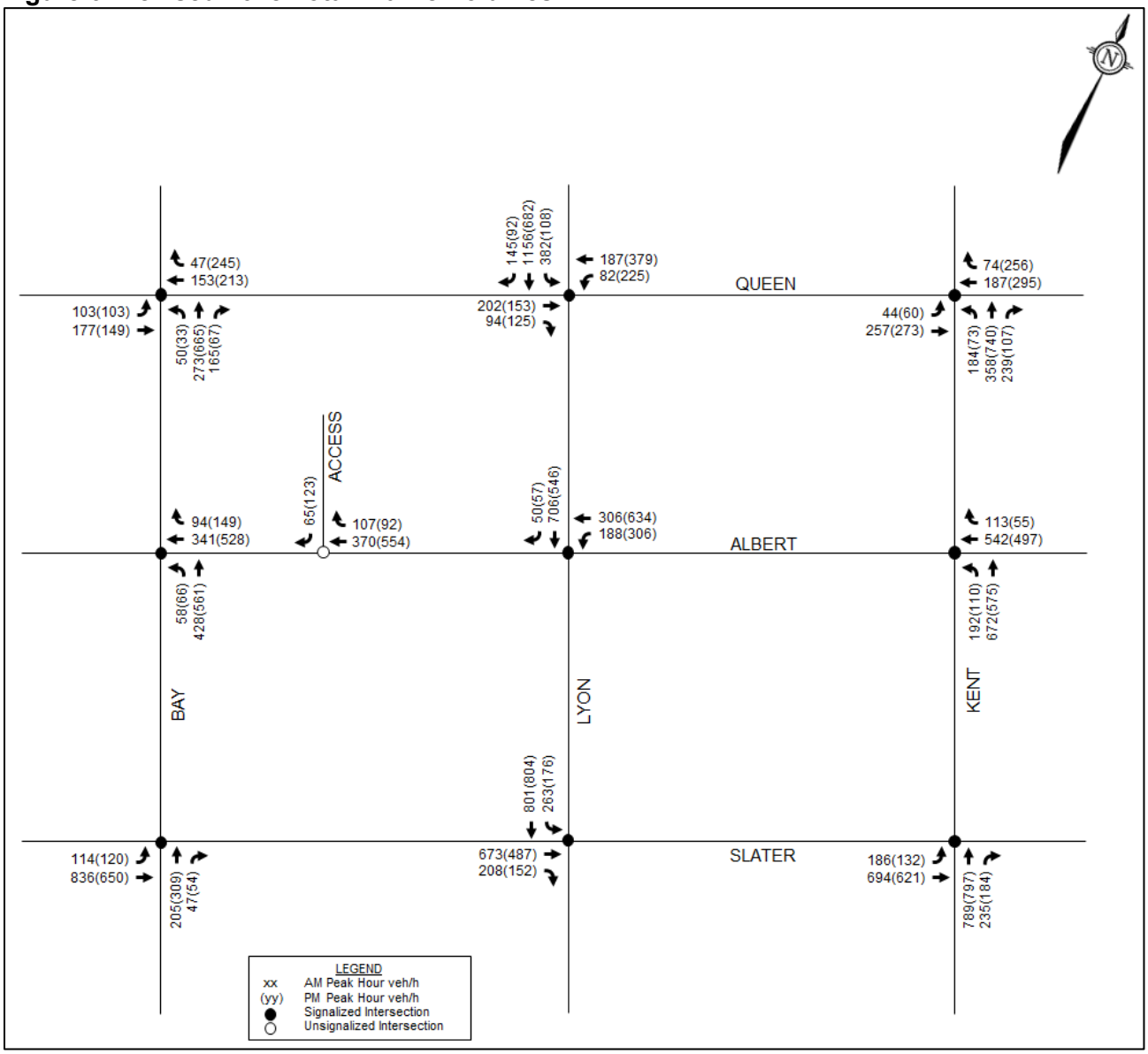
Based on the revised modal shares shown above in **Table 3**, the proposed development is anticipated to generate 55 fewer vehicle trips during the AM peak hour and 34 fewer vehicle trips during the PM peak hour, compared to the projections of the previous TIS.

It is recognized that some trips generated by the proposed development will be internally captured (for example, a resident making a trip to the ground level to buy groceries at the supermarket and

then immediately returning upstairs). However, it is likely that trips of this nature will make up only a small proportion of the overall site-generated trip volume, and as such, no deductions have been made. All trips generated by the proposed land uses are assumed to have an origin or destination beyond the subject site, an assumption which ensures that the analysis is more conservative.

In general, background traffic and the assignment of the vehicle trips generated by the proposed development will be consistent with the previous TIS. The revised 2028 total traffic volumes within the subject area are shown in **Figure 6**. The revised projections for trips generated by the proposed development will have no significant impact on the operating conditions identified in the previous TIS.

Figure 6: Revised 2028 Total Traffic Volumes



5.0 ANALYSIS

5.1 Development Design

Sidewalks will be provided along Queen Street, Lyon Street, and Albert Street. Sidewalks on Albert Street will be depressed and continuous across the access to the parking garage and loading area, and will be 2.0m in width, in accordance with City standards.

A total of nine exterior bicycle parking spaces for the supermarket will be provided adjacent to the entrance on Queen Street, and the remaining 350 bicycle parking spaces will be provided in secure areas within the underground parking garage. In total, these 359 bicycle parking spaces meet the minimum requirements of the City's *Zoning By-Law* (ZBL), as shown in Section 5.2. The maximum grade of the garage ramp is proposed to be 13%, as discussed further in Section 5.4. For cyclists who find this grade too steep, the elevators can also be used to access the underground parking facility.

Presently, Albert Street and Slater Street are the spines of the OC Transpo Transitway in the downtown core. OC Transpo stop #3003 is located on the north side of Albert Street, west of Kent Street. This stop is within a walking distance of approximately 210m of all entrances to the subject site. OC Transpo stop #3006 is located on the south side of Slater Street, west of Kent Street. This stop is within a walking distance of approximately 280m of all entrances to the subject site.

These two stops both provide service to 13 regular routes, 10 rapid transit routes, and 36 express routes. The Albert/Kent stop additionally provides service to the special event route 403. OC Transpo stop #7549 is located on the west side of Bay Street, north of Queen Street. This stop is within a walking distance of approximately 300m of all entrances to the subject site, and provides service to the express routes 234 and 293.

The City of Ottawa is currently converting the east-west transitway between the Tunney's Pasture and Blair stations to light rail transit. This construction is currently ongoing, and is anticipated to be complete in 2019. As part of the project, the existing bus stops listed above will be replaced by the Lyon Street LRT station. Access to the LRT station will be provided from the proposed development on the ground floor, at the intersection of Queen Street and Lyon Street.

To identify whether any transit capacity issues would arise due to this development, passenger loadings were projected in the previous TIS, and no capacity issues were identified on any of the nearby bus routes or bus stops. With the implementation of the Confederation Line LRT in the downtown core, it is expected that overall transit volumes will increase, and bus transit volumes will decrease as riders will prefer to use the LRT instead. Further discussion is included in Section 5.6.

A review of the Transportation Demand Management (TDM) – *Supportive Development Design and Infrastructure Checklist* has been conducted. A copy of the TDM checklist is included in **Appendix F**. All required TDM-supportive design and infrastructure measures in the TDM checklist are met. The development is collocated with the Lyon LRT Station, which will result in increased transit use and reduced auto use.

Delivery vehicles for the supermarket will be accommodated with a receiving and loading zone directly east of the access to the underground parking garage. Manoeuvering into this area will require heavy trucks to reverse into the driveway and encroach into adjacent travel lanes. Further review of the access is included in Section 5.4.

5.2 Parking

The subject site is located in Area A of Schedule 1 and Area Z of Schedule 1A of the City's ZBL. Within this area, no vehicular parking is required to be provided, except for visitors to the residences. Minimum bicycle parking rates and maximum vehicular parking rates for the proposed development are identified in the ZBL, and are summarized in **Table 4**.

Table 4: Parking Requirements Per Zoning By-Law

Land Use	Rate	Units/GFA	Required
Vehicle Parking (minimum)			
Residential	0.1 per dwelling unit after the first 12 units for visitors; no more than 30 visitor parking spaces required per building within Area Z	588 units	30
Retail Food	No requirement for Area Z	1,935 m^2	0
Parking Garage	None	130 spaces	0
		Minimum	**30**
		Provided	**359**
Vehicle Parking (maximum)			
Residential	1.5 per dwelling unit	588 units	882
Retail Food	1.0 per 100m^2 GFA	1,935 m^2	19
Parking Garage	N/A	130 spaces	N/A
		Maximum	**901**
		Provided	**359**
Bicycle Parking (minimum)			
Residential	0.5 per dwelling unit	588 units	294
Retail Food	1.0 per 250m^2 GFA	1,935 m^2	8
Parking Garage	N/A	130 spaces	N/A
		Minimum	**302**
		Provided	**359**

Based on the above **Table 4**, the vehicular and bicycle parking provided for the proposed development will satisfy both the minimum and maximum requirements identified in the ZBL.

The City's *Accessibility Design Standards* outline minimum requirements for the number of accessible parking spaces that must be provided, based on the total number of parking spaces. For a total number of parking spaces between 301 and 350, nine accessible spaces are required, with four 'Type A' spaces (minimum width of 3.4m) and five 'Type B' spaces (minimum width of 2.4m). Within the parking garage, five 'Type A' and five 'Type B' spaces are provided, for an overall total of ten accessible spaces. This meets the minimum requirements outlined in the *Accessibility Design Standards*.

Table 113A of the ZBL does not identify a requirement for any loading spaces for 'retail food stores' of less than 2,000 m^2 GFA. However, the proposed development will provide two loading spaces for the supermarket.

5.3 Boundary Streets

This section provides a review of the boundary streets using complete streets principles. The *Multi-Modal Level of Service* (MMLOS) guidelines produced by IBI Group in October 2015 were used to evaluate the LOS of all boundary roadway segments, for each mode of transportation. Schedule E of the City of Ottawa's Official Plan identifies all boundary streets as being in the Central Area. However, given the subject site's proximity to Transitway and future LRT stations, the guidelines stipulate that the "Within 600m of Rapid Transit Stations" policy area be used to evaluate whether the MMLOS targets are being met, regardless of the land use designation outlined in the Official Plan. Albert Street and Lyon Street are classified as arterials, while Queen Street is classified as a local roadway.

Currently, construction for the Confederation Line LRT and the Queen Street Renewal are taking place adjacent to the subject site. As part of the Confederation Line LRT construction, Lyon Street has been chosen as the primary connection point between Société de Transport de l'Outaouais (STO) services and the O-Train. To do so, the segment of Lyon Street between Queen Street and Albert Street will be modified to have two vehicle lanes, one bus lane, and widened sidewalks.

To maintain connectivity for cyclists throughout the downtown area, northbound and southbound cycle tracks will be added to Bay Street, between Wellington Street and Laurier Avenue West. A conceptual plan of the bus-train connection at Lyon Street and Queen Street is shown in **Figure 7**. A conceptual plan of the Queen Street Renewal between Bay Street and Lyon Street is provided in **Figure 8**. There are discrepancies between the two figures regarding the road modifications on Lyon Street, as **Figure 7** indicates a bus lane while **Figure 8** indicates a bike lane. In the case of any discrepancy, **Figure 7** should be taken as correct.

The boundary streets review evaluates Queen Street and Lyon Street as per the renewal project, and Albert Street based on the Albert-Slater repurposing study.

Figure 7: Lyon Station Bus-LRT Connection

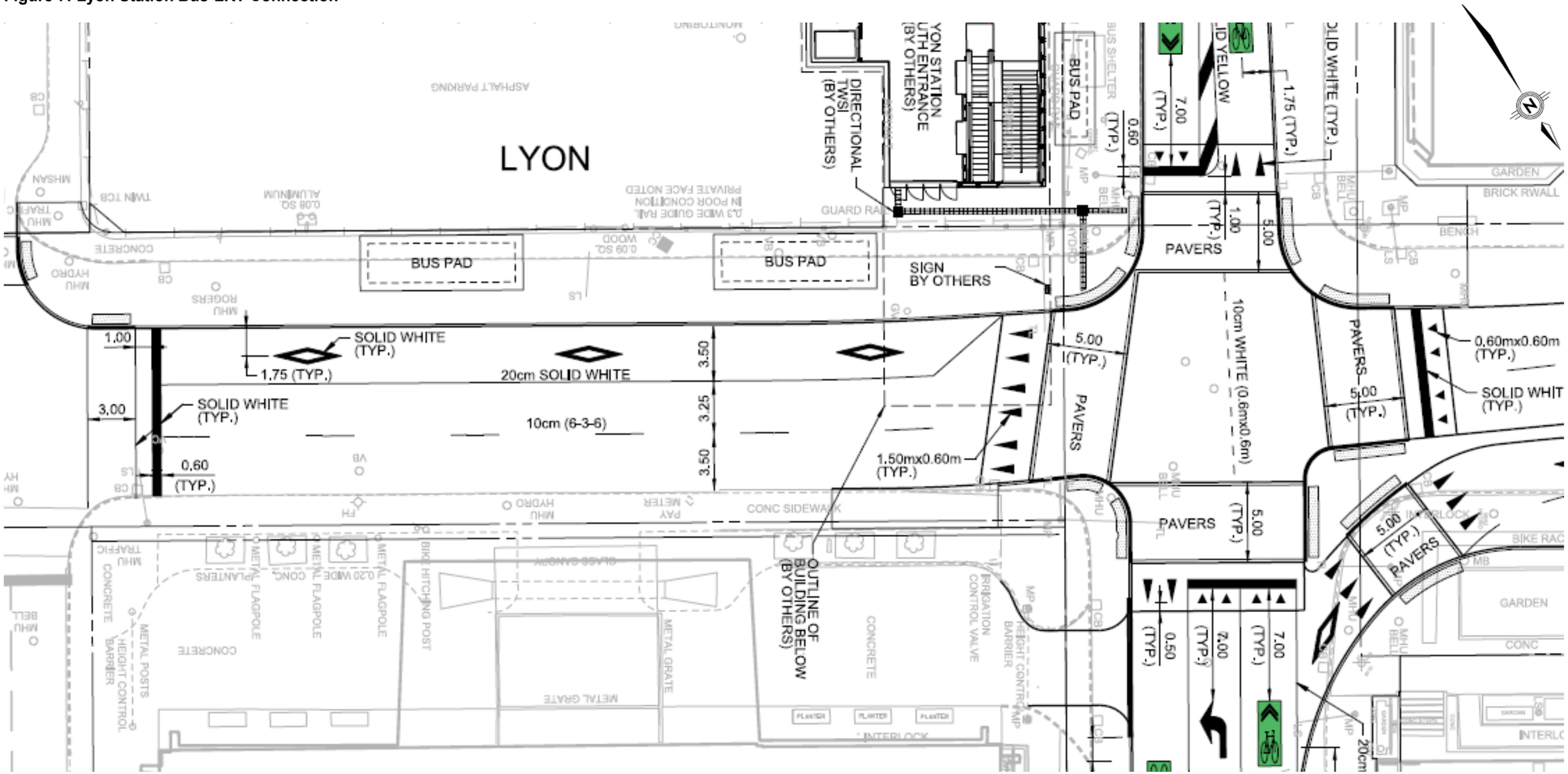
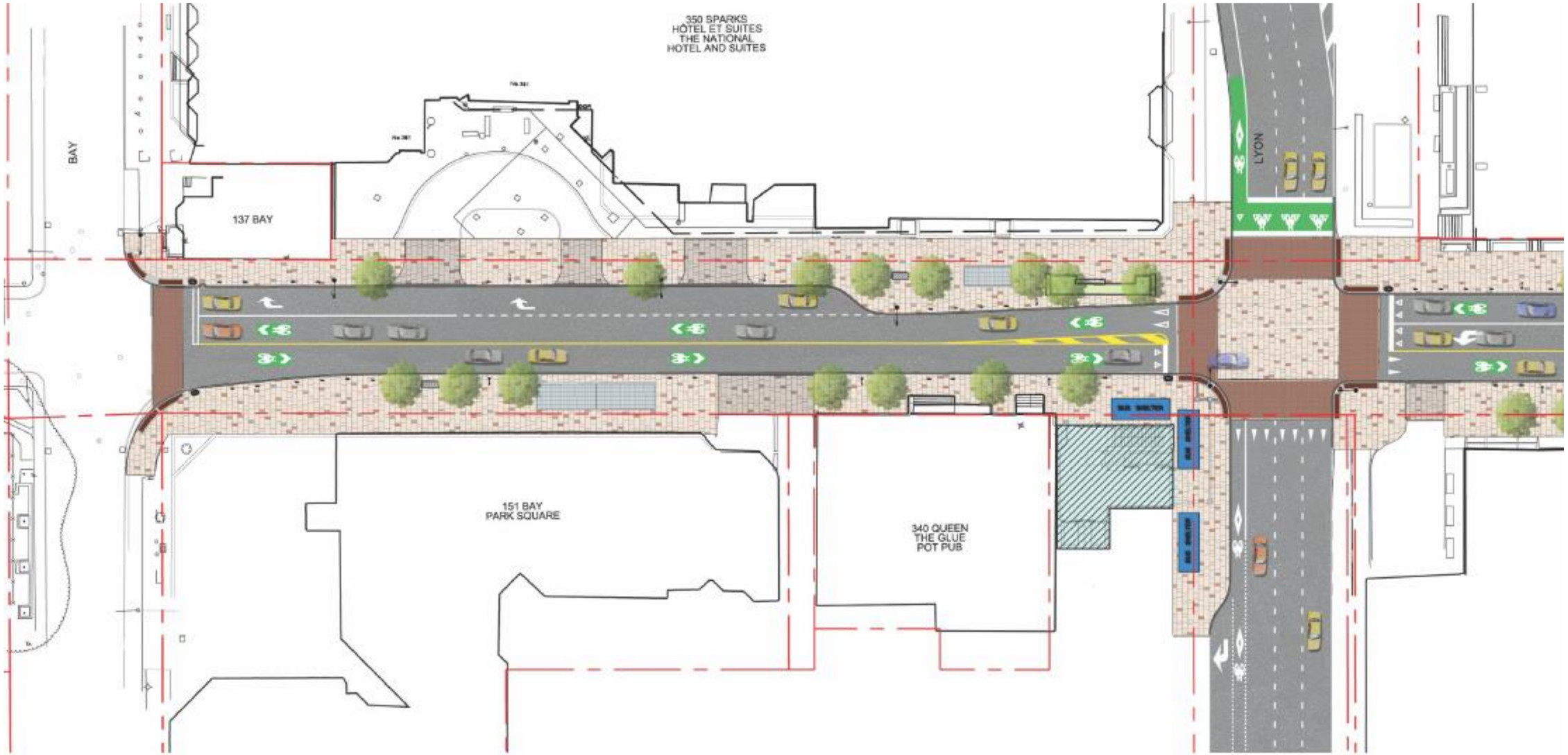


Figure 8: Queen Street Renewal



5.3.1 Pedestrian Level of Service (PLOS)

Exhibit 4 of the MMLOS guidelines has been used to evaluate the segment PLOS of the boundary streets. Exhibit 22 of the MMLOS guidelines suggests a target PLOS A for all classes of roadways within 600m of a rapid transit station. Table 1 of the City's Addendum to the MMLOS Guidelines has been used to evaluate the segment PLOS with regards to pedestrian crowding. The results of the segment PLOS analysis are summarized in **Tables 5** and **6**.

Table 5: PLOS Segment Analysis

Sidewalk Width	Boulevard Width	Avg. Daily Curb Lane Traffic Volume	Presence of On-Street Parking	Operating Speed	Segment PLOS
Queen Street (north side)					
≥ 2.0m	0.5-2.0m	< 3000 vpd	No	50 km/h	A
Queen Street (south side)					
≥ 2.0m	0.5-2.0m	< 3000 vpd	No	50 km/h	A
Albert Street (north side)					
≥ 2.0m	0.5-2.0m	< 3000 vpd	No	50 km/h	A
Albert Street (south side)					
≥ 2.0m	0m	< 3000 vpd	Yes	50 km/h	B
Lyon Street (east side)					
≥ 2.0m	0m	> 3000 vpd	No	50 km/h	C
Lyon Street (west side)					
≥ 2.0m	0m	< 3000 vpd	No	50 km/h	B

Table 6: PLOS Segment Analysis – Crowding

Sidewalk Width	Approximate Platoon Flow	Segment PLOS
Queen Street (north side)		
3.2m	< 250 ped/h	A
Queen Street (south side)		
3.2m	< 250 ped/h	A
Albert Street (north side)		
2.0m	< 250 ped/h	B
Albert Street (south side)		
2.0m	< 250 ped/h	B
Lyon Street (east side)		
2.5m	< 500 ped/h	B
Lyon Street (west side)		
5.5m	< 250 ped/h	A

Based on the foregoing tables, crowding is the governing case only on the north side of Albert Street.

5.3.2 Bicycle Level of Service (BLOS)

Exhibit 11 of the MMLOS guidelines has been used to evaluate the existing segment BLOS along the boundary streets. Exhibit 22 of the MMLOS guidelines suggests a target BLOS C for arterial roadways classified as Spine Routes (Lyon Street and Albert Street), and BLOS B for local roadways

classified as Local Routes (Queen Street). The results of the segment BLOS analysis are summarized in **Table 7**.

Table 7: BLOS Segment Analysis

Road Class	Bike Route	Type of Bikeway	Bike Lane Width	Bike Lane Blockage	Travel Lanes	Center-line Type	Operating Speed	Segment BLOS
Queen Street (Bay Street to Lyon Street)								
Local	Local Route	Mixed Traffic	-	-	2	Line Markings	50 km/h	D
Albert Street (Bay Street to Lyon Street)								
Arterial	Spine Route	Bike Lane	1.5-1.8m	Rare	2	-	50 km/h	B
Lyon Street (Queen Street to Albert Street)								
Arterial	Spine Route	Mixed Traffic	-	-	3	-	50 km/h	D

5.3.3 Transit Level of Service (TLOS)

Exhibit 15 of the MMLOS guidelines has been used to evaluate the existing segment TLOS along the boundary streets. Upon opening of the Confederation Line LRT, no boundary streets will be classified as Rapid Transit Corridors or Transit Priority roadways. Per discussions with City staff, Queen Street and Lyon Street will act as transfer points between bus and train users. At the subject site, Albert Street will provide emergency transit service in the event that the Confederation Line LRT becomes non-operational. For these reasons, the TLOS for the boundary streets has been evaluated despite having no target. The results of the segment TLOS analysis are summarized in **Table 8**.

Table 8: TLOS Segment Analysis

Facility Type	Level/Exposure to Congestion Delay, Friction and Incidents			Segment TLOS
	Congestion	Friction	Incident Potential	
Queen Street (Bay Street to Lyon Street)				
Mixed Traffic – Moderate Parking/Driveway Friction	Yes	Medium	Medium	E
Albert Street (Bay Street to Lyon Street)				
Mixed Traffic – Moderate Parking/Driveway Friction	Yes	Medium	Medium	E
Lyon Street (Queen Street to Albert Street)				
Bus Lane – Limited Parking/Driveway Friction	No	Low	Low	B

5.3.4 Truck Level of Service (TkLOS)

Exhibit 20 of the MMLOS guidelines has been used to evaluate the existing segment TkLOS along the boundary streets. Exhibit 22 of the MMLOS guidelines suggests a target TkLOS D for arterial roadways classified as truck routes (Albert Street), and TkLOS E for arterial roadways not classified as truck routes (Lyon Street). No target is set for local roadways (Queen Street).

Albert Street is classified as a truck route, while Lyon Street is not. Queen Street, as a local roadway, cannot be classified as a truck route for this policy area, and has therefore not been evaluated for TkLOS. The results of the segment TkLOS analysis are summarized in **Table 9**.

Table 9: TkLOS Segment Analysis

Curb Lane Width	Number of Travel Lanes Per Direction	Segment TkLOS
Albert Street (Bay Street to Lyon Street)		
≤ 3.5m	2	A
Lyon Street (Queen Street to Albert Street)		
≤ 3.5m	2	A

5.3.5 Vehicular Level of Service (Auto LOS)

Exhibit 22 of the MMLOS guidelines suggests a target Auto LOS E for all roadway classes within 600m of a rapid transit station. The typical lane capacity along the study area roadways are based on the City's guidelines for the TRANS Long-Range Transportation Model. The lane capacity along the boundary streets has been estimated based on roadway classification and general characteristics (i.e. suburban with limited access, urban with on-street parking, etc.). The results of the Auto LOS analysis are summarized in **Table 10**.

Table 10: Auto LOS Segment Analysis

Direction	Directional Capacity	Traffic Volumes		V/C Ratio and LOS			
		AM Peak	PM Peak	AM Peak		PM Peak	
				V/C	LOS	V/C	LOS
Queen Street (Bay Street to Lyon Street)							
Eastbound	400 vph	262	233	0.66	B	0.58	A
Westbound	400 vph	316	459	0.79	C	**1.15**	**F**
Albert Street (Bay Street to Lyon Street)							
Westbound	1,600 vph	334	646	0.21	A	0.40	A
Lyon Street (Queen Street to Albert Street)							
Southbound	1,600 vph	1,304	986	0.81	D	0.61	B

5.3.6 Segment MMLOS Summary

A summary of the results of the segment MMLOS analysis for the boundary streets Queen Street, Albert Street, and Lyon Street, are provided in **Table 11**.

Results of the segment MMLOS analysis can be summarized as follows:

- Queen Street meets the target PLOS, while Albert Street and Lyon Street do not;
- Albert Street meets the target BLOS, while Queen Street and Lyon Street do not;
- No boundary streets will have targets for TLOS once the Confederation Line LRT begins service;
- Albert Street and Lyon Street meet the target TkLOS;
- Albert Street and Lyon Street meet the target Auto LOS, while Queen Street does not.

Table 11: Segment MMLOS Summary

	Segment	Queen Street	Albert Street	Lyon Street
Pedestrian	Sidewalk Width	≥ 2.0m	≥ 2.0m	≥ 2.0m
	Boulevard Width	0.5 - 2.0m	0m	0m
	Average Daily Curb Lane Traffic Volume	< 3000 vpd	< 3000 vpd	> 3000 vpd
	On-Street Parking	No	Yes	No
	Operating Speed	50 km/h	50 km/h	50 km/h
	Platoon Flow	< 250 ped/h	< 250 ped/h	< 500 ped/h
	Level of Service	A	B	C
	Target	A	A	A
Cyclist	Road Classification	Local	Arterial	Arterial
	Bike Route Classification	Local Route	Spine Route	Spine Route
	Type of Bikeway	Mixed Traffic	Bike Lane	Mixed Traffic
	Bike Lane Width	-	1.5 - 1.8m	-
	Bike Lane Blocking	-	Rare	-
	Travel Lanes	2	2	3
	Centerline Type	Centerline Markings	-	-
	Operating Speed	50 km/h	50 km/h	50 km/h
	Level of Service	D	B	D
	Target	B	C	C
Transit	Facility Type	Mixed Traffic	Mixed Traffic	Bus Lane
	Friction/Congestion/Incident Potential	Moderate	Moderate	Limited
	Level of Service	E	E	B
	Target	-	-	-
Truck	Lane Width	-	≤ 3.5m	≤ 3.5m
	Travel Lanes (per direction)	-	3	2
	Level of Service	-	A	A
	Target	-	D	E
Auto	Level of Service	F	A	D
	Target	E	E	E

Based on the pedestrian crowding evaluation outlined in City's Addendum to the MMLOS Guidelines, the north side of Albert Street achieves a PLOS B. A 3.0m sidewalk is required to achieve the target PLOS A. No recommendations are made in widening this sidewalk, as there is insufficient space to accommodate the new cycle tracks and roadway configuration.

The south side of Albert Street achieves a PLOS B. As Albert Street has an average daily curb lane traffic volume of less than 3,000 vehicles/day and an operating speed of 50 km/h, a PLOS A can only be achieved by implementing a minimum 2.0m sidewalk width with a minimum 0.5m boulevard width.

The east side of Lyon Street has an average daily curb lane traffic volume of greater than 3000 vehicles/day and an operating speed of 50 km/h. Based on Exhibit 22 of the MMLOS guidelines, a PLOS A can then be achieved by implementing a minimum 2.0m sidewalk width with a minimum 0.5m boulevard width. Based on Table 1 of the Addendum to the MMLOS Guidelines, a minimum sidewalk width of 5.5m is required for sidewalks with a pedestrian flow up to 500 pedestrians/hour, which can be expected once the Confederation Line LRT is open. The west sidewalk on Lyon Street will meet this width requirement and will be responsible for handling the majority of the foot traffic in the area.

Queen Street achieves a BLOS D. A decrease in the operating speed to 40 km/h from 50 km/h would improve Queen Street to the target BLOS B. If this decrease in the operating speed on Queen Street can be achieved as part of the Queen Street Renewal project, the BLOS on Queen Street will be met.

Lyon Street achieves a BLOS D. Due to the road modifications to Lyon Street outlined previously in **Figure 7**, cycling facilities will be provided on Bay Street instead to maintain a north-south connection to the downtown cycling network. It is therefore acknowledged that the target BLOS on Lyon Street will not be met, in order to appropriately address other levels of service. Lyon Street will remain at a BLOS D.

Queen Street does not meet the target Auto LOS E. The City's *Downtown Moves* report identifies the Queen Street Renewal as a project that will 'transform Queen Street into a transit showcase street.' As such, it is clear that the levels of service for pedestrians, cyclists, and transit take a much higher priority than vehicular traffic.

5.4 Access Design

The existing access driveway serving the surface parking lot at 383 Albert Street will be removed as part of the proposed development, and full-height curb and sidewalks will be reinstated as per City standards. The proposed development will be serviced through a single two-way ramp access to the underground parking garage located on Albert Street, approximately 90m west of Lyon Street (measured centerline to centerline).

Section 25 (c) of the City of Ottawa's *Private Approach By-Law* identifies a requirement for two-way accesses to have a width of no greater than 9m, as measured at the street line. Section 107(1)(a) of the *Zoning By-Law* identifies a maximum width requirement of 6.7m for a two-way driveway to a parking garage with 20 or more parking spaces. The width of the proposed parking garage ramp will be approximately 7.0m, and therefore a waiver to relax the maximum width will be required.

Section 25 (l) of the *Private Approach By-Law* identifies a requirement to provide a minimum distance of 60m at the street line between the private approach and the nearest intersecting street line. The spacing between the nearest edge of the proposed access on Albert Street and the intersection with Bay Street is approximately 40m, which is 20m less than the minimum spacing identified in the *Private Approach By-Law*.

The frontage of the subject site is insufficient to allow for the provision of a two-way vehicular access driveway with adequate spacing from adjacent street lines. In cases such as this, Section 25 (m) of the *Private Approach By-Law* states that a private approach shall be permitted only on the highway carrying the lesser volume of vehicular traffic and the private approach shall be located as far from the nearest intersections as possible. The proposed access is located as far from Lyon Street as possible, as the traffic volumes are higher on Lyon Street than on Bay Street. This is therefore consistent with Section 25 (m).

Section 25 (o) of the *Private Approach By-Law* identifies a requirement to provide a minimum spacing of 3m between the nearest edge of the development access and the property line as measured at the street line. The spacing between the nearest edge of the proposed access onto Albert Street and the property line is approximately 1.5m, which is 1.5m less than the minimum spacing identified in the *Private Approach By-Law*. However, Section 25 (o) also states that a relaxation of the minimum clearance distance from 3m to 0.3m is permissible by the General Manager, provided there are no safety issues associated with doing so.

Section 25 (t) of the *Private Approach By-Law* identifies a requirement that for a private approach serving a parking area of more than 50 spaces, a grade exceeding 6% is not permitted for the first nine metres, as measured from the street line. This requirement is met by the proposed ramp, as a 2% grade is proposed between the property line and door, descending toward Albert Street (approximately 4m), and a 6% grade is proposed for the first 5m inside the door, ascending toward Albert Street. Beyond this 9m distance, the ramp will transition to a 13% grade before transitioning to a 5% grade at the bottom of the ramp. Due to the steepness of the ramp, a subsurface melting device will be provided. By limiting the grade to 6% for the first 9m inside the property line, drivers exiting the garage will be able to see pedestrians and cyclists crossing the access. A cross-section of the parking garage ramp is included in **Figure 9**.

Given that the first two levels of underground parking are anticipated to be available to the public, there is no garage door panel proposed on the surface (i.e. only the residential parking levels will be controlled). Therefore, it is not anticipated that vehicles will block the sidewalk by having to wait to enter the garage.

The proposed loading access is approximately 3.1m east of the entrance to the parking garage. Because the loading entrance does not access any parking, the typical spacing requirements between driveways as stated in the *Private Approach By-law* are not applicable. The width of the proposed loading access is approximately 8m. An AutoTURN analysis was performed for loading vehicles entering and exiting the loading access on Albert Street. The preliminary plan for the Albert-Slater Post LRT Repurposing indicates that west of the subject site, the westbound right turn lane at Albert Street/Bay Street will shift south to accommodate an on-road bike lane, and the southernmost through lane will be converted into on-street parking.

The entrance and exit manoeuvres with this configuration require on-street parking to be restricted in front of the entire loading access. It is recommended that the loading space on the south side of Albert Street (as shown on the Albert-Slater Repurposing plan) be moved 15m to the east to avoid

this conflict. It is anticipated that two on-street parking spaces will be lost due to the relocation of the loading space, however it should be noted that since the proposed development includes public parking within the underground parking garage, the loss of two on-street parking spaces is not significant to the overall parking supply. With this restriction, trucks will still encroach into both through lanes while entering or exiting the loading access. Given that the site is located in the downtown area, it is a common occurrence for loading vehicles to perform these manoeuvres and is not a significant cause for concern. The entrance and exit manoeuvres are shown in **Figure 10** and **Figure 11**, respectively.

Concerning the potential conflict between loading trucks and vulnerable road users, it is proposed that a flashing red light be installed at the cycle track/sidewalk, which will be activated when the loading dock door begins to open. A loading dock worker will operate the door during deliveries. The grade between the cycle track and roadway will be ramped to provide a vertical cue to reversing trucks that they are approaching the cycle track and sidewalk. In addition, the building face accommodates a 45-degree sightline and mirrors are proposed to improve visibility for truck drivers exiting the loading access.

The possibility of a drive-in access from Queen Street and a drive-out access onto Albert Street for loading and deliveries has been evaluated, per a request from City staff. While a drive-in/drive-out configuration would eliminate the need for reversing trucks, this configuration is not viable for the following reasons:

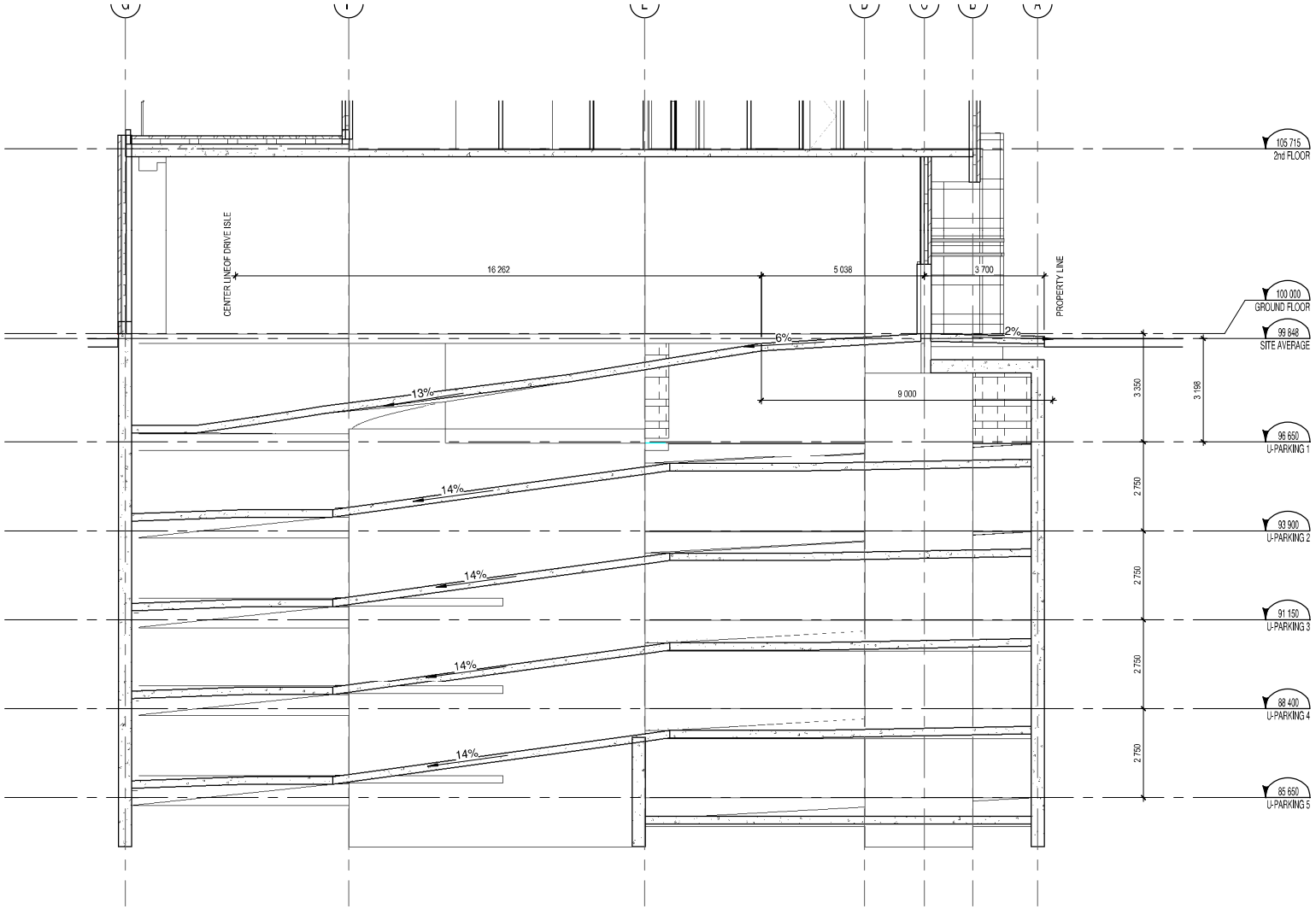
- The site is L-shaped, and a drive-in/drive-out configuration will result in an inefficient driveway shape or a straight driveway that results in dead space;

- The proposed supermarket is currently at the minimum possible floorplate. The introduction of a straight driveway would further reduce the floor area, making the supermarket use unfeasible;

- The addition of a driveway on Queen Street would need to be located as far from the Lyon Station entrance as possible, resulting in a reconfiguration of the condominium lobby;

- Even if the condominium lobby could be reconfigured, the Ontario Building Code requires an emergency exit stairwell be provided within 6m of the end of a hallway. Although the stairwell could potentially be rotated or slightly relocated, the driveway would need to be sufficiently east of the stairwell to ensure a safe exit to the outdoors. This would create more dead space west of the driveway, and likely increase the number of conflicts with pedestrians given the proximity to the LRT station on Lyon Street.

A lay-by is proposed for Tower C on the north side of Albert Street adjacent to the site. The proposed lay-by begins to the east of the loading area and ends approximately 33m west of the intersection of Lyon Street/Albert Street. It will be 2.4m in width and 10m in length, which is sufficient space for two vehicles, and will not alter the width of the adjacent westbound travel lane. The proposed lay-by will form part of the required RMA submission which will be prepared under a separate cover in support of the site plan application. The functional design of the Albert Street frontage is included in **Appendix G**.



NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6

Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

383 ALBERT STREET

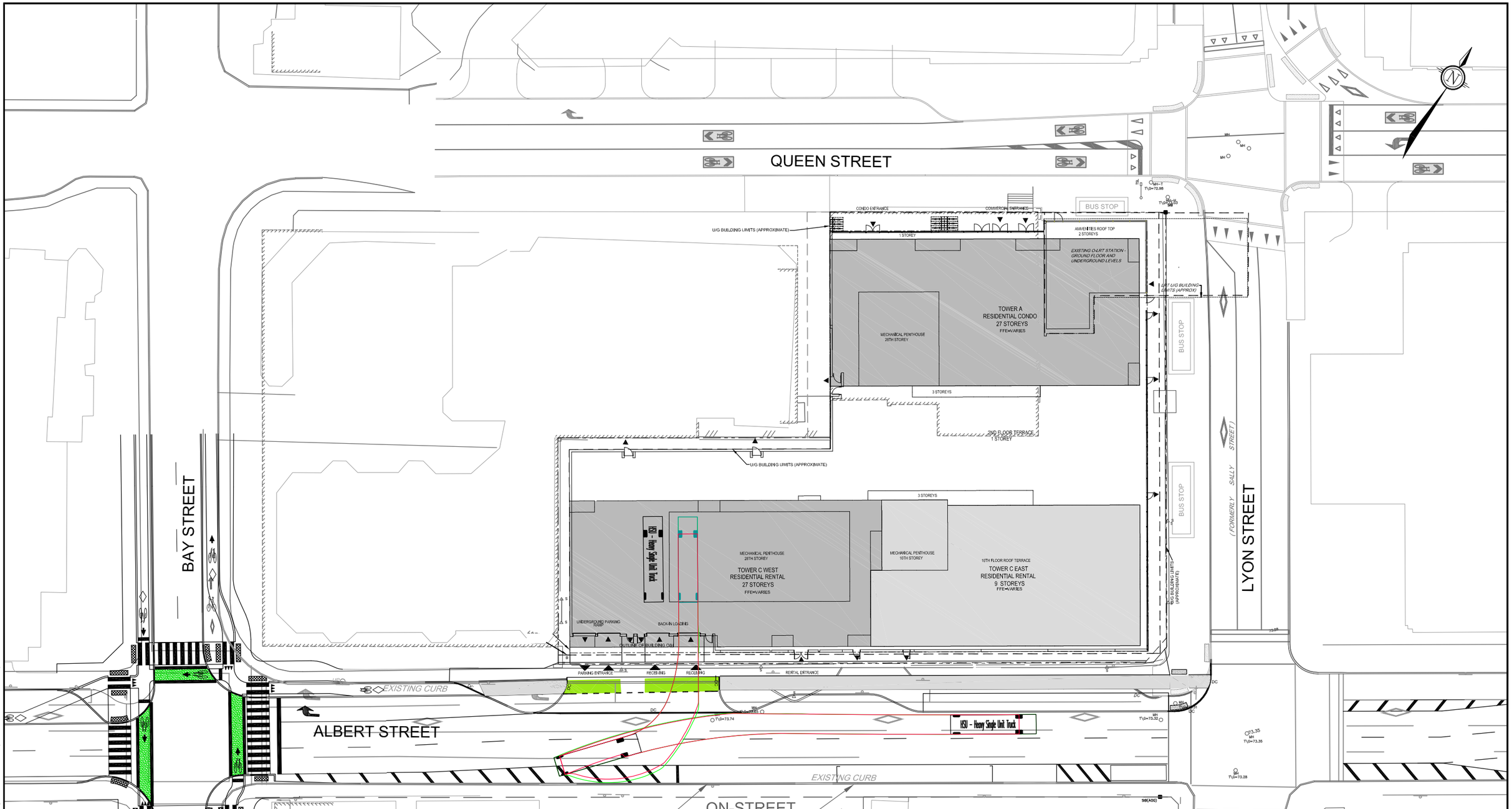
PARKING GARAGE RAMP CROSS-SECTION

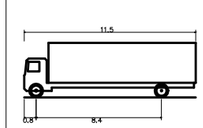
SCALE 1 : 200 (0 2 4 6 8m)

DATE MAY 2019 | JOB 109111 | FIGURE FIGURE 9

SHT8X11.DWG - 216mmx279mm

M:\2009\109111\CAD\Traffic\109111 - RampSection.dwg, RAMP, May 08, 2019 - 1:44pm, jaudia





HSU – Heavy Single Unit Truck	
Overall Length	11.500m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	14.100m

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

383 ALBERT STREET

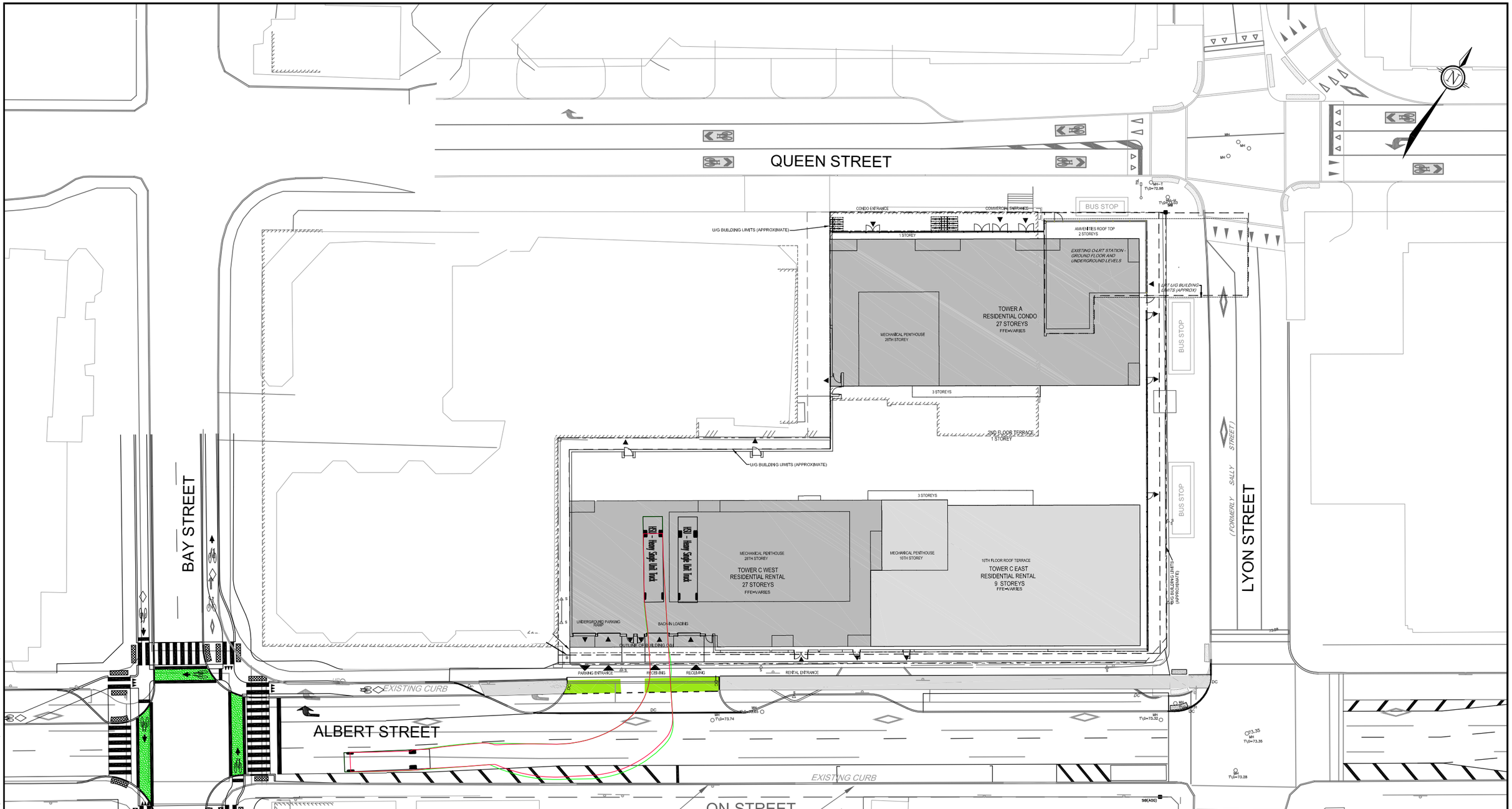
LOADING ACCESS ENTRANCE MANOEUVRE

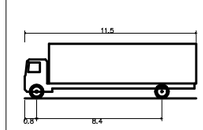
SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE MAY 2019 | JOB 109111 | FIGURE FIGURE 10

M:\2009\109111\CAD\Traffic\109111 - Albert Figs.dwg, Vehicle IN, May 14, 2019 - 10:46am, jaudia

SHT11X17.DWG - 279mmX432mm





HSU – Heavy Single Unit Truck	
Overall Length	11.500m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	14.100m

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

383 ALBERT STREET

LOADING ACCESS EXIT MANOEUVRE

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE MAY 2019 | JOB 109111 | FIGURE FIGURE 11

5.5 Transportation Demand Management

The subject site is located within a Transit-Oriented Development (TOD) zone. An entrance to the Lyon LRT station will be provided at the northeast corner of the site. The proposed development is mixed-use in nature, and promotes the pedestrian, cyclist, and transit modes of travel. The forecasted traffic volumes generated by the proposed redevelopment are considered highly conservative, given that internally captured trips were not accounted for in the analysis. Therefore, the volumes presented represent a 'worst case' scenario for traffic generated by the site.

A review of the non-residential and residential components of the City's *TDM Measures Checklist* has been performed, and is provided in **Appendix F**. The property manager has elected to implement the following TDM measures upon opening of the proposed development:

- Contract with provider to install on-site carshare vehicles and promote their use by tenants/residents;
- Unbundle parking cost from purchase price (*condominium*);
- Unbundle parking cost from monthly rent (*multi-family*).

5.6 Transit

The previous TIS anticipated the proposed development to generate approximately 51 transit trips in the AM peak (9 in, 42 out) and 105 transit trips in the PM peak (62 in, 43 out). Based on the trip generation presented in Section 4.0, the proposed development is projected to generate 194 transit trips in the AM peak (56 in, 138 out) and 290 transit trips in the PM peak (166 in, 124 out).

No capacity problems were identified on any of the adjacent bus routes or at any of the nearby bus stops in the previous TIS. While the revised number of transit trips generated by the proposed development is much higher compared to the previous TIS, it should be noted that Confederation Line LRT service was not accounted for in the previous analysis. The completion of the Confederation Line within the study area will provide additional capacity for potential transit users, and therefore no capacity problems are anticipated as a result of the proposed development.

5.7 Intersection Design

5.7.1 Intersection MMLOS Analysis

This section provides a review of the study area intersections using complete streets principles. The MMLOS guidelines produced by IBI Group in October 2015 were used to evaluate the LOS of all intersections for each mode of transportation. As discussed in Section 5.3, the subject site's proximity to a future LRT station stipulate that the 'Within 600m of a Rapid Transit Station' policy area be used to evaluate whether the MMLOS targets are being met, regardless of the land use designation outlined in the Official Plan.

All study area intersections have been evaluated per the Queen Street Renewal, Albert-Slater Repurposing, and Bay Street Cycling Facility functional designs for PLOS, BLOS, and TkLOS. All intersections have been evaluated for TLOS and Auto LOS based on the results of the Synchro analysis from the previous TIS, as they are still representative of the current traffic operations.

The full intersection MMLOS analysis is included in **Appendix H**. A summary of the results is shown in **Table 12**.

The results of the intersection MMLOS analysis are as follows:

- No intersections meet the target pedestrian level of service (PLOS);
- Queen Street/Kent Street, Queen Street/Lyon Street, Queen Street/Bay Street, Albert Street/ Kent Street, and Slater Street/Lyon Street do not meet the target bicycle level of service (BLOS);
- No study area intersections will have targets for transit level of service (TLOS) once the Confederation Line LRT begins service;
- Queen Street/Kent Street and Queen Street/Lyon Street do not meet the target truck level of service (TkLOS);
- All intersections meet the vehicular level of service (Auto LOS).

Table 12: Intersection MMLOS Summary

Intersection	PLOS		BLOS		TLOS		TkLOS		Auto LOS	
	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target
Queen Street/ Kent Street	**C**	A	**F**	B	-	-	**F**	D	B	E
Queen Street/ Lyon Street	**D**	A	**D**	B	C	-	**F**	E	C	E
Queen Street/ Bay Street	**C**	A	**F**	B	D	-	-	-	D	E
Albert Street/ Kent Street	**C**	A	**F**	C	C	-	D	D	B	E
Albert Street/ Lyon Street	**C**	A	C	C	C	-	D	D	D	E
Albert Street/ Bay Street	**C**	A	A	C	C	-	D	D	E	E
Slater Street/ Kent Street	**C**	A	A	C	C	-	D	D	D	E
Slater Street/ Lyon Street	**C**	A	**F**	C	C	-	D	D	D	E
Slater Street/ Bay Street	**C**	A	A	C	B	-	D	D	C	E

The following sections outline possible MMLOS improvements to each intersection.

5.7.1.1 Queen Street/Kent Street

Queen Street/Kent Street does not meet the target PLOS A, BLOS B, or TkLOS D.

The north and east approaches do not achieve the target PLOS A. It is not possible to achieve the target without major modifications, such as reducing the number of lanes crossed or restricting turning movements at these approaches. The south and west approaches achieve the target due to the absence of conflicting right turns, as Kent Street is a one-way roadway. There is limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles. For these reasons, no recommendations to improve the intersection PLOS have been made.

The south approach does not achieve the target BLOS B based on left turn characteristics, and the east approach does not achieve the target based on right turn characteristics. Per Exhibit 12 of the MMLOS guidelines, only the implementation of a two-stage left-turn bike box would allow the south approach to achieve the target BLOS. This is undesirable as right turns on red for westbound vehicles would become prohibited and could significantly deteriorate the vehicular level of service. The 2013 Ottawa Cycling Plan identifies the completion of the O'Connor Street Bikeway from Wellington Street to Laurier Avenue, which will provide a more attractive north-south connection than Kent Street. Therefore, no recommendations to improve the BLOS have been made for the south approach. The east approach can achieve the target BLOS by implementing a pocket bike lane, however this would require a road widening and would come at the expense of the newly expanded sidewalks. As an acceptable pedestrian level of service is the highest priority for the Queen Street Renewal, no recommendations to improve the BLOS have been made at this approach.

The south approach does not achieve the target TkLOS D. An effective corner radius of less than 10m is acceptable if trucks are provided with more than one receiving lane when turning right. The stop bar for westbound through vehicles on Queen Street is approximately 12m behind the eastern crosswalk. In effect, this results in two receiving lanes for approximately this short distance. No other recommendations to improve the TkLOS have been made at this approach.

5.7.1.2 Queen Street/Lyon Street

Queen Street/Lyon Street does not meet the target PLOS A, BLOS B, or TkLOS E.

All approaches do not achieve the target PLOS A. It is not possible to achieve the target without major modifications, such as reducing the number of lanes crossed or restricting turning movements. There is limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles. For these reasons, no recommendations to improve the intersection PLOS have been made.

The north and east approaches do not achieve the target BLOS B, based on left turn characteristics. As mentioned in Section 5.3.6, the north-south cycling connection previously provided on Lyon Street will be provided on Bay Street instead, in order to properly address the levels of service for other modes. Therefore, no recommendations are made for the north approach. The east approach can achieve the target BLOS with a reduction in the operating speed to 40 km/h. This may occur upon completion of the Queen Street Renewal, as the high pedestrian volumes and presence of on-street parking are anticipated to provide friction for drivers. As stated previously, exclusive cycling facilities on Queen Street have not been recommended.

The north approach does not meet the target TkLOS E. Consideration could be given to shifting the stop bar for eastbound vehicles further from the intersection, as this would provide large vehicles with more space to safely complete the right turn, similar to the previous intersection. While Queen Street is not a truck route, STO buses will be performing right turns at this intersection to provide service to/from the Confederation Line LRT.

5.7.1.3 Queen Street/Bay Street

Queen Street/Bay Street does not meet the target PLOS A or BLOS B.

All approaches do not achieve the target PLOS A, based on delay score. There is limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles. For this reason, no recommendations to improve the intersection PLOS have been made.

The east approach does not achieve the target BLOS B, based on right turn characteristics. As the right turn lane is greater than 50m, only the implementation of a curbside bike lane or higher order facility will allow the east approach to achieve the target BLOS. As stated previously, exclusive cycling facilities on Queen Street have not been recommended.

5.7.1.4 Albert Street/Kent Street

Albert Street/Kent Street does not meet the target PLOS A or BLOS C.

All approaches do not achieve the target PLOS A. It is not possible to achieve the target without major modifications, such as reducing the number of lanes crossed or restricting turning movements. There is limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles. All approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks (greater than 400,000 vehicle/pedestrian conflicts over an eight-hour period). The level of comfort for pedestrians can be increased by implementing zebra-striped or textured crosswalks.

The south approach does not achieve the target BLOS C, based on left turn characteristics. Without reducing the number of lanes on Kent Street, the target can only be achieved by implementing a two-stage left-turn bike box. This is undesirable as right turns on red for westbound vehicles would become prohibited and could significantly deteriorate the vehicular level of service on Albert Street. A more attractive east-west cycling connection are the cycle tracks on Laurier Avenue, just one block south of Slater Street. Additionally, the shared through/left turn lane on Kent Street provides an opportunity for cyclists to enter the cycle track on Albert Street. Since Kent Street is a one-way roadway, cyclists do not face the threat of oncoming traffic on their left. Therefore, no recommendations to improve the BLOS have been made at this approach.

5.7.1.5 Albert Street/Lyon Street

Albert Street/Lyon Street does not meet the target PLOS A.

The south, east, and west approaches do not achieve the target PLOS A. It is not possible to achieve the target without major modifications, such as reducing the number of lanes crossed or restricting turning movements. There is limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles. All approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks (greater than 400,000 vehicle/pedestrian conflicts over an eight-hour period). The level of comfort for pedestrians can be increased by implementing zebra-striped or textured crosswalks.

5.7.1.6 Albert Street/Bay Street

Albert Street/Bay Street does not meet the target PLOS A.

All approaches do not achieve the target PLOS A, based on delay score. There is limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles. For this reason, no recommendations to improve the intersection PLOS have been made.

5.7.1.7 Slater Street/Kent Street

Slater Street/Kent Street does not meet the target PLOS A.

All approaches do not achieve the target PLOS A. It is not possible to achieve the target without major modifications, such as reducing the number of lanes crossed or restricting turning movements. There is limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles. All approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks (greater than 400,000 vehicle/pedestrian conflicts over an eight-hour period). The level of comfort for pedestrians can be increased by implementing zebra-striped or textured crosswalks.

5.7.1.8 Slater Street/Lyon Street

Slater Street/Lyon Street does not meet the target PLOS A or BLOS C.

All approaches do not achieve the target PLOS A. It is not possible to achieve the target without major modifications, such as reducing the number of lanes crossed or restricting turning movements. There is limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles. All approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks (greater than 400,000 vehicle/pedestrian conflicts over an eight-hour period). The level of comfort for pedestrians can be increased by implementing zebra-striped or textured crosswalks.

The north approach does not achieve the target BLOS C based on left turn characteristics. Without reducing the number of lanes on Lyon Street, the target can only be achieved by implementing a two-stage left-turn bike box. This is undesirable as right turns on red for eastbound vehicles would become prohibited and could significantly deteriorate the vehicular level of service. The O'Connor Street Bikeway will provide a more attractive north-south connection than Lyon Street. Additionally, the shared through/left turn lane on Lyon Street provides an opportunity for cyclists to enter the cycle track on Slater Street. Since Lyon Street is a one-way roadway, cyclists do not face the threat of oncoming traffic on their left. Therefore, no recommendations to improve the BLOS have been made for this approach.

5.7.1.9 Slater Street/Bay Street

Slater Street/Bay Street does not meet the target PLOS A.

The east and west approaches do not achieve the target PLOS A, based on delay score. There is limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles. For this reason, no recommendations to improve the intersection PLOS have been made.

5.7.2 2023/2028 Total Traffic Conditions

The previous TIS included intersection capacity analysis of the study area in the buildout and horizon years. The analysis presented in the previous TIS can still be considered conservative, since the site-generated traffic projections are significantly higher when compared to the projections of this revised TIA, as shown in Section 4.0. Therefore, the findings of the previous TIS are discussed below, including the results of the Synchro analysis, shown in **Table 13**.

Table 13: Auto LOS Intersection Analysis – 2028 Total

Intersection	AM Peak			PM Peak		
	Max v/c or Delay	LOS	Movement	Max v/c or Delay	LOS	Movement
Queen Street/ Kent Street	0.48	A	NBL/T/R	0.68	B	WBT/R
Queen Street/ Lyon Street	0.94	E	EBT/R	0.85	D	WBL/T
Queen Street/ Bay Street	0.90	D	NBL/T/R	0.96	E	NBL/T/R
Albert Street/ Kent Street	0.67	B	WBT	0.55	A	WBT
Albert Street/ Lyon Street	0.65	B	WBL/T	0.86	D	WBL/T
Albert Street/ Bay Street	0.63	B	NBL/T	0.98	E	NBL/T
Slater Street/ Kent Street	0.85	D	EBT	0.73	C	NBT/R
Slater Street/ Lyon Street	0.82	D	EBT	0.73	C	SBL/T
Slater Street/ Bay Street	0.72	C	EBT/R	0.76	C	NBT/R
Albert Street/ Site Access(1)	10 sec	A	SBR	10 sec	A	SBR

1. Unsignalized intersection

Among study area intersections, the previous TIS only identified notable changes as a result of site-generated traffic at the intersection of Queen Street/Lyon Street, where the v/c ratio of the eastbound movements were shown to increase from 0.76 to 0.94, along with a 30m increase in the corresponding maximum queue length. These increases are still within acceptable operating conditions. All other changes to v/c ratios, queue lengths, and delays within the study area were marginal.

The previous TIS was completed prior to the completion of the functional designs of the Queen Street Renewal, Albert-Slater Post-LRT Repurposing, and Bay Street Cycling Facilities, and lane configurations were based on existing conditions. The following discussion outlines the justification for why the previous analysis still stands as conservative, despite not accounting for these changes.

On Albert Street and Slater Street, bus lanes were modelled as general travel lanes, as bus volumes accounted for approximately one-third of the traffic volumes and bus lanes accounted for one-third of the capacity. Updating any Synchro models to remove the bus lane as shown in the Albert-Slater Repurposing would also require bus volumes to be subtracted from the total traffic. Therefore, as non-transit vehicles can only use two general purpose lanes for travel regardless of the presence of a bus lane, the findings of the previous TIS on Albert Street and Slater Street remain valid. The increase in projected volumes due to the addition of a parking garage are not anticipated to increase delays at the proposed access.

The previous TIS modelled Bay Street as a single-lane roadway, whereas the Bay Street Cycling Facility functional design indicates two lanes. Considering this increase in capacity, the findings of the previous TIS remain conservative.

At Queen Street and Albert Street, the previous TIS modelled Lyon Street (i.e. the southbound approach) with three through lanes and one right turn lane. Upon opening of the Confederation Line LRT, this approach will consist of one through lane, one shared through/right turn lane, and a transit lane from north of Queen Street to Albert Street. At Queen Street and Albert Street, Lyon Street was projected to operate at an Auto LOS A during the AM and PM peak hours, and it was the approaches on Queen Street and Albert Street that were shown to be critical. Additionally, the revised TIA projects reductions in site-generated traffic of approximately 60% in the AM peak when an increase in the v/c ratio for the eastbound movements at Queen Street/Lyon Street was shown to be a result of site-generated traffic. For these reasons, the findings of the previous TIS on Lyon Street remain conservative.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations of this TIA can be summarized as follows:

Forecasting

- Compared to the previous TIS, the net increase in trips generated by the proposed development is approximately 75 person trips in the AM peak hour and 139 person trips in the PM peak hour. As directed by City staff, the modal shares have been adjusted to better reflect the subject site as a transit-oriented development, resulting in a decrease of 55 vehicle trips in the AM peak hour and 34 vehicle trips in the PM peak hour.

Development Design

- Approximately 359 vehicle parking spaces and 359 bicycle parking spaces are proposed for the subject site, meeting the requirements of the ZBL.

- A total of ten accessible parking spaces are proposed within the parking garage, meeting the minimum requirements of the City's *Accessibility Design Standards*.

- The parking garage access configuration has not changed since the previous TIS, and will therefore continue to accommodate the appropriate vehicles.

- All required TDM-supportive design and infrastructure measures in the TDM checklist are met. An access to the underground Lyon Station has also been constructed at the northeast corner of the subject site.

Boundary Streets

- The results of the segment multi-modal level of service (MMLOS) analysis are as follows:
    - Queen Street meets the pedestrian level of service (PLOS), while Albert Street and Lyon Street do not;
    - No roadways meet the bicycle level of service (BLOS);
    - As the only roadway to provide service to transit, Albert Street does not meet the transit level of service (TLOS);
    - Albert Street and Lyon Street meet the truck level of service (TkLOS);
    - Albert Street and Lyon Street meet the vehicular level of service (Auto LOS), while Queen Street does not.

- Albert Street and Slater Street have their transitway lanes repurposed, and Lyon Street will have a vehicular lane and a bike lane removed to allow for a widened sidewalk and bus lane once the Confederation Line LRT opens. Northbound and southbound cycle tracks will be added to Bay Street. Preliminary plans are complete.

- Based on Exhibit 22 of the MMLOS guidelines, the PLOS of Albert Street and Lyon Street can meet the target by implementing 2.0m sidewalks with a minimum boulevard width of 0.5m. With regards to pedestrian crowding, Table 1 of the Addendum to the MMLOS Guidelines identifies that a PLOS A for Lyon Street and Albert Street can only be achieved with a minimum sidewalk width of 5.5m. The west sidewalk on Lyon Street, which will handle the majority of the pedestrian traffic on Lyon Street, will meet the target PLOS.

- The BLOS of Queen Street can meet the target by reducing the operating speed to 40 km/h. The implementation of a cycle track on Albert Street as outlined in the post-LRT study's preliminary plan will improve the roadway to a BLOS A. On Lyon Street, the conversion of a vehicle lane and the bike lane to a bus lane and wider sidewalks will improve other levels of service, but will keep the roadway at BLOS D. The bike lane addition to Bay Street will address this deficiency.

- The TLOS of Albert Street does not meet the target, but will be addressed with the opening of the Confederation Line LRT. As such, the transitway lane will be converted to address other levels of service.

- The Auto LOS of Queen Street does not meet the target, in the interest of promoting the levels of service for pedestrians, cyclists, and transit.

Access Design

- The spacing between the nearest edge of the proposed access on Albert Street and Bay Street is approximately 40m, which is 20m less than the minimum spacing identified in the *Private Approach By-Law*. The proposed access is located as far from Lyon Street as possible, which is consistent with Section 25 (m), as the traffic volumes on Lyon Street are higher than those on Bay Street.

- The proposed parking garage access is approximately 7.0m in width. Section 25 (c) of the *Private Approach By-Law* identifies a requirement to provide a maximum access width of 9m, as measured at the street line. This is met by the proposed parking garage access. However, Section 107(1)(a) of the *Zoning By-Law* identifies a requirement to provide a maximum parking garage access width of 6.7m, as measured at the street line. The proposed parking garage access will require a waiver to relax this maximum width requirement.

- Section 25 (o) of the *Private Approach By-Law* identifies a requirement to provide a minimum spacing of 3m between the nearest edge of the development access and the property line, as measured at the street line. Section 25 (o) also states that a relaxation of the minimum clearance distance of 3m to 0.3m is permissible by the General Manager, if there are no safety issues associated with doing so.

- Section 25 (t) of the *Private Approach By-Law* identifies a requirement that for a private approach serving a parking area of more than 50 spaces, a grade exceeding 6% is not permitted for the first 9m from the street line. This requirement is met by the proposed parking

garage access, and ensures that drivers exiting the garage will be adequately able to see pedestrians and cyclists crossing the access.

- The loading access requires restrictions to proposed on-street parking, by relocating the loading zone on the south side of Albert Street approximately 15m east. With this modification, the appropriate design vehicles will be accommodated.

- To address concerns of conflicts between vulnerable road users and loading trucks, the following measures are proposed at the loading access:
    - Installation of a flashing red light at the cycle track, which is activated by a loading dock operator when a truck arrives;
    - Ramping the grade between the cycle track and the roadway, to provide a vertical cue to reversing trucks that they are approaching the cycle track and sidewalk;
    - A 45-degree notch in the building face and mirrors, to improve visibility for truck drivers exiting the loading access.

- A drive-in access from Queen Street and a drive-out access onto Albert Street is not feasible for this site. Locating the loading access beside the parking garage access limits conflicts between vehicles and vulnerable road users to one frontage.

- The proposed lay-by on the north side of Albert Street will provide sufficient space for two vehicles, and is located sufficiently west of the upstream intersection with Lyon Street.

Transportation Demand Management

- The following TDM measures will be implemented upon opening of the proposed development:
    - Contract with provider to install on-site carshare vehicles and promote their use by tenants/residents;
    - Unbundle parking cost from purchase price (*condominium*);
    - Unbundle parking cost from monthly rent (*multi-family*).

Transit

- No capacity problems were identified on any of the adjacent bus routes or at any of the nearby bus stops in the previous TIS. While the revised number of transit trips generated by the proposed development is much higher compared to the previous TIS, it should be noted that Confederation Line LRT service was not accounted for in the analysis. The completion of the Confederation Line within the study area will provide additional capacity for potential transit users.

Intersection Design

- The network analysis presented in the previous TIS is representative of the projected operations following the build-out of the subject site, which showed that all study area intersections are operating under acceptable conditions during the AM and PM peak hours, and are expected to continue doing so within the timeframe of this study.

- Based on the results of the intersection MMLOS analysis:
  - No intersections meet the target pedestrian level of service (PLOS);
  - Queen Street/Kent Street, Queen Street/Lyon Street, Queen Street/Bay Street, Albert Street/Kent Street, and Slater Street/Lyon Street do not meet the target bicycle level of service (BLOS);
  - No study area intersections will have targets for transit level of service (TLOS) once the Confederation Line LRT begins service;
  - Queen Street/Kent Street and Queen Street/Lyon Street do not meet the target truck level of service (TkLOS);
  - All intersections meet the vehicular level of service (Auto LOS).

- Pedestrian Level of Service
  - It is not possible for any intersection to achieve the target PLOS A without major modifications, such as reducing the number of lanes crossed or restricting turning movements, and/or there is limited opportunity in improving the delay score for pedestrians at all intersections. To increase the pedestrians' level of comfort, zebra-striped or textured crosswalks could be considered for all study area intersections at Albert Street and Slater Street. No other recommendations to improve the PLOS have been made.

- Bicycle Level of Service
  - The south and east approaches of Queen Street/Kent Street do not meet the target BLOS B. Implementation of a two-stage left-turn bike box for the south approach may significantly deteriorate the vehicular level of service on Queen Street. The completion of the O'Connor Street bikeway will provide a more attractive north-south connection for cyclists than Kent Street. As a high pedestrian level of service is a priority on Queen Street, widening the roadway to accommodate cycling facilities is not recommended. Therefore, no recommendations to improve the BLOS have been made.

  - The north and east approaches of Queen Street/Lyon Street do not meet the target BLOS B. The north-south cycling connection previously provided on Lyon Street will be provided on Bay Street instead, in order to properly address the levels of service for other modes. The east approach can achieve the target BLOS with a reduction in the operating speed to 40 km/h. This may occur upon completion of the Queen Street Renewal, as the high pedestrian volumes and presence of on-street parking are anticipated to provide friction for drivers. Therefore, no recommendations to improve the BLOS have been made.

  - The east approach of Queen Street/Bay Street does not meet the target BLOS B. As a high pedestrian level of service is a priority on Queen Street, widening the roadway to accommodate cycling facilities is not recommended. Therefore, no recommendations to improve the BLOS have been made.

  - The south approach of Albert Street/Kent Street does not meet the target BLOS C. Implementation of a two-stage left-turn bike box for the south approach may significantly deteriorate the vehicular level of service on Albert Street. A more attractive east-west cycling connection are the cycle tracks on Laurier Avenue, and cyclists may enter the cycle track on Albert Street from the shared through/left turn

lane. Therefore, no recommendations to improve the BLOS have been made at this approach.

- The north approach of Slater Street/Lyon Street does not meet the target BLOS C. Implementation of a two-stage left-turn bike box for the north approach may significantly deteriorate the vehicular level of service on Slater Street. The O'Connor Street bikeway will provide a more attractive north-south connection than Lyon Street, and cyclists may enter the cycle track on Slater Street from the shared through/left turn lane. Therefore, no recommendations to improve the BLOS have been made at this approach.

- Truck Level of Service
  - The south approach of Queen Street/Kent Street does not meet the target TkLOS D. The stop bar at the east approach is approximately 12m from the crosswalk, which accommodates trucks requiring a wider turn. No other recommendations to improve the TkLOS have been made.

  - The north approach of Queen Street/Lyon Street does not meet the target TkLOS E. Consideration could be given to shifting the stop bar at the west approach further from the crosswalk, similar to the east approach of Queen Street/Kent Street. This will accommodate trucks requiring a wider turn, including STO buses providing service to the Confederation Line LRT.

- Vehicular Level of Service
  - The previous TIS identified that all study area intersections are anticipated to continue operating acceptably. While the previous analysis was completed at a time when functional designs of the Queen Street Renewal, Albert-Slater Repurposing, and Bay Street Cycling Facilities were not known, the conclusions of the previous TIS can be considered valid and conservative.

- Based on the foregoing, the proposed development is recommended from a transportation perspective.

NOVATECH

Prepared by:

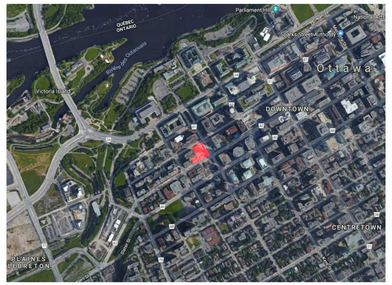
Reviewed by:

Joshua Audia, B.Sc.
E.I.T.,
Transportation/Traffic

Jennifer Luong, P.Eng.
Senior Project Manager,
Transportation/Traffic

APPENDIX A

Site Plan



MIXED-USE RESIDENTIAL WITH GROUND FLOOR COMMERCIAL AND TWO RESIDENTIAL BUILDINGS
383 ALBERT ST ZONED R5Q(240) H(64) AND 340 QUEEN ST ZONED R5PH(64)
SUBJECT TO OMB DECISION CASE NO. PL101388

ZONING MECHANISM	REGULATION	PROVIDED
Minimum lot area	540m²	3848.5m²
Minimum lot width	18m	45.09m
Maximum building height	Part A : 81m Part C: 64m	Part A : 80.95m Part B: 29.05m Part C: 80.82m
Minimum front yard Setback (Queen St.)	2.5m	1.10m
Minimum corner side yard setback (Lyon St.)	1.5m	1.513m
Minimum interior side yard setback	Along West property line, adjacent to Part C: 1.5m Along north property line, adjacent to Part C: 1.5m (podium only); 7.5m for remainder Along west property line, adjacent to Part A: 3.075m	Along West property line, adjacent to Part C: 1.502m Along north property line, adjacent to Part C: 1.518m (podium only); 8.403m for remainder Along west property line, adjacent to Part A: 0.032m
Minimum rear yard setback (Albert St.)	0.25m	0.267m
Minimum landscaped area (hard and soft landscaping, at-grade only)	8.9% of the total lot area (0.089x3848.5m² = 342.5m²)	8.9% (342.75m²)
Commercial uses	Can occupy 100% of the total ground floor area (1935m²)	100% of GFA (1935m²)
Minimum amenity area	Total amenity area = 6m² per dwelling unit (588units x 6 m² = 3528 m² required total amenity area) Communal amenity area = 33% of total amenity area (33% x 3528 m² = 1164 m² required communal amenity area) Layout = Aggregated into areas up to 54 m², and where more than one aggregated area is provided, at least one must be a minimum of 54 m².	Total amenity area: 4051 m² provided Communal amenity area: 1771 m² provided (Lounges: 90+108+109m²; Pool Rooms: 141+141m²; Business Centers: 78+55m²; Fitness Rooms: 93+98m²; Terraces: 400+422m²; Theatre: 36m²) Private amenity area : 2280m² provided (Part A/B/C: balconies)

	PART A	PART C / PART B
Number of Units	Total: 267 units (46 xStudio; 163 x1BR; 56 x2BR; 2 x3BR)	Total: 321 units (58 xStudio; 155 x1BR; 108 x2BR)
Number of Storeys	27	27 (Part C) / 9 (Part B)
GFA by Use	Residential (Condo) : 15824m²	Residential (Rental) : 19086m²
	Retail (Podium Part A, B, C): 1935m²	

AREA Z: NEAR LRT STATIONS ON SCHEDULE A1, ZONING BY-LAW 2008-250

ZONING MECHANISM	REGULATION	PROVIDED
Minimum parking space requirement	Residential: 0 Non residential use: 0 (Area Z) Visitor: 30 spaces Total = 27 required spaces (30-3 spaces as per Section 101(6)(c))	Residential: 314 spaces Retail: 15 spaces Visitor: 30 spaces Total: 359 spaces
Maximum parking space requirement (within 600m of rapid transit station)	Residential: 1.5/dwelling (Max. 882 spaces) Retail store: 1.0 per 100m² of GFA (1935m² /100m² = 19 spaces)	Residential: 314 spaces Retail: 15 spaces
Minimum parking spaces reserved for physically disabled persons	4 spaces (given 300-399 spaces)	10 spaces
Minimum bicycle parking	Residential: 0.5/dwelling (0.5*588=294 spaces required) Retail : 1.0 per 250m² of GFA (1935m²/250m²= 8 spaces required)	Residential : 350 interior spaces (96 vertical spaces; 254 horizontal spaces) 72% of required spaces located on P1+P2 Retail : 9 exterior spaces (Queen St.)
Minimum loading spaces	Retail, retail food store = 2 (assuming entire ground floor is one space)	2
Minimum driveway width	6m	6.7m
Minimum aisle width	6m	6m

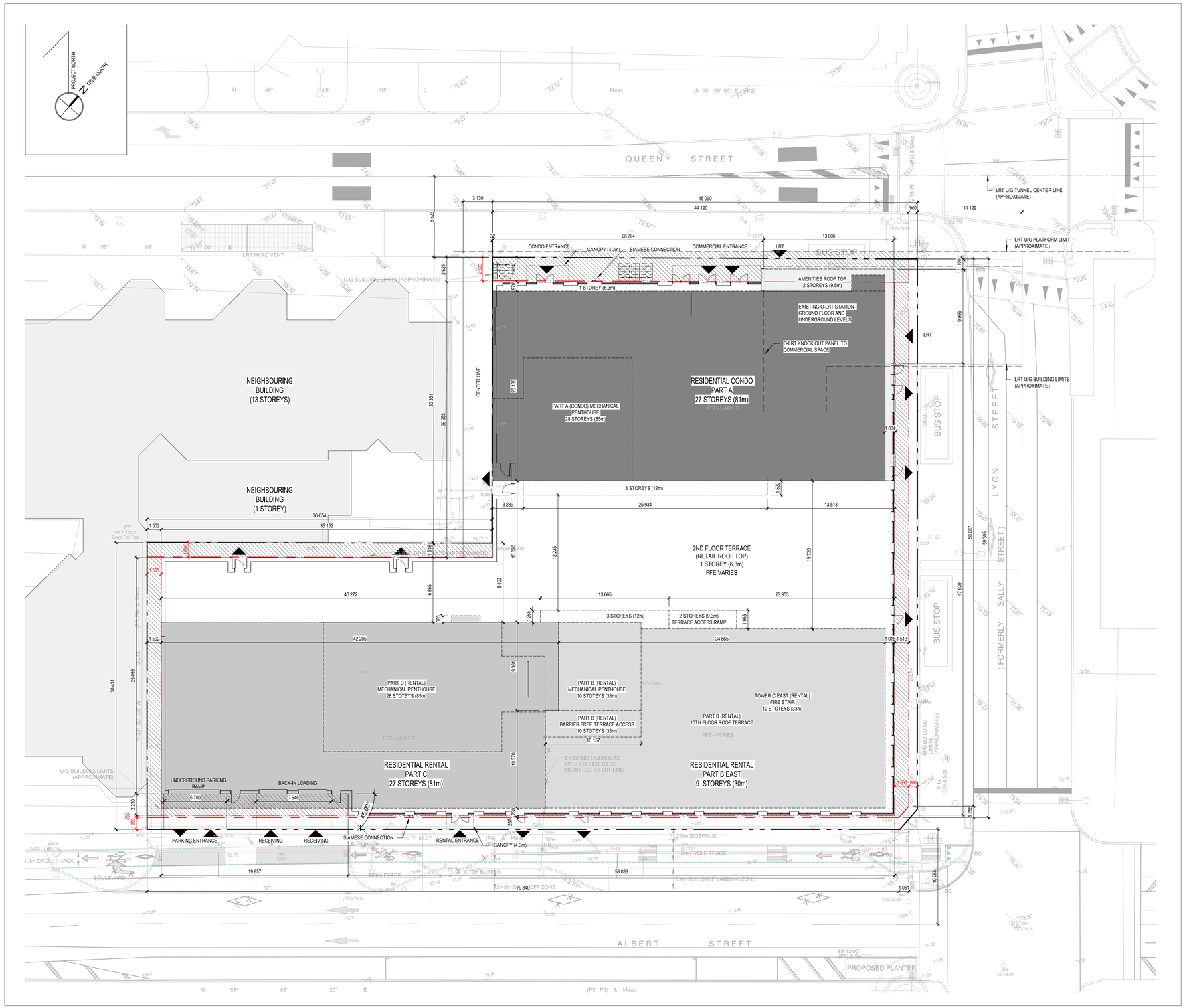
WASTE MANAGEMENT : SINGLE CHUTE TRI-SORTER WITH ORGANICS COLLECTION IN CENTRAL ROOM (P1)

ZONING MECHANISM	REGULATION	PROVIDED
PART A (261 units)	GARBAGE (loose): 0.110 cubic yards/unit FIBER: 0.038 cubic yards/unit GLASS/METAL/PLASTIC: 0.018 cubic yards/unit ORGANICS : 1x (240L bin)/ 50 units	GARBAGE: 6 x (4 yard) + 2 x (3 yard) bins FIBER : 3 x (4 yard) bins GLASS/METAL/PLASTIC : 2 x (3 yard) bins ORGANICS: 6 x (240L) bins
PART C / PART B (321 units)	GARBAGE (loose): 0.110 cubic yards/unit FIBER: 0.038 cubic yards/unit GLASS/METAL/PLASTIC: 0.018 cubic yards/unit ORGANICS : 1x (240L bin)/ 50 units	GARBAGE: 7 x (4 yard) + 3 x (3 yard) bins FIBER : 3 x (4 yard) + 1 x (3 yard) bins GLASS/METAL/PLASTIC : 2 x (3 yard) bins ORGANICS: 7 x (240L) bins

LEGEND

- PROPERTY LINE
- SETBACK LIMIT
- A — REQUIRED SETBACK
- PEDESTRIAN EASEMENT / LANDSCAPED AREA
- BICYCLE LANE DEMARCATION
- HP/UP — EXISTING HYDRO / UTILITY POLE

0 2000 4000 6000 8000
BAR SCALE 1:200



SITE PLAN AT GROUND FLOOR
1 : 200
1 / A100

NOTES GÉNÉRALES General Notes

1 Ces documents d'architecture sont la propriété exclusive de NEUF architect(e)s et ne pourront être utilisés, reproduits ou copiés sans autorisation écrite préalable. / These architectural documents are the exclusive property of NEUF architect(e)s and cannot be used, copied or reproduced without written pre-authorisation
2 Les dimensions apparaissant aux documents devront être vérifiées par l'entrepreneur avant le début des travaux. / All dimensions which appear on the documents must be verify by the contractor before to start the work.
3 Veuillez aviser l'architecte de toute dimension erreur et/ou divergences entre ces documents et ceux des autres professionnels. / The architect must be notified of all errors, omissions and discrepancies between these documents and those of the others professionnals.
4 Les dimensions sur ces documents doivent être lues et non mesurées. / The dimensions on these documents must be read and not measured.

MÉCANIQUE ÉLECTRIQUE Mechanical Electrical
Smith + Andersen
1600, Carling Avenue, Suite 530, Ottawa, ON K1Z 1G3
T 613 230 1188 smithandandersen.com

STRUCTURE Structural
Goodeve Manhire Inc.
18-77, Auriga Drive, Ottawa, ON K2E 7Z7
T 613 226 4558 goodevemanhire.ca

ARCHITECTURE DE PAYSAGE Landscape Architect
James B. Lennox & Associates
3332, Carling Avenue, Ottawa, ON, K2H 5A8
T 613 722 5168 jbla.ca

CIVIL Civil
Novatech Eng. Consultants Ltd.
240, Michael Cowpland Drive, Suite 200, Ottawa ON K2M 1P6
T 613 234 9643 novatech-eng.com

ARCHITECTES Architect
NEUF architect(e)s SENCRL
630, boul. René-Lévesque O. 32e étages, Montréal QC H3B 1S6
T 514 847 1117 NEUFarchitectes.com

SCEAU / Seal

ONTARIO ASSOCIATION OF ARCHITECTS
LUCIEN HABRAD
LICENCE
8286

NEUF
ARCHITECT(E)S
NEUF ARCHITECTES SENCRL

CLIENT Client
CLARIDGE HOMES

OUVRAGE Project
MOON - PARKING, PODIUM & RENTAL TOWER "C"

EMPLACEMENT Location
383 ALBERT ST.
OTTAWA,ON

NO PROJET No.
11679.00

NO	RÉVISION	DATE (aa-mm-jj)
0	SITE PLAN APPLICATION REVISION	2019.05.03

DESSINÉ PAR Drawn by
CR/PV/RB

VÉRIFIÉ PAR Checked
LH/AC

DATE (aa.mm.jj)
NOV 2018

ÉCHELLE Scale
As indicated

TITRE DU DESSIN Drawing Title
SITE PLAN AT GROUND FLOOR

RÉVISION Revision
0

NO. DESSIN Dwg Number
A100

APPENDIX B

TIA Screening Form

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	**383 Albert Street and 340 Queen Street**
Description of Location	**West of Lyon Street, between Queen Street and Albert Street**
Land Use Classification	**Residential, Commercial**
Development Size (units)	**588 Dwellings**
Development Size (m^2)	**1,935 m^2 of Commercial**
Number of Accesses and Locations	**One along Albert Street, near western limits of property**
Phase of Development	**1**
Buildout Year	**2023**

If available, please attach a sketch of the development or site plan to this form.

2. Trip Generation Trigger

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Land Use Type	Minimum Development Size
Single-family homes	40 units
Townhomes or apartments	**90 units**
Office	3,500 m^2
Industrial	5,000 m^2
Fast-food restaurant or coffee shop	100 m^2
Destination retail	**1,000 m^2**
Gas station or convenience market	75 m^2

** If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.*

If the proposed development size is greater than the sizes identified above, the Trip Generation Trigger is satisfied.

3. Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?	✓	
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*	✓	

**DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).*

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

4. Safety Triggers

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

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

5. Summary

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

If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).

APPENDIX C

Traffic Counts

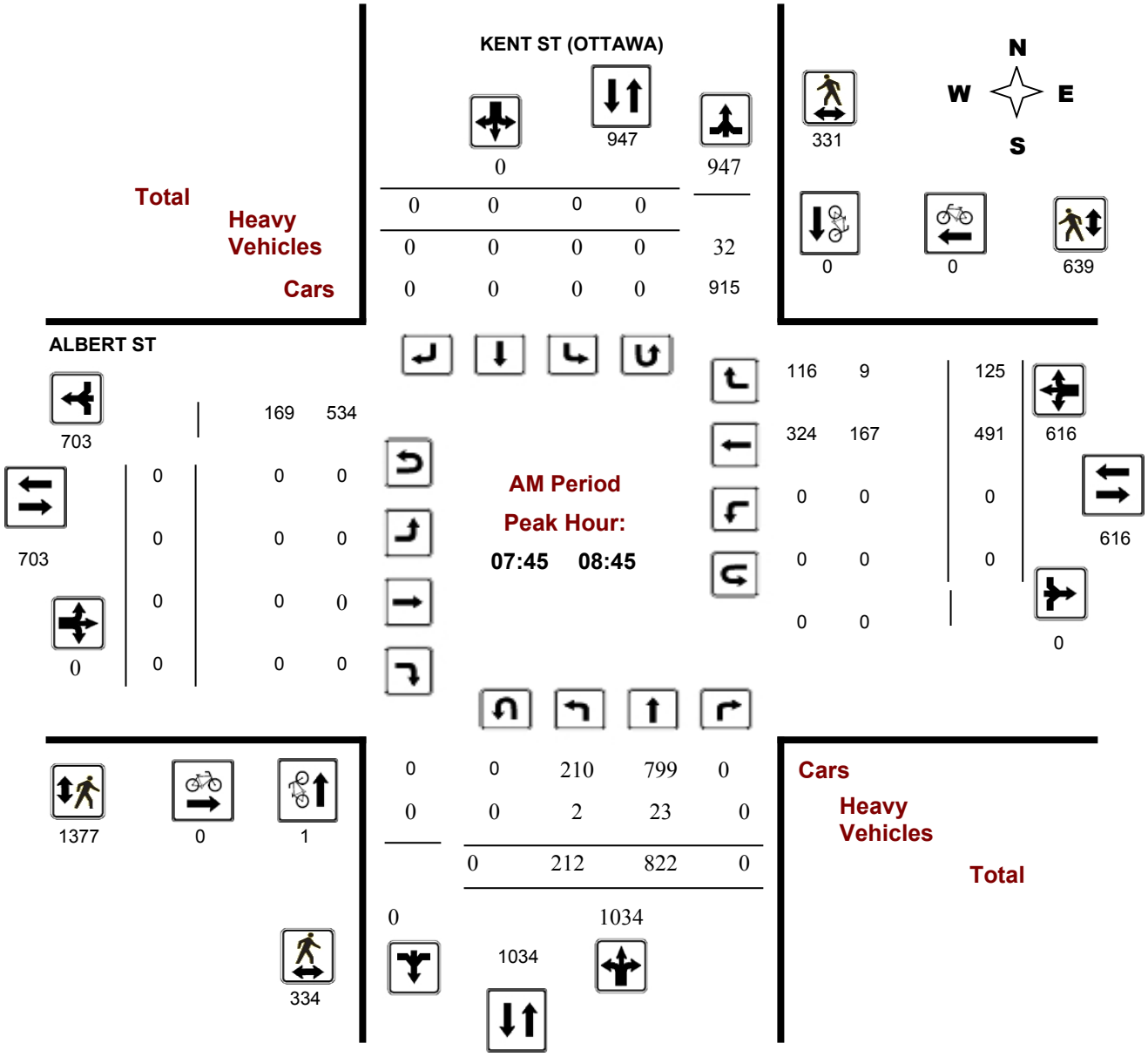
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

ALBERT ST @ KENT ST (OTTAWA)

Survey Date: Tuesday, March 28, 2017 **WO No:** 36816

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



Comments

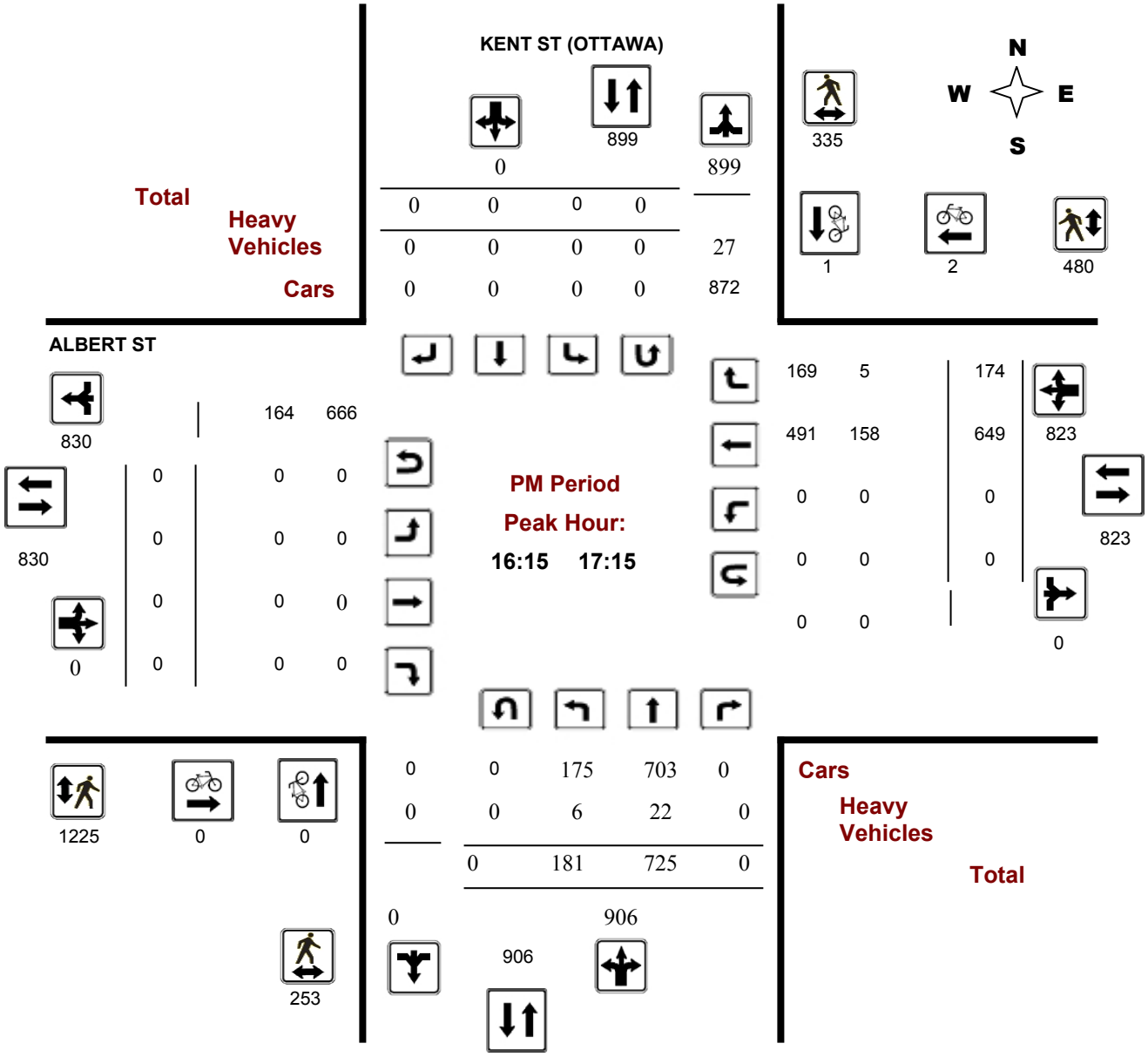
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

ALBERT ST @ KENT ST (OTTAWA)

Survey Date: Tuesday, March 28, 2017 **WO No:** 36816

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



Comments

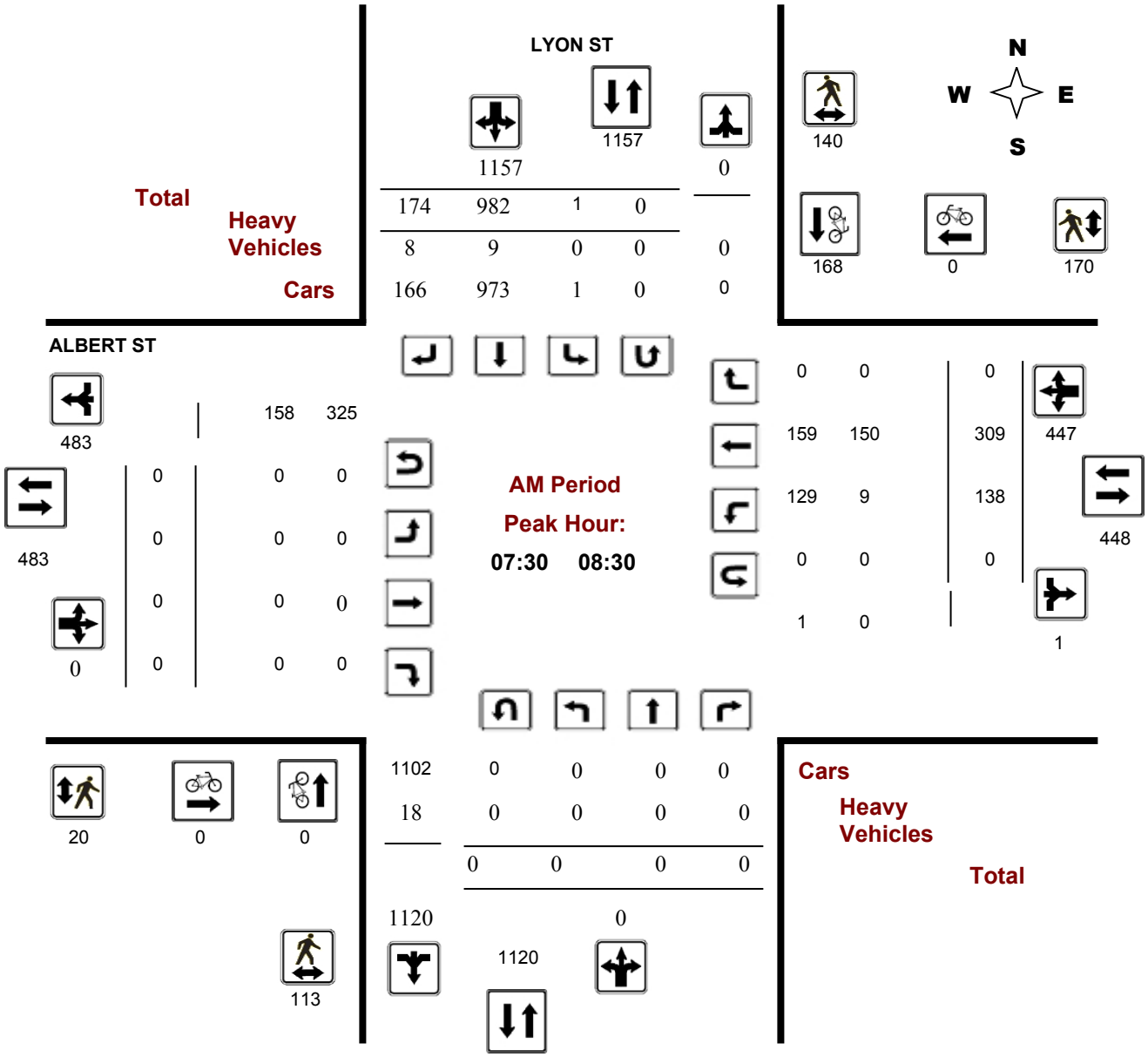
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

ALBERT ST @ LYON ST

Survey Date: Thursday, June 11, 2015
Start Time: 07:00

WO No: 34679
Device: Jamar Technologies, Inc



Comments

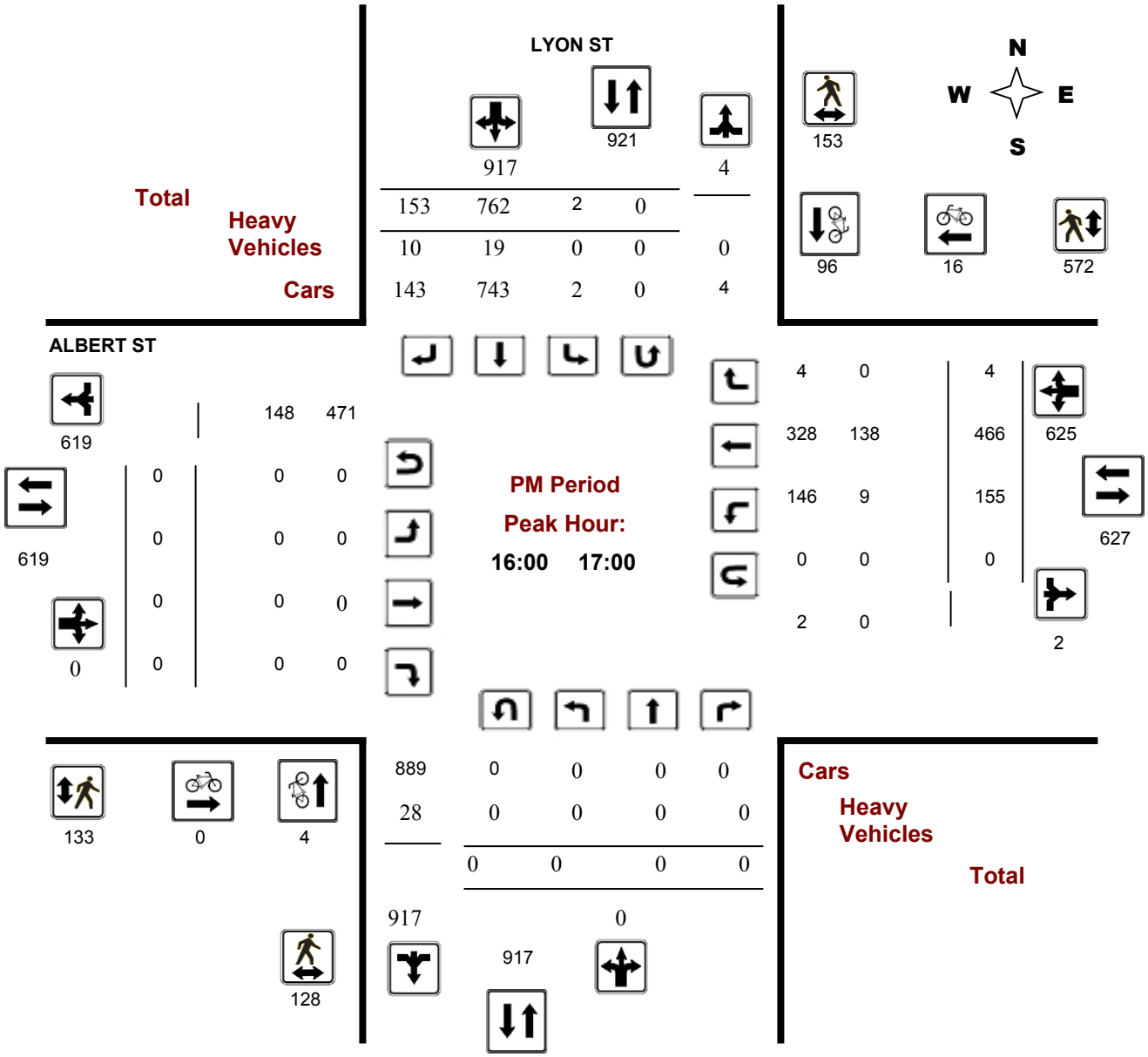
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

ALBERT ST @ LYON ST

Survey Date: Thursday, June 11, 2015
Start Time: 07:00

WO No: 34679
Device: Jamar Technologies, Inc



Comments

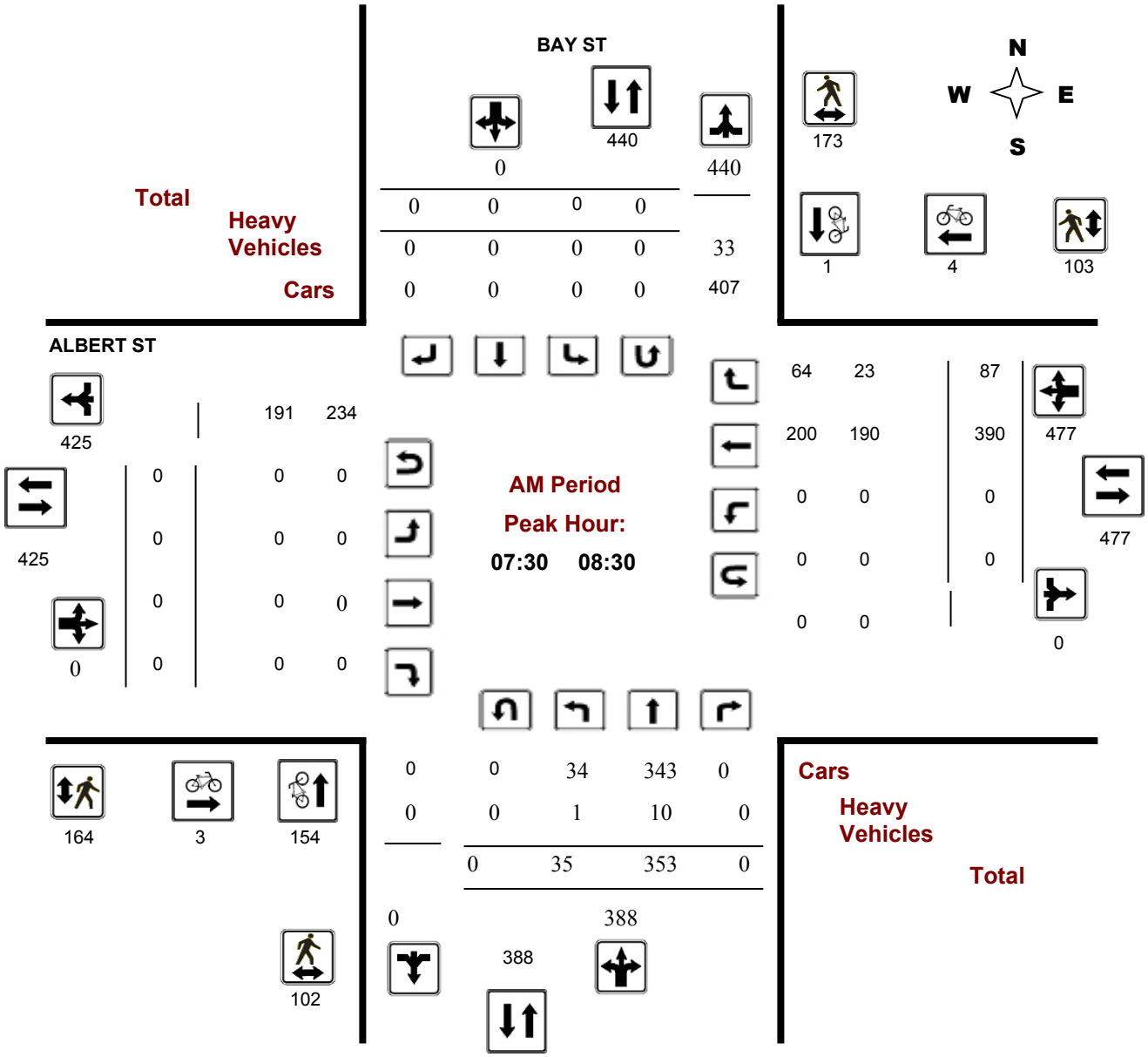
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

ALBERT ST @ BAY ST

Survey Date: Thursday, June 18, 2015
Start Time: 07:00

WO No: 34725
Device: Jamar Technologies, Inc



Comments

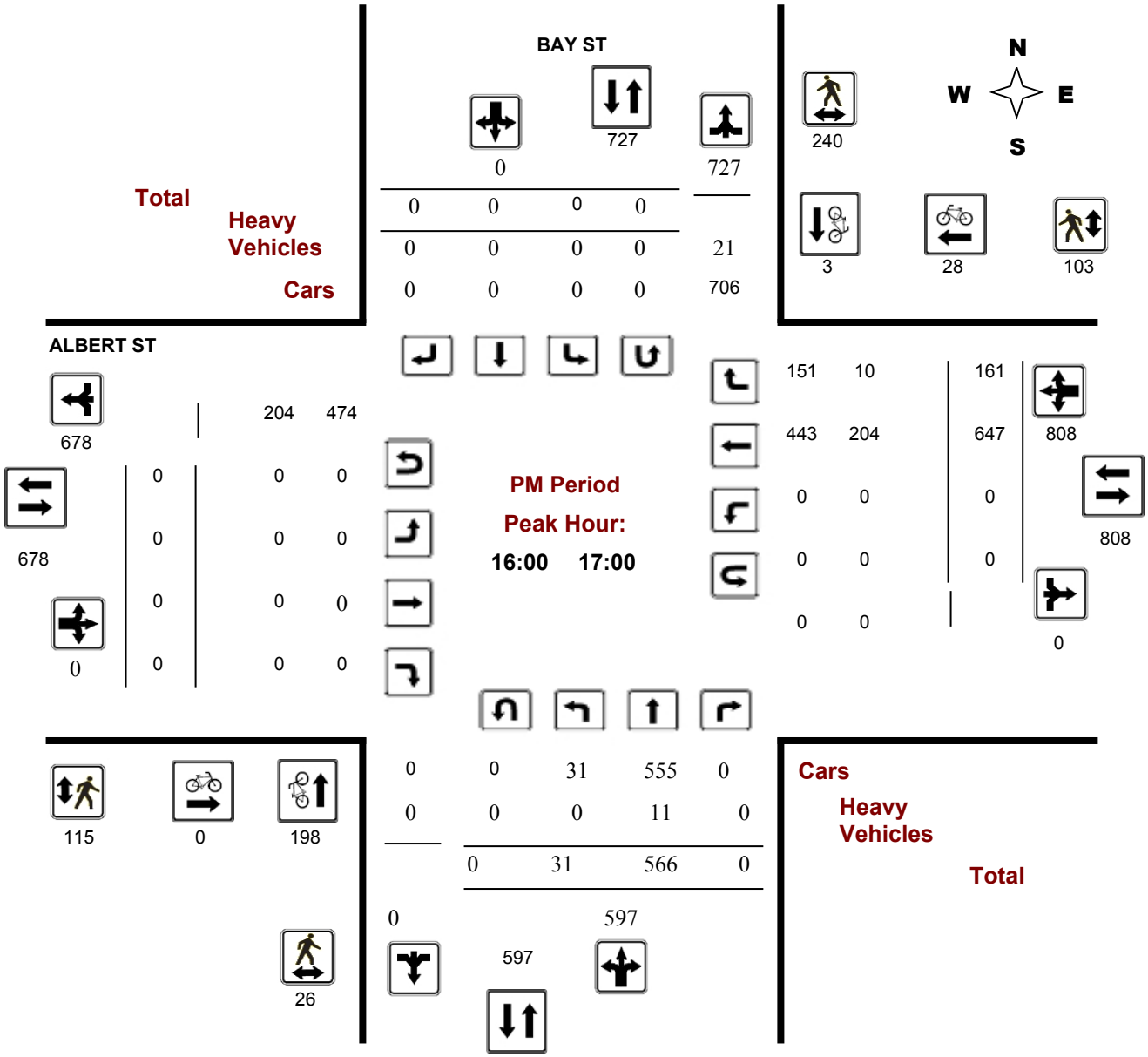
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

ALBERT ST @ BAY ST

Survey Date: Thursday, June 18, 2015
Start Time: 07:00

WO No: 34725
Device: Jamar Technologies, Inc



Comments

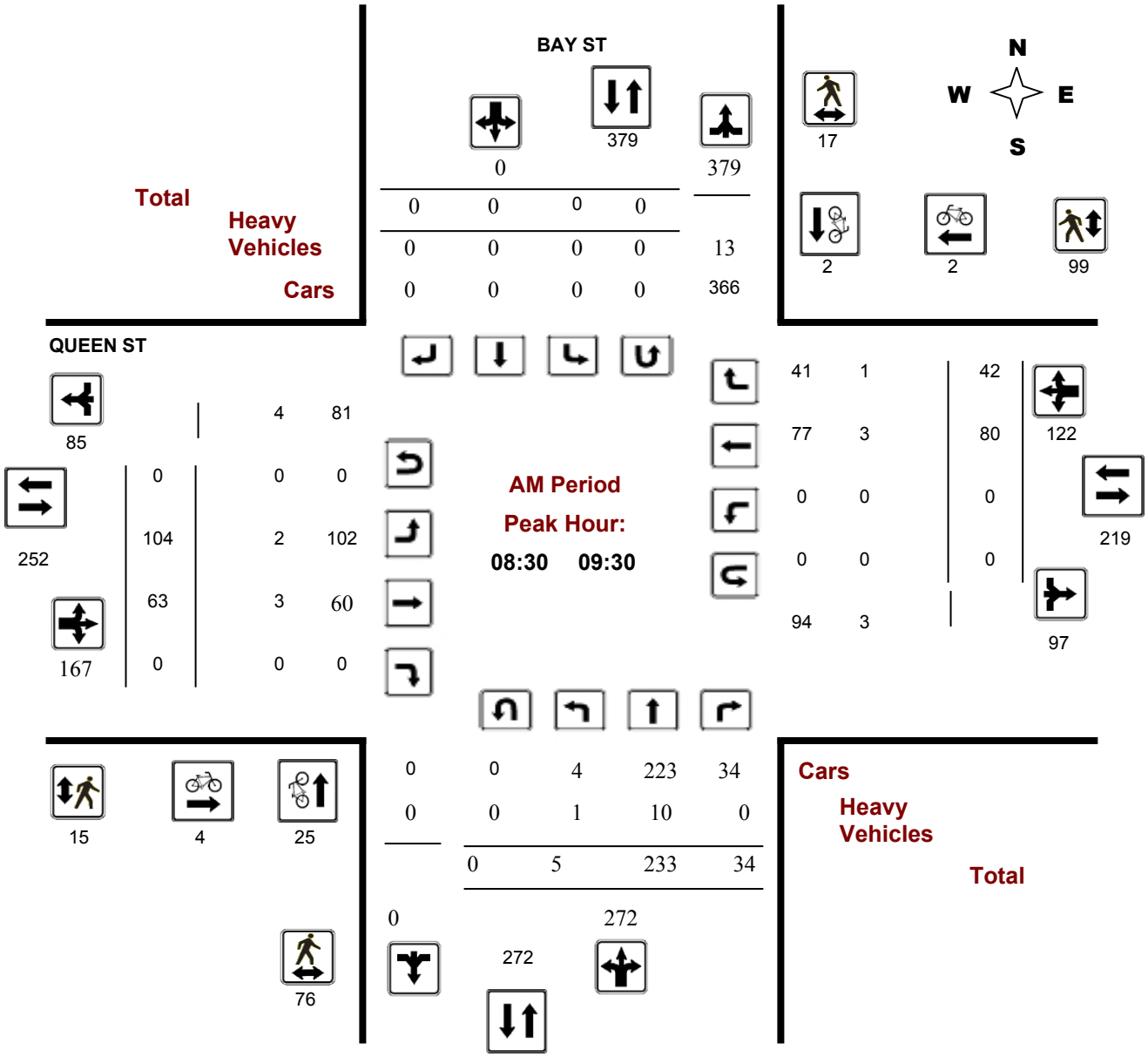
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

BAY ST @ QUEEN ST

Survey Date: Thursday, August 20, 2015
Start Time: 07:00

WO No: 35271
Device: Jamar Technologies, Inc



Comments

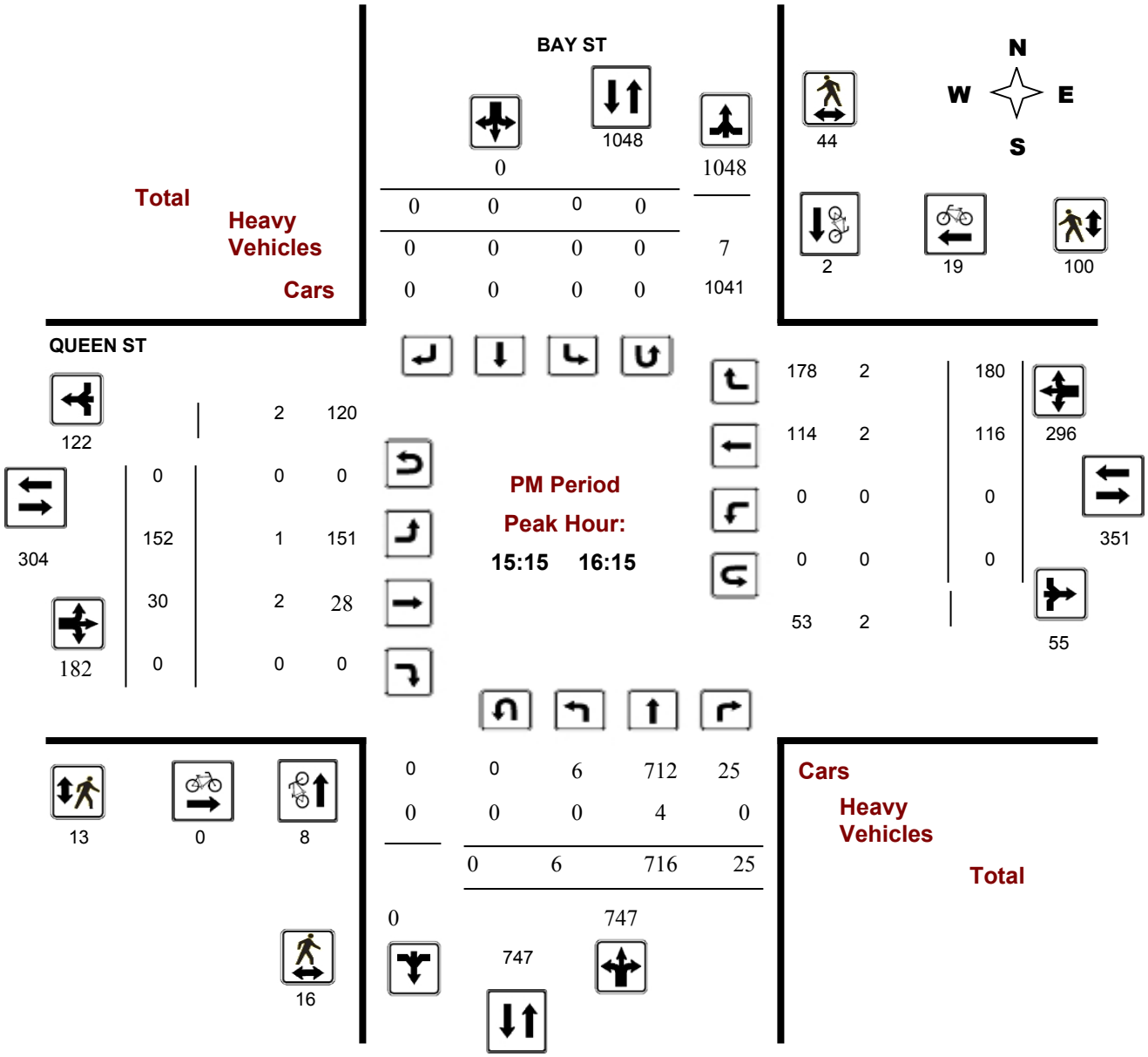
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

BAY ST @ QUEEN ST

Survey Date: Thursday, August 20, 2015
Start Time: 07:00

WO No: 35271
Device: Jamar Technologies, Inc



Comments

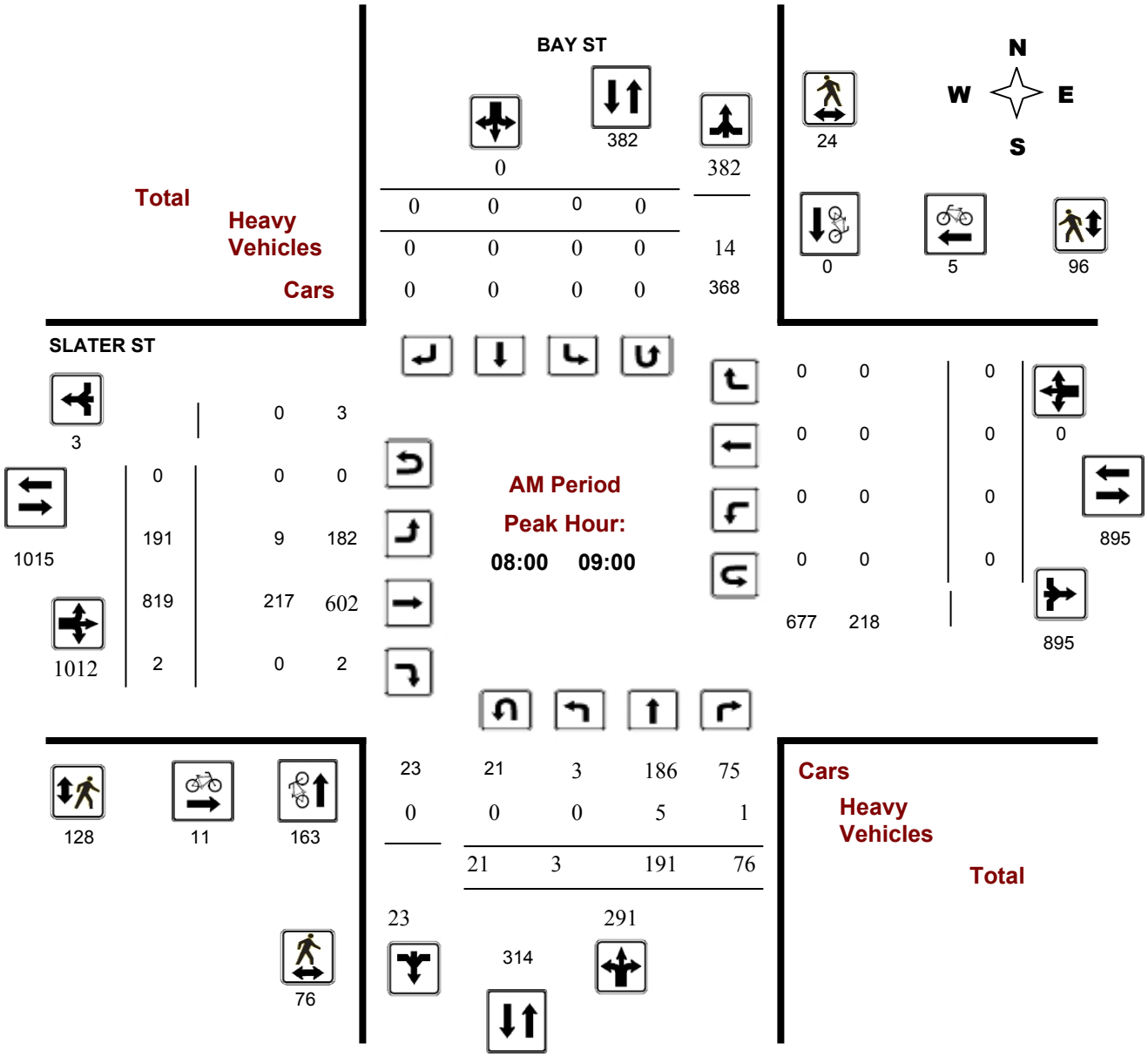
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

BAY ST @ SLATER ST

Survey Date: Thursday, June 25, 2015
Start Time: 07:00

WO No: 34784
Device: Jamar Technologies, Inc



Comments

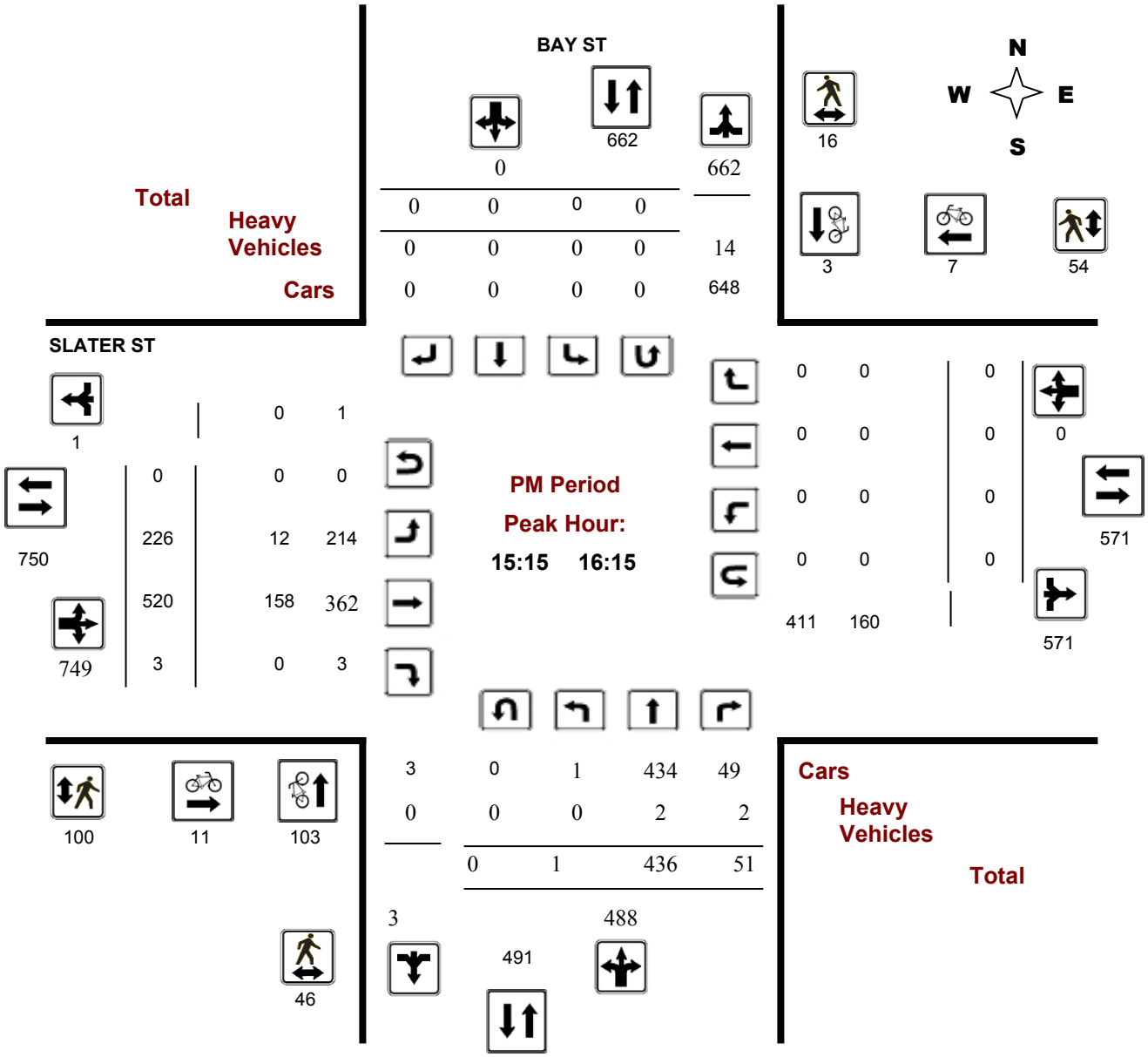
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

BAY ST @ SLATER ST

Survey Date: Thursday, June 25, 2015
Start Time: 07:00

WO No: 34784
Device: Jamar Technologies, Inc



Comments

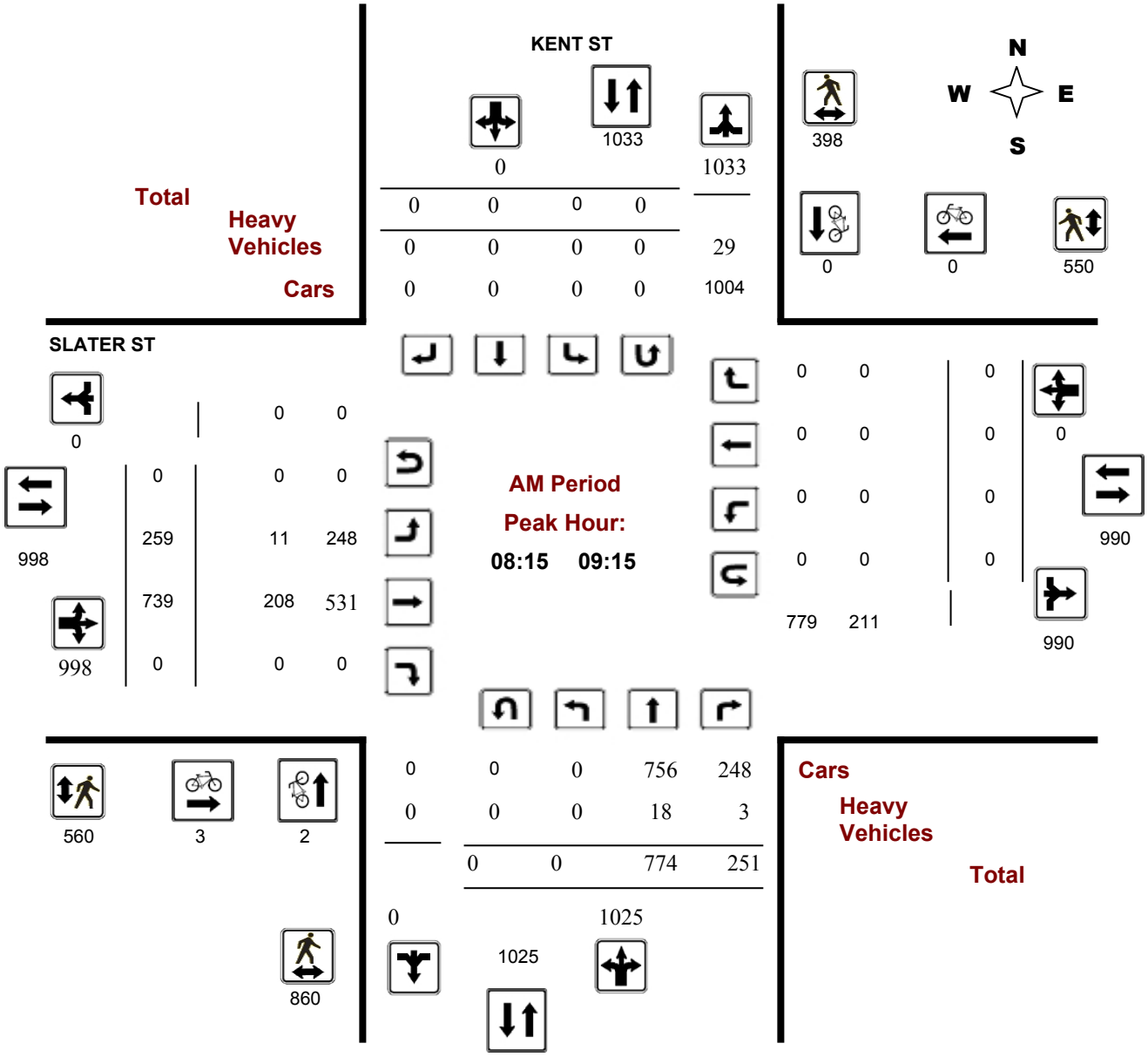
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

KENT ST @ SLATER ST

Survey Date: Tuesday, March 28, 2017 **WO No:** 36814

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



Comments

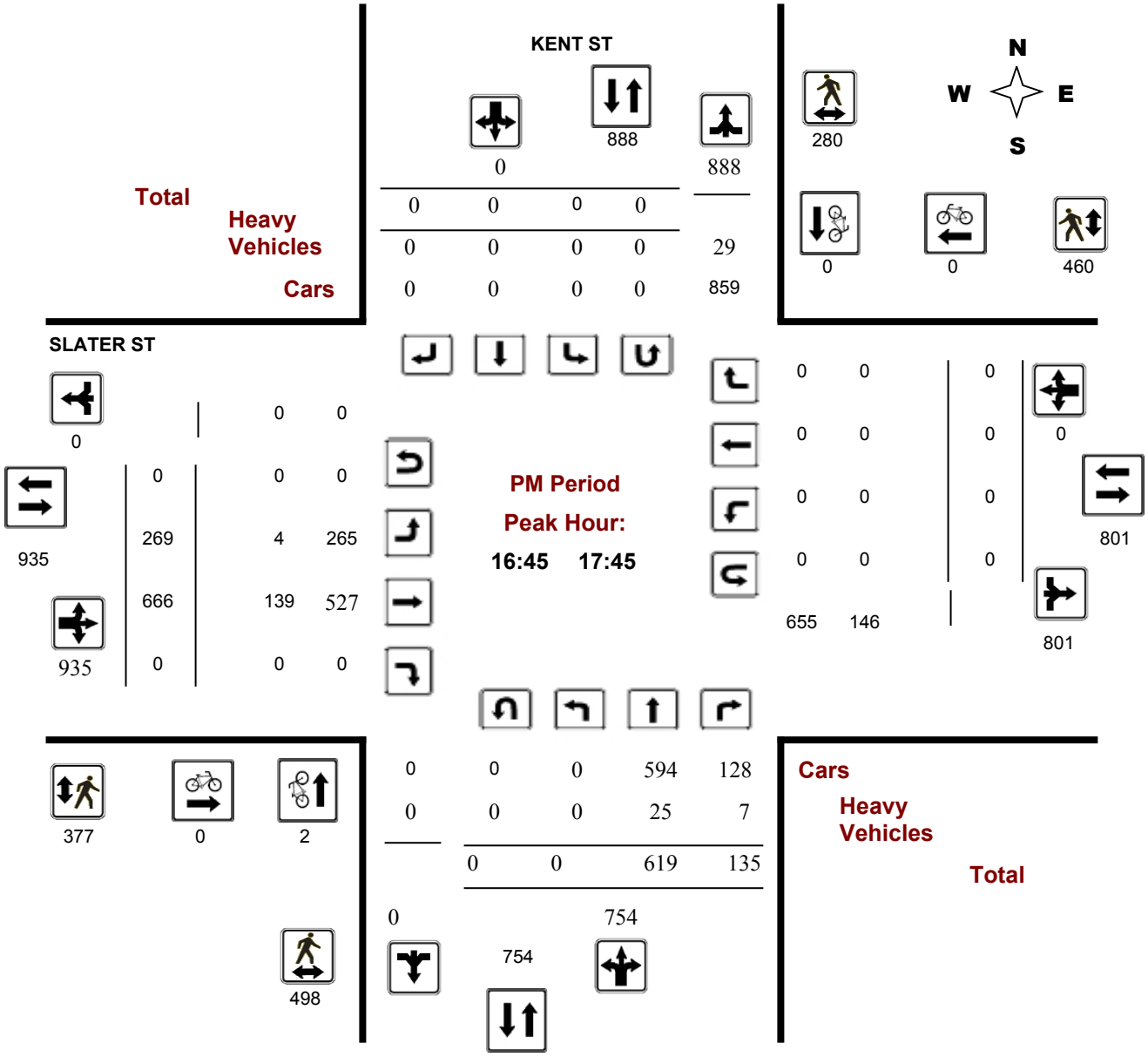
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

KENT ST @ SLATER ST

Survey Date: Tuesday, March 28, 2017 **WO No:** 36814

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



Comments

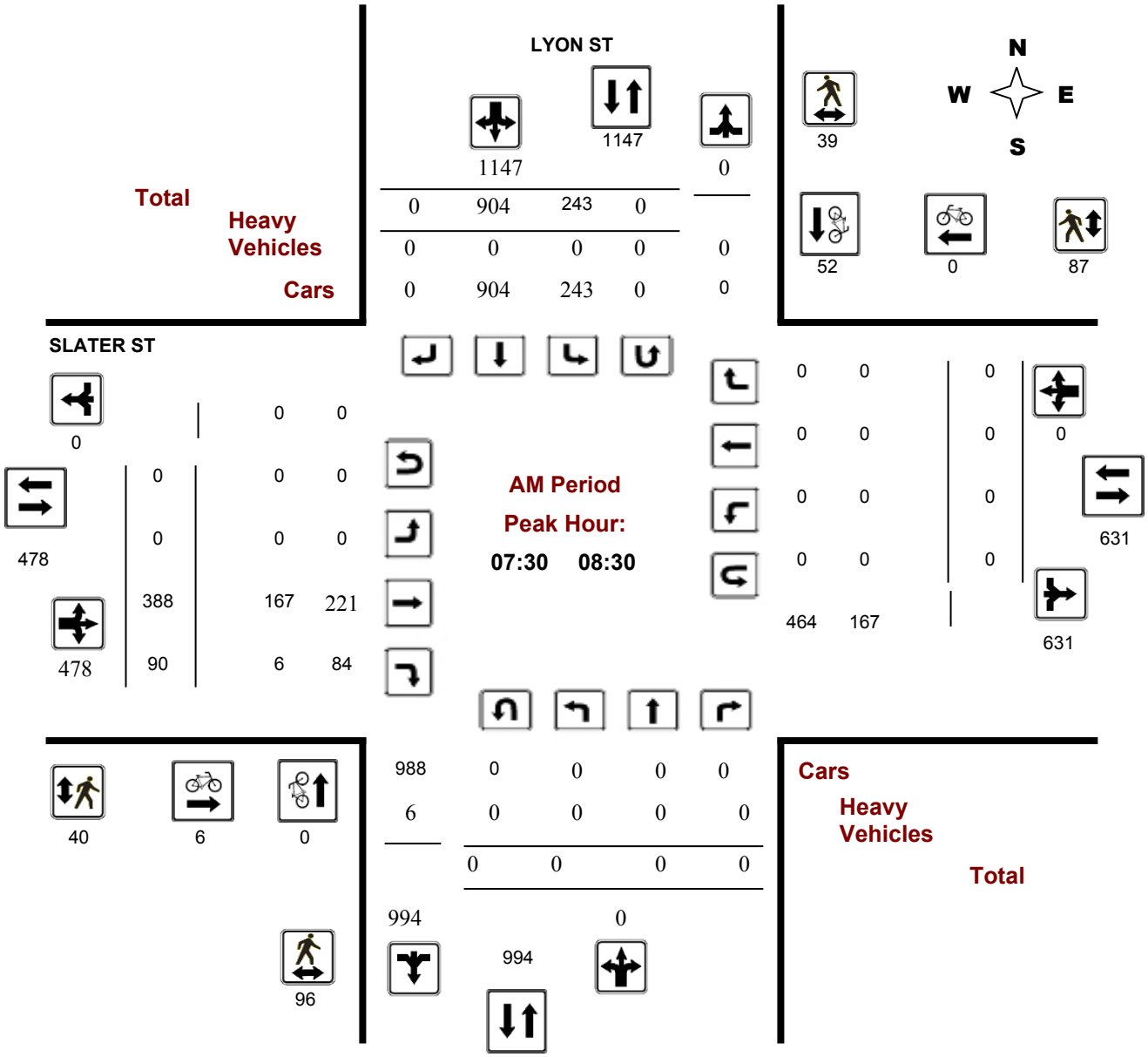
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

LYON ST @ SLATER ST

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

WO No: 34685
Device: Jamar Technologies, Inc



Comments

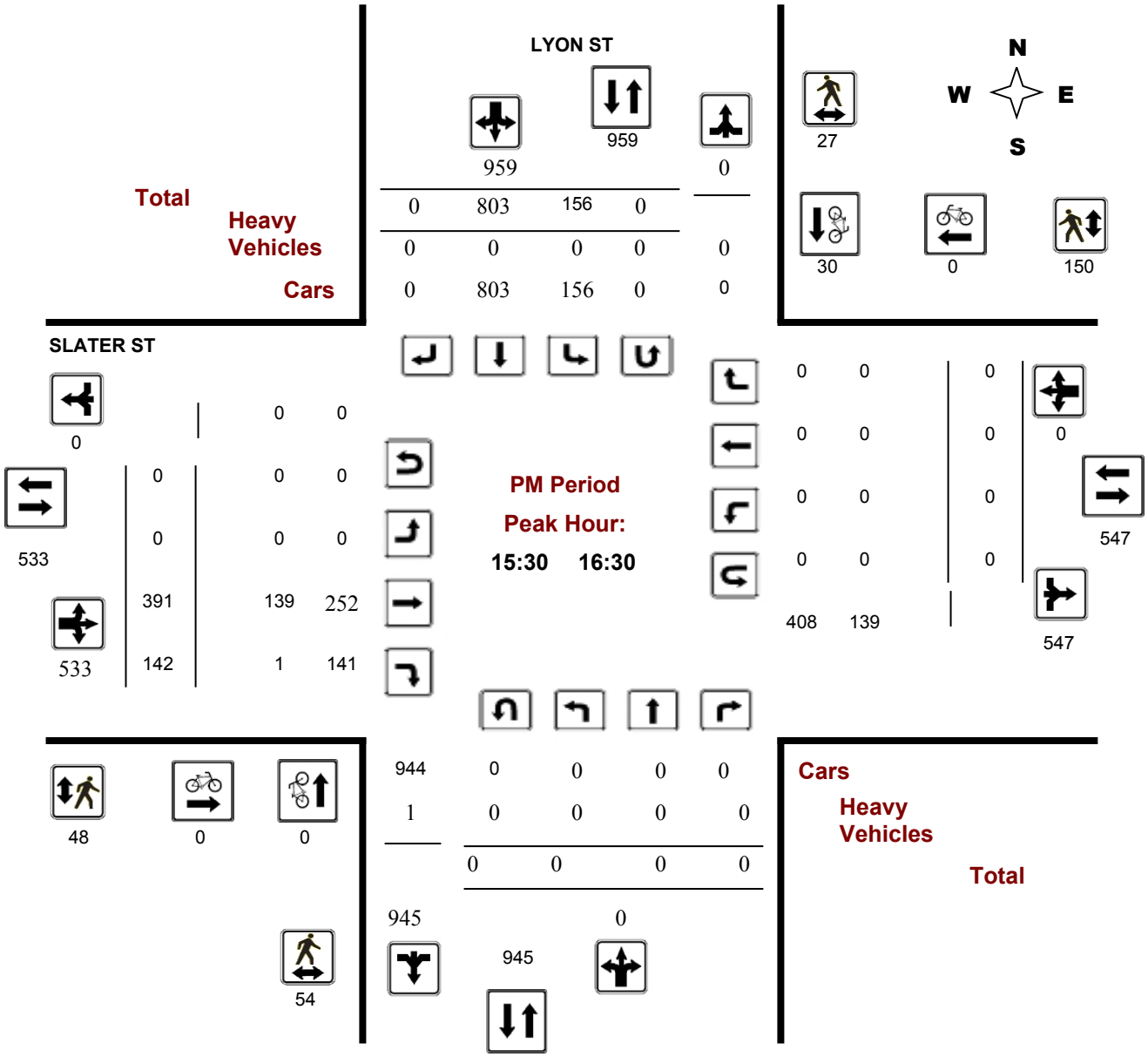
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

LYON ST @ SLATER ST

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

WO No: 34685
Device: Jamar Technologies, Inc



Comments

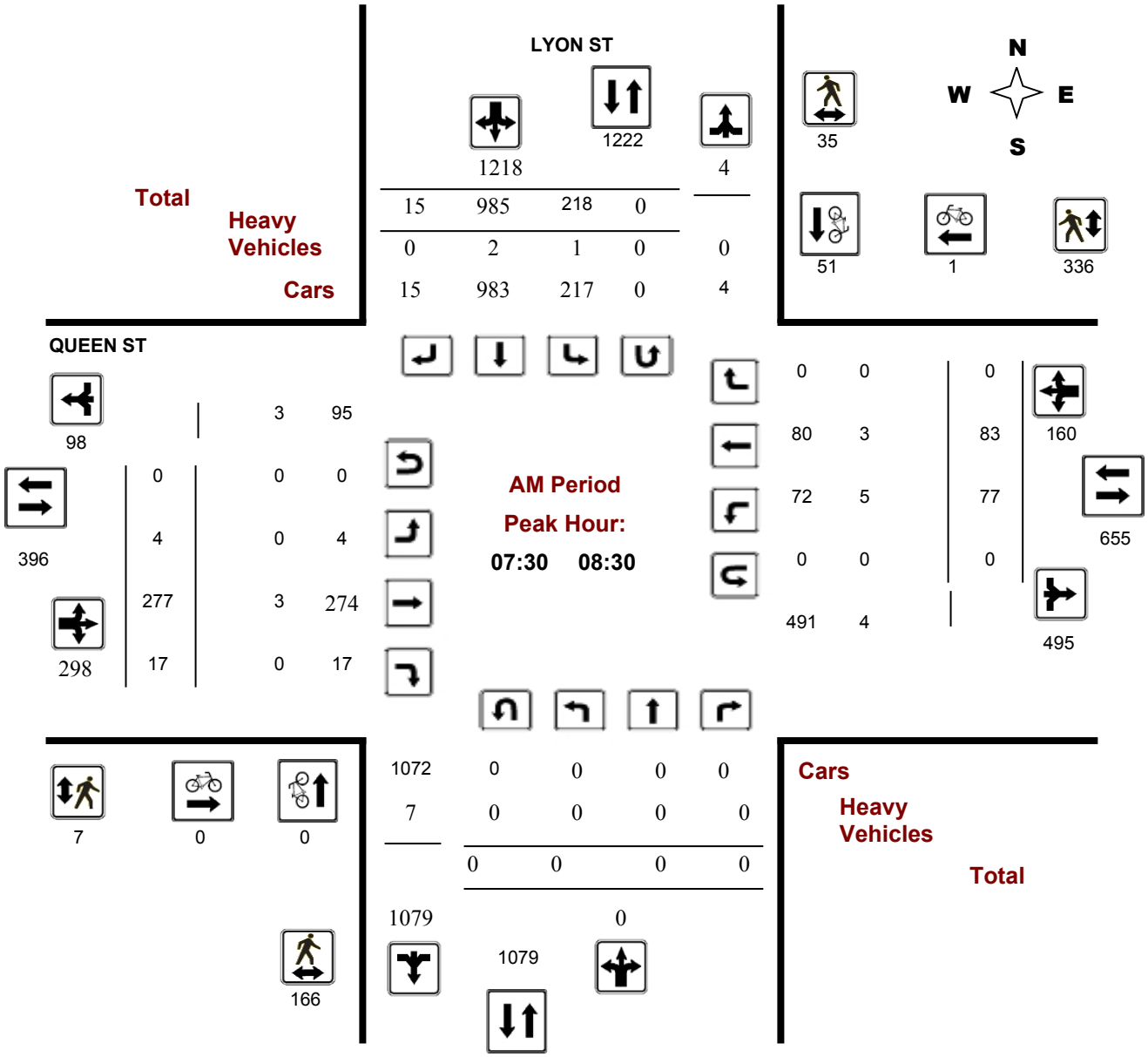
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

QUEEN ST @ LYON ST

Survey Date: Thursday, June 11, 2015
Start Time: 07:00

WO No: 34678
Device: Jamar Technologies, Inc



Comments

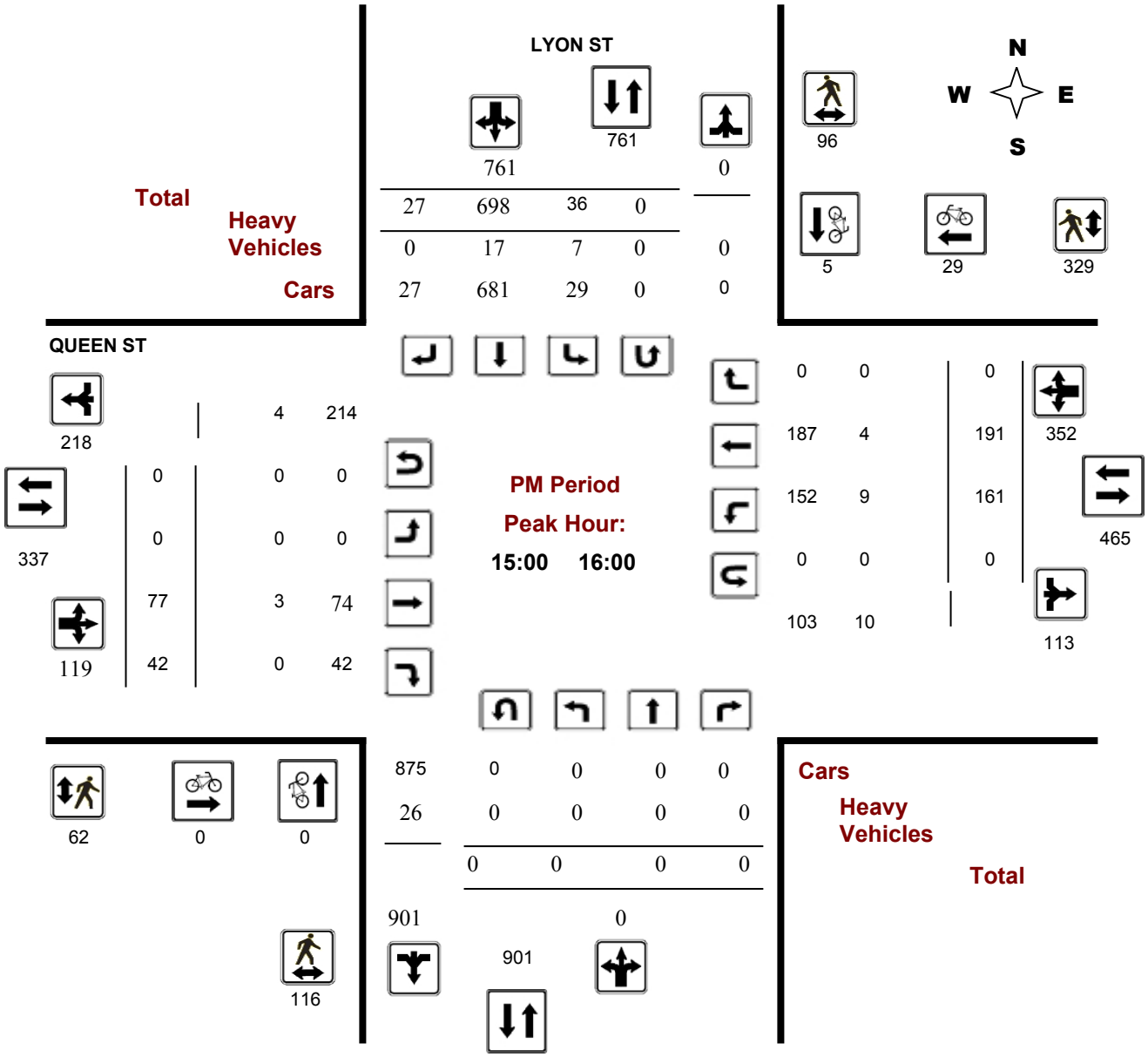
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

QUEEN ST @ LYON ST

Survey Date: Thursday, June 11, 2015
Start Time: 07:00

WO No: 34678
Device: Jamar Technologies, Inc



Comments

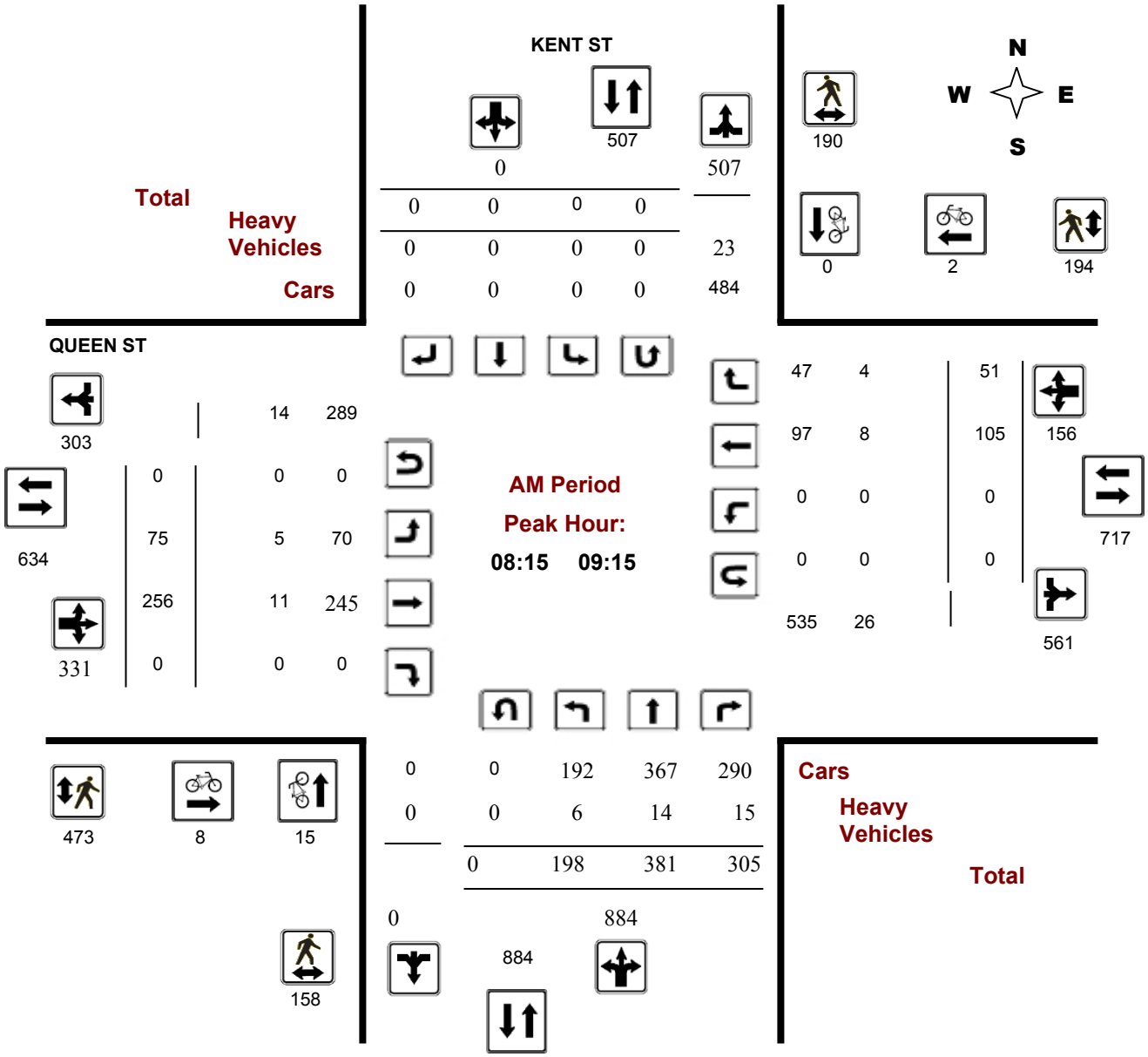
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

KENT ST @ QUEEN ST

Survey Date: Wednesday, August 13, 2014
Start Time: 07:00

WO No: 29507
Device: Jamar Technologies, Inc



Comments

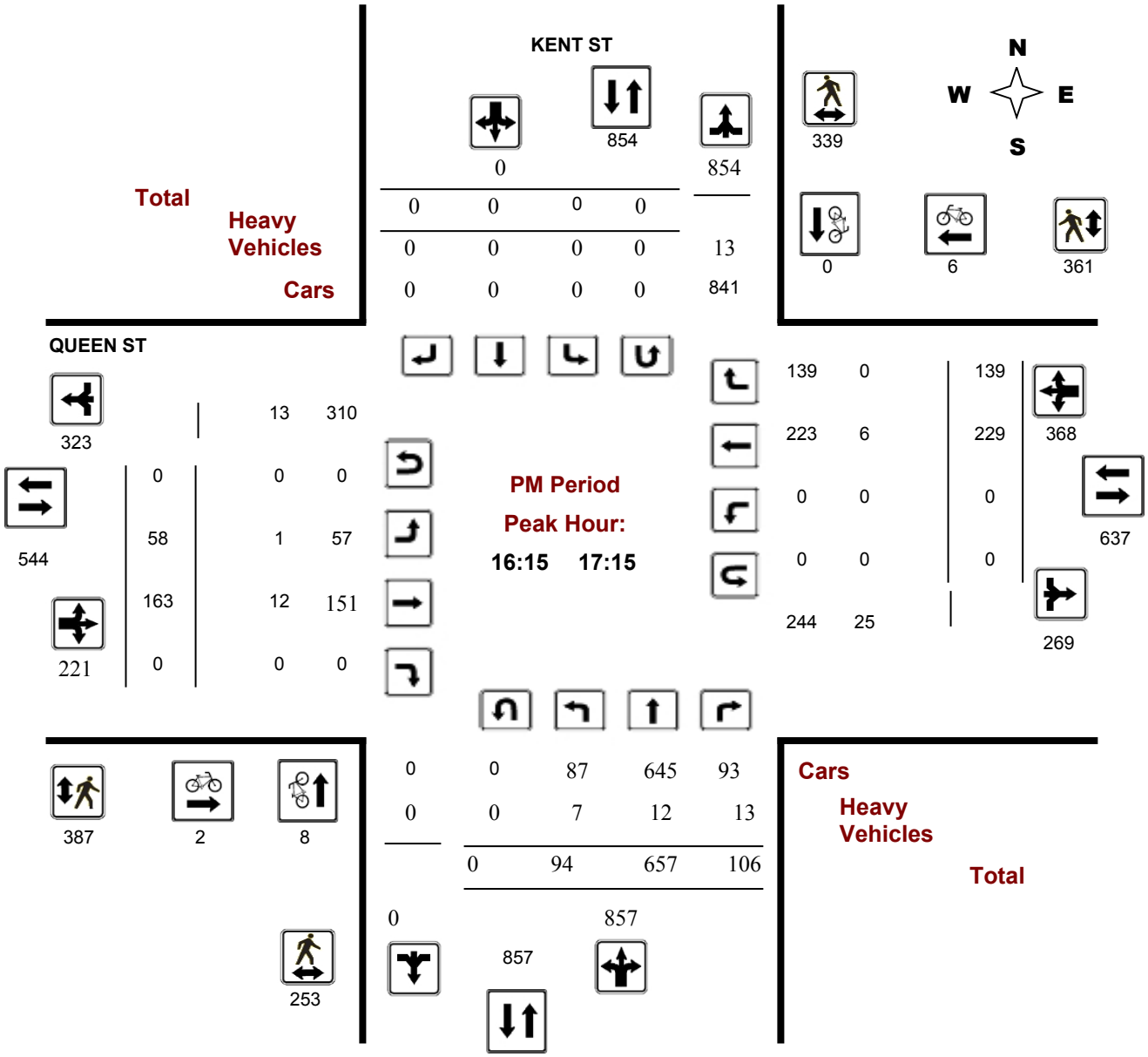
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

KENT ST @ QUEEN ST

Survey Date: Wednesday, August 13, 2014
Start Time: 07:00

WO No: 29507
Device: Jamar Technologies, Inc



Comments

APPENDIX D

East Lebreton Flats TIS Excerpts

1.0 INTRODUCTION

This Transportation Impact Study (TIS) has been prepared in support of Zoning By-law Amendment and Official Plan Amendment applications for Phase 1 of the lands east of Booth Street between the historic aqueduct and Confederation Line LRT to the south and Fleet Street to the north. The subject lands will henceforth be referred to as the "East LeBreton Flats Lands". The subject lands are designated as Block P, Q and I in the National Capital Commission's (NCC) Block Subdivision Plan, which can be found in **Appendix A**.

An aerial photo of the East LeBreton Flats Lands is shown in **Figure 1**.

Figure 1: Aerial Photo of the East LeBreton Flats Lands

The East LeBreton Flats Lands are currently zoned GM17[120] H(40) S94 or R5O H (20) and are currently vacant. The subject lands are bounded by the following:

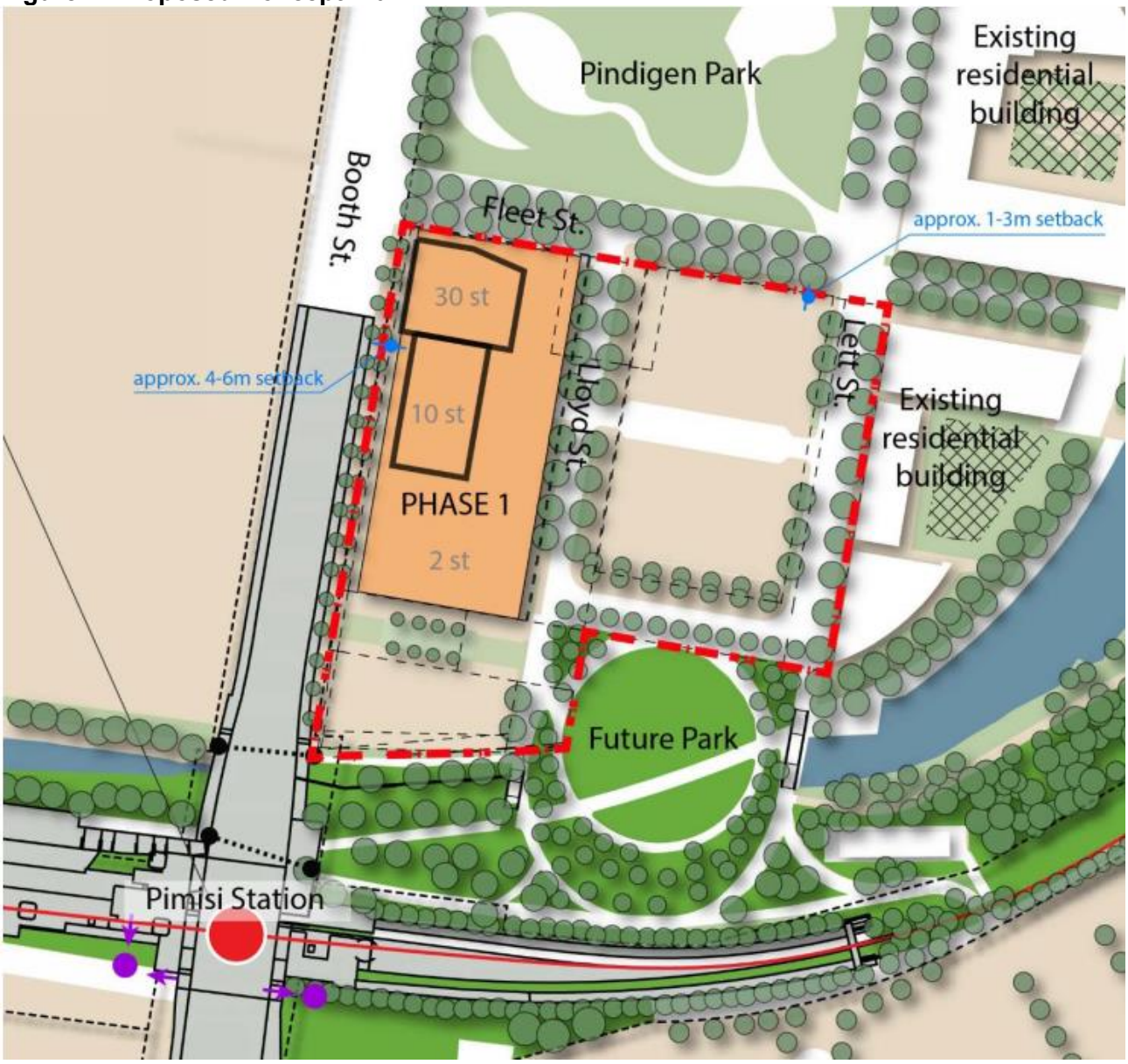
- To the north, Fleet Street and parkland;
- To the south, the historic aqueduct and Confederation Line LRT;
- To the east, existing residential development;
- To the west, Booth Street and vacant land planned for future mixed-use development.

1.1 Proposed Development

Phase 1 of the East LeBreton Flats Lands will consist of approximately 350 residential units, a 21,500ft^2 food store (or other retail uses) and 43,000ft^2 of institutional development. A conceptual

plan for Phase 1 of the development is shown in **Figure 2**. The estimated completion date of Phase 1 of the development is 2023.

Figure 2: Proposed Concept Plan

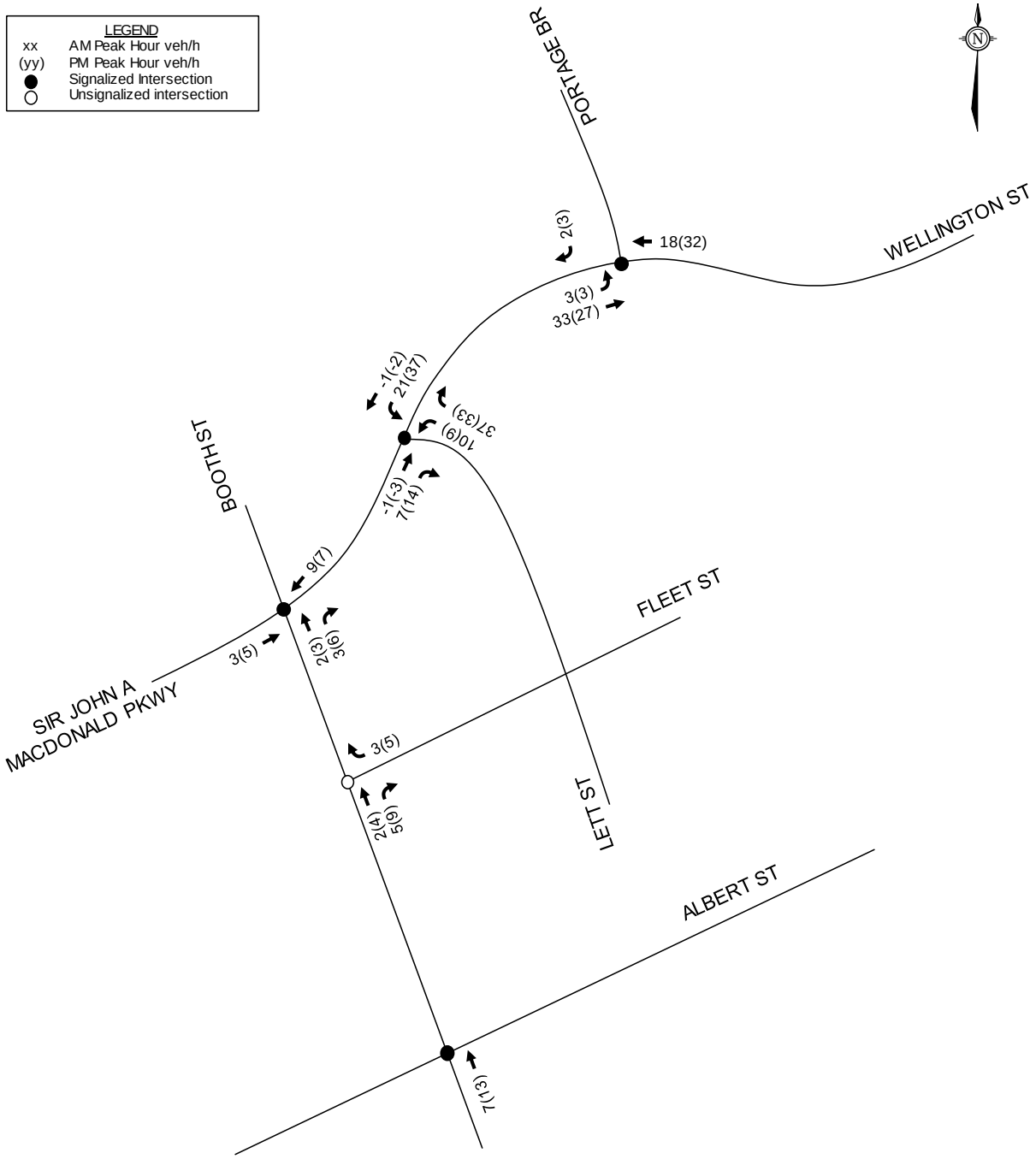


1.2 Analysis Methods

Intersection capacity analysis has been completed using the software package Synchro 10.0. This software uses methodology from the *Highway Capacity Manual 2010* (HCM), published by the Transportation Research Board, to evaluate signalized and unsignalized intersections.

Intersection operating conditions are commonly described in terms of a Level of Service (LOS). LOS is a qualitative measurement of speed, freedom to manoeuvre, interruptions, comfort and

Figure 8: Site Generated Traffic



APPENDIX E

Table 14-1, ITE Traffic Engineering Handbook

Table 14–1 Typical Peak-Hour Volumes as a Percentage of the Total Parking Stalls

	A.M. Peak Hour		P.M. Peak Hour	
Type of Activity	In	Out	In	Out
Hotel-motel	30 – 50	30 – 50	30 – 60	10 – 30
Residential	5 – 10	30 – 50	30 – 50	10 – 30
Office	40 – 70	5 – 15	5 – 20	40 – 70
Medical Office	40 – 60	10 – 20	10 – 30	60 – 80
Hospital				
Visitor	30 – 40	40 – 50	40 – 60	50 – 75
Employee	60 – 75	5 – 10	10 – 15	60 – 75
Retail–commercial	10 – 30	10 – 20	30 – 60	40 – 65
Central business district	40 – 60	10 – 20	10 – 30	40 – 60
Airport — All Traffic*	40 – 65	30 – 50	70 – 90	70 – 90
Short-term (0–3 hr)	50 – 75	80 – 100	90 – 100	90 – 100
Mid-term (4–24 hr)	10 – 30	5 – 10	10 – 30	10 – 30
Long-term (more than 24 hr)	5 – 10	5 – 10	5 – 10	5 – 10
Special events	Before event—(In) 80 – 100		After event—(Out) 85 – 200**	

*Parking and bypass (loading–unloading).
**Maximum assumes a 30-min departure.

Source: Adapted from Robert A. Weant and Herbert S. Levinson, *Parking*, Westport, Conn.: Eno Foundation for Transportation, Inc., 1990. Adapted from Robert W. Crommelin, *Entrance-Exit Design and Control for Major Parking Facilities*, a seminar presentation (Encino, Calif., 1972); and Anthony P. Chest, Mary S. Smith, and Sam Bhuyan, *Parking Structures Planning, Design, Construction, Maintenance and Repair* (New York: Van Nostrand Reinhold, 1989).

on the type of generator served, user characteristics (employee, shopper, etc.), and parking capacity. Volumes are typically expressed as a ratio of the number of vehicles to the number of parking stalls in the facility. Table 14–1 gives peak-hour ratios for a number of activities.

The number of vehicles that can enter (acceptance rate) or leave a parking facility, per lane, is related to the angle of approach (sharp turns have less capacity then straight-in runs), whether any control is used, the familiarity of the driver with the facility, the freedom of internal circulation (for entry), the amount of vehicular traffic on the streets (for exit) and the degree of conflict with pedestrians crossing the driveway. In general, for a self-parking facility with no control, the capacity per lane ranges up to 800 vph. One engineer has recommended a design value of 400 vph.[5] Guidelines have been developed for considering capacities related to control methods, and also to street traffic (but not pedestrian sidewalk conflicts).[6]

Table 14–2 Vehicle Acceptance Rates of Large Parking Areas

		Average Acceptance Rates Vehicles per Hour per Lane	
Approach to Entrance	Number of Studies	Unfamiliar Entrance[1]	Familiar Entrance[2]
Straight approach (no turn movement)	20	850	1,100
90° right turn	15	750	1,000
90° left turn	24	830	900
Oblique angle, right	8	650	1,000
Oblique angle, left	4	720	[3]

[1] Includes racetracks, stadiums, and other facilities not frequently visited by the same individuals.
[2] Includes industrial plants, military bases, and other facilities where the same drivers enter daily.
[3] No data available.

Source: A.A. Carter, Jr. "Vehicle Acceptance Rates of Parking Areas," *Public Roads* (Oct. 1959).

[5] R.T. Hintersteiner, "Parking Control Guidelines for the Design of Parking Facility Portals," *ITE Journal* (Jan. 1989), p. 28–31.

[6] J.M. Frantzeskakis, "Traffic Flow Analysis for Dimensioning Entrances-Exits and Reservoir Space for Off Street Parking," *ITE Journal* (May 1981), pp. 16–24.

APPENDIX F

Transportation Demand Management Checklists

TRANSPORTATION DEMAND MANAGEMENT

TDM-Supportive Development Design and Infrastructure Checklist

TDM-Supportive Development Design and Infrastructure Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

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: *Non-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	☑ All vehicle parking is underground
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑ LRT access within site
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑ Ground floor includes glass windows and doors
	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)*	☑ LRT access within site
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)*	☑ LRT access within site

TDM-supportive design & infrastructure measures: *Non-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)*	☑ On-site sidewalks constructed with either concrete or unit pavers
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)*	☑ Sidewalks are easily accessible
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)*	☑ Entrances are directly adjacent to existing sidewalk network
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☑ LRT access within site
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☑ Sidewalks will include lighting and trees
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	☑ Sidewalks will include lighting and trees
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)	☑ Wayfinding anticipated, as LRT access is within site

		TDM-supportive design & infrastructure measures: *Non-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)*	☑ Bicycle parking provided in highly visible areas or in the underground parking garage
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)*	☑ Bicycle parking exceeds the ZBL requirements
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)*	☑ Bicycle parking exceeds the ZBL requirements
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	☑ Bicycle parking exceeds the ZBL requirements
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	☒
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office 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)*	☑ Majority of bicycle parking spaces will be located in underground parking garage
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	☒
	2.3	**Shower & change facilities**	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	☒
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	☒
	2.4	**Bicycle repair station**	
BETTER	2.4.1	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)	☒

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☑ LRT access within site
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☒
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☒
	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	☒
	4.2	**Carpool parking**	
BASIC	4.2.1	Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	☒
BETTER	4.2.2	At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	☒
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces *(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	☒

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	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	☑ Number of parking spaces meet ZBL requirements
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	Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	☒
	7.	**OTHER**	
	7.1	**On-site amenities to minimize off-site trips**	
BETTER	7.1.1	Provide on-site amenities to minimize mid-day or mid-commute errands	☒

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	☑ All vehicle parking is underground
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑ LRT access within site
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑ Ground floor includes glass windows and doors
	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)*	☑ LRT access within site
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)*	☑ LRT access within site

		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)*	☑ On-site sidewalks are constructed with either concrete or unit pavers
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)*	☑ Sidewalks are easily accessible
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)*	☑ Entrances are directly adjacent to existing sidewalk network
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☑ LRT access within site
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☑ Sidewalks will include lighting and trees
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	☑ Sidewalks will include lighting and trees
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)	☑ Wayfinding anticipated, as LRT access is within site

		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)*	☑ Bicycle parking is provided in highly visible areas or in the underground parking garage
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)*	☑ Bicycle parking exceeds the ZBL requirements
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)*	☑ Bicycle parking exceeds the ZBL requirements
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	☑ Bicycle parking exceeds the ZBL requirements
	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)*	☑ Majority of bicycle parking spaces provided in underground parking garage
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	☑ LRT access within site
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☒
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☒

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☒
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(see Zoning By-law Section 94)*	☒
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☒
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑ Number of parking spaces meet ZBL requirements
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)	☒

TRANSPORTATION DEMAND MANAGEMENT

TDM Measures Checklist

TDM Measures Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

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
★	The measure is one of the most dependably effective tools to encourage the use of sustainable modes

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		1.	**TDM PROGRAM MANAGEMENT**	
		1.1	**Program coordinator**	
BASIC	★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☒
		1.2	**Travel surveys**	
BETTER		1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☒
		2.	**WALKING AND CYCLING**	
		2.1	**Information on walking/cycling routes & destinations**	
BASIC		2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances	☒
		2.2	**Bicycle skills training** *Commuter travel*	
BETTER	★	2.2.1	Offer on-site cycling courses for commuters, or subsidize off-site courses	☒
		2.3	**Valet bike parking** *Visitor travel*	
BETTER		2.3.1	Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	☒

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		3.	**TRANSIT**	
		3.1	**Transit information**	
BASIC		3.1.1	Display relevant transit schedules and route maps at entrances	☒
BASIC		3.1.2	Provide online links to OC Transpo and STO information	☒
BETTER		3.1.3	Provide real-time arrival information display at entrances	☒
		3.2	**Transit fare incentives**	
			Commuter travel	
BETTER		3.2.1	Offer preloaded PRESTO cards to encourage commuters to use transit	☒
BETTER	★	3.2.2	Subsidize or reimburse monthly transit pass purchases by employees	☒
			Visitor travel	
BETTER		3.2.3	Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	☒
		3.3	**Enhanced public transit service**	
			Commuter travel	
BETTER		3.3.1	Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	☒
			Visitor travel	
BETTER		3.3.2	Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	☒
		3.4	**Private transit service**	
			Commuter travel	
BETTER		3.4.1	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	☒
			Visitor travel	
BETTER		3.4.2	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	☒

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		4.	**RIDESHARING**	
		4.1	**Ridematching service**	
			Commuter travel	
BASIC	★	4.1.1	Provide a dedicated ridematching portal at OttawaRideMatch.com	☒
		4.2	**Carpool parking price incentives**	
			Commuter travel	
BETTER		4.2.1	Provide discounts on parking costs for registered carpools	☒
		4.3	**Vanpool service**	
			Commuter travel	
BETTER		4.3.1	Provide a vanpooling service for long-distance commuters	☒
		5.	**CARSHARING & BIKESHARING**	
		5.1	**Bikeshare stations & memberships**	
BETTER		5.1.1	Contract with provider to install on-site bikeshare station for use by commuters and visitors	☒
			Commuter travel	
BETTER		5.1.2	Provide employees with bikeshare memberships for local business travel	☒
		5.2	**Carshare vehicles & memberships**	
			Commuter travel	
BETTER		5.2.1	Contract with provider to install on-site carshare vehicles and promote their use by tenants	☑
BETTER		5.2.2	Provide employees with carshare memberships for local business travel	☒
		6.	**PARKING**	
		6.1	**Priced parking**	
			Commuter travel	
BASIC	★	6.1.1	Charge for long-term parking (daily, weekly, monthly)	☒
BASIC		6.1.2	Unbundle parking cost from lease rates at multi-tenant sites	☒
			Visitor travel	
BETTER		6.1.3	Charge for short-term parking (hourly)	☒

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		7.	**TDM MARKETING & COMMUNICATIONS**	
		7.1	**Multimodal travel information**	
			Commuter travel	
BASIC	★	7.1.1	Provide a multimodal travel option information package to new/relocating employees and students	☒
			Visitor travel	
BETTER	★	7.1.2	Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	☒
		7.2	**Personalized trip planning**	
			Commuter travel	
BETTER	★	7.2.1	Offer personalized trip planning to new/relocating employees	☒
		7.3	**Promotions**	
			Commuter travel	
BETTER		7.3.1	Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	☒
		8.	**OTHER INCENTIVES & AMENITIES**	
		8.1	**Emergency ride home**	
			Commuter travel	
BETTER	★	8.1.1	Provide emergency ride home service to non-driving commuters	☒
		8.2	**Alternative work arrangements**	
			Commuter travel	
BASIC	★	8.2.1	Encourage flexible work hours	☒
BETTER		8.2.2	Encourage compressed workweeks	☒
BETTER	★	8.2.3	Encourage telework	☒
		8.3	**Local business travel options**	
			Commuter travel	
BASIC	★	8.3.1	Provide local business travel options that minimize the need for employees to bring a personal car to work	☒
		8.4	**Commuter incentives**	
			Commuter travel	
BETTER		8.4.1	Offer employees a taxable, mode-neutral commuting allowance	☒
		8.5	**On-site amenities**	
			Commuter travel	
BETTER		8.5.1	Provide on-site amenities/services to minimize mid-day or mid-commute errands	☒

TDM Measures Checklist:
Residential Developments (multi-family, condominium or subdivision)

Legend

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
★	The measure is one of the most dependably effective tools to encourage the use of sustainable modes

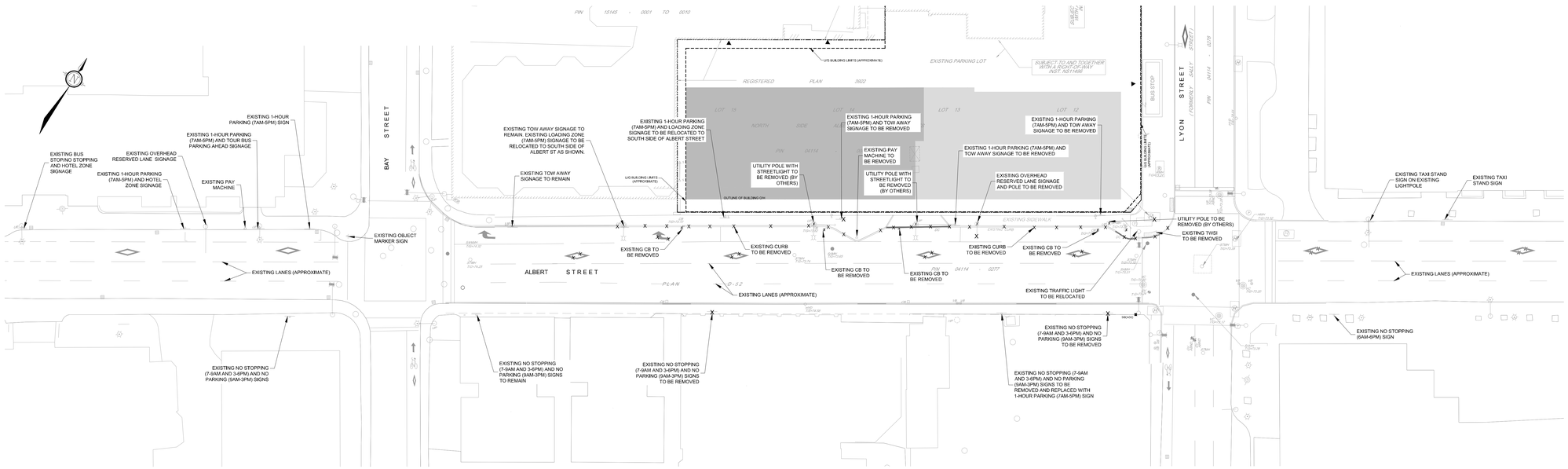
			TDM measures: *Residential developments*	Check if proposed & add descriptions
		1.	**TDM PROGRAM MANAGEMENT**	
		1.1	**Program coordinator**	
BASIC	★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☒
		1.2	**Travel surveys**	
BETTER		1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☒
		2.	**WALKING AND CYCLING**	
		2.1	**Information on walking/cycling routes & destinations**	
BASIC		2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances *(multi-family, condominium)*	☒
		2.2	**Bicycle skills training**	
BETTER		2.2.1	Offer on-site cycling courses for residents, or subsidize off-site courses	☒

			TDM measures: *Residential developments*	Check if proposed & add descriptions
		3.	**TRANSIT**	
		3.1	**Transit information**	
BASIC		3.1.1	Display relevant transit schedules and route maps at entrances *(multi-family, condominium)*	☒
BETTER		3.1.2	Provide real-time arrival information display at entrances *(multi-family, condominium)*	☒
		3.2	**Transit fare incentives**	
BASIC	★	3.2.1	Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit	☒
BETTER		3.2.2	Offer at least one year of free monthly transit passes on residence purchase/move-in	☒
		3.3	**Enhanced public transit service**	
BETTER	★	3.3.1	Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels *(subdivision)*	☒
		3.4	**Private transit service**	
BETTER		3.4.1	Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)	☒
		4.	**CARSHARING & BIKESHARING**	
		4.1	**Bikeshare stations & memberships**	
BETTER		4.1.1	Contract with provider to install on-site bikeshare station (*multi-family)*	☒
BETTER		4.1.2	Provide residents with bikeshare memberships, either free or subsidized *(multi-family)*	☒
		4.2	**Carshare vehicles & memberships**	
BETTER		4.2.1	Contract with provider to install on-site carshare vehicles and promote their use by residents	☑
BETTER		4.2.2	Provide residents with carshare memberships, either free or subsidized	☒
		5.	**PARKING**	
		5.1	**Priced parking**	
BASIC	★	5.1.1	Unbundle parking cost from purchase price *(condominium)*	☑
BASIC	★	5.1.2	Unbundle parking cost from monthly rent *(multi-family)*	☑

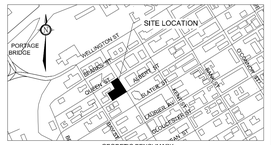
		TDM measures: *Residential developments*	Check if proposed & add descriptions
		6. TDM MARKETING & COMMUNICATIONS	
		6.1 Multimodal travel information	
BASIC	★	6.1.1 Provide a multimodal travel option information package to new residents	☒
		6.2 Personalized trip planning	
BETTER	★	6.2.1 Offer personalized trip planning to new residents	☒

APPENDIX G

Albert Street Functional Design



EXISTING CONDITIONS AND REMOVALS AND RELOCATIONS

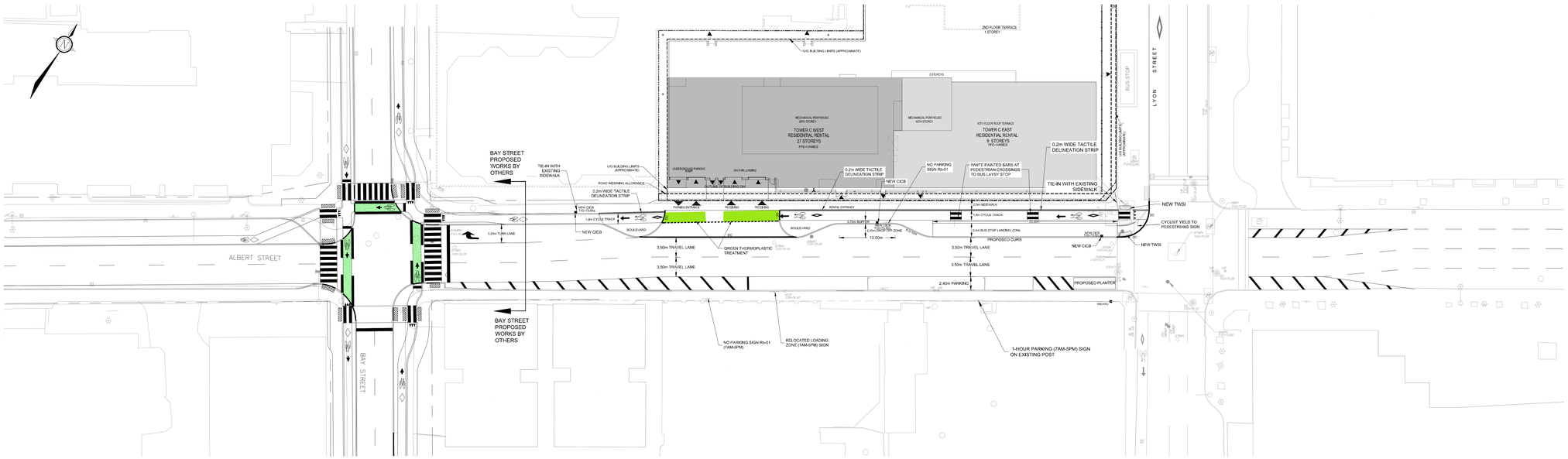


GEODETIC BENCHMARK

MON. No. 263
Wellington Street 8.79m from Light Pole, 1.58m from MH and 8.93m from MH
N=5031559.614 E=366805.387 ELV. 66.559m

LEGEND

- EXISTING STANDARD IRON BAR / CONTROL POINT
- EXISTING DEPRESSED CURB
- EXISTING JOINT USE STREET LIGHT
- EXISTING TRAFFIC LIGHT
- EXISTING STREET LIGHT
- EXISTING BELL MANHOLE
- EXISTING HYDRO MANHOLE
- EXISTING JOINT TELECOMMUNICATIONS MANHOLE
- EXISTING ROGERS CABLE MANHOLE
- EXISTING GAS VALVE
- EXISTING UNDERGROUND UTILITIES CHAMBER - ATRA / BELL / HYDRO / ROGERS / TELLUS / TRAFFIC
- EXISTING HYDRO / UTILITY POLE
- EXISTING GUY WIRE
- EXISTING HYDRANT C3W LEAD & SHUT OFF VALVE BOX
- EXISTING WATERMAIN VALVE CHAMBER
- EXISTING WATERMAIN SHUT-OFF VALVE BOX
- EXISTING TRAFFIC CONTROL BOX
- EXISTING VERTICAL TRAFFIC LIGHT DISCONNECT
- EXISTING TRAFFIC MANHOLE



PROPOSED CONDITIONS

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

CLARIDGE HOMES

No.	REVISION	DATE	BY
4.	REVISED PER CITY COMMENTS	MAY 14/2019	GJM
3.	REVISED PER TRAFFIC COMMENTS	MAY 2/2019	GJM
2.	ISSUED WITH SITE PLAN APPLICATION	FEB 19/2019	GJM
1.	DRAFT FOR COORDINATION	FEB 1/2019	JL

SCALE 1:300

DESIGN LGB/JL
CHECKED GJM/JL
DRAWN M/WC/LGB
CHECKED JL/GJM
APPROVED GJM

FOR REVIEW ONLY

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
383 ALBERT STREET / 340 QUEEN STREET
ALBERT AND LYON STREET DEVELOPMENT (MOON)

DRAWING NAME
FUNCTIONAL DESIGN - ALBERT STREET

PROJECT No. 109111
REV REV # 4
DRAWING No. 109111-FD

PLANNO.DWG - 1189mmx841mm

APPENDIX H

Intersection MMLOS Analysis

Intersection MMLOS Analysis

Pedestrian Level of Service (PLOS)

Exhibit 5 of the Addendum to the MMLOS guidelines has been used to evaluate the PLOS at all intersections within the study area. Exhibit 22 of the MMLOS guidelines suggests a target PLOS A for all roadways within 600m of a rapid transit station. The results of the intersection PLOS analysis are summarized as follows:

- Intersections at Queen Street: **Tables 1**, **2**, and **3**;
- Intersections at Albert Street: **Tables 4**, **5**, and **6**;
- Intersections at Slater Street: **Tables 7**, **8**, and **9**.

Bicycle Level of Service (BLOS)

Exhibit 12 of the MMLOS guidelines has been used to evaluate the BLOS at all intersections within the study area. Within 600m of a rapid transit station, Exhibit 22 of the MMLOS guidelines suggests a target BLOS B for all roadways designated as local cycling routes (Queen Street), a target BLOS B for local roadways designated as spine cycling routes (Bay Street), a target BLOS C for arterial roadways designated as spine cycling routes (Albert Street, Slater Street, and Lyon Street), and a target BLOS D for all roadways with no bike classification (Kent Street). The results of the intersection BLOS analysis are summarized as follows:

- Intersections at Queen Street: **Table 10**;
- Intersections at Albert Street: **Table 11**;
- Intersections at Slater Street: **Table 12**.

Transit Level of Service (TLOS)

Exhibit 16 of the MMLOS guidelines has been used to evaluate the existing TLOS at relevant intersections within the study area. Upon completion of the Confederation Line LRT, no roadways within the study area will have a transit priority designation (thereby having no target TLOS). Those approaches where transit is/will be accommodated have been evaluated for TLOS based on existing conditions. The results of the Synchro analysis from the previous TIS have been carried forward, as they are still representative of the current traffic operations.

- The results of the intersection TLOS analysis are summarized in **Table 13**.

Truck Level of Service (TkLOS)

Exhibit 21 of the MMLOS guidelines has been used to evaluate the TkLOS at relevant intersections within the study area. Within 600m of a rapid transit station, Exhibit 22 of the MMLOS guidelines suggests a target TkLOS D for collector and arterial roadways designated as truck routes (Albert Street, Slater Street, and Kent Street), and a target TkLOS E for arterial roadways not designated as truck routes (Lyon Street). No targets for TkLOS are set for local roadways (Queen Street and Bay Street).

- The results of the intersection TkLOS analysis are summarized in **Table 14**.

Vehicular Level of Service (Auto LOS)

Exhibit 22 of the MMLOS guidelines suggests a target Auto LOS E for all roadways within 600m of a rapid transit station. The results of the Synchro analysis from the previous TIS have been carried forward, as they are still representative of the current traffic operations.

- The results of the intersection Auto LOS analysis are summarized in **Table 15**.

Intersection MMLOS Summary

A summary of the results of the intersection MMLOS analysis is provided in the following tables:

- Intersections at Queen Street: **Table 16**;
- Intersections at Albert Street: **Table 17**;
- Intersections at Slater Street: **Table 18**.

All intersections have been evaluated for MMLOS based on the Queen Street Renewal, Albert-Slater Repurposing, and Bay Street Cycling Facility functional designs, as applicable. The functional designs are included in **Figure 1** through **Figure 3** at the end of this appendix for reference.

Table 1: PLOS Intersection Analysis – Queen Street/Kent Street

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	105	No	105	No	105	No	120
Lanes Crossed (3.5m Lane Width)	3		3		3		2	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Permissive	-8	No Left Turn/Prohibited	0	No Left Turn/Prohibited	0	Permissive	-8
Right Turn Conflict	Permissive or Yield	-5	No Right Turn/Prohibited	0	Permissive or Yield	-5	No Right Turn/Prohibited	0
Right Turn on Red	RTOR Allowed	-3	N/A	0	RTOR Allowed	-3	N/A	0
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	> 5m to 10m	-5	No Right Turn	0	> 5m to 10m	-5	No Right Turn	0
Parallel Right Turn Channel	No Right Turn Channel	-4	No Right Turn	0	No Right Turn Channel	-4	No Right Turn	0
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Textured	-4	Textured	-4	Textured	-4	Textured	-4
	PETSI SCORE	**74**		**99**		**82**		**106**
	LOS	**C**		**A**		**B**		**A**
DELAY SCORE								
Cycle Length		60		60		60		60
Pedestrian Walk Time		16.5		16.5		15.8		15.8
	DELAY SCORE	**15.8**		**15.8**		**16.3**		**16.3**
	LOS	**B**		**B**		**B**		**B**
	OVERALL	**C**		**B**		**B**		**B**

Table 2: PLOS Intersection Analysis – Queen Street/Lyon Street

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	88	No	105	No	88	No	105
Lanes Crossed (3.5m Lane Width)	4		3		4		3	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	No Left Turn/Prohibited	0	Permissive	-8	Perm + Prot	-8	No Left Turn/Prohibited	0
Right Turn Conflict	Permissive or Yield	-5	Permissive or Yield	-5	No Right Turn/Prohibited	0	Permissive or Yield	-5
Right Turn on Red	N/A	0	RTOR Allowed	-3	N/A	0	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	> 10m to 15m	-6	> 5m to 10m	-5	No Right Turn	0	> 5m to 10m	-5
Parallel Right Turn Channel	Conventional with Receiving	-3	No Right Turn Channel	-4	No Right Turn	0	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	> 10m to 15m	-6	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	Conventional with Receiving	-3	N/A	0
CROSSING TREATMENT								
Treatment	Textured	-4	Textured	-4	Textured	-4	Textured	-4
	PETSI SCORE	**68**		**74**		**65**		**82**
	LOS	**C**		**C**		**C**		**B**
DELAY SCORE								
Cycle Length		120		120		120		120
Pedestrian Walk Time		24.5		24.5		64.6		90.6
	DELAY SCORE	**38.0**		**38.0**		**12.8**		**3.6**
	LOS	**D**		**D**		**B**		**A**
	OVERALL	**D**		**D**		**C**		**B**

Table 3: PLOS Intersection Analysis – Queen Street/Bay Street

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	120	No	120	No	88	No	120
Lanes Crossed (3.5m Lane Width)	2		2		4		2	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Permissive	-8	No Left Turn/Prohibited	0	No Left Turn/Prohibited	0	Permissive	-8
Right Turn Conflict	Permissive or Yield	-5	No Right Turn/Prohibited	0	Permissive or Yield	-5	No Right Turn/Prohibited	0
Right Turn on Red	N/A	0	RTOR Allowed	-3	RTOR Allowed	-3	N/A	0
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	> 5m to 10m	-5	No Right Turn	0	> 5m to 10m	-5	No Right Turn	0
Parallel Right Turn Channel	No Right Turn Channel	-4	No Right Turn	0	No Right Turn Channel	-4	No Right Turn	0
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Textured	-4	Textured	-4	Textured	-4	Textured	-4
	PETSI SCORE	**92**		**111**		**65**		**106**
	LOS	**A**		**A**		**C**		**A**
DELAY SCORE								
Cycle Length		55		55		60		60
Pedestrian Walk Time		10.1		10.1		17.9		17.9
	DELAY SCORE	**18.3**		**18.3**		**14.8**		**14.8**
	LOS	**B**		**B**		**B**		**B**
	OVERALL	**B**		**B**		**C**		**B**

Table 4: PLOS Intersection Analysis – Albert Street/Kent Street

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	88	No	88	No	88	No	88
Lanes Crossed (3.5m Lane Width)	4		4		4		4	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	No Left Turn/Prohibited	0	No Left Turn/Prohibited	0	No Left Turn/Prohibited	0	Permissive	-8
Right Turn Conflict	Permissive or Yield	-5	No Right Turn/Prohibited	0	No Right Turn/Prohibited	0	No Right Turn/Prohibited	0
Right Turn on Red	RTOR Allowed	-3	N/A	0	N/A	0	N/A	0
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	> 5m to 10m	-5	No Right Turn	0	No Right Turn	0	No Right Turn	0
Parallel Right Turn Channel	No Right Turn Channel	-4	No Right Turn	0	No Right Turn	0	No Right Turn	0
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Standard	-7	Standard	-7	Standard	-7	Standard	-7
	PETSI SCORE	**62**		**79**		**79**		**71**
	LOS	**C**		**B**		**B**		**C**
DELAY SCORE								
Cycle Length		60		60		55		55
Pedestrian Walk Time		17.5		17.5		12.5		12.5
	DELAY SCORE	**15.1**		**15.1**		**16.4**		**16.4**
	LOS	**B**		**B**		**B**		**B**
	OVERALL	**C**		**B**		**B**		**C**

Table 5: PLOS Intersection Analysis – Albert Street/Lyon Street

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	105	No	88	No	88	No	88
Lanes Crossed (3.5m Lane Width)	3		4		4		4	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	No Left Turn/Prohibited	0	Permissive	-8	No Left Turn/Prohibited	0	No Left Turn/Prohibited	0
Right Turn Conflict	No Right Turn/Prohibited	0	No Right Turn/Prohibited	0	No Right Turn/Prohibited	0	Permissive or Yield	-5
Right Turn on Red	N/A	0	N/A	0	N/A	0	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	No Right Turn	0	No Right Turn	0	No Right Turn	0	> 5m to 10m	-5
Parallel Right Turn Channel	No Right Turn	0	No Right Turn	0	No Right Turn	0	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Standard	-7	Standard	-7	Standard	-7	Standard	-7
	PETSI SCORE	**96**		**71**		**79**		**62**
	LOS	**A**		**C**		**B**		**C**
DELAY SCORE								
Cycle Length		60		60		55		55
Pedestrian Walk Time		13.6		13.6		8.5		8.5
	DELAY SCORE	**17.9**		**17.9**		**19.7**		**19.7**
	LOS	**B**		**B**		**B**		**B**
	OVERALL	**B**		**C**		**B**		**C**

Table 6: PLOS Intersection Analysis – Albert Street/Bay Street

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	120	No	120	No	105	No	120
Lanes Crossed (3.5m Lane Width)	2		2		3		2	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	No Left Turn/Prohibited	0	No Left Turn/Prohibited	0	No Left Turn/Prohibited	0	Permissive	-8
Right Turn Conflict	Permissive or Yield	-5	No Right Turn/Prohibited	0	No Right Turn/Prohibited	0	No Right Turn/Prohibited	0
Right Turn on Red	N/A	0	N/A	0	RTOR Allowed	-3	N/A	0
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	> 5m to 10m	-5	No Right Turn	0	No Right Turn	0	No Right Turn	0
Parallel Right Turn Channel	No Right Turn Channel	-4	No Right Turn	0	No Right Turn	0	No Right Turn	0
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Standard	-7	Standard	-7	Standard	-7	Standard	-7
	PETSI SCORE	**97**		**111**		**93**		**103**
	LOS	**A**		**A**		**A**		**A**
DELAY SCORE								
Cycle Length		55		55		60		60
Pedestrian Walk Time		17.8		17.8		8.8		8.8
	DELAY SCORE	**12.6**		**12.6**		**21.8**		**21.8**
	LOS	**B**		**B**		**C**		**C**
	OVERALL	**B**		**B**		**C**		**C**

Table 7: PLOS Intersection Analysis – Slater Street/Kent Street

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	88	No	88	No	88	No	88
Lanes Crossed (3.5m Lane Width)	4		4		4		4	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Permissive	-8	No Left Turn/Prohibited	0	No Left Turn/Prohibited	0	No Left Turn/Prohibited	0
Right Turn Conflict	No Right Turn/Prohibited	0	No Right Turn/Prohibited	0	Permissive or Yield	-5	No Right Turn/Prohibited	0
Right Turn on Red	N/A	0	N/A	0	RTOR Allowed	-3	N/A	0
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	No Right Turn	0	No Right Turn	0	> 5m to 10m	-5	No Right Turn	0
Parallel Right Turn Channel	No Right Turn	0	No Right Turn	0	No Right Turn Channel	-4	No Right Turn	0
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Standard	-7	Standard	-7	Standard	-7	Standard	-7
	PETSI SCORE	**71**		**79**		**62**		**79**
	LOS	**C**		**B**		**C**		**B**
DELAY SCORE								
Cycle Length		60		60		55		55
Pedestrian Walk Time		17.6		17.6		9.6		9.6
	DELAY SCORE	**15.0**		**15.0**		**18.7**		**18.7**
	LOS	**B**		**B**		**B**		**B**
	OVERALL	**C**		**B**		**C**		**B**

Table 8: PLOS Intersection Analysis – Slater Street/Lyon Street

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	88	No	88	No	88	No	88
Lanes Crossed (3.5m Lane Width)	4		4		4		4	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	No Left Turn/Prohibited	0	No Left Turn/Prohibited	0	Permissive	-8	No Left Turn/Prohibited	0
Right Turn Conflict	No Right Turn/Prohibited	0	Permissive or Yield	-5	No Right Turn/Prohibited	0	No Right Turn/Prohibited	0
Right Turn on Red	N/A	0	RTOR Allowed	-3	N/A	0	N/A	0
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	No Right Turn	0	> 5m to 10m	-5	No Right Turn	0	No Right Turn	0
Parallel Right Turn Channel	No Right Turn	0	No Right Turn Channel	-4	No Right Turn	0	No Right Turn	0
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Standard	-7	Standard	-7	Standard	-7	Standard	-7
	PETSI SCORE	**79**		**62**		**71**		**79**
	LOS	**B**		**C**		**C**		**B**
DELAY SCORE								
Cycle Length		60		60		55		55
Pedestrian Walk Time		17.8		17.8		13.7		13.7
	DELAY SCORE	**14.8**		**14.8**		**15.5**		**15.5**
	LOS	**B**		**B**		**B**		**B**
	OVERALL	**B**		**C**		**C**		**B**

Table 9: PLOS Intersection Analysis – Slater Street/Bay Street

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	120	No	120	No	120	No	120
Lanes Crossed (3.5m Lane Width)	2		2		2		2	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Permissive	-8	No Left Turn/Prohibited	0	No Left Turn/Prohibited	0	No Left Turn/Prohibited	0
Right Turn Conflict	No Right Turn/Prohibited	0	No Right Turn/Prohibited	0	Permissive or Yield	-5	No Right Turn/Prohibited	0
Right Turn on Red	N/A	0	RTOR Allowed	-3	N/A	0	N/A	0
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	No Right Turn	0	No Right Turn	0	> 5m to 10m	-5	No Right Turn	0
Parallel Right Turn Channel	No Right Turn	0	No Right Turn	0	No Right Turn Channel	-4	No Right Turn	0
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Standard	-7	Standard	-7	Standard	-7	Standard	-7
	PETSI SCORE	**103**		**108**		**97**		**111**
	LOS	**A**		**A**		**A**		**A**
DELAY SCORE								
Cycle Length		55		55		60		60
Pedestrian Walk Time		25.0		25.0		6.8		6.8
	DELAY SCORE	**8.2**		**8.2**		**23.6**		**23.6**
	LOS	**A**		**A**		**C**		**C**
	OVERALL	**A**		**A**		**C**		**C**

Table 10: BLOS Intersection Analysis – Queen Street

Approach	Bikeway Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
Queen Street/Kent Street				
South Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	2 lanes crossed; 50 km/h	F
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane < 50m; turning speed ≤ 25 km/h	D
		Left Turn Accommodation	No left turn	-
West Approach	Mixed Traffic	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	0 lanes crossed; 50 km/h	B
Queen Street/Lyon Street				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	1 lane crossed; 50 km/h	D
East Approach	Mixed Traffic	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	1 lane crossed; 50 km/h	D
West Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No left turn	-
Queen Street/Bay Street				
North Approach	Cycle Track	Right Turn Lane Characteristics	Cycle track remains to the right of all vehicle lanes	A
		Left Turn Accommodation	N/A(1)	-
South Approach	Cycle Track	Right Turn Lane Characteristics	Cycle track remains to the right of shared through/right turn lane	A
		Left Turn Accommodation	N/A(1)	-
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane > 50m	F
		Left Turn Accommodation	No left turn	-
West Approach	Mixed Traffic	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	0 lanes crossed; 50 km/h	B

1. Cyclists are required to dismount to turn left; BLOS not applicable

Table 11: BLOS Intersection Analysis – Albert Street

Approach	Bikeway Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
Albert Street/Kent Street				
South Approach	Mixed Traffic	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	2 lanes crossed; 50 km/h	F
East Approach	Cycle Track	Right Turn Lane Characteristics	Bike lane remains to the right of right turn lane	A
		Left Turn Accommodation	No left turn	-
Albert Street/Lyon Street				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No left turn	-
East Approach	Cycle Track	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	1 lane crossed; 50 km/h	C
Albert Street/Bay Street				
North Approach	Cycle Track	Right Turn Lane Characteristics	Protected intersection; cyclists do not interact with vehicular traffic	A
		Left Turn Accommodation	No left turn	-
South Approach	Cycle Track	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	Protected intersection; two-stage left turn	A
East Approach	Cycle Track	Right Turn Lane Characteristics	Cycle track remains to the right of right turn lane	A
		Left Turn Accommodation	Protected intersection; two-stage left turn	A

Table 12: BLOS Intersection Analysis – Slater Street

Approach	Bikeway Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
Slater Street/Kent Street				
South Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No left turn	-
West Approach	Cycle Track	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	Two-stage left-turn bike box	A
Slater Street/Lyon Street				
North Approach	Curbside Bike Lane	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	3 lanes crossed; 50 km/h	F
West Approach	Cycle Track	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No left turn	-
Slater Street/Bay Street				
North Approach	Cycle Track	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	Two-stage left-turn bike box	A
South Approach	Cycle Track	Right Turn Lane Characteristics	Protected intersection; cyclists do not interact with vehicular traffic	A
		Left Turn Accommodation	No left turn	-
West Approach	Cycle Track	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	Protected intersection; two-stage left turn	A

Table 13: TLOS Intersection Analysis

Approach	Delay[1]	TLOS
Queen Street/Lyon Street		
North Approach	15 sec	C
Queen Street/Bay Street		
South Approach	15 sec	C
East Approach	25 sec	D
Albert Street/Kent Street		
East Approach	20 sec	C
Albert Street/Lyon Street		
North Approach	10 sec	B
East Approach	20 sec	C
Albert Street/Bay Street		
East Approach	15 sec	C
Slater Street/Kent Street		
West Approach	15 sec	C
Slater Street/Lyon Street		
North Approach	10 sec	B
West Approach	20 sec	C
Slater Street/Bay Street		
West Approach	10 sec	B

1. Delay based on existing traffic outputs from Synchro analysis of previous TIS

Table 14: TkLOS Intersection Analysis

Approach	Effective Corner Radius	Number of Receiving Lanes on Departure from Intersection	LOS
Queen Street/Kent Street			
South Approach	< 10m	1	F
East Approach	< 10m	3	D
Queen Street/Lyon Street			
North Approach	< 10m	1	F
West Approach	< 10m	3	D
Albert Street/Kent Street			
East Approach	< 10m	4	D
Albert Street/Lyon Street			
North Approach	< 10m	2	D
Albert Street/Bay Street			
East Approach	< 10m	2	D
Slater Street/Kent Street			
South Approach	< 10m	2	D
Slater Street/Lyon Street			
West Approach	< 10m	3	D
Slater Street/Bay Street			
South Approach	< 10m	2	D

Table 15: Auto LOS Intersection Analysis – Existing Traffic

Intersection	AM Peak			PM Peak		
	Max v/c	LOS	Movement	Max v/c	LOS	Movement
Queen Street/ Kent Street	0.47	A	NBL/T/R	0.67	B	WBT/R
Queen Street/ Lyon Street	0.76	C	EBT/R	0.78	C	WBL/T
Queen Street/ Bay Street	0.79	C	NBL/T/R	0.90	D	NBL/T/R
Albert Street/ Kent Street	0.66	B	WBT	0.53	A	WBT
Albert Street/ Lyon Street	0.63	B	WBL/T	0.82	D	WBL/T
Albert Street/ Bay Street	0.63	B	NBL/T	0.97	E	NBL/T
Slater Street/ Kent Street	0.83	D	EBT	0.71	C	NBT/R
Slater Street/ Lyon Street	0.82	D	EBT	0.71	C	SBL/T
Slater Street/ Bay Street	0.72	C	EBT/R	0.75	C	NBT/R

Table 16: Intersection MMLOS Summary – Queen Street

	Intersection	Queen Street/Kent Street				Queen Street/Lyon Street				Queen Street/Bay Street			
		North	South	East	West	North	South	East	West	North	South	East	West
Pedestrian	Island Refuge	No	No	No	No	No	No	No	No	No	No	No	No
	Lanes	3	3	3	2	4	3	4	3	2	2	4	2
	Conflicting Left Turns	Permissive	No Left Turn	No Left Turn	Permissive	No Left Turn	Permissive	Perm + Prot	No Left Turn	Permissive	No Left Turn	No Left Turn	Permissive
	Conflicting Right Turns	Permissive	No Right Turn	Permissive	No Right Turn	Permissive/Yield	Permissive	No Right Turn	Permissive	Permissive	No Right Turn	Permissive	No Right Turn
	Right Turn on Red	RTOR Allowed	-	RTOR Allowed	-	N/A	RTOR Allowed	-	RTOR Allowed	-	RTOR Allowed	RTOR Allowed	-
	Ped Leading Interval	No	No	No	No	No	No	No	No	No	No	No	No
	Parallel Radius	5-10m	-	5-10m	-	10-15m	5-10m	-	5-10m	5-10m	-	5-10m	-
	Parallel Channel	No Channel	-	No Channel	-	Conventional with Receiving	No Channel	-	No Channel	No Channel	-	No Channel	-
	Perpendicular Radius	-	-	-	-	-	-	10-15m	-	-	-	-	-
	Perpendicular Channel	-	-	-	-	-	-	Conventional with Receiving	-	-	-	-	-
	Crosswalk Type	Textured	Textured	Textured	Textured	Textured	Textured	Textured	Textured	Textured	Textured	Textured	Textured
	PETSI Score	74	99	82	106	68	74	65	82	92	111	65	106
	Delay Score	15.8	15.8	16.3	16.3	38.0	38.0	12.8	3.6	18.3	18.3	14.8	14.8
	Level of Service	C	B	B	B	D	D	C	B	B	B	C	B
		C				D				C			
	Target	A				A				A			
Cyclist	Type of Bikeway	-	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	-	Mixed Traffic	Mixed Traffic	Cycle Track	Cycle Track	Mixed Traffic	Mixed Traffic
	Turning Speed	-	Slow	Slow	Slow	Slow	-	Slow	Slow	-	Slow	Slow	Slow
	Right Turn Storage	-	-	< 50m	-	-	-	-	-	-	-	> 50m	-
	Dual Right Turn Lanes	-	No	No	No	No	-	No	No	-	No	No	No
	Shared Through-Right Lane	-	Yes	No	Yes	Yes	-	Yes	Yes	-	Yes	No	Yes
	Two-Stage Left Turns	-	No	No	No	No	-	No	No	No	No	No	No
	Lanes Crossed for Left Turns	-	2	-	0	1	-	1	-	-	-	-	0
	Dual Left Turn Lanes	-	No	No	No	No	-	No	No	No	No	No	No
	Approach Speed	-	50 km/h	50 km/h	50 km/h	50 km/h	-	50 km/h	50 km/h	-	50 km/h	50 km/h	50 km/h
	Level of Service	-	F	D	B	D	-	D	A	A	A	F	B
		F				D				F			
	Target	B				B				B			
Transit	Average Signal Delay	-	-	-	-	15 sec	-	-	-	-	15 sec	25 sec	-
	Level of Service	-	-	-	-	C	-	-	-	-	C	D	-
		-				C				D			
	Target	-				-				-			
Truck	Turning Radius	-	< 10m	< 10m	-	< 10m	-	-	< 10m	-	-	-	-
	Receiving Lanes	-	1	3	-	1	-	-	3	-	-	-	-
	Level of Service	-	F	D	-	F	-	-	D	-	-	-	-
		F				F				-			
	Target	D				E				-			
Auto	Level of Service	B				C				D			
	Target	E				E				E			

Table 17: Intersection MMLOS Summary – Albert Street

	Intersection	Albert Street/Kent Street				Albert Street/Lyon Street				Albert Street/Bay Street			
		North	South	East	West	North	South	East	West	North	South	East	West
Pedestrian	Island Refuge	No	No	No	No	No	No	No	No	No	No	No	No
	Lanes	4	4	4	4	3	4	4	4	2	2	3	2
	Conflicting Left Turns	No Left Turn	No Left Turn	No Left Turn	Permissive	No Left Turn	Permissive	No Left Turn	No Left Turn	No Left Turn	No Left Turn	No Left Turn	Permissive
	Conflicting Right Turns	Permissive	No Right Turn	No Right Turn	No Right Turn	No Right Turn	No Right Turn	No Right Turn	Permissive	Permissive	No Right Turn	No Right Turn	Permissive
	Right Turn on Red	RTOR Allowed	-	-	-	-	-	-	RTOR Allowed	-	-	RTOR Allowed	-
	Ped Leading Interval	No	No	No	No	No	No	No	No	No	No	No	No
	Parallel Radius	5-10m	-	-	-	-	-	-	5-10m	5-10m	-	-	-
	Parallel Channel	No Channel	-	-	-	-	-	-	No Channel	No Channel	-	-	-
	Perpendicular Radius	-	-	-	-	-	-	-	-	-	-	-	-
	Perpendicular Channel	-	-	-	-	-	-	-	-	-	-	-	-
	Crosswalk Type	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
	PETSI Score	62	79	79	71	96	71	79	62	97	111	93	103
	Delay Score	15.1	15.1	16.4	16.4	17.9	17.9	19.7	19.7	12.6	12.6	21.8	21.8
	Level of Service	C	B	B	C	B	C	B	C	B	B	C	C
		C				C				C			
	Target	A				A				A			
Cyclist	Type of Bikeway	-	Mixed Traffic	Cycle Track	-	Mixed Traffic	-	Cycle Track	-	Cycle Track	Cycle Track	Cycle Track	-
	Turning Speed	-	Slow	Slow	-	Slow	-	Slow	-	-	Slow	Slow	-
	Right Turn Storage	-	-	25 – 50m	-	-	-	-	-	-	-	25 – 50m	-
	Dual Right Turn Lanes	-	No	No	-	No	-	No	-	-	No	No	-
	Shared Through-Right Lane	-	-	Right Only	-	Yes	-	-	-	-	-	Right Only	-
	Two-Stage Left Turns	-	No	No	-	No	-	No	-	-	Yes	Yes	-
	Lanes Crossed for Left Turns	-	2	-	-	-	-	1	-	-	0	-	-
	Dual Left Turn Lanes	-	No	No	-	No	-	No	-	-	No	No	-
	Approach Speed	-	50 km/h	50 km/h	-	50 km/h	-	50 km/h	-	-	50 km/h	50 km/h	-
	Level of Service	-	F	A	-	A	-	C	-	A	A	A	-
		F				C				A			
	Target	C				C				C			
Transit	Average Signal Delay	-	-	20 sec	-	10 sec	-	20 sec	-	-	-	15 sec	-
	Level of Service	-	-	C	-	B	-	C	-	-	-	C	-
		C				C				C			
	Target	-				-				-			
Truck	Turning Radius	-	-	< 10m	-	< 10m	-	-	-	-	-	< 10m	-
	Receiving Lanes	-	-	4	-	2	-	-	-	-	-	2	-
	Level of Service	-	-	D	-	D	-	-	-	-	-	D	-
		D				D				D			
	Target	D				D				D			
Auto	Level of Service	B				D				E			
	Target	E				E				E			

Table 18: Intersection MMLOS Summary – Slater Street

	Intersection	Slater Street/Kent Street				Slater Street/Lyon Street				Slater Street/Bay Street			
		North	South	East	West	North	South	East	West	North	South	East	West
Pedestrian	Island Refuge	No	No	No	No	No	No	No	No	No	No	No	No
	Lanes	4	4	4	4	4	4	4	4	2	2	2	2
	Conflicting Left Turns	Permissive	No Left Turn	No Left Turn	No Left Turn	No Left Turn	No Left Turn	Permissive	No Left Turn	Permissive	No Left Turn	No Left Turn	No Left Turn
	Conflicting Right Turns	No Right Turn	No Right Turn	Permissive	No Right Turn	No Right Turn	Permissive	No Right Turn	No Right Turn	No Right Turn	No Right Turn	Permissive	No Right Turn
	Right Turn on Red	-	-	RTOR Allowed	-	-	RTOR Allowed	-	-	-	RTOR Allowed	-	-
	Ped Leading Interval	No	No	No	No	No	No	No	No	No	No	No	No
	Parallel Radius	-	-	5-10m	-	-	5-10m	-	-	-	-	5-10m	-
	Parallel Channel	-	-	No Channel	-	-	No Channel	-	-	-	-	No Channel	-
	Perpendicular Radius	-	-	-	-	-	-	-	-	-	-	-	-
	Perpendicular Channel	-	-	-	-	-	-	-	-	-	-	-	-
	Crosswalk Type	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
	PETSI Score	71	79	62	79	79	62	71	79	103	108	97	111
	Delay Score	15.0	15.0	18.7	18.7	14.8	14.8	15.5	15.5	8.2	8.2	23.6	23.6
	Level of Service	C	B	C	B	B	C	C	B	A	A	C	C
		C				C				C			
	Target	A				A				A			
Cyclist	Type of Bikeway	-	Mixed Traffic	-	Cycle Track	Bike Lane	-	-	Cycle Track	Cycle Track	Cycle Track	-	Cycle Track
	Turning Speed	-	Slow	-	Slow	Slow	-	-	Slow	-	Slow	-	Slow
	Right Turn Storage	-	-	-	-	-	-	-	-	-	-	-	-
	Dual Right Turn Lanes	-	No	-	No	No	-	-	No	-	No	-	No
	Shared Through-Right Lane	-	Yes	-	-	-	-	-	Yes	-	Yes	-	-
	Two-Stage Left Turns	-	No	-	Yes	No	-	-	No	Yes	No	-	Yes
	Lanes Crossed for Left Turns	-	-	-	-	3	-	-	-	-	-	-	-
	Dual Left Turn Lanes	-	No	-	No	No	-	-	No	No	No	-	No
	Approach Speed	-	50 km/h	-	50 km/h	50 km/h	-	-	50 km/h	-	50 km/h	-	50 km/h
	Level of Service	-	A	-	A	F	-	-	A	A	A	-	A
		A				F				A			
	Target	C				C				C			
Transit	Average Signal Delay	-	-	-	15 sec	10 sec	-	-	20 sec	-	-	-	10 sec
	Level of Service	-	-	-	C	B	-	-	C	-	-	-	B
		C				C				B			
	Target	-				-				-			
Truck	Turning Radius	-	< 10m	-	-	-	-	-	< 10m	-	< 10m	-	-
	Receiving Lanes	-	2	-	-	-	-	-	3	-	2	-	-
	Level of Service	-	D	-	-	-	-	-	D	-	D	-	-
		D				D				D			
	Target	D				D				D			
Auto	Level of Service	D				D				C			
	Target	E				E				E			

Figure 1: Queen Street Renewal

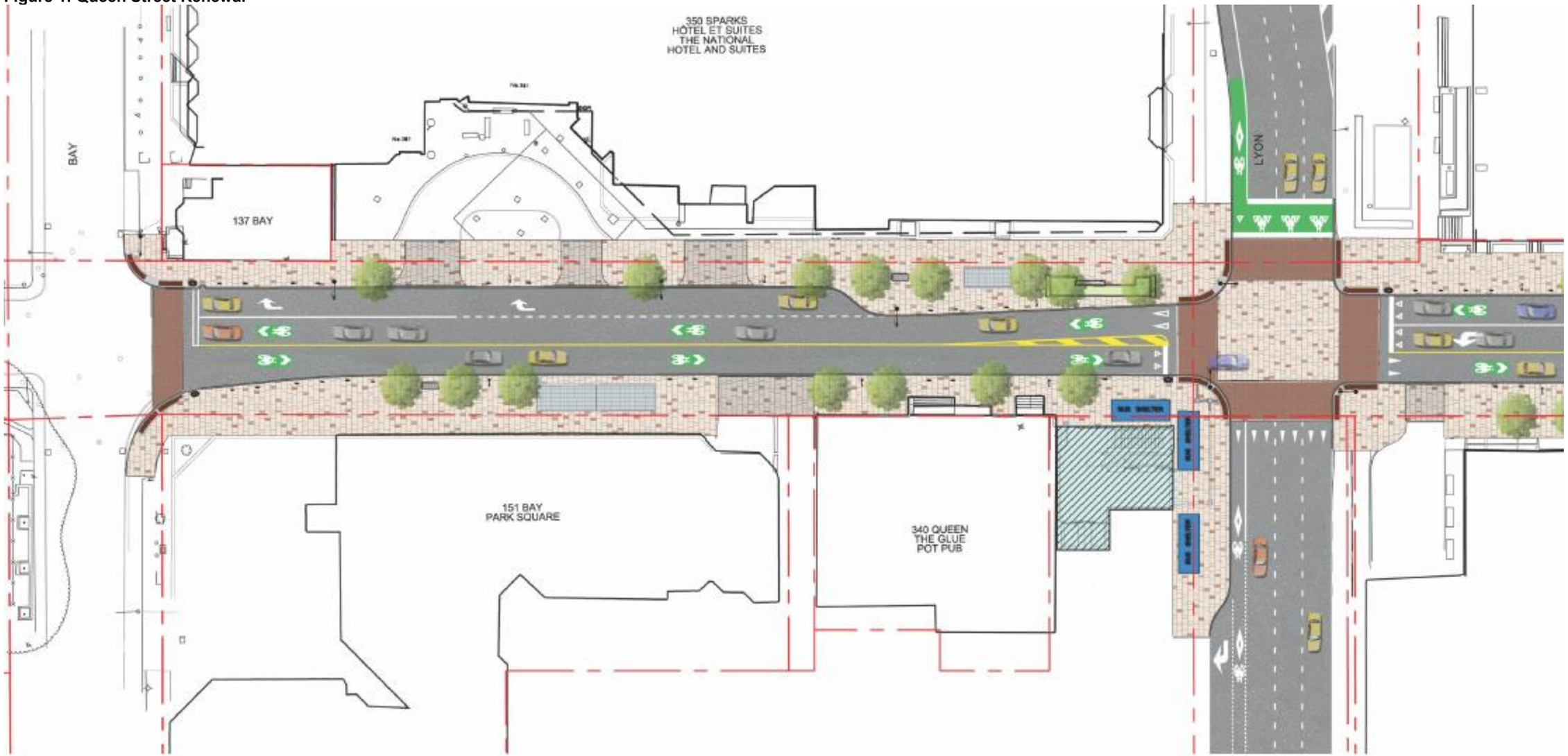


Figure 2: Albert-Slater Post-LRT Repurposing

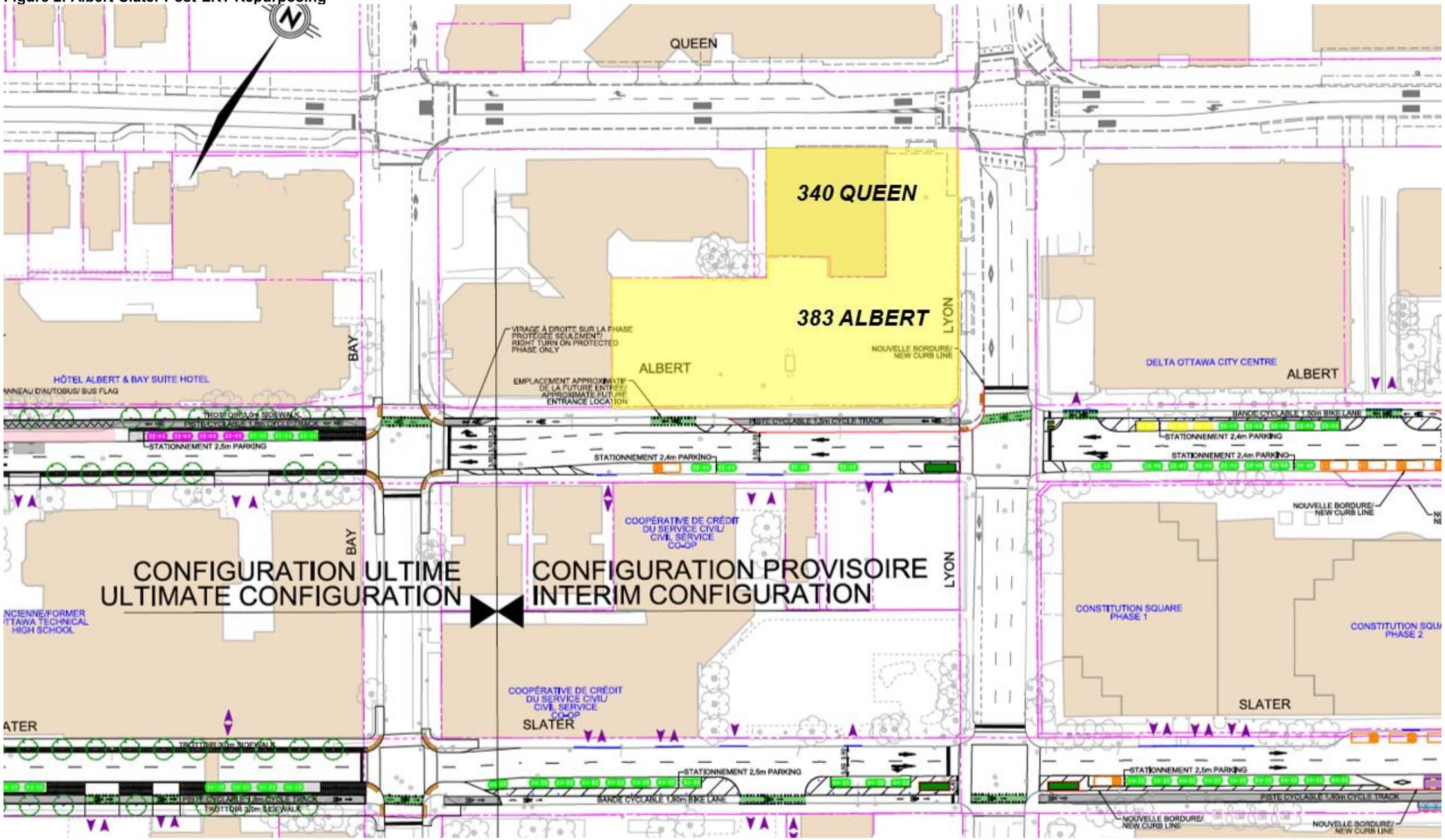


Figure 3: Bay Street Cycling Facilities