APPENDIX A

SCREENING FORM & COMMENT RESPONSE

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24 April 2023

City of Ottawa
Development Review Services
110 Laurier Avenue West
Ottawa, ON K1P 1J1

Attention: Neeti Paudel, P.Eng.

Dear Neeti:

Re: 240-270 Lamarche & 3484 Innes – Lépine TIA
Step 4 Plan of Subdivision– Response to City Comments

The following response form has been prepared to address City of Ottawa comments received on November 28, 2021. City comments are noted in black with the corresponding responses from Parsons in Green.

Transportation Engineering Services

Ensure that the rezoning only allows for the four options provided in the TIA Strategy report. Previous submissions with higher density had significant impact on the road network. Noted, proponent intends to design one of the four proposed options.

Traffic Signal Analysis has not been provided for Lamarche and Innes which is DC Eligible. Please provide a signal warrant. Noted, traffic signal warrant has been provided with this submission.

Traffic Signal Design

Traffic Signal Design and Specification reserves the right to make future comments based on subsequent submissions, if any. Noted.

Street Lighting

No comment with this TIA. We reserve the right to comment on future submissions. Please note, if there are road geometry changes or signal work is undertaken a street light review would be required. Noted.

Traffic Signal Operations

Explain how the suggested 15s Innes/Lamarche crossing time suggestion was arrived at on pg. 35.

If bi-directional crossride is to be implemented on the west side of Lamarche, phasing will require segregation from NBL vehicle phasing. Acknowledged, the cyclist and pedestrian timings provided in the analysis were not fully segregated; however, additional time can be provided if the total cycle length was increased accordingly to accommodate the additional phases. We have provided a sample timing plan with fully segregated AT timing plans with a 120s cycle length, shown to operate adequately. The new AT crossing times were calculated based on pedestrian clearing distances.

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24 April 2023

City of Ottawa
Development Review Services
110 Laurier Avenue West
Ottawa, ON K1P 1J1

Attention: Neeti Paudel, P.Eng.

Dear Neeti:

Re: Lepine Innes Plan of Subdivision and Zoning By-Law Amendment TIA
Step 4 – Response to City Comments

The following response form has been prepared to address City of Ottawa comments received on April 20, 2022. City comments are noted in black with the corresponding responses from Parsons in Green.

Transportation Engineering Services

Ensure that the rezoning does not allow for an option that would generate a greater impact than the options provided in the TIA Strategy report. Previous submissions with higher density had significant impact on the road network. Noted. The four options represent the potential mix for the full development permitted within the accepted zoning; no additional density is permitted.

The standard cross section for a public local roadway has an 8.5m width with parking on both sides. Noted.

Traffic Signal Analysis was not provided for Lamarche and Innes which is a DC eligible intersection. Noted.

Clarification is required as to whether the applicant will front end the signals and the timing for payback. Yes, the client intends to front-end these costs. The anticipated payback period is by 2027 if Zone 2 is confirmed residential use. If a retirement home or lower density Zone 2 is proposed, then it may be met by 2031 instead.

Traffic Signal Operations

Explain how the suggested 15s Innes/Lamarche crossing time suggestion was arrived at on page 35. Acknowledged, the cyclist and pedestrian timings provided in the analysis were not fully segregated; however, additional time can be provided if the total cycle length was increased accordingly to accommodate the additional phases. We have provided a sample timing plan with fully segregated AT timing plans with a 120s cycle length, shown to operate adequately. The new AT crossing times were calculated based on pedestrian clearing distances.

If a bi-directional cross ride is to be implemented on the west side of Lamarche, phasing will require segregation from NBL vehicle phasing. Noted, refer to comment above.

Traffic Signal Design

Traffic Signal Design and Specification reserves the right to make future comments based on subsequent submissions, if any. Noted

However, since there are proposed changes in the existing roadway geometry for the purpose of construction of a new TCS(s) [pg31/4.4.3 for Lamarche/Innes from un-signalized to signalized] City of Ottawa Traffic Signal Design and Specification Unit is required to complete a review for traffic signal plant design/layout and provide the actual design to the proponent or involved consulting entity. Noted

If the proposed traffic signals are warranted/approved for installation or modifications to existing TCS are approved, and RMA approved, please forward an approved geometry detail design drawings (dwg digital format in NAD 83 coordinates) including following: base mapping, existing and new underground utilities/sewers, new/existing catch basins locations, AutoTurn-Rads Modeling for approved vehicles and approved pavement markings drawings in separate files , no Xref files attached in master file(s), for detail traffic plant design lay out. Noted.

Please send all digital (CADD) design files to Peter.Grajcar@ottawa.ca 613-580-2424 ext. 23035. If not sure as per above request and more detail info needed as per input files, (i.e., format, etc.) please ask for our Dispatch checklist document and it will be gladly provided. Noted.

Street Lighting

No comment with this TIA. We reserve the right to comment on future submissions. Please note, if there are road geometry changes or signal work is undertaken a street light review would be required. Noted

Transit Services

Section 2 - Scoping Report

Site Plan

- Please show a continuous pedestrian path from all buildings to Innes Road in the site plan when a final design option is selected. Pedestrian facilities are proposed continuous throughout the site. Facilities will be confirmed zone by zone as their respective SPA TIA's are completed.

Section 2.1.2 - Existing Conditions

Transit Network

- Route 131
- The description of route 131 is not accurate. Please update.
- A reference to route 46 is included in the description of route 131. Route 46 does not operate in the area.

Noted, section updated.

Section 2.1.3 – Planned Conditions

Figure 9

- The future LRT will terminate at Trim road, not Place d'Orleans as shown in the map. Please update.

Noted, figure updated.

Section 3 – Forecasting Report

3.1.1 Trip Generation and Mode Shares

• Expected new transit trips and potential changes to transit service will be inspected in detail when a final design is selected. Noted

Appendix J - TDM Checklist

• It is noted that a Presto card has been recommended. Please consider including other measures as well. Noted, client to confirm other measures as part of each SPA.

Development Review – Transportation

Ensure that the TIA and the warrant analysis clearly indicate the year that the warrants are met at Lamarche and Innes intersection. The anticipated payback period (warrant met) is by 2027 if Zone 2 is confirmed residential use. If a retirement home or lower density Zone 2 is proposed, then it may be met by 2031 instead, when Zone 3 is built.

The Brian Coburn/Cumberland Transitway EA study is recommending Interim and ultimate design for the Brian Coburn and Cumberland Transitway extension. The interim measures consist of widening Innes Road for 2km from Blair and east for shared transit priority and HOV lanes as well as localized queue jump lanes at the intersection of Blackburn Hamlet Bypass and Navan Road. The project horizon for the interim phase is within 2031 planning horizon based on affordability. The information is provided in the City website. Please include this update in the planning conditions of the TIA. Noted, planning conditions updated.

Other Relevant Transportation Comments

7. Road Right-of-Way Width, Street Trees, Sidewalks. The following comments are provided in review of the proposed road allowance cross-section prepared by Neuf. The proposed ROW design has been updated to satisfy the latest City of Ottawa cross-section for 20m local street.

a) The provision of a public road width of 20 metres is acceptable.
b) The proposed road cross-section (Plate 22 of Design Brief) does not provide sufficient space for tree planting and utilities. Street trees are to be 2.0m from the curb and 1.0m from the sidewalk/MUP as an absolute minimum. Please refer to the attached street tree planting standards for your information.
c) The standard cross-section for a public local roadway has an 8.5m width with on-street parking. Consider limiting on-street parking to one side of the street.
d) A 20-metre local street with an 8.5-metre travelled road width should accommodate sidewalks on both sides of the street, street trees and utility installations.
e) Confirm whether the geotechnical investigation recommendations and associated tree setbacks comply with the 2017 Clay Soils Policy requirements.

8. Signalization of Lamarche Avenue/Innes Road Intersection. As concluded in the Parsons TIA and expressed as a condition in the registered subdivision agreement for the subject site, expect a condition of draft plan of subdivision approval for this application to require the front-ending of the intersection of Lamarche Avenue and Innes Road as traffic. The ward councillor also has expressed that this requirement be in the conditions of draft plan of subdivision approval. Noted

22. Transportation Impact Study (TIS). The TIS prepared by Parson, dated October 2021, was circulated to Neeti Paudel, who coordinated the review of the report by internal City staff. The comments received from Planning Services, Transportation Engineering Services, OC Transpo and other City staff concerning the study are attached separately for your consideration and action. Please resubmit a revise study accordingly. Noted a revised study is being submitted.

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15 February 2023

City of Ottawa
Development Review Services
110 Laurier Avenue West
Ottawa, ON K1P 1J1

Attention: Pascale Lepine, Planning and Marketing Manager

Dear Pascale:

Re: Lepine Innes Plan of Subdivision and Zoning By-Law Amendment TIA
Step 4 – Response to City Comments (2nd set)

The following response form has been prepared to address City of Ottawa comments received on November 16, 2022. City comments are noted in black with the corresponding responses from Parsons in Green. Comments/questions in grey are not transportation comments and need to be addressed/responded to by others.

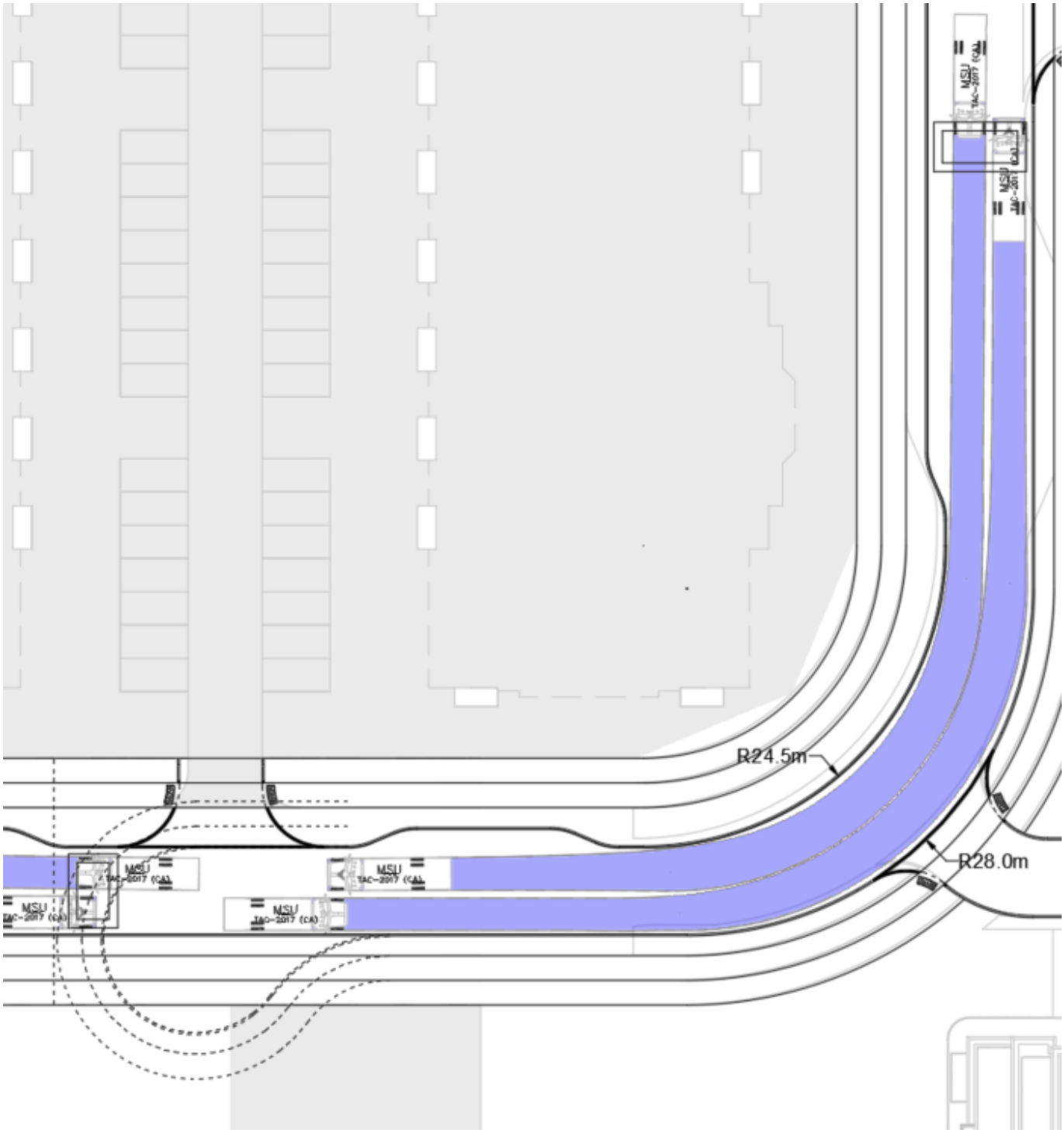
City Staff Comments

1. Scale of Potential Development. I accept your revised approach to limit the proposed zoning amendment to Phase 1 (Blocks 1 and 4 of the draft plan of subdivision) and leave the zoning currently in effect over future Blocks 2 and 3 in place (Development Reserve) at this time.

2. Building Transition. I accept the revised transition setbacks and step backs for Buildings A, B and C adjacent to the existing low-rise residential development. They now comply with the provisions of the standard AM zone.

Draft Plan of Subdivision Application
The following comments are specific to the proposed application for draft plan of subdivision approval.

3. Proposed Draft Plan of Subdivision. Please address the following remaining minor technical comments.
a) Add the road widening (Block 5) to the Land Use Table so that all blocks on the draft plan are referenced.
b) Are there any natural and artificial features within the limits of the plan, such as existing buildings other structures, fences, etc.? This previous request appears to have been missed or was not responded to in your Response Letter. Please indicate them and their location on the draft plan.
c) Please further revise the City's approval signature block to indicate "Geraldine Wildman, RPP, MCIP, Acting Manager..."
d) Please refer to the Transportation comments below specific to the proposed radii of Street 1. The comments refer to the submitted "Option 1" for Street 1's road allowance. This matter was not raised in the initial transportation comments. Nonetheless, please provide a rationale for the wide curvature of the future public street. Given the site proposes potential commercial uses (Zone 3) and high-density residential uses, it was deemed prudent to design the local street to accommodate oncoming MSU trucks without overlapping paths within the bends. Furthermore, the TAC design manual (Chapter 3) Tables 3.2.2 and 3.2.4 indicates that a super-elevated corner encourages 30km/h speeds for radii as wide as 30 meters (even wider than the proposed 24.5 to 28m). The following figure illustrates the proposed radii and two MSU trucks meeting at the bend at the same time. All vehicle turning movements for the site are attached to this response letter.



4. Parkland Dedication. While I was not privy to your conversation with Phil Castro referred to in your response letter, he is prepared to accept the proposed area of Block 4 on the revised draft plan of subdivision, being 0.1968 ha. However, the intent is that parkland dedication over the balance of the future subdivision phases will be in the form of land rather than a cash-in-lieu of parkland payment.
It remains that the final parkland area to be dedicated will depend upon the future proposed uses and densities on Blocks 2 and 3. This will be expressed as a condition(s) of draft plan of subdivision approval.

5. Road Right-of-Way Width, Street Trees, Sidewalks. The following comments are provided in review of the proposed revised road allowance cross-section that appears on p. 21 of the Design Brochure and the road allowance plan view referred to as “Draft - Option 1”.

a) As you may be aware, the City recently issued a set of approved revised standard road cross-sections, including one for a 20m local road. Given that the draft plan of subdivision is still in review, it is strongly recommended that the new cross-sections be employed. The Technical Service Bulletin is attached for your reference. Acknowledged, the proposed design updated to satisfy the latest City of Ottawa cross-section for 20m local street.

b) City staff will continue to accept street trees located 2.0m from the curb and 1.0m from the sidewalk/MUP as absolute minimums, if necessary, as indicated in City staff's initial comments. The attached street tree planting standards once again are provided for your information. Noted, the proposed design has been refined to satisfy latest City of Ottawa cross-section for 20m local street.

6. Signalization of Lamarche Avenue/Innes Road Intersection. It is understood that a revised TIA will be resubmitted in the future. In the meantime, your transportation consultant and City staff are continuing to address the design of the signalized intersection for the poses of the RMA. Noted.

7. Transportation Engineering. Please refer to the attached comments from the City's Transportation Engineering Services staff. Many of the comments are provided for your information and likely will be addressed through conditions of draft plan of subdivision approval. However, the comment pertaining to the proposed radii of Street 1 requires attention and a response. If this matter needs to be discussed further, please let me know. A meeting with Transportation staff may be necessary. Please refer to the responses to Comment 3.

8. Timing of Draft Plan Approval. As Development Review staff already have conveyed to you and your engineering consultant, the stormwater design capacity for the proposed subdivision lands remains unknown at this time. As a result, the Manager, Development Review – East will not render a decision respecting the draft plan of subdivision until the upgraded stormwater facility is operational and the subdivision lands deemed serviceable.

Zoning By-law Amendment Application

The following comments are specific to the proposed zoning by-law amendment application.

9. Proposed Zoning. It is acknowledged that the revised proposal is to rezone only Blocks 1 and 4 to "Arterial Mainstreet" (AM), with a few site-specific exceptions as suggested below, and to leave the current "Development Reserve" (DR) in effect over Blocks 2 and 3 in place for future consideration. The application of a Holding (-h) provision no longer appears necessary.

10. Park Use. In the context of the subject subdivision and site development applications, given that a park use is already a permitted use in the AM zone, there will be no need to specifically zone the park block as "Parks and Open Space" (O1). However, a few exception provisions are deemed appropriate to protect the integrity of the future municipal parkland from adjacent future development. These provisions are itemized below.

11. Proposed Zoning Provisions. The following comments address the details of the proposed zoning by-law amendment.
a) Front/Corner Side Yard Building Setbacks – A dimensioned site plan was not provided with the partial resubmission. By scaling the initial site plan submitted in support of the related site plan control application, it appears that a minimum building setback of 4.0m to Building C from both Lamarche Avenue and Street 1 is achievable, which as indicated in City staff's initial comment letter would be more appropriate and preferred. What is the proposed dimension to Building C from Street 1, and why is a 4.0m setback not achievable given that the proposed subdivision lot/block dimensions are not yet fixed?
b) Rear/Interior Side Yard Setbacks – An exception provision is to be included the proposed zoning amendment to entrench the proposed yard setbacks for Phase 1 (Buildings A, B and C) of 9.0m and 20m to the south and west lot lines adjacent to the R1 and R3 zones to provide greater assurance for abutting property owners.
c) Building Height Transition – As noted above, the existing graduated building height setbacks and step back provisions of the current AM zone are to be maintained, as is now illustrated on pp. 30-31 of the revised Design Brochure.
d) Maximum Building Height – After considerable discussion, I reluctantly accept your arguments respecting the maximum height limit of 25 metres. The maximum height limit of 25.0m stated in the AM zone provisions will be accepted.
e) Parking – The following comments are offered.

i. An explanation for why a reduced visitor parking rate of 0.1 spaces/dw.u. is preferred is still requested. Perhaps your client can provide empirical data from their portfolio of rental apartment buildings across the City demonstrating that the reduced visitor parking rate is practical and appropriate. The applicant will be encouraging non-auto modes through its site design and TDM offerings to reduce the traffic and environmental implications of providing additional parking. Furthermore, the existing Lamarche Ave provides on-street parking

and the proposed local road will provide additional on-street parking supply to help offset the onsite visitor requirement and limit potential traffic infiltration on adjacent residential streets. The parking details and empirical details will be considered and revisited during the Site Plan Application.

ii. The sharing of the commercial and visitor parking spaces in the at-grade parking area is noted and of no concern. However, it is noted that nine visitor parking spaces are to be provided in the underground parking garage. How is this to work operationally? Should all at-grade visitor and commercial parking spaces be occupied, will visitors be required to obtain access from tenants to gain entry into the parking garage? This seems somewhat unworkable and would risk compromising building and tenant security. Is it intended that there be a parking control management operator? It would be more appropriate and practical were all visitor parking spaces provided in the at-grade parking area. To be clear, it is not expected that the proposed at-grade parking area be expanded; the matter simply requires more explanation.
The parking management details will be revisited during the Site Plan Application.

f) Parkland Provisions. Given that the park use will not be specifically zoned, it is appropriate to apply site-specific zone provisions to ensure the integrity of the park is maintained. Therefore, it is suggested that the following exception provisions be applied: 1) the use and development of the park block is to be in accordance with Sec. 179 of the Zoning By-law (O1 – Parks and Open Space Zone); and 2) a minimum building setback from a park block/lot line of 4.0m shall be imposed. It appears from the initial proposed site plan that such a setback already has been provided.

Review of Submitted Reports

It is understood that a subsequent submission of the supporting engineering reports and plans will follow once the Stormwater Management Pond 1 design and capacity have been resolved and/or approved. Similarly, a revised Transportation Impact Study and Tree Conservation report are expected to be submitted in the near future. Noted.

12. Geotechnical Investigation. City staff's review of the revised Geotechnical Investigation report and response memorandum will be undertaken at the time of submission of the supporting engineering reports and plans.

13. Environmental Noise Control Study. Please address the following comments and resubmit a separate revised report, not one appended to the geotechnical investigation report.
a) Lamarche Avenue is classified as a major collector road as per Schedule E of the Official Plan (2003) and, therefore, should be assessed in the noise study.
b) Confirm that no exposed rooftop mechanical equipment is proposed for the buildings in Phase 1, as there are noise sensitive uses along Pagé Road.

14. Design Brochure. Please address the following comments and resubmit a revised design brochure.
a) Any revisions to the proposed subdivision layout resulting from the above comments are to be incorporated in the design brochure.
b) The proposed 20m road right-of-way (p.21) is to be revised in response to the above comments. Acknowledged, the proposed design has been updated to satisfy the latest City of Ottawa cross-section for 20m local street.
c) P2 & P1 Level Parking (pp. 24 & 25) – The retail parking standard and gross floor area should be expressed in metric and consistent with the Zoning By-law (3.4 sp./100 sq.m.). Correct the spelling of the work "visitors" in the tables.
d) General Site Plan – Any revisions to the proposed public road layout and cross-section resulting from the above comments are to be incorporated in the general site plan. Noted.
e) Section Development Scale Studies (p.32) – In both sections, please provide a height dimension of the abutting residential zone. Also, a similar section should be provided for the Building C transition, which is the most critical one.
f) East Elevation (p.36) – For complete understanding, it would be beneficial to add a schematic of the adjacent low-rise dwelling in relation to Building C, as is done on the West Elevation (p.35). Please revise the elevation accordingly.
g) Sun Study-June (p.43 & 45) – Provide images for 7:00 and 19:00 for a complete sun study of the summer solstice.
h) General Statistics (p.46) – Provide the retail gross floor area somewhere in the general site statistics.

Technical Agency Comments

15. Conservation Authorities (RVCA). The RVCA's comments respecting the latest partial submission of the revised proposed subdivision and zoning applications are not available at this time and will be undertaken at the time of submission of the supporting engineering reports and plans.

It is requested that you and your consultants review and address the comments and design issues accordingly and further revise the reports and plans as necessary. Once the revisions have been completed, please contact me to discuss the quantity of revised reports and plans that are to be resubmitted to City staff for further review.

Additional Comments

Transportation Engineering Services

1. At GRDD, please label lane widths:
a. At the curb extensions on Avenue de Lamarche
b. At the parking bays on Avenue de Lamarche
c. At the curb extensions on Street No. 1
Noted.

2. Future bus stops planned along Avenue de Lamarche to be confirmed with Transit Services. Noted.

3. Please ensure that all speed humps are located no closer than 1.5m from driveway/private access The local street design has been updated to reflect this comment.

4. Regarding the multi-use pathway crossings at the intersections of Avenue de Lamarche with Street No. 1: a. Consider raised multi-use pathway crossings
b. Stop bars are not required for the multi-use pathway at the Avenue de Lamarche intersections with Street No. 1
c. Ensure mixed crossride pavement markings (per Figure 6.4 of OTM Book 18) are provided
The local street design and intersection design with Lamarche has been updated to reflect these comments.

5. Is there a reason for the wide radiuses (R28/R24.5)? a. Please consider tightening radiuses if possible. Please refer to Comment 3 within City Staff Comments.
b. Such large radii may not serve to slow traffic, and therefore it would be prudent to place additional speed humps on the corners to maintain target separation between speed humps as recommended by the 30km/h Design Toolbox.
Please refer to Comment 3 within City Staff Comments in regard to TAC Chapter 3 that speaks to curb radii and speeds. Additional speed humps within the corners are not justified. Additionally, proposed driveway accesses are proposed in both bends, making these unsuitable locations for speed humps.

6. Review whether private approach curb return radii can be reduced. The proposed site plan uses 5m radii for the private approaches, which is considered a typical curb radius. Reducing the curb radius to less than 5m would cause a standard TAC car to encroach on the opposing lane, which is not recommended from a transportation perspective.

ATTACHMENT

OUTSIDE LANE (TAC Chapter 3 – Table 3.2.2 / Formula 3.2.3)

Table 3.2.2: Maximum Lateral Friction for Low Speed Urban Design

Design Speed (km/h)	Maximum Lateral Friction for Low Speed Urban Design
30	0.31
40	0.25
50	0.21
60	0.18

$$R_{min} = \frac{V^2}{127(e_{max} + f_{max})} \quad (3.2.3)$$

Where:

R_{min} = Minimum radius of curve
e_{max} = Maximum pavement superelevation
f_{max} = Maximum lateral friction
V = Speed of vehicle (km/h)

Radius (centre of vehicle path) = 26.5m

Design Speed (V) = 30 km/h

Fmax = 0.31

Emax = -0.02 (negative for outside lane)

Rmin = 24.4m (rounded)

Given Radius 26.5m, solve for V = 31.2 km/h (rounded)

Table 3.2.4: Minimum Radii for Urban Designs[28]

Design Speed (km/h)		Minimum Radius (m)				
		Crown Section			Superelevated Section	
		Normal[4] (-0.02 m/m)	Reverse[3,4] (+0.02 m/m)		Maximum Rate	
			e_{max} +0.04	e_{max} +0.06	+0.04 (m/m)	+0.06 (m/m)
Low Speed[1]	30	420	30	40	20	20
	40	660	65	80	45	40
	50	950	115	135	80	75
	60	1290	185	220	130	120
High Speed[2]	70	1680	290	330	200	190
	80	2130	400	450	280	250
	90	2620	530	600	380	340
	100	3180	690	770	490	440

INSIDE LANE (TAC Chapter 3 – Table 3.2.4)

Table suggests a minimum radius of 30m. Proposed design is tighter than minimum for the inside lane (24.5m). Radii used support desired speed management for a 30 km/h roadway.

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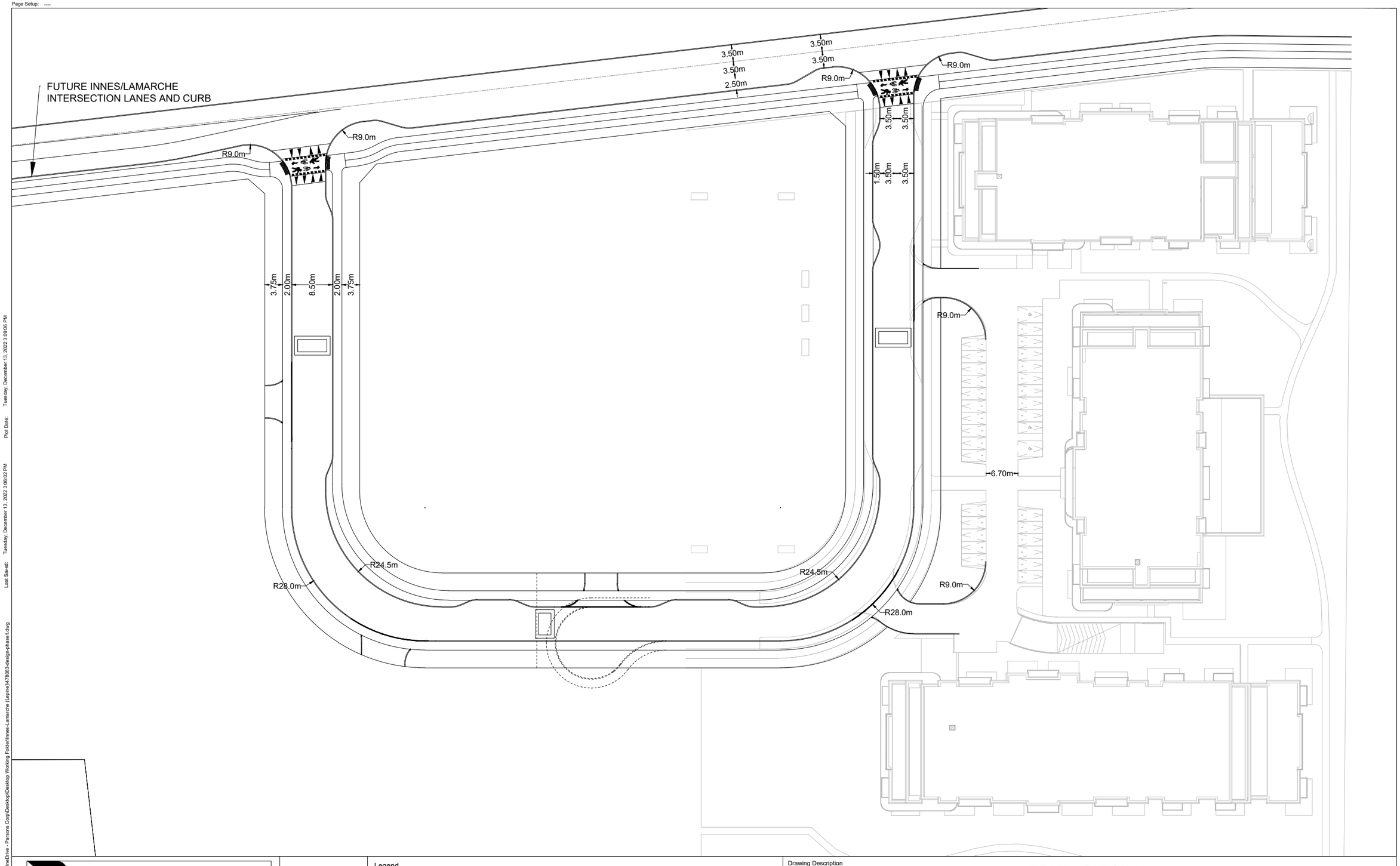

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NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

Legend

Scale (m)

0 5 15 25

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Project Number: 478083	Project Description: 3484 INNES ROAD	

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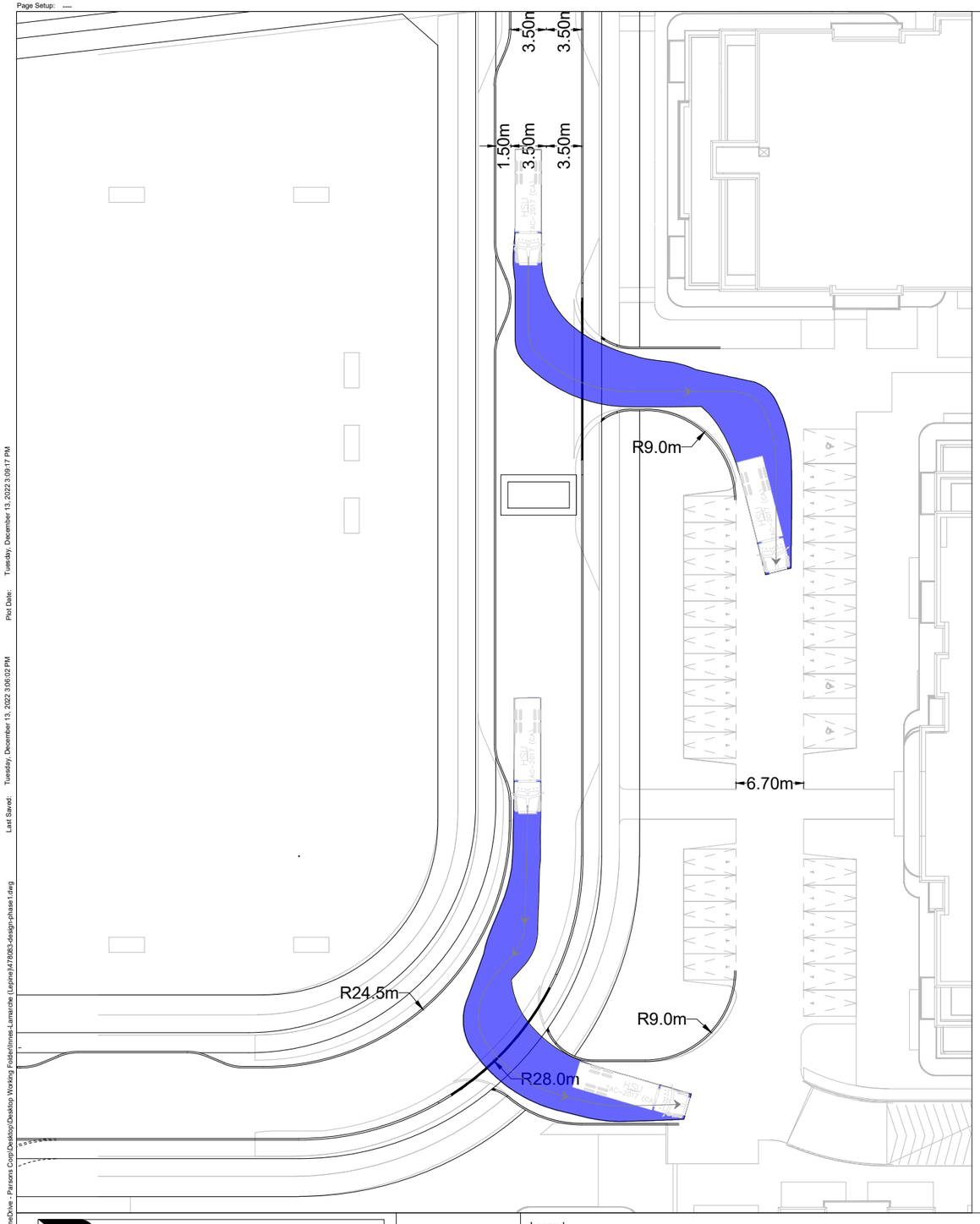

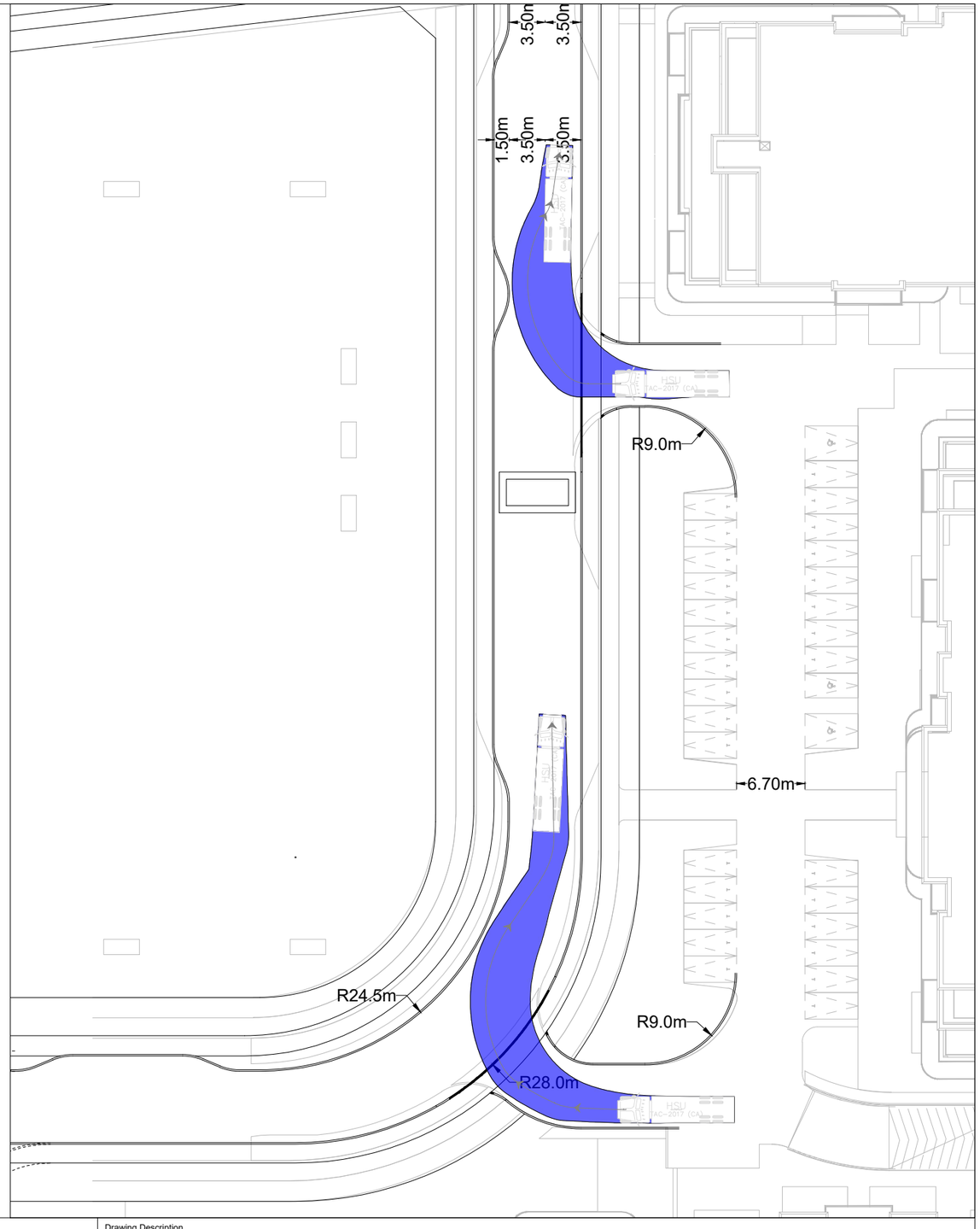

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Drawing Description	DRAFT - OPTION 1 - FIRE ACCESS
Client	
Date	2022/12/13
Figure Number	002
Project Number	478083
Project Description	3484 INNES ROAD

Consultant's Information

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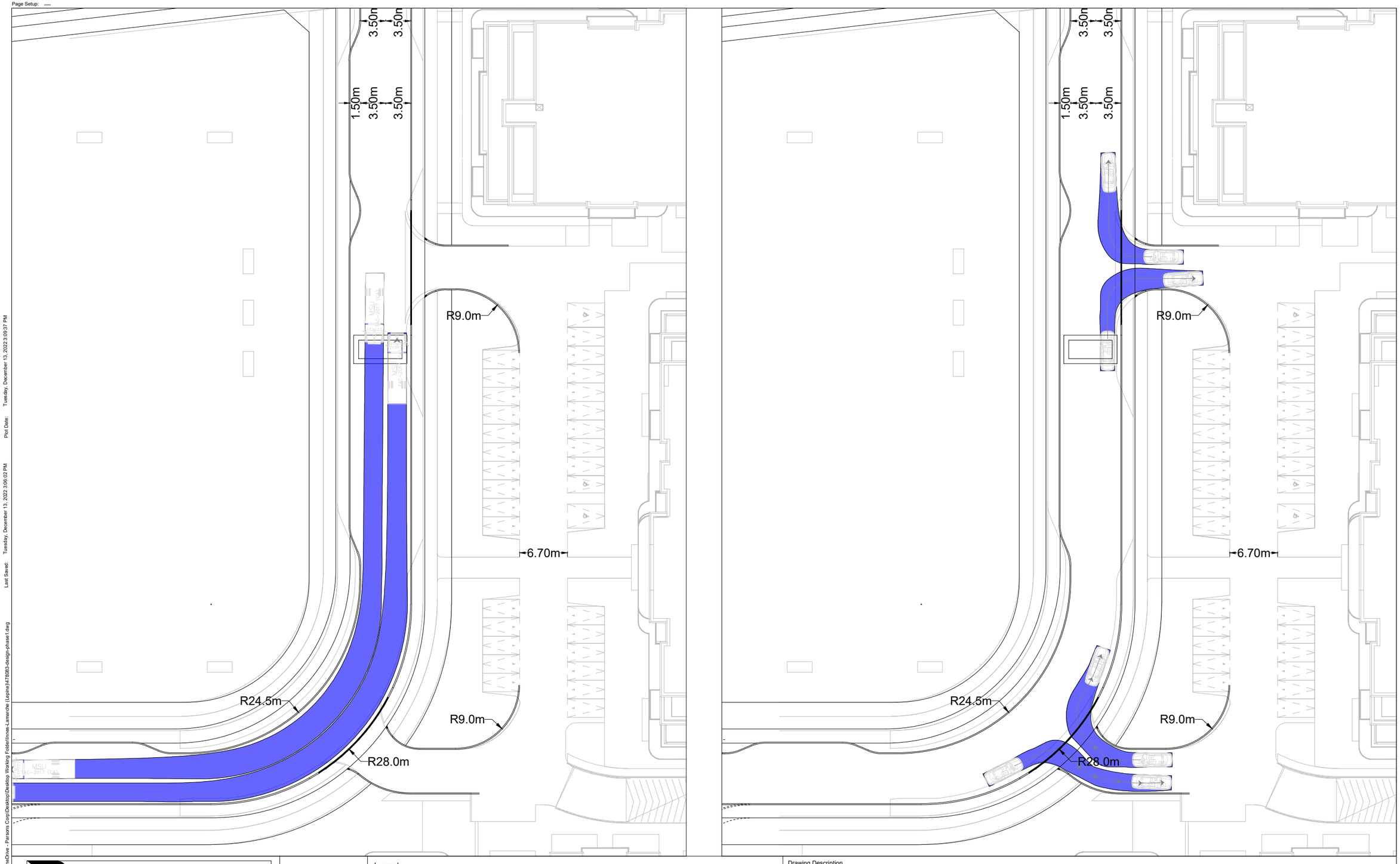

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PARSONS

NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

Legend

Scale (m)

0 5 15 25

Drawing Description: DRAFT - OPTION 1 - MSU CIRCULATION + P ENTERING/EXITING

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	2022/12/13	004
Project Number	**Project Description**	
478083	3484 INNES ROAD	

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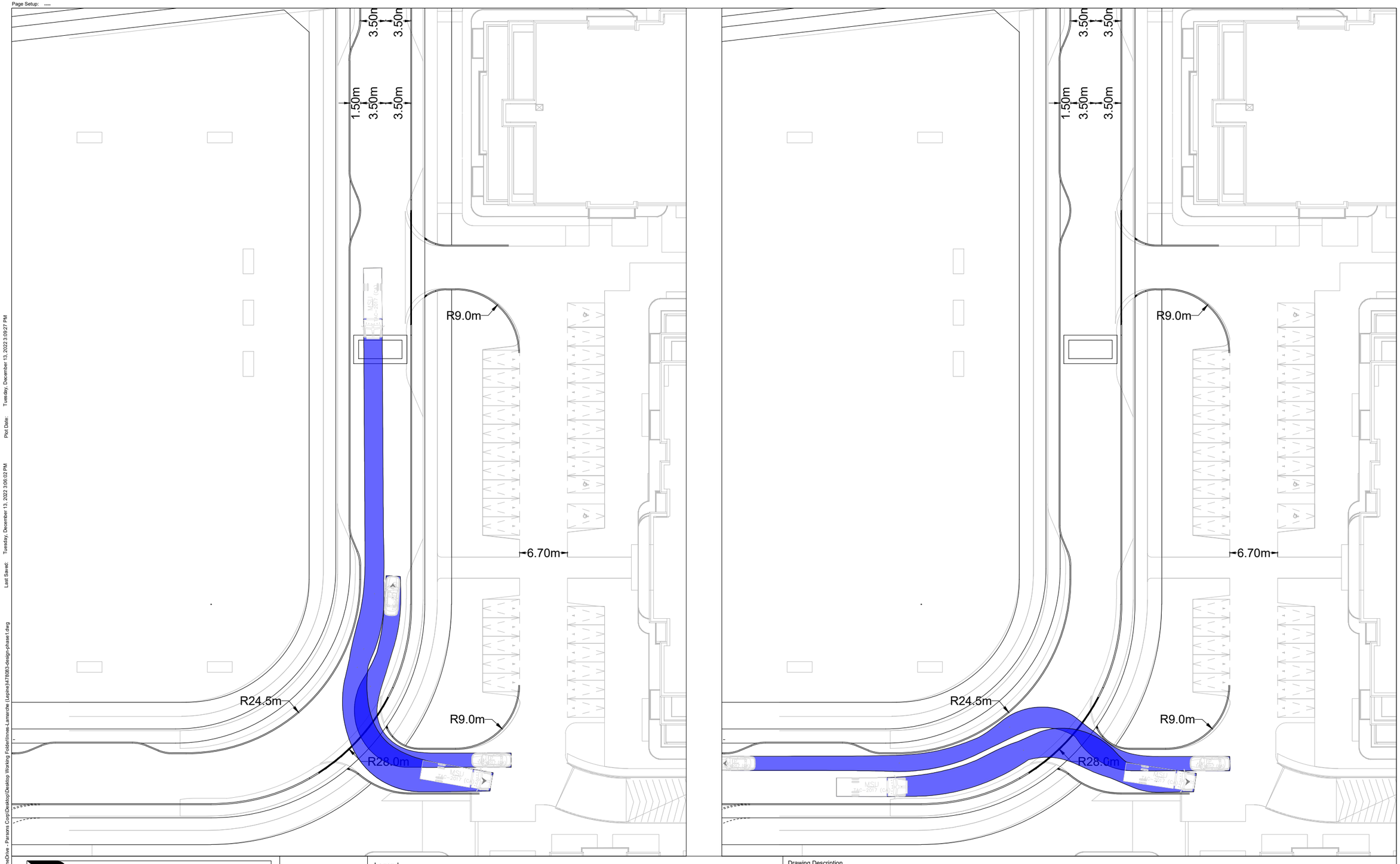

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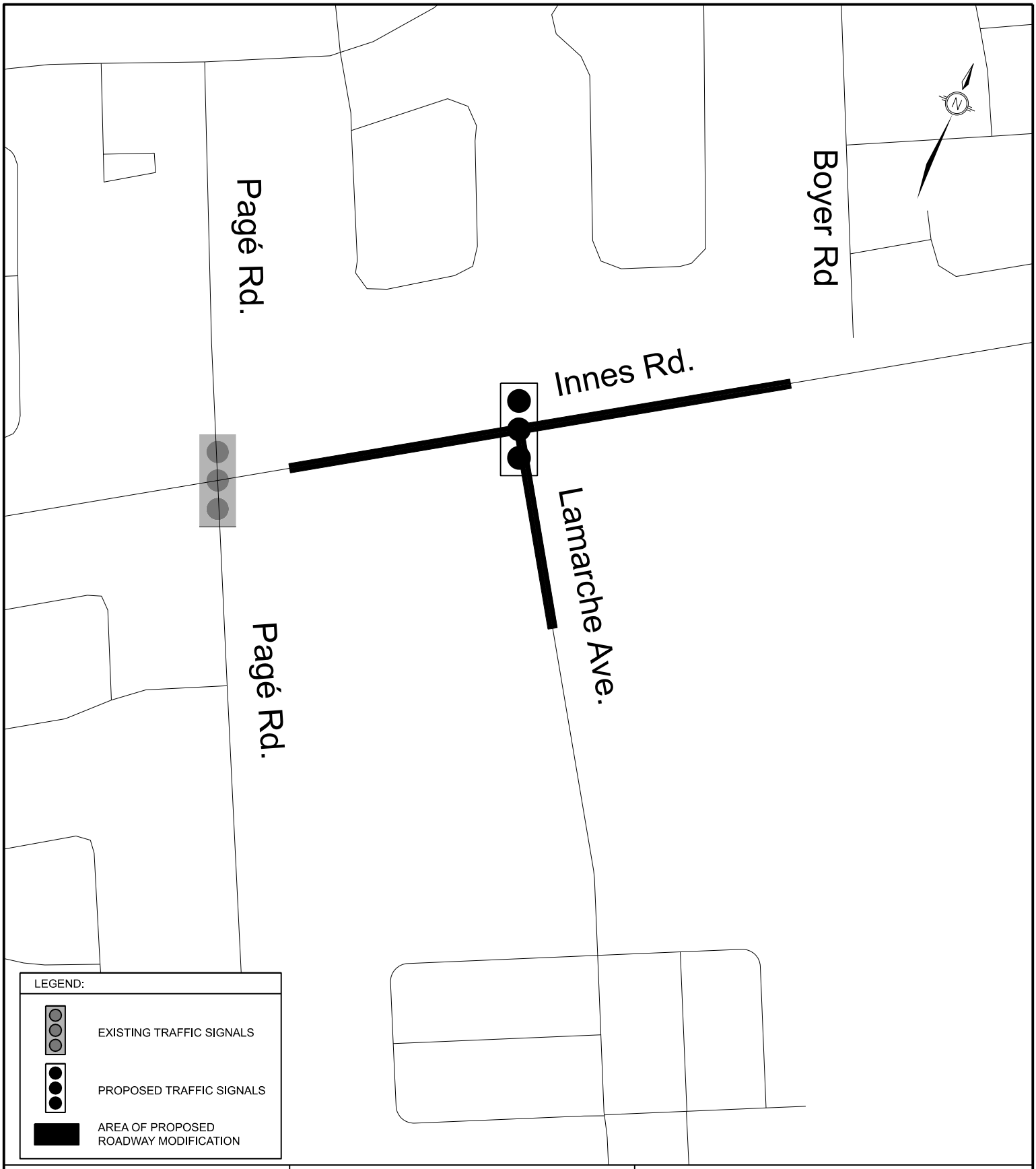
NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

Legend

Scale (m)

0 5 15 25

Drawing Description: DRAFT - OPTION 1 - MSU+P		
Client	Date: 2022/12/13	Figure Number: 003
Project Number: 478083	Project Description: 3484 INNES ROAD	



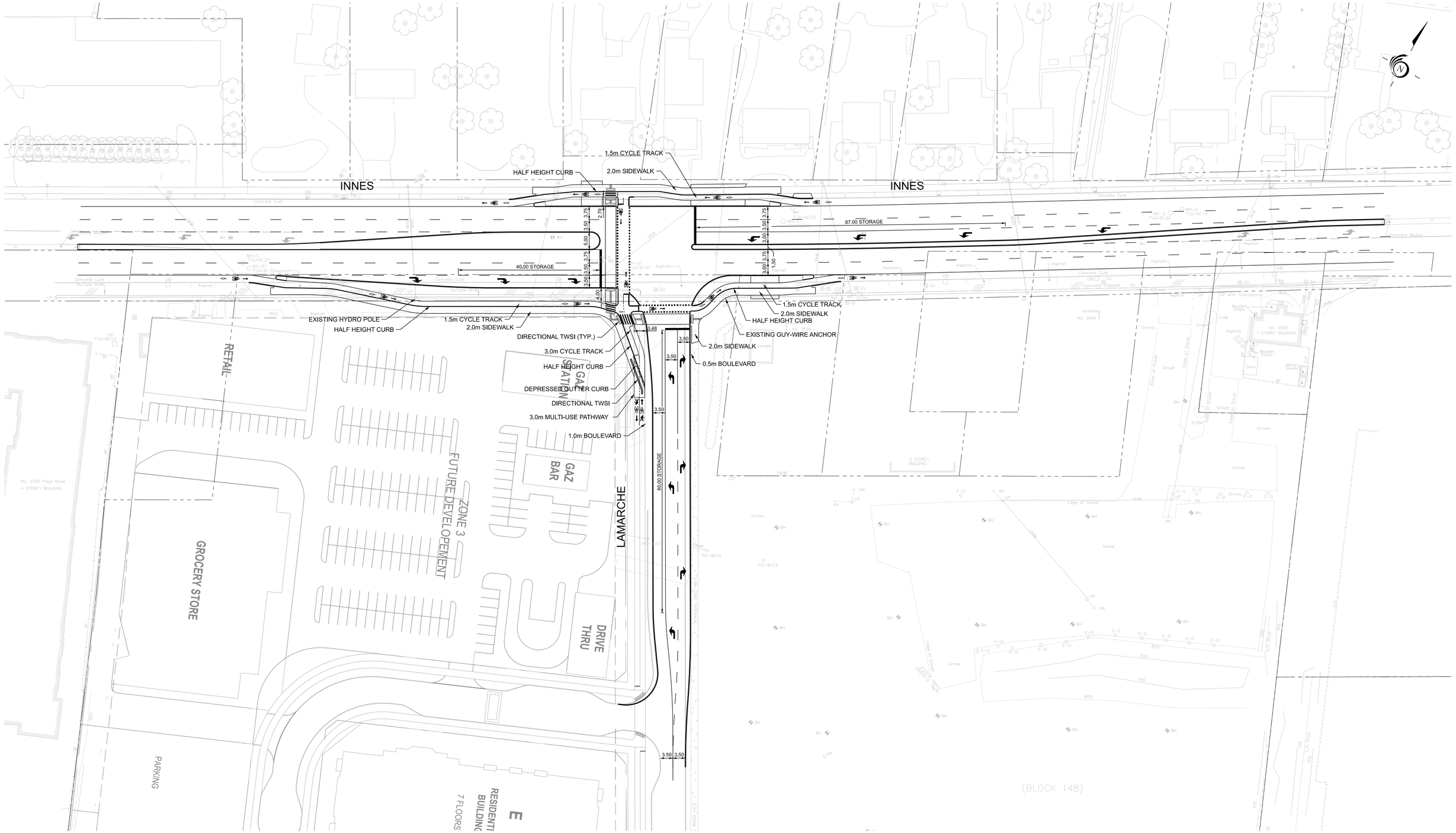
TRANSPORTATION SERVICES DEPARTMENT

KEY PLAN

INTERSECTION OF INNES ROAD AND LAMARCHE AVENUE

Transportation Engineering Services Branch

Approved By: V. BLACK	Drawing No.: RMA-2022-XXX-XXX-A
Completed By: PARSONS	
Scale: N.T.S.	Date: November 2022



PARSONS

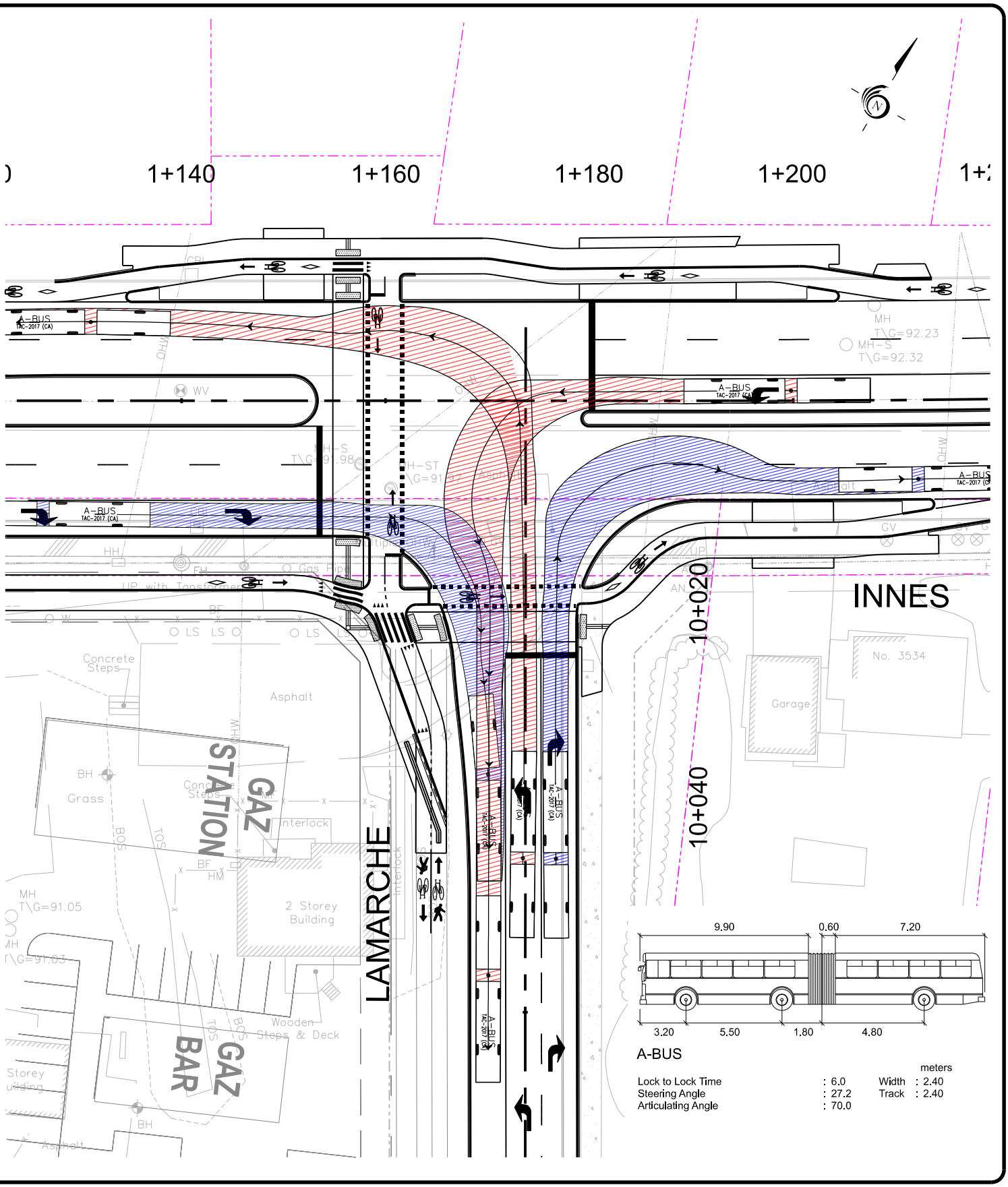
NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

INNES ROAD AND LAMARCHE AVENUE
CONCEPTUAL INTERSECTION DESIGN

FOR PRELIMINARY DISCUSSIONS ONLY

Project Number:	Dwn.	Dwg. No.
476731	D.D.C.	001
Date: November 10, 2022	Sheet 1 of 1	

Scale: HORIZONTAL 0m 5 10 20



INNES ROAD AND LAMARCHE AVENUE

TURNING MOVEMENTS

A-BUS MOVEMENTS

PARSONS

scale:	1:500
date:	11/9/2022
drawn:	MJP
proj:	478083
dwg no:	01
rev:	0

Consultant's Information: H:\ISO\478083\10000\DWGS\01-Conceptual (Formerly 476731)\478083-02-Turn Movement-Lamarche.Dgn Last Saved: 11/9/2022 5:44:27 PM

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

24 April 2023

City of Ottawa
Development Review Services
110 Laurier Avenue West
Ottawa, ON K1P 1J1

Attention: Neeti Paudel, P.Eng.

Dear Neeti:

Re: 240-270 Lamarche & 3484 Innes – Lépine TIA
Step 4 Plan of Subdivision– Response to City Comments

The following response form has been prepared to address City of Ottawa comments received on January 30, 2023. City comments are noted in black with the corresponding responses from Parsons in Green. Note that only TIA transportation related comments were extracted.

City Staff Comments (General)

1. Proposed Draft Plan of Subdivision. Please address the following remaining minor technical comments.

a) Despite the provision of Block 8 on the draft plan, additional corner sight triangle at the corner of Innes Road and Lamarche Avenue is required to be taken from Block 3. Such taking is to be consistent with the conceptual intersection design illustrated on the attached preliminary Road Modification Approval (RMA) design drawing. Please coordinate the extent of the additional sight triangle with Neeti Paudel, Project Manager (Transportation). Noted, sight triangles have been provided below for Zone 1 and CF accesses to Lamarche. Zone 3 remains as a concept at this time, with no defined buildings proposed. Once Zone 3 Site Plan Application is filed, sight triangles at Lamarche/Innes will be explored to assure that no building obstructs sight lines.
b) Dimension the width of additional road widening Block 7 on the draft plan. The latest draft plan within the Site Plan Application for Zone 1 addresses road widths. The proposed design has been updated to satisfy the latest City of Ottawa cross-section for 20m local street.

7. Proposed Zoning Provisions. The following few remaining comments address the details of the proposed zoning by-law amendment.
b) Reduced Visitor Parking Rate – Further to the explanation provided in your response letter, it is still requested that actual empirical data from your client's portfolio of existing suburban rental apartment developments across the City, preferably those not within proximity to a rapid transit station, be provided to demonstrate that the reduced visitor parking rate of 0.1 spaces per dwelling unit is indeed functional and appropriate. I also will research other similar suburban apartment developments to determine what visitor parking standards were approved and employed and to learn whether there have been any concerns expressed with them. Noted, client to provide empirical data to City of Ottawa if available. Actual parking quantities will be determined as part of each individual zone Site Plan Application.

11. Transportation Impact Assessment (TIA). A revised TIA was not included with the latest revised submission materials as was requested. Please provided such revised report in the next resubmission. TIA has been revised.

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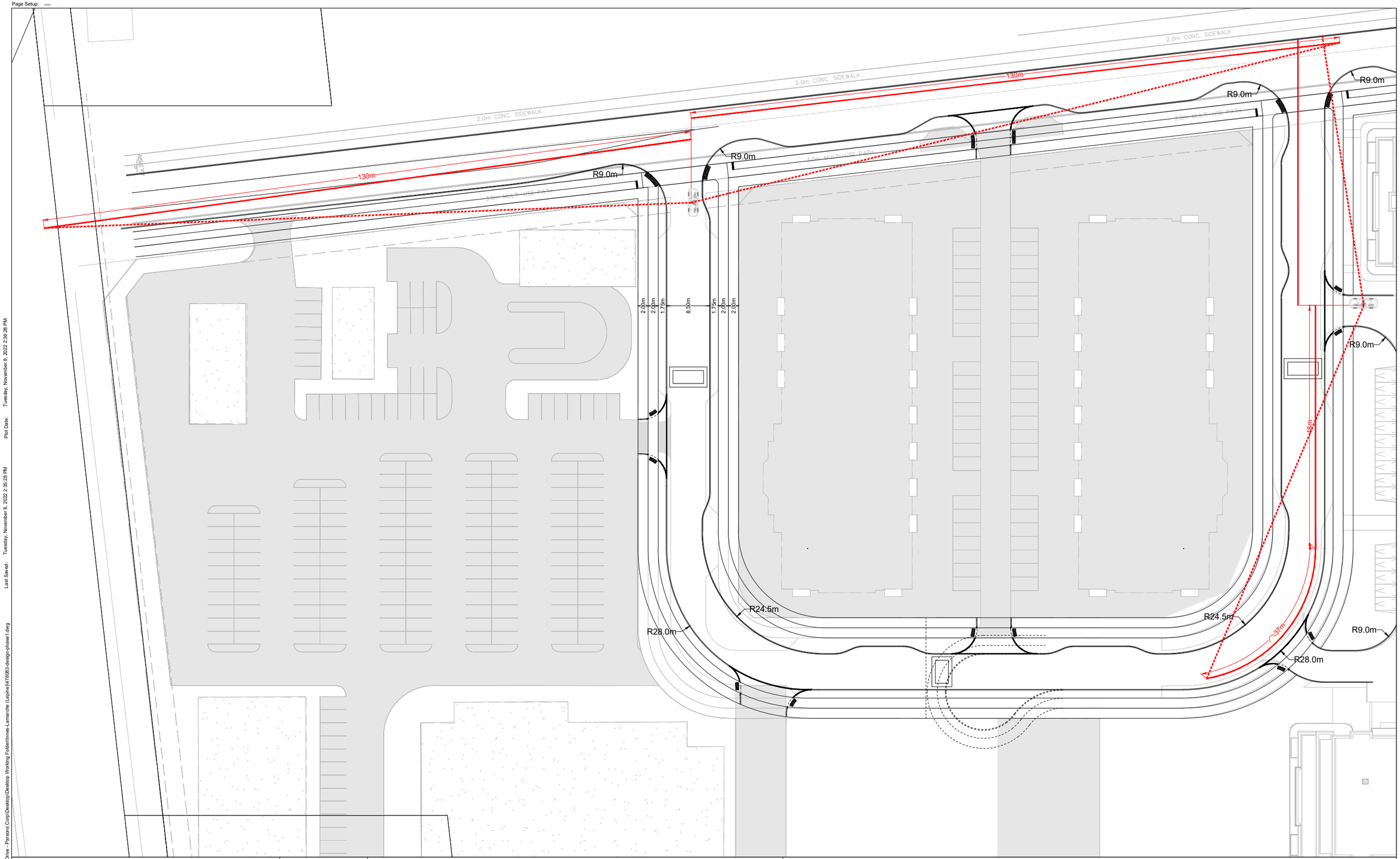

PARSONS®

NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

Legend

TAC SIGHT DISTANCE REQUIREMENTS
DS 40 KM/H = 85 M
DS 60 KM/H = 130 M

Drawing Description: LAMARCHE SIGHTLINES		
Client	Date: 2022/11/08	Figure Number: 002
Project Number: 478083	Project Description: 3484 INNES ROAD	

Consultant's Information

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Last Saved: Tuesday, November 8, 2022 2:36:28 PM

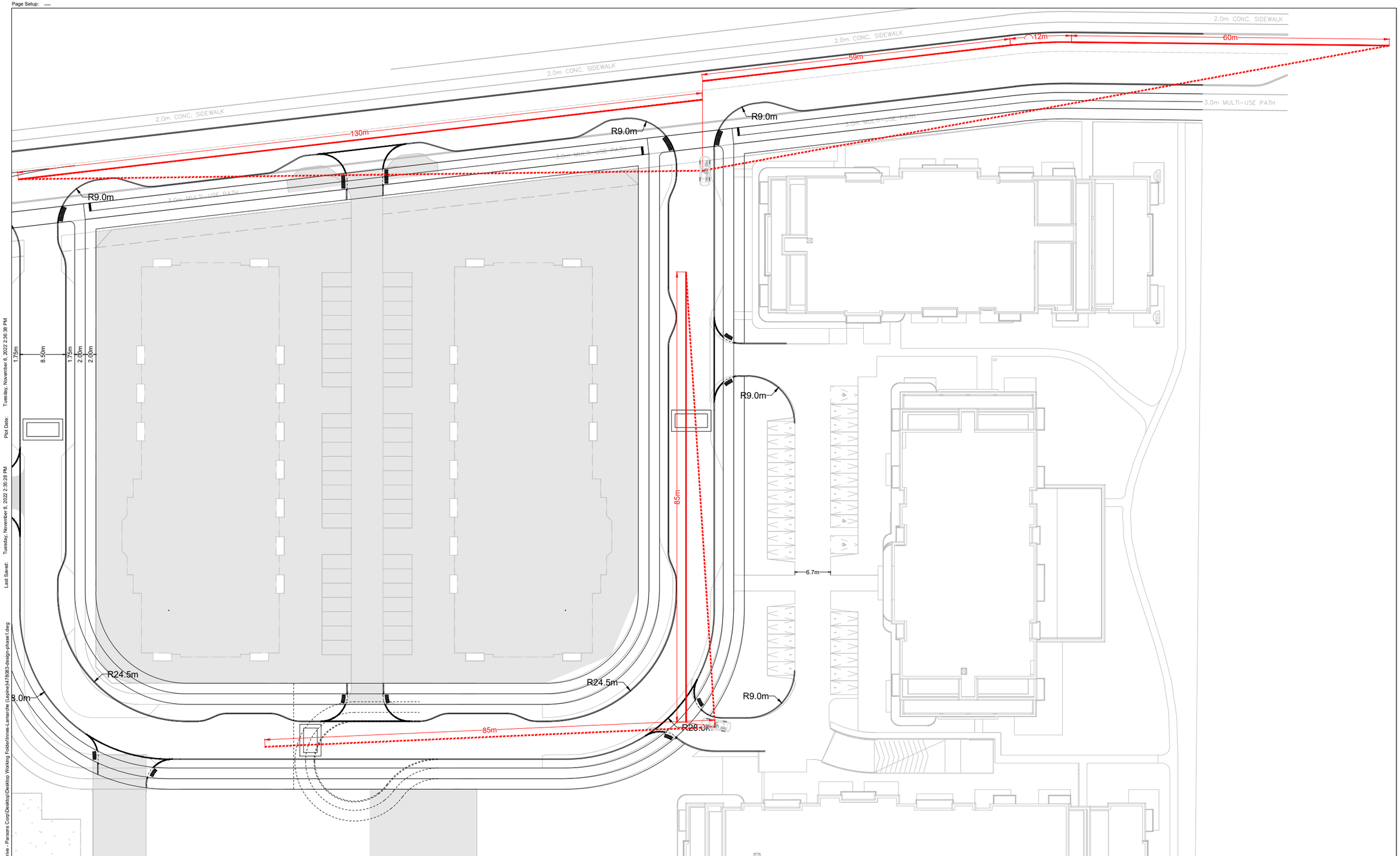
Plot Date: Tuesday, November 8, 2022 2:36:28 PM

Page Setup: ----

Plot Date: Tuesday, November 8, 2022 2:36:38 PM

Last Saved: Tuesday, November 8, 2022 2:35:28 PM

Consultant's Information: C:\Users\p0049768\OneDrive - Parsons Corp\Desktop\Desktop Working Folder\Innes-Lamarche (Jasine)\478083-design-phase1.dwg



PARSONS®

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Legend

TAC SIGHT DISTANCE REQUIREMENTS
DS 40 KM/H = 85 M
DS 60 KM/H = 130 M

Drawing Description: LAMARCHE SIGHTLINES		
Client	Date: 2022/11/08	Figure Number: 003
Project Number: 478083	Project Description: 3484 INNES ROAD	

APPENDIX B

TRAFFIC COUNT DATA

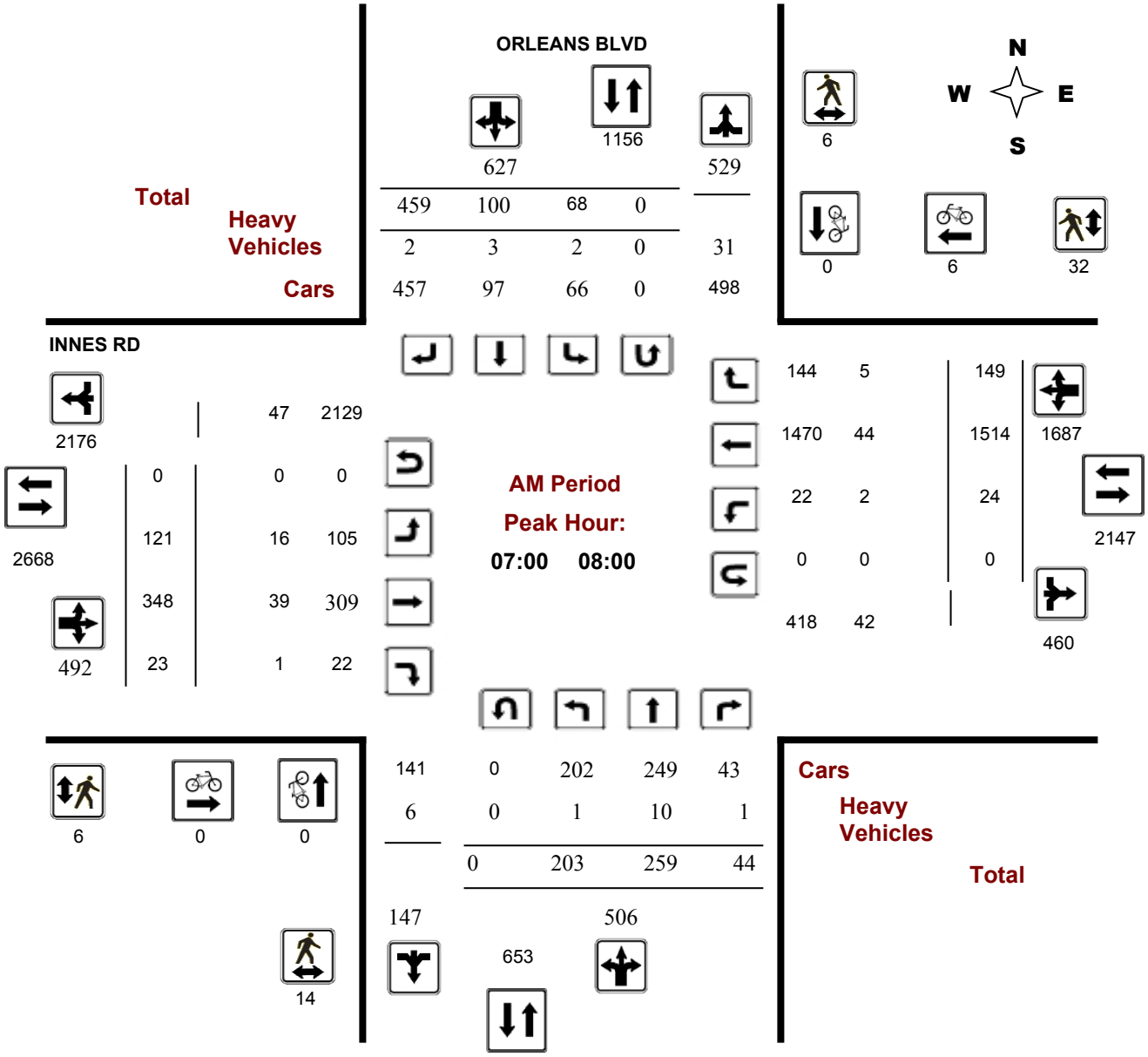
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

INNES RD @ ORLEANS BLVD

Survey Date: Wednesday, May 03, 2017
Start Time: 07:00

WO No: 36978
Device: Miovision



Comments

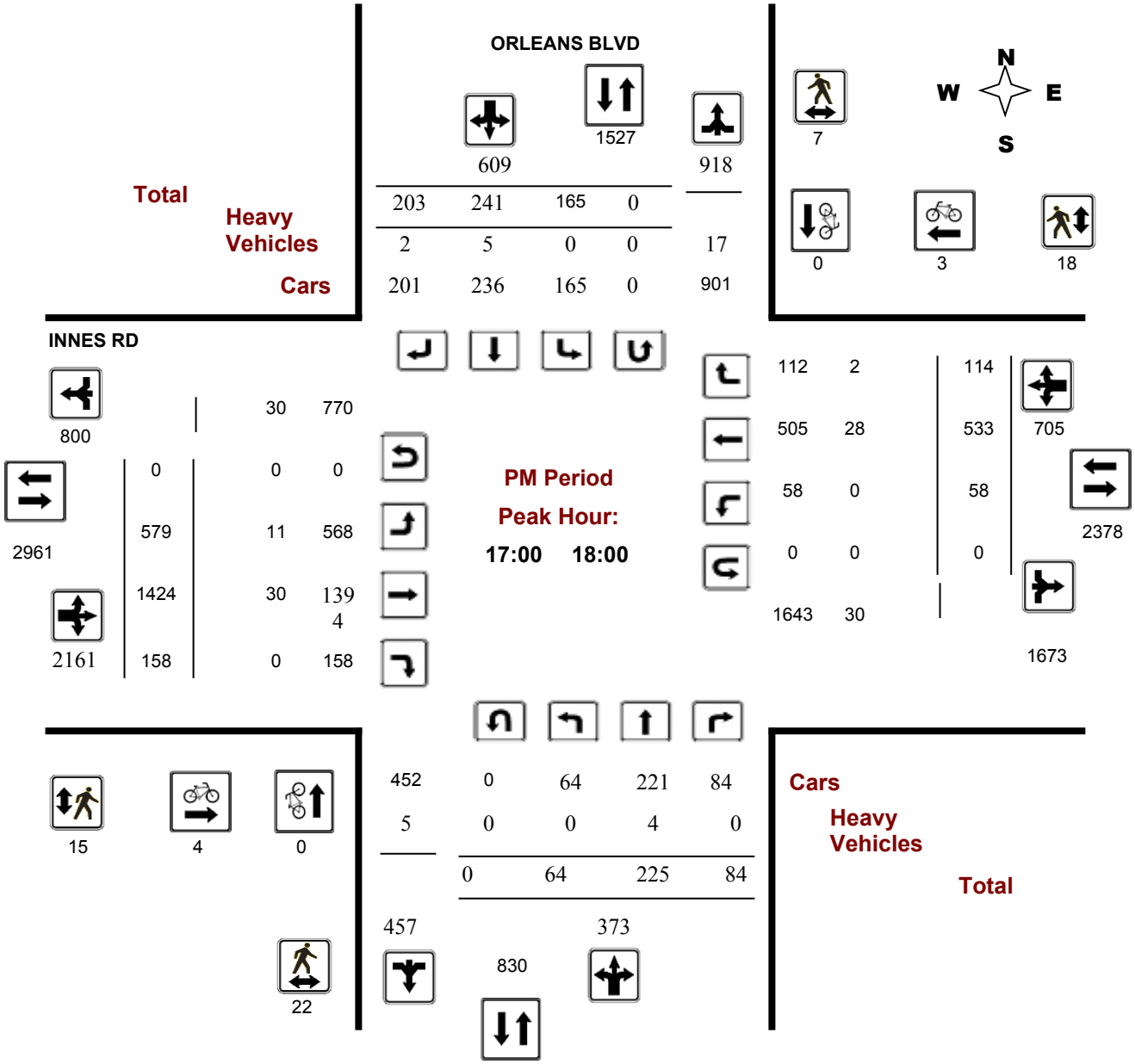
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

INNES RD @ ORLEANS BLVD

Survey Date: Wednesday, May 03, 2017
Start Time: 07:00

WO No: 36978
Device: Miovision



Comments

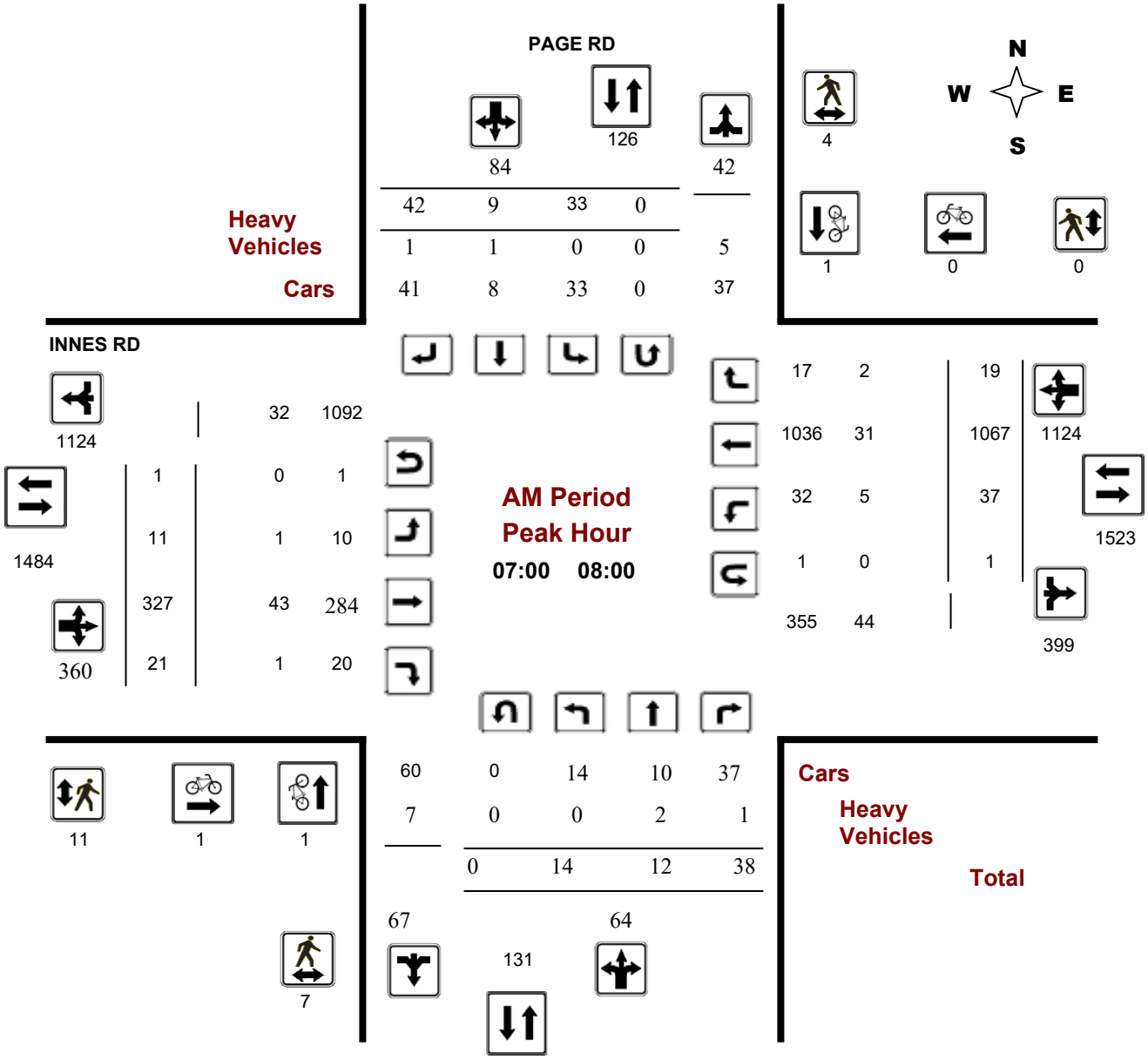
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

INNES RD @ PAGE RD

Survey Date: Tuesday, January 08, 2019 **WO No:** 38221

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



Comments

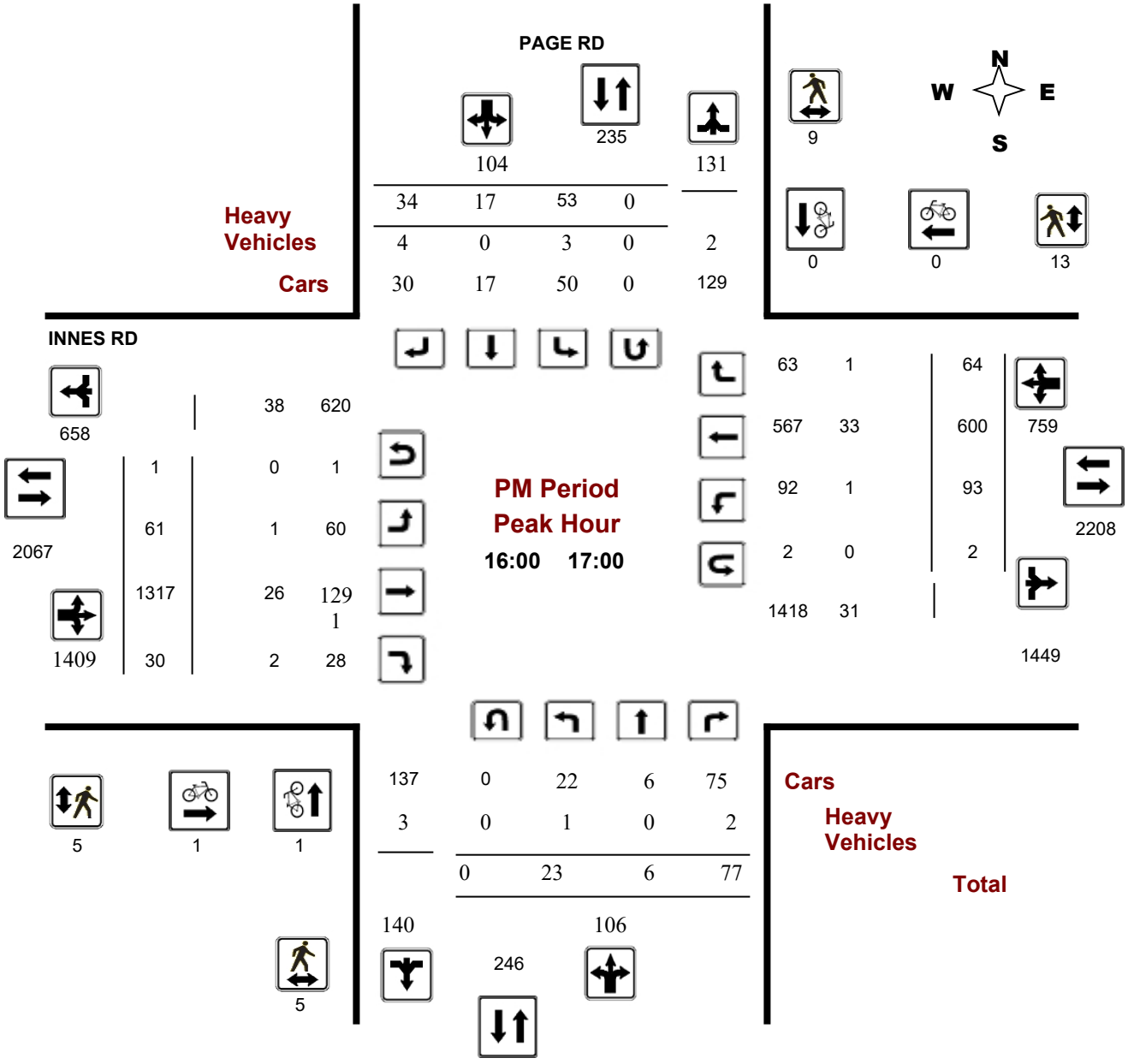
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

INNES RD @ PAGE RD

Survey Date: Tuesday, January 08, 2019 **WO No:** 38221

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



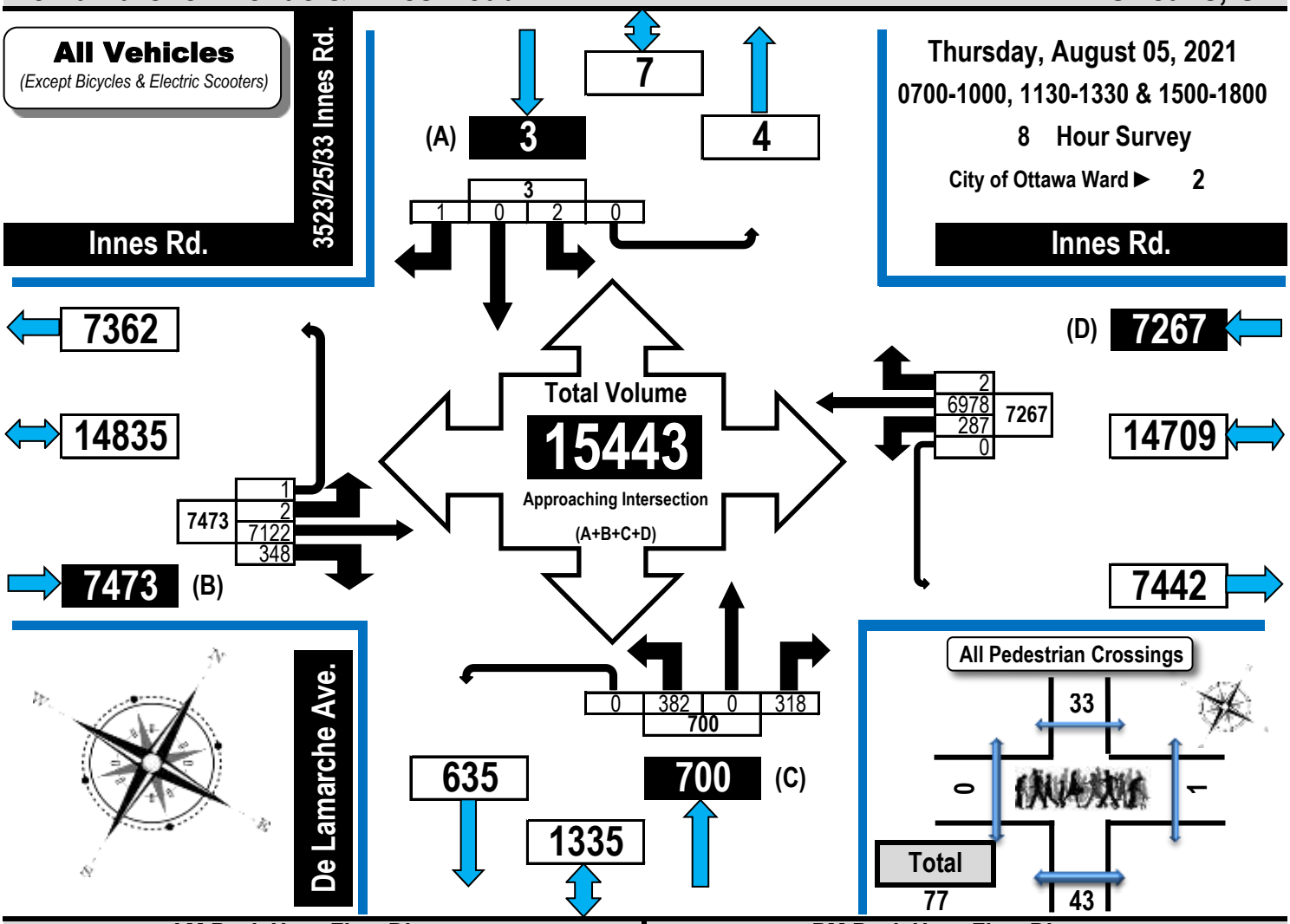
Comments

Turning Movement Count
Summary, AM and PM Peak Hour Flow Diagrams
All Vehicles Except Bicycles

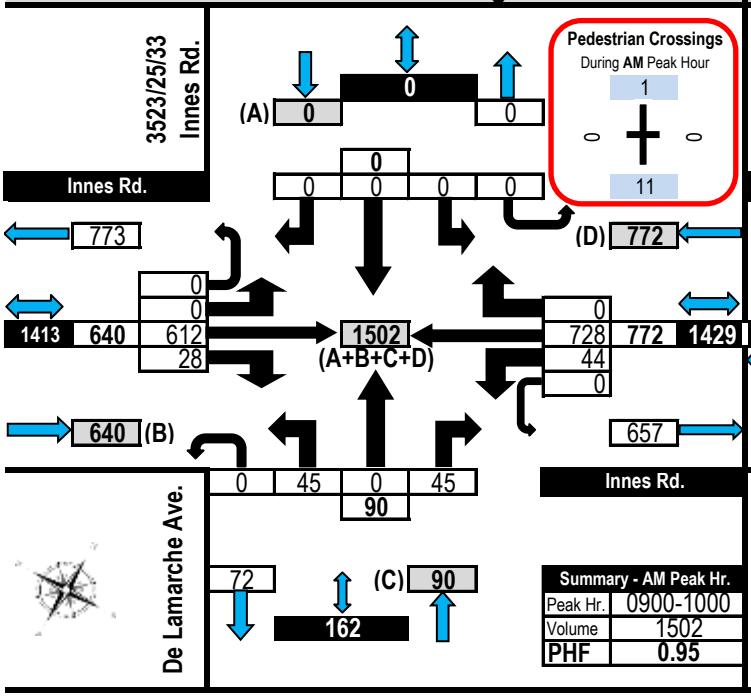
De Lamarche Avenue & Innes Road — Orléans, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Thursday, August 05, 2021
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ▶ 2

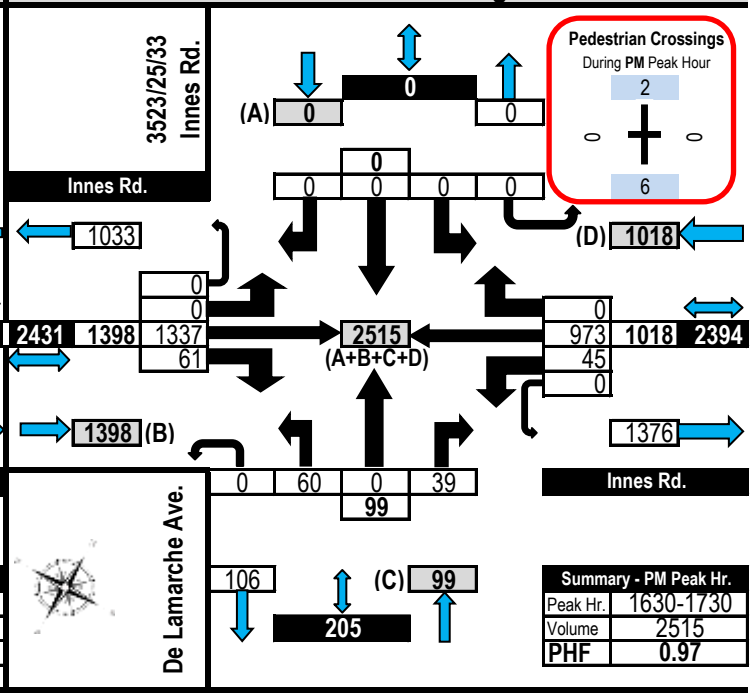


AM Peak Hour Flow Diagram



Summary - AM Peak Hr.	
Peak Hr.	0900-1000
Volume	1502
PHF	0.95

PM Peak Hour Flow Diagram



Summary - PM Peak Hr.	
Peak Hr.	1630-1730
Volume	2515
PHF	0.97

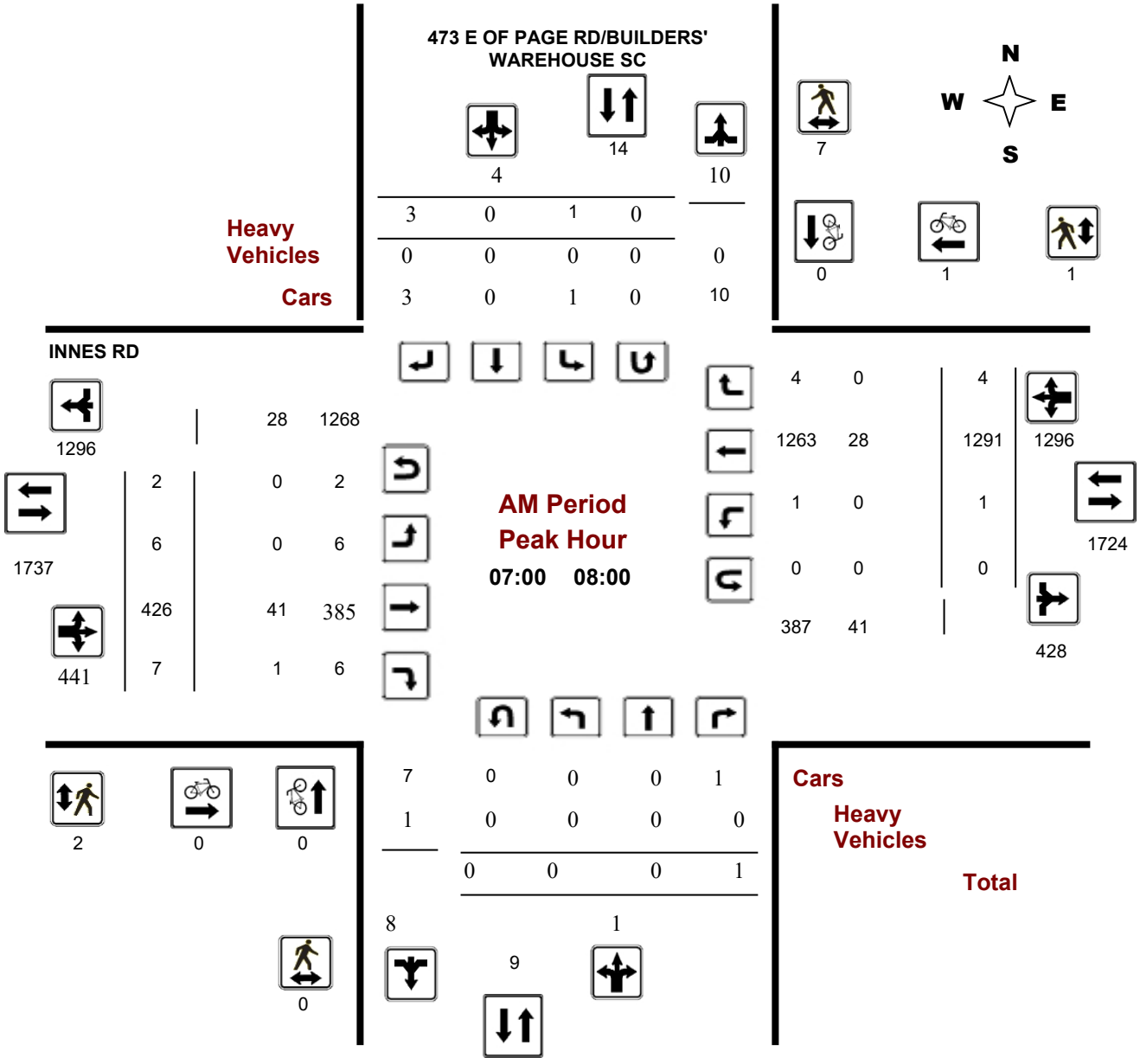
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

INNES RD @ 473 E OF PAGE RD/BUILDERS' WAREHOUS

Survey Date: Thursday, January 31, 2019 **WO No:** 38223

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



Comments

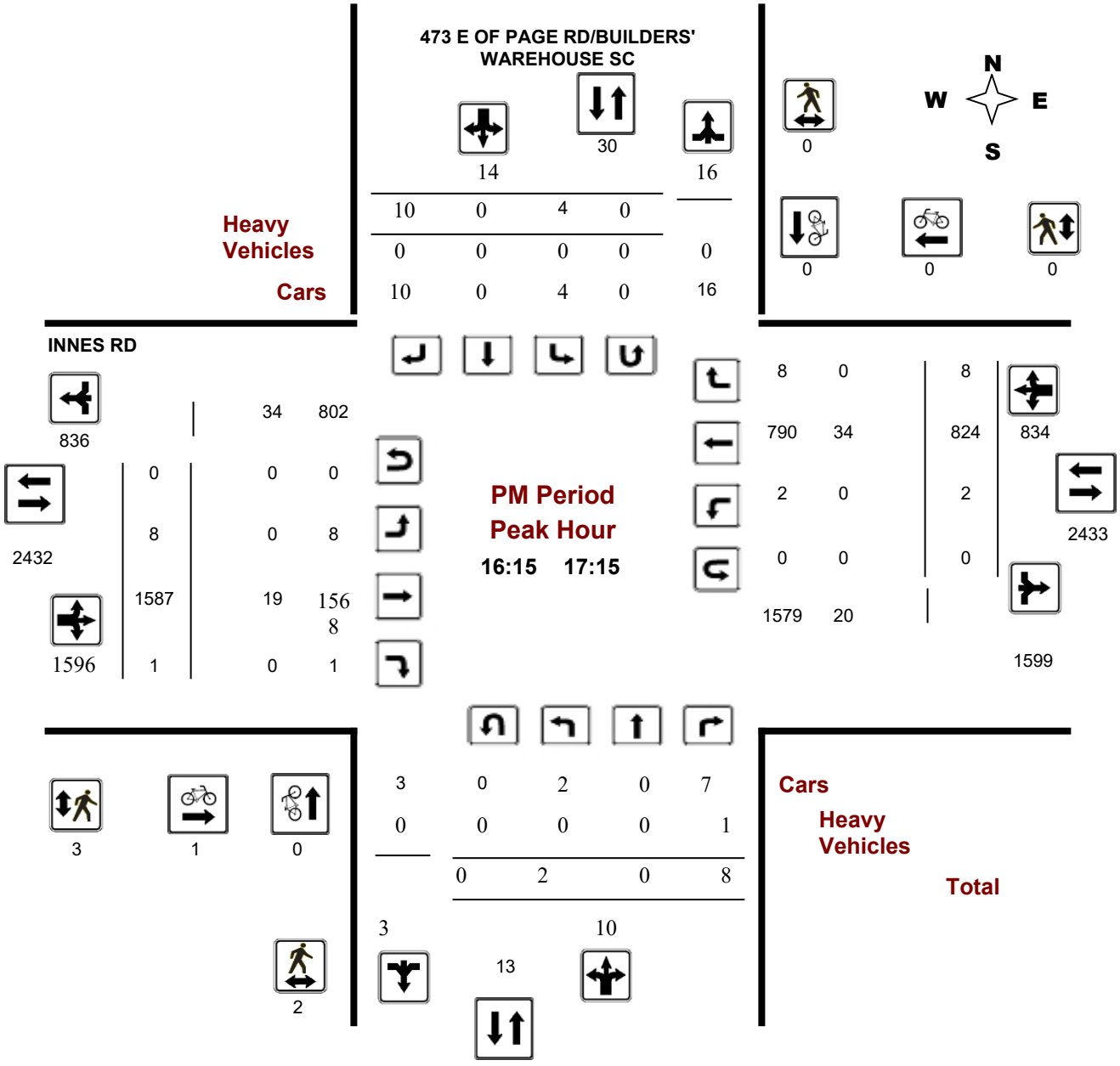
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

INNES RD @ 473 E OF PAGE RD/BUILDERS' WAREHOUS

Survey Date: Thursday, January 31, 2019 **WO No:** 38223

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



Comments

APPENDIX C

COLLISION DATA

Total Area

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	52	16	13	12	0	6	0	1	100	74%
Non-fatal injury	15	9	1	4	0	6	0	0	35	26%
Non-reportable	1	0	0	0	0	0	0	0	1	1%
Total	**68**	**25**	**14**	**16**	**0**	**12**	**0**	**1**	**136**	100%
	#1 or 50%	#2 or 18%	#4 or 10%	#3 or 12%	#7 or 0%	#5 or 9%	#7 or 0%	#6 or 1%		

INNES RD/ORLEANS BLVD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2015-2019	68	40,237	1825	**0.93**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	27	12	4	5	0	1	0	0	49	72%
Non-fatal injury	8	6	0	2	0	3	0	0	19	28%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**35**	**18**	**4**	**7**	**0**	**4**	**0**	**0**	**68**	100%
	51%	26%	6%	10%	0%	6%	0%	0%		

INNES RD/PAGE RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2015-2019	31	28,278	1825	**0.60**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	11	3	2	2	0	2	0	1	21	68%
Non-fatal injury	3	3	0	1	0	3	0	0	10	32%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**14**	**6**	**2**	**3**	**0**	**5**	**0**	**1**	**31**	100%
	45%	19%	6%	10%	0%	16%	0%	3%		

INNES RD/473 E OF PAGE RD/BUILDERS' WAREHOUS

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2015-2019	5	26,788	1825	**0.10**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	2	0	0	1	0	1	0	0	4	80%
Non-fatal injury	1	0	0	0	0	0	0	0	1	20%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**3**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**5**	100%
	60%	0%	0%	20%	0%	20%	0%	0%		

ROAD SEGMENTS

INNES RD EB, ORLEANS BLVD to INNES RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2015-2019	4	n/a	1825	**n/a**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	1	0	2	0	0	0	0	0	3	75%
Non-fatal injury	0	0	1	0	0	0	0	0	1	25%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**1**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**4**	100%
	25%	0%	75%	0%	0%	0%	0%	0%		

INNES RD WB, ORLEANS BLVD to INNES RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2015-2019	5	n/a	1825	**n/a**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	4	0	0	0	0	1	0	0	5	100%
Non-fatal injury	0	0	0	0	0	0	0	0	0	0%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**4**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**5**	100%
	80%	0%	0%	0%	0%	20%	0%	0%		

INNES RD, INNES RD to PAGE RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2015-2019	8	n/a	1825	**n/a**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	4	0	2	0	0	0	0	0	6	75%
Non-fatal injury	1	0	0	0	0	0	0	0	1	13%
Non-reportable	1	0	0	0	0	0	0	0	1	13%
Total	**6**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**8**	100%
	75%	0%	25%	0%	0%	0%	0%	0%		

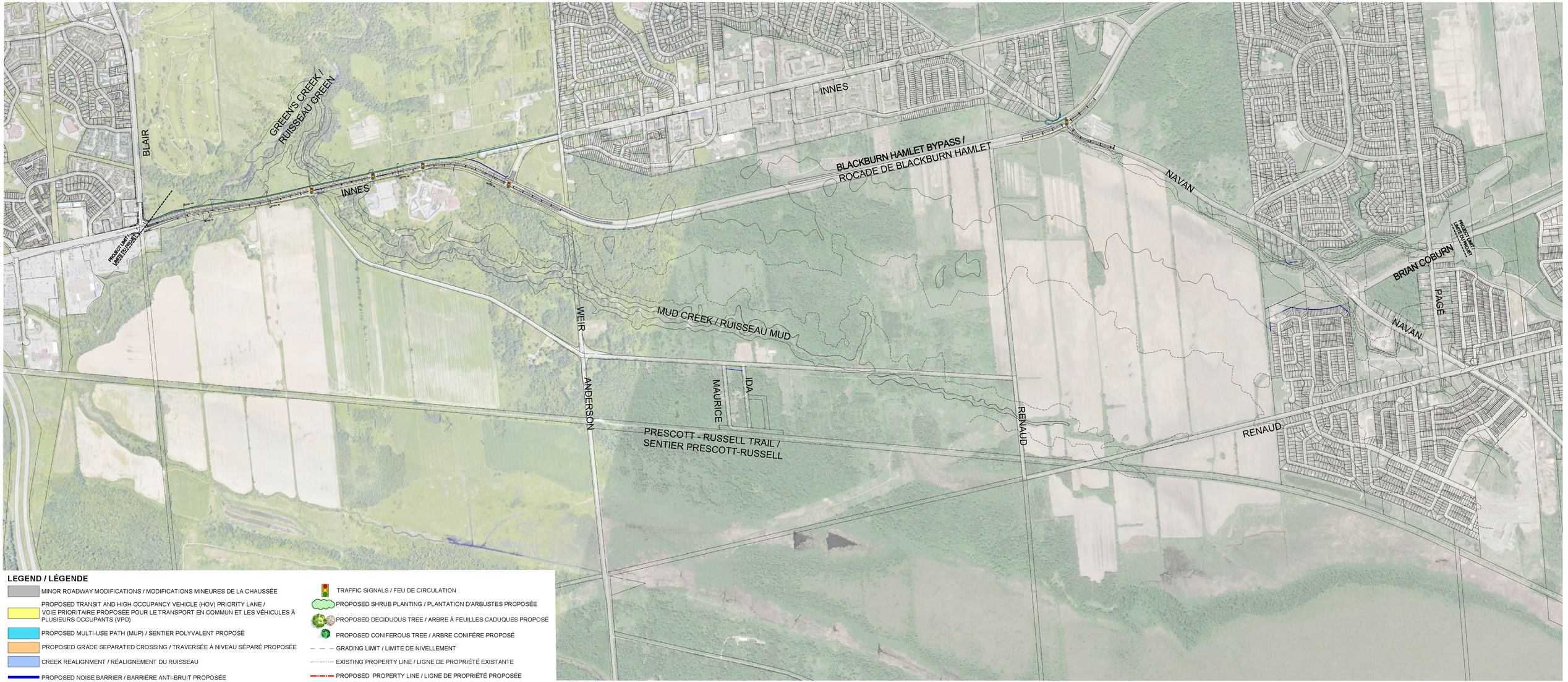
INNES RD, PAGE RD to 473 E OF PAGE RD/BUILDERS' WAREHOUSE SC

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2015-2019	15	n/a	1825	**n/a**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	3	1	3	4	0	1	0	0	12	80%
Non-fatal injury	2	0	0	1	0	0	0	0	3	20%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**5**	**1**	**3**	**5**	**0**	**1**	**0**	**0**	**15**	100%
	33%	7%	20%	33%	0%	7%	0%	0%		

APPENDIX D

BLACKBURN BYPASS PLANNED TRANSIT PRIORITY AND BRT



LEGEND / LÉGENDE

- MINOR ROADWAY MODIFICATIONS / MODIFICATIONS MINEURES DE LA CHAUSSÉE
- PROPOSED TRANSIT AND HIGH OCCUPANCY VEHICLE (HOV) PRIORITY LANE / VOIE PRIORITAIRE PROPOSÉE POUR LE TRANSPORT EN COMMUN ET LES VÉHICULES À PLUSIEURS OCCUPANTS (VPO)
- PROPOSED MULTI-USE PATH (MUP) / SENTIER POLYVALENT PROPOSÉ
- PROPOSED GRADE SEPARATED CROSSING / TRAVERSÉE À NIVEAU SÉPARÉ PROPOSÉE
- CREEK REALIGNMENT / RÉALIGNEMENT DU RUISSEAU
- PROPOSED NOISE BARRIER / BARRIÈRE ANTI-BRUIT PROPOSÉE
- GATEWAYS / POINT D'ACCÈS
- TRAFFIC SIGNALS / FEU DE CIRCULATION
- PROPOSED SHRUB PLANTING / PLANTATION D'ARBUSTES PROPOSÉE
- PROPOSED DECIDUOUS TREE / ARBRE À FEUILLES CADUQUES PROPOSÉ
- PROPOSED CONIFEROUS TREE / ARBRE CONIFÈRE PROPOSÉ
- GRADING LIMIT / LIMITE DE NIVELLEMENT
- EXISTING PROPERTY LINE / LIGNE DE PROPRIÉTÉ EXISTANTE
- PROPOSED PROPERTY LINE / LIGNE DE PROPRIÉTÉ PROPOSÉE

Ottawa | Morrison Hershfield

BRIAN COBURN / CUMBERLAND TRANSITWAY EA STUDY

ÉTUDE D'ÉE DU PROLONGEMENT DU BOULEVARD BRIAN-COBURN / TRANSITWAY DE CUMBERLAND

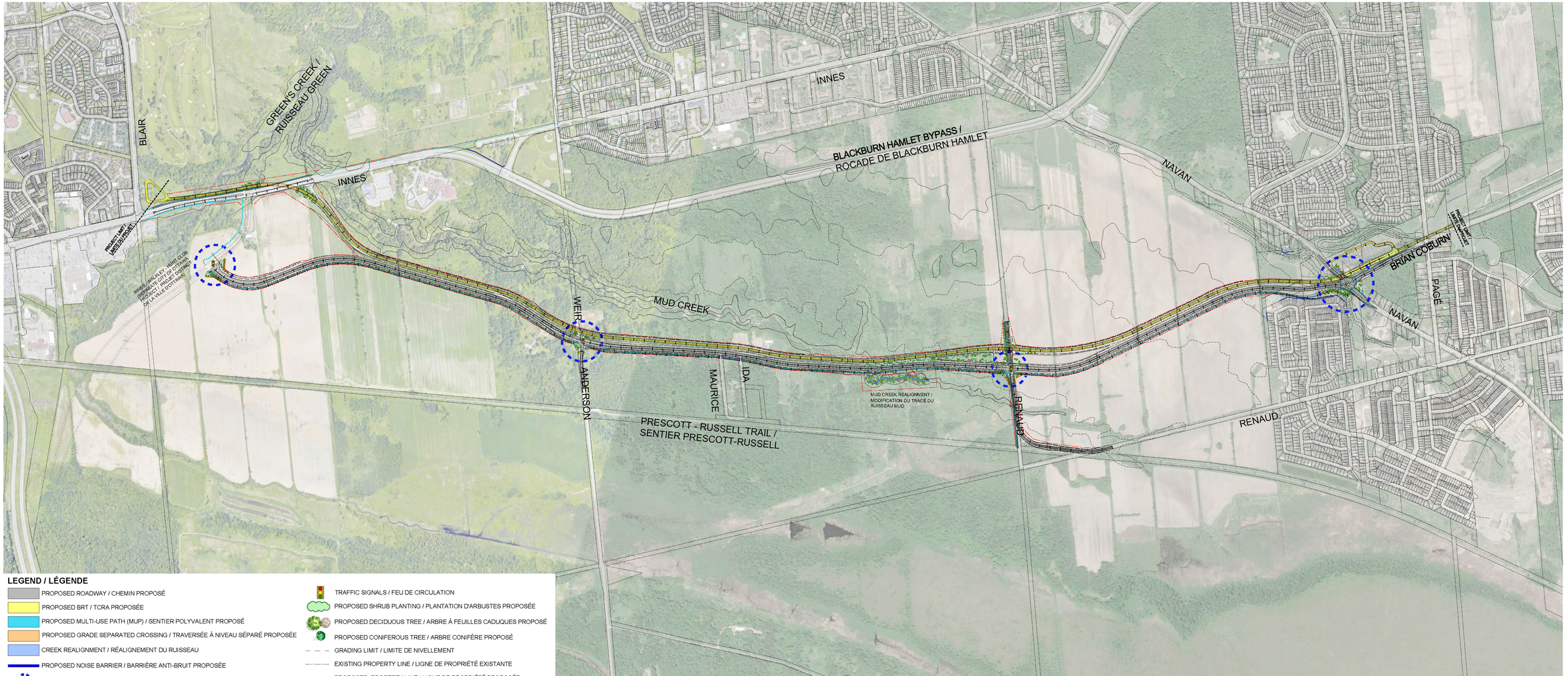
INTERIM TRANSIT PRIORITY / PRIORITÉ AU TRANSIT INTÉRIMAIRE

SOURCES:
1. Ottawa Pedestrian Plan (2013) / Plan de la circulation piétonnière d'Ottawa (2013)
2. Transportation Master Plan, City of Ottawa (2013) / Plan directeur des transports, Ville d'Ottawa (2013)
3. Transit-oriented development guidelines, City of Ottawa (2007) / Lignes directrices sur l'utilisation du sol et la conception des aménagements axés sur le transport en commun, Ville d'Ottawa (2007)
4. geoOttawa, City of Ottawa / GeoOttawa, Ville d'Ottawa

2021.05.25

0 100 200
SCALE / ÉCHELLE 1:4000

CSW



LEGEND / LÉGENDE

- PROPOSED ROADWAY / CHEMIN PROPOSÉ
- PROPOSED BRT / TCRA PROPOSÉE
- PROPOSED MULTI-USE PATH (MUP) / SENTIER POLYVALENT PROPOSÉ
- PROPOSED GRADE SEPARATED CROSSING / TRAVERSÉE À NIVEAU SÉPARÉ PROPOSÉE
- CREEK REALIGNMENT / RÉALIGNEMENT DU RUISSEAU
- PROPOSED NOISE BARRIER / BARRIÈRE ANTI-BRUIT PROPOSÉE
- GATEWAYS / POINT D'ACCÈS
- TRAFFIC SIGNALS / FEU DE CIRCULATION
- PROPOSED SHRUB PLANTING / PLANTATION D'ARBUSTES PROPOSÉE
- PROPOSED DECIDUOUS TREE / ARBRE À FEUILLES CADUQUES PROPOSÉ
- PROPOSED CONIFEROUS TREE / ARBRE CONIFÈRE PROPOSÉ
- GRADING LIMIT / LIMITE DE NIVELLEMENT
- EXISTING PROPERTY LINE / LIGNE DE PROPRIÉTÉ EXISTANTE
- PROPOSED PROPERTY LINE / LIGNE DE PROPRIÉTÉ PROPOSÉE

Ottawa MORRISON HERSHFIELD

BRIAN COBURN / CUMBERLAND TRANSITWAY EA STUDY
ÉTUDE D'ÉE DU PROLONGEMENT DU BOULEVARD BRIAN-COBURN / TRANSITWAY DE CUMBERLAND
ULTIMATE DESIGN / CONCEPTION ULTIME

SOURCES:
1. Ottawa Pedestrian Plan (2013) / Plan de la circulation piétonnière d'Ottawa (2013)
2. Transportation Master Plan, City of Ottawa (2013) / Plan directeur des transports, Ville d'Ottawa (2013)
3. Transit-oriented development guidelines, City of Ottawa (2007) / Lignes directrices sur l'utilisation du sol et la conception des aménagements axés sur le transport en commun, Ville d'Ottawa (2007)
4. geoOttawa, City of Ottawa / GeoOttawa, Ville d'Ottawa

2021.05.25

0 100 200
SCALE / ÉCHELLE 1:4000

CSW

APPENDIX E

EAST URBAN COMMUNITY & GLENVIEW & 245 LAMARCHE SITE PLANS

TRAILSEDGE PHASE 5

BLOCK CONCEPT PLAN

LEGEND

- Low Density Residential - Detached Units
- Low Density Residential - Townhome Units
- Low Density Residential - Back-to-back Townhome Units
- Medium Density Residential
- Highest Density Residential
- Future Employment
- Park
- Stormwater Management Facility
- Existing Municipal Snow Disposal Facility
- Rock Barren
- Land Adjacent to Rock Barren
- Subject Lands

0 50 100 200m

No.	REVISION	DATE	BY
5	REVISE LABELS	2021.05.26	EL
4	REVISE BOUNDARY LINE	2021.05.07	RP
3	REVISE BLOCK 73, 74, 75	2020.08.17	EL
2	FOR CLIENT REVIEW	2020.08.13	RP
1	BLOCK PLAN	2020.08.12	RP

CLIENT
RICHCRAFT

RICHCRAFT Group of Companies

FOTENN
Planning + Design
396 Cooper Street, Suite 300, Ottawa ON K2P 2H7
613.730.5709 www.fotenn.com

DESIGNED	RP
REVIEWED	RP
DATE	2020.08.10

P1

DRAFT PLAN OF SUBDIVISION OF

PART OF LOT 4
CONCESSION 4 (Ottawa Front)

GEOGRAPHIC TOWNSHIP of GLOUCESTER
CITY OF OTTAWA

SCALE
1 : 1250

DATE: SEPTEMBER, 2019

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51 (17) OF THE PLANNING ACT.

A) The boundaries of the land proposed to be subdivided, certified by an Ontario land Surveyor;
As shown on Draft Plan

B) The locations, widths & names of the proposed highways within the proposed subdivision & of existing highways on which the proposed subdivision abuts;
As shown on Draft Plan

C) On a small keyplan, on a scale of not less than 1cm to 100m, all of the land adjacent to the proposed subdivision that is owned by the applicant or in which the applicant has an interest, every subdivision adjacent to the proposed subdivision & the relationship of the boundaries of the land to be subdivided to the boundaries of the township lot of other original grant of which the land forms the whole part;
As Shown on Draft Plan

D) The purpose for which the proposed lots are to be used;
Residential, Mixed Use and Open Space shown on Draft Plan

E) The existing uses of all adjoining lands;
Residential and Mixed Use shown on Draft Plan

F) The approximate dimensions & layout of the proposed lots;
As shown on Draft Plan

G) Natural & artificial features such as buildings or other structures or installations, railways, highways, watercources, drainage ditches, wetlands & wooded areas within or adjacent to the land proposed to be subdivided;
As shown on Draft Plan

H) The availability and nature of domestic water supplies;
Development will be supplied with full municipal piped water service

I) The nature & porosity of the soil;
-

J) Existing contours or elevations as may be required to determine the grade of the highways and the drainage of the land proposed to be subdivided;
Contours shown at 0.25 metre intervals on Draft Plan

K) The municipal services available or to be available to the land proposed to be subdivided;
Development will be supplied with full sanitary and storm water sewer services.

L) The nature & extent of any restrictions affecting the land proposed to be subdivided, including restrictive covenants or easements. 1994, c. 23, s. 30; 1996, c. 4, s. 28 (3).;
As shown on Draft Plan.

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO ADJOINING LANDS ARE CORRECTLY SHOWN.

DATED ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

?surveyor name?
ONTARIO LAND SURVEYOR

?name of surveying company?
ONTARIO LAND SURVEYORS
?surveyor job number?

OWNER'S CERTIFICATE

I/WE, .BEING THE REGISTERED OWNER(S), HEREBY AUTHORIZE NOVATECH TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE CITY OF OTTAWA FOR REVIEW AND APPROVAL.

DATED ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

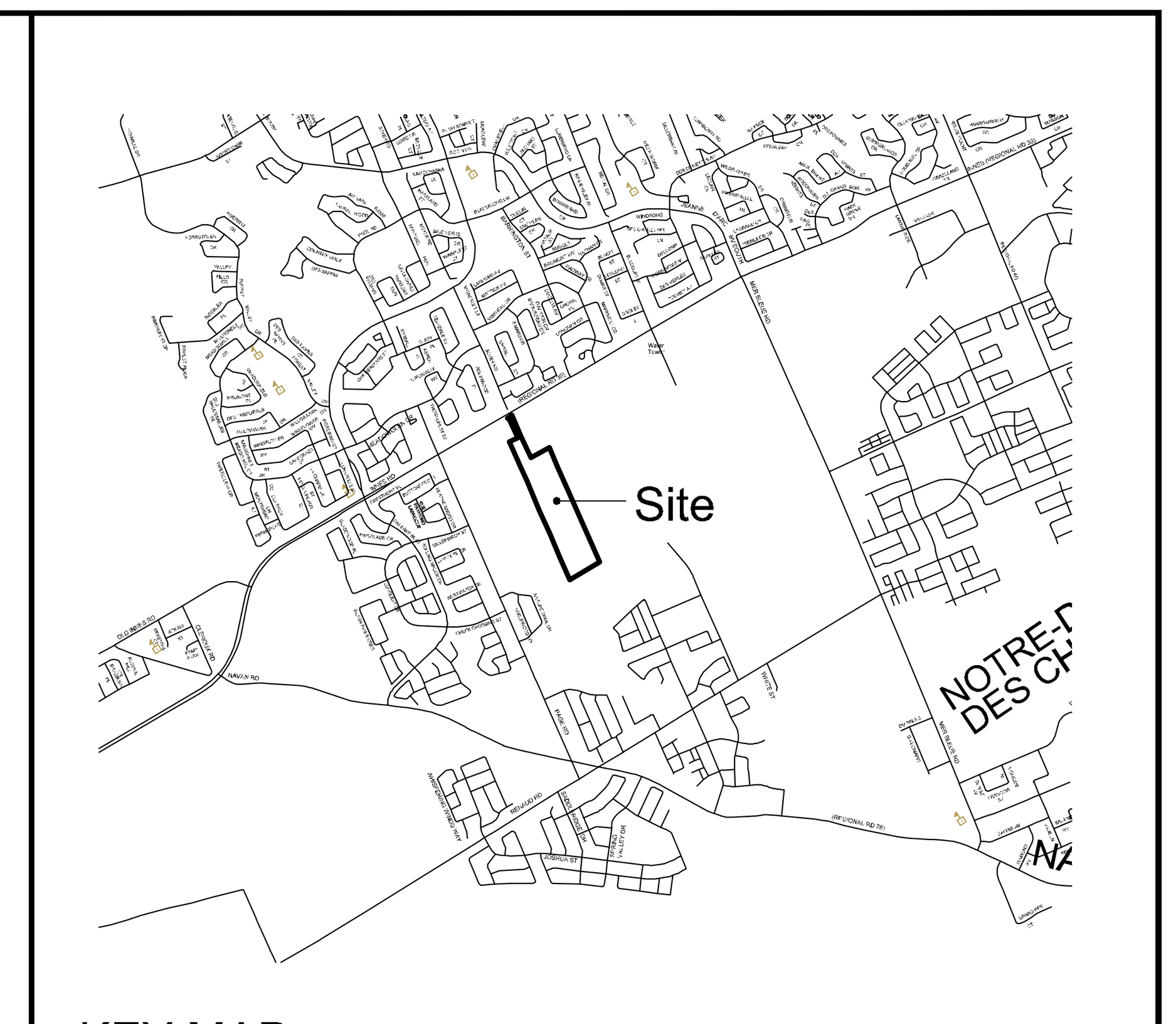
owner name

SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR LETTER DATED ____________, THIS DRAFT PLAN IS APPROVED BY THE CITY OF OTTAWA UNDER SECTION 51 OF THE PLANNING ACT THIS ______ DAY OF ________, 20___

JEFF MCEWEN, P.ENG , MANAGER
DEVELOPMENT REVIEW EAST ,
PLANNING, INFRASTRUCTURE AND ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

UNIT MIX BREAKDOWN

LOT/BLOCK #'s	LOT SIZE	UNITS	%
1-35, 85, 88, 90, 97-108, 147,148, 150-180	30' (9.15m)	82	17.94
36-84, 86, 86, 89, 91-96, 109-146, 149	36' (11.0m)	98	21.44
BLK 183 - 190	21' (6.6m)	109	23.85
BLK 181, 182	Medium Density	168	36.76
Total		**457**	**100.0**



KEY MAP
NOT TO SCALE

METRIC : MEASUREMENTS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

CONCEPT STATISTICS:

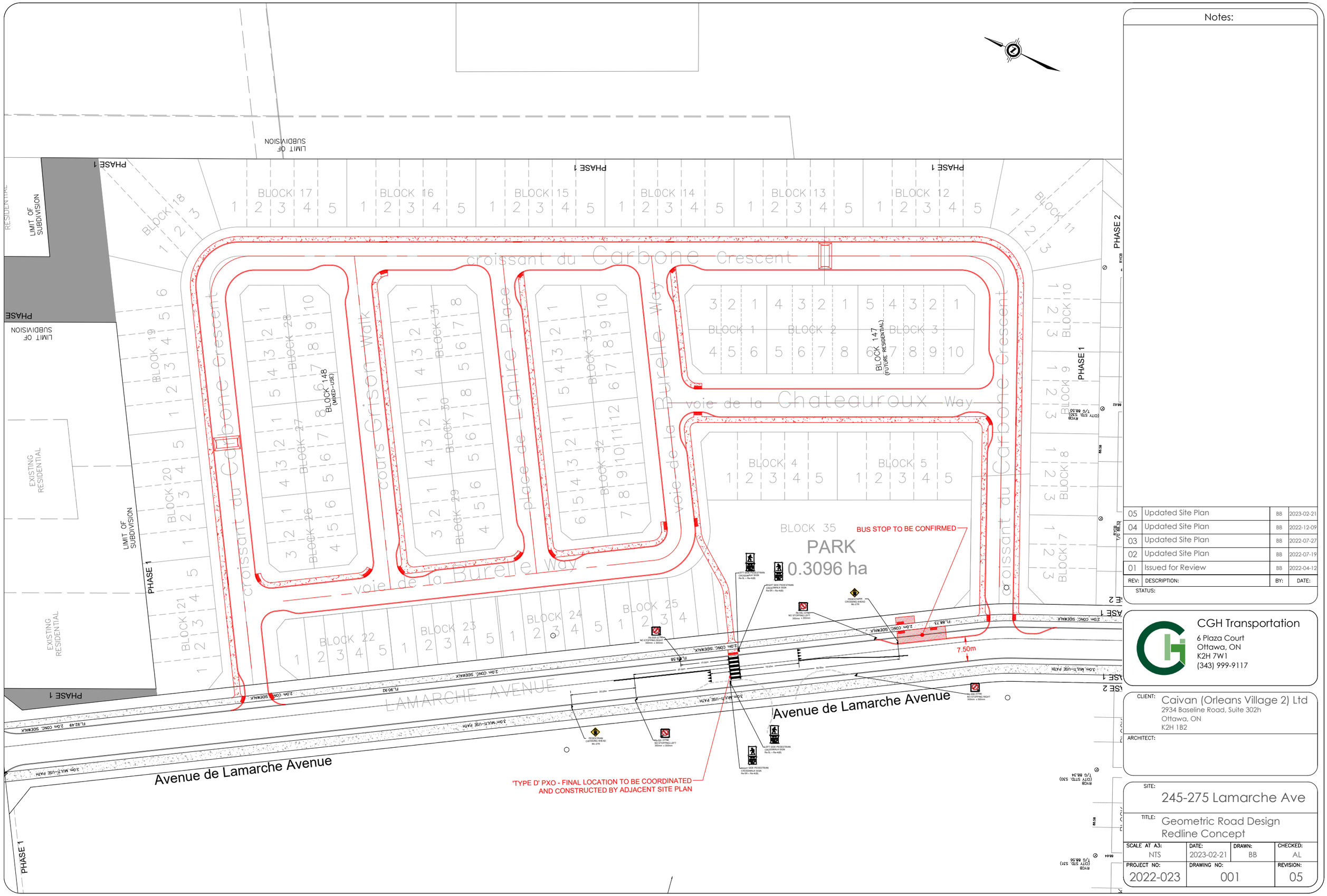
RESIDENTIAL FRONTAGE:
Singles - 1876.23m
Towns - 826.32m
Total - 2702.55m

ROAD LENGTH:
Total - 2329.25m

BMR LANDS - INNES

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

PROJECT No. 118224



Notes:

REV:	DESCRIPTION:	BY:	DATE:
05	Updated Site Plan	BB	2023-02-21
04	Updated Site Plan	BB	2022-12-09
03	Updated Site Plan	BB	2022-07-27
02	Updated Site Plan	BB	2022-07-19
01	Issued for Review	BB	2022-04-12

STATUS:

CGH Transportation
6 Plaza Court
Ottawa, ON
K2H 7W1
(343) 999-9117

CLIENT: Caivan (Orleans Village 2) Ltd
2934 Baseline Road, Suite 302h
Ottawa, ON
K2H 1B2

ARCHITECT:

SITE: 245-275 Lamarche Ave

TITLE: Geometric Road Design
Redline Concept

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2023-02-21	BB	AL

PROJECT NO:	DRAWING NO:	REVISION:
2022-023	001	05

APPENDIX F

INTERNAL REDUCTION CALCULATIONS

Target Mode Share Assumption

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Lepine Innes	**Organization:**	Parsons
Project Location:	3490 Innes Road	**Performed By:**	
Scenario Description:	External - Internal Trips AM	**Date:**	1-Sep-21
Analysis Year:	2021 Target Mode Share	**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	820	37,536	sq ft GFA	103	53	50
Restaurant	937	2,217	sq ft GFA	178	91	87
Cinema/Entertainment				0		
Residential	220	525	units	91	28	63
Hotel				0		
All Other Land Uses[2]	945	1,550	sq ft GFA	151	90	61
				523	262	261

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		7	0	1	0
Restaurant	0	4		0	1	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	13	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	523	262	261
Internal Capture Percentage	10%	10%	10%
External Vehicle-Trips[5]	469	235	234
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	9%	16%
Restaurant	22%	6%
Cinema/Entertainment	N/A	N/A
Residential	7%	22%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Target Mode Share Assumption

Project Name:	Lepine Innes
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	53	53	1.00	50	50
Restaurant	1.00	91	91	1.00	87	87
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	28	28	1.00	63	63
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	15		7	0	7	0
Restaurant	27	12		0	3	3
Cinema/Entertainment	0	0	0		0	0
Residential	1	1	13	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		17	21	0	0	0
Retail	0		46	0	1	0
Restaurant	0	4		0	1	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	9	18	0		0
Hotel	0	2	5	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	5	48	53	48	0	0
Restaurant	20	71	91	71	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	2	26	28	26	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	90	90	90	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	8	42	50	42	0	0
Restaurant	5	82	87	82	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	14	49	63	49	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	61	61	61	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

Target Mode Share Assumption

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Lepine Innes	**Organization:**	Parsons
Project Location:	3490 Innes Road	**Performed By:**	
Scenario Description:	External - Internal Trips PM	**Date:**	1-Sep-21
Analysis Year:	2021 Target Mode Share	**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	820	37,536	sq ft GFA	300	151	149
Restaurant	937	2,217	sq ft GFA	87	43	44
Cinema/Entertainment				0		
Residential	220	525	units	94	55	39
Hotel				0		
All Other Land Uses[2]	945	1,550	sq ft GFA	175	89	86
				656	338	318

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail					550	
Restaurant					500	
Cinema/Entertainment						
Residential		550	500			
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		12	0	25	0
Restaurant	0	18		0	8	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	14	5	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	656	338	318
Internal Capture Percentage	25%	24%	26%
External Vehicle-Trips[5]	492	256	236
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	21%	25%
Restaurant	40%	59%
Cinema/Entertainment	N/A	N/A
Residential	60%	49%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Target Mode Share Assumption

Project Name:	Lepine Innes
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	151	151	1.00	149	149
Restaurant	1.00	43	43	1.00	44	44
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	55	55	1.00	39	39
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	3		43	6	39	7
Restaurant	1	18		4	8	3
Cinema/Entertainment	0	0	0		0	0
Residential	2	15	7	0		1
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		12	1	0	2	0
Retail	0		12	0	25	0
Restaurant	0	76		0	9	0
Cinema/Entertainment	0	6	1		2	0
Residential	0	14	5	0		0
Hotel	0	3	2	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	32	119	151	119	0	0
Restaurant	17	26	43	26	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	33	22	55	22	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	89	89	89	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	37	112	149	112	0	0
Restaurant	26	18	44	18	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	19	20	39	20	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	86	86	86	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

TRANS Mode Share Assumption

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Lepine Innes	**Organization:**	Parsons
Project Location:	3490 Innes Road	**Performed By:**	
Scenario Description:	External - Internal Trips AM	**Date:**	1-Sep-21
Analysis Year:	2021 TRANS Mode Share	**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	820	37,536	sq ft GFA	103	53	50
Restaurant	937	2,217	sq ft GFA	178	91	87
Cinema/Entertainment				0		
Residential	220	525	units	109	34	75
Hotel				0		
All Other Land Uses[2]	945	1,550	sq ft GFA	151	90	61
				541	268	273

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		7	0	1	0
Restaurant	0	4		0	2	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	15	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	541	268	273
Internal Capture Percentage	11%	11%	11%
External Vehicle-Trips[5]	481	238	243
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	9%	16%
Restaurant	24%	7%
Cinema/Entertainment	N/A	N/A
Residential	9%	21%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

TRANS Mode Share Assumption

Project Name:	Lepine Innes
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	53	53	1.00	50	50
Restaurant	1.00	91	91	1.00	87	87
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	34	34	1.00	75	75
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	15		7	0	7	0
Restaurant	27	12		0	3	3
Cinema/Entertainment	0	0	0		0	0
Residential	2	1	15	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		17	21	0	0	0
Retail	0		46	0	1	0
Restaurant	0	4		0	2	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	9	18	0		0
Hotel	0	2	5	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	5	48	53	48	0	0
Restaurant	22	69	91	69	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	3	31	34	31	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	90	90	90	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	8	42	50	42	0	0
Restaurant	6	81	87	81	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	16	59	75	59	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	61	61	61	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

TRANS Mode Share Assumption

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Lepine Innes	**Organization:**	Parsons
Project Location:	3490 Innes Road	**Performed By:**	
Scenario Description:	External - Internal Trips PM	**Date:**	1-Sep-21
Analysis Year:	2021 TRANS Mode Share	**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	820	37,536	sq ft GFA	300	151	149
Restaurant	937	2,217	sq ft GFA	87	43	44
Cinema/Entertainment				0		
Residential	220	525	units	127	74	53
Hotel				0		
All Other Land Uses[2]	945	1,550	sq ft GFA	175	89	86
				689	357	332

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail					550	
Restaurant					500	
Cinema/Entertainment						
Residential		550	500			
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		12	0	34	0
Restaurant	0	18		0	8	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	14	5	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	689	357	332
Internal Capture Percentage	26%	25%	27%
External Vehicle-Trips[5]	507	266	241
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	21%	31%
Restaurant	40%	59%
Cinema/Entertainment	N/A	N/A
Residential	57%	36%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

TRANS Mode Share Assumption

Project Name:	Lepine Innes
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	151	151	1.00	149	149
Restaurant	1.00	43	43	1.00	44	44
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	74	74	1.00	53	53
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	3		43	6	39	7
Restaurant	1	18		4	8	3
Cinema/Entertainment	0	0	0		0	0
Residential	2	20	10	0		2
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		12	1	0	3	0
Retail	0		12	0	34	0
Restaurant	0	76		0	12	0
Cinema/Entertainment	0	6	1		3	0
Residential	0	14	5	0		0
Hotel	0	3	2	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	32	119	151	119	0	0
Restaurant	17	26	43	26	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	42	32	74	32	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	89	89	89	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	46	103	149	103	0	0
Restaurant	26	18	44	18	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	19	34	53	34	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	86	86	86	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

APPENDIX G

PROJECTED BACKGROUND GROWTH

Innes/Orleans
8 hrs

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2003	Monday May 5	3894	4061	2568	2126	5041	4663	7013	7666	37032
2004	Thursday July 22	3435	3253	2003	1682	4016	4101	5585	6003	30078
2014	Tuesday Jan 21	3719	3786	1906	1485	6786	7032	8225	8333	41272
2017	Wednesday May 3	4527	4881	2515	2055	7900	8264	9610	9352	49104

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2003	4061	3894	7955	37032				
2004	3253	3435	6688	30078	-19.9%	-11.8%	-15.9%	-18.8%
2014	3786	3719	7505	41272	16.4%	8.3%	12.2%	37.2%
2017	4881	4527	9408	49104	28.9%	21.7%	25.4%	19.0%

Regression Estimate	2003	3587	3611	7198
Regression Estimate	2017	4466	4220	8686
Average Annual Change		**1.58%**	**1.12%**	**1.35%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2003	7013	7666	14679	37032				
2004	5585	6003	11588	30078	-20.4%	-21.7%	-21.1%	-18.8%
2014	8225	8333	16558	41272	47.3%	38.8%	42.9%	37.2%
2017	9610	9352	18962	49104	16.8%	12.2%	14.5%	19.0%

Regression Estimate	2003	6178	6757	12935
Regression Estimate	2017	9259	9086	18345
Average Annual Change		**2.93%**	**2.14%**	**2.53%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2003	4663	5041	9704	37032				
2004	4101	4016	8117	30078	-12.1%	-20.3%	-16.4%	-18.8%
2014	7032	6786	13818	41272	71.5%	69.0%	70.2%	37.2%
2017	8264	7900	16164	49104	17.5%	16.4%	17.0%	19.0%

Regression Estimate	2003	4237	4412	8649
Regression Estimate	2017	8067	7694	15761
Average Annual Change		**4.71%**	**4.05%**	**4.38%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2003	2568	2126	4694	37032				
2004	2003	1682	3685	30078	-22.0%	-20.9%	-21.5%	-18.8%
2014	1906	1485	3391	41272	-4.8%	-11.7%	-8.0%	37.2%
2017	2515	2055	4570	49104	32.0%	38.4%	34.8%	19.0%

Regression Estimate	2003	2260	1880	4139
Regression Estimate	2017	2234	1788	4022
Average Annual Change		**-0.08%**	**-0.36%**	**-0.20%**

Innes/Orleans
AM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2003	Monday May 5	881	410	584	165	1095	308	355	2032	5830
2004	Thursday July 22	558	229	336	95	872	294	302	1480	4166
2014	Tuesday Jan 21	670	482	450	98	1527	388	424	2103	6142
2017	Wednesday May 3	627	529	506	147	1687	460	492	2176	6624

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2003	410	881	1291	5830				
2004	229	558	787	4166	-44.1%	-36.7%	-39.0%	-28.5%
2014	482	670	1152	6142	110.5%	20.1%	46.4%	47.4%
2017	529	627	1156	6624	9.8%	-6.4%	0.3%	7.8%

Regression Estimate	2003	316	731	1047
Regression Estimate	2017	524	630	1154
Average Annual Change		**3.68%**	**-1.06%**	**0.69%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2003	355	2032	2387	5830				
2004	302	1480	1782	4166	-14.9%	-27.2%	-25.3%	-28.5%
2014	424	2103	2527	6142	40.4%	42.1%	41.8%	47.4%
2017	492	2176	2668	6624	16.0%	3.5%	5.6%	7.8%

Regression Estimate	2003	322	1754	2076
Regression Estimate	2017	475	2171	2646
Average Annual Change		**2.82%**	**1.53%**	**1.75%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2003	308	1095	1403	5830				
2004	294	872	1166	4166	-4.5%	-20.4%	-16.9%	-28.5%
2014	388	1527	1915	6142	32.0%	75.1%	64.2%	47.4%
2017	460	1687	2147	6624	18.6%	10.5%	12.1%	7.8%

Regression Estimate	2003	294	963	1257
Regression Estimate	2017	442	1678	2120
Average Annual Change		**2.96%**	**4.05%**	**3.81%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2003	584	165	749	5830				
2004	336	95	431	4166	-42.5%	-42.4%	-42.5%	-28.5%
2014	450	98	548	6142	33.9%	3.2%	27.1%	47.4%
2017	506	147	653	6624	12.4%	50.0%	19.2%	7.8%

Regression Estimate	2003	461	128	590
Regression Estimate	2017	478	124	602
Average Annual Change		**0.25%**	**-0.27%**	**0.14%**

Innes/Orleans
PM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2003	Monday May 5	566	996	303	593	466	1170	2009	585	6688
2004	Thursday July 22	514	796	311	404	450	895	1445	625	5440
2014	Tuesday Jan 21	506	812	231	382	596	1551	2058	646	6782
2017	Wednesday May 3	609	918	373	457	705	1673	2161	800	7696

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2003	996	566	1562	6688				
2004	796	514	1310	5440	-20.1%	-9.2%	-16.1%	-18.7%
2014	812	506	1318	6782	2.0%	-1.6%	0.6%	24.7%
2017	918	609	1527	7696	13.1%	20.4%	15.9%	13.5%

Regression Estimate	2003	894	534	1428
Regression Estimate	2017	865	566	1431
Average Annual Change		**-0.24%**	**0.41%**	**0.01%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2003	2009	585	2594	6688				
2004	1445	625	2070	5440	-28.1%	6.8%	-20.2%	-18.7%
2014	2058	646	2704	6782	42.4%	3.4%	30.6%	24.7%
2017	2161	800	2961	7696	5.0%	23.8%	9.5%	13.5%

Regression Estimate	2003	1724	591	2315
Regression Estimate	2017	2143	748	2891
Average Annual Change		**1.57%**	**1.69%**	**1.60%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2003	1170	466	1636	6688				
2004	895	450	1345	5440	-23.5%	-3.4%	-17.8%	-18.7%
2014	1551	596	2147	6782	73.3%	32.4%	59.6%	24.7%
2017	1673	705	2378	7696	7.9%	18.3%	10.8%	13.5%

Regression Estimate	2003	1017	447	1464
Regression Estimate	2017	1675	678	2353
Average Annual Change		**3.63%**	**3.03%**	**3.45%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2003	303	593	896	6688				
2004	311	404	715	5440	2.6%	-31.9%	-20.2%	-18.7%
2014	231	382	613	6782	-25.7%	-5.4%	-14.3%	24.7%
2017	373	457	830	7696	61.5%	19.6%	35.4%	13.5%

Regression Estimate	2003	298	500	797
Regression Estimate	2017	312	412	725
Average Annual Change		**0.35%**	**-1.36%**	**-0.68%**

APPENDIX H

CAIVAN LANDS PLAN & LAMARCHE AVENUE ACTIVE TRANSPORTATION FACILITIES

Page Setup: ----

Drawing Frame: 790mm x 534mm City of Ottawa 2008 (Rev.0)

Plot Date: Wednesday, January 23, 2019 11:21:04 AM

Last Saved: Wednesday, January 23, 2019 10:48:26 AM

Consultant's Information: H:\ISO\476145\1000\DWG\CAIVAN_INNES_23-01-2019.dwg

Caivan Innis Road

Signage and Pavement Marking Plan North

PARSONS

476145	Dwg. No. 001
Sheet 1 of 3	
Des.	Chk'd.
Dwn. MJM	Chk'd.

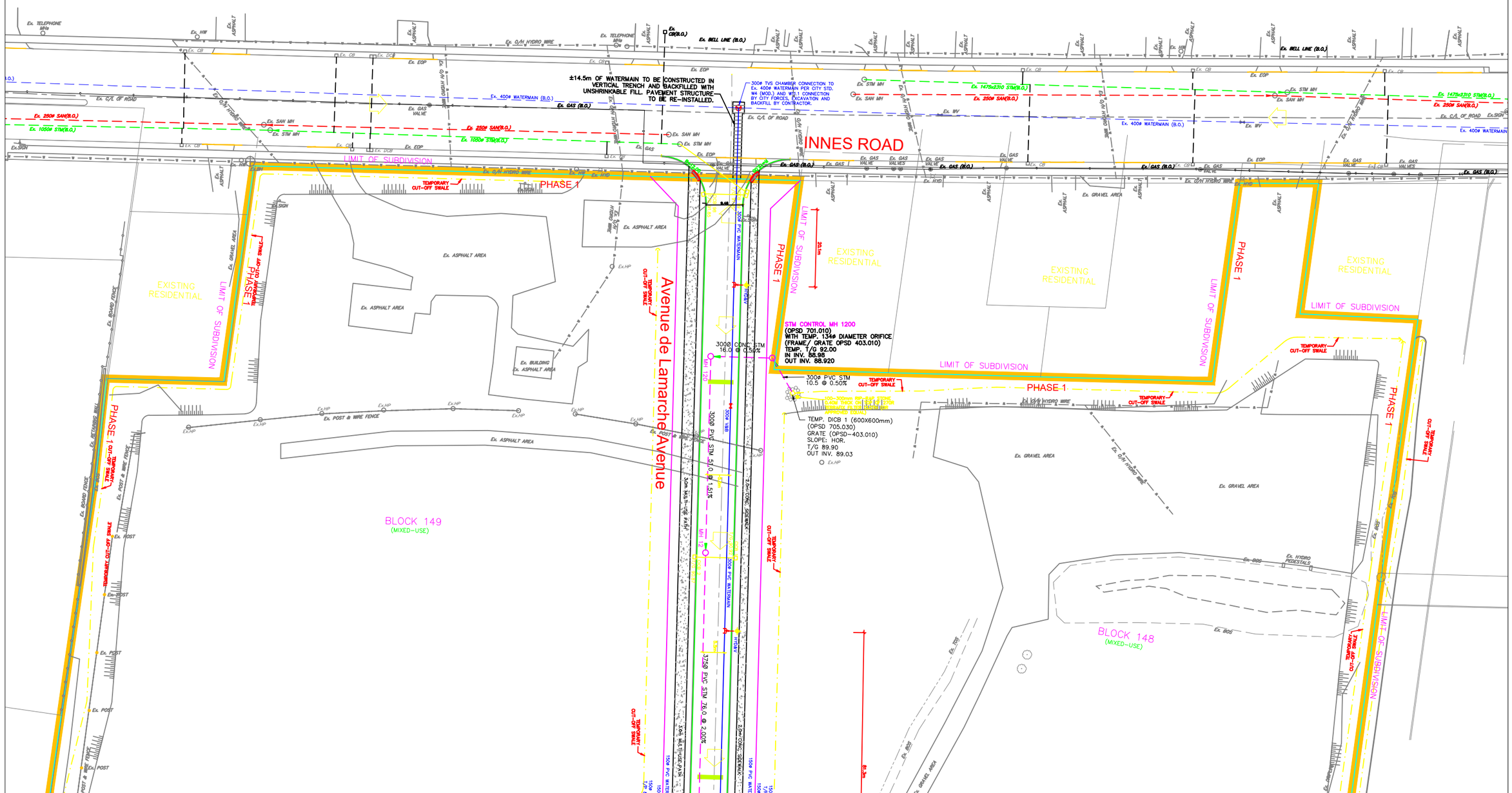
Scale: HORIZONTAL 0m 2.5 5 10

NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

REVISIONS

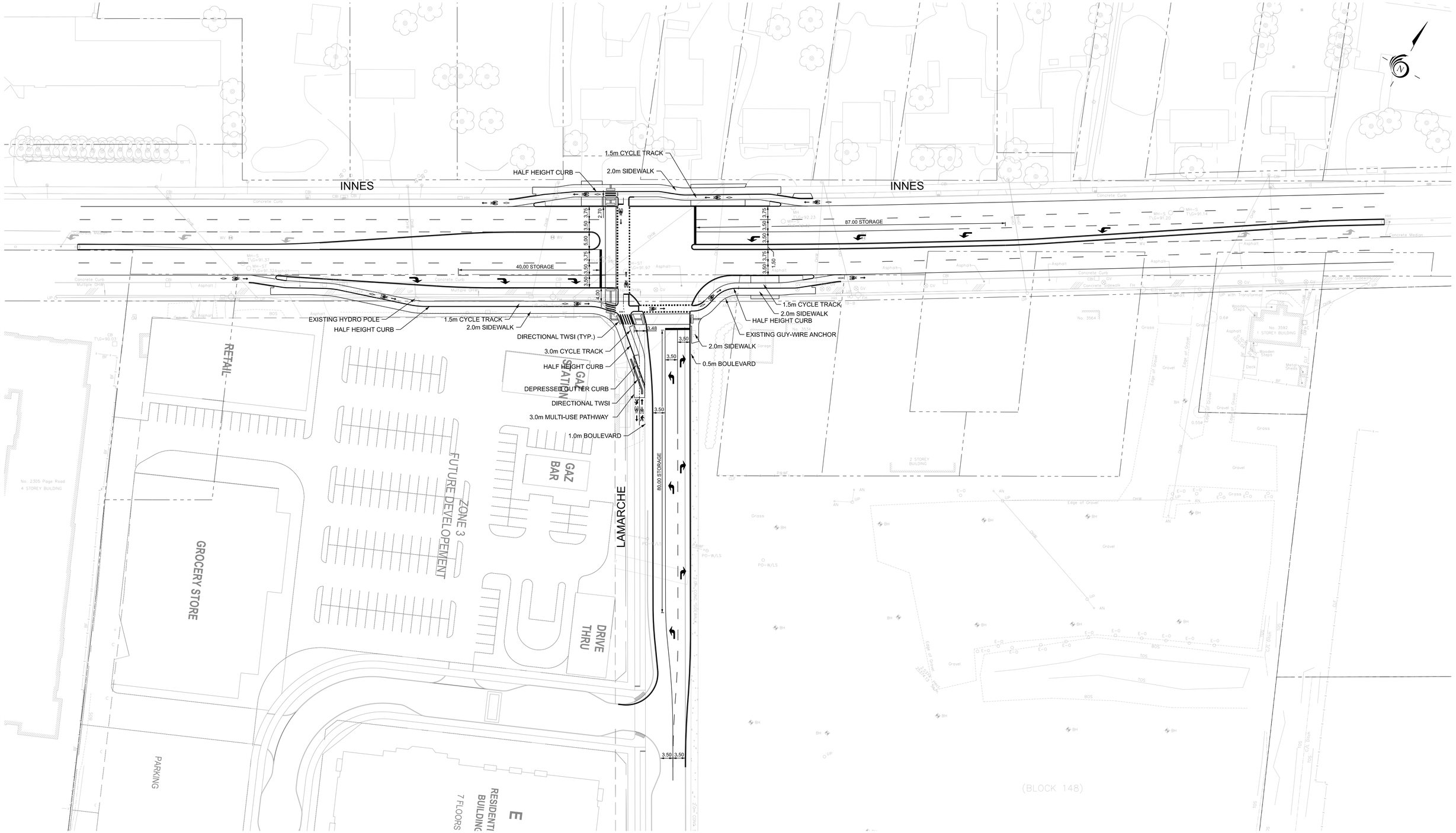
No.	Description	By	Date (dd/mm/yy)
01	Signage Plan	MJM	03/08/18
02	Signage Plan	RN	23/01/19

BETWEEN CONCESSIONS 2 AND 3 (OTTAWA FRONT)
Known as INNES ROAD
REGIONAL ROAD NO. 30



APPENDIX I

LAMARCHE/INNES PROPOSED SIGNALIZED INTERSECTION



PARSONS

NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

INNES ROAD AND LAMARCHE AVENUE
CONCEPTUAL INTERSECTION DESIGN

FOR PRELIMINARY DISCUSSIONS ONLY

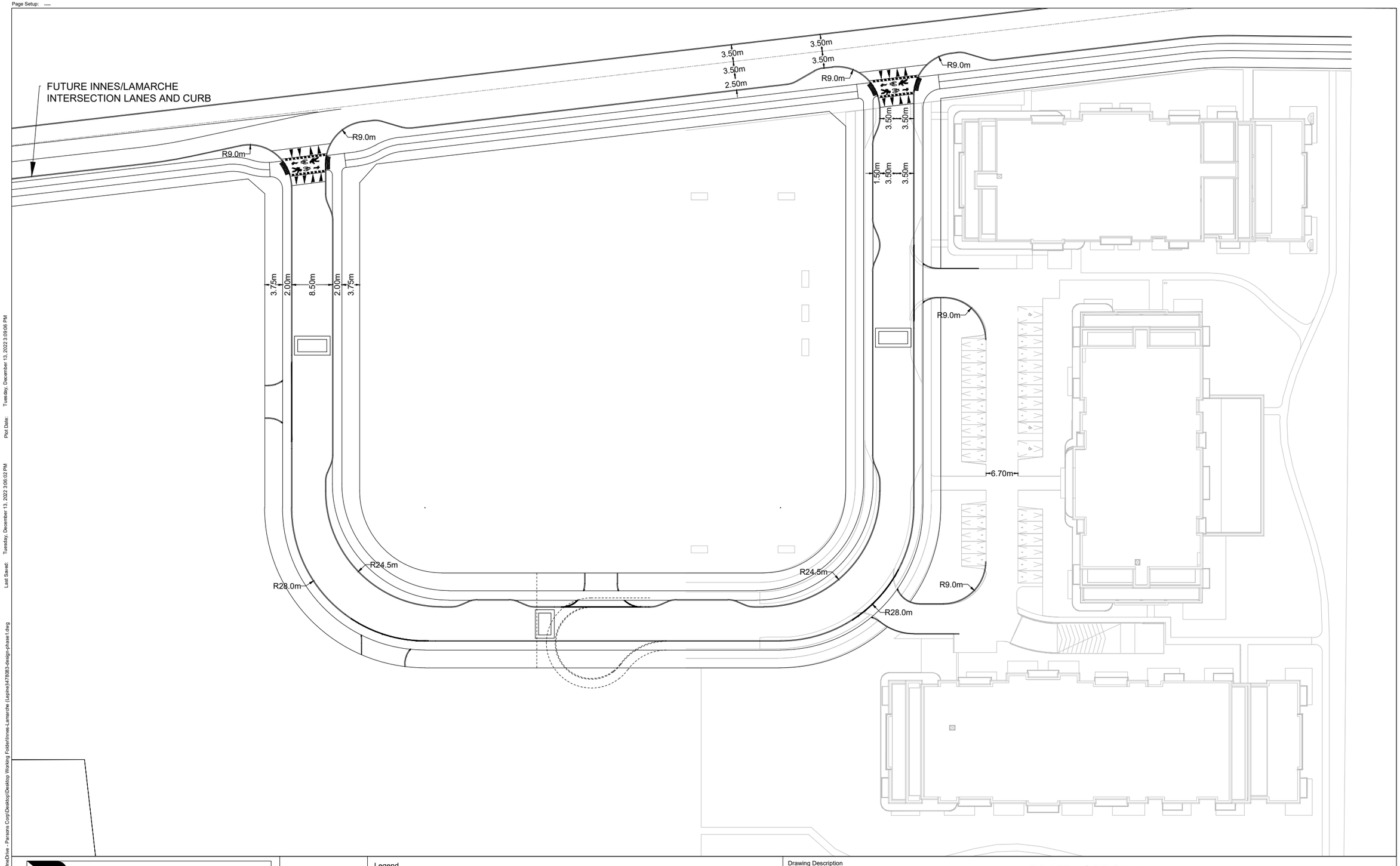
Project Number:	Dwn.	Dwg. No.
476731	D.D.C.	001
Date: November 10, 2022	Sheet 1 of 1	

Scale: HORIZONTAL 0m 5 10 20

APPENDIX J

CROISSANT FRANCOISE STREET CALMING MEASURES

Page Setup: ----



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PARSONS

NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

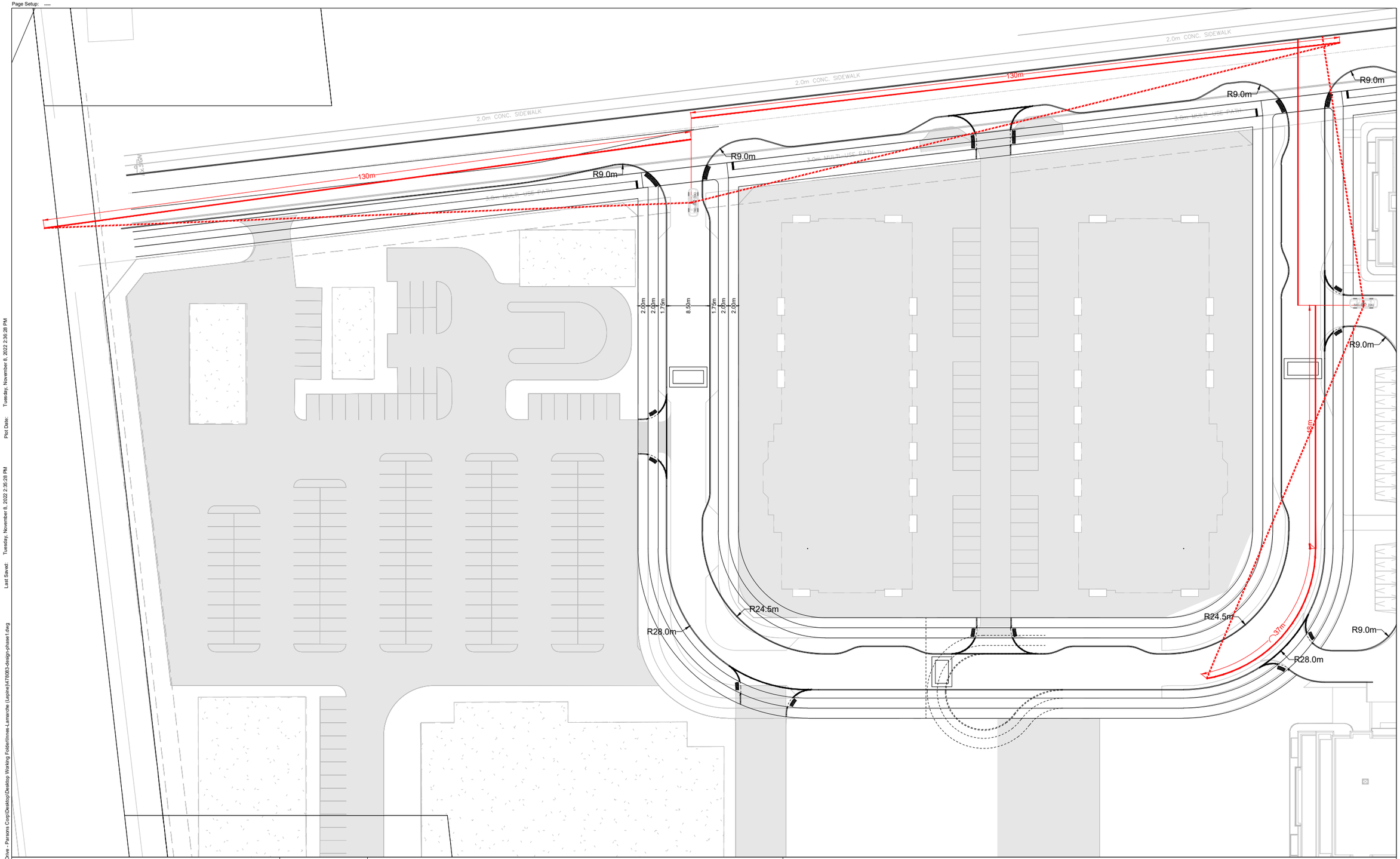
Legend

Scale (m)

0 5 15 25

Drawing Description: DRAFT - OPTION 1		
Client	Date: 2022/12/13	Figure Number: 001
Project Number: 478083	Project Description: 3484 INNES ROAD	

Page Setup: ----



PARSONS®

NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

Legend

TAC SIGHT DISTANCE REQUIREMENTS
DS 40 KM/H = 85 M
DS 60 KM/H = 130 M

Drawing Description: LAMARCHE SIGHTLINES		
Client	Date: 2022/11/08	Figure Number: 002
Project Number: 478083	Project Description: 3484 INNES ROAD	

Consultant's Information

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Plot Date: Tuesday, November 8, 2022 2:36:28 PM

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Last Saved: Tuesday, November 8, 2022 2:35:28 PM

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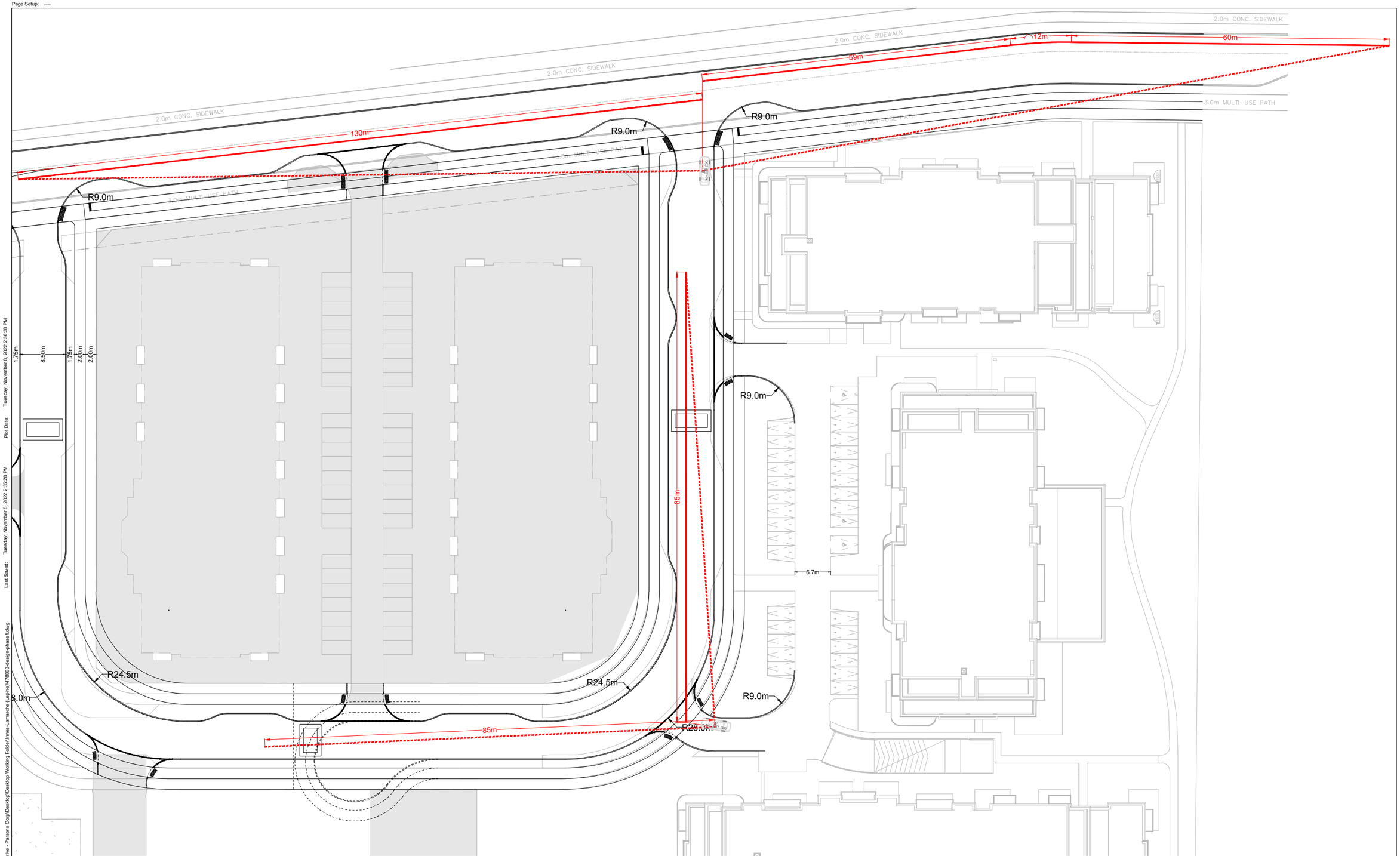


PARSONS®

NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

Legend

TAC SIGHT DISTANCE REQUIREMENTS
DS 40 KM/H = 85 M
DS 60 KM/H = 130 M

Drawing Description: LAMARCHE SIGHTLINES		
Client	Date: 2022/11/08	Figure Number: 003
Project Number: 478083	Project Description: 3484 INNES ROAD	

APPENDIX K

MMLOS: BOUNDARY STREETS ROAD SEGMENTS

Multi-Modal Level of Service - Segments Form

Consultant	**Parsons**	**Project**	**Lepine 477947**
Scenario		**Date**	**Sept 8 2021**
Comments			

SEGMENTS		**Street A**	Innes	Lamarche	Lamarche	Access Loop	Section	Section	Section	Section	Section
			Both Sides	West Side	East Side	Both Sides	5	6	7	8	9
Pedestrian	Sidewalk Width Boulevard Width	-	1.8 m 0.5 - 2 m	≥ 2 m 0.5 - 2 m	≥ 2 m > 2 m	≥ 2 m < 0.5			≥ 2 m > 2 m		
	Avg Daily Curb Lane Traffic Volume		> 3000	≤ 3000	≤ 3000	≤ 3000			> 3000		
	Operating Speed On-Street Parking		> 60 km/h no	> 50 to 60 km/h yes	> 50 to 60 km/h yes	> 30 to 50 km/h yes			> 50 to 60 km/h no		
	Exposure to Traffic PLoS		**E**	**A**	**A**	**B**	**-**	**-**	**C**	**-**	**-**
	Effective Sidewalk Width										
	Pedestrian Volume										
	Crowding PLoS		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Level of Service		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Bicycle	Type of Cycling Facility	**D**	Curbside Bike Lane	Physically Separated	Mixed Traffic	Mixed Traffic					
	Number of Travel Lanes		2 ea. dir. (no median)		≤ 2 (no centreline)	≤ 2 (no centreline)					
	Operating Speed		>50 to 70 km/h		≥ 50 to 60 km/h	≤ 40 km/h					
	# of Lanes & Operating Speed LoS		**C**	**-**	**D**	**A**	**-**	**-**	**-**	**-**	**-**
	Bike Lane (+ Parking Lane) Width		≥ 1.8 m								
	Bike Lane Width LoS		**A**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Bike Lane Blockages		Rare								
	Blockage LoS		**A**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge		< 1.8 m refuge	< 1.8 m refuge					
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes		≤ 3 lanes	≤ 3 lanes					
	Sidestreet Operating Speed		>40 to 50 km/h		>40 to 50 km/h	≤ 40 km/h					
	Unsignalized Crossing - Lowest LoS		**B**	**A**	**B**	**A**	**-**	**-**	**-**	**-**	**-**
	Level of Service		**C**	**A**	**D**	**A**	**-**	**-**	**-**	**-**	**-**
Transit	Facility Type	**D**	Mixed Traffic	Mixed Traffic	Mixed Traffic						
	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8						
	Level of Service		**D**	**D**	**D**	**-**	**-**	**-**	**-**	**-**	**-**
Truck	Truck Lane Width	**A**	≤ 3.5 m								
	Travel Lanes per Direction		> 1								
	Level of Service		**A**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

APPENDIX L

WARRANT ANALYSIS

Lamarche/Innes - (peak hour signal warrant assuming up to Zone 2 Built)

Signal Warrant		Description		Minimum Requirement for Two Lane Roadways	Compliance		
				Restricted Flow - Operating Speed Less Than 70 km/h	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	900	166%	49%	**100% Yes**
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	49%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	900	152%	100%	
		(2) B	Combined Vehicle and Pedestrian Volume Crossing the Major Street for Each of the Same 8 Hours	75	100%		

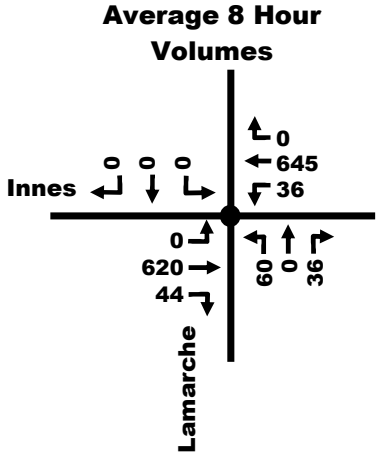
Notes

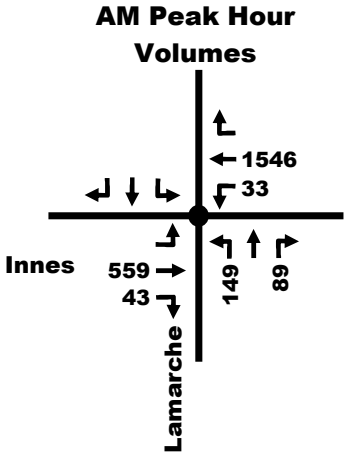
1 *Vehicle Volume Warrants (1A), (2A) and (5B) for Roadways Having Two or More Moving Lanes in one Direction Should Be 25% Higher Than Values Given Above* **Yes**

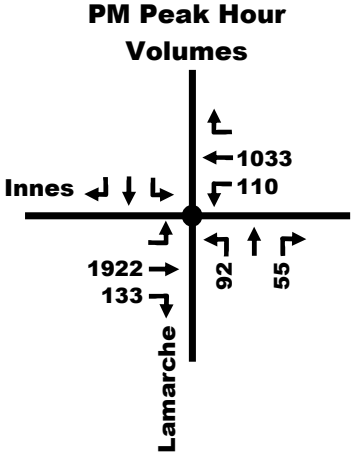
2 *For Definition of Crossing Volume Refer to Note 4 on the Signal Warrant Analysis Form B2.03.08*

3 *The Lowest Sectional Percentage Governs the Entire Warrant*

4 *For "T" Intersections the Warrant Values for Minor Street Should be Increased by 50% (Warrant 1B only)* **Yes**



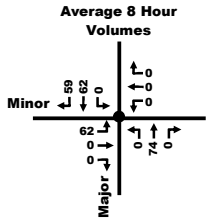


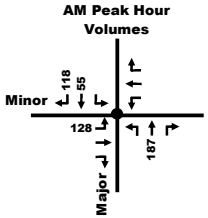


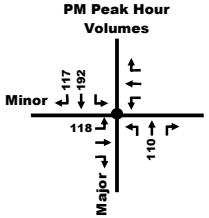
Loop/Lamarche - 2031 projected

AWSC Warrant			Description	Minimum Requirement for a 'T' intersection	Compliance		
					Sectional %	Entire %	Warrant
Intersection	1. Minimum Volume Criterion	A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, or	200	129%	78%	No
		B	Vehicle Volume, All Approaches for the Heaviest Peak Hour, and	350	153%		
		C	Vehicle and pedestrian Volume, Along Minor Streets for Each of the Same 8 Hours, and	80	78%		
		D	The volume split between the major and minor streets	75/25	95%		
	2. Minimum Collision Criterion	A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	9	0%	0%	

Note: ***0*** *preventable by AWSC collisions (i.e. right angle and turning movement collisions) were reported during a 3 year time period*







Assumes 50% of all site gen traffic to use the first municipal loop access

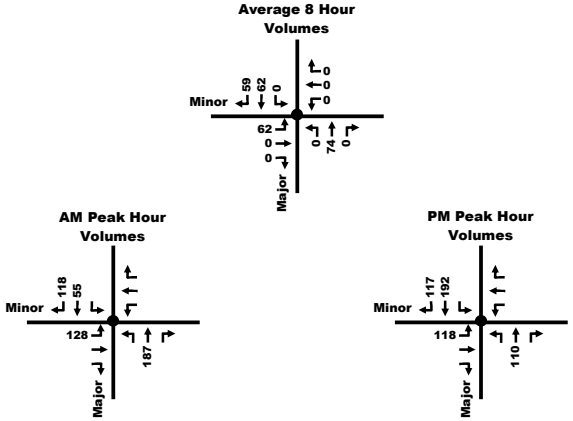
		IN	OUT	% assumed using exit
	AM	235	256	50%
	PM	234	236	

				Major Lamarche						Minor Loop			
	Peak	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Existing	8 hr												
	AM		187			55	118	128					
	PM		110			192	117	118					
Site Generated	AM												
	PM												
	Avg. 8 hr	0	74	0	0	62	59	62	0	0	0	0	0

Loop/Lamarche - 2031 projected

AWSC Warrant			Description	Minimum Requirement for a 'T' intersection	Compliance		
					Sectional %	Entire %	Warrant
Intersection	1. Minimum Volume Criterion	A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, or	200	146%	100%	**Yes**
		B	Vehicle Volume, All Approaches for the Heaviest Peak Hour, and	350	173%		
		C	Vehicle and pedestrian Volume, Along Minor Streets for Each of the Same 8 Hours, and	80	100%		
		D	The volume split between the major and minor streets	75/25	113%		
	2. Minimum Collision Criterion	A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	9	0%	0%	

Note: ***0*** *preventable by AWSC collisions (i.e. right angle and turning movement collisions) were reported during a 3 year time period*



Assumes 65% of all site gen traffic to use the first municipal loop access

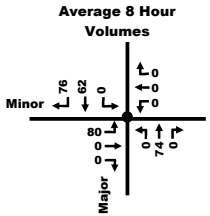
		IN	OUT	% assumed using exit
	AM	235	256	65%
	PM	234	236	

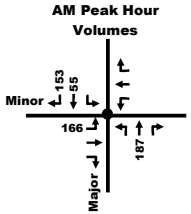
				Major						Minor			
				Lamarche					Loop				
	Peak	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Existing	8 hr												
	AM		187			55	153	166					
	PM		110			192	152	153					
Site Generated	AM												
	PM												
	Avg. 8 hr	0	74	0	0	62	76	80	0	0	0	0	0

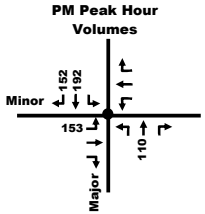
Loop/Lamarche - 2031 projected

AWSC Warrant			Description	Minimum Requirement for a 'T' intersection	Compliance		
					Sectional %	Entire %	Warrant
Intersection	1. Minimum Volume Criterion	A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, or	200	142%	98%	**No**
		B	Vehicle Volume, All Approaches for the Heaviest Peak Hour, and	350	171%		
		C	Vehicle and pedestrian Volume, Along Minor Streets for Each of the Same 8 Hours, and	80	98%		
		D	The volume split between the major and minor streets	75/25	114%		
	2. Minimum Collision Criterion	A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	9	0%	0%	

Note: ***0*** *preventable by AWSC collisions (i.e. right angle and turning movement collisions) were reported during a 3 year time period*







Assumes x% of all site gen traffic to use the first municipal loop access AND 245 Lamarche added to leg

	IN	OUT	% assumed using exit
AM	235	256	50%
PM	234	236	

		Major Lamarche							Minor Loop				
	Peak	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Existing	8 hr												
	AM		187		10	55	118	128					36
	PM		110		34	192	117	118					27
Site Generated	AM												
	PM												
	Avg. 8 hr	0	74	0	11	62	59	62	0	0	0	0	16

APPENDIX M

TDM CHECKLIST

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

Legend

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

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☑ Majority of parking located underground
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑ Building entrances located to the exterior perimeter/roads
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑ modern design buildings with windows
	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)*	☑ The furthest Buildings from OC-Transpo major bus route #25 bus-stop on Innes Road are located approximately 350 meters walking distance from existing stops
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)*	☑ Internal pedestrian walkways are proposed through landscaped courtyards which connect all the buildings to the municipal loop road and Innes Road / Lamarche Avenue

	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)*	☑ Sidewalks to be built to city standards
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)*	☑ The buildings will have at-grade access directly onto the municipal loop road and Lamarche Avenue plus a proposed public plaza in zone 2
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)*	☑ Internal pathways will connect to existing pedestrian and cycling facilities on Lamarche Avenue and Innes Road
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☑ MUP on east side of Lamarche Avenue connects to Innes Road
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☑ MUP on east side of Lamarche Avenue connects to Innes Road
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	☑ MUP on east side of Lamarche Avenue connects to Innes Road cycling facilities
	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	☑ Public plaza proposed and sidewalks on the municipal loop road
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)	☑ likely to have signs for each building

	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)*	☑ Expected to be located indoors in secure area. To be confirmed in SPA
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)*	☑ Expected to meet bylaw. To be confirmed in SPA
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)*	☑ Expected to meet bylaw. To be confirmed in SPA
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☑ Expected to be located indoors in secure area. To be confirmed in SPA
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☐
	2.3	**Bicycle repair station**	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐ to be considered
	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)*	☐ to be considered
	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	☐ to be considered
	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	☑ expected to meet parking bylaw. To be confirmed in SPA
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	☑ Separated parking for visitors/commercial (short-term) and residents (long-term)
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)*	☑ if an option with commercial is chosen, recommended shared parking for visitors to be considered
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)	☐

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	☐ recommended, to be confirmed in SPA
	1.2	**Travel surveys**	
BETTER	1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐ recommended, to be confirmed in SPA
	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)*	☐ recommended, to be confirmed in SPA
	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	☐ highly recommended, to be confirmed in SPA
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)	☐ recommended if options involving senior homes chosen, to be confirmed in SPA
		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)*	☐ highly recommended, to be confirmed in SPA

			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	☐ recommended, to be confirmed in SPA
		6.2	**Personalized trip planning**	
BETTER	★	6.2.1	Offer personalized trip planning to new residents	☐ recommended, to be confirmed in SPA

APPENDIX N

MMLOS: INTERSECTION ANALYSIS

Multi-Modal Level of Service - Intersections Form

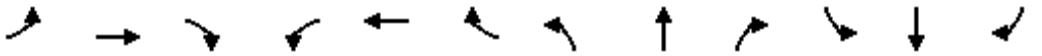
Consultant	**Parsons**	**Project**	**Lepine 477947**
Scenario		**Date**	**3-Nov-22**
Comments			

Unlocked Rows for Replicating

INTERSECTIONS		Innes/Page				Innes/Boyer				Orleans/Innes				Future Innes/Lamarche			
Crossing Side		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	5	6	7	7	4	5	7	7	6	6	9	9		3	7	7
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m		No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Protected/ Permissive	Protected	Protected		Permissive	Permissive	No left turn / Prohib.
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control		Protected	No right turn	Protected
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed		RTOR prohibited	RTOR prohibited	RTOR prohibited
	Ped Signal Leading Interval?	No	No	No	No	No	No	No	No	No	No	No	No		Yes	Yes	Yes
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	Conventional with Receiving Lane	Conventional with Receiving Lane	Conventional with Receiving Lane	Conventional with Receiving Lane		No Channel	No Channel	No Channel
	Corner Radius	5-10m	10-15m	10-15m	10-15m	10-15m	10-15m	10-15m	10-15m	15-25m	15-25m	15-25m	15-25m		10-15m	10-15m	10-15m
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings		Textured/coloured pavement	Textured/coloured pavement	Textured/coloured pavement
	PETSI Score	**38**	**20**	**4**	**4**	**53**	**37**	**4**	**4**	**19**	**19**	**-19**	**-19**		**83**	**17**	**25**
	Ped. Exposure to Traffic LoS	**E**	**F**	**F**	**F**	**D**	**E**	**F**	**F**	**F**	**F**	**#N/A**	**#N/A**	-	**B**	**F**	**F**
	Cycle Length	110	110	110	110	120	120	120	120	110	110	110	110		110	110	110
	Effective Walk Time	31	31	33	33	26	26	28	28	26	26	20	20		30	30	30
	Average Pedestrian Delay	**28**	**28**	**27**	**27**	**37**	**37**	**35**	**35**	**32**	**32**	**37**	**37**		**29**	**29**	**29**
	Pedestrian Delay LoS	**C**	**C**	**C**	**C**	**D**	**D**	**D**	**D**	**D**	**D**	**D**	**D**	-	**C**	**C**	**C**
	Level of Service	**E**	**F**	**F**	**F**	**D**	**E**	**F**	**F**	**F**	**F**	**#N/A**	**#N/A**	**-**	**C**	**F**	**F**
		F				**F**				**#N/A**				**F**			
Approach From		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic	Pocket Bike Lane	Mixed Traffic		Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP
	Right Turn Lane Configuration	≤ 50 m	≤ 50 m	Not Applicable	Not Applicable	≤ 50 m	≤ 50 m	Not Applicable	Not Applicable	≤ 50 m	≤ 50 m	> 50 m Introduced right turn lane	> 50 m		Not Applicable	Not Applicable	Not Applicable
	Right Turning Speed	≤ 25 km/h	≤ 25 km/h	Not Applicable	Not Applicable	≤ 25 km/h	≤ 25 km/h	Not Applicable	Not Applicable	≤ 25 km/h	≤ 25 km/h	>25 to 30 km/h	>25 km/h		Not Applicable	Not Applicable	Not Applicable
	Cyclist relative to RT motorists	**D**	**D**	**Not Applicable**	**Not Applicable**	**D**	**D**	**Not Applicable**	**Not Applicable**	**D**	**D**	**D**	**F**	-	**Not Applicable**	**Not Applicable**	**Not Applicable**
	Separated or Mixed Traffic	**Mixed Traffic**	**Mixed Traffic**	**Separated**	**Separated**	**Mixed Traffic**	**Mixed Traffic**	**Separated**	**Separated**	**Mixed Traffic**	**Mixed Traffic**	**Separated**	**Mixed Traffic**	-	**Separated**	**Separated**	**Separated**
	Left Turn Approach	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed	No lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed	No lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed		No lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed
	Operating Speed	> 50 to < 60 km/h	> 50 to < 60 km/h	≥ 60 km/h	≥ 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	≥ 60 km/h	≥ 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	≥ 60 km/h	≥ 60 km/h		> 50 to < 60 km/h	≥ 60 km/h	≥ 60 km/h
	Left Turning Cyclist	**F**	**F**	**F**	**F**	**C**	**C**	**F**	**F**	**C**	**C**	**F**	**F**	-	**C**	**F**	**F**
	Level of Service	**F**	**F**	**F**	**F**	**D**	**D**	**F**	**F**	**D**	**D**	**F**	**F**	**-**	**C**	**F**	**F**
		F				**F**				**F**				**F**			
Transit	Average Signal Delay			≤ 10 sec	≤ 10 sec			≤ 20 sec	≤ 10 sec			> 40 sec	> 40 sec			≤ 40 sec	≤ 30 sec
	Level of Service	**-**	**-**	**B**	**B**	**-**	**-**	**C**	**B**	**-**	**-**	**F**	**F**	**-**	**-**	**E**	**D**
		B				**C**				**F**				**E**			
Truck	Effective Corner Radius									> 15 m		> 15 m	> 15 m				
	Number of Receiving Lanes on Departure from Intersection									≥ 2		≥ 2	≥ 2				
	Level of Service	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**A**	**-**	**A**	**A**	**-**	**-**	**-**	**-**
		-				**-**				**A**				**-**			
Auto	Volume to Capacity Ratio																
	Level of Service	**-**				**-**				**-**				**-**			

APPENDIX O

SYNCHRO ANALYSIS: EXISTING INTERSECTION PERFORMANCE



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	318	23	24	1186	109	203	259	44	61	100	459
Future Volume (vph)	121	318	23	24	1186	109	203	259	44	61	100	459
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.493			0.575		
Satd. Flow (perm)	3280	3390	1492	1667	3390	1480	874	3390	1427	993	3390	1496
Satd. Flow (RTOR)			195			143			82			256
Lane Group Flow (vph)	134	353	26	27	1318	121	226	288	49	68	111	510
Turn Type	Prot	NA	Free	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Free
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			Free			6	8		8	4		Free
Detector Phase	5	2		1	6	6	3	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.6	26.2		11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	
Total Split (s)	13.0	65.0		13.0	65.0	65.0	19.0	52.0	52.0	33.0	33.0	
Total Split (%)	10.0%	50.0%		10.0%	50.0%	50.0%	14.6%	40.0%	40.0%	25.4%	25.4%	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.9	2.5		2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.2		6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes			Yes	Yes	
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	
Act Effct Green (s)	8.7	70.9	130.0	6.7	63.7	63.7	38.1	38.1	38.1	17.5	17.5	130.0
Actuated g/C Ratio	0.07	0.55	1.00	0.05	0.49	0.49	0.29	0.29	0.29	0.13	0.13	1.00
v/c Ratio	0.61	0.19	0.02	0.31	0.79	0.15	0.66	0.29	0.10	0.51	0.24	0.34
Control Delay	71.6	17.4	0.0	68.7	33.0	2.4	46.6	35.3	2.0	63.5	49.5	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.6	17.4	0.0	68.7	33.0	2.4	46.6	35.3	2.0	63.5	49.5	0.6
LOS	E	B	A	E	C	A	D	D	A	E	D	A
Approach Delay		30.7			31.1			37.0			14.7	
Approach LOS		C			C			D			B	
Queue Length 50th (m)	17.1	24.8	0.0	6.8	146.3	0.0	48.4	30.7	0.0	16.9	14.0	0.0
Queue Length 95th (m)	#34.6	38.9	0.0	16.7	187.9	7.3	65.8	38.9	2.9	29.6	20.9	0.0
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	219	1850	1492	91	1662	798	344	1181	550	200	685	1496
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.19	0.02	0.30	0.79	0.15	0.66	0.24	0.09	0.34	0.16	0.34

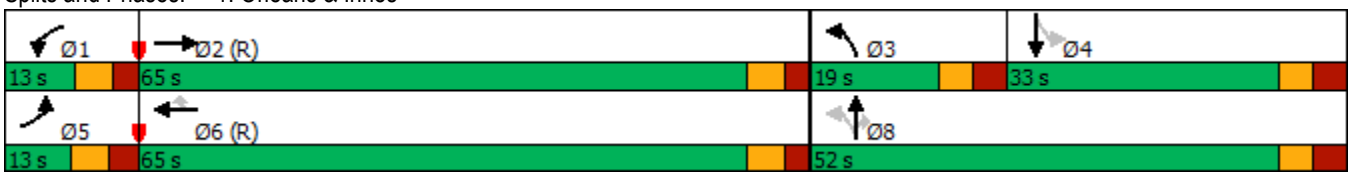
Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 99 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

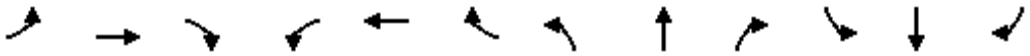
Maximum v/c Ratio: 0.79

Intersection Signal Delay: 28.6	Intersection LOS: C
Intersection Capacity Utilization 86.0%	ICU Level of Service E
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Orleans & Innes





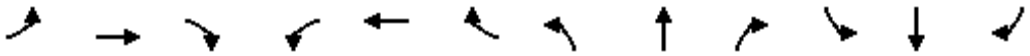
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	399	11	41	1275	27	14	14	61	37	7	59
Future Volume (vph)	13	399	11	41	1275	27	14	14	61	37	7	59
Satd. Flow (prot)	1695	3375	0	1695	3378	0	0	1589	0	0	1589	0
Flt Permitted	0.154			0.490				0.929			0.824	
Satd. Flow (perm)	275	3375	0	873	3378	0	0	1485	0	0	1332	0
Satd. Flow (RTOR)		4			3			68			53	
Lane Group Flow (vph)	14	455	0	46	1447	0	0	100	0	0	115	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		39.2	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	82.0	82.0		82.0	82.0		38.0	38.0		38.0	38.0	
Total Split (%)	68.3%	68.3%		68.3%	68.3%		31.7%	31.7%		31.7%	31.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2			6.8			6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	91.9	91.9		91.9	91.9			15.1			15.1	
Actuated g/C Ratio	0.77	0.77		0.77	0.77			0.13			0.13	
v/c Ratio	0.07	0.18		0.07	0.56			0.41			0.54	
Control Delay	6.7	4.8		2.6	6.1			21.7			34.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	6.7	4.8		2.6	6.1			21.7			34.8	
LOS	A	A		A	A			C			C	
Approach Delay		4.9			6.0			21.7			34.8	
Approach LOS		A			A			C			C	
Queue Length 50th (m)	0.6	10.3		1.9	50.3			7.1			14.2	
Queue Length 95th (m)	4.1	29.5		3.0	147.4			19.4			27.5	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	210	2584		668	2587			436			385	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.07	0.18		0.07	0.56			0.23			0.30	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 26 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 8.0	Intersection LOS: A
Intersection Capacity Utilization 67.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Page & Innes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	505	8	3	1307	1	3	0	0	0	0	5
Future Volume (vph)	3	505	8	3	1307	1	3	0	0	0	0	5
Satd. Flow (prot)	1695	3382	0	1695	3390	0	0	1695	0	0	1520	0
Flt Permitted	0.170			0.438				0.769				
Satd. Flow (perm)	303	3382	0	779	3390	0	0	1372	0	0	1520	0
Satd. Flow (RTOR)		3									60	
Lane Group Flow (vph)	3	570	0	3	1453	0	0	3	0	0	6	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0	33.0	
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%	27.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	112.3	112.3		112.3	112.3			13.2			13.2	
Actuated g/C Ratio	0.94	0.94		0.94	0.94			0.11			0.11	
v/c Ratio	0.01	0.18		0.00	0.46			0.02			0.03	
Control Delay	3.7	1.9		3.7	3.4			43.0			0.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	3.7	1.9		3.7	3.4			43.0			0.2	
LOS	A	A		A	A			D			A	
Approach Delay		1.9			3.4			43.0			0.2	
Approach LOS		A			A			D			A	
Queue Length 50th (m)	0.0	0.0		0.0	0.0			0.7			0.0	
Queue Length 95th (m)	m1.1	27.6		1.2	111.2			3.2			0.0	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	284	3166		729	3173			305			384	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.01	0.18		0.00	0.46			0.01			0.02	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.46

Intersection Signal Delay: 3.0	Intersection LOS: A
Intersection Capacity Utilization 57.3%	ICU Level of Service B
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: U-Haul Access/Boyer & Innes

Intersection	
Int Delay, s/veh	3.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	469	21	20	1277	84	56
Future Vol, veh/h	469	21	20	1277	84	56
Conflicting Peds, #/hr	0	5	5	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	500	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	521	23	22	1419	93	62

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	549	0	1292	277
Stage 1	-	-	-	-	538	-
Stage 2	-	-	-	-	754	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1017	-	155	720
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	425	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1013	-	151	717
Mov Cap-2 Maneuver	-	-	-	-	151	-
Stage 1	-	-	-	-	547	-
Stage 2	-	-	-	-	416	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	52.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	221	-	-	1013	-
HCM Lane V/C Ratio	0.704	-	-	0.022	-
HCM Control Delay (s)	52.6	-	-	8.6	-
HCM Lane LOS	F	-	-	A	-
HCM 95th %tile Q(veh)	4.6	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	579	1341	158	58	584	154	64	225	84	165	241	203
Future Volume (vph)	579	1341	158	58	584	154	64	225	84	165	241	203
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.438			0.597		
Satd. Flow (perm)	3263	3390	1487	1687	3390	1477	773	3390	1465	1048	3390	1492
Satd. Flow (RTOR)			292			230			159			292
Lane Group Flow (vph)	643	1490	176	64	649	171	71	250	93	183	268	226
Turn Type	Prot	NA	Free	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Free
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			Free			6	8		8	4		Free
Detector Phase	5	2		1	6	6	3	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.6	26.2		11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	
Total Split (s)	31.0	49.0		16.0	34.0	34.0	12.0	45.0	45.0	33.0	33.0	
Total Split (%)	28.2%	44.5%		14.5%	30.9%	30.9%	10.9%	40.9%	40.9%	30.0%	30.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.9	2.5		2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.2		6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes			Yes	Yes	
Recall Mode	Max	C-Min		Max	C-Min	C-Min	None	None	None	None	None	
Act Effct Green (s)	30.4	42.8	110.0	15.8	27.8	27.8	32.3	32.3	32.3	22.7	22.7	110.0
Actuated g/C Ratio	0.28	0.39	1.00	0.14	0.25	0.25	0.29	0.29	0.29	0.21	0.21	1.00
v/c Ratio	0.71	1.13	0.12	0.26	0.76	0.31	0.26	0.25	0.17	0.85	0.38	0.15
Control Delay	42.9	101.0	0.2	45.0	49.3	12.8	28.2	28.8	0.9	73.7	38.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.9	101.0	0.2	45.0	49.3	12.8	28.2	28.8	0.9	73.7	38.5	0.2
LOS	D	F	A	D	D	B	C	C	A	E	D	A
Approach Delay		77.1			41.9			22.5			35.2	
Approach LOS		E			D			C			D	
Queue Length 50th (m)	68.1	~195.7	0.0	13.1	58.9	2.5	10.5	20.1	0.0	37.0	25.5	0.0
Queue Length 95th (m)	#99.0	#237.6	0.0	28.8	97.4	33.9	20.4	29.3	1.0	#68.8	36.9	0.0
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	908	1319	1487	243	856	545	271	1180	613	250	810	1492
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	1.13	0.12	0.26	0.76	0.31	0.26	0.21	0.15	0.73	0.33	0.15

Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated

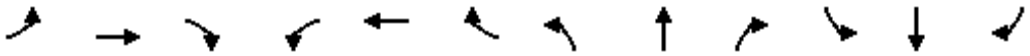
Maximum v/c Ratio: 1.13

Intersection Signal Delay: 58.0	Intersection LOS: E
Intersection Capacity Utilization 88.8%	ICU Level of Service E
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Orleans & Innes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	1506	23	53	764	98	13	21	98	50	23	35
Future Volume (vph)	61	1506	23	53	764	98	13	21	98	50	23	35
Satd. Flow (prot)	1695	3381	0	1695	3321	0	0	1564	0	0	1650	0
Flt Permitted	0.279			0.101				0.965			0.696	
Satd. Flow (perm)	497	3381	0	180	3321	0	0	1515	0	0	1170	0
Satd. Flow (RTOR)		2			22			23			22	
Lane Group Flow (vph)	68	1699	0	59	958	0	0	146	0	0	121	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		39.2	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	72.0	72.0		72.0	72.0		38.0	38.0		38.0	38.0	
Total Split (%)	65.5%	65.5%		65.5%	65.5%		34.5%	34.5%		34.5%	34.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2			6.8			6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	80.2	80.2		80.2	80.2			16.8			16.8	
Actuated g/C Ratio	0.73	0.73		0.73	0.73			0.15			0.15	
v/c Ratio	0.19	0.69		0.45	0.39			0.58			0.61	
Control Delay	2.3	6.1		31.9	11.0			44.1			47.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	2.3	6.1		31.9	11.0			44.1			47.0	
LOS	A	A		C	B			D			D	
Approach Delay		6.0			12.2			44.1			47.0	
Approach LOS		A			B			D			D	
Queue Length 50th (m)	1.6	23.5		3.7	30.4			25.4			20.6	
Queue Length 95th (m)	m2.0	m23.8		#27.2	118.0			38.1			33.4	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	362	2465		131	2426			446			347	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.19	0.69		0.45	0.39			0.33			0.35	

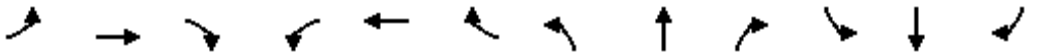
Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 2 (2%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 11.5	Intersection LOS: B
Intersection Capacity Utilization 83.0%	ICU Level of Service E
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Page & Innes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1647	4	1	899	12	5	0	3	12	0	7
Future Volume (vph)	14	1647	4	1	899	12	5	0	3	12	0	7
Satd. Flow (prot)	1695	3390	0	1695	3382	0	0	1641	0	0	1623	0
Flt Permitted	0.274			0.097				0.799			0.806	
Satd. Flow (perm)	488	3390	0	173	3382	0	0	1340	0	0	1348	0
Satd. Flow (RTOR)					2			31			31	
Lane Group Flow (vph)	16	1834	0	1	1012	0	0	9	0	0	21	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	77.0	77.0		77.0	77.0		33.0	33.0		33.0	33.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	93.4	93.4		93.4	93.4			13.2			13.2	
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.12			0.12	
v/c Ratio	0.04	0.64		0.01	0.35			0.05			0.11	
Control Delay	2.4	5.0		5.0	4.3			0.5			9.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	2.4	5.0		5.0	4.3			0.5			9.4	
LOS	A	A		A	A			A			A	
Approach Delay		5.0			4.3			0.5			9.4	
Approach LOS		A			A			A			A	
Queue Length 50th (m)	1.1	90.3		0.0	26.3			0.0			0.0	
Queue Length 95th (m)	m0.4	126.6		0.7	65.1			0.3			4.6	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	414	2877		146	2870			348			350	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.04	0.64		0.01	0.35			0.03			0.06	

Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 36 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 4.8	Intersection LOS: A
Intersection Capacity Utilization 71.5%	ICU Level of Service C
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: U-Haul Access/Boyer & Innes

Intersection	
Int Delay, s/veh	39.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1621	72	72	877	50	33
Future Vol, veh/h	1621	72	72	877	50	33
Conflicting Peds, #/hr	0	11	11	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	500	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1801	80	80	974	56	37

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1892	0	2499	952
Stage 1	-	-	-	-	1852	-
Stage 2	-	-	-	-	647	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	312	-	~ 24	260
Stage 1	-	-	-	-	110	-
Stage 2	-	-	-	-	483	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	309	-	~ 18	258
Mov Cap-2 Maneuver	-	-	-	-	~ 18	-
Stage 1	-	-	-	-	109	-
Stage 2	-	-	-	-	358	-

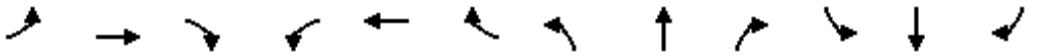
Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	$ 1266.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	29	-	-	309	-
HCM Lane V/C Ratio	3.18	-	-	0.259	-
HCM Control Delay (s)	$ 1266.4	-	-	20.7	-
HCM Lane LOS	F	-	-	C	-
HCM 95th %tile Q(veh)	11	-	-	1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

APPENDIX P

SYNCHRO ANALYSIS: BACKGROUND INTERSECTION PERFORMANCE



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	408	23	24	1490	114	203	259	44	63	100	459
Future Volume (vph)	121	408	23	24	1490	114	203	259	44	63	100	459
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.496			0.592		
Satd. Flow (perm)	3282	3390	1492	1669	3390	1480	879	3390	1427	1021	3390	1496
Satd. Flow (RTOR)			195			143			82			266
Lane Group Flow (vph)	121	408	23	24	1490	114	203	259	44	63	100	459
Turn Type	Prot	NA	Free	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Free
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			Free			6	8		8	4		Free
Detector Phase	5	2		1	6	6	3	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.6	26.2		11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	
Total Split (s)	13.0	65.0		13.0	65.0	65.0	19.0	52.0	52.0	33.0	33.0	
Total Split (%)	10.0%	50.0%		10.0%	50.0%	50.0%	14.6%	40.0%	40.0%	25.4%	25.4%	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.9	2.5		2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.2		6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes			Yes	Yes	
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	
Act Effct Green (s)	8.2	73.0	130.0	6.6	66.3	66.3	36.1	36.1	36.1	17.2	17.2	130.0
Actuated g/C Ratio	0.06	0.56	1.00	0.05	0.51	0.51	0.28	0.28	0.28	0.13	0.13	1.00
v/c Ratio	0.59	0.21	0.02	0.28	0.86	0.14	0.63	0.28	0.10	0.47	0.22	0.31
Control Delay	71.4	16.9	0.0	67.6	35.4	1.9	46.9	36.3	1.3	61.1	49.4	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.4	16.9	0.0	67.6	35.4	1.9	46.9	36.3	1.3	61.1	49.4	0.5
LOS	E	B	A	E	D	A	D	D	A	E	D	A
Approach Delay		28.1			33.5			37.5			14.5	
Approach LOS		C			C			D			B	
Queue Length 50th (m)	15.5	27.1	0.0	6.0	166.3	0.0	44.7	28.5	0.0	15.7	12.6	0.0
Queue Length 95th (m)	#30.0	45.0	0.0	15.1	#245.2	6.0	59.1	35.1	1.5	27.9	19.2	0.0
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	206	1904	1492	91	1728	824	321	1181	550	206	685	1496
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.21	0.02	0.26	0.86	0.14	0.63	0.22	0.08	0.31	0.15	0.31

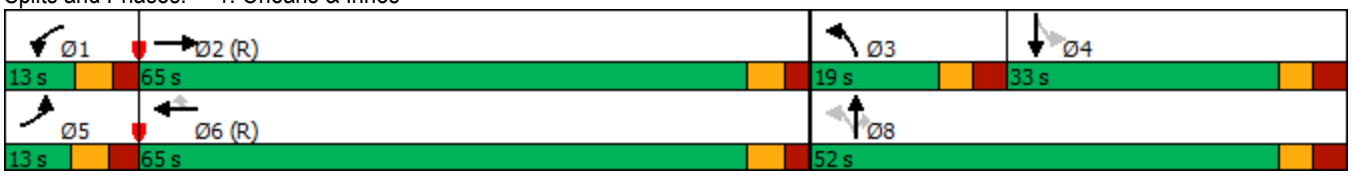
Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 99 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 29.7	Intersection LOS: C
Intersection Capacity Utilization 94.9%	ICU Level of Service F
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Orleans & Innes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	498	11	41	1554	31	14	14	61	43	7	70
Future Volume (vph)	16	498	11	41	1554	31	14	14	61	43	7	70
Satd. Flow (prot)	1695	3378	0	1695	3378	0	0	1587	0	0	1585	0
Flt Permitted	0.126			0.465				0.937			0.850	
Satd. Flow (perm)	225	3378	0	829	3378	0	0	1496	0	0	1371	0
Satd. Flow (RTOR)		3			3			61			39	
Lane Group Flow (vph)	16	509	0	41	1585	0	0	89	0	0	120	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		39.2	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	82.0	82.0		82.0	82.0		38.0	38.0		38.0	38.0	
Total Split (%)	68.3%	68.3%		68.3%	68.3%		31.7%	31.7%		31.7%	31.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2			6.8			6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	91.2	91.2		91.2	91.2			15.8			15.8	
Actuated g/C Ratio	0.76	0.76		0.76	0.76			0.13			0.13	
v/c Ratio	0.09	0.20		0.07	0.62			0.36			0.56	
Control Delay	7.6	5.1		2.5	7.5			20.5			41.0	
Queue Delay	0.0	0.0		0.0	0.2			0.0			0.0	
Total Delay	7.6	5.1		2.5	7.8			20.5			41.0	
LOS	A	A		A	A			C			D	
Approach Delay		5.2			7.6			20.5			41.0	
Approach LOS		A			A			C			D	
Queue Length 50th (m)	0.7	12.8		1.0	91.5			6.1			18.5	
Queue Length 95th (m)	4.8	33.2		m2.7	198.3			18.0			31.8	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	170	2569		630	2569			434			385	
Starvation Cap Reductn	0	0		0	322			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.09	0.20		0.07	0.71			0.21			0.31	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 26 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 76.2%	ICU Level of Service D
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Page & Innes

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	559	43	33	1546	149	89
Future Volume (vph)	559	43	33	1546	149	89
Satd. Flow (prot)	3344	0	1695	3390	1695	1517
Flt Permitted			0.422		0.950	
Satd. Flow (perm)	3344	0	750	3390	1695	1517
Satd. Flow (RTOR)	12					89
Lane Group Flow (vph)	602	0	33	1546	149	89
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases			6			8
Detector Phase	2		6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0
Minimum Split (s)	39.2		37.2	37.2	39.8	39.8
Total Split (s)	80.0		80.0	80.0	40.0	40.0
Total Split (%)	66.7%		66.7%	66.7%	33.3%	33.3%
Yellow Time (s)	3.7		3.7	3.7	3.0	3.0
All-Red Time (s)	2.5		2.5	2.5	3.8	3.8
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2		6.2	6.2	6.8	6.8
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Min		C-Min	C-Min	None	None
Act Effct Green (s)	88.9		88.9	88.9	18.1	18.1
Actuated g/C Ratio	0.74		0.74	0.74	0.15	0.15
v/c Ratio	0.24		0.06	0.62	0.58	0.29
Control Delay	5.3		3.3	5.4	54.9	10.0
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	5.3		3.3	5.4	54.9	10.0
LOS	A		A	A	D	A
Approach Delay	5.3			5.4	38.1	
Approach LOS	A			A	D	
Queue Length 50th (m)	16.5		1.0	30.1	33.8	0.0
Queue Length 95th (m)	30.3		m1.5	96.4	46.2	12.2
Internal Link Dist (m)	206.4			215.4	157.2	
Turn Bay Length (m)			50.0		55.0	
Base Capacity (vph)	2479		555	2510	468	484
Starvation Cap Reductn	0		0	25	0	0
Spillback Cap Reductn	0		0	76	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.24		0.06	0.64	0.32	0.18

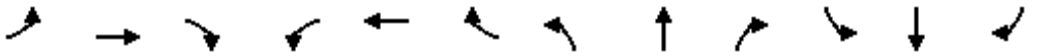
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 8.6	Intersection LOS: A
Intersection Capacity Utilization 64.7%	ICU Level of Service C
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Lamarche & Innes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	573	39	14	1504	1	102	0	38	0	0	5
Future Volume (vph)	3	573	39	14	1504	1	102	0	38	0	0	5
Satd. Flow (prot)	1695	3350	0	1695	3390	0	0	1651	0	0	1520	0
Flt Permitted	0.141			0.419				0.782				
Satd. Flow (perm)	251	3350	0	746	3390	0	0	1338	0	0	1520	0
Satd. Flow (RTOR)		13						28			54	
Lane Group Flow (vph)	3	612	0	14	1505	0	0	140	0	0	5	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0	33.0	
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%	27.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	91.1	91.1		91.1	91.1			16.5			16.5	
Actuated g/C Ratio	0.76	0.76		0.76	0.76			0.14			0.14	
v/c Ratio	0.02	0.24		0.02	0.59			0.67			0.02	
Control Delay	4.3	3.6		5.1	8.2			53.9			0.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	4.3	3.6		5.1	8.2			53.9			0.2	
LOS	A	A		A	A			D			A	
Approach Delay		3.6			8.2			53.9			0.2	
Approach LOS		A			A			D			A	
Queue Length 50th (m)	0.1	11.2		0.7	66.3			25.6			0.0	
Queue Length 95th (m)	m0.7	21.3		3.1	118.4			42.8			0.0	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	190	2545		566	2572			319			380	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.02	0.24		0.02	0.59			0.44			0.01	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 69.6%	ICU Level of Service C
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: U-Haul Access/Boyer & Innes

Intersection	
Int Delay, s/veh	14.4

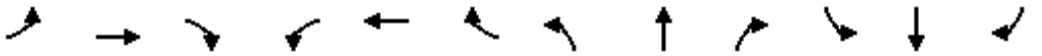
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	559	43	33	1546	149	89
Future Vol, veh/h	559	43	33	1546	149	89
Conflicting Peds, #/hr	0	5	5	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	55	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	559	43	33	1546	149	89

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	607	0	1425	306
Stage 1	-	-	-	-	586	-
Stage 2	-	-	-	-	839	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	967	-	~ 126	690
Stage 1	-	-	-	-	519	-
Stage 2	-	-	-	-	384	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	963	-	~ 121	687
Mov Cap-2 Maneuver	-	-	-	-	~ 121	-
Stage 1	-	-	-	-	517	-
Stage 2	-	-	-	-	371	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	145.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	121	687	-	-	963	-
HCM Lane V/C Ratio	1.231	0.13	-	-	0.034	-
HCM Control Delay (s)	225.4	11	-	-	8.9	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	9.4	0.4	-	-	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	579	1672	158	58	754	158	64	225	84	170	241	203
Future Volume (vph)	579	1672	158	58	754	158	64	225	84	170	241	203
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.459			0.611		
Satd. Flow (perm)	3266	3390	1487	1689	3390	1477	809	3390	1465	1072	3390	1492
Satd. Flow (RTOR)			292			230			159			292
Lane Group Flow (vph)	579	1672	158	58	754	158	64	225	84	170	241	203
Turn Type	Prot	NA	Free	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Free
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			Free			6	8		8	4		Free
Detector Phase	5	2		1	6	6	3	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.6	26.2		11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	
Total Split (s)	31.0	49.0		16.0	34.0	34.0	12.0	45.0	45.0	33.0	33.0	
Total Split (%)	28.2%	44.5%		14.5%	30.9%	30.9%	10.9%	40.9%	40.9%	30.0%	30.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.9	2.5		2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.2		6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes			Yes	Yes	
Recall Mode	Max	C-Min		Max	C-Min	C-Min	None	None	None	None	None	
Act Effct Green (s)	31.6	42.8	110.0	17.0	27.8	27.8	31.1	31.1	31.1	21.5	21.5	110.0
Actuated g/C Ratio	0.29	0.39	1.00	0.15	0.25	0.25	0.28	0.28	0.28	0.20	0.20	1.00
v/c Ratio	0.61	1.27	0.11	0.22	0.88	0.29	0.24	0.23	0.16	0.81	0.36	0.14
Control Delay	39.4	157.5	0.1	43.5	52.8	11.6	28.2	29.2	0.6	69.8	38.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	157.5	0.1	43.5	52.8	11.6	28.2	29.2	0.6	69.8	38.9	0.2
LOS	D	F	A	D	D	B	C	C	A	E	D	A
Approach Delay		118.8			45.6			22.6			34.7	
Approach LOS		F			D			C			C	
Queue Length 50th (m)	58.1	~238.6	0.0	9.9	55.2	1.9	9.7	18.5	0.0	34.7	23.3	0.0
Queue Length 95th (m)	80.6	#280.7	0.0	27.1	#118.0	31.5	18.7	26.6	0.0	#60.8	33.4	0.0
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	944	1319	1487	262	856	545	271	1180	613	256	810	1492
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	1.27	0.11	0.22	0.88	0.29	0.24	0.19	0.14	0.66	0.30	0.14

Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

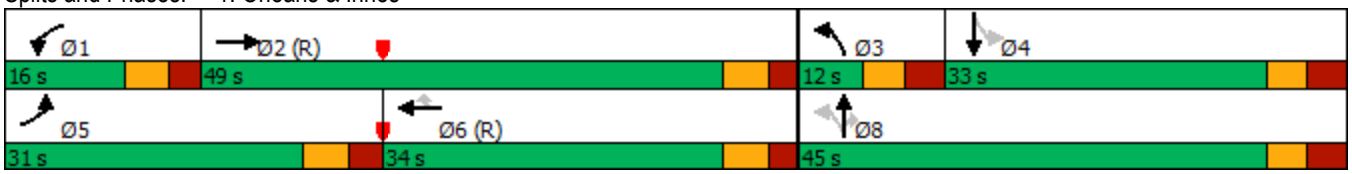
Maximum v/c Ratio: 1.27

Intersection Signal Delay: 82.5	Intersection LOS: F
Intersection Capacity Utilization 98.7%	ICU Level of Service F
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Orleans & Innes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	1849	23	53	939	101	13	21	98	58	23	38
Future Volume (vph)	74	1849	23	53	939	101	13	21	98	58	23	38
Satd. Flow (prot)	1695	3382	0	1695	3329	0	0	1566	0	0	1650	0
Flt Permitted	0.253			0.075				0.964			0.720	
Satd. Flow (perm)	451	3382	0	134	3329	0	0	1515	0	0	1211	0
Satd. Flow (RTOR)		2			18			15			21	
Lane Group Flow (vph)	74	1872	0	53	1040	0	0	132	0	0	119	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		39.2	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	72.0	72.0		72.0	72.0		38.0	38.0		38.0	38.0	
Total Split (%)	65.5%	65.5%		65.5%	65.5%		34.5%	34.5%		34.5%	34.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2			6.8			6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	80.5	80.5		80.5	80.5			16.5			16.5	
Actuated g/C Ratio	0.73	0.73		0.73	0.73			0.15			0.15	
v/c Ratio	0.22	0.76		0.54	0.43			0.55			0.60	
Control Delay	2.2	10.6		33.5	3.9			45.2			46.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	2.2	10.6		33.5	3.9			45.2			46.4	
LOS	A	B		C	A			D			D	
Approach Delay		10.3			5.3			45.2			46.4	
Approach LOS		B			A			D			D	
Queue Length 50th (m)	1.6	41.4		3.1	33.1			24.2			20.4	
Queue Length 95th (m)	m1.7	m20.5		#30.9	11.2			35.9			32.7	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	329	2475		98	2440			440			358	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.22	0.76		0.54	0.43			0.30			0.33	

Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 2 (2%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 11.3	Intersection LOS: B
Intersection Capacity Utilization 94.8%	ICU Level of Service F
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Page & Innes

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1922	133	110	1033	92	55
Future Volume (vph)	1922	133	110	1033	92	55
Satd. Flow (prot)	3347	0	1695	3390	1695	1517
Flt Permitted			0.053		0.950	
Satd. Flow (perm)	3347	0	95	3390	1695	1517
Satd. Flow (RTOR)	9					55
Lane Group Flow (vph)	2055	0	110	1033	92	55
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases			6			8
Detector Phase	2		1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0		5.0	10.0	10.0	10.0
Minimum Split (s)	39.2		11.0	37.2	39.8	39.8
Total Split (s)	59.2		11.0	70.2	39.8	39.8
Total Split (%)	53.8%		10.0%	63.8%	36.2%	36.2%
Yellow Time (s)	3.7		4.0	3.7	3.0	3.0
All-Red Time (s)	2.5		2.0	2.5	3.8	3.8
Lost Time Adjust (s)	0.0		0.2	0.0	0.0	0.0
Total Lost Time (s)	6.2		6.2	6.2	6.8	6.8
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Min		None	C-Min	None	None
Act Effct Green (s)	71.1		84.9	86.1	15.5	15.5
Actuated g/C Ratio	0.65		0.77	0.78	0.14	0.14
v/c Ratio	0.95		0.60	0.39	0.38	0.21
Control Delay	29.5		34.8	10.7	45.2	10.8
Queue Delay	20.1		0.0	0.0	0.0	0.1
Total Delay	49.6		34.8	10.7	45.2	10.9
LOS	D		C	B	D	B
Approach Delay	49.6			13.0	32.4	
Approach LOS	D			B	C	
Queue Length 50th (m)	152.6		10.2	28.6	19.1	0.0
Queue Length 95th (m)	#332.8		#44.8	127.5	27.2	9.0
Internal Link Dist (m)	206.4			215.4	157.2	
Turn Bay Length (m)			50.0		55.0	
Base Capacity (vph)	2166		183	2653	508	493
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	193		0	0	0	105
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	1.04		0.60	0.39	0.18	0.14

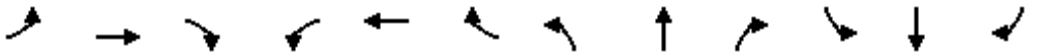
Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 36.3	Intersection LOS: D
Intersection Capacity Utilization 91.4%	ICU Level of Service F
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Lamarche & Innes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1882	109	41	1047	12	66	0	26	12	0	7
Future Volume (vph)	14	1882	109	41	1047	12	66	0	26	12	0	7
Satd. Flow (prot)	1695	3358	0	1695	3382	0	0	1649	0	0	1624	0
Flt Permitted	0.255			0.071				0.776			0.820	
Satd. Flow (perm)	454	3358	0	127	3382	0	0	1311	0	0	1373	0
Satd. Flow (RTOR)		11			2			31			31	
Lane Group Flow (vph)	14	1991	0	41	1059	0	0	92	0	0	19	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	77.0	77.0		77.0	77.0		33.0	33.0		33.0	33.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	88.2	88.2		88.2	88.2			13.9			13.9	
Actuated g/C Ratio	0.80	0.80		0.80	0.80			0.13			0.13	
v/c Ratio	0.04	0.74		0.41	0.39			0.48			0.10	
Control Delay	4.3	16.4		23.1	5.3			36.9			7.4	
Queue Delay	0.0	3.5		0.0	0.0			0.0			0.0	
Total Delay	4.3	19.9		23.1	5.3			36.9			7.4	
LOS	A	B		C	A			D			A	
Approach Delay		19.8			6.0			36.9			7.4	
Approach LOS		B			A			D			A	
Queue Length 50th (m)	0.5	240.3		2.2	28.9			12.6			0.0	
Queue Length 95th (m)	m1.1	m255.3		#22.2	69.3			24.6			3.9	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	364	2694		101	2711			341			356	
Starvation Cap Reductn	0	597		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.04	0.95		0.41	0.39			0.27			0.05	

Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 36 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 82.0%	ICU Level of Service D
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: U-Haul Access/Boyer & Innes

Intersection	
Int Delay, s/veh	137.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1922	133	110	1033	92	55
Future Vol, veh/h	1922	133	110	1033	92	55
Conflicting Peds, #/hr	0	11	11	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	55	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1922	133	110	1033	92	55

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2066	0	2737	1039
Stage 1	-	-	-	-	2000	-
Stage 2	-	-	-	-	737	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	267	-	~ 16	227
Stage 1	-	-	-	-	~ 91	-
Stage 2	-	-	-	-	434	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	265	-	~ 9	225
Mov Cap-2 Maneuver	-	-	-	-	~ 9	-
Stage 1	-	-	-	-	~ 90	-
Stage 2	-	-	-	-	254	-

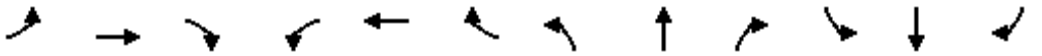
Approach	EB	WB	NB
HCM Control Delay, s	0	2.7	$ 3113.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	9	225	-	-	265	-
HCM Lane V/C Ratio	10.222	0.244	-	-	0.415	-
HCM Control Delay (s)	$ 4959	26.1	-	-	27.9	-
HCM Lane LOS	F	D	-	-	D	-
HCM 95th %tile Q(veh)	13	0.9	-	-	1.9	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

APPENDIX Q

SYNCHRO ANALYSIS: FUTURE INTERSECTION PERFORMANCE



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	461	23	24	1542	127	203	259	44	76	100	459
Future Volume (vph)	121	461	23	24	1542	127	203	259	44	76	100	459
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.501			0.592		
Satd. Flow (perm)	3282	3390	1487	1671	3390	1471	888	3390	1427	1021	3390	1496
Satd. Flow (RTOR)			195			143			82			215
Lane Group Flow (vph)	121	461	23	24	1542	127	203	259	44	76	100	459
Turn Type	Prot	NA	Free	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Free
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			Free			6	8		8	4		Free
Detector Phase	5	2		1	6	6	3	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.6	26.2		11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	
Total Split (s)	12.4	71.9		12.4	71.9	71.9	13.0	45.7	45.7	32.7	32.7	
Total Split (%)	9.5%	55.3%		9.5%	55.3%	55.3%	10.0%	35.2%	35.2%	25.2%	25.2%	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.9	2.5		2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.2		6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes			Yes	Yes	
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	
Act Effct Green (s)	8.0	76.0	130.0	6.3	69.0	69.0	33.5	33.5	33.5	17.8	17.8	130.0
Actuated g/C Ratio	0.06	0.58	1.00	0.05	0.53	0.53	0.26	0.26	0.26	0.14	0.14	1.00
v/c Ratio	0.60	0.23	0.02	0.30	0.86	0.15	0.71	0.30	0.10	0.55	0.22	0.31
Control Delay	72.1	14.8	0.0	69.4	32.8	2.3	56.9	39.1	1.5	64.8	48.8	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.1	14.8	0.0	69.4	32.8	2.3	56.9	39.1	1.5	64.8	48.8	0.5
LOS	E	B	A	E	C	A	E	D	A	E	D	A
Approach Delay		25.7			31.0			43.0			15.8	
Approach LOS		C			C			D			B	
Queue Length 50th (m)	15.4	28.6	0.0	6.0	164.4	0.0	46.7	29.8	0.0	18.9	12.4	0.0
Queue Length 95th (m)	#33.0	45.5	0.0	15.2	219.3	7.7	63.6	37.7	1.6	32.5	19.2	0.0
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	202	1982	1487	83	1799	848	284	1017	485	204	678	1496
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.23	0.02	0.29	0.86	0.15	0.71	0.25	0.09	0.37	0.15	0.31

Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 99 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 29.0	Intersection LOS: C
Intersection Capacity Utilization 96.4%	ICU Level of Service F
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Orleans & Innes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	564	11	41	1619	31	14	14	61	43	7	70
Future Volume (vph)	16	564	11	41	1619	31	14	14	61	43	7	70
Satd. Flow (prot)	1695	3378	0	1695	3378	0	0	1587	0	0	1585	0
Flt Permitted	0.115			0.436				0.938			0.850	
Satd. Flow (perm)	205	3378	0	777	3378	0	0	1497	0	0	1371	0
Satd. Flow (RTOR)		3			3			61			33	
Lane Group Flow (vph)	16	575	0	41	1650	0	0	89	0	0	120	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		39.2	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	82.0	82.0		82.0	82.0		38.0	38.0		38.0	38.0	
Total Split (%)	68.3%	68.3%		68.3%	68.3%		31.7%	31.7%		31.7%	31.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2			6.8			6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	91.0	91.0		91.0	91.0			16.0			16.0	
Actuated g/C Ratio	0.76	0.76		0.76	0.76			0.13			0.13	
v/c Ratio	0.10	0.22		0.07	0.64			0.35			0.57	
Control Delay	8.1	5.3		3.6	9.3			20.3			43.9	
Queue Delay	0.0	0.0		0.0	0.5			0.0			0.0	
Total Delay	8.1	5.3		3.6	9.8			20.3			43.9	
LOS	A	A		A	A			C			D	
Approach Delay		5.4			9.6			20.3			43.9	
Approach LOS		A			A			C			D	
Queue Length 50th (m)	0.7	15.3		1.5	34.5			6.1			19.9	
Queue Length 95th (m)	4.9	37.9		m3.6	225.4			18.0			33.1	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	155	2562		589	2562			434			380	
Starvation Cap Reductn	0	0		0	430			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.10	0.22		0.07	0.77			0.21			0.32	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 26 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 10.7	Intersection LOS: B
Intersection Capacity Utilization 78.1%	ICU Level of Service D
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Page & Innes

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø2	Ø6	Ø10	Ø11	Ø12
Lane Configurations											
Traffic Volume (vph)	517	151	160	1484	276	196					
Future Volume (vph)	517	151	160	1484	276	196					
Satd. Flow (prot)	3390	1517	1695	3390	1695	1517					
Flt Permitted			0.453		0.950						
Satd. Flow (perm)	3390	1296	767	3390	1488	1517					
Satd. Flow (RTOR)											
Lane Group Flow (vph)	517	151	160	1484	276	196					
Turn Type	NA	custom	custom	NA	Prot	Perm					
Protected Phases	2 11	8	9	6 11	8		2	6	10	11	12
Permitted Phases		2	6			8					
Detector Phase	2 11	8	9	6 11	8	8					
Switch Phase											
Minimum Initial (s)		10.0	5.0		10.0	10.0	10.0	10.0	1.0	3.0	1.0
Minimum Split (s)		17.1	11.2		17.1	17.1	39.2	37.2	29.0	5.0	5.0
Total Split (s)		39.0	29.0		39.0	39.0	47.0	47.0	29.0	5.0	5.0
Total Split (%)		32.5%	24.2%		32.5%	32.5%	39%	39%	24%	4%	4%
Yellow Time (s)		3.3	3.7		3.3	3.3	3.7	3.7	2.0	2.0	2.0
All-Red Time (s)		3.3	2.5		3.3	3.3	2.4	2.4	0.0	0.0	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0					
Total Lost Time (s)		6.6	6.2		6.6	6.6					
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode		None	None		None	None	C-Min	C-Min	None	None	None
Act Effct Green (s)	65.9	64.6	75.2	65.9	24.8	24.8					
Actuated g/C Ratio	0.55	0.54	0.63	0.55	0.21	0.21					
v/c Ratio	0.28	0.20	0.29	0.80	0.79	0.63					
Control Delay	21.9	11.0	6.5	23.3	60.6	51.4					
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0					
Total Delay	21.9	11.0	6.5	23.5	60.6	51.4					
LOS	C	B	A	C	E	D					
Approach Delay	19.5			21.8	56.8						
Approach LOS	B			C	E						
Queue Length 50th (m)	25.6	13.2	4.3	134.3	62.2	42.4					
Queue Length 95th (m)	80.8	35.4	11.5	#273.3	85.3	61.8					
Internal Link Dist (m)	206.4			215.4	157.2						
Turn Bay Length (m)		40.0	87.0		80.0						
Base Capacity (vph)	1880	838	742	1861	457	409					
Starvation Cap Reductn	0	0	0	0	0	0					
Spillback Cap Reductn	0	0	0	43	0	0					
Storage Cap Reductn	0	0	0	0	0	0					
Reduced v/c Ratio	0.28	0.18	0.22	0.82	0.60	0.48					

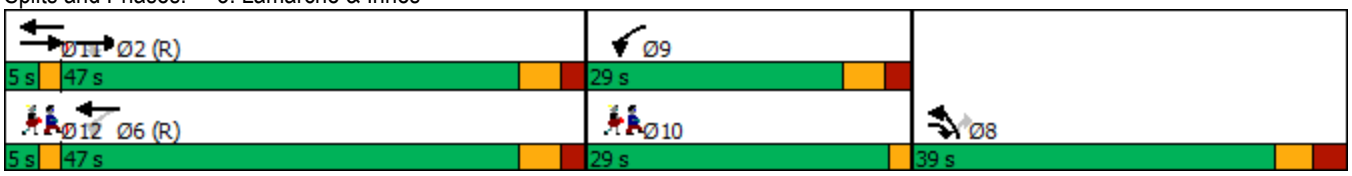
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

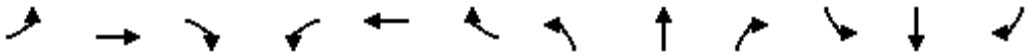
Maximum v/c Ratio: 0.80

Intersection Signal Delay: 27.2	Intersection LOS: C
Intersection Capacity Utilization 70.0%	ICU Level of Service C
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Lamarche & Innes





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	638	39	14	1569	1	102	0	38	0	0	5
Future Volume (vph)	3	638	39	14	1569	1	102	0	38	0	0	5
Satd. Flow (prot)	1695	3354	0	1695	3390	0	0	1651	0	0	1520	0
Flt Permitted	0.129			0.390				0.782				
Satd. Flow (perm)	230	3354	0	694	3390	0	0	1338	0	0	1520	0
Satd. Flow (RTOR)		11						28			47	
Lane Group Flow (vph)	3	677	0	14	1570	0	0	140	0	0	5	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0	33.0	
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%	27.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	91.1	91.1		91.1	91.1			16.5			16.5	
Actuated g/C Ratio	0.76	0.76		0.76	0.76			0.14			0.14	
v/c Ratio	0.02	0.27		0.03	0.61			0.67			0.02	
Control Delay	2.3	2.3		5.2	8.6			53.9			0.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	2.3	2.3		5.2	8.6			53.9			0.2	
LOS	A	A		A	A			D			A	
Approach Delay		2.3			8.6			53.9			0.2	
Approach LOS		A			A			D			A	
Queue Length 50th (m)	0.1	4.3		0.7	71.6			25.6			0.0	
Queue Length 95th (m)	m0.4	26.5		3.1	127.8			42.8			0.0	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	174	2547		526	2572			319			374	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.02	0.27		0.03	0.61			0.44			0.01	

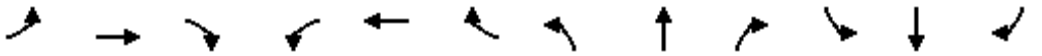
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 9.4	Intersection LOS: A
Intersection Capacity Utilization 71.5%	ICU Level of Service C
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: U-Haul Access/Boyer & Innes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	579	1731	158	58	805	171	64	225	84	185	241	203
Future Volume (vph)	579	1731	158	58	805	171	64	225	84	185	241	203
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.464			0.611		
Satd. Flow (perm)	3268	3390	1484	1690	3390	1464	818	3390	1465	1072	3390	1492
Satd. Flow (RTOR)			292			230			159			292
Lane Group Flow (vph)	579	1731	158	58	805	171	64	225	84	185	241	203
Turn Type	Prot	NA	Free	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Free
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			Free			6	8		8	4		Free
Detector Phase	5	2		1	6	6	3	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.6	26.2		11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	
Total Split (s)	27.0	54.4		11.2	38.6	38.6	11.7	44.4	44.4	32.7	32.7	
Total Split (%)	24.5%	49.5%		10.2%	35.1%	35.1%	10.6%	40.4%	40.4%	29.7%	29.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.9	2.5		2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.2		6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes			Yes	Yes	
Recall Mode	Max	C-Min		Max	C-Min	C-Min	None	None	None	None	None	
Act Effct Green (s)	26.3	48.2	110.0	10.9	32.4	32.4	31.8	31.8	31.8	22.5	22.5	110.0
Actuated g/C Ratio	0.24	0.44	1.00	0.10	0.29	0.29	0.29	0.29	0.29	0.20	0.20	1.00
v/c Ratio	0.74	1.17	0.11	0.35	0.81	0.29	0.23	0.23	0.16	0.84	0.35	0.14
Control Delay	47.4	112.3	0.1	52.5	44.9	9.0	27.9	28.8	0.6	73.3	38.1	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.4	112.3	0.1	52.5	44.9	9.0	27.9	28.8	0.6	73.3	38.1	0.2
LOS	D	F	A	D	D	A	C	C	A	E	D	A
Approach Delay		89.9			39.4			22.3			36.2	
Approach LOS		F			D			C			D	
Queue Length 50th (m)	62.9	~232.8	0.0	12.3	59.2	0.0	9.5	18.1	0.0	37.4	22.8	0.0
Queue Length 95th (m)	#96.9	#275.3	0.0	#34.7	112.1	24.5	18.9	26.8	0.0	#69.6	33.6	0.0
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	784	1485	1484	167	998	593	276	1161	606	253	801	1492
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	1.17	0.11	0.35	0.81	0.29	0.23	0.19	0.14	0.73	0.30	0.14

Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

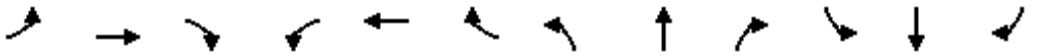
Maximum v/c Ratio: 1.17

Intersection Signal Delay: 65.2	Intersection LOS: E
Intersection Capacity Utilization 101.3%	ICU Level of Service G
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Orleans & Innes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	1923	23	53	1003	101	13	21	98	58	23	38
Future Volume (vph)	74	1923	23	53	1003	101	13	21	98	58	23	38
Satd. Flow (prot)	1695	3381	0	1695	3331	0	0	1566	0	0	1650	0
Flt Permitted	0.233			0.065				0.964			0.720	
Satd. Flow (perm)	415	3381	0	116	3331	0	0	1515	0	0	1211	0
Satd. Flow (RTOR)		2			17			13			21	
Lane Group Flow (vph)	74	1946	0	53	1104	0	0	132	0	0	119	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		39.2	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	72.0	72.0		72.0	72.0		38.0	38.0		38.0	38.0	
Total Split (%)	65.5%	65.5%		65.5%	65.5%		34.5%	34.5%		34.5%	34.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2			6.8			6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	80.4	80.4		80.4	80.4			16.6			16.6	
Actuated g/C Ratio	0.73	0.73		0.73	0.73			0.15			0.15	
v/c Ratio	0.24	0.79		0.63	0.45			0.55			0.59	
Control Delay	1.7	8.2		49.5	7.6			45.8			46.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	1.7	8.2		49.5	7.6			45.8			46.1	
LOS	A	A		D	A			D			D	
Approach Delay		7.9			9.6			45.8			46.1	
Approach LOS		A			A			D			D	
Queue Length 50th (m)	1.2	28.7		4.3	37.8			24.6			20.4	
Queue Length 95th (m)	m1.8	m23.7		#33.7	85.9			36.3			32.7	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	303	2471		84	2438			439			358	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.24	0.79		0.63	0.45			0.30			0.33	

Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 2 (2%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 11.3	Intersection LOS: B
Intersection Capacity Utilization 94.8%	ICU Level of Service F
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Page & Innes

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø2	Ø6	Ø10	Ø11	Ø12
Lane Configurations											
Traffic Volume (vph)	1841	288	211	1006	183	200					
Future Volume (vph)	1841	288	211	1006	183	200					
Satd. Flow (prot)	3390	1517	1695	3390	1695	1517					
Flt Permitted			0.064		0.950						
Satd. Flow (perm)	3390	1252	114	3390	1318	1517					
Satd. Flow (RTOR)											
Lane Group Flow (vph)	1841	288	211	1006	183	200					
Turn Type	NA	custom	custom	NA	Prot	Perm					
Protected Phases	2 11	8	9	6 11	8		2	6	10	11	12
Permitted Phases		2	6			8					
Detector Phase	2 11	8	9	6 11	8	8					
Switch Phase											
Minimum Initial (s)		10.0	5.0		10.0	10.0	10.0	10.0	1.0	3.0	1.0
Minimum Split (s)		17.1	11.2		17.1	17.1	39.1	37.1	29.0	5.0	5.0
Total Split (s)		26.0	29.0		26.0	26.0	60.0	60.0	29.0	5.0	5.0
Total Split (%)		21.7%	24.2%		21.7%	21.7%	50%	50%	24%	4%	4%
Yellow Time (s)		3.3	3.7		3.3	3.3	3.7	3.7	2.0	2.0	2.0
All-Red Time (s)		3.3	2.5		3.3	3.3	2.4	2.4	0.0	0.0	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0					
Total Lost Time (s)		6.6	6.2		6.6	6.6					
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode		None	None		None	None	C-Min	C-Min	None	None	None
Act Effct Green (s)	63.5	73.1	80.3	64.5	19.7	19.7					
Actuated g/C Ratio	0.53	0.61	0.67	0.54	0.16	0.16					
v/c Ratio	1.03	0.36	0.74	0.55	0.66	0.81					
Control Delay	57.8	7.8	51.8	21.3	58.8	72.1					
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0					
Total Delay	57.8	7.8	51.8	21.3	58.8	72.1					
LOS	E	A	D	C	E	E					
Approach Delay	51.0			26.5	65.7						
Approach LOS	D			C	E						
Queue Length 50th (m)	~245.2	17.1	32.6	81.1	39.8	44.7					
Queue Length 95th (m)	#320.7	33.7	56.7	118.3	#65.9	#84.0					
Internal Link Dist (m)	206.4			215.4	157.2						
Turn Bay Length (m)		40.0	87.0		80.0						
Base Capacity (vph)	1793	819	383	1821	293	262					
Starvation Cap Reductn	0	0	0	0	0	0					
Spillback Cap Reductn	0	0	0	0	0	0					
Storage Cap Reductn	0	0	0	0	0	0					
Reduced v/c Ratio	1.03	0.35	0.55	0.55	0.62	0.76					

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

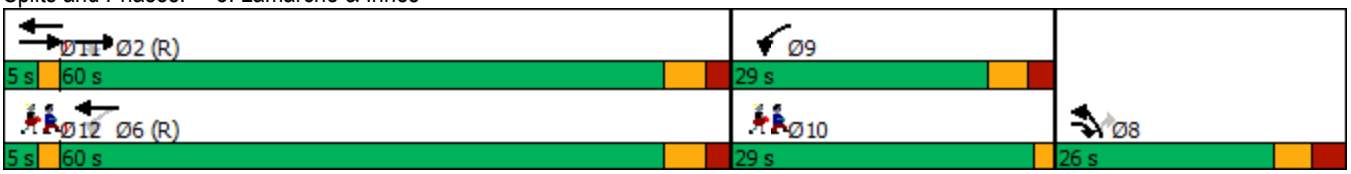
Maximum v/c Ratio: 1.03

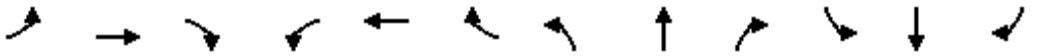
Intersection Signal Delay: 44.5	Intersection LOS: D
Intersection Capacity Utilization 92.5%	ICU Level of Service F
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Lamarche & Innes





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1946	109	41	1121	12	66	0	26	12	0	7
Future Volume (vph)	14	1946	109	41	1121	12	66	0	26	12	0	7
Satd. Flow (prot)	1695	3357	0	1695	3382	0	0	1649	0	0	1624	0
Flt Permitted	0.234			0.063				0.776			0.820	
Satd. Flow (perm)	417	3357	0	112	3382	0	0	1311	0	0	1373	0
Satd. Flow (RTOR)		10			2			31			31	
Lane Group Flow (vph)	14	2055	0	41	1133	0	0	92	0	0	19	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	77.0	77.0		77.0	77.0		33.0	33.0		33.0	33.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	88.2	88.2		88.2	88.2			13.9			13.9	
Actuated g/C Ratio	0.80	0.80		0.80	0.80			0.13			0.13	
v/c Ratio	0.04	0.76		0.46	0.42			0.48			0.10	
Control Delay	5.4	11.3		29.8	5.5			36.9			7.4	
Queue Delay	0.0	0.5		0.0	0.0			0.0			0.0	
Total Delay	5.4	11.8		29.8	5.5			36.9			7.4	
LOS	A	B		C	A			D			A	
Approach Delay		11.8			6.4			36.9			7.4	
Approach LOS		B			A			D			A	
Queue Length 50th (m)	0.5	99.2		2.3	32.0			12.6			0.0	
Queue Length 95th (m)	3.4	#268.3		#24.4	76.4			24.6			3.9	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	334	2693		89	2711			341			356	
Starvation Cap Reductn	0	247		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.04	0.84		0.46	0.42			0.27			0.05	

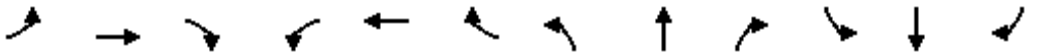
Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 36 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 10.6	Intersection LOS: B
Intersection Capacity Utilization 83.8%	ICU Level of Service E
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: U-Haul Access/Boyer & Innes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	462	23	24	1546	127	203	259	44	76	100	459
Future Volume (vph)	121	462	23	24	1546	127	203	259	44	76	100	459
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.501			0.592		
Satd. Flow (perm)	3282	3390	1487	1671	3390	1471	888	3390	1427	1021	3390	1496
Satd. Flow (RTOR)			195			143			82			214
Lane Group Flow (vph)	121	462	23	24	1546	127	203	259	44	76	100	459
Turn Type	Prot	NA	Free	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Free
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			Free			6	8		8	4		Free
Detector Phase	5	2		1	6	6	3	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.6	26.2		11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	
Total Split (s)	12.4	71.9		12.4	71.9	71.9	13.0	45.7	45.7	32.7	32.7	
Total Split (%)	9.5%	55.3%		9.5%	55.3%	55.3%	10.0%	35.2%	35.2%	25.2%	25.2%	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.9	2.5		2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.2		6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes			Yes	Yes	
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	
Act Effct Green (s)	8.0	76.0	130.0	6.3	69.1	69.1	33.4	33.4	33.4	17.8	17.8	130.0
Actuated g/C Ratio	0.06	0.58	1.00	0.05	0.53	0.53	0.26	0.26	0.26	0.14	0.14	1.00
v/c Ratio	0.60	0.23	0.02	0.30	0.86	0.15	0.72	0.30	0.10	0.55	0.22	0.31
Control Delay	72.1	14.8	0.0	69.4	32.9	2.3	57.0	39.1	1.5	64.8	48.8	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.1	14.8	0.0	69.4	32.9	2.3	57.0	39.1	1.5	64.8	48.8	0.5
LOS	E	B	A	E	C	A	E	D	A	E	D	A
Approach Delay		25.7			31.1			43.0			15.8	
Approach LOS		C			C			D			B	
Queue Length 50th (m)	15.4	28.7	0.0	6.0	165.1	0.0	46.7	29.8	0.0	18.9	12.4	0.0
Queue Length 95th (m)	#33.0	45.6	0.0	15.2	220.1	7.7	63.6	37.7	1.6	32.5	19.2	0.0
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	202	1983	1487	83	1800	848	283	1017	485	204	678	1496
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.23	0.02	0.29	0.86	0.15	0.72	0.25	0.09	0.37	0.15	0.31

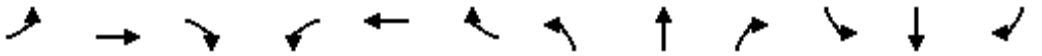
Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 99 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 29.1	Intersection LOS: C
Intersection Capacity Utilization 96.4%	ICU Level of Service F
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Orleans & Innes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	565	11	41	1623	31	14	14	61	43	7	70
Future Volume (vph)	16	565	11	41	1623	31	14	14	61	43	7	70
Satd. Flow (prot)	1695	3378	0	1695	3378	0	0	1587	0	0	1585	0
Flt Permitted	0.114			0.435				0.938			0.850	
Satd. Flow (perm)	203	3378	0	776	3378	0	0	1497	0	0	1371	0
Satd. Flow (RTOR)		3			3			61			33	
Lane Group Flow (vph)	16	576	0	41	1654	0	0	89	0	0	120	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		39.2	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	82.0	82.0		82.0	82.0		38.0	38.0		38.0	38.0	
Total Split (%)	68.3%	68.3%		68.3%	68.3%		31.7%	31.7%		31.7%	31.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2			6.8			6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	91.0	91.0		91.0	91.0			16.0			16.0	
Actuated g/C Ratio	0.76	0.76		0.76	0.76			0.13			0.13	
v/c Ratio	0.10	0.22		0.07	0.65			0.35			0.57	
Control Delay	8.1	5.3		3.7	9.4			20.3			43.9	
Queue Delay	0.0	0.0		0.0	0.5			0.0			0.0	
Total Delay	8.1	5.3		3.7	9.9			20.3			43.9	
LOS	A	A		A	A			C			D	
Approach Delay		5.4			9.7			20.3			43.9	
Approach LOS		A			A			C			D	
Queue Length 50th (m)	0.7	15.3		1.6	34.9			6.1			19.9	
Queue Length 95th (m)	4.9	38.0		m3.6	225.8			18.0			33.1	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	154	2562		588	2562			434			380	
Starvation Cap Reductn	0	0		0	449			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.10	0.22		0.07	0.78			0.21			0.32	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 26 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 10.7	Intersection LOS: B
Intersection Capacity Utilization 78.2%	ICU Level of Service D
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Page & Innes

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø2	Ø6	Ø10	Ø11	Ø12
Lane Configurations											
Traffic Volume (vph)	517	152	162	1484	280	201					
Future Volume (vph)	517	152	162	1484	280	201					
Satd. Flow (prot)	3390	1517	1695	3390	1695	1517					
Flt Permitted			0.453		0.950						
Satd. Flow (perm)	3390	1296	767	3390	1488	1517					
Satd. Flow (RTOR)											
Lane Group Flow (vph)	517	152	162	1484	280	201					
Turn Type	NA	custom	custom	NA	Prot	Perm					
Protected Phases	2 11	8	9	6 11	8		2	6	10	11	12
Permitted Phases		2	6			8					
Detector Phase	2 11	8	9	6 11	8	8					
Switch Phase											
Minimum Initial (s)		10.0	5.0		10.0	10.0	10.0	10.0	1.0	3.0	1.0
Minimum Split (s)		17.1	11.2		17.1	17.1	39.2	37.2	29.0	5.0	5.0
Total Split (s)		39.0	29.0		39.0	39.0	47.0	47.0	29.0	5.0	5.0
Total Split (%)		32.5%	24.2%		32.5%	32.5%	39%	39%	24%	4%	4%
Yellow Time (s)		3.3	3.7		3.3	3.3	3.7	3.7	2.0	2.0	2.0
All-Red Time (s)		3.3	2.5		3.3	3.3	2.4	2.4	0.0	0.0	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0					
Total Lost Time (s)		6.6	6.2		6.6	6.6					
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode		None	None		None	None	C-Min	C-Min	None	None	None
Act Effct Green (s)	65.7	65.0	74.9	65.7	25.1	25.1					
Actuated g/C Ratio	0.55	0.54	0.62	0.55	0.21	0.21					
v/c Ratio	0.28	0.20	0.29	0.80	0.79	0.64					
Control Delay	22.0	10.8	6.6	23.5	60.7	51.7					
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0					
Total Delay	22.0	10.8	6.6	23.7	60.7	51.7					
LOS	C	B	A	C	E	D					
Approach Delay	19.5			22.0	57.0						
Approach LOS	B			C	E						
Queue Length 50th (m)	24.9	13.0	4.6	135.2	62.9	43.5					
Queue Length 95th (m)	80.8	35.5	11.6	#273.2	86.7	63.4					
Internal Link Dist (m)	206.4			215.4	157.2						
Turn Bay Length (m)		40.0	87.0		80.0						
Base Capacity (vph)	1867	841	741	1855	457	409					
Starvation Cap Reductn	0	0	0	0	0	0					
Spillback Cap Reductn	0	0	0	44	0	0					
Storage Cap Reductn	0	0	0	0	0	0					
Reduced v/c Ratio	0.28	0.18	0.22	0.82	0.61	0.49					

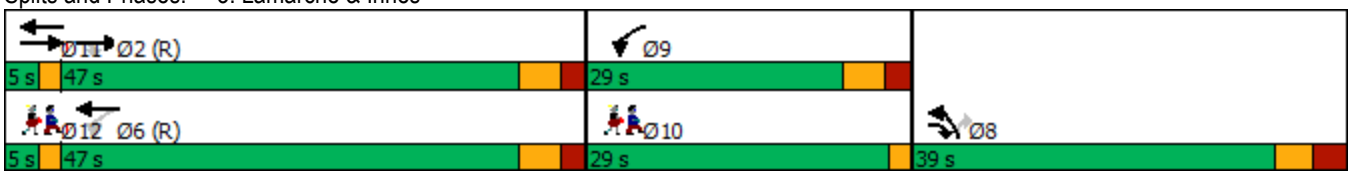
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

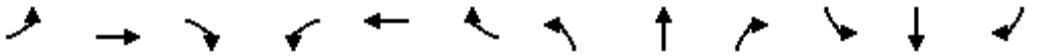
Maximum v/c Ratio: 0.80

Intersection Signal Delay: 27.4	Intersection LOS: C
Intersection Capacity Utilization 70.3%	ICU Level of Service C
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Lamarche & Innes





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	643	39	14	1571	1	102	0	38	0	0	5
Future Volume (vph)	3	643	39	14	1571	1	102	0	38	0	0	5
Satd. Flow (prot)	1695	3354	0	1695	3390	0	0	1651	0	0	1520	0
Flt Permitted	0.128			0.388				0.782				
Satd. Flow (perm)	228	3354	0	691	3390	0	0	1338	0	0	1520	0
Satd. Flow (RTOR)		11						28			47	
Lane Group Flow (vph)	3	682	0	14	1572	0	0	140	0	0	5	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0	33.0	
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%	27.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	91.1	91.1		91.1	91.1			16.5			16.5	
Actuated g/C Ratio	0.76	0.76		0.76	0.76			0.14			0.14	
v/c Ratio	0.02	0.27		0.03	0.61			0.67			0.02	
Control Delay	2.3	2.3		5.2	8.6			53.9			0.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	2.3	2.3		5.2	8.6			53.9			0.2	
LOS	A	A		A	A			D			A	
Approach Delay		2.3			8.6			53.9			0.2	
Approach LOS		A			A			D			A	
Queue Length 50th (m)	0.1	4.2		0.7	71.8			25.6			0.0	
Queue Length 95th (m)	m0.4	26.6		3.1	128.1			42.8			0.0	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	173	2547		524	2572			319			374	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.02	0.27		0.03	0.61			0.44			0.01	

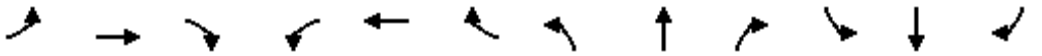
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 9.4	Intersection LOS: A
Intersection Capacity Utilization 71.5%	ICU Level of Service C
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: U-Haul Access/Boyer & Innes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	579	1735	158	58	807	171	64	225	84	185	241	203
Future Volume (vph)	579	1735	158	58	807	171	64	225	84	185	241	203
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.464			0.611		
Satd. Flow (perm)	3268	3390	1484	1690	3390	1464	818	3390	1465	1072	3390	1492
Satd. Flow (RTOR)			292			230			159			292
Lane Group Flow (vph)	579	1735	158	58	807	171	64	225	84	185	241	203
Turn Type	Prot	NA	Free	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Free
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			Free			6	8		8	4		Free
Detector Phase	5	2		1	6	6	3	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.6	26.2		11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	
Total Split (s)	27.0	54.4		11.2	38.6	38.6	11.7	44.4	44.4	32.7	32.7	
Total Split (%)	24.5%	49.5%		10.2%	35.1%	35.1%	10.6%	40.4%	40.4%	29.7%	29.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.9	2.5		2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.2		6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes			Yes	Yes	
Recall Mode	Max	C-Min		Max	C-Min	C-Min	None	None	None	None	None	
Act Effct Green (s)	26.3	48.2	110.0	10.9	32.4	32.4	31.8	31.8	31.8	22.5	22.5	110.0
Actuated g/C Ratio	0.24	0.44	1.00	0.10	0.29	0.29	0.29	0.29	0.29	0.20	0.20	1.00
v/c Ratio	0.74	1.17	0.11	0.35	0.81	0.29	0.23	0.23	0.16	0.84	0.35	0.14
Control Delay	47.4	113.5	0.1	52.5	45.0	9.0	27.9	28.8	0.6	73.3	38.1	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.4	113.5	0.1	52.5	45.0	9.0	27.9	28.8	0.6	73.3	38.1	0.2
LOS	D	F	A	D	D	A	C	C	A	E	D	A
Approach Delay		90.7			39.5			22.3			36.2	
Approach LOS		F			D			C			D	
Queue Length 50th (m)	62.9	~233.8	0.0	12.3	59.3	0.0	9.5	18.1	0.0	37.4	22.8	0.0
Queue Length 95th (m)	#96.9	#276.0	0.0	#34.7	112.3	24.4	18.9	26.8	0.0	#69.6	33.6	0.0
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	784	1485	1484	167	998	593	276	1161	606	253	801	1492
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	1.17	0.11	0.35	0.81	0.29	0.23	0.19	0.14	0.73	0.30	0.14

Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

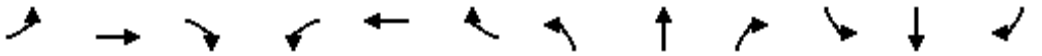
Maximum v/c Ratio: 1.17

Intersection Signal Delay: 65.7	Intersection LOS: E
Intersection Capacity Utilization 101.5%	ICU Level of Service G
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Orleans & Innes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	1928	23	53	1006	101	13	21	98	58	23	38
Future Volume (vph)	74	1928	23	53	1006	101	13	21	98	58	23	38
Satd. Flow (prot)	1695	3381	0	1695	3331	0	0	1566	0	0	1650	0
Flt Permitted	0.232			0.064				0.964			0.720	
Satd. Flow (perm)	413	3381	0	114	3331	0	0	1515	0	0	1211	0
Satd. Flow (RTOR)		2			17			12			21	
Lane Group Flow (vph)	74	1951	0	53	1107	0	0	132	0	0	119	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		39.2	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	72.0	72.0		72.0	72.0		38.0	38.0		38.0	38.0	
Total Split (%)	65.5%	65.5%		65.5%	65.5%		34.5%	34.5%		34.5%	34.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2			6.8			6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	80.4	80.4		80.4	80.4			16.6			16.6	
Actuated g/C Ratio	0.73	0.73		0.73	0.73			0.15			0.15	
v/c Ratio	0.25	0.79		0.64	0.45			0.55			0.59	
Control Delay	1.7	8.2		51.4	7.7			46.3			46.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	1.7	8.2		51.4	7.7			46.3			46.0	
LOS	A	A		D	A			D			D	
Approach Delay		8.0			9.7			46.3			46.0	
Approach LOS		A			A			D			D	
Queue Length 50th (m)	1.2	29.3		4.4	38.1			24.8			20.4	
Queue Length 95th (m)	m1.8	m23.7		#34.0	86.2			36.5			32.7	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	301	2470		83	2438			438			358	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.25	0.79		0.64	0.45			0.30			0.33	

Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 2 (2%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 11.3	Intersection LOS: B
Intersection Capacity Utilization 94.8%	ICU Level of Service F
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Page & Innes

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø2	Ø6	Ø10	Ø11	Ø12
Lane Configurations											
Traffic Volume (vph)	1841	293	216	1006	186	203					
Future Volume (vph)	1841	293	216	1006	186	203					
Satd. Flow (prot)	3390	1517	1695	3390	1695	1517					
Flt Permitted			0.064		0.950						
Satd. Flow (perm)	3390	1252	114	3390	1318	1517					
Satd. Flow (RTOR)											
Lane Group Flow (vph)	1841	293	216	1006	186	203					
Turn Type	NA	custom	custom	NA	Prot	Perm					
Protected Phases	2 11	8	9	6 11	8		2	6	10	11	12
Permitted Phases		2	6			8					
Detector Phase	2 11	8	9	6 11	8	8					
Switch Phase											
Minimum Initial (s)		10.0	5.0		10.0	10.0	10.0	10.0	1.0	3.0	1.0
Minimum Split (s)		17.1	11.2		17.1	17.1	39.1	37.1	29.0	5.0	5.0
Total Split (s)		26.0	29.0		26.0	26.0	60.0	60.0	29.0	5.0	5.0
Total Split (%)		21.7%	24.2%		21.7%	21.7%	50%	50%	24%	4%	4%
Yellow Time (s)		3.3	3.7		3.3	3.3	3.7	3.7	2.0	2.0	2.0
All-Red Time (s)		3.3	2.5		3.3	3.3	2.4	2.4	0.0	0.0	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0					
Total Lost Time (s)		6.6	6.2		6.6	6.6					
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode		None	None		None	None	C-Min	C-Min	None	None	None
Act Effct Green (s)	63.1	73.2	80.2	64.1	19.8	19.8					
Actuated g/C Ratio	0.53	0.61	0.67	0.53	0.16	0.16					
v/c Ratio	1.03	0.36	0.75	0.56	0.66	0.81					
Control Delay	59.8	7.8	52.6	21.5	59.0	72.5					
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0					
Total Delay	59.8	7.8	52.6	21.5	59.0	72.5					
LOS	E	A	D	C	E	E					
Approach Delay	52.7			27.0	66.0						
Approach LOS	D			C	E						
Queue Length 50th (m)	~247.8	17.7	33.9	82.2	40.4	45.3					
Queue Length 95th (m)	#320.7	34.3	58.0	118.3	#67.6	#85.9					
Internal Link Dist (m)	206.4			215.4	157.2						
Turn Bay Length (m)		40.0	87.0		80.0						
Base Capacity (vph)	1782	819	382	1810	293	262					
Starvation Cap Reductn	0	0	0	0	0	0					
Spillback Cap Reductn	0	0	0	0	0	0					
Storage Cap Reductn	0	0	0	0	0	0					
Reduced v/c Ratio	1.03	0.36	0.57	0.56	0.63	0.77					

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

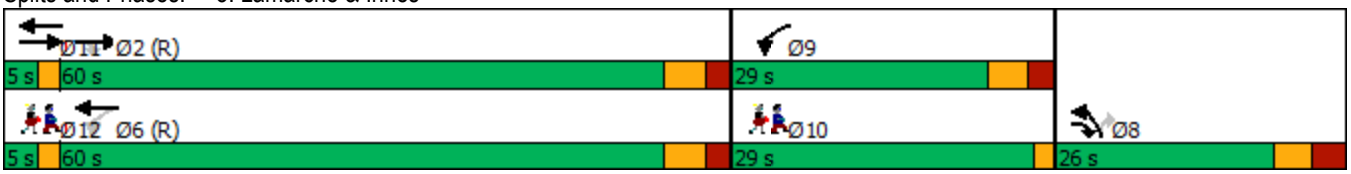
Maximum v/c Ratio: 1.03

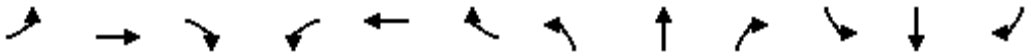
Intersection Signal Delay: 45.7	Intersection LOS: D
Intersection Capacity Utilization 93.0%	ICU Level of Service F
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Lamarche & Innes





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1949	109	41	1126	12	66	0	26	12	0	7
Future Volume (vph)	14	1949	109	41	1126	12	66	0	26	12	0	7
Satd. Flow (prot)	1695	3357	0	1695	3382	0	0	1649	0	0	1624	0
Flt Permitted	0.232			0.063				0.776			0.820	
Satd. Flow (perm)	413	3357	0	112	3382	0	0	1311	0	0	1373	0
Satd. Flow (RTOR)		10			2			31			31	
Lane Group Flow (vph)	14	2058	0	41	1138	0	0	92	0	0	19	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	77.0	77.0		77.0	77.0		33.0	33.0		33.0	33.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	88.2	88.2		88.2	88.2			13.9			13.9	
Actuated g/C Ratio	0.80	0.80		0.80	0.80			0.13			0.13	
v/c Ratio	0.04	0.76		0.46	0.42			0.48			0.10	
Control Delay	5.4	11.4		29.8	5.5			36.9			7.4	
Queue Delay	0.0	0.5		0.0	0.0			0.0			0.0	
Total Delay	5.4	11.9		29.8	5.5			36.9			7.4	
LOS	A	B		C	A			D			A	
Approach Delay		11.8			6.4			36.9			7.4	
Approach LOS		B			A			D			A	
Queue Length 50th (m)	0.5	99.5		2.3	32.1			12.6			0.0	
Queue Length 95th (m)	3.4	#269.1		#24.4	77.0			24.6			3.9	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	331	2693		89	2711			341			356	
Starvation Cap Reductn	0	246		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.04	0.84		0.46	0.42			0.27			0.05	

Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 36 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

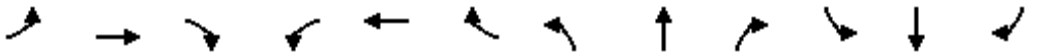
Intersection Signal Delay: 10.6	Intersection LOS: B
Intersection Capacity Utilization 83.9%	ICU Level of Service E
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: U-Haul Access/Boyer & Innes

APPENDIX R

SYNCHRO ANALYSIS: 2037 EUC ASSUMPTIONS INTERSECTION PERFORMANCE



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	419	22	23	1392	122	193	246	42	73	95	436
Future Volume (vph)	115	419	22	23	1392	122	193	246	42	73	95	436
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.501			0.599		
Satd. Flow (perm)	3281	3390	1487	1669	3390	1471	888	3390	1427	1032	3390	1496
Satd. Flow (RTOR)			195			143			82			226
Lane Group Flow (vph)	115	419	22	23	1392	122	193	246	42	73	95	436
Turn Type	Prot	NA	Free	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Free
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			Free			6	8		8	4		Free
Detector Phase	5	2		1	6	6	3	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.6	26.2		11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	
Total Split (s)	12.4	71.9		12.4	71.9	71.9	13.0	45.7	45.7	32.7	32.7	
Total Split (%)	9.5%	55.3%		9.5%	55.3%	55.3%	10.0%	35.2%	35.2%	25.2%	25.2%	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.9	2.5		2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.2		6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes			Yes	Yes	
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	
Act Effct Green (s)	7.8	74.7	130.0	6.3	68.0	68.0	34.8	34.8	34.8	17.6	17.6	130.0
Actuated g/C Ratio	0.06	0.57	1.00	0.05	0.52	0.52	0.27	0.27	0.27	0.14	0.14	1.00
v/c Ratio	0.59	0.22	0.01	0.28	0.79	0.15	0.64	0.27	0.10	0.53	0.21	0.29
Control Delay	72.1	15.3	0.0	68.8	29.7	2.1	50.4	37.7	1.0	63.6	48.7	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.1	15.3	0.0	68.8	29.7	2.1	50.4	37.7	1.0	63.6	48.7	0.5
LOS	E	B	A	E	C	A	D	D	A	E	D	A
Approach Delay		26.4			28.1			39.6			15.7	
Approach LOS		C			C			D			B	
Queue Length 50th (m)	14.7	29.0	0.0	5.8	152.5	0.0	41.3	26.4	0.0	18.1	11.8	0.0
Queue Length 95th (m)	#31.1	41.2	0.0	15.2	183.6	6.8	60.7	36.1	1.1	31.3	18.4	0.0
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	196	1948	1487	83	1772	837	302	1017	485	206	678	1496
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.22	0.01	0.28	0.79	0.15	0.64	0.24	0.09	0.35	0.14	0.29

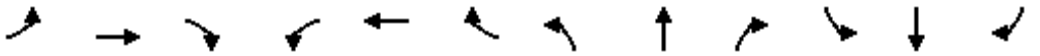
Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 99 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 27.2	Intersection LOS: C
Intersection Capacity Utilization 92.0%	ICU Level of Service F
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Orleans & Innes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	511	10	39	1458	30	13	13	58	41	7	67
Future Volume (vph)	15	511	10	39	1458	30	13	13	58	41	7	67
Satd. Flow (prot)	1695	3378	0	1695	3377	0	0	1587	0	0	1585	0
Flt Permitted	0.146			0.459				0.941			0.859	
Satd. Flow (perm)	260	3378	0	818	3377	0	0	1502	0	0	1386	0
Satd. Flow (RTOR)		3			3			58			48	
Lane Group Flow (vph)	15	521	0	39	1488	0	0	84	0	0	115	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		39.2	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	82.0	82.0		82.0	82.0		38.0	38.0		38.0	38.0	
Total Split (%)	68.3%	68.3%		68.3%	68.3%		31.7%	31.7%		31.7%	31.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2			6.8			6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	91.7	91.7		91.7	91.7			15.3			15.3	
Actuated g/C Ratio	0.76	0.76		0.76	0.76			0.13			0.13	
v/c Ratio	0.08	0.20		0.06	0.58			0.35			0.53	
Control Delay	6.9	5.0		3.6	8.5			20.6			35.9	
Queue Delay	0.0	0.0		0.0	0.3			0.0			0.0	
Total Delay	6.9	5.0		3.6	8.8			20.6			35.9	
LOS	A	A		A	A			C			D	
Approach Delay		5.0			8.7			20.6			35.9	
Approach LOS		A			A			C			D	
Queue Length 50th (m)	0.6	12.4		1.3	26.9			5.8			15.3	
Queue Length 95th (m)	4.4	34.1		m4.2	209.5			17.2			28.4	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	198	2583		625	2582			433			395	
Starvation Cap Reductn	0	0		0	454			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.08	0.20		0.06	0.70			0.19			0.29	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 26 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 9.6	Intersection LOS: A
Intersection Capacity Utilization 73.2%	ICU Level of Service D
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Page & Innes

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø2	Ø6	Ø10	Ø11	Ø12
Lane Configurations											
Traffic Volume (vph)	501	105	91	1378	217	134					
Future Volume (vph)	501	105	91	1378	217	134					
Satd. Flow (prot)	3390	1517	1695	3390	1695	1517					
Flt Permitted			0.468		0.950						
Satd. Flow (perm)	3390	1296	790	3390	1488	1517					
Satd. Flow (RTOR)											
Lane Group Flow (vph)	501	105	91	1378	217	134					
Turn Type	NA	custom	custom	NA	Prot	Perm					
Protected Phases	2 11	8	9	6 11	8		2	6	10	11	12
Permitted Phases		2	6			8					
Detector Phase	2 11	8	9	6 11	8	8					
Switch Phase											
Minimum Initial (s)		10.0	5.0		10.0	10.0	10.0	10.0	1.0	3.0	1.0
Minimum Split (s)		17.1	11.2		17.1	17.1	39.2	37.2	29.0	5.0	5.0
Total Split (s)		39.0	29.0		39.0	39.0	47.0	47.0	29.0	5.0	5.0
Total Split (%)		32.5%	24.2%		32.5%	32.5%	39%	39%	24%	4%	4%
Yellow Time (s)		3.3	3.7		3.3	3.3	3.7	3.7	2.0	2.0	2.0
All-Red Time (s)		3.3	2.5		3.3	3.3	2.4	2.4	0.0	0.0	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0					
Total Lost Time (s)		6.6	6.2		6.6	6.6					
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode		None	None		None	None	C-Min	C-Min	None	None	None
Act Effct Green (s)	71.3	56.6	78.9	70.5	20.6	20.6					
Actuated g/C Ratio	0.59	0.47	0.66	0.59	0.17	0.17					
v/c Ratio	0.25	0.16	0.15	0.69	0.75	0.52					
Control Delay	15.7	12.7	4.3	17.1	62.2	51.1					
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0					
Total Delay	15.7	12.7	4.3	17.1	62.2	51.1					
LOS	B	B	A	B	E	D					
Approach Delay	15.2			16.3	58.0						
Approach LOS	B			B	E						
Queue Length 50th (m)	22.3	11.3	2.1	108.8	49.0	29.0					
Queue Length 95th (m)	61.2	19.8	5.2	#229.2	70.4	45.3					
Internal Link Dist (m)	206.4			215.4	157.2						
Turn Bay Length (m)		40.0	87.0		80.0						
Base Capacity (vph)	2140	797	780	1992	457	409					
Starvation Cap Reductn	0	0	0	0	0	0					
Spillback Cap Reductn	0	0	0	16	0	0					
Storage Cap Reductn	0	0	0	0	0	0					
Reduced v/c Ratio	0.23	0.13	0.12	0.70	0.47	0.33					

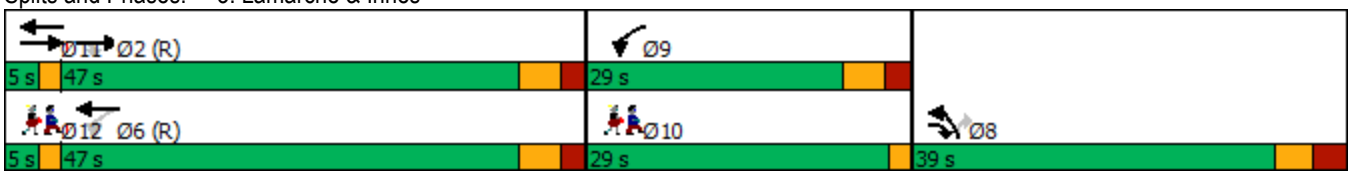
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

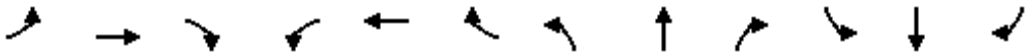
Maximum v/c Ratio: 0.75

Intersection Signal Delay: 22.1	Intersection LOS: C
Intersection Capacity Utilization 63.5%	ICU Level of Service B
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Lamarche & Innes





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	553	40	24	1388	1	96	0	60	0	0	5
Future Volume (vph)	3	553	40	24	1388	1	96	0	60	0	0	5
Satd. Flow (prot)	1695	3350	0	1695	3390	0	0	1630	0	0	1520	0
Flt Permitted	0.163			0.427				0.809				
Satd. Flow (perm)	291	3350	0	760	3390	0	0	1360	0	0	1520	0
Satd. Flow (RTOR)		14						28			69	
Lane Group Flow (vph)	3	593	0	24	1389	0	0	156	0	0	5	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0	33.0	
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%	27.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	90.3	90.3		90.3	90.3			17.3			17.3	
Actuated g/C Ratio	0.75	0.75		0.75	0.75			0.14			0.14	
v/c Ratio	0.01	0.23		0.04	0.54			0.71			0.02	
Control Delay	1.0	1.8		5.3	7.9			56.6			0.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	1.0	1.8		5.3	7.9			56.6			0.2	
LOS	A	A		A	A			E			A	
Approach Delay		1.8			7.9			56.6			0.2	
Approach LOS		A			A			E			A	
Queue Length 50th (m)	0.1	3.5		1.2	60.7			29.3			0.0	
Queue Length 95th (m)	m0.0	0.0		4.5	103.2			47.9			0.0	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	218	2525		572	2551			324			391	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.01	0.23		0.04	0.54			0.48			0.01	

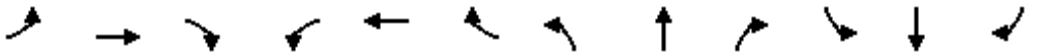
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: U-Haul Access/Boyer & Innes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	550	1563	150	55	737	163	61	214	80	177	229	193
Future Volume (vph)	550	1563	150	55	737	163	61	214	80	177	229	193
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.466			0.618		
Satd. Flow (perm)	3266	3390	1484	1688	3390	1464	821	3390	1465	1084	3390	1492
Satd. Flow (RTOR)			292			230			159			292
Lane Group Flow (vph)	550	1563	150	55	737	163	61	214	80	177	229	193
Turn Type	Prot	NA	Free	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Free
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			Free			6	8		8	4		Free
Detector Phase	5	2		1	6	6	3	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.6	26.2		11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	
Total Split (s)	27.0	54.4		11.2	38.6	38.6	11.7	44.4	44.4	32.7	32.7	
Total Split (%)	24.5%	49.5%		10.2%	35.1%	35.1%	10.6%	40.4%	40.4%	29.7%	29.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.9	2.5		2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.2		6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes			Yes	Yes	
Recall Mode	Max	C-Min		Max	C-Min	C-Min	None	None	None	None	None	
Act Effct Green (s)	27.0	48.2	110.0	11.6	32.4	32.4	31.1	31.1	31.1	21.8	21.8	110.0
Actuated g/C Ratio	0.25	0.44	1.00	0.11	0.29	0.29	0.28	0.28	0.28	0.20	0.20	1.00
v/c Ratio	0.68	1.05	0.10	0.31	0.74	0.27	0.22	0.22	0.15	0.83	0.34	0.13
Control Delay	44.9	69.6	0.1	52.8	42.9	8.9	28.1	29.1	0.6	71.1	38.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.9	69.6	0.1	52.8	42.9	8.9	28.1	29.1	0.6	71.1	38.4	0.2
LOS	D	E	A	D	D	A	C	C	A	E	D	A
Approach Delay		59.0			37.6			22.5			35.8	
Approach LOS		E			D			C			D	
Queue Length 50th (m)	58.2	~193.3	0.0	11.5	62.3	0.0	9.2	17.4	0.0	36.0	22.0	0.0
Queue Length 95th (m)	#89.7	#235.5	0.0	#33.0	102.9	22.0	18.3	25.7	0.0	#64.4	32.1	0.0
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	805	1485	1484	178	998	593	272	1161	606	256	801	1492
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	1.05	0.10	0.31	0.74	0.27	0.22	0.18	0.13	0.69	0.29	0.13

Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

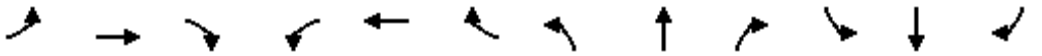
Maximum v/c Ratio: 1.05

Intersection Signal Delay: 47.6	Intersection LOS: D
Intersection Capacity Utilization 96.0%	ICU Level of Service F
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Orleans & Innes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	1734	22	50	911	96	12	20	93	56	22	36
Future Volume (vph)	71	1734	22	50	911	96	12	20	93	56	22	36
Satd. Flow (prot)	1695	3381	0	1695	3330	0	0	1566	0	0	1650	0
Flt Permitted	0.264			0.093				0.965			0.733	
Satd. Flow (perm)	470	3381	0	166	3330	0	0	1517	0	0	1233	0
Satd. Flow (RTOR)		2			18			20			21	
Lane Group Flow (vph)	71	1756	0	50	1007	0	0	125	0	0	114	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		39.2	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	72.0	72.0		72.0	72.0		38.0	38.0		38.0	38.0	
Total Split (%)	65.5%	65.5%		65.5%	65.5%		34.5%	34.5%		34.5%	34.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2			6.8			6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	81.0	81.0		81.0	81.0			16.0			16.0	
Actuated g/C Ratio	0.74	0.74		0.74	0.74			0.15			0.15	
v/c Ratio	0.21	0.71		0.41	0.41			0.53			0.58	
Control Delay	2.5	6.9		22.3	7.0			42.5			45.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	2.5	6.9		22.3	7.0			42.5			45.4	
LOS	A	A		C	A			D			D	
Approach Delay		6.7			7.7			42.5			45.4	
Approach LOS		A			A			D			D	
Queue Length 50th (m)	0.4	15.6		3.0	31.3			21.7			19.4	
Queue Length 95th (m)	m2.0	m24.2		#24.7	75.4			33.1			31.1	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	345	2489		122	2456			444			364	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.21	0.71		0.41	0.41			0.28			0.31	

Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 2 (2%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 9.9	Intersection LOS: A
Intersection Capacity Utilization 92.0%	ICU Level of Service F
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Page & Innes

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø2	Ø6	Ø10	Ø11	Ø12
Lane Configurations											
Traffic Volume (vph)	1708	213	158	921	161	107					
Future Volume (vph)	1708	213	158	921	161	107					
Satd. Flow (prot)	3390	1517	1695	3390	1695	1517					
Flt Permitted			0.058		0.950						
Satd. Flow (perm)	3390	1252	103	3390	1318	1517					
Satd. Flow (RTOR)											
Lane Group Flow (vph)	1708	213	158	921	161	107					
Turn Type	NA	custom	custom	NA	Prot	Perm					
Protected Phases	2 11	8	9	6 11	8		2	6	10	11	12
Permitted Phases		2	6			8					
Detector Phase	2 11	8	9	6 11	8	8					
Switch Phase											
Minimum Initial (s)		10.0	5.0		10.0	10.0	10.0	10.0	1.0	3.0	1.0
Minimum Split (s)		17.1	11.2		17.1	17.1	39.1	37.1	29.0	5.0	5.0
Total Split (s)		26.0	29.0		26.0	26.0	60.0	60.0	29.0	5.0	5.0
Total Split (%)		21.7%	24.2%		21.7%	21.7%	50%	50%	24%	4%	4%
Yellow Time (s)		3.3	3.7		3.3	3.3	3.7	3.7	2.0	2.0	2.0
All-Red Time (s)		3.3	2.5		3.3	3.3	2.4	2.4	0.0	0.0	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0					
Total Lost Time (s)		6.6	6.2		6.6	6.6					
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode		None	None		None	None	C-Min	C-Min	None	None	None
Act Effct Green (s)	71.0	69.3	84.1	71.0	15.9	15.9					
Actuated g/C Ratio	0.59	0.58	0.70	0.59	0.13	0.13					
v/c Ratio	0.85	0.28	0.64	0.46	0.72	0.53					
Control Delay	27.4	7.7	44.2	16.6	67.3	57.7					
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0					
Total Delay	27.4	7.7	44.2	16.6	67.3	57.7					
LOS	C	A	D	B	E	E					
Approach Delay	25.2			20.6	63.5						
Approach LOS	C			C	E						
Queue Length 50th (m)	160.0	10.0	20.1	58.7	36.6	23.7					
Queue Length 95th (m)	#286.4	24.4	41.2	105.0	58.0	40.8					
Internal Link Dist (m)	206.4			215.4	157.2						
Turn Bay Length (m)		40.0	87.0		80.0						
Base Capacity (vph)	2006	802	382	2006	274	245					
Starvation Cap Reductn	0	0	0	0	0	0					
Spillback Cap Reductn	0	0	0	0	0	0					
Storage Cap Reductn	0	0	0	0	0	0					
Reduced v/c Ratio	0.85	0.27	0.41	0.46	0.59	0.44					

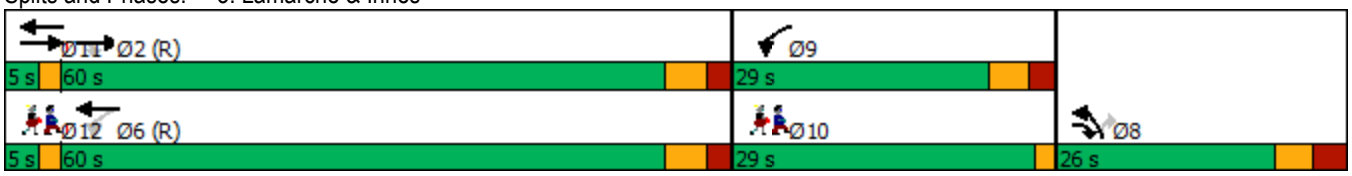
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

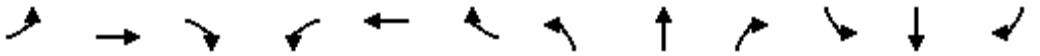
Maximum v/c Ratio: 0.85

Intersection Signal Delay: 26.8	Intersection LOS: C
Intersection Capacity Utilization 84.2%	ICU Level of Service E
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Lamarche & Innes





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	1715	102	62	978	11	65	0	42	11	0	7
Future Volume (vph)	13	1715	102	62	978	11	65	0	42	11	0	7
Satd. Flow (prot)	1695	3356	0	1695	3382	0	0	1630	0	0	1619	0
Flt Permitted	0.273			0.089				0.804			0.843	
Satd. Flow (perm)	486	3356	0	159	3382	0	0	1337	0	0	1406	0
Satd. Flow (RTOR)		11			2			31			31	
Lane Group Flow (vph)	13	1817	0	62	989	0	0	107	0	0	18	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	77.0	77.0		77.0	77.0		33.0	33.0		33.0	33.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Act Effct Green (s)	83.2	83.2		83.2	83.2			14.4			14.4	
Actuated g/C Ratio	0.76	0.76		0.76	0.76			0.13			0.13	
v/c Ratio	0.04	0.72		0.52	0.39			0.53			0.09	
Control Delay	5.4	10.3		27.9	5.8			39.7			6.5	
Queue Delay	0.0	0.4		0.0	0.0			0.0			0.0	
Total Delay	5.4	10.8		27.9	5.8			39.7			6.5	
LOS	A	B		C	A			D			A	
Approach Delay		10.7			7.1			39.7			6.5	
Approach LOS		B			A			D			A	
Queue Length 50th (m)	0.5	79.1		3.9	28.1			15.7			0.0	
Queue Length 95th (m)	3.2	176.1		#31.5	63.2			28.8			3.5	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	367	2541		120	2558			348			364	
Starvation Cap Reductn	0	283		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.04	0.80		0.52	0.39			0.31			0.05	

Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 36 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 10.5	Intersection LOS: B
Intersection Capacity Utilization 77.7%	ICU Level of Service D
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: U-Haul Access/Boyer & Innes

APPENDIX S

SIMTRAFFIC SUMMARY OUTPUT SHEETS

Intersection: 1: Orleans & Innes

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	T	L	T	T	R	L	T	T	R
Maximum Queue (m)	44.0	54.7	52.9	51.6	107.1	175.9	182.3	77.5	57.0	80.3	58.7	4.4
Average Queue (m)	10.2	29.9	25.4	21.4	10.0	101.2	108.3	25.2	40.6	39.9	25.6	0.2
95th Queue (m)	34.8	49.8	45.3	42.6	45.4	173.7	182.0	84.5	61.8	72.8	52.0	2.7
Link Distance (m)			182.5	182.5		448.2	448.2			66.2	66.2	
Upstream Blk Time (%)										2	0	
Queuing Penalty (veh)										0	0	
Storage Bay Dist (m)	150.0	150.0			120.0			70.0	50.0			45.0
Storage Blk Time (%)						7	19	0	8	1	0	
Queuing Penalty (veh)						2	24	1	10	3	0	

Intersection: 1: Orleans & Innes

Movement	B13	SB	SB	SB
Directions Served	T	L	T	T
Maximum Queue (m)	4.6	41.4	41.5	26.8
Average Queue (m)	0.4	19.0	20.0	6.2
95th Queue (m)	3.8	34.3	35.1	18.9
Link Distance (m)	150.5		233.1	233.1
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)		65.0		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Page & Innes

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	18.2	61.2	103.7	22.7	64.4	72.8	37.7	50.0
Average Queue (m)	4.8	20.2	27.5	5.4	20.1	23.9	13.7	20.4
95th Queue (m)	14.0	46.4	78.3	17.0	46.0	54.4	28.2	38.7
Link Distance (m)		448.2	448.2		211.6	211.6	197.1	232.3
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)	110.0			75.0				
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Intersection: 3: Lamarche & Innes

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (m)	58.1	59.5	42.1	177.0	227.6	230.1	86.6	77.1
Average Queue (m)	25.9	26.9	12.5	117.7	206.5	206.3	48.3	35.5
95th Queue (m)	47.6	51.0	28.5	239.1	261.0	260.9	77.9	64.5
Link Distance (m)	211.6	211.6			220.5	220.5		163.2
Upstream Blk Time (%)					15	14		
Queuing Penalty (veh)					128	119		
Storage Bay Dist (m)			40.0	87.0			80.0	
Storage Blk Time (%)		4	0		54		1	0
Queuing Penalty (veh)		5	0		86		2	1

Intersection: 4: U-Haul Access/Boyer & Innes

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	7.8	37.3	42.2	53.1	198.7	193.1	133.2	11.0
Average Queue (m)	0.5	15.3	20.5	7.6	113.4	100.7	61.2	1.6
95th Queue (m)	3.9	32.9	38.0	35.0	219.4	205.7	144.9	7.4
Link Distance (m)		220.5	220.5		212.5	212.5	194.8	47.5
Upstream Blk Time (%)					6	4	4	
Queuing Penalty (veh)					0	0	0	
Storage Bay Dist (m)	45.0			50.0				
Storage Blk Time (%)		0		0	33			
Queuing Penalty (veh)		0		0	5			

Intersection: 17: Lamarche

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	21.1	15.9	21.1	22.5
Average Queue (m)	11.0	7.3	11.5	11.3
95th Queue (m)	17.0	13.8	17.8	17.7
Link Distance (m)	205.9	260.3	259.3	132.9
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 20: Lamarche

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (m)	31.8	24.0	26.2
Average Queue (m)	13.9	13.6	13.8
95th Queue (m)	23.7	21.1	21.8
Link Distance (m)	207.4	148.4	259.3
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 385

Intersection: 1: Orleans & Innes

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (m)	102.1	157.5	196.9	197.7	92.5	31.9	123.5	131.7	77.5	30.4	53.4	47.2
Average Queue (m)	48.5	146.7	187.4	188.3	58.7	13.3	77.5	82.3	32.4	13.3	28.2	16.7
95th Queue (m)	85.0	196.4	196.0	193.3	131.9	27.4	117.9	125.8	92.4	26.1	45.0	38.0
Link Distance (m)			182.5	182.5			448.2	448.2			66.2	66.2
Upstream Blk Time (%)			29	44							0	0
Queuing Penalty (veh)			0	0							0	0
Storage Bay Dist (m)	150.0	150.0			85.0	120.0			70.0	50.0		
Storage Blk Time (%)		0	32	54	0		1	22	0		0	0
Queuing Penalty (veh)		2	183	85	1		0	37	0		0	0

Intersection: 1: Orleans & Innes

Movement	NB	SB	SB	SB
Directions Served	R	L	T	T
Maximum Queue (m)	25.3	67.4	75.6	65.2
Average Queue (m)	5.3	37.8	32.7	20.9
95th Queue (m)	18.7	63.4	66.9	51.9
Link Distance (m)			233.1	233.1
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	45.0	65.0		
Storage Blk Time (%)	0	3	0	0
Queuing Penalty (veh)	0	4	0	0

Intersection: 2: Page & Innes

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	35.4	126.2	432.4	69.7	120.0	126.0	49.4	52.6
Average Queue (m)	12.3	62.0	89.7	27.0	42.6	48.5	22.0	24.1
95th Queue (m)	31.0	107.4	237.9	63.9	100.7	107.1	40.8	43.5
Link Distance (m)		448.2	448.2		211.6	211.6	197.1	232.3
Upstream Blk Time (%)			0					
Queuing Penalty (veh)			0					
Storage Bay Dist (m)	110.0			75.0				
Storage Blk Time (%)		1		5	2			
Queuing Penalty (veh)		1		26	1			

Intersection: 3: Lamarche & Innes

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (m)	213.3	215.0	90.0	78.3	112.4	113.1	75.1	84.6
Average Queue (m)	159.9	166.0	69.2	40.8	66.0	68.1	36.1	41.5
95th Queue (m)	222.6	227.3	121.9	67.1	101.2	103.2	64.5	74.4
Link Distance (m)	211.6	211.6			220.5	220.5		163.2
Upstream Blk Time (%)	1	1						
Queuing Penalty (veh)	8	14						
Storage Bay Dist (m)			40.0	87.0			80.0	
Storage Blk Time (%)		44	2	0	2		0	1
Queuing Penalty (veh)		127	14	0	3		1	1

Intersection: 4: U-Haul Access/Boyer & Innes

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	28.3	161.9	168.0	39.7	75.9	66.4	40.4	17.6
Average Queue (m)	2.9	46.8	53.7	10.4	37.8	27.8	18.6	4.6
95th Queue (m)	14.4	122.6	130.4	27.1	66.8	55.0	34.7	13.5
Link Distance (m)		220.5	220.5		212.5	212.5	194.8	47.5
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)	45.0			50.0				
Storage Blk Time (%)		6		0	2			
Queuing Penalty (veh)		1		0	1			

Intersection: 17: Lamarche

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	20.2	15.4	18.4	33.7
Average Queue (m)	11.2	6.8	9.9	16.4
95th Queue (m)	17.6	14.2	14.2	26.1
Link Distance (m)	205.9	260.3	259.3	132.9
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 20: Lamarche

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (m)	27.3	19.4	33.0
Average Queue (m)	14.2	10.7	18.7
95th Queue (m)	22.5	16.8	28.6
Link Distance (m)	207.4	148.4	259.3
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 513

Intersection: 1: Orleans & Innes

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	T	L	T	T	R	L	T	T	R
Maximum Queue (m)	46.8	55.5	52.7	44.2	62.8	172.3	179.0	77.5	56.6	83.0	61.5	2.1
Average Queue (m)	10.2	30.0	24.2	18.9	8.5	93.5	99.9	25.9	37.6	37.3	22.9	0.1
95th Queue (m)	35.7	50.6	44.7	38.4	33.5	162.8	170.3	85.8	60.1	69.1	49.4	1.5
Link Distance (m)			182.5	182.5		448.2	448.2			66.2	66.2	
Upstream Blk Time (%)										2	0	
Queuing Penalty (veh)										0	0	
Storage Bay Dist (m)	150.0	150.0			120.0			70.0	50.0			45.0
Storage Blk Time (%)						5	17	0	5	1	0	
Queuing Penalty (veh)						1	21	0	6	3	0	

Intersection: 1: Orleans & Innes

Movement	B13	B13	SB	SB	SB
Directions Served	T	T	L	T	T
Maximum Queue (m)	15.7	7.5	43.1	37.8	24.1
Average Queue (m)	0.9	0.3	19.3	17.7	5.3
95th Queue (m)	9.7	5.3	37.3	32.0	16.4
Link Distance (m)	150.5	150.5		233.1	233.1
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			65.0		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Page & Innes

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	16.1	44.4	51.1	14.2	89.8	94.7	38.2	46.8
Average Queue (m)	3.9	15.4	20.0	4.2	15.7	17.8	13.8	20.1
95th Queue (m)	12.0	35.8	43.8	12.2	54.3	59.1	28.4	37.0
Link Distance (m)		448.2	448.2		211.6	211.6	197.1	232.3
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)	110.0			75.0				
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Intersection: 3: Lamarche & Innes

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (m)	51.6	53.7	30.8	46.3	156.0	158.5	79.5	58.5
Average Queue (m)	22.9	25.3	11.9	16.3	97.5	98.2	40.6	25.0
95th Queue (m)	43.9	47.8	26.1	36.5	152.1	151.2	69.8	47.6
Link Distance (m)	211.6	211.6			220.5	220.5		163.2
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			40.0	87.0			80.0	
Storage Blk Time (%)		3	0		11		1	0
Queuing Penalty (veh)		3	0		10		1	0

Intersection: 4: U-Haul Access/Boyer & Innes

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	7.0	39.0	41.1	25.5	81.5	75.1	64.0	10.4
Average Queue (m)	0.6	10.0	12.0	4.1	40.8	29.6	29.2	1.4
95th Queue (m)	4.3	27.5	30.6	15.6	71.9	60.8	53.0	6.9
Link Distance (m)		220.5	220.5		212.5	212.5	194.8	47.5
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)	45.0			50.0				
Storage Blk Time (%)		0			3			
Queuing Penalty (veh)		0			1			

Intersection: 17: Lamarche

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	22.5	16.6	21.5	22.3
Average Queue (m)	11.0	7.4	11.5	11.3
95th Queue (m)	17.6	14.1	18.0	17.6
Link Distance (m)	205.9	260.3	259.3	132.9
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 20: Lamarche

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (m)	28.8	26.4	26.3
Average Queue (m)	14.5	13.7	14.1
95th Queue (m)	23.5	21.9	21.8
Link Distance (m)	207.4	148.4	259.3
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 45

Intersection: 1: Orleans & Innes

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (m)	96.7	157.5	196.7	194.5	92.5	34.0	110.3	118.7	77.5	31.5	51.0	40.5
Average Queue (m)	52.5	147.0	187.0	187.7	59.0	12.9	64.2	69.6	21.9	12.1	27.1	14.9
95th Queue (m)	88.8	194.2	196.4	193.3	131.9	27.0	101.0	108.7	75.8	25.6	45.0	35.2
Link Distance (m)			182.5	182.5			448.2	448.2			66.2	66.2
Upstream Blk Time (%)			27	42							0	
Queuing Penalty (veh)			0	0							0	
Storage Bay Dist (m)	150.0	150.0			85.0	120.0			70.0	50.0		
Storage Blk Time (%)		0	30	53	0		0	13	0	0	0	0
Queuing Penalty (veh)		2	167	79	1		0	21	0	0	0	0

Intersection: 1: Orleans & Innes

Movement	NB	SB	SB	SB
Directions Served	R	L	T	T
Maximum Queue (m)	23.7	69.2	66.6	53.3
Average Queue (m)	4.8	36.2	27.5	16.3
95th Queue (m)	17.2	60.9	51.4	35.5
Link Distance (m)			233.1	233.1
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	45.0	65.0		
Storage Blk Time (%)		1	0	0
Queuing Penalty (veh)		2	0	0

Intersection: 2: Page & Innes

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	56.9	157.2	362.7	59.0	94.9	103.1	48.6	48.0
Average Queue (m)	12.5	59.3	91.0	17.7	32.1	38.5	21.8	21.8
95th Queue (m)	36.1	118.6	256.6	42.8	77.3	87.5	41.1	40.3
Link Distance (m)		448.2	448.2		211.6	211.6	197.1	232.3
Upstream Blk Time (%)			0					
Queuing Penalty (veh)			1					
Storage Bay Dist (m)	110.0			75.0				
Storage Blk Time (%)		1		0	1			
Queuing Penalty (veh)		1		0	1			

Intersection: 3: Lamarche & Innes

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (m)	198.1	203.0	90.0	61.4	97.4	98.2	68.0	50.8
Average Queue (m)	134.6	140.9	57.3	30.5	59.0	58.3	33.0	19.8
95th Queue (m)	193.0	201.0	117.6	52.0	91.3	91.1	58.3	40.4
Link Distance (m)	211.6	211.6			220.5	220.5		163.2
Upstream Blk Time (%)	0	0						
Queuing Penalty (veh)	0	1						
Storage Bay Dist (m)			40.0	87.0			80.0	
Storage Blk Time (%)		40	1		1		0	
Queuing Penalty (veh)		85	6		1		0	

Intersection: 4: U-Haul Access/Boyer & Innes

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	19.8	159.5	159.1	44.2	78.1	62.2	48.2	20.2
Average Queue (m)	3.3	37.8	42.9	14.8	33.9	24.7	20.7	4.4
95th Queue (m)	14.2	108.4	111.7	32.0	61.7	50.5	39.4	14.1
Link Distance (m)		220.5	220.5		212.5	212.5	194.8	47.5
Upstream Blk Time (%)		0						
Queuing Penalty (veh)		0						
Storage Bay Dist (m)	45.0			50.0				
Storage Blk Time (%)		4			1			
Queuing Penalty (veh)		1			1			

Intersection: 17: Lamarche

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	20.2	18.4	18.4	34.7
Average Queue (m)	11.1	7.1	10.1	17.4
95th Queue (m)	17.3	14.9	14.7	27.6
Link Distance (m)	205.9	260.3	259.3	132.9
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 20: Lamarche

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (m)	26.0	18.9	40.6
Average Queue (m)	14.8	10.9	19.6
95th Queue (m)	22.8	16.7	31.5
Link Distance (m)	207.4	148.4	259.3
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 369