INNES ROAD DEVELOPMENT 3817 - 3843 INNES ROAD OTTAWA, ONTARIO

TIA - STRATEGY DOCUMENT (REVISED 2)

May 4, 2022

D. J. Halpenny & Associates Ltd.

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Prepared for:

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INNES ROAD DEVELOPMENT

3817 - 3843 INNES ROAD OTTAWA, ONTARIO

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INTRODUCTION

The Innes Road Development will be situated on a parcel of land at 3817 - 3843 Innes Road. The development will consist of two buildings containing 110 rental apartments. The site will have one site access to Innes Road with completion of the apartment development expected by the year 2024.

The Transportation Impact Assessment (TIA) report will be examining the operation of the apartment building access and connecting road segments and intersections in close proximity to the site. The study will follow the City of Ottawa document, *Transportation Impact Assessment Guidelines (2017)*. Exhibit 1.1 in the Appendix presents the consultants Certification Form.

STEP 1 - SCREENING

A Screening Form has been prepared which is included as Exhibit 1.2 in the Appendix. The Screening Form was submitted to the City of Ottawa along with the Scoping Document. The Screening Form has determined that the Trip Generation, Location, and Safety Triggers have been met and a Transportation Impact Assessment (TIA) must continue onto the next stage. The following will address the Scoping Document.

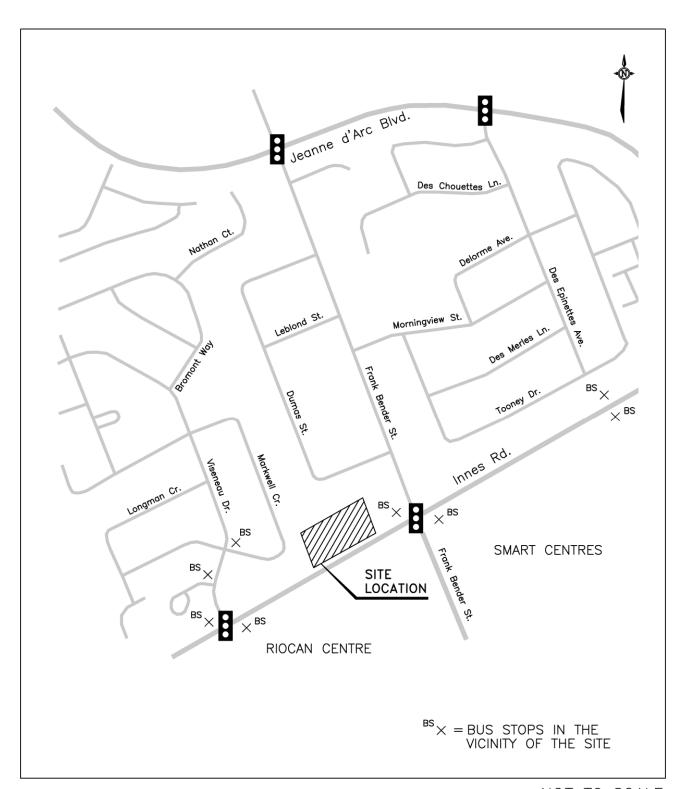
STEP 2 - SCOPING

MODULE 2.1 – Existing and Planned Conditions

Element 2.1.1 – Proposed Development

The proposed Innes Road Development will be located on three blocks of land at 3817, 3835 and 3843 Innes Road. The total property is 7,268 m² in size and is located on the north side of Innes Road approximately 132 m west of the intersection of Frank Bender Street and Innes Road. The three sites currently have two existing residential buildings. Development in the area consists of retail and commercial development along Innes Road and residential development on the local streets north of Innes Road. The property is currently zoned R4Z, Residential Fourth Density, which will support the proposed apartment development. Figure 2.1 provides a location plan of the site.

FIGURE 2.1 SITE LOCATION PLAN



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The Innes Road Development will consist of two apartment buildings, each on a separate Block of land. The development will be constructed in two phases, one phase for each Block of land and apartment building. The total development will comprise of 110 residential rental apartments. The site will contain 44 surface parking spaces and 84 spaces in an underground parking garage for a total of 128 parking spaces which include 2 barrier free spaces. Bicycle racks will be provided in a secured bicycle room in the underground parking garage. The site will have a bicycle room for each Block providing a total of 110 spaces for interior bike parking.

The site will provide one access onto Innes Road. The access is located approximately 125 m west of Frank Bender Street. The access will be restricted to right-in/right-out turning movements which would be controlled by extending the existing raised center median along Innes Road by approximately 29 m.

A conceptual site plan of the two phases of the development is provided as Figure 2.2. The total development is expected to be completed and substantially occupied by the year 2024.

Element 2.1.2 – Existing Conditions

ROADS

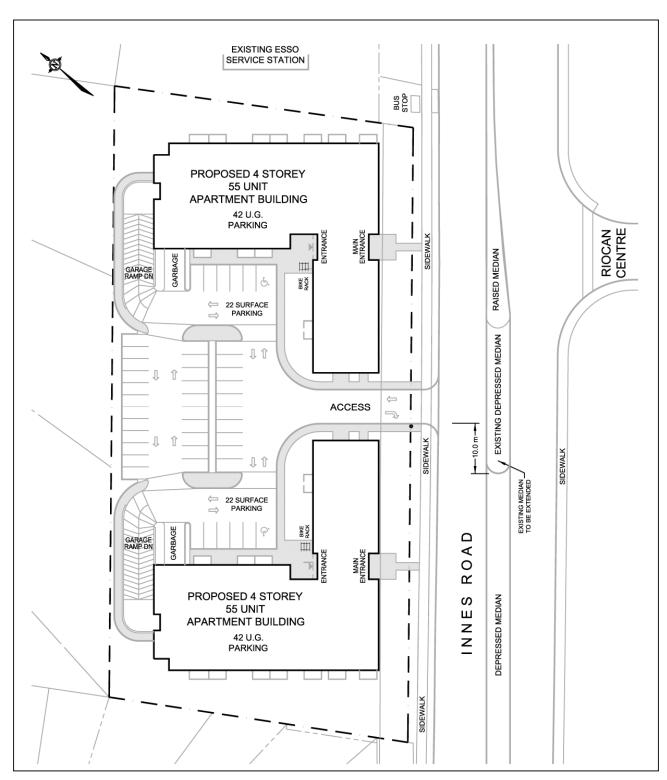
The Innes Road Development is located along the north side of Innes Road. Adjacent to the east limit of the site is an Esso Service Centre with convenience mart which has two right-in/right-out accesses onto Innes Road, and one full movement access onto Frank Bender Street. There are no other driveways onto Innes Road along the north side between Viseneau Drive and Frank Bender Street. Along the south side of Innes Road across from the site is the Riocan Shopping Centre. There is one right-in/right-out access on the south side of Innes Road across from the east portion of the site.

Innes Road is a four lane divided roadway which is under the jurisdiction of the City of Ottawa and is designated in the Ottawa 20/20 - Transportation Master Plan (TMP) as an east-west arterial road. Innes Road in the vicinity of the site is designated as a "Spine Route" in the City's TMP with cycling lanes provided along the roadway adjacent to the site. There are pedestrian sidewalks along both sides of the road. The speed limit along Innes Road is posted at 60 km./h.

Approximately 132 m east of the site is Frank Bender Street. Frank Bender Street is a north-south road designated in the TMP as a two lane collector road in the section north of Innes Road which passes through a residential neighbourhood, and a major collector road south of Innes Road. The north section the road is a two lane urban street with a sidewalk along the east side of the road and a posted speed limit of 40 km./h. There are 5 speed humps along the road between Innes Road and Jeanne d'Arc Boulevard. The south section of road is a four lane divided road with sidewalks along both sides of the street which provides access to the retail and commercial shopping centres.

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FIGURE 2.2 **CONCEPTUAL SITE PLAN**



Viseneau Drive is located approximately 240 m west of the site. The road is designated as collector road with a two lane urban cross section. Signs are posted which prohibits trucks. The speed limit is posted at 40 km./h. Viseneau Drive has a pedestrian sidewalk along the west side of the road. There are no cycling facilities along the road and the road is not designated as a cycling route.

Jeanne d'Arc Boulevard is located approximately 730 m east of the site and is designated in the City of Ottawa TMP as an arterial road. The road has a four lane divided urban cross section with a posted speed limit of 60 km./hr. Jeanne d'Arc Boulevard is designated as a "Spine Route" in the TMP. There are no dedicated cycling facilities along the road, which has pedestrian sidewalks along both sides of the road. South of Innes Road Jeanne d'Arc Boulevard becomes Mer Bleue Road. Mer Bleue Road is identified as an arterial road in the TMP. The road has a posted speed limit of 60 km./hr. with sidewalks along both sides of the road. The road is identified as a "Spine Route" and has designated cycling lanes.

INTERSECTIONS

The intersection of Frank Bender Street and Innes Road is controlled by traffic signals with Innes Road forming the eastbound and westbound approaches, and Frank Bender Street the northbound and southbound approaches. The intersection has the following lane configuration:

Northbound Frank Bender Street Approach One exclusive left turn lane

One through lane

One exclusive right turn lane

Southbound Frank Bender Street Approach One exclusive left turn lane

One shared through/right lane

Eastbound Innes Road Approach One exclusive left turn lane

Two through lanes

One exclusive right turn lane

Westbound Innes Road Approach

One exclusive left turn lane

One through lane

One shared through/right lane

The intersection of Viseneau Drive and Innes Road is controlled by traffic signals with Viseneau Drive forming the southbound approach, and the access to the Riocan Centre the northbound approach. The intersection has the following lane configuration:

Northbound Riocan Centre Approach

One exclusive left turn lane

One through lane

One exclusive right turn lane

Southbound Viseneau Drive Approach One shared left/through/right lane

Eastbound Innes Road Approach

One exclusive left turn lane

Two through lanes

One exclusive left turn lane

Westbound Innes Road Approach One exclusive left turn lane

One through lane

One shared through/right lane

INTERSECTION OF FRANK BENDER STREET AND INNES ROAD



INTERSECTION OF VISENEAU DRIVE AND INNES ROAD



Eastbound Innes Road Approach

Westbound Innes Road Approach

The intersection of Jeanne d'Arc Boulevard (Mer Bleue Road) and Innes Road is controlled by traffic signals where Jeanne d'Arc Boulevard forms the southbound approach and Mer Bleue Road the northbound approach. The intersection has the following lane configuration:

Northbound Mer Bleue Road Approach Two exclusive left turn lanes

One through lane

One shared through/right lane (channelized)

Southbound Jeanne d'Arc Blvd. Approach Two exclusive left turn lanes

One through lane

One shared through/right lane (channelized)

One exclusive left turn lane

Two through lanes

One exclusive right turn lane (channelized)

One exclusive left turn lane

Two through lanes

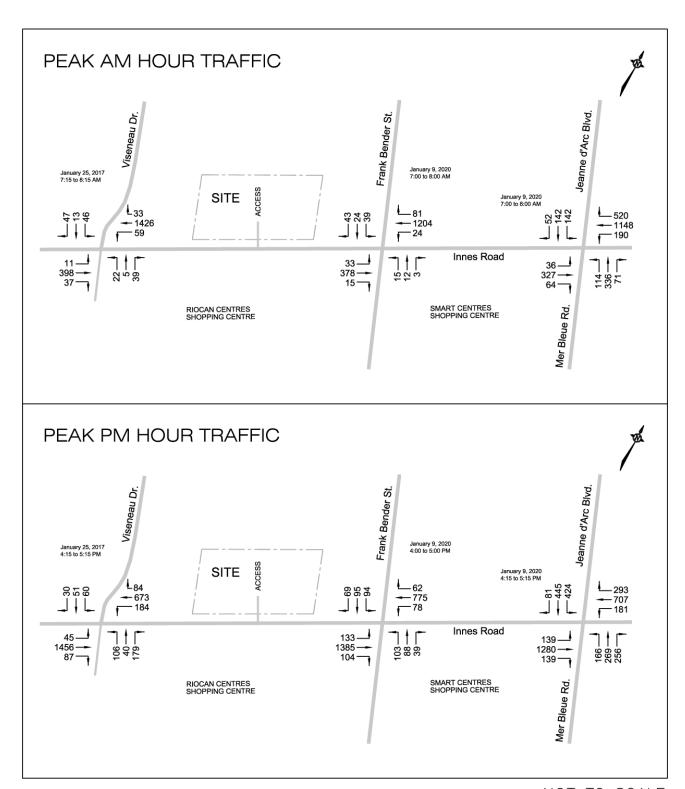
One exclusive right turn lane (channelized)

INTERSECTION OF JEANNE D'ARC BOULEVARD AND INNES ROAD



Figure 2.3 shows the weekday peak AM and PM hour traffic counts obtained from the City of Ottawa at the Frank Bender/Innes intersection taken January 9, 2020, the Viseneau/Innes intersection taken January 25, 2017, and the Jeanne d'Arc/Innes intersection taken January 9, 2020. The traffic counts are presented in the Appendix as Exhibit 2.1 for the Frank Bender/Innes intersection, Exhibit 2.2 for the Viseneau/Innes intersection, and Exhibit 2.3 for the Jeanne d'Arc/Innes intersection.

FIGURE 2.3
PEAK AM AND PM HOUR TRAFFIC COUNTS



TRANSIT

Local Routes 131 and 138 travel along Innes Road, with Route 131 traveling to the Jeanne d'Arc Rapid Route Station and Route 138 travelling to both the Jeanne d'Arc and Place d'Orléans Rapid Route Stations, each with 30 minute peak hour service. Frequent Route 25 travels along Innes Road between the Blair Transitway Station and the Millennium Rapid Route Station with 10 minute peak hour service. Weekday 15 minute peak hour service is provided by Route 231 which travels along Viseneau Drive to the Jeanne d'Arc Rapid Route Station. The bus routes are provided in Exhibit 2.4.

Bus stops are located along Innes Road in close proximity to the site with the westbound Innes Road stop located in front of the Esso Service Centre at the northwest corner of the Frank Bender/Innes intersection, and the eastbound Innes Road stop located at the southeast corner of the Frank Bender/Innes intersection. The locations of the bus stops in the vicinity of the site are shown in Figure 2.1.

COLLISION HISTORY

Collision reports were obtained from the City of Ottawa through Open Data Ottawa for the five year time period between the years January 1, 2014 and December 31, 2018. The collision data was obtained for the Frank Bender/Innes, Viseneau/Innes, and the Jeanne d'Arc/Innes intersections along with the road segments along Innes Road between Viseneau Drive and Frank Bender Street, and Frank Bender Street and Jeanne d'Arc Boulevard. Over the five year period there were 34 collisions at the Frank Bender/Innes intersection, and 14 collisions along Innes Road segment past the site. The Viseneau/Innes and Jeanne d'Arc/Innes intersections experienced 36 and 104 collisions respectively. The road segment between Frank Bender Street and Jeanne d'Arc Boulevard experienced 38 collisions over the same five year period. The collision data for all intersections and road segments showed that the majority of collisions were rear end collisions which would not be attributed to the roadway infrastructure. A summary of the type and year of each collision is provided in Table 2.1.

Element 2.1.3 – Planned Conditions

The City of Ottawa Transportation Master Plan 2013 was reviewed to identify transit and roadway projects in the vicinity of the development which may have an impact on travel demands and trip patterns. The document identified in the 2031 Affordable Network the extension of the LRT Confederation Line from the Blair Road Transit Station easterly to Place d'Orléans. Under the 2031 Affordable Transit Priority projects, peak period bus lanes and transit signal priority were identified along Blackburn Hamlet Bypass between Innes Road and Brian Coburn Boulevard.

Under the roadway projects, the document identified the extension of Brian Coburn Boulevard. Phase 1 has already been completed between Mer Bleue Road and Navan Road which was identified in the TMP to take place between 2014 and 2019. Phase 2 will be the continuation of the extension of Brian Coburn Boulevard from Navan Road to Innes Road and is identified in the TMP. The alignment options are still under review.

TABLE 2.1 COLLISION SUMMARY

	COLLISION TYPE					
YEAR	REAR END ANGULAR TURNING SIDESWIPE OTHER-SMV					
Frank Bend	der Street and Ini	nes Road Interse	ection	•		
2014	2	0	2	1	1	6
2015	6	1	1	2	0	10
2016	3	0	3	0	0	6
2017	4	1	1	0	0	6
2018	3	0	2	1	0	6
TOTAL	18	2	9	4	1	34
Viseneau D	Prive and Innes R	oad Intersection	1			
2014	2	2	2	0	0	6
2015	3	0	3	0	0	6
2016	7	2	1	0	1	11
2017	0	0	4	0	0	4
2018	6	0	0	3	0	9
TOTAL	18	4	10	3	1	36
Jeanne d'A	arc Boulevard an	d Innes Intersec	tion			
2014	11	2	4	1	1	19
2015	12	1	1	0	2	16
2016	9	1	6	2	1	19
2017	11	4	9	3	1	28
2018	12	1	6	3	0	22
TOTAL	55	9	26	9	5	104
Innes Road	Between Visene	eau Drive and Fr	ank Bender Stre	eet		
2014	3	0	0	1	0	4
2015	1	0	0	2	0	3
2016	1	0	0	3	0	4
2017	2	0	0	0	0	2
2018	0	0	0	1	0	1
TOTAL	7	0	0	7	0	14
Innes Road	Between Frank	Bender Street a	nd Jeanne d'Arc	Boulevard		
2014	3	1	1	3	0	8
2015	3	2	0	3	0	8
2016	5	1	1	1	1	9
2017	3	0	1	1	1	6
2018	6	0	0	1	0	7
TOTAL	20	4	3	9	2	38

The TMP has identified the construction of queue jump lanes and transit signal priority at selected intersections along Innes Road between Jeanne d'Arc Boulevard and Blackburn Hamlet Bypass as a Transit Priority Project in the 2031 Affordable Network. The measures would reduce travel time and improve reliability.

Other study area developments which may have an impact of the surrounding road network which are in the approval process or have been approved are the following:

2025 Innes Road - The SmartREIT is located 1.0 kilometre east of the site at the southeast corner of the Jeanne d'Arc/Innes intersection. The development will comprise of approximately 183,000 $\rm ft^2$ gross floor area of retail space, 30,000 $\rm ft^2$ of restaurant, and 10,000 $\rm ft^2$ for banking use.

3434 Innes Road - The development is a six storey mixed-use building located at the northwest corner of the intersection of Innes Road and Page Road which is approximately 1.3 km west of the site. The development would provide 35 residential units above a ground floor commercial use.

3490 Innes Road - The development is located on the south side of Innes Road just east of Page Road and about 1.2 km west of the site. The development would consist of a subdivision with 534 single family residential homes and townhouse units.

3604 Innes Road - The development is a subdivision located on the south side of Innes Road at the intersection of Boyer Road. The subdivision would be approximately 825 m west of the site and would comprise of 457 single family and townhouse dwellings units.

MODULE 2.2 – Study Area and Time Periods

Element 2.2.1 - Study Area

The number of site generated trips would be low with the TIA Trip Generation Trigger just meeting the 90 unit trigger with a total of 110 apartment units. The Location Trigger was met due to the site location being in a Design Priority Area (DPA), and the Safety Trigger met by being within 150 m of a signalized intersection.

The study area was determined following an examination of the size of the development and TIA Triggers satisfied by the development, along with all major intersections located within 1 km. of the site as stipulated in the TIA Guidelines. The study area would comprise of the site access onto Innes Road and the Frank Bender/Innes, Viseneau/Innes, and Jeanne d'Arc/Innes intersections. The road segment would consist of Innes Road between Frank Bender Street and Viseneau Drive, and the segment between Frank Bender Street and Jeanne d'Arc Boulevard.

The study will examine the intersection geometry and roadway segments in accordance with the City of Ottawa *Transportation Impact Assessment Guidelines (2017).*

Element 2.2.2 – Time Periods

The time periods for the analysis would be determined from the background traffic from the traffic counts obtained from the City of Ottawa at the Frank Bender/Innes intersection. The peak hours for the analysis would be the weekday peak AM and PM hours which would coincide with the trips from the residential apartment units of the development.

Element 2.2.3 – Horizon Years

The development would be constructed in two phases, with each phase representing the construction of one apartment building. The total development is expected to be completed and substantially occupied by the year 2024. The TIA study will examine the site at the completion of both phases in 2024, and the impact of the development traffic at five years beyond completion at the year 2029.

MODULE 2.3 – Exemptions Review

The exemptions, which provide possible reductions to the scope of work of the TIA Study, were examined using Table 4: Possible Exemptions which is provided in the City's *Transportation Impact Assessment Guidelines (2017)*. Utilizing the table, the following lists the possible exemptions proposed for the TIA Study report:

MODULE	ELEMENT	EXEMPTION CONSIDERATIONS				
Design Review Component						
4.1 Davidenment Design	4.1.2 Circulation and Access	No - The access and circulation of on-site traffic will be examined.				
4.1 Development Design	4.1.3 New Street Networks	Yes – The development does not propose any new municipal streets.				
4.2 Parking	4.2.1 Parking Supply	No – Parking does not meet the City of Ottawa parking Bylaws.				
4.2 Parking	4.2.2 Spillover Parking	No - Spillover will be examined as parking does not meet bylaws.				
Network Impact Compone	nt					
4.5 Transportation Demand Management	All Elements	No – TDM measures will be examined.				
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Yes – Access to the development will be from an arterial road.				
4.8 Network Concept		Yes - The site would not generate more than 200 person-trips per peak hour in excess of the volume permitted by established zoning.				

STEP 3 - FORECASTING

MODULE 3.1 - Development-generated Travel Demand

Element 3.1.1 – Trip Generation and Mode Shares

The residential development at 3817 - 3843 Innes Road would consist of 110 residential apartments in two free-standing buildings. Both apartment buildings would be 4 storeys in height, with the site having one access onto Innes Road. The site will provide both surface and underground parking.

The number of expected site generated trips utilized the trip statistical data documented in the *2009 TRANS Trip Generation Study* report. The analysis used the Vehicle Trip Generation Rates from Table 6.3 of the TRANS document for ITE Land Use 223, "Midrise apartments (3-10 floors)". The Base Rate was for a Suburban Area (Outside the Greenbelt). The number of site generated trips was proportioned inbound/outbound to the directional distribution shown in Table 3.17 of the document. The trips rates and distribution are shown below in Table 3.1.

TABLE 3.1 VEHICLE TRIP GENERATION RATES

Trip Rate	Peak A	M Hour	Peak PM Hour		
Blended Trip Rate	0.29 T/Dwe	elling Units	0.37 T/Dwelling Units		
Directional Distribution	24% Entering	77% Exiting	62% Entering	39% Exiting	

The site generated trips were determined by the product of the number of dwelling units (110 apartment units) and the trip rates during the peak hour as shown in Table 3.1. The total number of auto-trips is shown in Table 3.2. The person-trips were determined by the number of auto-trips divided by the mode share for the number of vehicle-trips. The mode share used was from Table 3.13 of the 2009 TRANS Trip Generation Study report for an apartment development in a suburban area (outside the greenbelt). The mode share is 0.44 vehicle-trips for the peak AM hour and PM hour. Table 3.2 shows the future peak hour person-trips.

TABLE 3.2 TOTAL PEAK HOUR SITE GENERATED TRIPS

A northwort I linite	AUTO-TRIP O	SENERATION	FUTURE PERSON-TRIPS		
Apartment Units	Peak AM Hr.	Peak PM Hr.	Peak AM Hr.	Peak PM Hr.	
110 Apartment Units	32 veh.	41 veh.	73 per.	93 per.	

The modal split of trips was determined from the City of Ottawa document, 2011 NCR Household Origin-Destination Survey, January 2013, and comments from City of Ottawa staff. The primary travel modal share used the demographic characteristics for the Orleans Area (Page 104) for trips. The residential modal share was based on all observed trips within the Orleans district, including those with an origin or destination beyond that area. Table 3.3 presents the modal share summary which will be used in the TIA study for the residential land use.

TABLE 3.3 MODE SHARE SUMMARY (Person-Trips)

Future Mode Share Targets for the Development					
Travel Mode Rationale					
Auto Driver	55%	Consistent with modal share targets			
Auto Passenger	10%	and proximity to employment areas			
Transit	30%	Consistent with the 2009 TRANS and			
Non-Auto	5%	2011 TRANS-OD reports			

OC Transpo provides Local Routes 131 and 138 and Frequent Route 25 which travel past the site along Innes Road to OC Transpo transit stations. The bus stops are located as far side bus stops at the Frank Bender/Innes intersection which is 132 m east of the site. Cycling lanes are provided along Innes Road which is identified in the City of Ottawa TMP as a Spine Route. Pedestrian sidewalks are provided on both sides of Innes Road and Jeanne d'Arc Boulevard, and along one site of the street for both Viseneau Drive and Frank Bender Street.

The peak hour person-trips per mode were determined by the product of the peak hour future person-trips from Table 3.2 and the future mode share from Table 3.3. The results are shown in Table 3.4 for the residential apartment buildings on Innes Road.

The TIA Guidelines allow for three Trip Reduction Factors. The three trip reductions would consist of trips from existing development on site, pass-by trips, and shared trips within the site between two or more uses. No trip reduction factors were applied for the following reasons:

- 1. The existing buildings on site would generate a negligible number of new trips.
- 2. The residential use would generate all primary trips with no pass-by trips.
- 3. The residential apartments would be a single use with no shared trips between other uses on site.

TABLE 3.4 FUTURE SITE GENERATED PERSON-TRIPS

TRAVEL MODE	DEVELOPMENT GENERATED PERSON-1				
TRAVEL WOOL	PEAK AM HR.	PEAK PM HR.			
Auto Driver	40 per. trips	51 per. trips			
Auto Passenger	7 per. trips	9 per. trips			
Transit	22 per. trips	28 per. trips			
Non-Auto	4 per. trips	5 per. trips			
Total Trips	73 per. trips	93 per. trips			

Element 3.1.2 – Trip Distribution

The distribution of site generated vehicle trips for the proposed apartment development was determined from the background traffic at major intersections in the area which would comprise mainly of trips to/from work. The trip pattern was applied to the surrounding roads assuming the shortest and most convenient route. distribution was also compared to the distribution of trips from other traffic studies in the area. The trip distribution for the residential trips during the weekday peak AM and PM hour is as follows:

To/From the north along Frank Bender Street 10% (to Jeanne d'Arc Blvd.)

To/From the east along Innes Road 20% To/From the west along Innes Road 70%

Element 3.1.3 – Trip Assignment

The distribution of site generated vehicle-trips was determined by applying the directional distribution shown in Table 3.1 to the Auto Driver trips shown in Table 3.4. Table 3.5 presents the distribution of vehicle-trips entering and exiting the site.

TABLE 3.5 PEAK HOUR DISTRIBUTION OF VEHICLE-TRIPS

PEAK HOUR TRIPS	WEEKDAY PEAK AM HR.			WEEKDAY PEAK PM HR.		
BUILDING USE	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT
110 Apartment Units	40	9 (24%)	31 (77%)	51	31 (62%)	20 (39%)

The trip distribution, as discussed in Element 3.1.2, was applied to the peak AM and PM peak hour vehicle-trips shown in Table 3.5. Figure 3.1 presents the peak AM and PM hour residential trips to/from the site.

MODULE 3.2 - Background Network Travel Demands

Element 3.2.1 – Transportation Network Plans

The City of Ottawa Transportation Master Plan (TMP) 2013 was reviewed to identify transit and roadway projects in the vicinity of the development. The proposed changes to the transportation network are identified in this report under Element 2.1.3 - Planned The most significant changes in the network would be the proposed Conditions. extension of Brian Coburn Boulevard from Navan Road to Innes Road, and the construction of the Cumberland Transitway between Blair Road and Frank Kenny Road. These projects would be outside the study area of the TIA, but would reduce traffic along Innes Road past the site.

Element 3.2.2 – Background Growth

The background growth in traffic represents the increase or decrease in traffic due to development outside the study area. The study has examined historical traffic counts along Innes Road past the site. The 2016 counts taken along Innes Road when compared to the 2020 counts, determined that with the exception of the eastbound peak PM hour traffic, the eastbound/westbound peak AM hour and westbound peak PM hour traffic all experienced a reduction in traffic over the four year period.

The trip trend of trips to/from the Ottawa Inner Area for auto driver trips was examined in the National Capital Region Travel Trends document prepared by the IBI Group. The document showed that trips from the Orleans Area increased at an annual compounded rate of 1.47 percent for the peak AM hour between the years of 2005 and 2011.

The study has therefore assumed that the background traffic would experience an annual average compounded increase of 1.0 percent which is consistent with traffic studies for other development in the area. The 1.0 percent annual increase would translate to the following growth factors which were applied to all intersection approaches:

Growth Factor at the Frank Bender/Innes and Jeanne d'Arc/Innes Intersections

```
2020 \rightarrow 2024 = 1.041
                                Completion
```

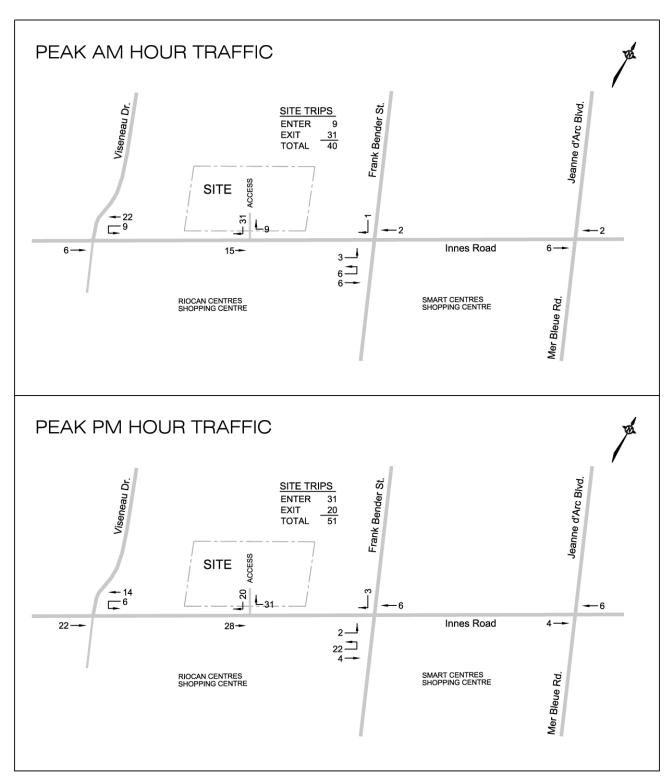
 $2020 \rightarrow 2029 = 1.094$ Completion + 5 Years

Growth Factor at the Viseneau/Innes Intersection

```
2017 \rightarrow 2024 = 1.072
                                Completion
```

Completion + 5 Years $2017 \rightarrow 2029 = 1.127$

FIGURE 3.1
PEAK AM AND PM HOUR SITE GENERATED TRIPS



Element 3.2.3 – Other Developments

The study area comprises of the road segment and intersections along Innes Road between Viseneau Drive and Jeanne d'Arc Boulevard (Mer Bleue Road). Other developments in the area are identified in Element 2.1.3 - Planned Conditions. The TIA studies for the other developments were reviewed and it was determined that the background growth factors would account for the expected new development in the area. The extension of the Brian Coburn Boulevard from Navan Road to Innes Road and the construction of the Cumberland Transitway would result in a reduction of traffic past the site.

Figure 3.2 presents the 2024 peak AM and PM peak hour background vehicle traffic (does not include trips from the proposed apartment development). Figure 3.3 shows the expected 2029 peak hour background traffic which represents five years beyond completion of the development. All background traffic includes the 1.0 percent annual average compounded increase in traffic.

MODULE 3.3 - Demand Rationalization

Innes Road and the signalized intersections within the study area would not exhibit capacity issues with travel demand. The roadway, cycling facilities, and OC Transpo bus routes with direct access to transit stations, would provide sufficient capacity to handle the expected trips from the apartment development. There would be no requirement to reduce travel demand from the development due to insufficient infrastructure capacity.

The total vehicular traffic is the sum of the peak hour site generated trips and the peak hour background traffic. The site generated trips would be the addition of the apartment trips from Figure 3.1, and the background traffic (Figure 3.2 for the year 2024 and Figure 3.3 for the year 2029). Figure 3.4 presents the total 2024 peak hour vehicular traffic and Figure 3.5 the total 2029 peak hour vehicular traffic.

FIGURE 3.2 2024 PEAK AM AND PM HOUR BACKGROUND TRAFFIC

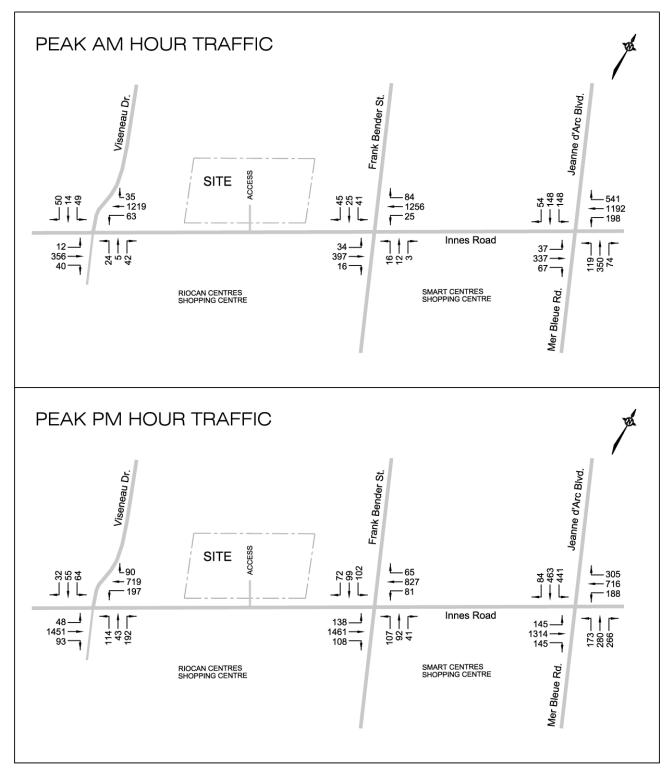


FIGURE 3.3 2029 PEAK AM AND PM HOUR BACKGROUND TRAFFIC

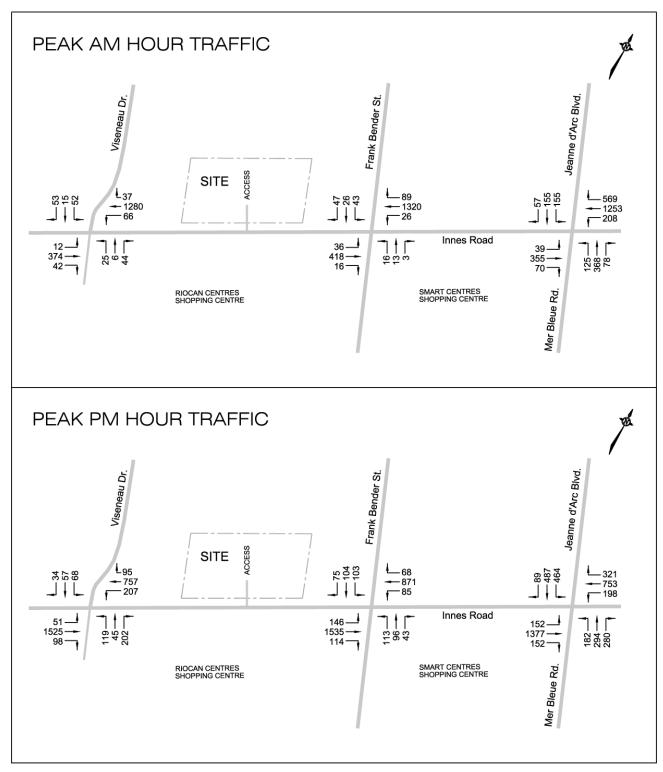


FIGURE 3.4 2024 PEAK AM AND PM HOUR TOTAL TRAFFIC

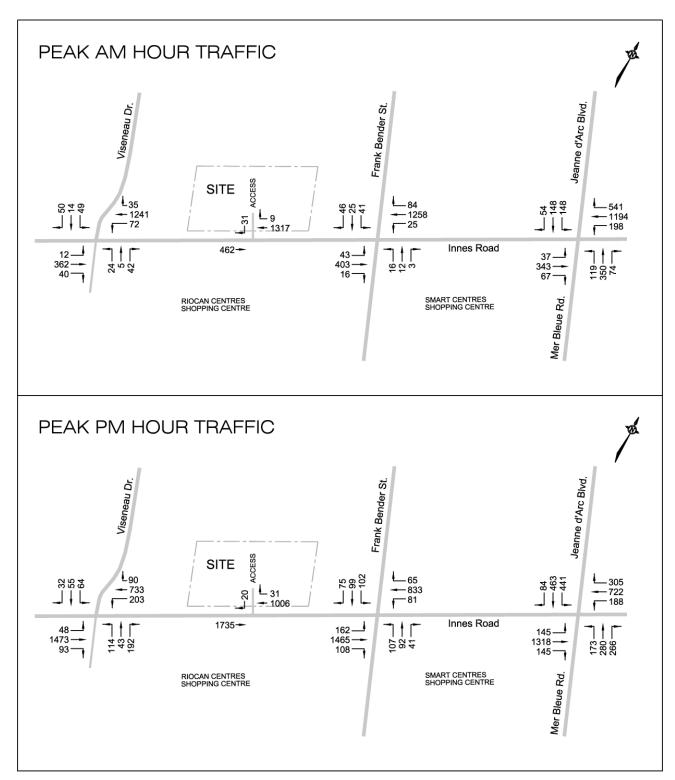
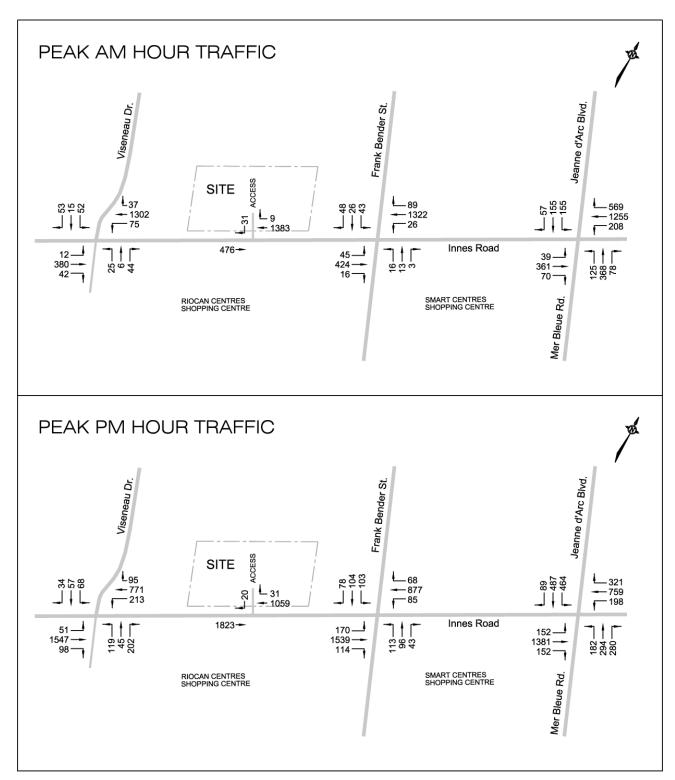


FIGURE 3.5 2029 PEAK AM AND PM HOUR TOTAL TRAFFIC



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STEP 4 - ANALYSIS

MODULE 4.1 – Development Design

Element 4.1.1 – Design for Sustainable Modes

The Site Plan provides on-site parking for residents of the apartment building. There are 44 surface and 84 underground parking spaces for a total of 128 vehicular parking spaces of which 2 will be designated as barrier free. The underground parking garage will have access onto Innes Road from the site Access. The parking provided does not meet the 154 space parking requirements of the City of Ottawa By-laws. An amendment to the By-laws is required.

There is storage space (racks) for 118 bicycles on site. On the surface, bike racks would be located outside the entrance of each of the two buildings for total of 8 storage spaces. There would be storage for 110 bicycles in a secured bicycle storage room in the underground parking garage.

There are pedestrian sidewalks along both sides of Innes Road and the site is in close proximity to a signalized intersection (Frank Bender/Innes) which will allow pedestrians a safe crossing of Innes Road to the retail and commercial on the south side of the road.

The site is served by several OC Transpo transit routes with bus stops within close proximity (< 200 m) to all entrances to the apartment buildings. The eastbound and westbound Innes Road transit routes have bus stops located at the intersection of Frank Bender Street and Innes Road.

The study has utilized the *TDM - Supportive Development Design and Infrastructure Checklist* for a Residential Development which is provided below. The checklist examines the opportunity to implement facilities which are supportive of sustainable modes.

TDM-Supportive Development Design and Infrastructure Checklist:

Residential Developments (multi-family or condominium)

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

	TDM-s	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	The building has surface parking at the side and rear with underground parking
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☐ The building and entrances are adjacent to the street
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	
	1.2	Facilities for walking & cycling	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations (see Official Plan policy 4.3.3)	OC Transpo bus stops are on close proximity to the site
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible (see Official Plan policy 4.3.12)	∑ The main building entrances are close to the public sidewalk

	TDM-s	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)	Paving stones are used to differentiate pedestrian sidewalks from the asphalt driving surface
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)	Sitting areas for tenants are easily accessible at the rear of the apartment buildings
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 onroad 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)	✓ Innes Road across the frontage of the site is designated as a Spine Route with on-street cycling lanes along Innes Road
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☐ The building entrances are close to the public sidewalk
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	All walking routes are along an arterial road with street lighting
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	
	1.3	Amenities for walking & cycling	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	

	TDM-s	supportive design & infrastructure measures: Residential developments	add descriptions, explanations or plan/drawing references
	2.	WALKING & CYCLING: END-OF-TRIP FACILI	TIES
	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)	□ There are secured bicycle storage rooms in the underground parking garage
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas (see Zoning By-law Section 111)	∑ The development will provide 110 bicycle parking spaces in the garage, and 8 surface parking spaces
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored (see Zoning By-law Section 111)	
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	
	2.2	Secure bicycle parking	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers (see Zoning By-law Section 111)	□ N/A
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multifamily residential developments	
	2.3	Bicycle repair station	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	
	3.	TRANSIT	
	3.1	Customer amenities	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	□ N/A
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	□ N/A
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	□ N/A

	TDM-s	supportive design & infrastructure measures: Residential developments	Check if completed & add descriptions, explanations or plan/drawing references
	4.	RIDESHARING	
	4.1	Pick-up & drop-off facilities	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	
	5.	CARSHARING & BIKESHARING	
	5.1	Carshare parking spaces	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses (see Zoning By-law Section 94)	
	5.2	Bikeshare station location	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	
	6.	PARKING	
	6.1	Number of parking spaces	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	∑ The Site Plan provides 128 surface and garage parking spaces. The By-law requires 154 spaces
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	Short-term parking will be accommodated within the surface parking area
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)	□ N/A
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)	

Element 4.1.2 – Circulation and Access

The site will have one right-in/right-out access. The access will have a pavement width of 6.7 m and a clear throat length of 30 m which exceeds the TAC guidelines of 25 m for the minimum clear throat length for a major driveway onto an arterial road for an apartment land use.

The designated fire route connects to Innes Road from the site Access. The fire route is 6.7 m in width providing access to both apartment buildings.

All service vehicles and moving vans will park along the aisle by the rear access to the building to load/unload. The site access to Innes Road will provide an efficient circulation of vehicles through the site.

Garbage containers will be kept in a designated area next to the buildings which would provide easy accessibility to a private garbage contractor.

The existing four entrances (depressed curb) and sidewalk onto Innes Road for the previous uses will be removed under the proposed Site Plan.

Element 4.1.3 – New Street Networks

Exempt as determined in the Scoping Document.

MODULE 4.2 – Parking

Element 4.2.1 – Parking Supply

The on-site parking will comprise of 128 parking spaces for tenants and visitors for the 110 apartment units.

The City of Ottawa By-law requires 154 auto parking spaces for the total development, which would require an amendment to the By-law. The parking required under the City By-law was determined by the following:

```
110 units x 1.2 spaces/unit = 132 spaces Tenant Parking
110 units x 0.2 spaces/unit = 22 spaces Visitor Parking
Total Parking Supplied 154 spaces
```

The site will provide 110 bike storage spaces in the underground parking garage plus 8 surface spaces, with the City By-law requiring 55 spaces determined by the following:

110 units x 0.5 bike spaces/unit = 55 bike spaces

- Stategy Booting (Noviced Ly

Element 4.2.2 – Spillover Parking

The apartment development will provide 128 parking spaces. With the available transit service along Innes Road past the site and the high employment opportunities in the area from the commercial and retail in close proximity to the site, parking is not expected to be a problem.

If spillover parking were to take place, the closest area for on-street parking would be along Drolet Street which is a local street located behind the site and a minimum 285 m walk from the building entrances. Spillover parking is not expected to be an issue.

MODULE 4.3 – Boundary Street Design

The City of Ottawa Complete Streets concept allows for the safe movement of everyone whether they choose to walk, bike, drive, or take public transit. The boundary roads to the site would consist of Innes Road which the site borders the north side of the road. Frank Bender Street and Viseneau Drive are collector streets located east and west of the site.

Innes Road is an arterial road with pedestrian sidewalks along both sides of the road and a posted speed limit of 60 km./h. Frequent transit service routes pass along Innes Road adjacent to the site providing transit service to the Place d'Orléans Rapid Route Station and the Blair Transit Station.

The multi-modal level of service for the Innes Road segment between Jeanne d'Arc Boulevard and Viseneau Drive was determined utilizing the City of Ottawa publication, *Multi-Modal Level of Service (MMLOS) Guidelines*. The following examined the MMLOS for the various modes of travel along the Innes Road street segment.

PEDESTRIAN LEVEL OF SERVICE (PLOS)

There are sidewalks along both sides of Innes Road. The sidewalks are 2.0 m in width with a 1.5 m boulevard. Table 4.1 presents the level of service for the street segment adjacent to the site, with the analysis sheets provided in the Appendix.

TABLE 4.1
PEDESTRIAN LEVEL OF SERVICE (PLOS) – Street Segment

Street	Segment	Level of Service	Analysis
Innes Road	Jeanne d'Arc Blvd. to Viseneau Dr.	E	Exhibit 4.1

BICYCLE LEVEL OF SERVICE (BLOS)

Innes Road along the road segment is designated as a Spine Route in the TMP. A cycling lane of 2.0 m width is provided along both sides of Innes Road. Table 4.2 presents the level of service for the Innes Road segment.

TABLE 4.2
BICYCLE LEVEL OF SERVICE (BLOS) – Street Segment

Street	Segment	Level of Service	Analysis
Innes Road	Jeanne d'Arc Blvd. to Viseneau Dr.	D	Exhibit 4.2

TRANSIT LEVEL OF SERVICE (TLOS)

OC Transpo provides transit service with Local Routes 131 and 138 traveling past the site to the Jeanne d'Arc and Place d'Orléans Rapid Route Stations, and Frequent Route 25 traveling to the Blair Transitway Station. Table 4.3 presents the level of service along the Innes Road segment between Jeanne d'Arc Boulevard and Viseneau Drive. The analysis sheets are provided in the Appendix.

TABLE 4.3
TRANSIT LEVEL OF SERVICE (TLOS) – Street Segment

Street	Segment	Level of Service	Analysis
Innes Road	Jeanne d'Arc Blvd. to Viseneau Dr.	D	Exhibit 4.3

TRUCK LEVEL OF SERVICE (TkLOS)

The truck LOS was determined for the Innes Road segment adjacent to the site. The City of Ottawa has designated Innes Road as a truck route. Table 4.4 presents the truck level of service with the analysis sheets provided in the Appendix.

TABLE 4.4
TRUCK LEVEL OF SERVICE (TkLOS) – Street Segment

Street	Segment	Level of Service	Analysis
Innes Road	Jeanne d'Arc Blvd. to Viseneau Dr.	Α	Exhibit 4.4

Traffic collisions along the Innes Road segment between Jeanne d'Arc Boulevard and Viseneau Drive are shown in Table 2.1 in Element 2.1.2. Over the five year period between January 1, 2014 and December 31, 2018, 52 collisions were recorded along the Innes Road segment. The pattern of collisions did not identify any measures which could be taken to reduce the number of collisions.

The Innes Road segment was analyzed to determine the level of service which was compared to the MMLOS targets for pedestrians, bicycles, transit and trucks. calculated Level of Service (LOS) as shown in Tables 4.1 to 4.4 is compared to the LOS targets for all modes of travel for an Arterial Main Street as designated in the Official Plan - Urban Policy Plan. The LOS targets were obtained from Exhibit 22 of the Multi-Modal Level of Service (MMLOS) Guidelines. Table 4.5 summarizes the MMLOS results for the road segments and targets.

TABLE 4.5 MULTI-MODAL (MMLOS) SUMMARY TABLE - Innes Road Street Segment

SECMENTS	Level of Service (LOS) – 2029				
SEGMENTS	Pedestrian	Bicycle	Transit	Auto	Truck
SEGMENT					
Calculated Innes Road	Е	D	D	-	Α
Target	С	С	D	-	D

Road Segment - Innes Road between Viseneau Drive and Jeanne d'Arc Boulevard

The pedestrian LOS did not meet the target due to the speed and volume of traffic along Innes Road.

The bicycle LOS target was not met because of the speed of traffic along Innes Road.

MODULE 4.4 – Access Intersection Design

Element 4.4.1 – Location and Design of Access

The development proposes one right-in/right-out access onto Innes Road which is located 125 m west of Frank Bender Street and 245 m east of Viseneau Drive. The turning movements at the access are controlled by a proposed extension to the center median along Innes Road past the site. To control the turning movements at the access, the center median was extended 29 m further west. The site Access will have a 6.7 m pavement width with one lane entering and one right turn lane exiting. The Access will have a clear throat length of 30 m.

The Esso Service Station is located adjacent to the east property line of the development. The station has two right-in/right-out accesses onto Innes Road with the first located 70 m east of the site Access and the second 95 m. Along the south side of Innes Road is the Riocan Centre shopping centre which has one access onto Innes Road which is located 30 m east of the site Access with right-in/right-out turning movements controlled by the center median.

Element 4.4.2 – Intersection Control

The site access onto Innes Road would be a right-in/right-out access controlled by a center median. The traffic controls would consist of the installation of a stop sign at the southbound Access exiting lane.

Element 4.4.3 – Intersection Design

The analysis of the Frank Bender/Innes, Viseneau /Innes, Jeanne d'Arc/Innes and Access/Innes intersections were completed for all modes using the Multi-Modal Level of Service (MMLOS) Guidelines and the Highway Capacity Manual (HCM) 2010. Each mode will be addressed in the following sections:

VEHICLE LEVEL OF SERVICE (LOS) – Intersection Capacity Analysis

The analysis of the site access and the Frank Bender/Innes, Viseneau /Innes, and Jeanne d'Arc/Innes intersections will use the Highway Capacity Software, HCS2022 Release 8.1, which uses the capacity analysis procedure as documented in the Highway Capacity Manual (HCM) 7th Edition.

For unsignalized intersections, the level of service of each lane movement and approach is determined as a function of the average control delay of vehicles at the approach. The following relates the level of service of each lane movement with the expected control delay at the approach.

LEVEL OF SERVICE	AVERAGE CONTRO	DL DELAY
Level of Service A Level of Service B Level of Service C Level of Service D Level of Service E Level of Service F	0-10 sec./vehicle >10-15 sec./vehicle >15-25 sec./vehicle >25-35 sec./vehicle >35-50 sec./vehicle >50 sec./vehicle	Little or No Delay Short Traffic Delays Average Traffic Delays Long Traffic Delays Very Long Traffic Delays Extreme Delays – Demand Exceeds Capacity

The expected length of queue at the critical lane movements for an unsignalized twoway stop controlled intersection was determined by the calculation of the 95th percentile queue at the lane approach. The 95th percentile queue length is the calculated 95th greatest queue length out of 100 occurrences at a movement during a 15-minute peak period. The 95th percentile queue length is a function of the capacity of a movement and the total expected traffic, with the calculated value determining the magnitude of the queue by representing the queue length as fractions of vehicles.

For a signalized intersection, the operation or level of service of an intersection is determined from the volume to capacity ratio (v/c) for each lane movement as documented by the City of Ottawa in the *Transportation Impact Assessment Guidelines* (2017). The following relates the level of service with the volume to capacity ratio at each lane movement.

LEVEL OF SERVICE	VOLUME TO CAPACITY RATIO
Level of Service A	0 to 0.60
Level of Service B	0.61 to 0.70
Level of Service C	0.71 to 0.80
Level of Service D	0.81 to 0.90
Level of Service E	0.91 to 1.00
Level of Service F	> 1.00

The results of the analysis are discussed in detail in the following sections:

Access and Innes Road Intersection

The intersection of Access and Innes Road is located 55.5 m west of the east property limit of the site. The access is a "T" intersection which is restricted to right-in/right-out turn movements. The turning movements would be controlled by the center median along Innes Road which will be extended 29 m west of the present position under the Innes Road Development project. A stop sign will be placed at the southbound site exit approach with the following intersection geometry:

Southbound Access 1 Approach	One right turn lane (Stop Sign)
Eastbound Innes Road Approach	Two through lanes
Westbound Innes Road Approach	One through lane
	One shared through/right lane

The operational analysis was conducted for the expected southbound right turn movements during the 2024 and 2029 peak AM and PM hours. The right turn approach was determined to function at a Level of Service (LOS) "C" during the 2024 peak AM hour and at a LOS "B" during the peak PM hour. Table 4.6 summarizes the 2024 operation of the intersection with the analysis sheets provided as Exhibit 4.5 and 4.6.

For the year 2029 traffic, the southbound approach to the intersection would continue to function at a LOS "C" during the peak AM hour and LOS "B" during the peak PM hour as shown in Table 4.6, with the analysis sheets provided as Exhibit 4.7 for the peak AM hour and 4.8 for the peak PM hour. The 95th percentile queue for the 2029 traffic was 0.3 vehicles (1 auto = 7 m) during the peak AM hour and 0.2 vehicles during the peak PM hour at the southbound approach. The site plan provides a 30 m clear throat distance at the site Access.

The construction of the site Access would only trigger the extension of the center median to control turning movements at the access.

Intersection

TABLE 4.6 ACCESS/INNES INTERSECTION - LOS, Control Delay & v/c

INTERSECTION APPROACH		DAY PEAK AN Total (2029				KDAY PEAK PM HOUR 024 Total (2029 Total)	
	LOS	Delay (sec)	V/C	LOS	Delay (sec)	V/C	
SB Right - Access	C (C)	16.0 (16.7)	0.09 (0.10)	<i>B</i> (B)	13.1 (13.4)	0.05 (0.05)	
Total Intersection	C (C)	16.0 (16.7)	0.09 (0.10)	<i>B</i> (B)	13.1 (13.4)	0.05 (0.05)	

Frank Bender Street and Innes Road Intersection

The intersection of Frank Bender Street and Innes Road is located 132 m east of the The intersection is controlled by traffic signals with Innes Road forming the eastbound and westbound approaches and Frank Bender Street the northbound and southbound approaches. The intersection was examined using the traffic signal timing plan which was obtained from the City of Ottawa. The analysis was for the existing 2020 traffic counts (Figure 2.3), for the 2024 and 2029 background traffic which does not include the site generated trips (Figure 3.2 and Figure 3.3), and the expected 2024 and 2029 total traffic including site trips (Figures 3.4 and 3.5).

The analysis determined that all approaches operated at an acceptable level of service for all peak AM periods, and at an acceptable level of service during the peak PM hour for all periods with the exception of the eastbound Innes Road through movement which functioned at a LOS "E". All approaches functioned at the same level of service when comparing the 2029 background to the 2029 total traffic (including site trips). The total intersection operated at a LOS "A" during both the peak AM and PM hours. The additional site generated trips had only a minor impact on the operation of the intersection and did not trigger any required roadwork. Table 4.7 summarizes the operation of the intersection with the analysis sheets provided as Exhibits 4.9 to 4.18.

TABLE 4.7 FRANK BENDER/INNES INTERSECTION – LOS & v/c Ratio

APPROACH	PEAK AM HOUR - 2017 Existing 2024 Background [2029 Background] 2024 Total (2029 Total)		PEAK PM HOUR - 2017 Existing 2024 Background [2029 Background] 2024 Total (2029 Total)		
	LOS	v/c Ratio	LOS	v/c Ratio	
EB Left	A A [A] A (A)	0.177 0.197 [0.230] <i>0.250</i> (0.288)	A A [A] A (A)	0.396 0.425 [0.468] <i>0.502</i> (0.548)	
EB Through	A A [A] A (A)	0.243 0.256 [0.269] <i>0.259</i> (0.273)	D E [E] <i>E</i> (E)	0.869 0.916 [0.963] <i>0.918</i> (0.965)	
EB Right	A A [A] A (A)	0.022 0.024 [0.024] <i>0.024</i> (0.024)	A A [A] A (A)	0.151 0.157 [0.165] <i>0.157</i> (0.165)	
WB Left	A A [A] A (A)	0.133 0.138 [0.144] <i>0.138</i> (0.144)	A A [A] A (A)	0.251 0.328 [0.344] <i>0.328</i> (0.344)	
WB Through	B B [C] <i>B</i> (C)	0.651 0.678 [0.712] <i>0.679</i> (0.713)	A A [A] A (A)	0.395 0.412 [0.433] <i>0.414</i> (0.436)	
WB Right	B B [C] <i>B</i> (C)	0.654 0.683 [0.719] <i>0.684</i> (0.720)	A A [A] A (A)	0.395 0.412 [0.433] <i>0.414</i> (0.436)	
NB Left	A A [A] A (A)	0.042 0.045 [0.046] <i>0.045</i> (0.046)	A A [A] A (A)	0.498 0.533 [0.583] <i>0.541</i> (0.592)	
NB Through	A A [A] A (A)	0.026 0.026 [0.029] <i>0.026</i> (0.029)	A A [A] A (A)	0.229 0.239 [0.250] <i>0.239</i> (0.250)	
NB Right	A A [A] A (A)	0.008 0.008 [0.008] <i>0.008</i> (0.008)	A A [A] A (A)	0.122 0.128 [0.135] <i>0.128</i> (0.135)	
SB Left	A A [A] A (A)	0.096 0.101 [0.106] <i>0.101</i> (0.106)	A A [A] A (A)	0.342 0.376 [0.384] <i>0.376</i> (0.384)	
SB Through	A A [A] A (A)	0.169 0.176 [0.184] <i>0.179</i> (0.187)	A A [A] A (A)	0.470 0.490 [0.512] <i>0.499</i> (0.522)	
Total Intersection	A A [A] <i>A</i> (A)	0.285 0.299 [0.315] <i>0.302</i> (0.318)	A A [A] A (A)	0.461 0.488 [0.514] <i>0.4</i> 93 (0.520)	

Viseneau Drive and Innes Road Intersection

The intersection of Viseneau Drive and Innes Road is located 240 m west of the site. The intersection is controlled by traffic signals with Innes Road forming the eastbound and westbound approaches, Viseneau Drive the southbound approach, and the Riocan Centre access the northbound approach. The traffic signal timing plan obtained from the City of Ottawa was used for all analysis periods.

The analysis determined that all approaches functioned at an acceptable level of service during the peak AM hour for all analysis periods. During the peak PM periods, all movements functioned at an acceptable level of service for all analysis periods with the exception of the eastbound Innes Road through movement which functioned at a LOS "F" for the 2029 traffic. The total intersection operated at a LOS "A" during both the peak AM and PM hours. All approaches functioned at the same level of service when comparing the 2029 background to the 2029 total traffic (including site trips). The additional site generated trips had only a minor impact on the operation of the

interpolitics and did not triumed any required modernia. Table 4.0 suggestions the

intersection and did not trigger any required roadwork. Table 4.8 summarizes the operation of the intersection with the analysis sheets provided as Exhibits 4.19 to 4.28.

TABLE 4.8
VISENEAU/INNES INTERSECTION – LOS & v/c Ratio

APPROACH	PEAK AM HOUR - 2017 Existing 2024 Background [2029 Background] 2024 Total (2029 Total)		PEAK PM HOUR - 2017 Existing 2024 Background [2029 Background] 2024 Total (2029 Total)		
	LOS	v/c Ratio	LOS	v/c Ratio	
EB Left	A A [A] A (A)	0.092 0.073 [0.080] <i>0.075</i> (0.083)	A A [A] A (A)	0.129 0.144 [0.159] <i>0.146</i> (0.161)	
EB Through	A A [A] A (A)	0.285 0.255 [0.268] <i>0.259</i> (0.272)	E E [F] <i>E</i> (F)	0.973 0.969 [1.019] <i>0.984</i> (1.033)	
EB Right	A A [A] A (A)	0.061 0.066 [0.070] <i>0.066</i> (0.070)	A A [A] A (A)	0.135 0.144 [0.152] <i>0.144</i> (0.152)	
WB Left	A A [A] A (A)	0.327 0.349 [0.366] <i>0.399</i> (0.415)	C C [D] C (D)	0.728 0.779 [0.819] <i>0.803</i> (0.843)	
WB Through	C B [C] C (C)	0.800 0.689 [0.723] <i>0.701</i> (0.735)	A A [A] A (A)	0.376 0.402 [0.424] <i>0.409</i> (0.431)	
WB Right	C B [C] C (C)	0.803 0.690 [0.725] <i>0.702</i> (0.737)	A A [A] A (A)	0.377 0.402 [0.424] <i>0.409</i> (0.431)	
NB Left	A A [A] A (A)	0.055 0.061 [0.065] <i>0.061</i> (0.065)	A A [A] A (A)	0.367 0.408 [0.438] <i>0.408</i> (0.438)	
NB Through	A A [A] A (A)	0.009 0.009 [0.011] <i>0.009</i> (0.011)	A A [A] A (A)	0.089 0.095 [0.100] <i>0.095</i> (0.100)	
NB Right	A A [A] A (A)	0.087 0.094 [0.098] <i>0.094</i> (0.098)	A A [A] A (A)	0.484 0.520 [0.547] <i>0.520</i> (0.547)	
SB Lt/Thru/Rt	A A [A] A (A)	0.218 0.232 [0.247] <i>0.232</i> (0.247)	A A [A] A (A)	0.334 0.357 [0.377] <i>0.357</i> (0.377)	
Total Intersection	A A [A] A (A)	0.356 0.317 [0.334] 0.323 (0.341)	A A [A] A (A)	0.477 0.495 [0.522] 0.502 (0.529)	

Jeanne d'Arc Boulevard and Innes Road Intersection

The intersection of Jeanne d'Arc Boulevard and Innes Road is located 730 m east of the site. The intersection is controlled by traffic signals with Innes Road forming the eastbound and westbound approaches, Mer Bleue Road the northbound approach, and Jeanne d'Arc Boulevard the southbound approach. The intersection was analyzed for all periods using the traffic signal timing plan obtained from the City of Ottawa.

The operational analysis determined that during the peak AM hour, all movements functioned at an acceptable level of service with the exception of the westbound left turn movement which functioned at a LOS "F" for all 2020, 2024 and 2029 traffic scenarios. During the peak PM hour, most approaches functioned at a lower level of service due to the high volume of traffic. The total 2024 and 2029 level of service of the intersection was a LOS "A" during the peak AM hour and a LOS "D" during the peak PM hour.

The analysis determined that the level of service for the 2029 background and 2029 total traffic (including site trips) were the same for all peak AM and PM hour movements resulting in the development having only a minor impact on the operation of the intersection and would not trigger any required roadwork. Table 4.9 summarizes the

operation of the intersection with the analysis sheets provided as Exhibits 4.29 to 4.38.

TABLE 4.9 JEANNE D'ARC/INNES INTERSECTION – LOS & v/c Ratio

APPROACH	PEAK AM HOUR - 2020 Existing 2024 Background [2029 Background] 2024 Total (2029 Total)		PEAK PM HOUR - 2020 Existing 2024 Background [2029 Background] 2024 Total (2029 Total)		
	LOS	v/c Ratio	LOS	v/c Ratio	
EB Left	A A [A] A (A)	0.379 0.389 [0.410] <i>0.389</i> (0.410)	E F [F] <i>F</i> (F)	0.994 1.037 [1.087] <i>1.037</i> (1.087)	
EB Through	A A [A] A (A)	0.255 0.263 [0.277] <i>0.267</i> (0.281)	E F [F] <i>F</i> (F)	0.992 1.019 [1.068] <i>1.022</i> (1.071)	
WB Left	F F [F] <i>F</i> (F)	1.936 2.017 [2.119] <i>2.017</i> (2.119)	F F [F] <i>F</i> (F)	1.264 1.312 [1.382] <i>1.312</i> (1.382)	
WB Through	D D [E] <i>D</i> (E)	0.873 0.907 [0.953] <i>0.908</i> (0.954)	A A [A] A (A)	0.552 0.559 [0.588] <i>0.564</i> (0.593)	
NB Left	A A [A] A (A)	0.439 0.458 [0.482] <i>0.4</i> 58 (0.482)	A A [A] A (A)	0.404 0.421 [0.443] <i>0.421</i> (0.443)	
NB Through	A A [B] <i>A</i> (B)	0.559 0.582 [0.613] <i>0.582</i> (0.613)	D D [E] <i>D</i> (E)	0.838 0.872 [0.916] <i>0.872</i> (0.916)	
NB Right	A A [B] <i>A</i> (B)	0.570 0.594 [0.624] <i>0.594</i> (0.624)	E F [F] <i>F</i> (F)	0.963 1.001 [1.053] <i>1.001</i> (1.053)	
SB Left	A A [A] A (A)	0.547 0.570 [0.597] <i>0.570</i> (0.597)	F F [F] <i>F</i> (F)	1.025 1.066 [1.121] <i>1.066</i> (1.121)	
SB Through	A A [A] A (A)	0.259 0.270 [0.284] <i>0.270</i> (0.284)	D D [E] <i>D</i> (E)	0.835 0.868 [0.915] <i>0.868</i> (0.915)	
SB Right	A A [A] A (A)	0.276 0.287 [0.301] <i>0.287</i> (0.301)	D D [E] <i>D</i> (E)	0.844 0.877 [0.923] <i>0.877</i> (0.923)	
Total Intersection	A A [A] <i>A</i> (A)	0.538 0.558 [0.587] 0.560 (0.589)	C D [D] <i>D</i> (D)	0.807 0.832 [0.874] 0.834 (0.876)	

PEDESTRIAN LEVEL OF SERVICE (PLOS)

The pedestrian level of service was determined utilizing the City of Ottawa publication, Multi-Modal Level of Service (MMLOS) Guidelines. There are sidewalks along both sides of Innes Road. The sidewalks are approximately 2.0 m in width and are adjacent to the curb. Table 4.10 presents the level of service for the three existing intersections, with the analysis sheets provided in the Appendix.

TABLE 4.10
PEDESTRIAN LEVEL OF SERVICE (PLOS) – Intersection

Intersection	Level of Service	Analysis
Frank Bender and Innes Road	F	Exhibit 4.39
Viseneau Drive and Innes Road	F	Exhibit 4.40
Jeanne d'Arc Boulevard and Innes Road	F	Exhibit 4.41

BICYCLE LEVEL OF SERVICE (BLOS)

The bicycle level of service (BLOS) was determined for the three intersections along lnnes Road. There are cycling lanes along lnnes Road. Cycling lanes also exist along Mer Bleue Road, and Jeanne d'Arc Boulevard for a distance of approximately 100 m. Table 4.11 presents the level of service for the three intersections with the analysis sheets provided in the Appendix.

TABLE 4.11
BICYCLE LEVEL OF SERVICE (BLOS) – Intersection

Intersection	Level of Service	Analysis
Frank Bender and Innes Road	F	Exhibit 4.42
Viseneau Drive and Innes Road	F	Exhibit 4.43
Jeanne d'Arc Boulevard and Innes Road	F	Exhibit 4.44

TRANSIT LEVEL OF SERVICE (TLOS)

OC Transpo provides transit service along Innes Road past the site with Local Routes 131 and 138 and frequent service Route 25. The TMP has identified a transit signal priority project along Innes Road between Jeanne d'Arc Boulevard and the Blackburn Hamlet Bypass which would improve transit service. Table 4.12 presents the level of service at the three intersections which was calculated from the evaluation tables provided in the City of Ottawa publication, *Multi-Modal Level of Service (MMLOS) Guidelines*. The TLOS is based on the Control Delay at each intersection which was determined from the 2029 peak PM hour intersection analyses sheets for the eastbound Innes Road through movement. The analysis sheets are provided in the Appendix.

TABLE 4.12
TRANSIT LEVEL OF SERVICE (TLOS) – Intersection

Intersection	Level of Service	Analysis
Frank Bender and Innes Road	F	Exhibit 4.45
Viseneau Drive and Innes Road	F	Exhibit 4.46
Jeanne d'Arc Boulevard and Innes Road	F	Exhibit 4.47

TRUCK LEVEL OF SERVICE (TkLOS)

Innes Road, Frank Bender Street, Jeanne d'Arc Boulevard and Mer Bleue Road are all designated as truck routes. Viseneau Drive north of Innes Road prohibits trucks, but the access to the Riocan Centre south of Innes Road allows truck travel. The level of service for the intersections is presented in Table 4.13 with the analysis sheets provided in the Appendix.

TABLE 4.13
TRUCK LEVEL OF SERVICE (TkLOS) – Intersection

Intersection	Level of Service	Analysis
Frank Bender and Innes Road	В	Exhibit 4.48
Viseneau Drive (Riocan Centre) and Innes Road	В	Exhibit 4.49
Jeanne d'Arc Boulevard and Innes Road	В	Exhibit 4.50

MODULE 4.5 – Transportation Demand Management

Element 4.5.1 – Context for TDM

The site is located along a major arterial road which functions at an acceptable level of service. The surrounding land uses consist mainly of commercial and retail uses which would experience only a minor impact by the trips generated by the development.

The area is well service by transit and pedestrian sidewalks and cycling network. The number of residential trips would be low due to the number of units and available multimodal travel options. With Innes Road designated as a four lane arterial road, higher than expected site trips would not have a detrimental impact on the surrounding land uses.

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Element 4.5.2 – Need and Opportunity

The residential component of the development would not require a program to promote various mode shares as the available transit routes and pedestrian/cycling facilities to the downtown core and transit stations would promote the use of alternative modes of travel. With the site located in close proximity to retail and other amenities, some tenants may not own a vehicle.

Element 4.5.3 – TDM Program

TDM measures could be implemented to encourage travel by sustainable modes which would be applied to the apartment development. The TDM measures, which would reduce the number of vehicle trips, would consist of the encouragement of transit and bicycle use. The programs would mainly be that of providing information in the form of transit schedules/routes, and maps showing designated bike routes.

The study has utilized the TDM Measures Checklist for a Residential Development which examines the implementation of facilities that are supportive of sustainable modes. The following provides the checklist which examines the Site Plan and transportation components for the proposed residential apartment development.

TDM Measures Checklist:

Residential Developments (multi-family, condominium or subdivision)

Legend The measure is generally feasible and effective, and in most cases would benefit the development and its users The measure could maximize support for users of sustainable modes, and optimize development performance The measure is one of the most dependably effective tools to encourage the use of sustainable modes

	TDM	measures: Residential developments	Check if proposed & add descriptions
	1.	TDM PROGRAM MANAGEMENT	
	1.1	Program coordinator	
BASIC	★ 1.1.1	Designate an internal coordinator, or contract with an external coordinator	
	1.2	Travel surveys	
BETTER	1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	
	2.	WALKING AND CYCLING	
	2.1	Information on walking/cycling routes & des	tinations
BASIC	2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances (multi-family, condominium)	Area maps for walking/cycling can be displayed on an information board in the lobby
	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	3.	TRANSIT		
	3	3.1	Transit information		
BASIC	3	3.1.1	Display relevant transit schedules and route maps at entrances (multi-family, condominium)	\boxtimes	Transit schedules can be displayed on an information board in the lobby
BETTER	3	3.1.2	Provide real-time arrival information display at entrances (multi-family, condominium)		
	3	3.2	Transit fare incentives		
BASIC	★ 3	3.2.1	Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit		
BETTER	3	3.2.2	Offer at least one year of free monthly transit passes on residence purchase/move-in		The site is located in an area well served by transit
	3	3.3	Enhanced public transit service		
BETTER	★ 3	3.3.1	Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels (subdivision)		
	3	3.4	Private transit service		
BETTER	(3)	3.4.1	Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)		
	4	4.	CARSHARING & BIKESHARING		
	4	4.1	Bikeshare stations & memberships		
BETTER	4	1.1.1	Contract with provider to install on-site bikeshare station (<i>multi-family</i>)		
BETTER	4	1.1.2	Provide residents with bikeshare memberships, either free or subsidized <i>(multi-family)</i>		
	4	1.2	Carshare vehicles & memberships		
BETTER	4	1.2.1	Contract with provider to install on-site carshare vehicles and promote their use by residents		
BETTER	4	1.2.2	Provide residents with carshare memberships, either free or subsidized		
	_ 5	5.	PARKING		
	5	5.1	Priced parking		
BASIC	* 5	5.1.1	Unbundle parking cost from purchase price (condominium)		N/A
BASIC	* 5	5.1.2	Unbundle parking cost from monthly rent (multi-family)		Unbundling parking from apartment rent will be considered

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Check if proposed & TDM measures: Residential developments add descriptions 6. **TDM MARKETING & COMMUNICATIONS** 6.1 Multimodal travel information 6.1.1 Provide a multimodal travel option information A multimodal travel information package to new residents package can be included with the rental agreement 6.2 Personalized trip planning BETTER ★ 6.2.1 Offer personalized trip planning to new residents

MODULE 4.6 – Neighbourhood Traffic Management

Element 4.6.1 – Adjacent Neighbourhoods

Exempt as determined in the Scoping Document.

MODULE 4.7 - Transit

Element 4.7.1 – Route Capacity

OC Transpo provides Local Routes 131 and 138 and Frequent Route 25 along Innes Road past the site. The transit routes provide service locally to retail centers, and to transit stations and the downtown area. The low number of transit person trips would produce a minor impact on the capacity of transit in the area and would not trigger the need for additional transit capacity.

Element 4.7.2 – Transit Priority

There are currently no transit priority measures along Innes Road past the site. The site is well serviced by transit with short wait times between buses during peak hours. There would be no need to impost transit priority measures to improve transit service.

MODULE 4.8 – Review of Network Concept

Exempt as determined in the Scoping Document.

MODULE 4.9 – Intersection Design

Element 4.9.1 – Intersection Control

The three intersections examined in the study (Frank Bender/Innes, Viseneau/Innes, Jeanne d'Arc/Innes) are all controlled by traffic signals and function at an acceptable level of service. No further intersection control measures are required.

The Charles Comment (Newscare)

Element 4.9.2 – Intersection Design

The proposed access was analyzed to determine the operation from expected site generated trips, plus the three existing intersections along Innes Road in the study area. The performance analysis for all modes was determined in Element 4.4.3 Intersection Design. A summary of the MMLOS analysis is provided in Table 4.14 for the expected 2029 traffic at the three existing intersections.

The calculated Level of Service (LOS) as shown in Tables 4.6 to 4.13 is compared to the LOS targets for all modes of travel. The LOS targets were obtained from Exhibit 22 of the *Multi-Modal Level of Service (MMLOS) Guidelines*. Table 4.14 summarizes the MMLOS results for the three intersections and targets.

TABLE 4.14
MULTI-MODAL (MMLOS) INTERSECTION SUMMARY TABLE - Intersection

INTERSECTION	Level of Service (LOS) – 2029						
INTERSECTION	Pedestrian	Bicycle Transit		Auto	Truck		
CALCULATED							
Frank Bender/Innes	Е	F	Е	Α	В		
Viseneau/Innes	F	F	Е	Α	В		
Jeanne d'Arc/Innes	Е	F	E	D	В		
TARGET	С	С	D	D	D		

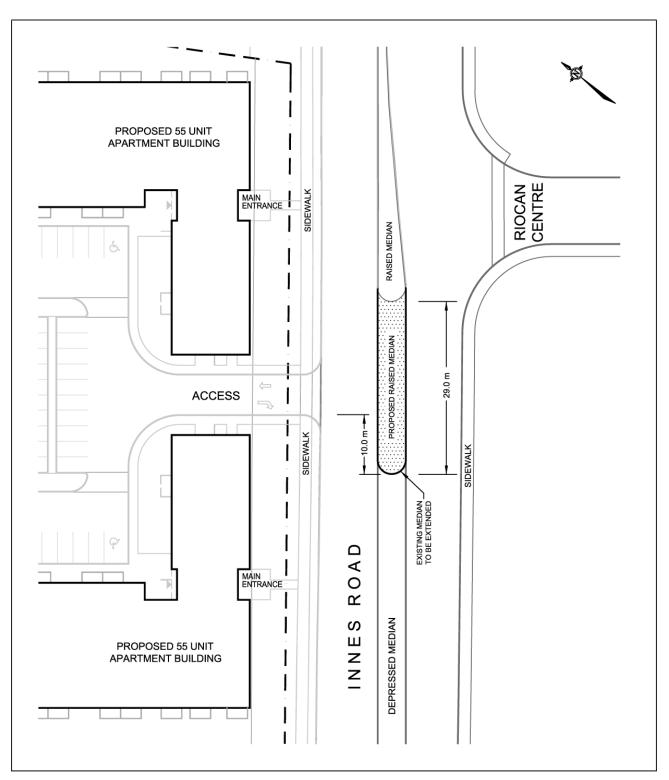
<u>Access</u>

The site Access will be restricted to right-in/right-out turning movements. The turning movements will be controlled by the center median along Innes Road. The existing median will require an extension of 29 m in order to control turning movements at the Access. Figure 4.1 shows a functional design of the median extension along Innes Road. Following the roadway modifications, the site access will operate at an acceptable level of service.

Frank Bender/Innes, Viseneau/Innes and Jeanne d'Arc/Innes Intersections

Auto LOS - Utilizing the expected 2029 peak AM and PM hour traffic, the Frank Bender/Innes, Viseneau/Innes and Jeanne d'Arc/Innes Intersections all operated at an acceptable level of service which would meet the MMLOS targets.

FIGURE 4.1 INNES ROAD MEDIAN EXTENSION



Pedestrian PLOS - For all three intersections the PLOS did not meet the target due to the number of lanes crossed and the length of the traffic signal cycle.

Bicycle BLOS - For all three intersections the BLOS did not meet the target due to the number of lanes crossed in making a left turn movement, and the travel speed of vehicles along Innes Road.

Transit TLOS - For all three intersections the TLOS did not meet the target due to the length of the traffic signal cycle.

SUMMARY

A Site Plan has been prepared for the development of a 0.727 ha parcel of land at 3817-3843 Innes Road. The site is located approximately 132 m west of Frank Bender Street and would consist of the construction of two apartment buildings.

The site would provide 110 rental apartments in the two 4 storey buildings. The site would have one access onto Innes Road, which would be restricted to right-in/right-out turning movements controlled by a center median along Innes Road.

The Transportation Impact Assessment report has established a study area which includes the Frank Bender/Innes, Viseneau/Innes and Jeanne d'Arc/Innes intersections. The operational analysis was completed for the weekday peak AM and PM hours at the completion of the development in 2024, and at five years beyond completion at the year 2029. The TIA analysis has examined all modes of transportation along the Innes Road segment and the intersections within the study area. The transportation analysis has determined the following:

- 1. The proposed Innes Road Development would be a residential apartment development providing 110 rental units. The total development is expected to generate 9 vehicle trips arriving and 31 vehicle trips departing during the weekday peak AM hour, and 31 vehicle trips arriving and 20 vehicle trips departing during the weekday peak PM hour.
- 2. The development would provide a total of 128 parking spaces including 2 barrier free spaces, of which 44 will be surface spaces and 84 spaces in an underground parking garage.
- 3. The Site Plan provides bicycle racks in a bike room in the parking garage for 110 bikes, with 8 spaces in bike racks located outside the entrance to each building for a total of 118 spaces for bicycles.
- 4. The site will have one access onto Innes Road. The access will be restricted to right-in/right-out turning movements controlled by a center median along Innes Road. The existing median must be extended 29 m further west to control the turning movements at the access as shown in Figure 4.1.

- The MMLOS analysis of the Innes Road segment between Viseneau Drive and Jeanne d'Arc Boulevard determined that the pedestrian PLOS and bicycle BLOS targets were not met. The low level of service of the PLOS and BLOS was attributed to the volume and speed of traffic along Innes Road. The site would have a minor impact on the level of service of the road segment.
- 6. The analysis of the Frank Bender/Innes, Viseneau/Innes and Jeanne d'Arc/Innes intersections determined that for the 2029 Auto LOS, the eastbound through movement at the Viseneau/Innes functioned at a LOS "F" during the peak PM hour, and all of the approaches at the Jeanne d'Arc/Innes intersection functioned at a LOS "E" of "F" during the peak PM hour due to the volume of traffic.
 - For the Frank Bender/Innes, Viseneau/Innes and Jeanne d'Arc/Innes intersections, the Pedestrian PLOS functioned at a LOS "E" or "F" due the number of travel lanes and signal cycle length, the Bicycle BLOS at a LOS "F" due to the number of travel lanes and traffic speed, and the Transit TLOS at a LOS "E" due to the length of the traffic signal cycle. There are no recommended modifications to the intersection resulting from the development of the site.
- 7. The intersections were examined using the existing traffic counts, the traffic at the year 2024 following the completion of the development, and at the year 2029 which represents five years beyond completion. The analysis was also performed for the 2024 and 2029 background traffic. The analysis determined that for the 2029 total traffic including site trips, all intersections operated at the same level of service as the 2029 background traffic which did not include the site generated trips. The conclusion is that the trips from the site would result in a minor impact and not change the level of service. The development at 3817 -3943 Innes Road would require the extension of the center median to control turning movements at the site access, but would not trigger the requirement for roadway or intersection modifications at the Frank Bender/Innes, Viseneau/Innes and Jeanne d'Arc/Innes intersections.

Prepared by:

David J. Halpenny, M. Eng., P. Eng.

David & Holamy



APPENDIX

CERTIFICATION FORM

SCREENING FORM

BUS ROUTE MAPS

TRAFFIC COUNTS

MMLOS ROAD SEGMENT AND INTERSECTION ANALYSIS

EXHIBIT 1.1 CERTIFICATION FORM

Transportation Impact Assessment Guidelines



Certification Form for TIA Study PM

TIA Plan Reports

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

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

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

CERTIFICATION

X	the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
X	I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
X	I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
X	I am either a licensed¹ or registered² professional in good standing, whose field of expertise is either transportation engineering or transportation planning.

City Of Ottawa Infrastructure Services and Community Sustainability Planning and Growth Management 110 Laurier Avenue West, 4th fl. Ottawa, ON K1P 1J1

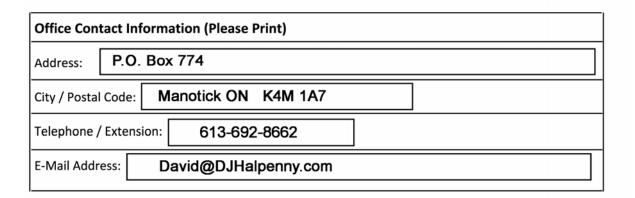
Tel.: 613-580-2424 Fax: 613-560-6006

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

Transportation Impact Assessment Guidelines

Dated at	Ottaw	а	this	2nd	day of	September	, 20 21
	((City)					
Name :	David	J. Halpenny					
Professio	nal title:	President	, D. J.	Halpe	nny & Ass	ociates Ltd.	1

Signature of individual certifier that s/he meets the above criteria



Stamp

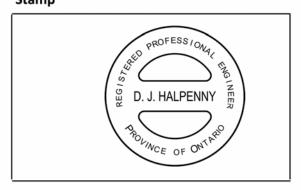


EXHIBIT 1.2 SCREENING FORM

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	3817-3843 Innes Road, Ottawa
Description of Location	Residential Development
Land Use Classification	"R4Z" Zoning – Residential Fourth Density
Development Size (units)	110 Units total in three Apartment Buildings
Development Size (m ²)	7,268 m ² Lot Area
Number of Accesses and Locations	One access onto Innes Road
Phase of Development	Two Phases of development
Buildout Year	2024

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

2. Trip Generation Trigger

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

Land Use Type	Minimum Development Size
Apartments	110 units

	Yes	No
110 Apartment units > 90 Minimum Development Size	Х	

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

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

3. Location Triggers

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

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

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

4. Safety Triggers

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

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

5. Summary

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

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

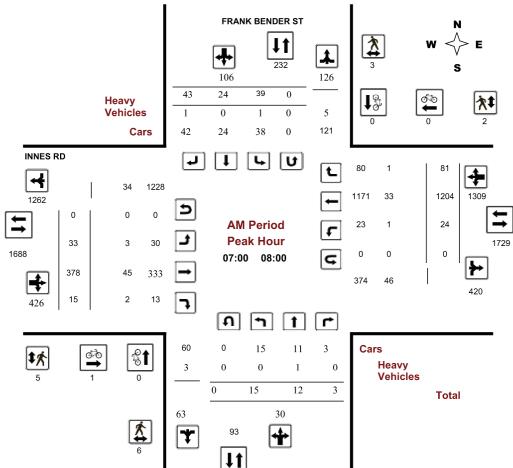
EXHIBIT 2.1 2020 PEAK AM HOUR TRAFFIC COUNTS - FRANK BENDER/INNES INTERSECTION



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram
FRANK BENDER ST @ INNES RD

Survey Date:Thursday, January 09, 2020WO No:39283Start Time:07:00Device:Miovision



Comments 5469224 - THU JAN 09, 2020 - 8HRS - LORETTA

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2020 PEAK PM HOUR TRAFFIC COUNTS - FRANK BENDER/INNES INTERSECTION

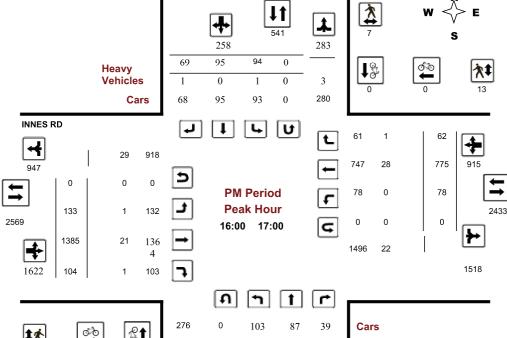


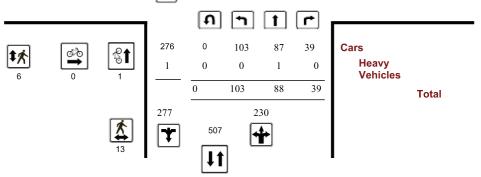
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

FRANK BENDER ST @ INNES RD

Survey Date: Thursday, January 09, 2020 WO No: 39283 Start Time: 07:00 Device: Miovision FRANK BENDER ST





Comments 5469224 - THU JAN 09, 2020 - 8HRS - LORETTA

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EXHIBIT 2.2 2017 PEAK AM HOUR TRAFFIC COUNTS - VISENEAU/INNES INTERSECTION



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

INNES RD @ VISENEAU DR WO No: Survey Date: Wednesday, January 25, 2017 Start Time: 07:00 Device: Miovision VISENEAU DR Heavy Vehicles Cars INNES RD ţ U t_ **AM Period Peak Hour** 07:15 08:15 + |ภ||๖| Cars Heavy Vehicles Total

Comments

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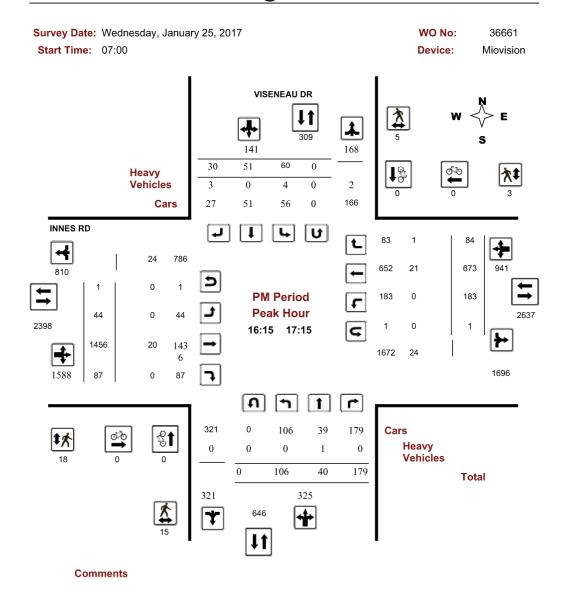
2017 PEAK PM HOUR TRAFFIC COUNTS - VISENEAU/INNES INTERSECTION



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

INNES RD @ VISENEAU DR



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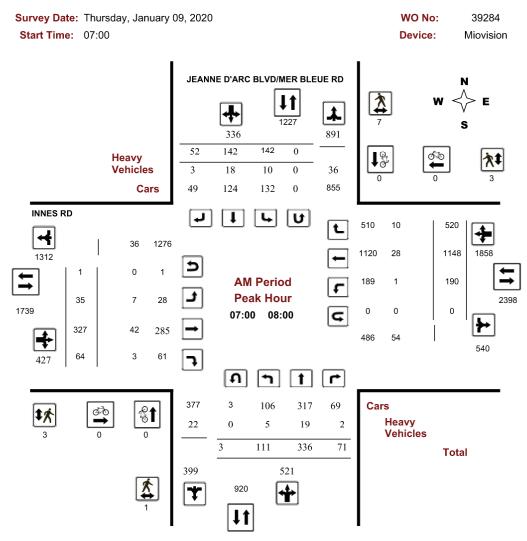
EXHIBIT 2.3 2020 PEAK AM HOUR TRAFFIC COUNTS - JEANNE D'ARC/INNES INTERSECTION



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

INNES RD @ JEANNE D'ARC BLVD/MER BLEUE RD



Comments 5469225 - THU JAN 09, 2020 - 8HRS - LORETTA

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2020 PEAK PM HOUR TRAFFIC COUNTS - JEANNE D'ARC/INNES INTERSECTION



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

INNES RD @ JEANNE D'ARC BLVD/MER BLEUE RD

Comments 5469225 - THU JAN 09, 2020 - 8HRS - LORETTA

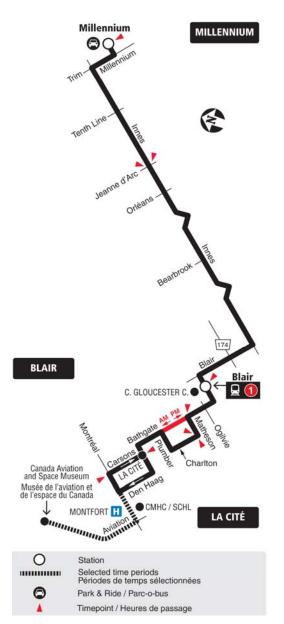
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EXHIBIT 2.4 OC TRANSPO BUS ROUTE - Route 25 and Route 131



7 days a week / 7 jours par semaine

All day service Service toute la journée





7 days a week / 7 jours par semaine All day service Service toute la journée





OC TRANSPO BUS ROUTE - Route 138 and Route 231



7 days a week / 7 jours par semaine



Monday to Friday / Lundi au vendredi

Peak periods only Périodes de pointe seulement







SEGMENT SCORE **E**

EXHIBIT 4.1 INNES ROAD - PLOS SEGMENT EVALUATION

STREET Innes Road FROM Viseneau Drive

TO Jeanne d'Arc Boulevard

YEAR 2029

DIRECTION Eastbound-Westbound

MMLOS MODE **PLOS**

	Boulevard Width (m)	Traffic Volume		Segment PLOS				
Sidewalk Width (m)			Presence of On- street Parking	Operating Speed (km/h)				
()	(,,,,	(AADT)	Succer arking	≤30	>30 or 50	>50 or 60	>60 1	
		≤ 3000	N/A	А	А	А	В	
	> 2	> 3000	Yes	А	В	В	N/A	
		> 3000	No	А	В	С	D	
		≤ 3000	N/A	А	А	А	В	
2.0 or more	0.5 to 2	> 3000	Yes	А	В	С	N/A	
		> 3000	No	A	С	D	Е	
		≤ 3000	NA	А	В	С	D	
	0	2000	Yes	В	В	D	N/A	
		> 3000	No	В	С	E	F	
	> 2	≤ 3000	N/A	А	А	А	В	
		> 3000	Yes	А	В	С	N/A	
			No	А	С	D	Е	
	0.5 to 2	≤ 3000	N/A	А	В	В	D	
1.8		> 3000	Yes	А	С	С	N/A	
			No	В	С	E	Е	
		≤ 3000	N/A	А	В	С	D	
	0	2000	Yes	В	С	D	N/A	
		> 3000	No	С	D	F	F	
		≤ 3000	N/A	С	С	С	С	
	> 2	2000	Yes	С	С	D	N/A	
		> 3000	No	С	D	Е	Е	
1.5		≤ 3000	N/A	С	С	С	D	
	0.5 to 2	2000	Yes	С	С	D	N/A	
		> 3000	No	D	E	E	E	
	0	N	/A	D	E	F ²	F ²	
<1.5		N/A		F ³	F ³	F ³	F ³	
No sidewalk		N/A		C ⁴	F ³	F ³	F ³	

SEGMENT SCORE **D**

EXHIBIT 4.2 INNES ROAD - BLOS SEGMENT EVALUATION

STREET Innes Road FROM Viseneay Drive

TO Jeanne d'Arc Boulevard

YEAR 2029

DIRECTION Eastbound-Westbound

MMLOS MODE **BLOS**

Type of Bikeway		LOS
	e tracks, protected bike lanes and multi-use paths). Physical separation refers to, but is not	Α
	ollards and parking lanes (adjacent to the bike lane along the travelled way i.e. not curbside).	
Bike Lanes Not Adjacent Parking L	ane - Select Worst Scoring Criteria	
	1 travel lane in each direction	A
No. of Travel Lanes	2 travel lanes in each direction separated by a raised median	В
to. or mater bands	2 travel lanes in each direction without a separating median	С
	More than 2-travel lanes in each direction	D
	≥ 1.8 m wide bkk late include marker biffer httpayee g to light	A
Bike Lane Width	≥1.5 m to <1.8 m wide bike lane (includes marked buffer and paved gutter width)	В
	≥1.2 m to <1.5 m wide bike lane (includes marked buffer and paved gutter width)	С
	≤ 50 km/h operating speed	Α
Operating Speed	60 km/h operating speed	С
	≥ 70 km/h operating speed	Е
Bike lane blockage	Rare	Α
commercial areas)	Frequent	С
	arking Lane - Select Worst Scoring Criteria	
In ad Travel I area	1 travel lane in each direction	Α
No. of Travel Lanes	2 or more travel lanes in each direction	С
	4.5 m wide bike lane plus parking lane (includes marked buffer and paved gutter width)	Α
Nice Lane and Desire Lane Maria	4.25 m wide bike lane plus parking lane (includes marked buffer and paved gutter width)	В
Bike Lane and Parking Lane Width	≤ 4.0 m wide bike lane plus parking lane (includes marked buffer and paved gutter width)	С
	40 km/h operating speed	A
Operating Speed	50 km/h operating speed	B
	60 km/h operating speed	D
	≥ 70 km/h operating speed	
Bike lane blockage	Rare	A
commercial areas)	Frequent	С
Mixed Traffic		
	2 travel lanes; ≤ 40 km/h; no marked centerline or classified as residential	A
	2 to 3 travel lanes; ≤ 40 km/h	В
	2 travel lanes; 50 km/h; no marked centertine or classified as residential. 2 to 3 travel and 50 km/h	В
No. of Travel Lanes and Operating		D
Speed	4 to 5 travel lanes; ≤ 40 km/h	D
	4 to 5 travel lanes; ≥ 50 km/h	E
	6 or more travel lanes; ≤ 40 km/h	Е
	≥ 60 km/h	F
Unsignalized Crossing along Route	e: no median refuge	
	3 or less lanes being crossed; ≤ 40 km/h	Α
	4 to 5 lanes being crossed; ≤ 40 km/h	В
	3 or less lanes being crossed; 50 km/h	В
	4 to 5 lanes being crossed; 50 km/h	С
No. of Travel Lanes on Side Street		С
and Operating Speed	3 or less lange teins organised; 60 pp PLICABLE	D
and operating operation	6 or more lanes being crossed; ≤ 40 km/h	Е
	3 or less lanes being crossed; ≥ 65 km/h	Е
	6 or more lanes being crossed; ≥ 50 km/h	F
	4 to 5 lanes being crossed; ≥ 65 km/h	F
Insignalized Crossing along Poute	e: with median refuge (> 1.8 m wide)	
noting money	5 or less lanes being crossed; ≤ 40 km/h	A
	3 or less lanes being crossed; 50 km/h	A
	6 or more lanes being crossed; < 40 km/h	В
	4 to E lange being amound: E0 km/h	В
	3 or less lanes of index seed of the PITCABLE	В
No. of Travel Lanes on Side Street	6 or more lanes being crossed; 50 km/h	C
and Operating Speed	4 to 5 lanes being crossed; 60 km/h	C
	3 or less lanes being crossed; ≥ 65 km/h	D
	6 or more lanes being crossed; 60 km/h	E
	4 to 5 lanes being crossed; ≥ 65 km/h 6 or more lanes being crossed; ≥ 65 km/h	E F

SEGMENT SCORE **D**

EXHIBIT 4.3 INNES ROAD - TLOS SEGMENT EVALUATION

STREET Innes Road FROM Viseneau Drive

TO Jeanne d'Arc Boulevard

YEAR 2029

Eastbound-Westbound DIRECTION

MMLOS MODE **TLOS**

Facility Type		Level/exposu friction	ire to conge on and incid	Quantitative	LOS	
		Congestion	Friction	Incident Potential	Measurement	LUS
Segregated ROW		No	No	No	N/A	А
Due lene	No/limited parking/driveway friction	No	Low	Low	$C_f \leq 60$	В
Bus lane	Frequent parking/driveway friction	No	Medium	Medium	$C_f > 60$	С
	Limited parking/driveway friction	Yes	Low	Medium	$VtVp \ge 0.8$	D
Mixed Traffic	Moderate parking/driveway friction	Yes	Medium	Medium	$VtVp \leq 0.6$	Е
	Frequent parking/driveway friction	Yes	High	High	Vt/Vp < 0.4	F

Notes:

Cf, Conflict Factor = = (Number of driveways x crossing volume) / 1 km

Vt/Vp is the ratio of average transit travel speed to posted speed limit

EXHIBIT 4.4 INNES ROAD - TKLOS SEGMENT EVALUATION

STREET

Innes Road

FROM

Viseneau Drive

TO

Jeanne d'Arc Boulevard

SEGMENT SCORE

YEAR

2029

DIRECTION

Eastbound-Westbound

MMLOS MODE

TkLOS

Exhibit 20 - TkLOS Segment Evaluation Table

Curb Lane Width (m)	Only two travel lanes (one in each direction)	More than two travel lanes
>3.7	В	А
≤3.5	С	A
≤3.3	D	С
≤3.2	E	D
≤3	F	E

EXHIBIT 4.5 2024 PEAK AM HOUR ANALYSIS (Total Traffic) - Access/Innes

			1C2 I	wo-	vvay	Stop	-Cor	ntrol	керс	ort								
General Information							Site	Inforr	natio	n								
Analyst	\top						Inters	ection			Acces	ss/Innes						
Agency/Co.							Jurisd	liction			City c	of Ottawa	a					
Date Performed	12/8/	2020					East/\	Nest Str	eet		Innes	Road						
Analysis Year	2024						North	/South :	Street		Acces	ss						
Time Analyzed	Peak	AM Hou	r				Peak	Hour Fa	ctor		0.92							
Intersection Orientation	East-\	West					Analy	sis Time	Period (hrs)	0.25							
Project Description	Innes	Road D	evelopm	ent														
Lanes																		
Vahiala Valuus sa saad 5 d				1) 4 + Y → Y ∩	ै। चै Majo	후 Ƴ '	የ ነጻ	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4										
Vehicle Volumes and Ad	justme											oound Southbound						
Approach	U		ound				bound				bound		U	_		l 5		
Movement	10	L 1	T 2	R 3	U 4U	L 4	T 5	R 6	U	L 7	T 8	R 9	0	10	T 11	R		
Priority Number of Lanes	0	0	2	0	0	0	2	0		0	0	0		0	0	12		
Configuration	+ "	0	T	-	"	-	T	TR		0	0	-		"	0	R		
Volume (veh/h)	+		462				1317	9								31		
	+		402				1517	9										
Percent Heavy Vehicles (%)	-															0		
Proportion Time Blocked	+																	
Percent Grade (%)	-											0 No.						
Right Turn Channelized	+								No									
Median Type Storage				Undi	vided													
Critical and Follow-up H	eadwa	ys																
Base Critical Headway (sec)																6.9		
Critical Headway (sec)																6.90		
Base Follow-Up Headway (sec)																3.3		
Follow-Up Headway (sec)																3.30		
Delay, Queue Length, an	d Leve	l of S	ervice															
Flow Rate, v (veh/h)	T															34		
Capacity, c (veh/h)																361		
v/c Ratio																0.09		
95% Queue Length, Q ₉₅ (veh)																0.3		
Control Delay (s/veh)																16.0		
Level of Service (LOS)																С		
Approach Delay (s/veh)														10	6.0			

EXHIBIT 4.6 2024 PEAK PM HOUR ANALYSIS (Total Traffic) - Access/Innes

		ŀ	HCS T	wo-	Way	Stop	-Cor	ntrol	Repo	ort							
General Information							Site	Inforr	natio	n							
Analyst	Т						Inters	ection			Acces	ss/Innes					
Agency/Co.							Jurisc	liction			City o	of Ottaw	a				
Date Performed	12/8/	2020					East/	West Str	eet		Innes	Road					
Analysis Year	2024						North	/South :	Street		Acces	SS					
Time Analyzed	Peak	PM Hou	ır				Peak	Hour Fa	ctor		0.92						
Intersection Orientation	East-\	Vest					Analy	sis Time	Period ((hrs)	0.25						
Project Description	Innes	Road D	evelopm	ent													
Lanes																	
Vohicle Volumes and Ad	iustma-	nto		1) 1 4 4 7 ↑ ₹ C	The Major	수 Y or Street: Ea	ተ ፫ ast-West	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0									
Vehicle Volumes and Ad	justme T		d			\A/+				NI		Southbound					
Approach Movement	U	L	oound T	R	U	L	bound T	R	U	L	bound	R	U	L	T	R	
Priority	10	1	2	3	4U	4	5	6	0	7	8	9	0	10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0		0	0	0		0	0	1	
Configuration	+ -		T			-	T	TR							-	R	
Volume (veh/h)			1735				1006	31								20	
Percent Heavy Vehicles (%)			1733				1000	31								0	
Proportion Time Blocked																-	
Percent Grade (%)															0		
Right Turn Channelized	+										No						
Median Type Storage	+			Undi	vided												
Critical and Follow-up H	o a dwa	ve		Orian	riaca												
-	T T	y														L c o	
Base Critical Headway (sec)																6.9	
Critical Headway (sec)	+															6.90	
Base Follow-Up Headway (sec)																3.3	
Follow-Up Headway (sec)																3.30	
Delay, Queue Length, an	d Leve	l of S	ervice														
Flow Rate, v (veh/h)																22	
Capacity, c (veh/h)																468	
v/c Ratio																0.05	
95% Queue Length, Q ₉₅ (veh)																0.1	
Control Delay (s/veh)																13.1	
Level of Service (LOS)																В	
Approach Delay (s/veh)														13	3.1		
Approach LOS															В		

EXHIBIT 4.7 2029 PEAK AM HOUR ANALYSIS (Total Traffic) - Access/Innes

		ŀ	ICS 1	wo-	Way	Stop	-Cor	ntrol	Repo	ort									
General Information							Site	Inforr	natio	n									
Analyst	Т						Inters	ection			Acces	Access/Innes							
Agency/Co.							Jurisd	iction			City	of Ottaw	a						
Date Performed	12/8/	2020					East/\	Nest Str	eet		Innes	Road							
Analysis Year	2029						North	/South :	Street		Acces	SS							
Time Analyzed	Peak	AM Hou	ır				Peak	Hour Fac	ctor		0.92								
Intersection Orientation	East-\	West					Analy	sis Time	Period ((hrs)	0.25								
Project Description	Innes	Road D	evelopm	ent															
Lanes																			
Vehicle Volumes and Ad	iustm s	unts		5) 4 4 4 + 7 + 7		수 Y or Street: Ea		4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4											
	Justme					147		ound Northbound Southbound											
Approach	U		ound T	R	U	L	bound T	R	U	L	T	R	U	L	T	R			
Movement	10	L 1		3	4U	4	_	6	0	7	8	9	0	10	11	-			
Priority Number of Lanes	0	0	2	0	0	0	5	0		0	0	0		0	0	12			
	+ "	0	T	0	0	0	T	TR		0	"	0		"	0	R			
Configuration			476					9								31			
Volume (veh/h)	-		4/6				1383	9								-			
Percent Heavy Vehicles (%)	-															0			
Proportion Time Blocked	+																		
Percent Grade (%)											0 No								
Right Turn Channelized	+													ľ	10				
Median Type Storage				Undi	vided														
Critical and Follow-up H	eadwa	ys																	
Base Critical Headway (sec)	_															6.9			
Critical Headway (sec)	_															6.90			
Base Follow-Up Headway (sec)																3.3			
Follow-Up Headway (sec)																3.30			
Delay, Queue Length, an	d Leve	l of S	ervice																
Flow Rate, v (veh/h)	Т															34			
Capacity, c (veh/h)																342			
v/c Ratio																0.10			
95% Queue Length, Q ₉₅ (veh)																0.3			
Control Delay (s/veh)																16.7			
Level of Service (LOS)																С			
A														10	6.7				
Approach Delay (s/veh)														-					

EXHIBIT 4.8 2029 PEAK PM HOUR ANALYSIS (Total Traffic) - Access/Innes

		ŀ	HCS T	wo-	Way	Stop	-Cor	ntrol	Repo	ort							
General Information							Site	Inforr	natio	n							
Analyst	Т						Inters	ection			Acces	ss/Innes					
Agency/Co.							Jurisc	liction			City o	of Ottaw	a				
Date Performed	12/8/	2020					East/	West Str	eet		Innes	Road					
Analysis Year	2029						North	/South :	Street		Acces	SS					
Time Analyzed	Peak	PM Hou	ır				Peak	Hour Fa	ctor		0.92						
Intersection Orientation	East-\	West					Analy	sis Time	Period ((hrs)	0.25						
Project Description	Innes	Road D	evelopm	ent													
Lanes																	
Vehicle Volumes and Ad	iustma	unts		A 7 4 4 7 ↑ ↑ ↑	기 박 Maje	후 Y or Street: Ea	ተ ድ ድ	4 → 4 → 4 → 4 → 4 → 4 → 4 → 4 → 4 → 4 →									
	Justme		oound			Most	bound			North		Southbound					
Approach Movement	U	L	T	R	U	L	Т	R	U	L	bound	R	U	L	Т	R	
Priority	10	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0		0	0	0		0	0	1	
Configuration	+ -		T			-	T	TR		-						R	
Volume (veh/h)	+		1823				1059	31								20	
Percent Heavy Vehicles (%)	+		1023				1000	J 1								0	
Proportion Time Blocked	+															Ť	
Percent Grade (%)	+														0		
Right Turn Channelized											No						
Median Type Storage				Undi	vided									<u> </u>			
Critical and Follow-up H	eadwa	vs															
Base Critical Headway (sec)	T		Т		Г		_	1	1	1	_	Г	Г	Т	Т	6.9	
Critical Headway (sec)	+															6.90	
Base Follow-Up Headway (sec)	+															3.3	
Follow-Up Headway (sec)	+															3.30	
	4	L . C C	•													3.30	
Delay, Queue Length, an	d Leve	of S	ervice						1								
Flow Rate, v (veh/h)	-															22	
Capacity, c (veh/h)																449	
v/c Ratio																0.05	
95% Queue Length, Q ₉₅ (veh)																0.2	
Control Delay (s/veh)	-															13.4	
Level of Service (LOS)																В	
Approach Delay (s/veh)	1														3.4		
Approach LOS	a All Righ						C Version							nd: 5/2/2	В		

EXHIBIT 4.9 2020 PEAK AM HOUR ANALYSIS (Existing Traffic) - Frank Bender/Innes

		HCS	Sigr	nalize	d Inte	ersect	ion R	esult	ts Sun	nmary	,				
Company Inform	4:								Intersec	tian luf	4i			4 7 4 1	k U
General Inform	nation							\rightarrow					- 1	41	
Agency						1.0.0.0		-	Duration		0.250		-		
Analyst				-		12/8/2		-	Area Typ	е	Other				
Jurisdiction		City of Ottawa		Time F			AM Hou		PHF		0.92		*		-
Urban Street		Innes Road		Analys	sis Year				Analysis	Period	1> 7:0	00	7		,
Intersection		Frank Bender/Innes	3	File Na	ame	723_2	2020_ex	_AM.x	us					111	
Project Descrip	tion	Innes Road Develo	pment										Б	4144	11 11
Demand Inform	nation				EB			WE	3		NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R		Т	R
Demand (v), v				33	378	15	24	120		15	12	3	39	24	43
0: 11.6					-		. II:								
Signal Informa Cycle, s	110.0	Reference Phase	2	-	}		1245						7		本
					"	<u>=</u>	["]	7				1	Y 2	3	4
Offset, s	0	Reference Point	End	Green		55.4	29.2	0.0	0.0	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow		3.7	3.0	0.0	0.0	0.0					V
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	2.9	3.8	0.0	0.0	0.0	-	5	6	7	8
Timer Results	_			EBI		EBT	WB	L	WBT	NBI		NBT	SBI		SBT
Assigned Phas	e					2	1		6			8			4
Case Number						5.3	2.0		4.0			5.0			6.0
Phase Duration	. S			-	\neg	62.0	12.0	-	74.0	-	-	36.0		-	36.0
Change Period	, -	c). s				6.6	4.7	-	6.6			6.8			6.8
	Allow Headway (<i>MAH</i>), s				_	0.0	3.1	_	0.0	_		3.2			3.2
	• • • • • • • • • • • • • • • • • • • •					0.0	3.5	-	0.0	-		6.9	_	_	5.9
	ue Clearance Time (g_s), s				-	0.0	0.0	_	0.0	_	_	0.2	_	_	0.3
	en Extension Time (g_{e}), s					0.0	1.00	_	0.0	_	_	1.00	_	_	1.00
Phase Call Pro Max Out Proba				-	-		0.29	_		-	-	0.00		-	0.00
Movement Gro		sults			EB			WB			NB			SB	
Approach Move	ement			L	T	R	ᆫ	T	R	L	T	R	L	T	R
Assigned Move	ment			5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow I	Rate (v), veh/h		36	411	16	26	706	691	16	13	3	42	73	
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	377	1647	1425	1661	1744	1699	1346	1800	1495	1394	1570	
Queue Service	Time (g s), s		7.4	7.6	0.6	1.5	28.3	28.5	1.0	0.6	0.2	2.5	3.9	
Cycle Queue C	learanc	e Time (<i>g c</i>), s		23.9	7.6	0.6	1.5	28.3	28.5	4.9	0.6	0.2	3.1	3.9	
Green Ratio (g	/C)			0.51	0.51	0.51	0.12	0.62	0.62	0.27	0.27	0.27	0.27	0.27	
Capacity (c), v	/eh/h			202	1689	731	196	1084	1056	388	494	411	441	431	
Volume-to-Cap	acity Ra	atio (X)		0.177	0.243	0.022	0.133	0.651	0.654	0.042	0.026	0.008	0.096	0.169	
		t/ln (50 th percentile)												
Back of Queue	(Q), v	eh/ln (50 th percent	le)	0.8	2.8	0.2	0.6	11.0	10.8	0.3	0.3	0.1	0.8	1.5	
Queue Storage	Ratio (RQ) (50 th percent	tile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay				24.7	14.9	13.2	43.5	13.5	_	32.2	29.2	29.0	30.3	30.4	
Incremental De		,		0.0	0.3	0.1	0.1	3.0	3.2	0.0	0.0	0.0	0.0	0.1	
	ial Queue Delay (d ₃), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	ntrol Delay (d), s/veh			26.6	15.3	13.3	43.6	16.5	16.4	32.2	29.2	29.0	30.3	30.4	
	rel of Service (LOS)			С	В	В	D	В	В	С	С	С	С	С	
Approach Delay	roach Delay, s/veh / LOS			16.1		В	17.0)	В	30.7	7	С	30.4	1	С
Intersection De	lay, s/ve	eh / LOS				17	7.7						В		
Multimodal Re	sulte				EB			WB			NB			SB	
Pedestrian LOS		/LOS		2.09	_	В	1.88	_	В	2.29		В	2.45	_	В
Bicycle LOS So				0.87	-	A	1.66	-	В	0.54	-	A	0.68	-	A
DICYCIE LOS SC	OIG / L	50		0.67			1.00	,	D	0.52		$\overline{}$	0.00	,	$\overline{}$

EXHIBIT 4.10 2020 PEAK PM HOUR ANALYSIS (Existing Traffic) - Frank Bender/Innes

		HCS	Sigr	nalize	d Inte	rsect	ion R	esult	s Sun	nmary	·				
General Inform	nation								ntersec	tion Inf	orm oti	n n		4 74+1	ьų
	iation	1											- 1	44	
Agency				A l	:- D-4-	40/0/0	000	-	Duration,		0.250		7		
Analyst		200		-		12/8/2		-	Area Typ	е	Other				
Jurisdiction		City of Ottawa		Time F			PM Hou		PHF		0.92				-
Urban Street		Innes Road		-	is Year				Analysis	Period	1> 7:0	00	_ F		
Intersection		Frank Bender/Innes	3	File Na	ame	723_2	020_ex	_PM.x	us					htr	
Project Descrip	tion	Innes Road Develo	pment										1	4144	11 11
Demand Inform	nation				EB		_	WE	3	_	NB			SB	_
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Demand (v), v				133	1385	-	62	775	_	103	88	39	94	95	69
					1000	101									
Signal Informa	tion				2		25						_		\mathbf{L}
Cycle, s	130.0	Reference Phase	2		2	†# `	F-5/1	2			×		Θ .		кТя
Offset, s	0	Reference Point	End	Green	15.3	67.4	29.2	0.0	0.0	0.0		1	X 2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Yellow		3.7	3.0	0.0	0.0	0.0			←		кŤз
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	2.9	3.8	0.0	0.0	0.0		5	6	7	Y
Timer Results				EBL	-	EBT	WB	L	WBT	NBI	_	NBT	SBI	-	SBT
Assigned Phase	e					2	1	_	6			8			4
Case Number						5.3	2.0		4.0			5.0			6.0
Phase Duration	i, S					74.0	20.0		94.0			36.0			36.0
Change Period	, (Y+R	c), S				6.6	4.7		6.6			6.8			6.8
Max Allow Head	Allow Headway (MAH), s					0.0	3.1		0.0			3.3			3.3
Queue Clearan	ue Clearance Time (g $_s$), s						6.6					25.5			16.7
Green Extension	ue Clearance Time (g_s), s en Extension Time (g_e), s					0.0	0.0		0.0			0.5			1.0
Phase Call Prol	bability						1.00)				1.00			1.00
Max Out Proba	bility						0.00)				0.79			0.01
Movement Gro	un Res	eulte			EB		_	WB			NB			SB	
Approach Move		Juito		L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				5	2	12	1	6	16	3	8	18	7	4	14
		1) voh/h		145	1505	113	67	472	_	112	96	42	102	178	14
Adjusted Flow F		, .					_		455		_		_		
Queue Service		ow Rate (s), veh/h/l	11	589 20.1	1647 51.9	1425 5.3	1661 4.6	1758 15.3	1692	1224	1800 5.6	1493 2.9	1285 9.1	1634 12.2	
Cycle Queue C		<u> </u>		20.1	51.9	5.3	4.6	15.3	15.3	23.5	5.6	2.9	14.7	12.2	
Green Ratio (g		o fille (ge), s		0.53	0.53	0.53	0.16	0.68	0.68	0.23	0.23	0.23	0.23	0.23	
Capacity (c), v				365	1733	750	268	1195	1151	225	418	347	298	380	
Volume-to-Capa		etio (X)		0.396	0.869	0.151	0.251	0.395	_	0.498	0.229	0.122	0.342	0.470	
		t/In (50 th percentile)	0.000	5.503	0.101	0.201	0.000	0.000	0.400	0.223	0.122	0.042	0.470	
		eh/ln (50 th percenti		3.0	20.9	1.8	1.9	5.8	5.6	3.5	2.5	1.1	2.9	5.0	
		RQ) (50 th percent		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay		, , , ,	-,	19.3	26.9	15.9	47.6	9.3	9.1	53.1	40.5	39.4	46.4	43.0	
				3.2	6.2	0.4	0.2	1.0	1.0	0.6	0.1	0.1	0.3	0.3	
	remental Delay (d 2), s/veh ial Queue Delay (d 3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	ntrol Delay (d), s/veh				33.1	16.3	47.8	10.3	10.1	53.8	40.6	39.5	46.7	43.3	
	el of Service (LOS)			22.5 C	С	В	D	В	В	D	D	D	D	D	
	proach Delay, s/veh / LOS					С	12.7	7	В	46.3	3	D	44.6	3	D
Intersection De							7.9						С		
Multimodal Re					EB			WB			NB			SB	
Pedestrian LOS				2.10	-	В	1.88	-	В	2.30	-	В	2.46	-	В
Bicycle LOS So	ore / LO	OS		1.94		В	1.3		Α	0.90)	Α	0.95	5	Α

EXHIBIT 4.11 2024 PEAK AM HOUR ANALYSIS (Background Traffic) - Frank Bender

		HCS	S Sigr	nalize	d Inte	ersect	ion R	esult	ts Sun	ımary	,				
General Inform	nation								Intersec	tion Inf	ormatio	on	2	11	Ja L
Agency									Duration,	h	0.250	1	7	* *	
Analyst				Analys	sis Date	12/8/2	2020		Area Typ	е	Other		<u></u>		
Jurisdiction		City of Ottawa		Time F	Period	Peak	AM Hou	r	PHF		0.92		*		÷_
Urban Street		Innes Road		Analys	sis Year	2024			Analysis	Period	1> 7:0	00			
Intersection		Frank Bender/Innes	3	File Na	ame	723_2	024_ba	k_AM.	xus					htr	
Project Descript	tion	Innes Road Develo	pment -	Backgr	ound T	raffic							T	1144	11
Demand Inform	nation				EB			WE	,		NB			SB	
					_	Т в			_		_	T B		_	T D
Approach Move				L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), v	en/n		-	34	397	16	25	125	6 84	16	12	3	41	25	45
Signal Informa	tion							$\overline{}$	$\overline{}$	$\overline{}$					I
Cycle, s	110.0	Reference Phase	2	1	2	∃ <u>.</u>	54	a l			×		♦ 』		4
Offset, s	0	Reference Point	End	Crasi	7.2	55.4	20.0	0.0	0.0	0.0		1	2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Green Yellow		55.4 3.7	3.0	0.0	0.0	0.0			←		κŤx
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	2.9	3.8	0.0	0.0	0.0		5	6	7	Y
Timer Results				EBI	-	EBT	WB	L	WBT	NBI	L	NBT	SBI	L	SBT
Assigned Phase	е					2	1		6			8			4
Case Number						5.3	2.0		4.0			5.0			6.0
Phase Duration	, S					62.0	12.0		74.0			36.0			36.0
Change Period,	nge Period, (Y+R c), s Allow Headway (MAH), s					6.6	4.7		6.6			6.8			6.8
Max Allow Head	Allow Headway (<i>MAH</i>), s					0.0	3.1		0.0			3.2			3.2
Queue Clearan	ue Clearance Time (g $_{s}$), s						3.6					7.2			6.1
Green Extensio	eue Clearance Time (g_s), s en Extension Time (g_e), s					0.0	0.0		0.0			0.3			0.3
Phase Call Prob	bability						1.00)				1.00			1.00
Max Out Probal	bility						0.33	3				0.00			0.00
Movement Gro	up Res	sults		_	EB			WB			NB		_	SB	
Approach Move				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow F		v) veh/h		37	432	17	27	735	721	17	13	3	45	76	
		ow Rate (s), veh/h/l	n	356	1647	1425	1661	1744	_	1342	1800	1495	1394	1570	
Queue Service		. ,,	.,	8.4	8.1	0.7	1.6	30.3	_	1.1	0.6	0.2	2.7	4.1	
Cycle Queue C				27.0	8.1	0.7	1.6	30.3		5.2	0.6	0.2	3.2	4.1	
Green Ratio (g		(g ·), o		0.51	0.51	0.51	0.12	0.62		0.27	0.27	0.27	0.27	0.27	
Capacity (c), v				188	1689	731	196	1084	_	384	494	411	441	431	
Volume-to-Capa		atio (X)		0.197	0.256	0.024	0.138	0.678	_	0.045	0.026	0.008	0.101	0.176	
		t/ln (50 th percentile	:)	51.101		5.521	3.700	2.3.0	2.555	5.5.5	5.525	5.500	51.101	55	
		eh/ln (50 th percenti		0.8	3.0	0.2	0.7	11.8	11.6	0.4	0.3	0.1	0.9	1.5	
		RQ) (50 th percent		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay ((d 1), s	/veh		26.5	15.0	13.2	43.5	13.9	13.7	32.4	29.2	29.0	30.3	30.4	
Incremental De	lay (d 2	2), s/veh		2.3	0.4	0.1	0.1	3.4	3.6	0.0	0.0	0.0	0.0	0.1	
Initial Queue De	ial Queue Delay (d 3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (ntrol Delay (d), s/veh				15.4	13.3	43.6	17.3	17.2	32.4	29.2	29.0	30.4	30.5	
Level of Service	vel of Service (LOS)				В	В	D	В	В	С	С	С	С	С	
Approach Delay	proach Delay, s/veh / LOS				3	В	17.7	7	В	30.8	3	С	30.4	4	С
	section Delay, s/veh / LOS					18	3.3						В		
Multimodal Re					EB			WB			NB			SB	
Pedestrian LOS				2.09	-	В	1.88	-	В	2.29	$\overline{}$	В	2.45	-	В
Bicycle LOS Sc	ore / LO	OS		0.89	9	Α	1.71		В	0.54	1	Α	0.69	9	Α

EXHIBIT 4.12 2024 PEAK PM HOUR ANALYSIS (Background Traffic) - Frank Bender

		HCS	Sigr	nalize	d Inte	ersect	ion R	esult	ts Sun	nmary					
General Inform	ation								Intersec	tion Inf				4741	h L
	iation	I						\rightarrow					- 1	44	
Agency				A l	:- D-4	40/0/0	1000	\rightarrow	Duration,		0.250				
Analyst				-		12/8/2		$\overline{}$	Area Typ	е	Other				
Jurisdiction		City of Ottawa		Time F			PM Hou		PHF		0.92				7
Urban Street		Innes Road		Analys					Analysis	Period	1> 7:0	00			į.
Intersection		Frank Bender/Innes	3	File Na	ame	723_2	024_ba	ık_PM.	xus					htr	
Project Descript	tion	Innes Road Develo	pment -	Backgr	ound T	raffic	_	_	_	_	_	_	1	4144	fr (*
Demand Inforn	nation				EB			WE	3		NB			SB	
Approach Move	ment			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Demand (v), v				138	1461	-	81	827		107	92	41	102	99	72
Signal Informa					5							_			人
Cycle, s	130.0	Reference Phase	2		"	1	1 50	7					€ 2	3	4
Offset, s	0	Reference Point	End	Green	15.3	67.4	29.2	0.0	0.0	0.0			<u> </u>		
Uncoordinated	No	Simult. Gap E/W	On	Yellow		3.7	3.0	0.0	0.0	0.0			—		N/Z
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	2.9	3.8	0.0	0.0	0.0		5	6	7	8
Time Beaute				EDI	_	EDT	14/0		MOT	NIDI		NDT	CDI	_	CDT
Timer Results Assigned Phase	2			EBL	-	EBT 2	WB 1	L	WBT 6	NBI	-	NBT 8	SBI	-	SBT 4
Case Number	J			-		5.3	2.0	_	4.0			5.0	-		6.0
Phase Duration	9			_	_	74.0	20.0	-	94.0			36.0	_	_	36.0
Change Period,		c). S				6.6	4.7	-	6.6			6.8			6.8
	Allow Headway (<i>MAH</i>), s			_		0.0	3.1	_	0.0			3.3	_	_	3.3
	• • • • • • • • • • • • • • • • • • • •			_	_	0.0	8.1	_	0.0	_		26.7	_	_	17.9
	ue Clearance Time (g_s), s			_	-	0.0	0.1	-	0.0	_		0.4	_	_	1.0
	en Extension Time ($g \circ$), s se Call Probability				_	0.0	1.00	-	0.0	-		1.00	_	_	1.00
Max Out Probal					_		0.00	-			-	1.00		-	0.01
Movement Gro		sults			EB			WB			NB			SB	
Approach Move	ment			L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move	ment			5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow F	Rate (v), veh/h		150	1588	117	88	492	477	116	100	45	111	186	
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	566	1647	1425	1661	1758	1705	1216	1800	1493	1280	1634	
Queue Service	Time (g	g s), S		22.2	57.4	5.5	6.1	16.2	16.2	11.9	5.9	3.1	10.0	12.8	
Cycle Queue C		e Time (g_c), s		22.2	57.4	5.5	6.1	16.2	16.2	24.7	5.9	3.1	15.9	12.8	
Green Ratio (g.				0.53	0.53	0.53	0.16	0.68	0.68	0.23	0.23	0.23	0.23	0.23	
Capacity (c), v				353	1733	750	268	1195	_	218	418	347	295	380	
Volume-to-Capa				0.425	0.916	0.157	0.328	0.412	0.412	0.533	0.239	0.128	0.376	0.490	
		t/ln (50 th percentile					_								
		eh/ln (50 th percent		3.2	23.7	1.9	2.5	6.1	6.0	3.7	2.6	1.1	3.2	5.2	
		RQ) (50 th percent	tile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (19.9 3.7	28.2	15.9	48.3	9.4	9.2	53.9	40.6	39.5	47.0	43.2	
	remental Delay (d 2), s/veh				9.2	0.4	0.3	0.0	0.0	0.0	0.1	0.1	0.3	0.4	
	al Queue Delay (d 3), s/veh				37.3	16.3	0.0 48.5	10.5	10.3	55.3	40.7	39.5	47.3	43.6	
	el of Service (LOS)				37.3 D	16.3	_	10.5 B	10.3 B	55.3 E	40.7 D	39.5 D	47.3 D	43.6 D	
	, ,			C 34.9	_	C B	D 13.6		В	47.0		D	45.0	_	D
	oach Delay, s/veh / LOS section Delay, s/veh / LOS				<u>' </u>).2	,	ь	47.0	,		C 45.0	,	D
	ay, arve					30									
Multimodal Re	sults				EB			WB			NB			SB	
Pedestrian LOS	Score	/LOS		2.10		В	1.88	3	В	2.30)	В	2.46	3	В
Bicycle LOS Sc	ore / L C	os		2.02	2	В	1.36	3	Α	0.92	2	Α	0.98	3	Α

EXHIBIT 4.13 2029 PEAK AM HOUR ANALYSIS (Background Traffic) - Frank Bender/Innes

Ceneral Information	B R
Agency Analyst Analyst Analyst Analyst Analyst Analyst Analyst Analyst Duration, h Duratio	B R
Agency	B R
Signal Information	r R
Urban Street	r R
Intersection	r R
Demand Information	r R
Demand Information EB WB NB SE Approach Movement L T R L D D D D D D D D D D	r R
Approach Movement Demand (v), veh/h Signal Information	r R
Approach Movement Demand (v), veh/h Signal Information	r R
Demand (v), veh/h 36 418 16 26 1320 89 16 13 3 43 26 Signal Information Cycle, s 110.0 Reference Phase 2 Green 7.3 55.4 29.2 0.0 <	_
Signal Information Cycle, s 110.0 Reference Phase 2 Offset, s 0 Reference Point End Uncoordinated No Simult. Gap E/W On Yellow 3.7 3.7 3.0 0.0 0.0 0.0 Force Mode Fixed Simult. Gap N/S On Red 1.0 2.9 3.8 0.0 0.0 0.0 Timer Results Assigned Phase 2 1 6 8 Case Number 5.3 2.0 4.0 5.0 Phase Duration, s 62.0 12.0 74.0 36.0 Change Period, (Y+R c), s 6.6 4.7 6.6 6.8 Max Allow Headway (MAH), s 0.0 3.1 0.0 3.2 Queue Clearance Time (g s), s 3.7 3.7 7.4 7.4	3 47 7 \$
Cycle, s 110.0 Reference Phase 2 Offset, s 0 Reference Point End Uncoordinated No Simult. Gap E/W On Yellow 3.7 3.7 3.0 0.0 0.0 0.0 Force Mode Fixed Simult. Gap N/S On Red 1.0 2.9 3.8 0.0 0.0 0.0 Timer Results EBL EBT WBL WBT NBL NBT SBL Assigned Phase 2 1 6 8 8 Case Number 5.3 2.0 4.0 5.0 9 Phase Duration, s 62.0 12.0 74.0 36.0 9 Change Period, (Y+Rc), s 6.6 4.7 6.6 6.8 Max Allow Headway (MAH), s 0.0 3.1 0.0 3.2 Queue Clearance Time (gs), s 3.7 3.7 7.4 7.4	3 A 4
Offset, s 0 Reference Point Uncoordinated End Simult. Gap E/W On Yellow 3.7 3.7 3.0 0.0 0.0 0.0 0.0 On On One of Simult. Gap E/W On Red Simult. Gap E/W On O	3 4 7 Y 8
Offset, s 0 Reference Point End Green 7.3 55.4 29.2 0.0	7
Uncoordinated No No Simult. Gap E/W On Yellow 3.7 3.5.4 29.2 0.0 0.0 0.0 0.0 Force Mode Fixed Simult. Gap N/S On Red 1.0 2.9 3.8 0.0 0.0 0.0 0.0 Timer Results EBL EBT WBL WBT NBL NBT SBL Assigned Phase 2 1 6 8 8 6 Case Number 5.3 2.0 4.0 5.0 5.0 5.0 6 74.0 36.0 6 7 7 7 7 4 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	7
Force Mode Fixed Simult. Gap N/S On Red 1.0 2.9 3.8 0.0 0.0 0.0 s Timer Results EBL EBL EBT WBL WBT NBL NBT SBL Assigned Phase 2 1 6 8 5.0 <	7 8
Timer Results EBL EBT WBL WBT NBL NBT SBL Assigned Phase 2 1 6 8 Case Number 5.3 2.0 4.0 5.0 Phase Duration, s 62.0 12.0 74.0 36.0 Change Period, $(Y+R_c)$, s 6.6 4.7 6.6 6.8 Max Allow Headway (MAH) , s 0.0 3.1 0.0 3.2 Queue Clearance Time $(g s)$, s 3.7 7.4	
Assigned Phase 2 1 6 8 Case Number 5.3 2.0 4.0 5.0 Phase Duration, s 62.0 12.0 74.0 36.0 Change Period, (Y+Rc), s 6.6 4.7 6.6 6.8 Max Allow Headway (MAH), s 0.0 3.1 0.0 3.2 Queue Clearance Time (gs), s 3.7 7.4 7.4	
Case Number 5.3 2.0 4.0 5.0 Phase Duration, s 62.0 12.0 74.0 36.0 Change Period, (Y+Rc), s 6.6 4.7 6.6 6.8 Max Allow Headway (MAH), s 0.0 3.1 0.0 3.2 Queue Clearance Time (gs), s 3.7 7.4 7.4	SBT
Phase Duration, s 62.0 12.0 74.0 36.0 Change Period, $(Y+R_c)$, s 6.6 4.7 6.6 6.8 Max Allow Headway (MAH) , s 0.0 3.1 0.0 3.2 Queue Clearance Time $(g s)$, s 3.7 7.4 7.4	4
Change Period, (Y+Rc), s 6.6 4.7 6.6 6.8 Max Allow Headway (MAH), s 0.0 3.1 0.0 3.2 Queue Clearance Time (gs), s 3.7 7.4 7.4	6.0
Max Allow Headway (MAH), s 0.0 3.1 0.0 3.2 Queue Clearance Time (g s), s 3.7 7.4	36.0
Queue Clearance Time (g s), s 3.7 7.4	6.8
	3.2
	6.2
	0.3
Phase Call Probability 1.00 1.00	1.00
Max Out Probability 0.38 0.00	0.00
Movement Group Results EB WB NB SE	0
Approach Movement L T R	_
11	
	- 11
Adjusted Saturation Flow Rate (s), veh/h/ln 331 1647 1425 1661 1744 1699 1338 1800 1495 1392 157 Queue Service Time (gs), s 10.1 8.6 0.7 1.7 33.1 33.6 1.1 0.6 0.2 2.8 4.2	_
Cycle Queue Clearance Time (gc) , s 31.7 8.6 0.7 1.7 33.1 33.6 5.4 0.6 0.2 2.8 4.2	
Green Ratio (g/C) 0.51 0.51 0.51 0.12 0.62 0.62 0.27 0.27 0.27 0.27 0.27 Capacity (c), veh/h 170 1689 731 196 1084 1056 381 494 411 440 431	_
Volume-to-Capacity Ratio (X) 0.230 0.269 0.024 0.144 0.712 0.719 0.046 0.029 0.008 0.106 0.18	_
Back of Queue (Q), ft/ln (50 th percentile)	77
Back of Queue (Q), veh/ln (50 th percentile) 0.9 3.2 0.2 0.7 12.9 12.9 0.4 0.3 0.1 0.9 1.6	3
Queue Storage Ratio (RQ) (50 th percentile) 0.9 3.2 0.0 0.00 0.00 0.00 0.00 0.00 0.00 0	_
Uniform Delay (d 1), s/veh 29.1 15.1 13.2 43.5 14.4 14.2 32.5 29.2 29.0 30.4 30.5	_
Incremental Delay (d 2), s/veh 3.1 0.4 0.1 0.1 4.0 4.2 0.0 0.0 0.0 0.0 0.0 0.1 0.1 0.1 0.1 0.1	_
Initial Queue Delay (d 3), s/veh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	_
Control Delay (<i>d</i>), s/veh 32.3 15.5 13.3 43.6 18.4 18.4 32.6 29.2 29.0 30.5 30.6	_
Level of Service (LOS) C B B D B B C C C C C	_
Approach Delay, s/veh / LOS 16.7 B 18.9 B 30.9 C 30.5	С
Intersection Delay, s/veh / LOS 10.7 B 10.9 B 30.9 C 30.5 B	
10.2	
Multimodal Results EB WB NB SE	
Pedestrian LOS Score / LOS 2.09 B 1.88 B 2.29 B 2.45	3
Bicycle LOS Score / LOS 0.91 A 1.77 B 0.54 A 0.70	ВВ

EXHIBIT 4.14 2029 PEAK PM HOUR ANALYSIS (Background Traffic) - Frank Bender/Innes

		HCS	Sigr	nalize	d Inte	rsect	ion R	esult	ts Sun	ımary	,				
General Inform	nation								Intersec	tion Inf	ormatio	on		4741	Ja L
Agency									Duration,	h	0.250	1		* *	
Analyst				Analys	is Date	12/8/2	2020		Area Typ	е	Other		<u></u> •		
Jurisdiction		City of Ottawa		Time F	Period	Peak	PM Hou	ır 📗	PHF		0.92		*		÷_
Urban Street		Innes Road		Analys	is Year	2029			Analysis	Period	1> 7:0	00	*		
Intersection		Frank Bender/Innes	3	File Na	ame	723_2	029_ba	k_PM.	xus					110	
Project Descrip	tion	Innes Road Develo	pment -	Backgr	ound T	raffic							Б	4 144	1
Demand Inform	nation				EB		_	WE	₹	_	NB			SB	
Approach Move				L	T	R	L	T	R	L	T	T R	L	T	R
Demand (v), v				146	1535	_	85	87		113	96	43	103	104	75
Demand (v), v	en/m			140	1000	114	00	07	1 00	113	90	43	103	104	/5
Signal Informa	tion				2		21.	\top	\top	\top					T
Cycle, s	130.0	Reference Phase	2		5	†#" `	54	2			K		♦ 』	1	кŢх
Offset, s	0	Reference Point	End	Green	15.3	67.4	29.2	0.0	0.0	0.0		1	Y 2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Yellow		3.7	3.0	0.0	0.0	0.0			←		ĸtz
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	2.9	3.8	0.0	0.0	0.0		5	6	7	Y
Timer Results				EBI	-	EBT	WB	L	WBT	NBI	_	NBT	SBI	-	SBT
Assigned Phase	е			_		2	1	\perp	6			8	_		4
Case Number						5.3	2.0	_	4.0			5.0			6.0
Phase Duration					_	74.0	20.0	\rightarrow	94.0			36.0			36.0
Change Period	nge Period, (Y+R $_{\circ}$), s Allow Headway (MAH), s					6.6	4.7		6.6			6.8			6.8
Max Allow Head	• • • • • • • • • • • • • • • • • • • •					0.0	3.1	\perp	0.0			3.3			3.3
Queue Clearan	ue Clearance Time (g s), s						8.4					28.3			18.3
Green Extension	eue Clearance Time (g_s), s en Extension Time (g_e), s					0.0	0.1		0.0			0.2			1.0
Phase Call Pro	bability						1.00)				1.00			1.00
Max Out Proba	bility			_	_		0.01			_		1.00		_	0.02
Movement Gro	oup Res	sults			EB			WB			NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Move				5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow F), veh/h		159	1668	124	92	518	503	123	104	47	112	195	
		ow Rate (s), veh/h/l	n	539	1647	1425	1661	1758		1207	1800	1493	1275	1634	
Queue Service				25.7	63.2	5.9	6.4	17.4	_	12.8	6.1	3.2	10.2	13.5	
Cycle Queue C				25.7	63.2	5.9	6.4	17.4	_	26.3	6.1	3.2	16.3	13.5	
Green Ratio (g		(3-7)		0.53	0.53	0.53	0.16	0.68	0.68	0.23	0.23	0.23	0.23	0.23	
Capacity (c), v				339	1733	750	268	1195	_	211	418	347	291	380	
Volume-to-Capa		atio (X)		0.468	0.963	0.165	0.344	0.433	_	0.583	0.250	0.135	0.384	0.512	
<u>.</u>		t/In (50 th percentile)						1						
		eh/ln (50 th percenti		3.6	27.2	2.0	2.7	6.6	6.4	4.0	2.7	1.2	3.3	5.5	
		RQ) (50 th percent		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay		, , , , , , , , , , , , , , , , , , ,		20.7	29.6	16.0	48.4	9.6	9.4	55.0	40.7	39.5	47.3	43.5	
Incremental De	lay (d 2), s/veh		4.6	14.4	0.5	0.3	1.1	1.2	2.8	0.1	0.1	0.3	0.5	
Initial Queue De	tial Queue Delay (d 3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (ntrol Delay (d), s/veh				44.0	16.5	48.7	10.8	10.6	57.7	40.8	39.6	47.6	44.0	
Level of Service	vel of Service (LOS)				D	В	D	В	В	Е	D	D	D	D	
Approach Delay	proach Delay, s/veh / LOS			40.7	·	D	13.8	3	В	48.2	2	D	45.3	3	D
	section Delay, s/veh / LOS					33	3.5						С		
														-	
Multimodal Re					EB		-	WB	_		NB			SB	
Pedestrian LOS				2.10	\rightarrow	В	1.88	-	В	2.30	-	В	2.46	-	В
Bicycle LOS So	ore / LO	JS		2.10)	В	1.41		Α	0.94	1	Α	0.99)	Α

EXHIBIT 4.15 2024 PEAK AM HOUR ANALYSIS (Total Traffic) - Frank Bender/Innes

		HCS	Sigr	nalize	d Inte	rsect	ion R	esul	ts Sun	nmary	,				
General Inform	ation								Intersec	tion Inf	ormatio	on		1 (4 Y 4 1	Ja la
Agency									Duration	, h	0.250	1	-	* *	
Analyst				Analys	is Date	12/8/2	2020		Area Typ	е	Other		<u></u>		
Jurisdiction		City of Ottawa		Time F	Period	Peak	AM Hou	ır	PHF		0.92		*		÷
Urban Street		Innes Road		Analys	is Year	2024			Analysis	Period	1> 7:0	00			
Intersection		Frank Bender/Innes	;	File Na	ame	723_2	2024_tot	t_AM.	kus					ጎተሰ	
Project Descript	ion	Innes Road Develop	oment										T	4 1 4 4	P [7]
Damand Info					EB		_	WI			NB		_	SB	
Demand Inform					_	Τ.		_				Τ.		_	T 5
Approach Move				L 40	T	R	L	10f	_	L	T	R	L	T	R
Demand (v), ve	en/n		-	43	403	16	25	125	84	16	12	3	41	25	46
Signal Informa	tion							\top	$\overline{}$	$\overline{}$					1
Cycle, s	110.0	Reference Phase	2	1	2	≒ <u>.</u>	E43	a l			×	<u> </u>	<u>م</u> ا	1	4
Offset, s	0	Reference Point	End	C===	7.0		200			100		1	2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Green Yellow	-	3.7	3.0	0.0		0.0			4		rt-
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	2.9	3.8	0.0		0.0		5	6	7	Y
Timer Results				EBL	-	EBT	WB	L	WBT	NBI	-	NBT	SBI	- T	SBT
Assigned Phase	;					2	1		6			8			4
Case Number						5.3	2.0		4.0			5.0			6.0
Phase Duration	, s					62.0	12.0		74.0			36.0			36.0
Change Period,	ge Period, (Y+R c), s					6.6	4.7		6.6			6.8			6.8
Max Allow Head	Allow Headway (<i>MAH</i>), s					0.0	3.1	\neg	0.0			3.2			3.2
	ue Clearance Time (g $_s$), s						3.6					7.2			6.1
	ue Clearance Time (g_s), s en Extension Time (g_e), s					0.0	0.0	\neg	0.0			0.3		\neg	0.3
Phase Call Prob		, , , , , , , , , , , , , , , , , , ,					1.00					1.00			1.00
Max Out Probab	oility						0.33	3				0.00			0.00
Movement Gro	un Bos	vulto			EB			WB			NB			SB	
Approach Move		suits		L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				5	2	12	1	6	16	3	8	18	7	4	14
		\ vob/b		47	438	17	27	737	722	17	13	3	45	77	14
Adjusted Flow F		, .	-			_	_	_	_		_		_		
Queue Service		ow Rate (s), veh/h/l		355 11.0	1647 8.2	0.7	1661	1744 30.4	_	1341	1800	1495 0.2	1394 2.7	1569 4.1	
Cycle Queue Cl		3 ,,		29.7	8.2	0.7	1.6	30.4		5.2	0.6	0.2	3.2	4.1	
•		e mile (<i>g c</i>), s		0.51	0.51	0.7	0.12	0.62	-	0.27	0.6	0.27	0.27	0.27	
Green Ratio (g/				187	1689	731	196	1084	_	383	494	411	441	431	
Capacity (c), v		atio (X)		0.250	0.259	0.024	0.138	0.679	_	0.045	0.026	0.008	0.101	0.179	
		t/ln (50 th percentile)	0.250	0.209	0.024	0.130	0.078	0.004	0.045	0.020	0.008	0.101	0.179	
		eh/In (50 th percenti	_	1.1	3.1	0.2	0.7	11.8	11.7	0.4	0.3	0.1	0.9	1.6	
		RQ) (50 th percent		0.00	0.00	0.2	0.00	0.00	_	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (, , , , ,		27.4	15.1	13.2	43.5	13.9	_	32.4	29.2	29.0	30.3	30.4	
Incremental Del				3.2	0.4	0.1	0.1	3.4	3.6	0.0	0.0	0.0	0.0	0.1	
		,		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	al Queue Delay (d ȝ), s/veh htrol Delay (d), s/veh			30.6	15.4	13.3	43.6	17.3	_	32.5	29.2	29.0	30.4	30.5	
	rel of Service (LOS)			C	В	В	D	В	В	C	C	C	C	C	
	proach Delay, s/veh / LOS			16.8	_	В	17.8		В	30.8	_	С	30.5	_	С
	section Delay, s/veh / LOS			10.0			3.5			00.0			В		
22.22.3	,, s														
Multimodal Res	sults				EB			WB			NB			SB	
Pedestrian LOS	Score	/LOS		2.09		В	1.88	3	В	2.29)	В	2.45	5	В
Bicycle LOS Sc	oro / I C	18		0.90)	Α	1.71	1	В	0.54		Α	0.69	9	Α

EXHIBIT 4.16 2024 PEAK PM HOUR ANALYSIS (Total Traffic) - Frank Bender/Innes

Agency Duration, h 0.250 Analyst Analysis Date 12/8/2020 Area Type Other Jurisdiction City of Ottawa Time Period Peak PM Hour PHF 0.92 Urban Street Innes Road Analysis Year 2024 Analysis Period 1> 7:00 Intersection Frank Bender/Innes File Name 723_2024_tot_PM.xus Project Description Innes Road Development Demand Information EB WB NB Approach Movement L T R L T R L T R L Demand (v), veh/h 162 1464 108 81 833 65 107 92 41 102 Signal Information Cycle, s 130.0 Reference Phase 2	SB T R 99 75
Agency Duration, h 0.250 Analyst Analysis Date 12/8/2020 Area Type Other Other Jurisdiction City of Ottawa Time Period Peak PM Hour PHF 0.92 0.92 Peak PM Hour PHF 0.92 Prior of Description Innes Road Analysis Year 2024 Analysis Period 1> 7:00 Prior of Description Innes Road Development Project Description Project Description Innes Road Development EB WB NB NB NB Approach Movement L T R L <td< th=""><th>T R</th></td<>	T R
Analyst Analysis Date 12/8/2020 Area Type Other Jurisdiction City of Ottawa Time Period Peak PM Hour PHF 0.92 Urban Street Innes Road Analysis Year 2024 Analysis Period 1> 7:00 Intersection Frank Bender/Innes File Name 723_2024_tot_PM.xus Project Description Innes Road Development B WB NB Approach Movement L T R L T<	SB R
Jurisdiction	T R
Urban Street Innes Road Analysis Year 2024 Analysis Period 1>7:00 Intersection Frank Bender/Innes File Name 723_2024_tot_PM.xus Project Description Innes Road Development NB Approach Movement L T R	T R
Intersection	T R
Demand Information	T R
Demand Information	T R
Approach Movement	T R
Approach Movement	T R
Demand (v), veh/h 162 1464 108 81 833 65 107 92 41 102 Signal Information Cycle, s 130.0 Reference Phase 2	
Signal Information Cycle, s 130.0 Reference Phase 2	99 75
Cycle, s 130.0 Reference Phase 2	
1 7	
	4
Offset, s 0 Reference Point End Cross 45.3 27.4 20.2 0.0 0.0	3 4
Uncoordinated No Simult. Gap E/W On Yellow 3.7 3.7 3.0 0.0 0.0 0.0 0.0 0.0	rt v
Force Mode Fixed Simult. Gap N/S On Red 1.0 2.9 3.8 0.0 0.0 0.0 5 6	7 78
Timer Results EBL EBT WBL WBT NBL NBT SBL	SBT
Assigned Phase 2 1 6 8	4
Case Number 5.3 2.0 4.0 5.0	6.0
Phase Duration, s 74.0 20.0 94.0 36.0	36.0
Change Period, (Y+R c), s 6.6 4.7 6.6 6.8	6.8
Max Allow Headway (<i>MAH</i>), s 0.0 3.1 0.0 3.3	3.3
Queue Clearance Time (<i>g s</i>), s 8.1 27.1	17.9
Green Extension Time (g e), s 0.0 0.1 0.0 0.3	1.0
Phase Call Probability 1.00 1.00	1.00
Max Out Probability 0.00 1.00	0.01
Movement Group Results EB WB NB	SB
Approach Movement L T R L T R L T R L	T R
	4 14
	189
	1631
·	13.1
10 //	13.1
	0.23
	379
1 7 7	0.499
Back of Queue (Q), ft/ln (50 th percentile)	.433
	5.3
	0.00
	43.3
	0.4
	0.0
	43.7
Level of Service (LOS) C D B D B B E D D D D	D D
Approach Delay, s/veh / LOS 35.2 D 13.6 B 47.2 D 45.0	D
Intersection Delay, s/veh / LOS 30.4 C	U
Multimodal Results EB WB NB	SB
Pedestrian LOS Score / LOS 2.10 B 1.88 B 2.30 B 2.46	В
Bicycle LOS Score / LOS 2.04 B 1.37 A 0.92 A 0.98	А

EXHIBIT 4.17 2029 PEAK AM HOUR ANALYSIS (Total Traffic) - Frank Bender/Innes

		нся	Sigr	nalize	d Inte	rsect	ion R	esult	s Sun	ımary	•				
														4741	ere.
General Inform	nation							_	ntersec		-			41	4. 4
Agency						1		-	Duration,		0.250		- 2		
Analyst						12/8/2		-	Area Typ	е	Other				2
Jurisdiction		City of Ottawa		Time F		-	AM Hou	_	PHF		0.92		*		7
Urban Street		Innes Road		Analys	is Year	2029		/	Analysis	Period	1> 7:0	00			V C
Intersection		Frank Bender/Innes	3	File Na	ame	723_2	029_tot	_AM.x	us					ጎተሰ	
Project Descrip	tion	Innes Road Develo	pment										1	14144	7 1
Demand Inform	nation				EB		_	WB	<u> </u>	_	NB		_	SB	
Approach Move				L	T	│ R	L	T	R		T	R	L	T	R
Demand (v), v				45	424	16	26	132	_	16	13	3	43	26	48
Bomana (+), +	011/11			-10		10		102		- 10	10				10
Signal Informa	tion				2			\top	\neg	\top					\mathbf{L}
Cycle, s	110.0	Reference Phase	2		2	†# `	- B - B - D	al			×		⇔∥		stz –
Offset, s	0	Reference Point	End	Green	7.3	55.4	29.2	0.0	0.0	0.0		1	Y 2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Yellow		3.7	3.0	0.0	0.0	0.0			←		κtz
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	2.9	3.8	0.0	0.0	0.0		5	6	7	8
Timer Results				EBI	-	EBT	WB	L	WBT	NBI	-	NBT	SBI	L	SBT
Assigned Phase	е					2	1		6			8			4
Case Number						5.3	2.0		4.0			5.0			6.0
Phase Duration	, S					62.0	12.0)	74.0			36.0			36.0
Change Period	ge Period, (<i>Y+R c</i>), s Allow Headway (<i>MAH</i>), s					6.6	4.7		6.6			6.8			6.8
Max Allow Head	Allow Headway (<i>MAH</i>), s					0.0	3.1		0.0			3.2			3.2
Queue Clearan	ie Clearance Time (g s), s						3.7					7.4			6.3
Green Extension	ue Clearance Time (g_s), s en Extension Time (g_e), s					0.0	0.0		0.0			0.3			0.3
Phase Call Prol	bability						1.00)				1.00			1.00
Max Out Proba	bility						0.38	3				0.00			0.00
Movement Gro	un Pos	vulto			EB			WB			NB			SB	
Approach Move		suits			T	R	L	T	R	L	T	R	L	T	R
				5	2	12	1	6	16	3	8	18	7	4	14
Assigned Move		\ vob/b		49	461	17	28	774	760	17	14	3	47	80	14
Adjusted Flow F		, .	n	331	1647	1425	1661	1744	1699	1337	1800	1495	1392	1569	
		ow Rate (s), veh/h/l	П	13.1	8.7	0.7	1.7	33.2	33.7	1.1	0.6	0.2	2.8	4.3	-
Queue Service				34.8	8.7	0.7	1.7	33.2	33.7	5.4	0.6	0.2	3.4	4.3	
Cycle Queue C Green Ratio (g		e fille (gc), s		0.51	0.51	0.7	0.12	0.62	0.62	0.27	0.6	0.27	0.27	0.27	
Capacity (c), v				170	1689	731	196	1084	1056	380	494	411	440	431	
Volume-to-Capa		atio (V)		0.288	0.273	0.024	0.144	0.713	_	0.046	0.029	0.008	0.106	0.187	-
		. ,	١	0.200	0.273	0.024	0.144	0.713	0.720	0.040	0.029	0.008	0.100	0.167	
		t/ln (50 th percentile		1.2	2.2	0.3	0.7	12.0	12.0	0.4	0.3	0.1	0.0	1.6	
		eh/In (50 th percenti RQ) (50 th percent		0.00	0.00	0.2	0.7	0.00	0.00	0.4	0.3	0.1	0.9	0.00	
			ille)				_		_				_	_	
Uniform Delay (Incremental De				30.2 4.2	15.2 0.4	13.2 0.1	43.5 0.1	14.4 4.0	14.2 4.2	32.6 0.0	29.2 0.0	29.0 0.0	0.0	30.5 0.1	
	• •	,		_			_		_	_		_	_	_	
	al Queue Delay (d 3), s/veh			0.0	0.0	0.0	0.0	0.0 18.4	0.0	0.0	0.0	0.0	0.0	0.0	
	etrol Delay (d), s/veh			34.5 C	15.6 B	13.3	43.6	18.4 B	18.5 B	32.6 C	29.2 C	29.0 C	30.5 C	30.6 C	
	el of Service (LOS)					В	D 19.0		_		_	C	_	_	
	oach Delay, s/veh / LOS section Delay, s/veh / LOS			17.3	·	B 10	18.9	7	В	30.9	7		30.5 B	,	С
intersection De	ay, S/VE	aii / LUS				18	9.4						ь		
Multimodal Re	sults				EB			WB			NB			SB	
Pedestrian LOS		/LOS		2.09	_	В	1.88		В	2.29		В	2.45		В
Bicycle LOS So				0.92	-	A	1.78	-	В	0.54	-	A	0.70	-	A
				0.02					_	0.0			J., (

EXHIBIT 4.18 2029 PEAK PM HOUR ANALYSIS (Total Traffic) - Frank Bender/Innes

		HCS	Sigr	nalize	d Inte	rsect	ion R	esult	s Sun	nmary	,				
														4741	UTI
General Inform	nation							\rightarrow	ntersec				- i	41	
Agency						1.0.0.0		$\overline{}$	Duration,		0.250		-		1
Analyst						12/8/2		-	Area Typ	е	Other				
Jurisdiction		City of Ottawa		Time F			PM Hou		PHF		0.92		<u></u>		-
Urban Street		Innes Road		Analys	is Year	-			Analysis	Period	1> 7:0	00	7		¥
Intersection		Frank Bender/Innes	;	File Na	ame	723_2	029_to	t_PM.x	us					711	
Project Descrip	tion	Innes Road Develo	pment										Т	14144	17
Demand Inform	nation				EB			WE	1		NB			SB	
Approach Move				L	T	l R	1	T	R	L	T	│ R	L	T	R
Demand (v), v				170	1539	114	85	877	_	113	96	43	103	104	78
Demand (V), V	CIIIII	_		170	1333	114	00	071	00	113	30	40	103	104	70
Signal Informa	tion							\top	\top	\top					1
Cycle, s	130.0	Reference Phase	2	1	2	†#" `	1 ISA	a l			×		↔		ζĺΖ
Offset, s	0	Reference Point	End	Green	15.2	67.4	29.2	0.0	0.0	0.0		1	¥ 2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Yellow		3.7	3.0	0.0	0.0	0.0	_		←		κŤz
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	2.9	3.8	0.0	0.0	0.0		5	6	7	8
Timer Results				EBL	-	EBT	WB	L	WBT	NBI	_	NBT	SBI	L	SBT
Assigned Phase	е					2	1		6			8			4
Case Number						5.3	2.0		4.0			5.0			6.0
Phase Duration	ı, s					74.0	20.0)	94.0			36.0			36.0
Change Period	ge Period, (<i>Y+R c</i>), s Illow Headway (<i>MAH</i>), s					6.6	4.7		6.6			6.8			6.8
Max Allow Head	illow Headway (<i>MAH</i>), s					0.0	3.1		0.0			3.3			3.3
Queue Clearan	e Clearance Time (g s), s						8.4					28.7			18.3
Green Extension	ue Clearance Time (g_s), s en Extension Time (g_s), s					0.0	0.1	\neg	0.0			0.1		\neg	1.0
Phase Call Prol	bability						1.00)				1.00			1.00
Max Out Proba							0.0	1				1.00			0.02
Mayamant Cra	un Bas	lto			EB			WB			NB			SB	
Movement Gro		suits			T	R		T	R	L	T	R	L	T	R
Approach Move							_	_	_		_		_	_	_
Assigned Move		` ' ' '		5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow F		, .		185	1673	124	92	521	506	123	104	47	112	198	
		ow Rate (s), veh/h/l	n	536	1647	1425	1661	1758	1706	1203	1800	1493	1275	1631	-
Queue Service				32.4	63.6	5.9	6.4	17.5	17.5	12.9	6.1	3.2	10.2	13.8	-
Cycle Queue C		e ⊓me (<i>g c</i>), s		32.4	63.6	5.9	6.4	17.5	17.5	26.7	6.1	3.2	16.3	13.8	
Green Ratio (g				0.53	0.53	0.53	0.16	0.68	0.68	0.23	0.23	0.23	0.23	0.23	-
Capacity (c), v				337	1733	750	268	1195	1160	207	418	347	291	379	
Volume-to-Capa		<u> </u>		0.548	0.965	0.165	0.344	0.436	0.436	0.592	0.250	0.135	0.384	0.522	
		t/ln (50 th percentile		4.5	07.1	0.0	0.7	0.7	0.5	4.1	0 -	4.0		5 0	
	, , .	eh/ln (50 th percenti		4.5	27.4	2.0	2.7	6.7	6.5	4.1	2.7	1.2	3.3	5.6	
		RQ) (50 th percent	ile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay				22.3	29.7	16.0	48.4	9.6	9.5	55.3	40.7	39.5	47.3	43.6	
Incremental De	• •	,		6.3	14.8	0.5	0.3	1.2	1.2	3.1	0.1	0.1	0.3	0.6	
Initial Queue De				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	rol Delay (d), s/veh			28.6	44.5	16.5	48.7	10.8	10.7	58.3	40.8	39.6	47.6	44.2	
	el of Service (LOS)			С	D	_ B	D	В	В	E	D	D	D	D	
	pach Delay, s/veh / LOS			41.2		D	13.9	9	В	48.5)	D	45.5)	D
Intersection De	lay, s/ve	eh / LOS				33	3.8						С		
Multimodal Re	eulte				EB			WB			NB			SB	
Pedestrian LOS		/108		2.10		В	1.88	_	В	2.30		В	2.46	_	В
Bicycle LOS Sc				2.12	-	В	1.4	-	A	0.94	-	A	1.00	-	A
Dicycle LOS SC	OIG / LC	-		2.12		D	1.4			0.92		\sim	1.00	,	

EXHIBIT 4.19 2017 PEAK AM HOUR ANALYSIS (Existing Traffic) - Viseneau/Innes

		нся	Sigr	nalize	d Inte	rsect	ion R	esult	ts Sun	nmary					
General Inform	ation								Intersec	tion Inf	ormatic	nn.		4 74 1	ja (j
	lauon							\rightarrow	Duration		0.250			*	
Agency				Analys	io Doto	12/8/2	0000	-			Other		2		
Analyst		City of Ottawa		-		-	AM Hou	$\overline{}$	Area Typ PHF	e	_				-
Jurisdiction		,		Time F		_	AIVI HOU	\rightarrow		Daviad	0.92	20			-
Urban Street		Innes Road		_	is Year		017 01		Analysis	Period	1> 7:0	JU	- 5		
Intersection	4!	Viseneau/Innes	4	File Na	ame	123_2	2017_ex	_AIVI.X	us				-	ጎተሰ	tr (*
Project Descript	tion	Innes Road Develo	pment												A) III)
Demand Inforn	nation				EB			WE	3		NB			SB	
Approach Move				L	T	l R	L	T	R	L	T	T R	L	T	R
Demand (v), v				11	398	37	59	142		22	5	39	46	13	47
Demand (V), V	CHIII		_		330	- 51	- 55	172	.0 00	- 22	J J	- 55	70	10	77
Signal Informa	tion				- H			$\overline{}$	$\overline{}$	$\overline{}$					T
Cycle, s	110.0	Reference Phase	2	1	2	₹ <u>~</u> * *	E42	<u>.</u>			×	<u> </u>	4		4
Offset, s	0	Reference Point	End			40.7				100		1	2	3	
Uncoordinated	No	Simult, Gap E/W	On	Green Yellow		49.7 3.7	34.7	0.0	0.0	0.0			4		-
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.6	2.6	4.3	0.0	0.0	0.0		5	6	7	Y
		omiani capinic				12.2	1111	1010	10.0	1212					
Timer Results				EBI		EBT	WB	L	WBT	NBI		NBT	SBI		SBT
Assigned Phase	e					2	1		6			8			4
Case Number						5.3	2.0	\rightarrow	4.0			5.0			8.0
Phase Duration	S					56.0	12.0	_	68.0			42.0			42.0
Change Period,		c). S				6.3	6.3	\rightarrow	6.3			7.3			7.3
	Allow Headway (<i>MAH</i>), s					0.0	3.1	_	0.0	_		3.3	_		3.3
	Allow Headway (MAH), so the Clearance Time (g_s), s					0.0	5.9		0.0	_		9.4	_		8.0
	• • • • • • • • • • • • • • • • • • • •					0.0	0.0	-	0.0	_		0.3	_	_	0.4
Phase Call Prob		(90), 3		_		0.0	1.00	-	0.0	_		1.00	_		1.00
Max Out Probal							1.00	_			-	0.00		-	0.00
Movement Gro	up Res	sults		_	EB		_	WB		_	NB		_	SB	
Approach Move				L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Move				5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow F), veh/h		12	433	40	64	795	791	24	5	42	_	115	
		ow Rate (s), veh/h/l	n	314	1647	1424	1661	1744	_	1356	1800	1497		1486	
Queue Service				3.4	9.0	1.7	3.9	39.6	39.9	1.4	0.2	2.2		3.4	
Cycle Queue Cl		- , .		31.4	9.0	1.7	3.9	39.6	39.9	7.4	0.2	2.2		6.0	
Green Ratio (g		(30),0		0.46	0.46	0.46	0.12	0.57	0.57	0.32	0.32	0.32		0.32	
Capacity (c), v				131	1518	656	196	994	985	432	584	486		529	
Volume-to-Capa		ntio (X)		0.092	0.285	0.061	0.327	0.800	_	0.055	0.009	0.087		0.218	
		t/In (50 th percentile)	U.302	5.200	0.501	5.5E7	0.500	0.000	0.300	0.500	5.501		5.2.10	
	, .	eh/ln (50 th percenti	_	0.3	3.4	0.6	1.6	16.5	16.5	0.5	0.1	0.8		2.2	
	, , .	RQ) (50 th percent		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
Uniform Delay (, , , , , , , , , , , , , , , , , , ,	0)	35.9	18.4	16.4	44.5	19.0	18.8	29.8	25.2	25.8		27.1	
Incremental Del	` ''			1.4	0.5	0.2	0.4	6.7	6.9	0.0	0.0	0.0		0.1	
	, ,	,.		0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
	tial Queue Delay (d 3), s/veh				18.9	16.6	44.8	25.8	25.7	29.9	25.2	25.9		27.1	
	vel of Service (LOS)				16.9 B	B	D 44.6	25.6 C	C C	29.9 C	C C	C C		C C	
					В	В	_	_	C			С	27.4	_	С
	roach Delay, s/veh / LOS rsection Delay, s/veh / LOS						26.5 5.0	<u>' </u>	U	27.1			27.1 C		U
Multimedal Da	ault-				ED			VA (D			ND			CD.	
Multimodal Re		11.00		0.40	EB	D	4.0	WB	В	2.00	NB	D	2.4	SB	D
Pedestrian LOS				2.10	\rightarrow	В	1.67	-	В	2.29	\rightarrow	В	2.44	-	В
Bicycle LOS Sc				0.89	\rightarrow	A	1.85	-	В	0.61	\rightarrow	A	0.68	-	Α

EXHIBIT 4.20 2017 PEAK PM HOUR ANALYSIS (Existing Traffic) - Viseneau/Innes

		HCS	Sigr	nalize	d Inte	ersect	ion R	esult	s Sun	nmary					
General Inform									ntersec	tion Inf				4741	b L
	nation							_					- 1	4	
Agency						10.00.00		-	Duration,		0.250		-		
Analyst		200		-		12/8/2		-	Area Typ	е	Other				
Jurisdiction		City of Ottawa		Time F			PM Hou		PHF		0.92				7
Urban Street		Innes Road		-	sis Year				Analysis	Period	1> 7:0	00			Ţ,
Intersection		Viseneau/Innes		File Na	ame	723_2	017_ex	_PM.x	us					ጎተሰ	
Project Descrip	tion	Innes Road Develo	pment	_	_	_	_	_	_	_	_	_	1	14144	7 1
Demand Inform	nation				EB			WE	3		NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R		Т	R
Demand (v), v				45	1456	-	184	673	_	106	40	179	60	51	30
Signal Informa			-		5	, ,						_	_		人
Cycle, s	130.0	Reference Phase	2		"	=	1 50	2					♦ ,	3	
Offset, s	0	Reference Point	End	Green	13.7	61.7	34.7	0.0	0.0	0.0			<u>K</u>		7
Uncoordinated	No	Simult. Gap E/W	On	Yellow		3.7	3.0	0.0	0.0	0.0			←		KÎZ
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.6	2.6	4.3	0.0	0.0	0.0		5	6	7	8
					_										
Timer Results				EBI	-	EBT	WB	L	WBT	NBI	-	NBT	SBI	_	SBT
Assigned Phase Case Number	e			-	_	2	1	_	6	_		8	_	_	4
Phase Duration				-	-	5.3 68.0	2.0	_	4.0 88.0		_	5.0 42.0	-		8.0 42.0
		a) e		-		6.3	6.3	-	6.3			7.3	-		7.3
	ge Period, (Y+R c), s Allow Headway (MAH), s			_	_	0.0	3.1		0.0			3.3	_		3.3
	• • • •			_	_	0.0	_		0.0	_	_		_	_	
	ue Clearance Time (g s), s			_	-	0.0	16.5	_	0.0	_		22.2	_	_	12.2
	n Extension Time (g_e), s			_	_	0.0	0.0	_	0.0	_	_	0.9	_	_	1.0
Phase Call Prol				_	-		1.00	_			-	1.00	_	-	1.00
Max Out Proba	DIIIty	_		_	-		1.00	_		_		0.01	_	-	0.00
Movement Gro	up Res	sults			EB			WB			NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	T	R
Assigned Move	ment			5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow F	Rate (v), veh/h		49	1583	95	200	421	402	115	43	195		153	
		ow Rate (s), veh/h/l	n	669	1687	1457	1701	1758	1677	1318	1786	1463		1529	
Queue Service				5.3	59.5	4.7	14.5	14.9	14.9	10.0	2.4	14.5		7.5	
Cycle Queue C	learanc	e Time (<i>g c</i>), s		5.3	59.5	4.7	14.5	14.9	14.9	20.2	2.4	14.5		10.2	
Green Ratio (g	/C)			0.48	0.48	0.48	0.16	0.64	0.64	0.27	0.27	0.27		0.27	
Capacity (c), v	/eh/h			378	1627	703	275	1118	1067	314	490	402		459	
Volume-to-Capa	acity Ra	atio (X)		0.129	0.973	0.135	0.728	0.376	0.377	0.367	0.089	0.484		0.334	
Back of Queue	(Q), f	t/ln (50 th percentile)												
		eh/ln (50 th percent		0.9	27.0	1.7	6.8	5.9	5.6	3.3	1.0	5.2		3.9	
		RQ) (50 th percent	tile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
Uniform Delay				18.8	32.8	18.6	51.8	11.5	11.3	46.0	35.1	39.4		37.8	
Incremental De		,		0.7	16.7	0.4	8.2	1.0	1.0	0.3	0.0	0.3	_	0.2	
	ial Queue Delay (d 3), s/veh			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
	atrol Delay (d), s/veh			19.5	49.5	19.0	60.0	12.5	12.3	46.3	35.1	39.8	-	38.0	
	rel of Service (LOS)			B 47.0	D	B	E 24 7	B	В	D 44.6	D	D	00.4	D	
	roach Delay, s/veh / LOS section Delay, s/veh / LOS			47.0	,	D	21.7		С	41.3)	D	38.0	J	D
intersection De	iay, s/ve	en / LOS				38	3.0						D		
Multimodal Re	sults				EB			WB			NB			SB	
Pedestrian LOS		/LOS		2.10		В	1.66	_	В	2.30		В	2.45		В
Bicycle LOS Sc				1.91	-	В	1.33	-	Α	1.07	-	Α	0.74	-	Α
,															

EXHIBIT 4.21 2024 PEAK AM HOUR ANALYSIS (Background Traffic) - Viseneau/Innes

		HCS	Sigr	nalize	d Inte	ersect	ion R	esult	s Sun	ımary	,				
Company Inform	4:								ntersec	tian Inf	4i			4741	k U
General Inforn	ation							_					- 1	4	
Agency					. 5 .	1.0.0.0		-	Duration,		0.250		-		
Analyst				-		12/8/2		-	Area Typ	e	Other				
Jurisdiction		City of Ottawa		Time F			AM Hou		PHF		0.92		_₹		-
Urban Street		Innes Road		-	sis Year	_		_	Analysis	Period	1> 7:0	00			į.
Intersection		Viseneau/Innes		File Na			024_ba	k_AM.:	xus					ጎተሰ	
Project Descrip	tion	Innes Road Develo	pment -	Backgr	ound T	raffic	_	_	_	_	_	_	1	14144	† (*
Demand Inform	nation				EB		_	WB			NB		_	SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Demand (v), v				12	356	40	63	1219	9 35	24	5	42	49	14	50
Cianal Inform	tion				- 144										
Signal Informa		Reference Phase	2	1	}	≒ ,• •	542				_		A		本
Cycle, s	110.0				"	<u> </u>	1:7	7				1	7 2	3	4
Offset, s	0	Reference Point	End	Green	5.7	49.7	34.7	0.0	0.0	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow		3.7	3.0	0.0	0.0	0.0					V
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.6	2.6	4.3	0.0	0.0	0.0		5	6	7	8
Timer Results				EBI		EBT	WB	L	WBT	NBI	_	NBT	SBI	L	SBT
Assigned Phase	e					2	1		6			8			4
Case Number						5.3	2.0		4.0			5.0			8.0
Phase Duration	S .					56.0	12.0	-	68.0			42.0			42.0
Change Period		c) s		_		6.3	6.3	-	6.3			7.3	_		7.3
Max Allow Hea				_	_	0.0	3.1	_	0.0	_	_	3.3	_	_	3.3
Queue Clearan				_		0.0	6.2		0.0	_		10.0	_		8.5
				-	-	0.0		_	0.0	-	-		-	-	
Green Extension		(<i>g</i> e), S		-	_	0.0	0.0	-	0.0	_	_	0.4	-	_	0.4
Phase Call Pro				_	-		1.00	_		_	-	1.00	_		1.00
Max Out Proba	DIIIty			-	-		1.00	,				0.00	-		0.00
Movement Gro	up Res	sults			EB			WB			NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	T	R
Assigned Move	ment			5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow I	Rate (v), veh/h		13	387	43	68	685	678	26	5	46		123	
		ow Rate (s), veh/h/l	n	390	1647	1424	1661	1744	1724	1351	1800	1497		1486	
Queue Service				2.7	7.9	1.9	4.2	30.6	30.7	1.6	0.2	2.3		3.8	
Cycle Queue C				21.4	7.9	1.9	4.2	30.6	30.7	8.0	0.2	2.3		6.5	
Green Ratio (g		(3 //		0.46	0.46	0.46	0.12	0.57	0.57	0.32	0.32	0.32		0.32	
Capacity (c), v				179	1518	656	196	994	982	425	584	486		529	
Volume-to-Cap		atio (X)		0.073	0.255	0.066	0.349	0.689	_	0.061	0.009	0.094		0.232	
		t/In (50 th percentile)	0.0.0	0	0.000			0.000		0.000	0.00		0.202	
		eh/ln (50 th percenti		0.3	3.0	0.6	1.7	12.4	12.3	0.5	0.1	0.8		2.3	
		RQ) (50 th percent		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
Uniform Delay		- , , , ,	-,	28.6	18.1	16.5	44.6	17.0	16.8	30.2	25.2	25.9		27.2	
Incremental De				0.8	0.4	0.2	0.4	3.9	4.0	0.0	0.0	0.0		0.1	
Initial Queue De	elay (d	з), s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
Control Delay (d), s/v	eh		29.4	18.5	16.7	45.0	20.9	20.7	30.2	25.2	25.9		27.3	
Level of Service				С	В	В	D	С	С	С	С	С		С	
Approach Delay				18.7	7	В	22.0)	С	27.3	3	С	27.3	3	С
Intersection De							.8						С		
								16.50						65	
Multimodal Re					EB			WB			NB			SB	
Pedestrian LOS				2.10	-	В	1.67	-	В	2.29	-	В	2.44	-	В
Bicycle LOS So	ore / L0	JS		0.85		Α	1.67	'	В	0.61		Α	0.69)	Α

EXHIBIT 4.22 2024 PEAK PM HOUR ANALYSIS (Background Traffic) - Viseneau/Innes

		HCS	Sigr	nalize	d Inte	ersect	ion R	esult	s Sun	nmary	,				
Company Inform	4:								l4	l£	4i			14741	k U
General Inform	nation							\rightarrow	Intersec				- 6	4	
Agency						Lining		-	Duration		0.250		- 2		
Analyst				-		12/8/2		-	Area Typ	е	Other				
Jurisdiction		City of Ottawa		Time F			PM Hou		PHF		0.92		*		-
Urban Street		Innes Road		Analys	sis Year				Analysis	Period	1> 7:0	00	7		,
Intersection		Viseneau/Innes		File Na	ame	723_2	024_ba	k_PM.	xus					111	
Project Descrip	tion	Innes Road Develo	pment -	Backgr	ound T	raffic							1	14144	7 1
Demand Inform	nation				EB			WE	3		NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Demand (v), v				48	1451		197	719		114	43	192	64	55	32
0: 11.6							. II:								
Signal Informa		Reference Phase	2	-	}	≒ , ₹					_	_	A		本
Cycle, s	130.0				"	<u> </u>	1:7	7				1	7 2	3	4
Offset, s	0	Reference Point	End	Green	13.7	61.7	34.7	0.0	0.0	0.0			<u> </u>		
Uncoordinated	No	Simult. Gap E/W	On	Yellow		3.7	3.0	0.0	0.0	0.0					V
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.6	2.6	4.3	0.0	0.0	0.0		5	6	7	8
Timer Results				EBL	$\overline{}$	EBT	WB	L	WBT	NBI		NBT	SBI		SBT
Assigned Phase	e					2	1		6			8			4
Case Number						5.3	2.0		4.0			5.0			8.0
Phase Duration				_		68.0	20.0	-	88.0	_		42.0	_	_	42.0
Change Period		c). S				6.3	6.3	-	6.3			7.3			7.3
Max Allow Head		,-		_	_	0.0	3.1	_	0.0	_	_	3.3	_	_	3.3
Queue Clearan	• `			_		0.0	17.7	-	0.0	_		24.1	_		13.1
				_	-	0.0	_	_	0.0	_			_	-	
Green Extension		(<i>g</i> e), S		-	_	0.0	0.0	_	0.0	-	_	1.0	_	_	1.1
Phase Call Prol				_	-		1.00	_		-	-	1.00	_		1.00
Max Out Proba	DIIIty			-	-		1.00	,		-		0.02	-		0.00
Movement Gro	up Res	sults			EB			WB			NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Move	ment			5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow F), veh/h		52	1577	101	214	450	429	124	47	209		164	
		ow Rate (s), veh/h/l	n	635	1687	1457	1701	1758	1677	1310	1786	1463		1528	
Queue Service				6.0	59.1	5.0	15.7	16.3	16.3	11.0	2.5	15.7		8.4	
Cycle Queue C				6.0	59.1	5.0	15.7	16.3	16.3	22.1	2.5	15.7		11.1	
Green Ratio (g		(3 -), -		0.48	0.48	0.48	0.16	0.64	0.64	0.27	0.27	0.27		0.27	
Capacity (c), v				362	1627	703	275	1118	1067	304	490	402		459	
Volume-to-Capa		atio (X)		0.144	0.969	0.144	0.779	0.402	_	0.408	0.095	0.520		0.357	
		t/In (50 th percentile)		0.000				01102		0.000	0.020			
		eh/ln (50 th percent		1.0	26.7	1.8	7.6	6.4	6.1	3.6	1.1	5.7		4.2	
		RQ) (50 th percent		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
Uniform Delay		- , , , ,	-,	19.0	32.7	18.7	52.3	11.8	11.6	47.2	35.1	39.9		38.1	
Incremental De				0.8	16.1	0.4	12.2	1.1	1.1	0.3	0.0	0.6		0.2	
Initial Queue De	elay (d	з), s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
Control Delay (19.8	48.8	19.1	64.5	12.8	12.7	47.5	35.2	40.5		38.3	
Level of Service				В	D	В	E	В	В	D	D	D		D	
Approach Delay				46.2	2	D	22.9	9	С	42.1		D	38.3	3	D
Intersection De							7.8						D		
								1							
Multimodal Re					EB			WB			NB			SB	
Pedestrian LOS				2.10	-	В	1.66	-	В	2.30	-	В	2.45	-	В
Bicycle LOS So	ore / L0	JS		1.92	2	В	1.39)	Α	1.11		Α	0.76	j	Α

EXHIBIT 4.23 2029 PEAK AM HOUR ANALYSIS (Background Traffic) - Viseneau/Innes

		HCS	7 Sig	nalize	d Int	ersec	tion F	Resul	lts Sur	nmar	y				
General Inform	nation								Intersec	tion Inf	ormatio	on		* 1	Ja lg
Agency									Duration	, h	0.250)		*	
Analyst				Analys	sis Date	12/8/2	2020		Area Typ	е	Other	r	<u></u>		
Jurisdiction		City of Ottawa		Time F	Period	Peak	AM Hou	ır 📗	PHF		0.92		*		÷
Urban Street		Innes Road		Analys	sis Year	2029			Analysis	Period	1> 7:0	00	*		
Intersection		Viseneau/Innes		File Na	ame	723_2	029_ba	ık_AM.	xus					htr	
Project Descrip	tion	Innes Road Develo	pment -	Backgr	ound T	raffic							1	4144	h r
Demand Inform	nation				EB		_	WE	₹	_	NB			SB	
Approach Move				L	T	R	L	T	R	L	T	│ R	L	T	R
Demand (v), v				12	374	42	66	128	_	25	6	44	53	15	52
Demand (v), v	en/m			12	3/4	42	- 00	120	0 31	23	0	44	- 55	15	52
Signal Informa	tion				2			T	\top	\top			_		\mathbf{L}
Cycle, s	110.0	Reference Phase	2		5	†∰ `	5/10	a			×		♦ 』		кfд
Offset, s	0	Reference Point	End	Green	5.7	49.7	34.7	0.0	0.0	0.0		1	¥ 2	3	
Uncoordinated	No	Simult. Gap E/W	On	Yellow		3.7	3.0	0.0	0.0	0.0			—		KŤ2
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.6	2.6	4.3	0.0	0.0	0.0		5	6	7	Y
Timer Results				EBI	-	EBT	WB	L	WBT	NBI	_	NBT	SBI	-	SBT
Assigned Phase	9					2	1		6			8			4
Case Number				_	_	5.3	2.0	-	4.0	_	_	5.0	_	_	8.0
Phase Duration				_	_	56.0	12.0	-	68.0	_	_	42.0		_	42.0
Change Period,	(Y+R	c), s			_	6.3	6.3	_	6.3			7.3			7.3
Max Allow Head						0.0	3.1	_	0.0			3.3			3.3
Queue Clearan	ce Time	e (g s), s					6.4	-				10.6			8.9
Green Extensio		(g e), s				0.0	0.0	-	0.0			0.4			0.4
Phase Call Prol							1.00	_			_	1.00			1.00
Max Out Proba	bility			_	_		1.00			_	_	0.00	_	_	0.00
Movement Gro	up Res	sults			EB			WB			NB			SB	_
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Move				5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow F), veh/h		13	407	46	72	719	712	27	7	48		130	
		ow Rate (s), veh/h/l	n	365	1647	1424	1661	1744	_	1347	1800	1497		1485	
Queue Service		. ,,		3.0	8.4	2.0	4.4	33.2	_	1.7	0.3	2.5		4.4	
Cycle Queue C				24.3	8.4	2.0	4.4	33.2		8.6	0.3	2.5		6.9	
Green Ratio (g		(30),0		0.46	0.46	0.46	0.12	0.57	0.57	0.32	0.32	0.32		0.32	
Capacity (c), v				163	1518	656	196	994	982	418	584	486		529	
Volume-to-Capa		atio (X)		0.080	0.268	0.070	0.366	-	_	0.065	0.011	0.098		0.247	
		/In (50 th percentile)		7.9	83	17.4	46.7	-	337.1	13.6	2.9	21.7		63.6	
		eh/ln (50 th percenti		0.3	3.2	0.7	1.8	13.5	_	0.5	0.1	0.9		2.5	
		RQ) (50 th percent		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
Uniform Delay (,,,	,	30.7	18.2	16.5	44.7	17.6	_	30.6	25.2	25.9		27.4	
Incremental De				1.0	0.4	0.2	0.4	4.6	4.7	0.0	0.0	0.0		0.1	
Initial Queue De				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
Control Delay (,.		31.6	18.7	16.7	45.1	22.2	22.0	30.6	25.2	26.0		27.5	
Level of Service	, .			С	В	В	D	С	С	С	С	С		С	
Approach Delay				18.8	3	В	23.2	2	С	27.4	1	С	27.5	5	С
	tersection Delay, s/veh / LOS						2.7						С		
	ultim a dal Daguita														
Multimodal Re				_	EB			WB			NB			SB	
Pedestrian LOS				2.10	-	В	1.67	-	В	2.29	-	В	2.44	-	В
Bicycle LOS Sc	ore / LO	OS		0.87	'	Α	1.73	3	В	0.62	2	Α	0.70)	Α

EXHIBIT 4.24 2029 PEAK PM HOUR ANALYSIS (Background Traffic) - Viseneau/Innes

		HCS	Sigr	nalize	d Inte	rsect	ion R	esult	ts Sun	nmary	,				
														4 7 4 1	el m
General Inform	ation							_	Intersec				- 1	4	* 4
Agency								$\overline{}$	Duration		0.250		-		
Analyst				-		12/8/2		\rightarrow	Area Typ	е	Other				*
Jurisdiction		City of Ottawa		Time F			PM Hou	ır I	PHF		0.92		*		7
Urban Street		Innes Road		Analys	is Year				Analysis	Period	1> 7:0	00	7		
Intersection		Viseneau/Innes		File Na	ame	723_2	029_ba	k_PM.	xus					111	
Project Descrip	tion	Innes Road Develo	pment -	Backgr	ound T	raffic							T	4 1 4 4	tr [f]
Demand Inform	nation				EB		_	WE	<u> </u>	_	NB			SB	_
Approach Move				L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), v				51	1525	-	207	757	_	119	45	202	68	57	34
Demand (V), V	CII/II		-	31	1323	30	201	131	90	119	43	202	- 00	31	34
Signal Informa	tion							\top	\neg	\top					I
Cycle, s	130.0	Reference Phase	2	1	2	∃ <u>₽</u> * '	15 A	al .			×		4		4
Offset, s	0	Reference Point	End	Green	12.7	61.7	24.7	0.0	0.0	0.0		1	Y 2	3	
Uncoordinated	No	Simult. Gap E/W	On	Yellow	-	3.7	34.7	0.0	0.0	0.0			4		ĸŤ:
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.6	2.6	4.3	0.0	0.0	0.0		5	6	7	Y
Timer Results				EBL		EBT	WB	L	WBT	NB	L	NBT	SBI	-	SBT
Assigned Phase	Э					2	1		6			8			4
Case Number						5.3	2.0		4.0			5.0			8.0
Phase Duration	·					68.0	20.0)	88.0			42.0			42.0
Change Period,	nge Period, (Y+R ∘), s					6.3	6.3		6.3			7.3			7.3
Max Allow Head	dway (/	<i>MAH</i>), s				0.0	3.1		0.0			3.3			3.3
Queue Clearan	ce Time	e (g s), s					18.6	3				25.5			13.8
Green Extensio	n Time	(g e), s				0.0	0.0		0.0			1.0			1.2
Phase Call Prol	bability						1.00)				1.00			1.00
Max Out Proba	bility				\perp		1.00)			\perp	0.05			0.00
Movement Gro	up Res	sults			EB		_	WB		_	NB		_	SB	
Approach Move				L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Move				5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow F), veh/h		55	1658	107	225	474	452	129	49	220		173	· · ·
		ow Rate (s), veh/h/l	n	608	1687	1457	1701	1758	_	1305	1786	1463		1525	
Queue Service				6.8	62.7	5.3	16.6	17.5	17.5	11.7	2.7	16.7		9.1	
Cycle Queue C				6.8	62.7	5.3	16.6	17.5	17.5	23.5	2.7	16.7		11.8	
Green Ratio (g		, .		0.48	0.48	0.48	0.16	0.64	0.64	0.27	0.27	0.27		0.27	
Capacity (c), v				349	1627	703	275	1118	1067	296	490	402		458	
Volume-to-Capa		atio (X)		0.159	1.019	0.152	0.819	0.424	0.424	0.438	0.100	0.547		0.377	
Back of Queue	(Q), f	t/ln (50 th percentile)												
Back of Queue	(Q), ve	eh/ln (50 th percenti	le)	1.0	30.6	1.9	8.3	6.9	6.6	3.8	1.2	6.1		4.5	
		RQ) (50 th percent		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
Uniform Delay (d 1), s	/veh		19.2	33.7	18.8	52.7	12.0	11.8	48.0	35.2	40.2		38.4	
Incremental De	lay (d 2), s/veh		1.0	27.1	0.5	16.4	1.2	1.2	0.4	0.0	0.9		0.2	
Initial Queue De	elay (d	з), s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
Control Delay (d), s/ve	eh		20.1	60.8	19.3	69.1	13.2	13.0	48.4	35.2	41.1		38.6	
Level of Service	(LOS)			С	F	В	Е	В	В	D	D	D		D	
Approach Delay	, s/veh	/LOS		57.1		Е	24.0)	С	42.8	3	D	38.6	3	D
Intersection De	ntersection Delay, s/veh / LOS						3.8						D		
Multimodal Re					EB			WB			NB			SB	
Pedestrian LOS				2.10	-	В	1.66	-	В	2.30	-	В	2.45	-	В
Bicycle LOS Sc	ore / LC	OS		1.99)	В	1.44	4	Α	1.14	1	Α	0.77	7	Α

EXHIBIT 4.25 2024 PEAK AM HOUR ANALYSIS (Total Traffic) - Viseneau/Innes

		HCS	Sigr	nalize	d Inte	ersect	ion R	esult	s Sun	nmary	,				
Company Inform	4:									tian Inf	4i			4741	k U
General Inforn	nation							\rightarrow	ntersec				- 6	4	
Agency					. 5 .	1.0.0.0		-	Duration,		0.250		-		
Analyst				-		12/8/2		-	Area Typ	e	Other				
Jurisdiction		City of Ottawa		Time F			AM Hou		PHF		0.92				7
Urban Street		Innes Road		-	is Year	_		_	Analysis	Period	1> 7:0	00			į.
Intersection		Viseneau/Innes		File Na	ame	723_2	024_to	_AM.x	us					ጎተሰ	
Project Descrip	tion	Innes Road Develo	pment	_	_	_	_	_	_	_	_	_	1	14144	† (*
Demand Inform	nation				EB			WE	3		NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Demand (v), v				12	362	40	72	124	1 35	24	5	42	49	14	50
Cianal Inform	tion				ىپىد										
Signal Informa		Reference Phase	2	1	}	≒ ,• •	= ZV2				_		A		本
Cycle, s	110.0				"	<u> </u>	T:	7				1	7 2	3	4
Offset, s	0	Reference Point	End	Green		49.7	34.7	0.0	0.0	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow		3.7	3.0	0.0	0.0	0.0					V
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.6	2.6	4.3	0.0	0.0	0.0		5	6	7	8
Timer Results				EBI		EBT	WB	L	WBT	NB	_	NBT	SBI	L	SBT
Assigned Phase	е					2	1		6			8			4
Case Number						5.3	2.0		4.0			5.0			8.0
Phase Duration	. s					56.0	12.0	-	68.0			42.0			42.0
Change Period		c) s		_		6.3	6.3	-	6.3			7.3	_		7.3
Max Allow Hea				_	_	0.0	3.1	_	0.0	_	_	3.3	_	_	3.3
Queue Clearan	• `			_		0.0	6.8		0.0	_		10.0	_		8.5
				-	-	0.0	_	-	0.0	-	_		-	-	
Green Extension		(<i>g</i> e), S		-		0.0	0.0	-	0.0	-	_	0.4	-	_	0.4
Phase Call Pro				_	-		1.00	_		_	-	1.00	_		1.00
Max Out Proba	DIIIty			-			1.00	_				0.00	-		0.00
Movement Gro	up Res	sults			EB			WB			NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	T	R
Assigned Move	ment			5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow I	Rate (v), veh/h		13	393	43	78	697	690	26	5	46		123	
		ow Rate (s), veh/h/l	n	381	1647	1424	1661	1744	1724	1351	1800	1497		1486	
Queue Service				2.8	8.0	1.9	4.8	31.5	31.6	1.6	0.2	2.3		3.8	
Cycle Queue C	learanc	e Time (q c), s		22.4	8.0	1.9	4.8	31.5	31.6	8.0	0.2	2.3		6.5	
Green Ratio (g	/C)	(3 //		0.46	0.46	0.46	0.12	0.57	0.57	0.32	0.32	0.32		0.32	
Capacity (c), v				173	1518	656	196	994	983	425	584	486		529	
Volume-to-Cap		atio (X)		0.075	0.259	0.066	0.399	0.701	_	0.061	0.009	0.094		0.232	
		t/In (50 th percentile)	0.0.0	0.200	0.000			011.02	-	0.000	0.00		0.202	
		eh/ln (50 th percenti		0.3	3.1	0.6	2.0	12.8	12.7	0.5	0.1	0.8		2.3	
		RQ) (50 th percent		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
Uniform Delay		, , , ,	-,	29.3	18.2	16.5	44.9	17.2	17.0	30.2	25.2	25.9		27.2	
Incremental De				0.8	0.4	0.2	0.5	4.1	4.2	0.0	0.0	0.0		0.1	
Initial Queue De	elay (d	з), s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
Control Delay (d), s/v	eh		30.1	18.6	16.7	45.4	21.3	21.2	30.2	25.2	25.9		27.3	
Level of Service				С	В	В	D	С	С	С	С	С		С	
Approach Delay				18.7		В	22.5	5	С	27.3	3	С	27.3	3	С
Intersection De							2.2						С		
								1.4.5						65	
Multimodal Re		// 00			EB		1.53	WB		2.0	NB	_		SB	
Pedestrian LOS				2.10	-	В	1.67	-	В	2.29	-	В	2.44	-	В
Bicycle LOS So	ore / L0	JS		0.86	5	Α	1.70)	В	0.6		Α	0.69)	Α

EXHIBIT 4.26 2024 PEAK PM HOUR ANALYSIS (Total Traffic) - Viseneau/Innes

		HCS	Sigr	nalize	d Inte	rsect	ion R	esult	ts Sun	ımary	,				
General Inform	nation								Intersec	tion Inf	ormatio	on		4 74 1	Ja lu
Agency									Duration,	h	0.250)	7	7	
Analyst				Analys	is Date	12/8/2	2020		Area Typ	е	Other		<u> </u>		
Jurisdiction		City of Ottawa		Time F	Period	Peak	PM Hou	ır	PHF		0.92		*		÷_
Urban Street		Innes Road		Analys	is Year	2024			Analysis	Period	1> 7:0	00			
Intersection		Viseneau/Innes		File Na	ame	723_2	024_tot	_PM.x	us					htr	
Project Descrip	tion	Innes Road Develo	pment										1	1144	* (*
Demand Inform	nation				EB		_	WE	2	_	NB		_	SB	
				L	T	R	L	T	R	L	T	R	L	T	R
Approach Move				48	1473	-	-	733		-	_	-	-	55	-
Demand (v), v	en/n			40	14/3	93	203	/30	3 90	114	43	192	64	55	32
Signal Informa	tion				2			\top	\top	\top					1
Cycle, s	130.0	Reference Phase	2	1	2	†#" `	54				×		♦ 2	1	Δy.
Offset, s	0	Reference Point	End	Green	12.7	61.7	34.7	0.0	0.0	0.0		1	¥ 2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Yellow	-	3.7	34.7	0.0	0.0	0.0			4		κŤ
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.6	2.6	4.3	0.0	0.0	0.0		5	6	7	Y
Timer Results				EBI	-	EBT	WB	L	WBT	NBI	_	NBT	SB	L	SBT
Assigned Phase	е					2	1	_	6			8			4
Case Number						5.3	2.0	_	4.0			5.0			8.0
Phase Duration					_	68.0	20.0	-	88.0			42.0			42.0
Change Period	(Y+R	c), S				6.3	6.3		6.3			7.3			7.3
Max Allow Head						0.0	3.1		0.0			3.3			3.3
Queue Clearan	ce Time	e (g s), s					18.2	2				24.1			13.1
Green Extension	n Time	(g _e), s				0.0	0.0		0.0			1.0			1.1
Phase Call Pro	bability						1.00)				1.00			1.00
Max Out Proba	bility						1.00)				0.02			0.00
Movement Gro	un Res	sults			EB			WB			NB			SB	
Approach Move		74.150		L	T	R	L	Т	I R	L	Т	R	L	T	R
Assigned Move				5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow F) veh/h		52	1601	101	221	458	437	124	47	209	<u> </u>	164	17
		ow Rate (s), veh/h/l	n	626	1687	1457	1701	1758		1310	1786	1463	_	1528	
Queue Service		. ,,	.,	6.1	60.8	5.0	16.2	16.6	_	11.0	2.5	15.7		8.4	
Cycle Queue C				6.1	60.8	5.0	16.2	16.6	16.6	22.1	2.5	15.7		11.1	
Green Ratio (g		5 mile (g c), 5		0.48	0.48	0.48	0.16	0.64		0.27	0.27	0.27		0.27	
Capacity (c), v				357	1627	703	275	1118	1068	304	490	402	_	459	
Volume-to-Capa		atio (X)		0.146	0.984	0.144	0.803	-	_	0.408	0.095	0.520		0.357	
		t/ln (50 th percentile)	5.140	0.004	5.177	5.555	0.708	. J. 700	5.400	0.000	5.520		5.557	
		eh/ln (50 th percenti		1.0	28.0	1.8	8.0	6.6	6.3	3.6	1.1	5.7		4.2	
		RQ) (50 th percent		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
Uniform Delay		, , , , , , , , , , , , , , , , , , ,		19.0	33.2	18.7	52.5	11.8	11.6	47.2	35.1	39.9		38.1	
Incremental De	lay (d 2), s/veh		0.9	18.8	0.4	14.6	1.1	1.2	0.3	0.0	0.6		0.2	
Initial Queue De	elay (d	з), s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
Control Delay (d), s/v	eh		19.9	52.0	19.1	67.1	12.9	12.8	47.5	35.2	40.5		38.3	
Level of Service				В	D	В	Е	В	В	D	D	D		D	
Approach Delay	, s/veh	/LOS		49.1		D	23.6	3	С	42.1		D	38.3	3	D
	tersection Delay, s/veh / LOS					39	9.5						D		
	ultimedal Peculta														
Multimodal Re					EB	_		WB			NB	_		SB	
Pedestrian LOS				2.10	-	В	1.66	-	В	2.30	-	В	2.45	-	В
Bicycle LOS So	ore / LO	OS		1.93	3	В	1.41		Α	1.11		Α	0.76	3	Α

EXHIBIT 4.27 2029 PEAK AM HOUR ANALYSIS (Total Traffic) - Viseneau/Innes

		HCS	Sigr	nalize	d Inte	rsect	ion R	esult	ts Sun	nmary	,				
General Inform	ation							\rightarrow	Intersec				<u> </u>	4741	Ja la
Agency								-	Duration		0.250		-		
Analyst				Analys	sis Date	12/8/2	2020		Area Typ	е	Other		<u></u>		
Jurisdiction		City of Ottawa		Time F			AM Hou	ır l	PHF		0.92		-₹ -₹		7
Urban Street		Innes Road		Analys	sis Year	2029			Analysis	Period	1> 7:0	00	7		
Intersection		Viseneau/Innes		File Na	ame	723_2	029_tot	_AM.x	us					111	
Project Descript	ion	Innes Road Develo	pment										Т	1414	\$* I*
Damand Inform	4!				EB		_	WE		_	NB			SB	
Demand Inform									_		_	T 5			
Approach Move				L 40	T	R	L	T	R 0.7	L	T	R	L	T 45	R
Demand (v), ve	en/n		-	12	380	42	75	130	2 37	25	6	44	52	15	53
Signal Informat	tion				1			$\overline{}$	$\overline{}$	$\overline{}$					т
Cycle, s	110.0	Reference Phase	2	1	5	₹₹ *	542	_			×	<u></u> _	<u> </u>		Φ.
Offset, s	0	Reference Point	End							4		1	2	3	
Uncoordinated	No	Simult, Gap E/W	On	Green	_	49.7	34.7	0.0	0.0	0.0			—		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow Red	2.6	3.7	3.0 4.3	0.0	0.0	0.0		5	6	7	Ψ
T OFGE WIGGE	TIXCU	Cirruit: Cup 14/C	OII	Ttou		12.0	1.0	10.0	10.0	10.0					
Timer Results				EBI		EBT	WB	L	WBT	NBI		NBT	SBI		SBT
Assigned Phase						2	1		6			8			4
Case Number						5.3	2.0		4.0			5.0			8.0
Phase Duration.	<u>'</u>					56.0	12.0	-	68.0			42.0		\neg	42.0
	e Period, (Y+R c), s					6.3	6.3	-	6.3			7.3			7.3
Max Allow Head	•	, .				0.0	3.1	\neg	0.0			3.3		_	3.3
Queue Clearance						0.0	7.0	\rightarrow	0.0			10.6			8.9
Green Extension						0.0	0.0	-	0.0	_	\neg	0.4		-	0.4
Phase Call Prob		(3 - /, -					1.00	-				1.00			1.00
Max Out Probab					\neg		1.00	-			_	0.00		_	0.00
Mayamant Cra	D				- FD			\A/D			ND			CD	
Movement Gro		suits			EB T	В		WB T	T D	-	NB T	В		SB T	П
Approach Move				L		R	L	_	R	L		R	L		R
Assigned Mover		\ ln //n		5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow R		,.		13	413	46	82	731	725	27	7	48	_	130	
		ow Rate (s), veh/h/l	n	357	1647	1424	1661	1744		1346	1800	1497	_	1486	
Queue Service				3.1 25.4	8.5 8.5	2.0	5.0	34.1	34.3	1.7 8.6	0.3	2.5	_	4.3 6.9	
Cycle Queue Cle Green Ratio (g/		e Time (g c), s		0.46	0.46	0.46	0.12	0.57	0.57	0.32	0.32	0.32		0.32	
				158			_	-	_				_		
Capacity (c), ve		tio (V)		0.083	1518 0.272	0.070	196 0.415	994 0.735	983	418 0.065	584 0.011	486 0.098		529 0.247	
		t/In (50 th percentile)	0.063	0.212	0.070	0.415	0.735	0.737	0.000	0.011	0.098		0.247	
		eh/In (50 th percentile	,	0.3	3.3	0.7	2.1	14.0	13.9	0.5	0.1	0.9		2.5	
		RQ) (50 th percent		0.00	0.00	0.7	_	_	0.00	0.00	0.00	0.00		0.00	
Uniform Delay (, , , , ,	iie)	31.4	_		0.00	0.00	_	30.6	25.2	25.9		27.4	
Incremental Delay				1.0	18.3 0.4	16.5 0.2	45.0 0.5	17.8 4.8	17.5 4.9	0.0	0.0	0.0		0.1	
Initial Queue De	, ,	,.		0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
Control Delay (, .		32.4	18.7	16.7	45.5	22.6	22.5	30.6	25.2	26.0		27.5	
Level of Service	, .			C	B	B	D	C	C	C	C C	C C		C C	
Approach Delay				18.9	_	В	23.8	_	С	27.4		С	27.5	_	С
Intersection Delay	,			10.8	,		3.1	,	<u> </u>	21.5	•		C 27.5	,	
	ω y , σι ν €					2	, ı								
Multimodal Res	sults				EB			WB			NB			SB	
Pedestrian LOS		/LOS		2.10		В	1.67	7	В	2.29	9	В	2.44	4	В
i daddinan Edd		OS		0.88		Α	1.76		В	0.62		Α	0.70		Α

EXHIBIT 4.28 2029 PEAK PM HOUR ANALYSIS (Total Traffic) - Viseneau/Innes

		HCS	Sigr	nalize	d Inte	rsect	ion R	esult	s Sun	nmary	,				
														147411	el El
General Inform	ation							_	ntersec				- i	4	* 4
Agency						L		-	Duration,		0.250				
Analyst				-		12/8/2		-	Area Typ	е	Other				*
Jurisdiction		City of Ottawa		Time F			PM Hou		PHF		0.92		♦		7
Urban Street		Innes Road		Analys	is Year				Analysis	Period	1> 7:0	00	7		
Intersection		Viseneau/Innes		File Na	ame	723_2	:029_tot	_PM.xı	us					111	
Project Descript	tion	Innes Road Develo	pment										Ī	4 1 4 7	tr [f]
Demand Inforn	nation				EB		_	WB		_	NB			SB	_
Approach Move				L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), v				51	1547	98	213	771	_	119	45	202	68	57	34
Demand (V), V	EII/II		-	31	1547	90	213	111	95	119	40	202	00	31	34
Signal Informa	tion				,	- "5		$\overline{}$	$\overline{}$	\top					1
Cycle, s	130.0	Reference Phase	2	1	5	™ *	EW	al			K		4	1	4
Offset, s	0	Reference Point	End	C===	12.7	61.7	24.7		-	0.0		1	2	3	
Uncoordinated	No	Simult. Gap E/W	On	Green Yellow		3.7	34.7	0.0	0.0	0.0			—		KŤ:
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.6	2.6	4.3	0.0	0.0	0.0		5	6	7	Y
Timer Results				EBL	-	EBT	WB	L	WBT	NBI	L	NBT	SBI	L	SBT
Assigned Phase	9					2	1		6			8			4
Case Number						5.3	2.0		4.0			5.0			8.0
Phase Duration	·					68.0	20.0		88.0			42.0			42.0
Change Period,	nge Period, (Y+Rc), s					6.3	6.3		6.3			7.3			7.3
Max Allow Head	dway (/	<i>MAH</i>), s				0.0	3.1	\neg	0.0			3.3		\neg	3.3
Queue Clearan	ce Time	e (gs), s					19.2	2				25.5			13.8
Green Extensio					\neg	0.0	0.0	\neg	0.0			1.0		$\overline{}$	1.2
Phase Call Prob	ability	,,,					1.00					1.00			1.00
Max Out Probal	oility						1.00					0.05			0.00
Movement Gro	un Pos	culte			EB			WB			NB			SB	
Approach Move		uits		L	Т	R	L	T	R	L	T	R	L	T	R
				5	2	12	1	6	16	3	8	18	7	4	_
Assigned Move) voh/h		55			232	482	-	129	49	220	/	_	14
Adjusted Flow F		,.	n		1682	107			460		_			173	
		ow Rate (s), veh/h/l	11	599 6.9	1687 62.7	1457 5.3	1701 17.2	1758 17.8	1678 17.8	1305 11.7	1786 2.7	1463 16.7		1525 9.1	
Queue Service Cycle Queue C				6.9	62.7	5.3	17.2	17.8	17.8	23.5	2.7	16.7		11.8	
Green Ratio (g		e mile (g c), s		0.48	0.48	0.48	0.16	0.64	0.64	0.27	0.27	0.27		0.27	
Capacity (c), v				344	1627	703	275	1118	1068	296	490	402		458	
Volume-to-Capa		atio (X)		0.161	1.033	0.152	0.843	0.431	0.431	0.438	0.100	0.547		0.377	
		t/In (50 th percentile)	0.101	1.033	0.152	0.043	0.431	0.431	0.430	0.100	0.547		0.317	
	, .	eh/In (50 th percentile	,	1.0	31.6	1.9	8.8	7.0	6.7	3.8	1.2	6.1		4.5	
		RQ) (50 th percent		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
Uniform Delay (- , , ,	iiie)	19.2		18.8	52.9	12.0	11.9	48.0	35.2	40.2		38.4	
Incremental Del				1.0	33.7	0.5	19.5	1.2	1.3	0.4	0.0	0.9		0.2	
Initial Queue De	, ,	,.		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.2	
Control Delay (, .		20.2	65.1	19.3	72.4	13.3	13.1	48.4	35.2	41.1		38.6	
Level of Service	, .			C C	65.1	19.3 B	72.4 E	13.3 B	13.1 B	40.4 D	D D	41.1 D		D	
Approach Delay				61.1		E	24.9	_	С	42.8	_	D	38.6	_	D
Intersection Del				01.1			_	,	C	42.0	<u> </u>			,	U
intersection Del		11 / L U.S				40	3.1						D		_
	ay, s/ve														
					EB			WB			NB			SB	_
Multimodal Re	sults			2.10	EB	В	1.66	WB	В	2.30	NB	В	2.45	SB 5	В

EXHIBIT 4.29 2020 PEAK AM HOUR ANALYSIS (Existing Traffic) - Jeanne d'Arc/Innes

		HCS	Sigr	nalize	d Inte	ersect	ion R	esul	ts Sı	ımı	mary					
															(alimias) ni	eTE
General Inform	nation									_		ormatic		ı	4741	
Agency						1.0.0.0			Durati	_		0.250		-		
Analyst		011 (011		-		12/8/2			Area 7	ype	:	Other) E
Jurisdiction		City of Ottawa		Time F		_	AM Hou	ır	PHF			0.92		<u> </u>		?
Urban Street		Innes Road		Analys		\rightarrow			Analys	sis F	eriod	1> 7:0	00	-		v .
Intersection		Jeanne d'Arc/Innes		File Na	ame	723_2	2020_ex	_AM.:	kus						2. (4. (5. c)	
Project Descrip	tion	Innes Road Develo	pment											1	4 1 4 4	h r
Demand Inform	nation		_		EB	_	$\overline{}$	W	В	_		NB	_	$\overline{}$	SB	
Approach Move	ement			L	Т	R	L	T		R	L	Т	R	L	Т	R
Demand (v), v	eh/h			36	327		190	114	18		114	336	71	142	142	52
Signal Informa					1 2				7				_		κ .	<i>ا</i>
Cycle, s	110.0	Reference Phase	2		Γ. «	→	1 1	7 .	١ I				1	→ 2	3	4
Offset, s	0	Reference Point	End	Green	5.9	45.6	24.8	8.7	0	.0	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow		3.7	3.7	3.7		.0	0.0		7	\leftarrow	\	Þ
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.4	2.7	2.5	2.6	0	.0	0.0		6	6	7	8
Times Day 1				ED:		CDT	14/5		\A /D.T		NE		NDT	000		CDT
Timer Results				EBI	-	EBT	WB	-	WBT 6	+	NBL	-	NBT	SBI	-	SBT
Assigned Phase	9			5	_	2	1			+	3		8	2.0		4.0
Case Number Phase Duration				2.0 12.0	-	4.0 52.0	2.0 12.0	$\overline{}$	4.0 52.0	+	2.0 15.0		4.0 31.0	15.0	_	31.0
		- \ c		6.1		6.4	6.1	\rightarrow	6.4	-	6.3		6.2	6.3	$\overline{}$	6.2
	ange Period, (Y+R c), s x Allow Headway (<i>MAH</i>), s			3.1	_	0.0	3.1	-	0.0	+	3.1	_	3.1	3.1	_	3.1
	x Allow Headway (<i>MAH</i>), s eue Clearance Time (<i>g</i> s), s			4.5		0.0	8.9	\rightarrow	0.0	-	6.0		15.0	7.1	_	7.8
Green Extensio		(0),		0.0	-	0.0	0.0	-	0.0	+	0.0		0.6	0.1	_	0.3
Phase Call Pro		(<i>g _e</i>), s		1.00	\rightarrow	0.0	1.00	\rightarrow	0.0	-	1.00		1.00	1.00	,	1.00
Max Out Probal				1.00	-		1.00	-		7	1.00	-	0.01	1.00	_	0.00
max cat roba	J,									e)				1.00		0.00
Movement Gro	up Res	ults			EB			WE		4		NB			SB	
Approach Move	ment			L	Т	R	L	Т	R	4	L	T	R	L	Т	R
Assigned Move	ment			5	2		1	6		4	3	8	18	7	4	14
Adjusted Flow F	Rate (v), veh/h		39	355		207	1248	3	4	124	227	216	154	108	103
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1647	1647		1701	168	_	4	1600	1730	1613	1600	1772	1595
Queue Service		- ,		2.5	7.7		6.9	37.2	-	4	4.0	12.7	13.0	5.1	5.4	5.8
Cycle Queue C		e Time (g_c), s		2.5	7.7	-	6.9	37.2	_	4	4.0	12.7	13.0	5.1	5.4	5.8
Green Ratio (g				0.06	0.42	-	0.06	0.42	_	4	0.09	0.23	0.23	0.09	0.23	0.23
Capacity (c), v				103	1395		107	1429	_	4	282	406	378	282	416	374
Volume-to-Capa		· , ,		0.379	0.255		1.936	0.87	3	4	0.439	0.559	0.570	0.547	0.259	0.276
		/In (50 th percentile		4.0	0.0		40.0	45.5	-	-	1.0	F 1	5 0	0.4	0.0	0.0
		eh/ln (50 th percenti		1.0	3.0		16.3	15.9	$\overline{}$	-	1.6	5.4	5.2	2.1	2.3	2.3
		RQ) (50 th percent	iie)	0.00	0.00		0.00	0.00	$\overline{}$	+	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (49.5 0.8	20.8 0.4		51.6 453.4	29.4 7.6	-	-	47.6 0.4	37.5 1.1	37.2 1.3	48.0 1.3	34.7 0.1	34.5 0.1
	cremental Delay (d 2), s/veh			_	_	-	_	-	-	+	_		_	_		
	al Queue Delay (d ȝ), s/veh			0.0 50.3	21.2		0.0 505.0	0.0 37.1	$\overline{}$	+	0.0 48.0	0.0 38.5	0.0 38.5	0.0 49.3	0.0 34.8	0.0 34.6
	vel of Service (LOS)			D D	21.2 C		505.0	37.1	-	+	48.0 D	38.5 D	38.5 D	49.3 D	34.8 C	34.6 C
	pproach Delay, s/veh / LOS			24.1		С	103.		F	-	40.6	_	D	40.9		D
Intersection Delay				24.1			1.2	J	Г	+	40.0			E 40.8		D
crocollon Del	Stockion Boldy, Great Fee															
Multimodal Re	timodal Results				EB			WE		П		NB			SB	
Pedestrian LOS	Score	/LOS		2.43	3	В	2.43	3	В		2.31		В	2.31		В
Bicycle LOS Sc	ore / LC	os		0.81		Α	1.69	9	В		0.95		Α	0.79	9	Α

EXHIBIT 4.30 2020 PEAK PM HOUR ANALYSIS (Existing Traffic) - Jeanne d'Arc/Innes

		нся	S Sigr	alize	d Inte	ersect	ion R	esul	lts Sı	ımn	nary					
Company Inform	4:								Inton	4: .	I f	4 : -			4 4 4 1	h L
General Inform	ation	I										ormatic		ĺ		
Agency				A 1	·- D-4	40/0/	2000		Duratio			0.250				-
Analyst		0" (0"		-		e 12/8/2			Area T	ype		Other				2
Jurisdiction		City of Ottawa		Time F		_	PM Hou	ır	PHF			0.92			, in	
Urban Street		Innes Road		Analys		-			Analys	is Pe	eriod	1> 7:0)0			
Intersection		Jeanne d'Arc/Innes		File Na	ame	723_2	2020_ex	_PM.:	xus					- 4	4. 41. (5. 5)	
Project Descript	tion	Innes Road Develo	pment		-			_			_			-	4 1 4 4	F[f]
Demand Inform	nation				EB			W	В	т	-	NB	_	_	SB	
Approach Move	ment			L	Т	R	L	T	· F	₹	L	Т	R	L	Т	R
Demand (v), v				139	1280		181	70	7		166	269	256	424	445	81
Signal Informa	tion				2	""			7				_		K .	,
Cycle, s	130.0	Reference Phase	2		Γ '	~ → `	! ↑	2 1 1	s l			×		→ ,		* +
Offset, s	0	Reference Point	End	Green	10.9	52.6	24.8	16	.7 0.	0	0.0					-
Uncoordinated	No	Simult. Gap E/W	On	Yellow		3.7	3.7	3.7			0.0		>	\leftarrow	\	₽.
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.4	2.7	2.5	2.6	3 0.	0	0.0		6	6	7	8
										Ţ						
Timer Results				EBL	-	EBT	WB	L	WBT	+	NBL	-	NBT	SBI	-	SBT
Assigned Phase	e			5	_	2	1	\rightarrow	6	+	3	_	8	7	_	4
Case Number				2.0	_	4.0	2.0	-	4.0	4	2.0	_	4.0	2.0	-	4.0
Phase Duration				17.0 6.1		59.0	17.0	\rightarrow	59.0	4	23.0		31.0	23.0	\rightarrow	31.0
	ange Period, (Y+R c), s				_	6.4	6.1	-	6.4	4	6.3	_	6.2	6.3		6.2
	ax Allow Headway (<i>MAH</i>), s				_	0.0	3.1	\rightarrow	0.0	4	3.1		3.2	3.1		3.1
Queue Clearan	ce Time	e (g s), s		13.8			13.9	9		4	8.5		26.6	19.7	_	23.0
Green Extensio	n Time	(g _∈), s		0.0	_	0.0	0.0	\rightarrow	0.0	4	1.2		0.0	0.0	$\overline{}$	0.3
Phase Call Prob	bability			1.00			1.00)		4	1.00		1.00	1.00)	1.00
Max Out Probal	bility			1.00		_	1.00)	_	_	0.06		1.00	1.00)	1.00
Movement Gro	up Res	sults			EB			WE	3	т	_	NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	7	L	Т	R	L	Т	R
Assigned Move	ment			5	2		1	6			3	8	18	7	4	14
Adjusted Flow F	Rate (v), veh/h		151	1391		197	768		т	180	292	278	461	294	278
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1661	1700		1701	168	7	1	1639	1758	1456	1652	1772	1662
Queue Service	Time (g s), S		11.8	52.9		11.9	22.5	5	т	6.5	20.8	24.6	17.7	20.7	21.0
Cycle Queue C	learanc	e Time (<i>g</i> ℴ), s		11.8	52.9		11.9	22.5	5		6.5	20.8	24.6	17.7	20.7	21.0
Green Ratio (g.	/C)			0.09	0.41		0.09	0.4		7	0.14	0.20	0.20	0.14	0.20	0.20
Capacity (c), v	eh/h			152	1402		156	139	1		446	349	289	450	352	330
Volume-to-Capa	acity Ra	itio (X)		0.994	0.992		1.264	0.55	2	0	.404	0.838	0.963	1.025	0.835	0.844
Back of Queue	(Q), fl	t/ln (50 th percentile	e)							1						
		eh/ln (50 th percenti		7.9	25.7		12.0	9.3		T	2.7	10.6	12.3	10.4	10.6	10.2
		RQ) (50 th percent		0.00	0.00		0.00	0.00	$\overline{}$	_	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (, , , ,		59.0	38.2		59.1	29.4	$\overline{}$	1	51.3	50.6	51.6	56.2	50.5	50.2
Incremental De				71.0	22.3		159.8	1.6	_	T	0.2	15.5	42.5	48.9	15.0	16.9
	itial Queue Delay (d 3), s/veh				0.0		0.0	0.0	-	_	0.0	0.0	0.0	0.0	0.0	0.0
	ontrol Delay (d), s/veh			0.0 130.0	60.5		218.8	31.0	$\overline{}$	_	51.6	66.0	94.2	105.0	65.5	67.1
	evel of Service (LOS)			F	Е		F	С		1	D	E	F	F	Е	Е
	pproach Delay, s/veh / LOS			67.3	_	E	69.3		E		73.0		Е	83.6		F
	ntersection Delay, s/veh / LOS						2.6			1				E		
	ultimodal Results				EB			WE		1		NB			SB	
Pedestrian LOS				2.44	\rightarrow	В	2.44	-	В	1	2.31	-	В	2.31	-	В
Bicycle LOS Sc	ore / LC	OS		1.76	6	В	1.28	3	Α		1.11		Α	1.34	l	Α

EXHIBIT 4.31 2024 PEAK AM HOUR ANALYSIS (Background Traffic) - Jeanne d'Arc/Innes

		HCS	Sigr	nalize	d Inte	ersect	tion R	esu	Its S	Sum	mary	,				
General Inform	nation							_				ormatic		ı	4741	P 4
Agency						1000	2000			ation,		0.250		2		N.
Analyst		011 (011		-		12/8/2		_	_	а Тур -	9	Other				7
Jurisdiction		City of Ottawa		Time F			AM Hou	ır	PHF			0.92	-	<u> </u>		?
Urban Street		Innes Road			sis Yea	-					Period	1> 7:0	00	-		v .
Intersection		Jeanne d'Arc/Innes		File Na			2024_ba	ak_AN	1.xus						4. 4. A. A.	
Project Descrip	tion	Innes Road Develo	pment E	Backgro	und Tra	affic								1	4 1 4 4	11
Demand Inform	nation				EB			W	/B		$\overline{}$	NB		$\overline{}$	SB	
Approach Move	ment			L	Т	R	L	1	$\neg \top$	R	L	Т	R	L	Т	R
Demand (v), v	eh/h			37	337		198	11:	92		119	350	74	148	148	54
Signal Informa		D (D)			L.,	_			7				_		τ.	<i>l</i>
Cycle, s	110.0	Reference Phase	2		Γ		ľΛ	계 '	ſΙ				1	→ 2	3	4
Offset, s	0	Reference Point	End	Green	5.9	45.6	24.8	8.7	7	0.0	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow	-	3.7	3.7	3.7	-	0.0	0.0		~ '		>	Ŷ
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.4	2.7	2.5	2.6	3	0.0	0.0	_	5	6	7	8
Timer Results				EBI	_	EBT	WB		WE	RT.	NBI	_	NBT	SBI	_	SBT
Assigned Phase				5	-	2	1	-	6	_	3	-	8	7		4
Case Number	<u> </u>			2.0	-	4.0	2.0		4.0	_	2.0		4.0	2.0		4.0
Phase Duration	, S			12.0	-	52.0	12.0	\rightarrow	52.	_	15.0	_	31.0	15.0)	31.0
Change Period,	ange Period, (Y+Rc), s			6.1		6.4	6.1		6.4	4	6.3		6.2	6.3		6.2
Max Allow Head	x Allow Headway (<i>MAH</i>), s			3.1		0.0	3.1	\neg	0.0	0	3.1		3.1	3.1		3.1
Queue Clearan	x Allow Headway (<i>MAH</i>), s eue Clearance Time (<i>g</i> _s), s			4.6			8.9				6.2		15.6	7.3		8.1
Green Extensio	n Time	(g _€), s		0.0		0.0	0.0	\neg	0.0	0	0.2		0.7	0.1		0.3
Phase Call Prol	bability			1.00			1.00)			1.00)	1.00	1.00)	1.00
Max Out Proba	bility			1.00)		1.00)			1.00)	0.02	1.00)	0.00
Movement Gro	up Res	ults			EB			WE	3			NB			SB	
Approach Move	•			L	Т	R	L	Т	_	R	L	Т	R	L	Т	R
Assigned Move				5	2		1	6			3	8	18	7	4	14
Adjusted Flow F), veh/h		40	366		215	129	6	\neg	129	236	225	161	112	107
		ow Rate (s), veh/h/l	n	1647	1647		1701	168	7		1600	1730	1613	1600	1772	1595
Queue Service	Time (g	g s), S		2.6	7.9		6.9	39.5	5	\neg	4.2	13.3	13.6	5.3	5.7	6.1
Cycle Queue C	learance	e Time (<i>g c</i>), s		2.6	7.9		6.9	39.5	5		4.2	13.3	13.6	5.3	5.7	6.1
Green Ratio (g	/C)			0.06	0.42		0.06	0.42	2		0.09	0.23	0.23	0.09	0.23	0.23
Capacity (c), v	eh/h			103	1395		107	142	9		282	406	378	282	416	374
Volume-to-Capa	acity Ra	tio (X)		0.389	0.263		2.017	0.90	7		0.458	0.582	0.594	0.570	0.270	0.287
Back of Queue	(Q), ft	l/ln (50 th percentile)													
		eh/ln (50 th percenti		1.1	3.1		17.4	17.2	\rightarrow		1.7	5.7	5.5	2.2	2.4	2.4
		RQ) (50 th percent	ile)	0.00	0.00	-	0.00	0.00	$\overline{}$	_	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (. , , .			49.5	20.9		51.6	30.1	-		47.7	37.7	37.4	48.1	34.8	34.6
	cremental Delay (d 2), s/veh			0.9	0.5	-	489.0	9.9	$\overline{}$	_	0.4	1.4	1.7	1.8	0.1	0.2
	ial Queue Delay (d 3), s/veh			0.0	0.0		0.0	0.0	_		0.0	0.0	0.0	0.0	0.0	0.0
	ntrol Delay (d), s/veh			50.4	21.3		540.6	40.0	J		48.1	39.2	39.2	49.9	34.9	34.7
		/108		D 24.2	С	С	F 111.	2 D	F		D 41.1	D	D D	D 41.2	С	D
	oproach Delay, s/veh / LOS tersection Delay, s/veh / LOS			24.2	-		5.5	J	r		41.			E 41.2		D
intersection Del	Sidedian Belay, Green's Ede					,	0.0									
Multimodal Re	Itimodal Results				EB			WE	3			NB			SB	
Pedestrian LOS	Score	/LOS		2.43	3	В	2.43	3	В		2.31		В	2.31		В
Bicycle LOS Sc	ore / LC	os		0.82	2	Α	1.73	3	В		0.97	7	Α	0.80)	Α

EXHIBIT 4.32 2024 PEAK PM HOUR ANALYSIS (Background Traffic) - Jeanne d'Arc/Innes

		HCS	S Sigr	nalize	d Int	ersec	tion R	esul	lts Su	mm	ary					
																LTD
General Inform	nation										Info	ormatic		ı i	4741	2× 1/2
Agency						40/0/			Duratio			0.250		-		N.
Analyst		011 (011		-		e 12/8/			Area T	ype		Other				7
Jurisdiction		City of Ottawa		Time F		_	PM Hou	ır	PHF			0.92		3		?
Urban Street		Innes Road		Analys		_			Analys	is Per	iod	1> 7:0	00	-		¥.
Intersection		Jeanne d'Arc/Innes		File Na			2024_ba	ak_PM	l.xus						4, 14, 15	
Project Descrip	tion	Innes Road Develo	pment E	Backgro	und Tr	affic								1	4 1 4 4	t (1)
Demand Inform	nation		_		EB	_	$\overline{}$	W	В	т	_	NB	_	$\overline{}$	SB	
Approach Move	ement			L	Т	R	L	T	· F		L	Т	R	L	Т	R
Demand (v), v	eh/h			145	1314	4	188	71	6		173	280	266	441	463	84
Signal Informa					1 2		21		7				_		τ .	<i>ا</i> ا
Cycle, s	130.0	Reference Phase	2		Γ.,	~	ľ	21 .	s l			K	1	→ 2	3	4
Offset, s	0	Reference Point	End	Green	10.9	52.6	24.8	16	7 0.	0	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow	3.7	3.7	3.7	3.7	7 0.	0	0.0		~		\	Þ
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.4	2.7	2.5	2.6	6 0.	0	0.0		6	6	7	8
Times Dec. 1				ED:		CDT	14/5		VA (D.T.		ND:		NDT	00		CDT
Timer Results				EBI	+	EBT	WB	-	WBT 6	+	NBL	-	NBT	SBI	-	SBT
Assigned Phase	9			5 2.0	+	4.0	2.0		4.0	+	2.0		8 4.0	2.0	_	4.0
Case Number Phase Duration				17.0	-	59.0	17.0	-	59.0	+	23.0		31.0	23.0	_	31.0
	ange Period, (Y+R c), s			6.1		6.4	6.1	\rightarrow	6.4		6.3	$\overline{}$	6.2	6.3	_	6.2
	<u> </u>			3.1	-	0.0	3.1	-	0.0	-	3.1	_	3.2	3.1	_	3.1
	x Allow Headway (<i>MAH</i>), s eue Clearance Time (<i>g</i> s), s			13.9		0.0	13.9	\rightarrow	0.0	-	8.8		27.8	19.7	_	23.9
Green Extensio		(0),		0.0	-	0.0	0.0	-	0.0	-	1.2	_	0.0	0.0	_	0.2
Phase Call Pro		(<i>g _e</i>), s		1.00	-	0.0	1.00	\rightarrow	0.0	-	1.00	-	1.00	1.00	_	1.00
Max Out Probal				1.00	-		1.00	-		_	0.07	_	1.00	1.00	-	1.00
max cat resa	J,															
Movement Gro	up Res	ults			EB			WE	3	\perp		NB			SB	
Approach Move	ment			L	Т	R	L	Т	R	_	L	Т	R	L	Т	R
Assigned Move	ment			5	2		1	6		;	3	8	18	7	4	14
Adjusted Flow F	Rate (v), veh/h		158	1428		204	778	-	18	88	304	289	479	305	289
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1661	1700		1701	168	7	16	39	1758	1456	1652	1772	1662
Queue Service				11.9	53.6		11.9	22.9	-	_	.8	21.8	25.8	17.7	21.7	21.9
Cycle Queue C		e Time (<i>g շ</i>), s		11.9	53.6		11.9	22.9	_	_	.8	21.8	25.8	17.7	21.7	21.9
Green Ratio (g				0.09	0.41	-	0.09	0.4	_	_	14	0.20	0.20	0.14	0.20	0.20
Capacity (c), v				152	1402	_	156	139	_	_	46	349	289	450	352	330
Volume-to-Capa		. ,		1.037	1.019	•	1.312	0.55	9	0.4	421	0.872	1.001	1.066	0.868	0.877
		/In (50 th percentile				-			-	+-						
		eh/ln (50 th percenti		8.5	27.2	-	12.8	9.5	-	_	.8	11.5	13.6	11.1	11.4	11.0
		RQ) (50 th percent	tile)	0.00	0.00	-	0.00	0.00	-	_	00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (59.1 83.0	38.2 28.8	-	59.1 178.8	29.5	-	_	1.5	51.0 20.0	52.1 53.1	56.2 61.1	50.9 19.3	50.6 21.6
	cremental Delay (d 2), s/veh			_	_	+	_	_	-	_	\rightarrow			_		_
	ial Queue Delay (d ȝ), s/veh ntrol Delay (d), s/veh			0.0	67.0		0.0	0.0	$\overline{}$	_	1.7	71.0	0.0	0.0	70.2	72.1
	vel of Service (LOS)			142.1 F	67.0 F		237.8 F	31.1 C	-	_	1.7 D	71.0 E	105.2 F	117.2 F	70.2 E	72.1
		/1.08		74.5	_	E	74.		E	_	79.0		E	91.7		F
	pproach Delay, s/veh / LOS tersection Delay, s/veh / LOS			74.5			9.4			-	79.0			E 91.7		Г
intersection Del	ay, orve	, 200					J. T							_		
Multimodal Re	Itimodal Results				EB			WE	3	\mathbf{T}		NB			SB	
Pedestrian LOS		/LOS		2.44	_	В	2.44	4	В		2.31		В	2.31		В
Bicycle LOS Sc				1.80		В	1.30)	Α	_	1.13	-	Α	1.37	-	Α

EXHIBIT 4.33 2029 PEAK AM HOUR ANALYSIS (Background Traffic) - Jeanne d'Arc/Innes

		HCS	S Sigr	alize	d Inte	ersect	ion R	esul	ts S	um	mary	,				
																LTD
General Inform	nation											ormatic			4741	2× 1/2
Agency						1000			Durat	_		0.250		-		N.
Analyst		211 4 2 11		-		12/8/2		_	Area	Тур	e	Other				E
Jurisdiction		City of Ottawa		Time F			AM Hou	ır	PHF			0.92		3		?
Urban Street		Innes Road		-	sis Yea	-				/sis	Period	1> 7:0	00	7		¥.
Intersection		Jeanne d'Arc/Innes		File Na			2029_ba	ak_AN	l.xus						4, 14, 15	
Project Descrip	tion	Innes Road Develo	pment E	Backgro	und Tra	affic								1	4 1 4 4	t (1)
Demand Inform	nation		_		EB	_	$\overline{}$	W	В	-	_	NB	_	$\overline{}$	SB	
Approach Move	ment			L	Т	R	L	T	· T	R	L	Т	R	L	Т	R
Demand (v), v	eh/h			39	355		208	12	53		125	368	78	155	155	57
							ш. п									
Signal Informa		5.4			L.	_	21		7				_		τ .	ノ
Cycle, s	110.0	Reference Phase	2		Γ	—	Î ↑	계 '	ìΙ				1	→ 2	3	-◆
Offset, s	0	Reference Point	End	Green	5.9	45.6	24.8	8.7	, c	0.0	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow	-	3.7	3.7	3.7		0.0	0.0		~		\	Þ
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.4	2.7	2.5	2.6	5 C	0.0	0.0		5	6	7	8
Timer Results				EBI	_	EBT	WB		WB1	-	NBI	_	NBT	SBI	_	SBT
Assigned Phase	۵			5	-	2	1	-	6		3		8	7 7	-	4
Case Number	-			_	2.0		2.0		4.0	-	2.0		4.0	2.0	_	4.0
Phase Duration	s			12.0			12.0	-	52.0		15.0	-	31.0	15.0	_	31.0
Change Period,		c). s		6.1			6.1	$\overline{}$	6.4		6.3	\rightarrow	6.2	6.3		6.2
	flax Allow Headway (MAH), s		-	3.1		3.1		0.0	_	3.1		3.1	3.1		3.1	
	ueue Clearance Time (g s), s			4.7			8.9				6.4		16.4	7.6		8.4
Green Extensio				0.0 0		0.0	0.0	-	0.0	_	0.2	_	0.7	0.1		0.4
Phase Call Pro		(9 °), -		1.00	$\overline{}$		1.00	\rightarrow			1.00	\rightarrow	1.00	1.00)	1.00
Max Out Proba				1.00	-		1.00	-		П	1.00	_	0.04	1.00	_	0.00
May am ant Con	D	14-			ED			١٨/٦		-		NID			CD	
Approach Move	•	suits		L	EB	R	L	WE T	F	-	L	NB T	R	L	SB T	R
Assigned Move				5	2	N	1	6	+-	\vdash	3	8	18	7	4	14
		\ , , , o b /b		42	386	-	226	136	,	-	136	249	236	168	118	113
Adjusted Flow F		ow Rate (s), veh/h/l	n	1647	1647		1701	168	-	-	1600	1730	1613	1600	1772	1594
Queue Service		. , , , , , , , , , , , , , , , , , , ,	11	2.7	8.4		6.9	42.9	_	-	4.4	14.1	14.4	5.6	6.0	6.4
Cycle Queue C		- ,		2.7	8.4		6.9	42.9	-	-	4.4	14.1	14.4	5.6	6.0	6.4
Green Ratio (g		o milo (g c), o		0.06	0.42		0.06	0.42	_	-	0.09	0.23	0.23	0.09	0.23	0.23
Capacity (c), v				103	1395		107	1429	-	н	282	406	378	282	416	374
Volume-to-Capa		tio (X)		0.410	0.277		2.119	0.95	_	_	0.482	0.613	0.624	0.597	0.284	0.301
		t/ln (50 th percentile	:)					0.00			0.102	0.010	0.02	51667	0.20	0.001
		eh/ln (50 th percenti		1.1	3.3		18.7	19.5	5		1.8	6.1	5.9	2.3	2.6	2.5
		RQ) (50 th percent		0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (Jniform Delay (d 1), s/veh			49.6	21.0		51.6	31.1			47.8	38.1	37.7	48.3	34.9	34.7
Incremental De	lay (d 2), s/veh		1.0	0.5		533.7	14.9)		0.5	2.0	2.4	2.4	0.1	0.2
Initial Queue De	elay (d	з), s/veh		0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/ve	eh		50.6	21.5		585.3	46.1			48.2	40.1	40.1	50.7	35.0	34.8
Level of Service				D	С		F	D			D	D	D	D	D	С
Approach Delay	, s/veh	/LOS		24.4		С	122.	8	F		41.9)	D	41.6	3	D
Intersection Del	lay, s/ve	h / LOS				8	1.7							F		
Multimodal Ba	eulte				EB			WE				NB			SB	
Multimodal Re Pedestrian LOS		/1.08		2.43		В	2.43	_			2.31	_	В	2.31		R
Bicycle LOS Sc				0.84	-	A	1.80	\rightarrow	B B		1.00	$\overline{}$	A	0.82	-	B A
DICYCIE LOS SC	OIG / LC	70		0.64		^	1.60	,	Б		1.00	' _	^	0.62	-	^

EXHIBIT 4.34 2029 PEAK PM HOUR ANALYSIS (Background Traffic) - Jeanne d'Arc/Innes

		HCS	S Sigr	nalize	d Inte	ersect	ion R	esul	ts Su	nmary	,				
O - m - m - L land - m -	41								14	- 4' I f	41			4 사하 1	k ti
General Inform	nation									ction Inf			ĺ		100
Agency				A 1	·- D-4	- 40/0/	2000	-	Duratio	•	0.250				
Analyst		0 1.0		-		e 12/8/2			Area Ty	pe	Other				2
Jurisdiction		City of Ottawa		Time F		_	PM Hou	ır	PHF		0.92				¥ .
Urban Street		Innes Road		Analys		_			<u> </u>	s Period	1> 7:0	JO			Ž
Intersection		Jeanne d'Arc/Innes		File Na			2029_ba	ak_PIV	l.xus					2. 12. 13. 1	
Project Descrip	tion	Innes Road Develo	pment E	Backgro	und Tr	affic		_		_			1	1 4 1 4 4	7.0
Demand Inform	nation		_		EB	_	$\overline{}$	W	В	$\overline{}$	NB	_	_	SB	_
Approach Move	ment			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Demand (v), v	eh/h			152	1377	7	198	75	3	182	294	280	464	487	89
Signal Informa	tion				2				7			_		K	,
Cycle, s	130.0	Reference Phase	2		F "	~ `	ľ	2 1 r	i I		×		→ ,		* †
Offset, s	0	Reference Point	End	Green	10.9	52.6	24.8	16	7 0.0	0.0				1	-
Uncoordinated	No	Simult. Gap E/W	On	Yellow		3.7	3.7	3.7				≯ │	\leftarrow		₽.
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.4	2.7	2.5	2.6	0.0	0.0		5	6	7	8
Timer Results				EBI	-	EBT 2	WB	L	WBT	NB	L	NBT	SBI	_	SBT
Assigned Phase	e			_	5		1	_	6	3		8	7	_	4
Case Number				2.0	-	4.0	2.0	-	4.0	2.0	-	4.0	2.0	_	4.0
Phase Duration		`		17.0)	59.0	17.0	\rightarrow	59.0 6.4	23.0	$\overline{}$	31.0	23.0	$\overline{}$	31.0
	hange Period, (Y+R c), s				6.1 6		_	6.1		6.3	_	6.2	6.3		6.2
	lax Allow Headway (MAH), s			3.1		3.1		0.0	3.1	$\overline{}$	3.2	3.1		3.1	
Queue Clearan		(0),		13.9			13.9	-		9.2	_	27.8	19.7	_	25.4
Green Extension		(g ⊕), s		0.0	-	0.0	0.0	\rightarrow	0.0	1.2	_	0.0	0.0	_	0.0
Phase Call Prol				1.00	-		1.00	-		1.0	_	1.00	1.00	_	1.00
Max Out Proba	bility			1.00)		1.00)		0.1)	1.00	1.00)	1.00
Movement Gro	up Res	sults			EB			WE	3	$\overline{}$	NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Move	ment			5	2		1	6		3	8	18	7	4	14
Adjusted Flow F	Rate (v), veh/h		165	1497		215	818		198	320	304	504	322	304
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1661	1700		1701	168	7	1639	1758	1456	1652	1772	1661
Queue Service	Time (g	g s), S		11.9	53.6		11.9	24.5	5	7.2	23.2	25.8	17.7	23.1	23.4
Cycle Queue C	learanc	e Time (<i>g c</i>), s		11.9	53.6		11.9	24.5	5	7.2	23.2	25.8	17.7	23.1	23.4
Green Ratio (g	/C)			0.09	0.41		0.09	0.41		0.14	0.20	0.20	0.14	0.20	0.20
Capacity (c), v	eh/h			152	1402		156	139	1	446	349	289	450	352	330
Volume-to-Capa	acity Ra	tio (X)		1.087	1.068		1.382	0.58	8	0.443	0.916	1.053	1.121	0.915	0.923
Back of Queue	(Q), f	l/ln (50 th percentile	<u>:</u>)												
Back of Queue	(Q), ve	eh/ln (50 th percenti	ile)	9.1	30.2		14.0	10.1		3.0	12.8	14.7	12.3	12.8	12.4
Queue Storage	Queue Storage Ratio (RQ) (50 th percentile)		tile)	0.00	0.00		0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00
	Jniform Delay (d ₁), s/veh			59.1	38.2		59.1	30.0)	51.6	51.5	52.1	56.2	51.5	51.1
Incremental De	lay (d 2), s/veh		98.1	44.3		206.8	1.8		0.3	27.5	67.6	79.9	27.2	30.0
Initial Queue De		,.		0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (eh		157.1	82.5		265.8	31.8	3	51.9	79.0	119.7	136.1	78.8	81.1
Level of Service				F	F		F	С		D	E	F	F	E	F
Approach Delay	, s/veh	/LOS		89.9)	F	80.5	5	F	87.	3	F	105.	0	F
Intersection De	lay, s/ve	h / LOS				9	1.1						F		
Multim rate LD	lt-							100			ND			0.0	
Multimodal Re		11.00		244	EB	D.	2.4	WE		0.0	NB	D	0.04	SB	D
Pedestrian LOS				2.44	-	В	2.44	\rightarrow	В	2.3	-	В	2.31	-	В
Bicycle LOS So	ore / LC	75		1.86		В	1.34	4	Α	1.1	/	Α	1.42	<u> </u>	Α

EXHIBIT 4.35 2024 PEAK AM HOUR ANALYSIS (Total Traffic) - Jeanne d'Arc/Innes

Demand (v), veh/h			нся	S Sigr	alize	d Inte	rsect	ion R	esul	ts Sur	nmary	,				
Analysis																el el
Analysis Oltawa		nation							_			_		ı i	4 4 4	
Union Note City of Ottawa							1		_			_		-		
Demand Information					-		_		\rightarrow		ре	-				2
Intersection Inte					_		_	AM Hou	ır			_		- 2		9
Project Description							-			<u> </u>	Period	1> 7:0	00	7		2
Demand Information			Jeanne d'Arc/Innes		File Na	ame	723_2	2024_tot	t_AM.:	kus					St. 12, 15, 15	
Approach Movement	Project Descrip	tion	Innes Road Develo	pment										1	4 1 4 4	t- r
Demand (v), veh/h	Demand Inform	nation				EB	_	$\overline{}$	W	В	$\overline{}$	NB		$\overline{}$	SB	_
Signal Information	Approach Move	ement			L	Т	R	L	T	R	L	Т	R	L	Т	R
Cycle, s 110.0 Reference Plase 2 2 2 6 6 4 4 5 6 2 4 8 8 7 0.0	Demand (v), v	/eh/h			37	343		198	119	94	119	350	74	148	148	54
Cycle, s 110.0 Reference Plase 2 2 2 6 6 4 4 5 6 2 4 8 8 7 0.0	01							ш, п								
Offset, s O			Peference Phase	2		L ,	-[. •	- 24		7			<u> </u>		<	4
Considerate No Simult. Gap EMP On Force Mode Fixed Simult. Gap EMP On Simult. Gap EMP On Simult. Gap EMP On On On On On On On O	-	_		-		L		1	71 "				1	2	3	4
Force Mode		-		_			45.6	_	_							
BBL BBT WBL NBL NBL SBL SBT SBL SBT Assigned Phase 5			·								-		^ _	`]	7	P
Assigned Phase	Force Mode	rixed	Simult. Gap N/S	On	red	2.4	2.1	∠.5	2.6	0.0	0.0		6	6	7	8
Assigned Phase	Timer Results				EBI		EBT	WB	L	WBT	NB		NBT	SBI		SBT
Case Number 2.0 4.0 2.0 4.0 2.0 4.0 2.0 4.0 2.0 4.0 2.0 4.0 2.0 4.0 2.0 4.0 2.0 3.0 15.0 31.0 15.0 31.0 15.0 31.0 15.0 31.0 15.0 31.0 15.0 31.0 62.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 15.6 7.3 8.1 3.1<								_			_			_		
Change Period, (Y+Rc), s 6.1 6.4 6.1 6.4 6.1 6.4 6.3 6.2 6.3 6.3 6.2 Max Allow Headway (MAH), s 3.1 0.0 3.1 0.0 3.1 <td></td> <td></td> <td></td> <td></td> <td>_</td> <td></td> <td></td> <td>_</td> <td></td> <td></td> <td>_</td> <td></td> <td></td> <td>_</td> <td></td> <td></td>					_			_			_			_		
Max Allow Headway (MAH), s 3.1 0.0 3.1 0.0 3.1	Phase Duration	1, S			12.0		52.0	12.0	5	52.0	15.0		31.0	15.0		31.0
Queue Clearance Time (g $_{\circ}$), s 4.6 S 8.9 6.2 15.6 7.3 8.1 Green Extension Time (g $_{\circ}$), s 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.00 0.00	Change Period	hange Period, (Y+R c), s		6.1		6.4	6.1		6.4	6.3		6.2			6.2	
Green Extension Time (g ∘), s 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.00	Max Allow Hea			3.1			3.1	\neg	0.0	3.1		3.1	3.1		3.1	
Phase Call Probability	Queue Clearan	ice Time	e (gs), s					8.9			6.2		15.6	7.3		8.1
Movement Group Results Image: content of the content of	Green Extension	n Time	(g _e), s		0.0 0		0.0	0.0		0.0	0.2		0.7	0.1		0.3
Movement Group Results L T R L T L T R L T L L L L L L L L L L L	Phase Call Pro	bability			1.00			1.00)		1.00		1.00	1.00)	1.00
Approach Movement	Max Out Proba	bility			1.00			1.00)		1.00)	0.02	1.00)	0.00
Approach Movement	Movement Gro	oun Res	sults			FB			WP			NR			SB	
Assigned Movement Assigned Movement Adjusted Flow Rate (v), veh/h Adjusted Flow Rate (v), veh/h Adjusted Flow Rate (v), veh/h Adjusted Saturation Flow Rate (s), veh/h/ln Adjusted Saturation Flow Rate (s), veh/h Adjusted		•	74110				R	1		_			R	L		R
Adjusted Flow Rate (v), veh/h 40 373 373 373 373 374 375 375 376 370 37							- ' '	_	_	 ``	_	_		_	_	14
Adjusted Saturation Flow Rate (\$s\$), veh/h/ln 1647 1647 1701 1687 1600 1730 1613 1600 1772 151 151 161 1600 1730 1613 1600 1772 151 161 1600 1730 1613 1600 1772 151 161 1600 1730 1613 1600 1772 151 161 1600 1730 1613 1600 1772 151 161 1600 1730 1613 1600 1772 151 161 1600 1730 1613 1600 1772 151 1613 1600 1770 1770 17) veh/h		_				-	3	_	-			-	107
Queue Service Time (g s), s 2.6 8.1 6.9 39.6 4.2 13.3 13.6 5.3 5.7 6.9 Cycle Queue Clearance Time (g s), s 2.6 8.1 6.9 39.6 4.2 13.3 13.6 5.3 5.7 6.9 Green Ratio (g/C) 0.06 0.42 0.06 0.42 0.06 0.42 0.09 0.23 0.23 0.09 0.09 0.			,-	n		_		-	_	_	_				_	1595
Cycle Queue Clearance Time (g c), s 2.6 8.1 6.9 3.9 € 4.2 13.3 13.6 5.3 5.7 5.6 Green Ratio (g/C) 0.06 0.42 0.06 0.42 0.09 0.23 0.23 0.09 0.23 0.24 0.23 0.23 0.09 0.27 0.24 0.43 1.73 1.74 1.73 1.74 1.73 1.74 1.73 1.77 0.27 0.55 2.22 2.24 2.23			, ,,	.,				_	_	_	_					6.1
Green Ratio (g/C) 0.06 0.42 0.06 0.42 0.06 0.42 0.09 0.23 0.23 0.09 0.23 <t< td=""><td></td><td></td><td>- /-</td><td></td><td>-</td><td></td><td></td><td>_</td><td>_</td><td>-</td><td>_</td><td></td><td></td><td>_</td><td>_</td><td>6.1</td></t<>			- /-		-			_	_	-	_			_	_	6.1
Capacity (c), veh/h 103 1395 107 1429 282 406 378 282 416 37 Volume-to-Capacity Ratio (X) 0.389 0.267 2.017 0.908 0.458 0.522 0.594 0.570 0.270 0.2 Back of Queue (Q), ft/ln (50 th percentile) 1.1 3.1 17.4 17.3 1.7 5.7 5.5 2.2 2.4 2.0 Queue Storage Ratio (RQ) (50 th percentile) 0.00			, 5 ,					_	_	_	_					0.23
Back of Queue (Q), ft/ln (50 th percentile) Image: Control Delay (d), veh/ln					103	1395		107	1429	9	282	406	378	282	416	374
Back of Queue (Q), ft/ln (50 th percentile) Image: Control Delay (d), veh/ln	1 7 (),		atio (X)					_		_	_			_		0.287
Back of Queue (Q), veh/ln (50 th percentile) 1.1 3.1 17.4 17.3 1.7 5.7 5.5 2.2 2.4 2. Queue Storage Ratio (RQ) (50 th percentile) 0.00 0.00 <t< td=""><td></td><td></td><td></td><td><u>:</u>)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>				<u>:</u>)												
Uniform Delay (d 1), s/veh 49.5 20.9 51.6 30.1 47.7 37.7 37.4 48.1 34.8 34.8 34.1 Incremental Delay (d 2), s/veh 0.9 0.5 489.0 10.0 0.4 1.4 1.7 1.8 0.1 0. Initial Queue Delay (d 3), s/veh 0.0					1.1	3.1		17.4	17.3		1.7	5.7	5.5	2.2	2.4	2.4
Incremental Delay (d ₂), s/veh 0.9 0.5 489.0 10.0 0.4 1.4 1.7 1.8 0.1 0.0 Initial Queue Delay (d ₃), s/veh 0.0	Queue Storage	Ratio (RQ) (50 th percent	tile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Initial Queue Delay (d ₃), s/veh 0.0 <td>Uniform Delay</td> <td>(d 1), s</td> <td>/veh</td> <td></td> <td>49.5</td> <td>20.9</td> <td></td> <td>51.6</td> <td>30.1</td> <td></td> <td>47.7</td> <td>37.7</td> <td>37.4</td> <td>48.1</td> <td>34.8</td> <td>34.6</td>	Uniform Delay	(d 1), s	/veh		49.5	20.9		51.6	30.1		47.7	37.7	37.4	48.1	34.8	34.6
Control Delay (d), s/veh 50.4 21.4 540.6 40.2 48.1 39.2 39.2 49.9 34.9 34 Level of Service (LOS) D C F D D D D D D D D D D D C C Approach Delay, s/veh / LOS 24.2 C 111.3 F 41.1 D 41.2 D Intersection Delay, s/veh / LOS 75.4 E VB NB SB SB Pedestrian LOS Score / LOS 8 2.43 8 2.31 B 2.31 B 5.49 8 34.9 9 49.9 9 49.9 9 49.9 9 49.9 9 49.9 9 49.9 9 49.9 9 49.9 9 49.9 9 49.9 9 49.9 9 49.9 9 49.9 9 49.9 9 49.9 9 49.9 9 49.9 9 49.9 9 49.9 9 41.2 D 41.	Incremental De	lay (d 2), s/veh		0.9	0.5		489.0	10.0		0.4	1.4	1.7	1.8	0.1	0.2
Level of Service (LOS) D C F D D D D D D D D D D C C Approach Delay, s/veh / LOS 24.2 C 111.3 F 41.1 D 41.2 D Intersection Delay, s/veh / LOS T5.4 E E WB NB SB Wultimodal Results EB WB NB SB Pedestrian LOS Score / LOS 2.43 B 2.43 B 2.31 B 2.31 B	Initial Queue D	elay (d	з), s/veh		0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Approach Delay, s/veh / LOS 24.2 C 111.3 F 41.1 D 41.2 D Intersection Delay, s/veh / LOS 75.4 E E E WB NB SB Multimodal Results EB WB NB SB SB Pedestrian LOS Score / LOS 2.43 B 2.43 B 2.31 B 2.31 B	Control Delay (d), s/ve	eh		50.4	21.4		540.6	40.2		48.1	39.2	39.2	49.9	34.9	34.7
Intersection Delay, s/veh / LOS	Level of Service	e (LOS)			D	С		F	D		D	D	D			С
Multimodal Results EB WB NB SB Pedestrian LOS Score / LOS 2.43 B 2.43 B 2.31 B 2.31 B	Approach Dela	y, s/veh	/LOS		24.2	2	С	111.	3	F	41.	1	D	41.2	2	D
Pedestrian LOS Score / LOS 2.43 B 2.43 B 2.31 B 2.31 B	Intersection De	lay, s/ve	eh / LOS				7:	5.4						E		
Pedestrian LOS Score / LOS 2.43 B 2.43 B 2.31 B 2.31 B	Multimodal Pa	sults				FR			WP			NR			SB	
			/LOS		2 43	_	В	24	_		2.3		В	2.31	_	В
Bicycle LOS Score / LOS 0.83 A 1.74 B 0.97 A 0.80 A						-		_	-	В	_	-			_	

EXHIBIT 4.36 2024 PEAK PM HOUR ANALYSIS (Total Traffic) - Jeanne d'Arc/Innes

		нся	S Sigr	nalized	d Inte	rsect	ion R	esul	ts Sun	nmary	,				
0 11 6	41													4 7 4 1	WITE CONTRACT
General Inform	nation								Intersec		_		ı i	A 14 44 4	
Agency						Linini			Duration		0.250		-		
Analyst		200		-		12/8/2		\rightarrow	Area Typ	ре	Other				
Jurisdiction		City of Ottawa		Time F		_	PM Hou	ır	PHF		0.92		3		
Urban Street		Innes Road		<u> </u>	is Year	-			Analysis	Period	1> 7:0	00			2
Intersection		Jeanne d'Arc/Innes		File Na	ame	723_2	2024_to	t_PM.:	xus					and the	
Project Descrip	tion	Innes Road Develo	pment	_	_	_	_	_	_	_	_	_		4 1 4 4	r n
Demand Inform	nation				EB		$\overline{}$	W	В	т	NB			SB	
Approach Move	ement			L	Т	R	L	T	R	L	Т	R	L	Т	R
Demand (v), v	eh/h			145	1318		188	72	2	173	280	266	441	463	84
							ш, п	-							
Signal Informa		Deference Dhase			L ,	-	- 24	E	7			_		τ .	4
Cycle, s	130.0	Reference Phase	2 End		"	—	1	71 "	i I			1	2	3	4
Offset, s	0	Reference Point	End	Green		52.6	24.8	16.		0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow		3.7	3.7	3.7		0.0		^		7	P
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.4	2.7	2.5	2.6	0.0	0.0		5	6	7	8
Timer Results				EBL		EBT	WB		WBT	NB		NBT	SBI		SBT
Assigned Phase	e			5		2	1		6	3		8	7		4
Case Number				2.0		4.0	2.0		4.0	2.0		4.0	2.0	\rightarrow	4.0
Phase Duration	1, S			17.0	17.0 59		17.0		59.0	23.0		31.0	23.0		31.0
Change Period	ange Period, (Y+R c), s			6.1			6.1		6.4	6.3		6.2	6.3		6.2
Max Allow Head	ax Allow Headway (<i>MAH</i>), s		3.1		0.0	3.1	\neg	0.0			3.2	3.1		3.1	
Queue Clearan	ce Time	e (gs), s		13.9			13.9			8.8		27.8	19.7	7	23.9
Green Extension	n Time	(g e), s		0.0 0.		0.0	0.0	\neg	0.0	1.2		0.0	0.0		0.2
Phase Call Pro	bability			1.00			1.00			1.00		1.00	1.00)	1.00
Max Out Proba	bility			1.00			1.00)		0.07	7	1.00	1.00)	1.00
Movement Gro	un Bos	aulto.			EB			WB			NB			SB	
Approach Move		suits		L	Т	R	L	T	R	L	T	R	L	Т	R
Assigned Move				5	2	1	1	6	+ 1	3	8	18	7	4	14
Adjusted Flow I) veh/h		158	1433		204	785		188	304	289	479	305	289
		ow Rate (s), veh/h/l	n	1661	1700		1701	1687	_	1639	1758	1456	1652	1772	1662
Queue Service		, ,,	11	11.9	53.6		11.9	23.2	_	6.8	21.8	25.8	17.7	21.7	21.9
		e Time (<i>g c</i>), s		11.9	53.6		11.9	23.2		6.8	21.8	25.8	17.7	21.7	21.9
Green Ratio (g		(3 -), -		0.09	0.41		0.09	0.41	_	0.14	0.20	0.20	0.14	0.20	0.20
Capacity (c), v				152	1402		156	139	1	446	349	289	450	352	330
Volume-to-Cap	acity Ra	atio (X)		1.037	1.022		1.312	0.56	4	0.421	0.872	1.001	1.066	0.868	0.877
Back of Queue	(Q), f	t/ln (50 th percentile	:)												
		eh/ln (50 th percent		8.5	27.4		12.8	9.6		2.8	11.5	13.6	11.1	11.4	11.0
Queue Storage	Ratio (RQ) (50 th percent	tile)	0.00	0.00		0.00	0.00)	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay	(d 1), s	/veh		59.1	38.2		59.1	29.6	5	51.5	51.0	52.1	56.2	50.9	50.6
Incremental De	lay (d 2), s/veh		83.0	29.7		178.8	1.7		0.2	20.0	53.1	61.1	19.3	21.6
Initial Queue De	elay (d	з), s/veh		0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/ve	eh		142.1	67.9		237.8	31.2	2	51.7	71.0	105.2	117.2	70.2	72.1
Level of Service	e (LOS)			F	F		F	С		D	E	F	F	E	E
Approach Delay	y, s/veh	/LOS		75.2	2	E	73.9	9	E	79.0)	Е	91.7	7	F
Intersection De	lay, s/ve	eh / LOS				79	9.6						E		
Multimodal Ba	eulte				EB			WB			NB			SB	
Multimodal Re Pedestrian LOS		/1.08		2.44	_	В	2.44	_	В	2.3		В	2 24	_	В
Bicycle LOS So				1.80	_	В	1.30	-	A	1.13	$\overline{}$	A	2.31 1.37	-	A
Dicycle LOS SC	OIE / LC	J0		1.60		Ь	1.30	,	^	1.15	,	^	1.37		^

EXHIBIT 4.37 2029 PEAK AM HOUR ANALYSIS (Total Traffic) - Jeanne d'Arc/Innes

		нся	S Sigr	nalize	d Inte	rsect	ion R	esul	ts Sur	nmary	,				
														14741	LT III
General Inform	nation								Intersec		_		ı i		
Agency						Leave		_	Duration		0.250		-		
Analyst				-		12/8/2		\rightarrow	Area Ty	е	Other				
Jurisdiction		City of Ottawa		Time F		_	AM Hou	ır	PHF		0.92		- 2		
Urban Street		Innes Road			sis Year	-			Analysis	Period	1> 7:0	00	7		,
Intersection		Jeanne d'Arc/Innes		File Na	ame	723_2	2029_tot	t_AM.:	kus					4. 4. 5.	
Project Descrip	tion	Innes Road Develo	pment										l li	1 4 1 4 4	tr n
Demand Inform	mation				EB	_	$\overline{}$	W	В	$\overline{}$	NB		$\overline{}$	SB	_
Approach Move	ement			L	Т	R	L	T	R	L	T	R	L	T	R
Demand (v), v	/eh/h			39	361		208	12	55	125	368	78	155	155	57
Cianal Informa	tion					-		_		_					
Signal Informa Cycle, s	110.0	Reference Phase	2		12 6	ՙ	- 124	al -	7		×	<u> </u>		\	4
Offset, s	0	Reference Point	End				1	<u>~</u> _ ^				1	2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Green		45.6	24.8	8.7		0.0	_	_	\leftarrow	l	_
Force Mode	Fixed	·	On	Yellow Red	2.4	2.7	3.7 2.5	3.7 2.6		0.0		^ _	,	> ,	P.
Force Mode	rixea	Simult. Gap N/S	On	Red	2.4	2.1	2.5	2.0	0.0	0.0		0	6	/	8
Timer Results				EBI		EBT	WB	L	WBT	NB		NBT	SBI		SBT
Assigned Phas	e			5	$\neg \vdash$	2	1	\neg	6	3		8	7		4
Case Number				2.0		4.0	2.0		4.0	2.0		4.0	2.0		4.0
Phase Duration	1, S			12.0		52.0	12.0)	52.0	15.0		31.0	15.0		31.0
Change Period	, (Y+R	c), S		6.1		6.4	6.1		6.4	6.3		6.2	6.3		6.2
Max Allow Hea	ax Allow Headway (MAH), s		3.1	3.1 0		3.1		0.0	3.1		3.1	3.1		3.1	
Queue Clearan	ice Time	e (gs), s		4.7			8.9			6.4		16.4	7.6		8.4
Green Extension	n Time	(g _e), s		0.0 0		0.0	0.0		0.0	0.2		0.7	0.1		0.4
Phase Call Pro	bability			1.00			1.00)		1.00		1.00	1.00)	1.00
Max Out Proba	bility			1.00			1.00)		1.00)	0.04	1.00)	0.00
Movement Gro	oun Res	sults			EB			WB			NB			SB	
Approach Move	•			L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				5	2		1	6	 ``	3	8	18	7	4	14
Adjusted Flow) veh/h		42	392		226	1364		136	249	236	168	118	113
		ow Rate (s), veh/h/l	n	1647	1647		1701	1687	_	1600	1730	1613	1600	1772	1594
Queue Service		, ,,		2.7	8.6		6.9	43.0	_	4.4	14.1	14.4	5.6	6.0	6.4
		e Time (<i>g c</i>), s		2.7	8.6		6.9	43.0		4.4	14.1	14.4	5.6	6.0	6.4
Green Ratio (g		(3 • /) •		0.06	0.42		0.06	0.42	_	0.09	0.23	0.23	0.09	0.23	0.23
Capacity (c), v				103	1395		107	1429	_	282	406	378	282	416	374
Volume-to-Cap		atio (X)		0.410	0.281		2.119	0.95	_	0.482	0.613		0.597	0.284	0.301
		t/ln (50 th percentile	e)												
		eh/ln (50 th percent		1.1	3.3		18.7	19.6		1.8	6.1	5.9	2.3	2.6	2.5
		RQ) (50 th percent		0.00	0.00		0.00	0.00	_	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay	(d 1), s	/veh		49.6	21.0		51.6	31.1		47.8	38.1	37.7	48.3	34.9	34.7
Incremental De	lay (d 2), s/veh		1.0	0.5		533.7	15.2		0.5	2.0	2.4	2.4	0.1	0.2
Initial Queue D	elay (d	з), s/veh		0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/ve	eh		50.6	21.5		585.3	46.3		48.2	40.1	40.1	50.7	35.0	34.8
Level of Service	e (LOS)			D	С		F	D		D	D	D	D	D	С
Approach Dela	y, s/veh	/LOS		24.4	-	С	122.	9	F	41.9)	D	41.6	3	D
Intersection De						8	1.7						F		
Multim1-1-2	lt-							14.5			ND			CD	
Multimodal Re		// 00		0.40	EB	D.	2.44	WB		0.0	NB	D	0.04	SB	D.
Pedestrian LOS				2.43	-	В	2.43	-	В	2.3	-	В	2.31	_	В
Bicycle LOS So	core / LC)5		0.85		Α	1.80)	В	1.00)	Α	0.82	2	Α

EXHIBIT 4.38 2029 PEAK PM HOUR ANALYSIS (Total Traffic) - Jeanne d'Arc/Innes

		HCS	S Sigr	nalized	d Inte	rsect	ion R	esul	ts Sun	nmary	,				
								-							
General Inform	ation							\rightarrow	Intersec				- i	ヤアや↑	Ja L
Agency								$\overline{}$	Duration		0.250		2		
Analyst				Analys	is Date	12/8/2	2020		Area Typ	е	Other		<u>∆</u>		
Jurisdiction		City of Ottawa		Time F	Period	Peak	PM Hou	ır	PHF		0.92		*		
Urban Street		Innes Road		Analys	is Year	2029			Analysis	Period	1> 7:0	00	7		
Intersection		Jeanne d'Arc/Innes		File Na	ame	723 2	2029 tot	t PM.>	cus					a. a. a.	
Project Descript	tion	Innes Road Develo	pment										Ī	4 1 4 4	1- 1
Demand Inforn	nation				EB			WE	2		NB			SB	
				L	T	R	1	T	_	1	T	R	1	T	ТВ
Approach Move				_	_	+	L	-	R	L	-	-	L	-	R
Demand (v), v	en/n		-	152	1381		198	75	9	182	294	280	464	487	89
Signal Informa	tion							\top	2	\top				_	T
Cycle, s	130.0	Reference Phase	2		L' &	" ←	1 n	2 R			×		→ .		κ†
Offset, s	0	Reference Point	End	Green	10.0	52.6	24.8	16.	7 0.0	0.0		1	2	3	
Uncoordinated	No	Simult. Gap E/W	On	Yellow	-	3.7	3.7	3.7		0.0		7	←		1
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.4	2.7	2.5	2.6	0.0	0.0		5	6	7	_
Timer Results				EBL	-	EBT	WB	L	WBT	NBI	-	NBT	SBI	-	SBT
Assigned Phase	9			5	_	2	1	\rightarrow	6	3		8	7		4
Case Number				2.0		4.0	2.0	-	4.0	2.0	_	4.0	2.0	_	4.0
Phase Duration				17.0		59.0	17.0	\rightarrow	59.0	23.0	$\overline{}$	31.0	23.0	-	31.0
Change Period,	(Y+R	c), S		6.1		6.4	6.1		6.4	6.3		6.2	6.3		6.2
Max Allow Head	dway (I	<i>MAH</i>), s		3.1		0.0	3.1		0.0	3.1		3.2	3.1		3.1
Queue Clearan	ce Time	e (g s), s		13.9			13.9	9		9.2		27.8	19.7	7	25.4
Green Extensio	n Time	(g _e), s		0.0		0.0	0.0		0.0	1.2		0.0	0.0		0.0
Phase Call Prob	oability			1.00			1.00)		1.00)	1.00	1.00)	1.00
Max Out Probal				1.00			1.00)		0.10)	1.00	1.00)	1.00
Movement Gro	up Res	sults			EB			WB			NB			SB	
Approach Move		.		L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				5	2	<u> </u>	1	6	+ "	3	8	18	7	4	14
) yoh/h		165	1501			_		198	320	304	504	322	304
Adjusted Flow F				_			215	825					_		_
		ow Rate (s), veh/h/l	11	1661 11.9	1700 53.6		1701 11.9	1687 24.7	_	1639 7.2	1758 23.2	1456 25.8	1652 17.7	1772 23.1	166 23.4
Queue Service		-		11.9	53.6		11.9	24.7	_	7.2	23.2	25.8	17.7	23.1	23.4
Cycle Queue Cl		e mile (<i>g c</i>), s						_		-					-
Green Ratio (g				0.09	0.41		0.09	0.41	_	0.14	0.20	0.20	0.14	0.20	0.20
Capacity (c), v		P - () ()		152	1402		156	1391		446	349	289	450	352	330
Volume-to-Capa		itio (X) t/ln (50 th percentile)	1.087	1.071		1.382	0.593	3	0.443	0.916	1.053	1.121	0.915	0.92
	. ,	eh/In (50 th percentile		9.1	30.4		14.0	10.2		3.0	12.8	14.7	12.3	12.8	12.4
		RQ) (50 th percent		0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (,, ,		59.1	38.2		59.1	30.1	_	51.6	51.5	52.1	56.2	51.5	51.
Incremental Del				98.1	45.4		206.8	1.9		0.3	27.5	67.6	79.9	27.2	30.0
Initial Queue De				0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (,.		157.1	83.6		265.8	31.9		51.9	79.0	119.7	136.1	78.8	81.
Level of Service	, .			F	63.6 F		205.6 F	C C		D D	79.0 E	F	F	70.0 E	61. F
Approach Delay				90.9	_	F	80.3	_	F	87.6		F	105.		F
Intersection Del				90.9			1.4		'	67.0	,		F 105.	·	
	sults				EB			WB			NB			SB	
Multimodal Re	ounto														
Pedestrian LOS		/LOS		2.44		В	2.44	4	В	2.31	1	В	2.31		В

EXHIBIT 4.39 FRANK BENDER/INNES - PLOS INTERSECTION EVALUATION

MAIN STREET

Innes Road

MINOR STREET

Frank Bender Street

APPROACHES

ΑII

YEAR

2029

DIRECTION

ΑII

MMLOS MODE

PLOS

MMLOS MODE PLOS	North Approd		Soutl Approd		East Approd		West 20 Approd		
	Comment	Points	Comment	Points	Comment	Points	Comment	Points	
5.1 Crossing Distance & Conditions Median? Total Travel Lanes Crossed	No 3	105	No 5	72	No 6	55	No 7	39	
5.2 Signal Phasing & Timing Features Left Turn Conflict	Permissive	-8	Permissive	-8	Protected	0	Permissive	-8	
Right Turn Conflict	Permissive or Yield Control	-5							
Right Turns on Red	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3	
Leading Ped Interval	No	-2	No	-2	No	-2	No	-2	
5.3a Corner Radius	> 10m to 15m	-6							
5.3b Right Turn Channel	No Right Turn Channel	-4							
5.4 Crosswalk Treatment	Standard Transverse Markings	-7	Standard Transverse Markings	-7	Standard Transverse Markings	-7	Standard Transverse Markings	-7	
TOTAL PETSI SCORE		70		37		28		4	
DELAY SCORE Cycle length from Signal Timing Plan		130		130		130		130	
Delay (sec.)		39		39		38		38	
PETSI SCORE		C		E		F		F	
DELAY SCORE		D		D		D		D	
OVERALL APPROACH SCORE		D		E		F		F	

EXHIBIT 4.40 VISENEAU/INNES - PLOS INTERSECTION EVALUATION

MAIN STREET

Innes Road

MINOR STREET

Viseneau Drive

APPROACHES

ΑII

YEAR

2029

DIRECTION

ΑII

MMLOS MODE

PLOS

MMLOS MODE PLOS	North Approd		Sout Approd		East Approd		West 20 Approd	
	Comment	Points	Comment	Points	Comment	Points	Comment	Points
5.1 Crossing Distance & Conditions Median? Total Travel Lanes Crossed	No 2	120	No 5	72	No 6	55	No 7	39
5.2 Signal Phasing & Timing Features Left Turn Conflict	Permissive	-8	Permissive	-8	Protected	0	Permissive	-8
Right Turn Conflict	Permissive or Yield Control	-5						
Right Turns on Red	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3
Leading Ped Interval	No	-2	No	-2	No	-2	No	-2
5.3a Corner Radius	> 10m to 15m	-6						
5.3b Right Turn Channel	No Right Turn Channel	-4						
5.4 Crosswalk Treatment	Standard Transverse Markings	-7	Standard Transverse Markings	-7	Standard Transverse Markings	-7	Standard Transverse Markings	-7
TOTAL PETSI SCORE		85		37		28		4
DELAY SCORE Cycle length from Signal Timing Plan Delay (sec.)		130 32		130 32		130 38		130 38
PETSI SCORE		В		E		F		F
DELAY SCORE		D		D		D		D
OVERALL APPROACH SCORE		D		E		F		F

EXHIBIT 4.41 JEANNE D'ARC/INNES - PLOS INTERSECTION EVALUATION

MAIN STREET Innes Road

MINOR STREET Jeanne d'Arc Boulevard

APPROACHES AII
YEAR 2029
DIRECTION AII
MMLOS MODE PLOS

WINECOS WIODE 1 EOS	North Approd		Souti Approd		East Approd		West 20 Approc	
	Comment	Points	Comment	Points	Comment	Points	Comment	Points
5.1 Crossing Distance & Conditions Median? Total Travel Lanes Crossed	No 9	6	No 9	6	No 8	23	No 8	23
5.2 Signal Phasing & Timing Features Left Turn Conflict	Protected	0	Protected	0	Protected	0	Protected	0
Right Turn Conflict	No Right Turn	0	No Right Turn	0	No Right Turn	0	No Right Turn	0
Right Turns on Red	RTOR Prohibited	0	RTOR Prohibited	0	RTOR Prohibited	0	RTOR Prohibited	0
Leading Ped Interval	No	-2	No	-2	No	-2	No	-2
5.3a Corner Radius	> 10m to 15m	-6	> 10m to 15m	-6	> 10m to 15m	-6	> 10m to 15m	-6
5.3b Right Turn Channel	Conventional Right Turn No Receiving Lane	0	Conventional Right Turn No Receiving Lane	0	Conventional Right Turn No Receiving Lane	0	Conventional Right Turn No Receiving Lane	0
5.4 Crosswalk Treatment	Standard Transverse Markings	-7	Standard Transverse Markings	-7	Standard Transverse Markings	-7	Standard Transverse Markings	-7
TOTAL PETSI SCORE		0		0		8		8
DELAY SCORE Cycle length from Signal Timing Plan Delay (sec.)		130 43		130 43		130 41		130 41
PETSI SCORE		F		F		\mathbf{F}		F
DELAY SCORE		E		E		\mathbf{E}		E
OVERALL APPROACH SCORE		F		F		F		F

EXHIBIT 4.42 FRANK BENDER/INNES - BLOS INTERSECTION EVALUATION

MAIN STREET Innes Road

MINOR STREET Frank Bender Street Eastbound-Westbound APPROACHES

2029 YEAR

DIRECTION ΑII MMLOS MODE **BLOS** INTERSECTION SCORE ${f F}$

Sikeway and Intersection Type		LOS
	n a Signalized Intersection Approach	
Right-turn Lane and Turning Speed of Motorists	No impact on LTS (as long as cycling facility remains to the right of any turn lane - otherwise see pocket bike	lanes belov
NOTOTISTS	Two-stage, left-tum bike box; ≤ 50 km/h	Α
	No lane crossed, ≤ 50 km/h	В
	1 lane crossed, ≤ 40 km/h	В
cyclist Making a Left-turn and	No lane crossed, ≥ 60 km/h	С
Operating Speed of Motorists (refer	1 lane crossed, 50 km/h	С
figure)	2 or more lanes crossed, ≤ 40 km/h	D
	1 lane crossed, ≥ 60 km/h 2 or more lanes crossed, ≥ 50 km/h	F
	All other single left-turn lane configurations	
	Dual left-turn lanes (shared or exclusive)	F
ocket Bike Lanes on a Signalized Ir	ntersection Approach	
	Right-turn lane introduced to the right of the bike lane and ≤ 50 m long, turning speed ≤ 25 km/h (based on curb radii and angle of intersection)	В
Right-turn Lane and Turning Speed of	Right-turn lane introduced to the right of the bike lane and > 50 m long, turning speed ≤ 30 km/h (based on curb radii and angle of intersection)	D
Motorists	Bike lane shifts to the left of the right-turn lane, turning speed ≤ 25 km/h (based on curb radii and angle of intersection)	D
	Right-turn lane with any other configurations	F
	Dual right-turn lanes (shared or exclusive)	F
	Two-stage, left-turn bike box; ≤ 50 km/h	A
	No lane crossed, ≤ 50 km/h	В
	1 lane crossed, ≤ 40 km/h No lane crossed, ≥ 60 km/h No lane crossed, ≥ 60 km/h	В
cyclist Making a Left-turn and	No lane crossed, ≥ 60 km/h 1 lane crossed, 50 km/h	C
Operating Speed of Motorists (refer	2 or more lanes crossed, ≤ 40 km/h	D
figure)	1 lane crossed, ≥ 60 km/h	E
	2 or more lanes crossed, ≥ 50 km/h	F
	All other single left-turn lane configurations	F
	Dual left turn lanes (shared or exclusive)	F
lixed Traffic on a Signalized Interse		
Right-turn Lane and Turning Speed of	Right-turn lane 25 to 50 m long, turning speed ≤ 25 km/h (based on curb radii and angle of intersection) Right-turn lane 25 to 50 m long, turning speed > 25 km/h (based on curb radii and angle of intersection)	D E
Notorists	Right-turn lane 25 to 50 m long, turning speed > 25 km/n (based on curb radii and angle of intersection) Right-turn lane longer than 50 m	F
NO ED TO ES	Dual right-turn lanes (shared or exclusive)	F
	Two-stage, left-tum bike box; ≤ 50 km/h	A
	No lane crossed. < 50 km/h	В
	1 lane crossed, ≤ 40 km/h NOT APPLICABLE	В
cyclist Making a Left-turn and	No lane crossed, ≥ 60 km/n	D
Ingrating Speed of Motoriete (refer	1 lane crossed, 50 km/h	D D
figure)	2 or more lanes crossed, ≤ 40 km/h 1 lane crossed, ≥ 60 km/h	F
	2 or more lanes crossed, ≥ 50 km/h	F
	All other single left-turn lane configurations	F
	Dual left-turn lanes (shared or exclusive)	F
eft-turn Configurations		
Two-stage, left-ti	Im bike box No lane crossed One lane crossed	

notes:

1. Pocket bike lanes are defined as bike lanes that develop near intersections between vehicular right turn lanes on the right side and vehicular through or left lanes on the left side. All other configurations of bike lanes or separated facility that remain against the edge of the curb/parking lane and require right turning vehicles to yield to through cyclists will not impact the level of traffic stress (i.e. are considered to be LOS A).

EXHIBIT 4.43 VISENEAU/INNES - BLOS INTERSECTION EVALUATION

MAIN STREET Innes Road
MINOR STREET Viseneau Drive

APPROACHES Eastbound-Westbound

YEAR 2029 DIRECTION AII MMLOS MODE BLOS INTERSECTION SCORE ${f F}$

likeway and Intersection Type		LOS
	n a Signalized Intersection Approach	
tight-turn Lane and Turning Speed of Motorists	No impact on LTS (as long as cycling facility remains to the right of any turn lane - otherwise see pocket bike	lanes below
	Two-stage, left-tum bike box; ≤ 50 km/h	A
	No lane crossed, ≤ 50 km/h	В
	1 lane crossed, ≤ 40 km/h	В
cyclist Making a Left-turn and	No lane crossed, ≥ 60 km/h	С
perating Speed of Motorists (refer	1 lane crossed, 50 km/h	С
figure)	2 or more lanes crossed, ≤ 40 km/h	D
	1 lane crossed, ≥ 60 km/h	F
	2 or more lanes crossed, ≥ 50 km/h	- 1
	All other single left-turn lane configurations Dual left-turn lanes (shared or exclusive)	F
ocket Bike Lanes on a Signalized Ir		
	Right-turn lane introduced to the right of the bike lane and ≤ 50 m long, turning speed ≤ 25 km/h (based on	В
	curb radii and angle of intersection) Right-turn lane introduced to the right of the bike lane and > 50 m long, turning speed ≤ 30 km/h (based on	D
tight-turn Lane and Turning Speed of Motorists	curb radii and angle of intersection)	
10 tonsts	Bike lane shifts to the left of the right-turn lane, turning speed ≤ 25 km/h (based on curb radii and angle of intersection)	D
	Right-turn lane with any other configurations	F
	Dual right-turn lanes (shared or exclusive)	F
	Two-stage, left-tum bike box; ≤ 50 km/h	A
	No lane crossed, ≤ 50 km/h	В
	1 lane crossed, ≤ 40 km/h No lane crossed, ≥ 60 km/h NOT APPLICABLE	В
cyclist Making a Left-turn and		C
Ingrating Spand of Motorists (refer	1 lane crossed, 50 km/h	C
figure)	2 or more lanes crossed, ≤ 40 km/h	D
	1 lane crossed, ≥ 60 km/h	E F
	2 or more lanes crossed, ≥ 50 km/h	F
	All other single left-turn lane configurations Dual left-turn lanes (shared or exclusive)	F
		г
lixed Traffic on a Signalized Interse		D
light-turn Lane and Turning Speed of	Right-turn lane 25 to 50 m long, turning speed ≤ 25 km/h (based on curb radii and angle of intersection) Right-turn lane 25 to 50 m long, turning speed > 25 km/h (based on curb radii and angle of intersection)	E
Notorists	Right-turn lane longer than 50 m	F
OUTS	Dual right-turn lanes (shared or exclusive)	F
	Two-stage, left-turn bike box; ≤ 50 km/h	A
	No lane crossed, ≤ 50 km/h	В
	1 lane crossed, ≤ 40 km/h NOT APPLICABLE	В
	No lane crossed, ≥ 60 km/h	D
yclist Making a Left-turn and	1 lane crossed, 50 km/h	D
perating Speed of Motorists (refer	2 or more lanes crossed, ≤ 40 km/h	D
figure)	1 lane crossed, ≥ 60 km/h	F
	2 or more lanes crossed, ≥ 50 km/h	F
	All other single left-turn lane configurations	F
	Dual left-turn lanes (shared or exclusive)	F
eft-turn Configurations	but follow followed or excitation	
Two-stage, left-ti	Im bike box No lane crossed One lane crossed	

Notes

To Pocket bike lanes are defined as bike lanes that develop near intersections between vehicular right turn lanes on the right side and vehicular through or left lanes on the left side. All other configurations of bike lanes or separated facility that remain against the edge of the curb/parking lane and require right turning vehicles to yield to through cyclists will not impact the level of traffic stress (i.e. are considered to be LOSA).

EXHIBIT 4.44 JEANNE D'ARC/INNES - BLOS INTERSECTION EVALUATION

MAIN STREET Innes Road

MINOR STREET Jeanne d'Arc Boulevard APPROACHES Eastbound—Westbound

YEAR 2029 DIRECTION AII MMLOS MODE BLOS INTERSECTION SCORE ${f F}$

Bikeway and Intersection Type		LOS
	a Signalized Intersection Approach	L03
Right-turn Lane and Turning Speed of	-	
Motorists	No impact on LTS (as long as cycling facility remains to the right of any turn lane - otherwise see pocket bike	lanes below
NO EDITO ES	Two-stage, left-tum bike box; ≤ 50 km/h	A
	No lane crossed, ≤ 50 km/h	В В
	1 lane crossed, ≤ 40 km/h	В
	No lane crossed, ≥ 40 km/h	C
Cyclist Making a Left-turn and	1 lane crossed, 50 km/h	C
Operating Speed of Motorists (refer	2 or more lanes crossed, ≤ 40 km/h	D
o figure)		
	1 lane crossed, ≥ 60 km/h	F
}	2 or more lanes crossed, ≥ 50 km/h	
•	All other single left-turn lane configurations	
and the base of th	Dual left-turn lanes (shared or exclusive)	F
Pocket Bike Lanes on a Signalized In		
	Right-turn lane introduced to the right of the bike lane and \leq 50 m long, turning speed \leq 25 km/h (based on	В
	curb radii and angle of intersection)	
	Right-turn lane introduced to the right of the bike lane and > 50 m long, turning speed ≤ 30 km/h (based on	D
	curb radii and angle of intersection)	
Motorists	Bike lane shifts to the left of the right-turn lane, turning speed ≤ 25 km/h (based on curb radii and angle of	D
	intersection)	U
ľ	Right-turn lane with any other configurations	F
	Dual right-turn lanes (shared or exclusive)	F
	Two-stage, left-turn bike box; ≤ 50 km/h	A
	No lane crossed, ≤ 50 km/h	В
		В
	1 lane crossed, ≤ 40 km/h No lane crossed, ≥ 60 km/h NOT APPLICABLE	C
Cyclist Making a Left-turn and	1 lane crossed, 50 km/h	C
Operating Speed of Motorists (refer	2 or more lanes crossed, ≤ 40 km/h	D
	1 lane crossed, ≥ 60 km/h	E
	2 or more lanes crossed, ≥ 50 km/h	F
	All other single left-turn lane configurations	F
		F
	Dual left-turn lanes (shared or exclusive)	г
Mixed Traffic on a Signalized Intersec		_
	Right-turn lane 25 to 50 m long, turning speed ≤ 25 km/h (based on curb radii and angle of intersection)	D
	Right-turn lane 25 to 50 m long, turning speed > 25 km/h (based on curb radii and angle of intersection)	E
Motorists	Right-turn lane longer than 50 m	F
	Dual right-turn lanes (shared or exclusive)	F
	Two-stage, left-turn bike box; ≤ 50 km/h	A
	No lane crossed, ≤ 50 km/h	В
	1 lane crossed, < 40 km/h	В
Surfict Marking of a fixture and	No lane crossed, ≥ 60 km/h	D
Cyclist Making a Left-turn and	1 lane crossed, 50 km/h	D
Operating Speed of Motorists (refer	2 or more lanes crossed, ≤ 40 km/h	D
o figure)	1 lane crossed, ≥ 60 km/h	F
	2 or more lanes crossed, ≥ 50 km/h	F
ľ	All other single left-turn lane configurations	F
	Dual left-turn lanes (shared or exclusive)	F
eft-turn Configurations	buar retrummanes (shared or exclusive)	Г
Two-stage, left-tu	Im bike box No lane crossed One lane crossed One lane crossed One Lane Crossed	

Notes

To Pocket bike lanes are defined as bike lanes that develop near intersections between vehicular right turn lanes on the right side and vehicular through or left lanes on the left side. All other configurations of bike lanes or separated facility that remain against the edge of the curb/parking lane and require right turning vehicles to yield to through cyclists will not impact the level of traffic stress (i.e. are considered to be LOSA).

EXHIBIT 4.45 FRANK BENDER/INNES - TLOS INTERSECTION EVALUATION

MAIN STREET Innes Road

MINOR STREET Frank Bender Street

APPROACHES All INTERSECTION SCORE ${f F}$

YEAR 2029 MMLOS MODE TLOS

Delay	Typical Location	LOS
0	Grade Separation	А
≤10 sec	High Level TSP	В
≤20 sec	TSP & short (e.g. <60 sec) to medium (e.g.	С
≤30 sec	60-90 sec) cycle length	D
≤40 sec	TSP & long cycle length (e.g. >90 sec)	Ē
>40 sec	No TSP & long cycle length (e.g. >90 sec)	Ē

Note: Delay includes travel time from end of queue to entering the intersection

EXHIBIT 4.46 VISENEAU/INNES - TLOS INTERSECTION EVALUATION

MAIN STREET Innes Road
MINOR STREET Viseneau Drive

APPROACHES All Intersection score **F** year 2029

YEAR 2029 MMLOS MODE TLOS

Delay	Typical Location	LOS
0	Grade Separation	А
≤10 sec	High Level TSP	В
≤20 sec	TSP & short (e.g. <60 sec) to medium (e.g.	С
≤30 sec	60-90 sec) cycle length	D
≤40 sec	TSP & long cycle length (e.g. >90 sec)	E
>40 sec	No TSP & long cycle length (e.g. >90 sec)	E

Note: Delay includes travel time from end of queue to entering the intersection

EXHIBIT 4.47 JEANNE D'ARC/INNES - TLOS INTERSECTION EVALUATION

MAIN STREET Innes Road

MINOR STREET Jeanne d'Arc Boulevard

APPROACHES All INTERSECTION SCORE ${f F}$

YEAR 2029 MMLOS MODE TLOS

Delay	Typical Location	LOS
0	Grade Separation	Α
≤10 sec	High Level TSP	В
≤20 sec	TSP & short (e.g. <60 sec) to medium (e.g.	С
≤30 sec	60-90 sec) cycle length	D
≤40 sec	TSP & long cycle length (e.g. >90 sec)	Е
>40 sec	No TSP & long cycle length (e.g. >90 sec)	E

Note: Delay includes travel time from end of queue to entering the intersection

INTERSECTION SCORE B

EXHIBIT 4.48 FRANK BENDER/INNES - TKLOS INTERSECTION EVALUATION

MAIN STREET Innes Road

MINOR STREET Frank Bender Street
APPROACHES Eastbound-Westbound

YEAR 2029 MMLOS MODE TKLOS

Exhibit 21 - TkLOS Signalized Intersection Evaluation Table

Effective Corner Radius	One receiving lane on departure from intersection	More than one receiving lane on departure from intersection
< 10m	F	D
10 to 15m	Е	В
> 15m	С	A

INTERSECTION SCORE B

EXHIBIT 4.49 VISENEAU/INNES - TKLOS INTERSECTION EVALUATION

MAIN STREET Innes Road
MINOR STREET Viseneau Drive

APPROACHES Eastbound-Westbound

YEAR 2029 MMLOS MODE TKLOS

Exhibit 21 - TkLOS Signalized Intersection Evaluation Table

Effective Corner Radius	One receiving lane on departure from intersection	More than one receiving lane on departure from intersection
< 10m	F	D
10 to 15m	Е	В
> 15m	С	A

INTERSECTION SCORE B

EXHIBIT 4.50 JEANNE D'ARC/INNES - TKLOS INTERSECTION EVALUATION

MAIN STREET Innes Road

MINOR STREET Jeanne d'Arc Boulevard APPROACHES Eastbound—Westbound

YEAR 2029 MMLOS MODE TKLOS

Exhibit 21 - TkLOS Signalized Intersection Evaluation Table

Effective Corner Radius	One receiving lane on departure from intersection	More than one receiving lane on departure from intersection
< 10m	F	D
10 to 15m	Е	В
> 15m	С	А