

245- 275 Lamarche Avenue

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Strategy Report

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1 Screening

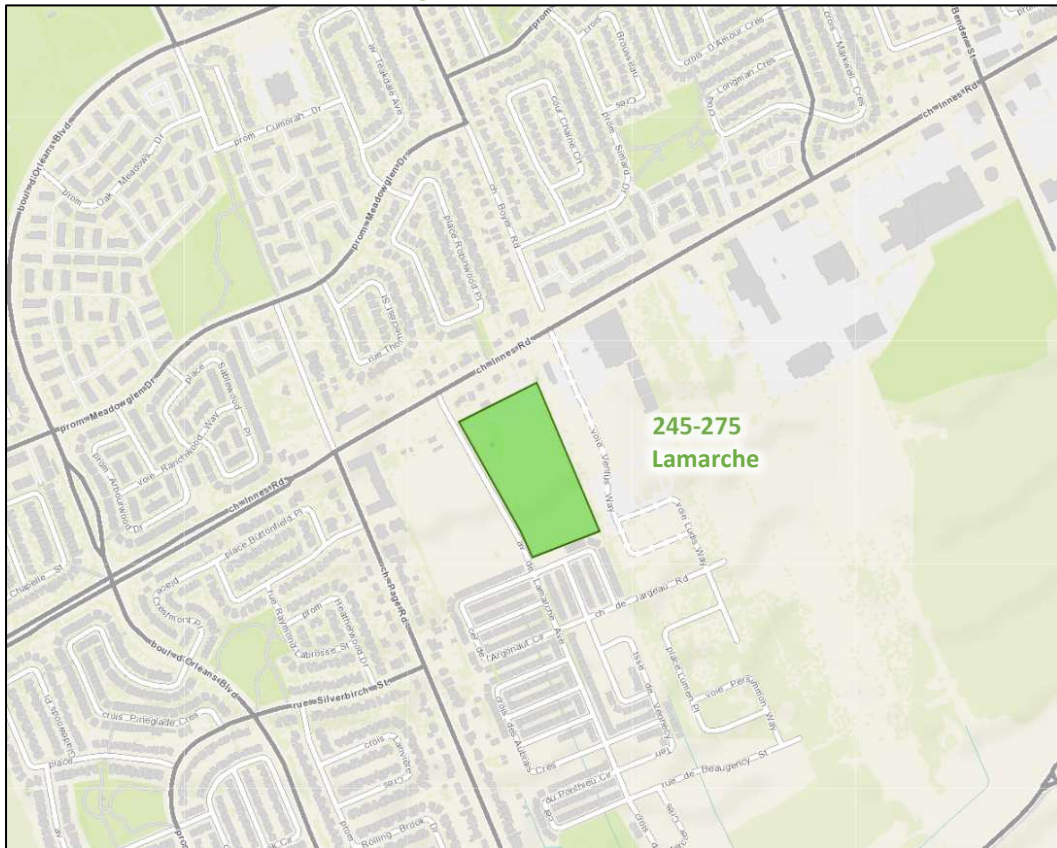
This study has been prepared according to the City of Ottawa’s 2017 Transportation Impact Assessment (TIA) Guidelines, incorporating the 2023 Revision to Transportation Impact Assessment Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for the TIA Study PM. As shown in the Screening Form, a TIA is required, and this study has been prepared to support a Site Plan application.

2 Existing and Planned Conditions

2.1 Proposed Development

The existing site, located at 245 and 275 Lamarche Avenue, is zoned as Development Reserve (DR). The proposed development consists of 476 stacked dwellings, 476 residential vehicle parking spaces, 36 visitor parking spaces, and 238 bicycle parking spaces. The concept plan includes two full-movement accesses onto Lamarche Avenue. The anticipated full build-out and occupancy horizon is 2026 with construction occurring in phases. Figure 1 illustrates the study area context. Figure 2 illustrates the proposed concept plan.

Figure 1: Area Context Plan

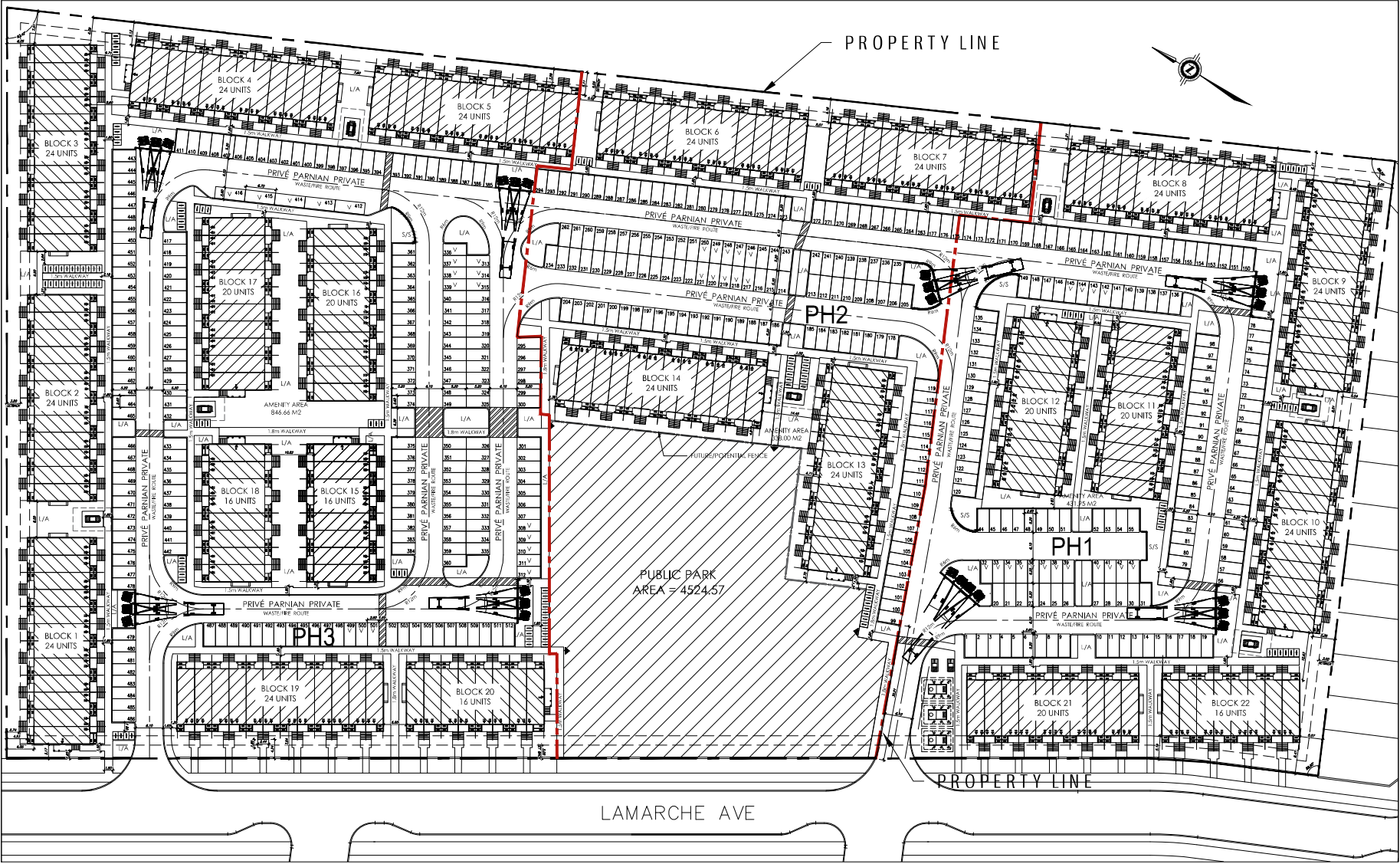


Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: August 6, 2024

Figure 2: Concept Plan

USE AREA	45,200 (43,819-47,432) SQ	ZONE PROVISION - PLANNED UNIT DEVELOPMENT	REQUIRED	PROPOSED	ADDITIONAL PROVISIONS	REQUIRED	PROPOSED
PAVED AREA	13,895 (12,517-15,276)	MAXIMUM HEIGHT (M)	12M	12M	FRONT PROJECTIONS INTO PARKING YARDS	40.00M (132.00 FT)	3.4M (11.15 FT)
LANDSCAPING AREA	97,926 (90,947-104,178)	MINIMUM SETBACK (M)	3.0M	3.0M	PERVIOUS OPENING SPACE (FLOOR)	2.1M (6.89 FT)	2.1M (6.89 FT)
TOTAL BUILDING COVERAGE	11,336 (10,487-12,235)	MIN. FRONT YARD SETBACK (M)	5.0M	5.0M	COVERED OR UNCOVERED BALCONY / PORCH DECK	2.1M x 3.2M	2.1M x 3.2M
TOTAL GROSS FLOOR AREA	43,819 (43,847-43,847)	MIN. REAR YARD SETBACK (M)	5.0M	5.0M	MIN. TERRACE BALCONY SPACE (FLOOR)	2.1M x 3.2M	2.1M x 3.2M
EXISTING UNIT	0	MIN. SIDE SETBACK (M)	5.0M	5.0M	MIN. WALKER FREE PARKING	3.4M (11.15 FT)	3.4M (11.15 FT)
ZONE CATEGORY	PAU	MIN. SIDE SETBACK (M) (NON-RESIDENTIAL)	5.0M	5.0M	MIN. WALKER FREE PARKING	3.4M (11.15 FT)	3.4M (11.15 FT)
COVERED BLOCK	20 UNITS	MIN. SIDE SETBACK (M) (RESIDENTIAL)	5.0M	5.0M	MIN. BIKE PARKING SPACE ACCESSIBLE WIDTH (M)	1.5M	1.5M
BLOCKS	14 UNITS	MIN. SIDE SETBACK (M) (RESIDENTIAL)	5.0M	5.0M	MIN. BIKE PARKING SPACE ACCESSIBLE WIDTH (M)	1.5M	1.5M
14-14-14-14-14-14	STACKED DWELLING	MIN. SIDE SETBACK (M) (RESIDENTIAL)	5.0M	5.0M	MIN. BIKE PARKING SPACE ACCESSIBLE WIDTH (M)	1.5M	1.5M
14-14-14-14-14-14	STACKED DWELLING	MIN. SIDE SETBACK (M) (RESIDENTIAL)	5.0M	5.0M	MIN. BIKE PARKING SPACE ACCESSIBLE WIDTH (M)	1.5M	1.5M
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14-14-14-14-14-14	STACKED DWELLING	MIN. SIDE SETBACK (M) (RESIDENTIAL)	5.0M	5.0M	MIN. BIKE PARKING SPACE ACCESSIBLE WIDTH (M)	1.5M	1.5M
TOTAL	474	MIN. SIDE SETBACK (M) (RESIDENTIAL)	5.0M	5.0M	MIN. BIKE PARKING SPACE ACCESSIBLE WIDTH (M)	1.5M	1.5M

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Location ORLEANS
 Client CAIVAN

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OVERALL SITE PLAN

SP1

2.2 Existing Conditions

2.2.1 Area Road Network

Innes Road: Innes Road is a City of Ottawa arterial road. It has a divided four-lane urban cross-section west of Page Road, and five-lane urban cross-section including a two-way left-turn lane to the east. Bike lanes and sidewalks are provided on both sides of the road east of Orleans Boulevard, and on the north side of the road west of Orleans Boulevard. The posted speed limit is 60 km/h east of Orleans Boulevard and 80 km/h west of Orleans Boulevard. The City-protected right-of-way is 37.5 metres. Innes Road is designated as a truck route.

Orleans Boulevard: Orleans Boulevard is a City of Ottawa urban arterial road with a four-lane divided cross-section north of Silverbirch Street and a two-lane cross-section south of Silverbirch Street. Sidewalks are present on both sides of the road north of Silverbirch Street, and on the west side of the road to the south of Silverbirch Street. The posted speed limit is 60 km/h north of Innes Road, and 50 km/h to the south. The city-protected right-of-way is 37.5 metres north of Innes Road, and the measured right-of-way is 34.0 metres south of Innes Road. Orleans Boulevard is designated as a truck route north of Innes Road.

Viseneau Drive: Viseneau Drive is a City of Ottawa collector road with a two-lane urban cross-section. A sidewalk is present on the west side of the road. The posted speed limit is 40 km/h, and the city-protected right-of-way is 26.0 metres.

Page Road: Page Road is a City of Ottawa local road with a two-lane semi-urban cross-section north of Innes Road and a collector road with a two-lane urban cross-section south of Innes Road. Sidewalks are present on the west side of the road and for 205 metres south of Innes Road on east side of the road. The posted speed limit is 40 km/h. The measured right-of-way varies between 20.0 and 22.0 metres north of Silverbirch Street, and the City-protected right-of-way is 24.0 metres south of Silverbirch Street.

Lamarche Avenue: Lamarche Avenue is a City of Ottawa urban local road with a two-lane cross. A MUP is present on the west side of the road north of Argonaut Circle/Jargeau Road. A sidewalk is present on the east side of the road north of Argonaut Circle/Jargeau Road and on the west side of the road between Argonaut Circle/Jargeau Road and Ponthieu Circle/Beaugency Street. The unposted speed limit is assumed to be 40 km/h, and the measured right-of-way is 24.0 metres.

Ventus Way: Ventus Way is a City of Ottawa local road with a two-lane cross. Ventus Way is currently under construction. The unposted speed limit is assumed to be 40 km/h, and the measured right-of-way is 23.5 metres.

2.2.2 Existing Intersections

The key existing signalized area intersections within one kilometre of the site have been summarized below:

Innes Road at Orleans Boulevard

The intersection of Innes Road at Orleans Boulevard is a signalized intersection. The northbound and southbound approaches each consist of an auxiliary left-turn lane, two through lanes, and an auxiliary channelized right-turn lane. The eastbound approach consists of two auxiliary left-turn lanes, two through lanes, and an auxiliary channelized right-turn lane, and the westbound approach consists of an auxiliary left-turn lane, two through lanes, a transit queue jump, a bike lane, and an auxiliary channelized right-turn lane.

Innes Road at Page Road

The intersection of Innes Road at Page Road is a signalized intersection. The northbound and southbound approaches each consist of a shared all-movement lane. The eastbound approach

consists of an auxiliary left-turn lane, a through lane, a shared through/right-turn lane, and a bike lane, and westbound approach consists of an auxiliary left-turn lane, which develops from the two-way left-turn lane, a through lane, a shared through/right-turn lane, and a bike lane. No turn restrictions were noted.

Innes Road at Lamarche Avenue

The intersection of Innes Road at Lamarche Avenue is a T-intersection stop-controlled on the minor approach of Lamarche Avenue. The northbound approach consists of a shared all-movement lane. The eastbound approach consists of a through lane and a shared through/right-turn lane, and westbound approach consists of two through lanes. A two-way left-turn lane is present through the intersection on Innes Road. No turn restrictions were noted.

Innes Road at Ventus Way

The intersection of Innes Road at Ventus Way is a signalized intersection. The northbound approach functions as a left-turn lane and a shared through/right-turn lane, and the southbound approach consists of a shared all-movement lane. The eastbound approach consists of an auxiliary left-turn lane, which develops from the two-way left-turn lane, a through lane, a shared through/right-turn lane, and a bike lane, and the westbound approach consists of an auxiliary left-turn lane, a through lane, a shared through/right-turn lane, and a bike lane. No turn restrictions were noted.

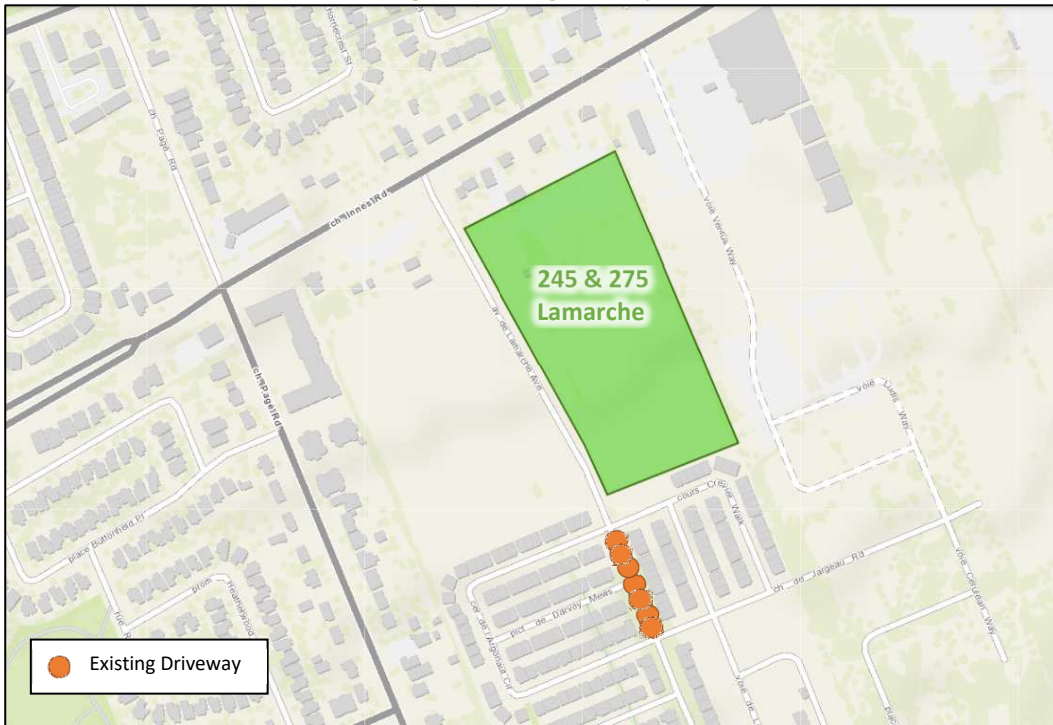
Innes Road at Viseneau Drive

The intersection of Innes Road at Viseneau Drive is a signalized intersection. The northbound approach consists of a left-turn lane, a through lane, and an auxiliary right-turn lane, and the southbound approach consists of a shared all-movement lane. The eastbound approach consists of an auxiliary left-turn lane, two through lanes, a bike lane, and an auxiliary right-turn lane, and the westbound approach consists of an auxiliary left-turn lane, a through lane, a shared through/right-turn lane, and a bike lane. No turn restrictions were noted.

2.2.3 Existing Driveways

Within 200 metres of the site accesses on Lamarche Avenue, driveways are provided to townhouses south of the future accesses. Figure 3 illustrates the existing driveways.

Figure 3: Existing Driveways



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: August 6, 2024

2.2.4 Cycling and Pedestrian Facilities

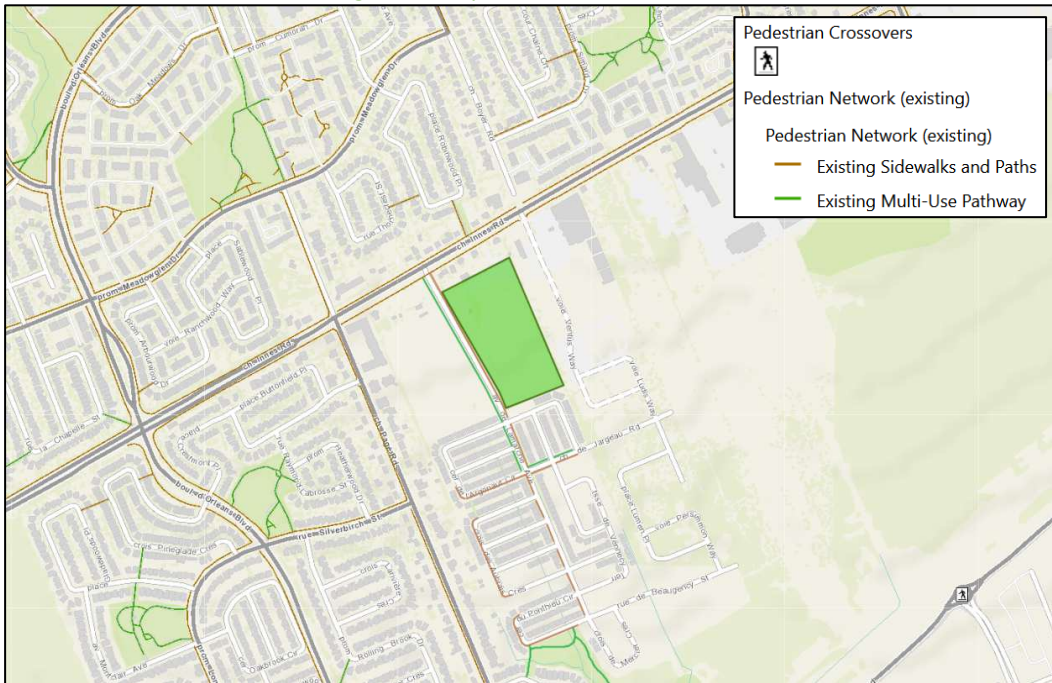
Figure 4 illustrates the pedestrian facilities in the study area and Figure 5 illustrates the cycling facilities.

Sidewalks are present along both sides of Innes Road, east of Orleans Boulevard, and along Orleans Boulevard, north of Silverbirch Street. They are also present on the west side of Orleans Boulevard, as well as on Viseneau Drive, Page Road, and Lamarche Avenue between Argonaut Circle/Jargeau Road and Ponthieu Circle/Beaugency Street. Additionally, sidewalks are located on the east side of Page Road for 205 meters south of Innes Road and on the east side of Lamarche Avenue, north of Argonaut Circle/Jargeau Road.

Cycling facilities include bike lanes along both side of Innes Road east of Orleans Boulevard. A path is provided to connect Innes Road and Robinwood Place. A MUP is present on the west side of Lamarche Avenue north of Argonaut Circle/Jargeau Road and on the north side of Jargeau Road between Lamarche Avenue and Crevier Walk.

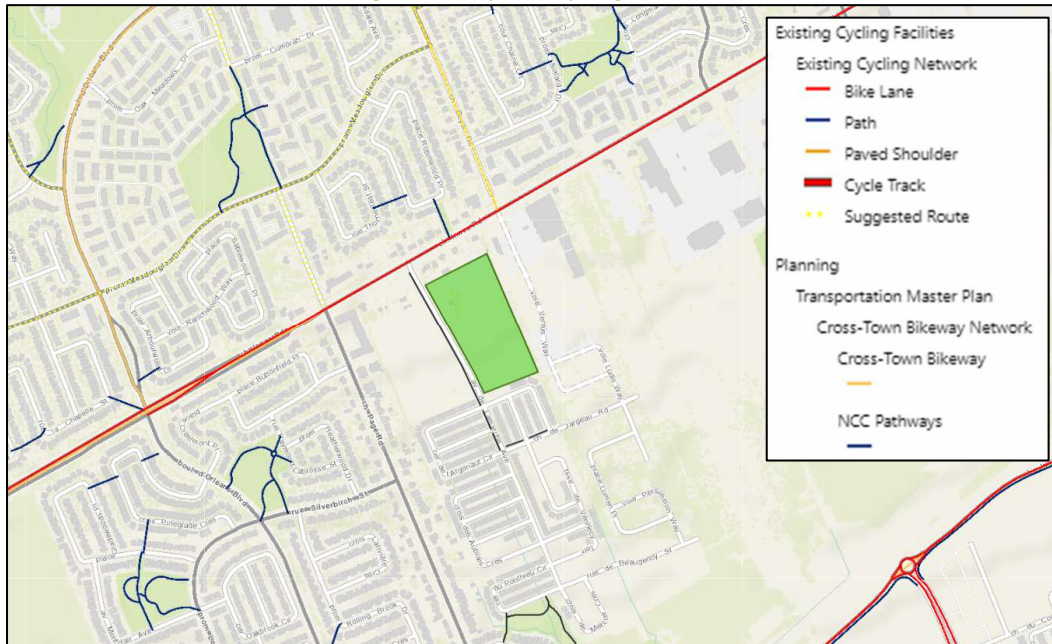
In the Transportation Master Plan – Part 1 (2023), Innes Road, Boyer Road, and Orleans Boulevard north of Innes Road are cross-town bikeways.

Figure 4: Study Area Pedestrian Facilities



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: August 6, 2024

Figure 5: Study Area Cycling Facilities



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: August 6, 2024

Pedestrian and cyclist volumes included in study area intersection counts, presented in Section 2.2.7, have been compiled and are illustrated in Figure 6 and Figure 7, respectively.

Figure 6: Existing Pedestrian Volumes

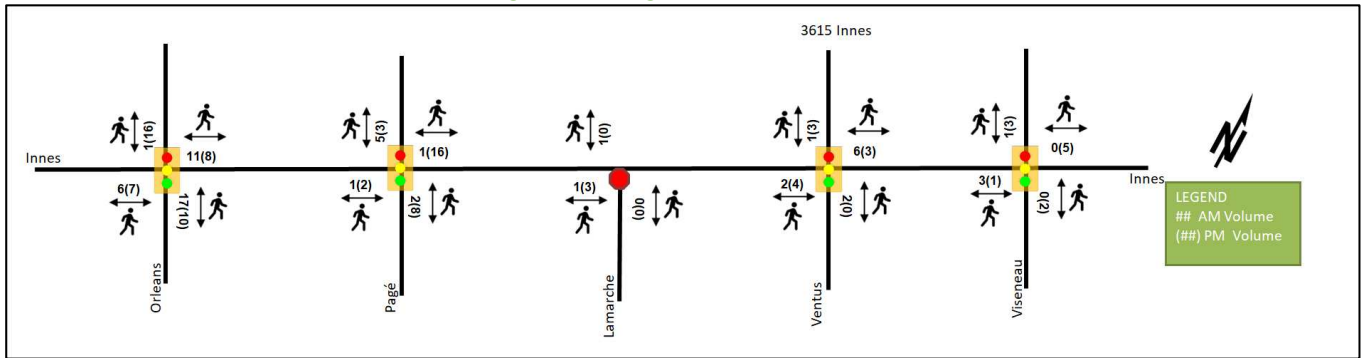
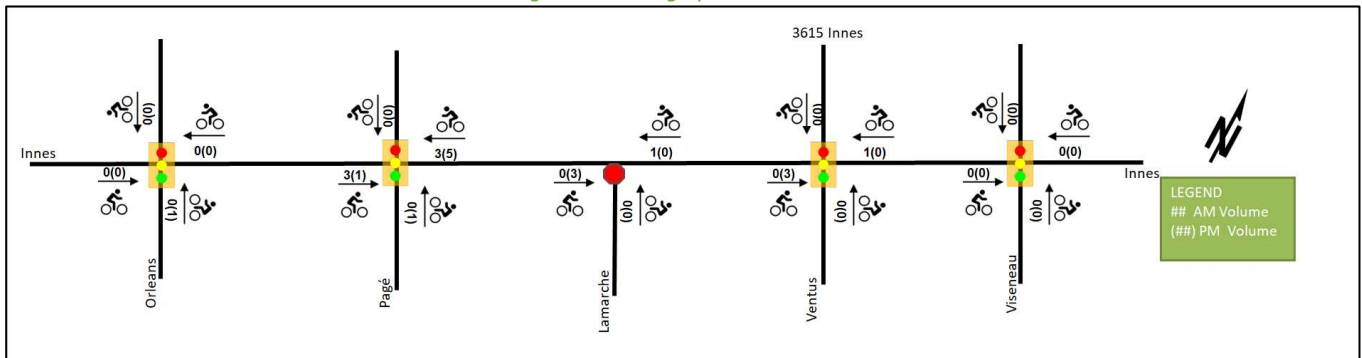


Figure 7: Existing Cyclist Volumes



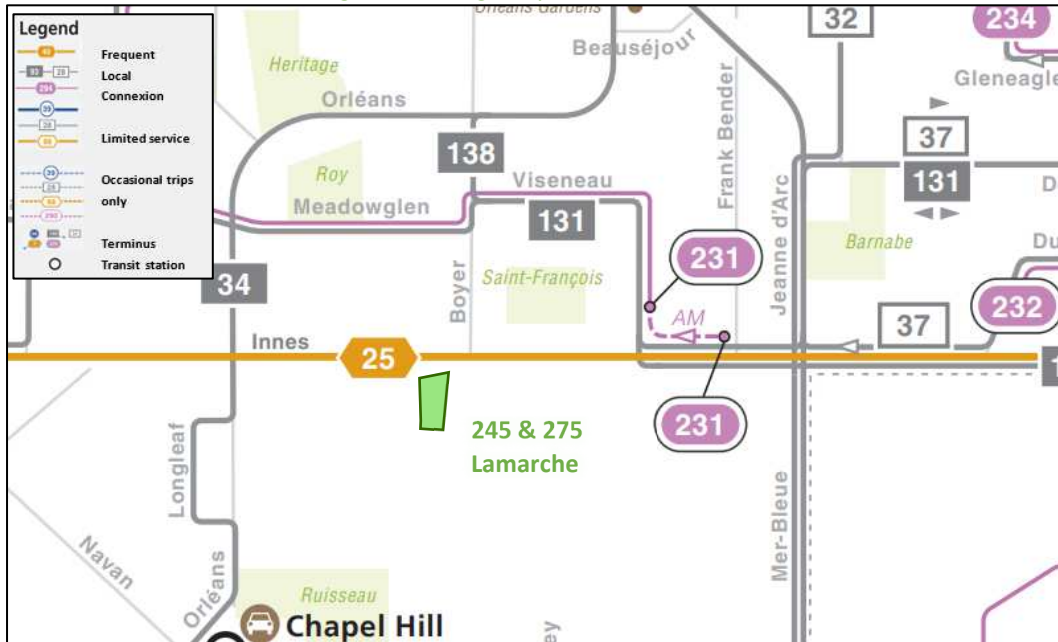
2.2.5 Existing Transit

Figure 8 illustrates the transit system map in the study area and Figure 9 illustrates nearby transit stops. All transit information is from August 6, 2024, and is included for general information purposes and context to the surrounding area.

Within the study area, route #25 travels along Innes Road, route #34 travels along Orleans Boulevard, routes 131 and 231 travel along Innes Road and Viseneau Drive. The closest stops from the site for route #25 are located at Innes Road at Ventus Way and Innes Road at Page Road, the closest stops from the site for route #34 is located at Innes Road at Orleans Boulevard intersection, and the closest stops from the site for route #131 and 231 is located at Innes Road at Viseneau Drive intersection. The frequency of these routes within proximity of the proposed site based on August 6, 2024 service levels are:

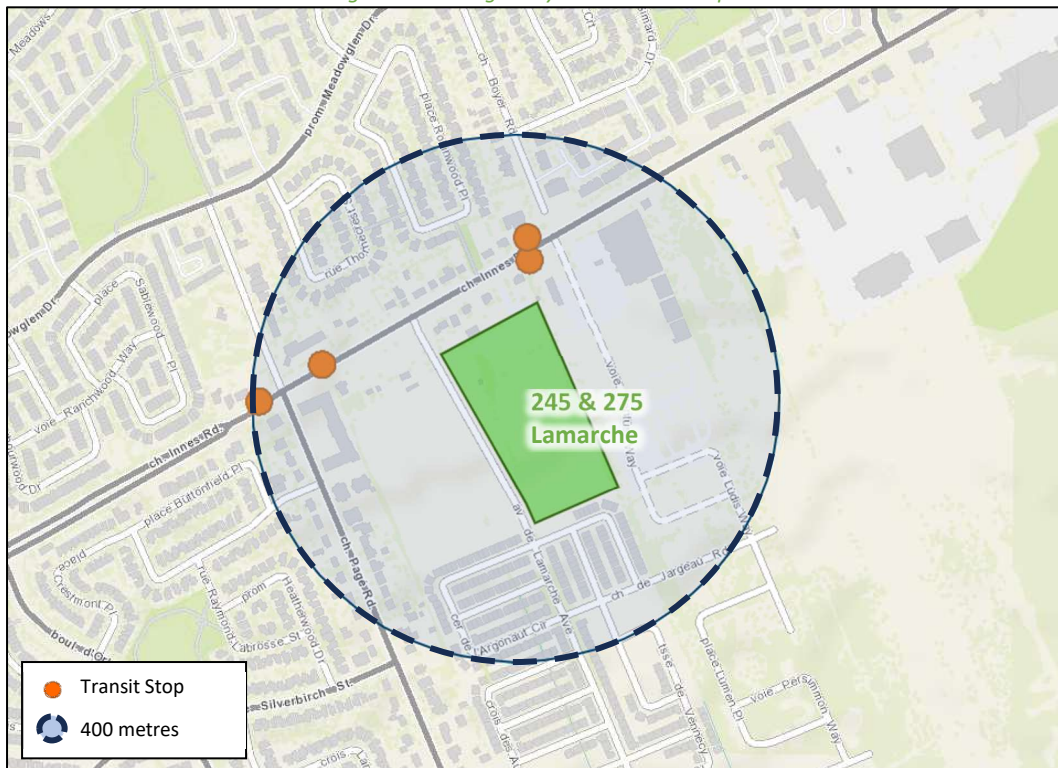
- Route #25 – 10-15-minute service in the peak period/direction, 15-minute daytime service, 30-minute service after 8:00 PM
- Route #34 – 30-minute service all-day
- Route #131 – 30-minute service all-day
- Route #231 – Four buses in the peak period/direction

Figure 8: Existing Study Area Transit Service



Source: <http://www.octranspo.com/> Accessed: August 6, 2024

Figure 9: Existing Study Area Transit Stops



Source: <http://www.octranspo.com/> Accessed: August 6, 2024

2.2.6 Existing Area Traffic Management Measures

Speed humps are present on Page Road north of Innes Road.

2.2.7 Existing Peak Hour Travel Demand

Existing turning movement counts were acquired from the City of Ottawa for the existing study area intersections. Table 1 summarizes the intersection count dates and sources.

Table 1: Intersection Count Date

Intersection	Count Date	Source
Innes Road at Orleans Boulevard	Wednesday, April 24, 2024	City of Ottawa
Innes Road at Page Road	Thursday, May 09, 2024	City of Ottawa
Innes Road at Lamarche Avenue	Wednesday, August 21, 2024	Ontario Traffic Inc.
Innes Road at Ventus Way	Wednesday, August 21, 2024	Ontario Traffic Inc.
Innes Road at Viseneau Drive	Wednesday, January 19, 2022	City of Ottawa

Figure 10 illustrates the existing traffic counts and Table 2 summarizes the existing intersection operations. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and average delay for unsignalized intersections. Detailed turning movement count data is included in Appendix B and the Synchro worksheets are provided in Appendix C.

Figure 10: Existing Traffic Counts

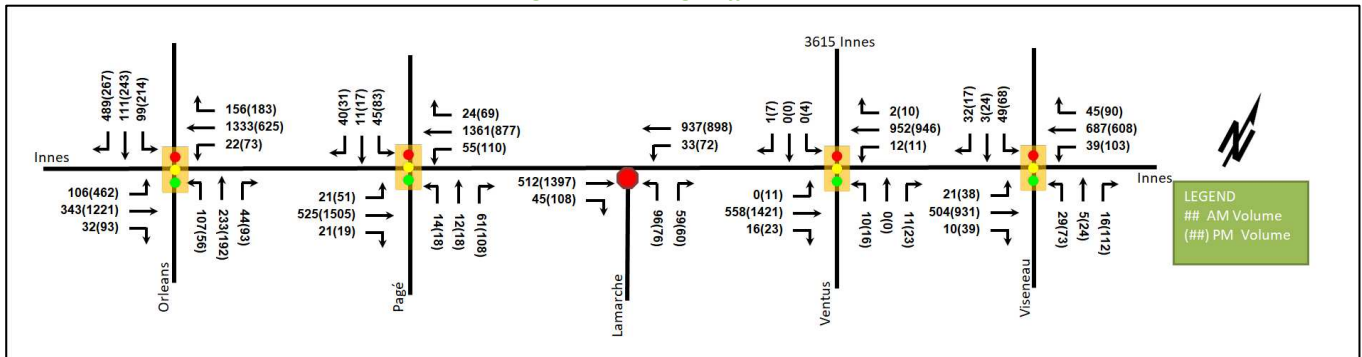


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Innes Road at Orleans Boulevard <i>Signalized</i>	EBL	C	0.77	91.7	#31.2	D	0.81	52.4	71.0
	EBT	A	0.25	20.6	42.7	E	0.98	52.0	#209.4
	EBR	A	0.05	0.1	0.0	A	0.15	0.9	1.8
	WBL	A	0.30	68.9	15.1	B	0.61	56.7	#34.9
	WBT	E	0.99	55.9	#247.3	C	0.78	48.3	#107.6
	WBR	A	0.25	6.1	17.3	A	0.36	14.5	44.9
	NBL	A	0.31	32.2	36.1	A	0.19	26.0	18.3
	NBT	A	0.23	30.7	35.1	A	0.19	25.5	25.4
	NBR	A	0.09	1.9	2.9	A	0.17	1.4	2.8
	SBL	A	0.52	56.4	45.5	D	0.86	68.5	#97.3
	SBT	A	0.18	43.7	22.7	A	0.32	35.1	37.5
	SBR	F	1.20	137.1	#198.3	A	0.50	7.3	21.6
Overall		E	0.98	59.2	-	E	0.96	42.0	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Innes Road at Page Road <i>Signalized</i>	EBL	A	0.15	9.8	7.3	A	0.19	3.6	m2.6
	EBT/R	A	0.25	5.9	45.1	C	0.73	6.5	m38.8
	WBL	A	0.11	5.3	7.0	F	1.05	127.9	#64.1
	WBT/R	B	0.62	9.3	205.2	A	0.46	14.1	142.0
	NB	A	0.38	19.5	17.7	A	0.57	42.3	40.5
	SB	A	0.52	41.1	28.4	C	0.74	57.5	40.6
	Overall	A	0.59	10.1	-	E	0.98	17.6	-
Innes Road at Lamarche Avenue <i>Unsignalized</i>	EBT/R	-	-	-	-	-	-	-	-
	WBL	A	0.04	8.9	0.8	C	0.21	17.1	6.0
	WBT	-	-	-	-	-	-	-	-
	NB	C	0.44	21.5	16.5	F	1.14	184.3	65.3
	Overall	A	-	2.2	-	B	-	10.1	-
Innes Road at Ventus Way <i>Signalized</i>	EBL	-	-	-	-	A	0.03	1.9	m0.4
	EBT/R	A	0.23	3.0	32.0	A	0.57	3.2	78.8
	WBL	A	0.02	8.2	m5.0	A	0.07	5.9	3.5
	WBT/R	A	0.38	7.6	122.1	A	0.38	4.5	70.6
	NBL	A	0.09	45.9	7.1	A	0.12	41.8	8.9
	NBT/R	A	0.03	0.1	0.0	A	0.13	7.0	4.5
	SB	A	0.00	0.0	0.0	A	0.06	3.3	1.7
	Overall	A	0.38	6.1	-	A	0.56	4.0	-
Innes Road at Viseneau Drive <i>Signalized</i>	EBL	A	0.27	77.0	14.9	A	0.39	67.6	22.0
	EBT	A	0.27	9.0	54.6	A	0.52	18.2	126.9
	EBR	A	0.01	0.1	0.0	A	0.05	0.1	0.0
	WBL	A	0.38	61.8	21.2	B	0.63	69.8	46.0
	WBT/R	A	0.38	10.9	81.6	A	0.37	12.4	77.6
	NBL	A	0.22	47.4	14.4	A	0.50	60.5	32.7
	NBT	A	0.03	41.0	4.6	A	0.11	46.4	13.6
	NBR	A	0.07	0.5	0.0	A	0.40	11.3	15.6
	SB	A	0.51	43.8	27.8	B	0.66	65.8	44.6
	Overall	A	0.42	15.1	-	A	0.57	23.2	-

Notes: Saturation flow rate of 1800 veh/h/lane
 Queue is measured in metres
 Peak Hour Factor = 0.90
 Delay = average driver delay in seconds

m = metered queue
 # = volume for the 95th %ile cycle exceeds capacity
 v/c = volume to capacity ratio

During both the AM and PM peak hours, capacity issues are noted at the intersection of Innes Road at Orleans Boulevard. At this intersection, the southbound right-turn movement during AM peak hour is over theoretical capacity and may be subject to high delays and extended queues. The westbound through movement during the AM peak hour is noted to reach V/C of 0.99 at this intersection. Extended queues may be exhibited on the eastbound left-turn and westbound through movements during the AM peak hour, and on the eastbound though, westbound left-turn, westbound through, and southbound left-turn movements during PM peak hour. High delays are anticipated on the eastbound left-turn movement during AM peak hour.

The intersection of the Innes Road and Page Road may be subject to high delays and extended queues on the westbound left-turn movement during PM peak hour. The City may improve the operation by changing the eastbound and westbound left-turn to be protected/permissive phasing, and it would be subject to coordination of the Innes Road corridor.

At the intersection of Innes Road at Lamarche Avenue, the northbound movement experiences delays of over 180 seconds during the PM peak hour. Signal warrant analysis of the Ontario Traffic Manual Book 12 Justifications 1

and 2 were performed for the intersection of Innes Road at Lamarche Avenue. The intersection does not meet signal warrants, as provided in Appendix D.

2.2.8 Collision Analysis

Collision data have been acquired from the City of Ottawa open data website (data.ottawa.ca) for five years prior to the commencement of this TIA for the surrounding study area road network. Table 3 summarizes the collision types and conditions in the study area, Figure 11 illustrates the area collisions, and Table 4 summarizes the total collisions for each of the locations analyzed. Collision data are included in Appendix E.

Table 3: Study Area Collision Summary, 2018-2022

Total Collisions		Number	%
		13	100%
Classification	Fatality	0	0%
	Non-Fatal Injury	3	23%
	Property Damage Only	10	77%
Initial Impact Type	Angle	6	46%
	Rear end	1	8%
	Sideswipe	2	15%
	Turning Movement	1	8%
	SMV Other	3	23%
Road Surface Condition	Dry	9	69%
	Wet	1	8%
	Slush	1	8%
	Packed Snow	1	8%
	Ice	1	8%
Pedestrian Involved		0	0%
Cyclists Involved		1	8%

Figure 11: Study Area Collision Records

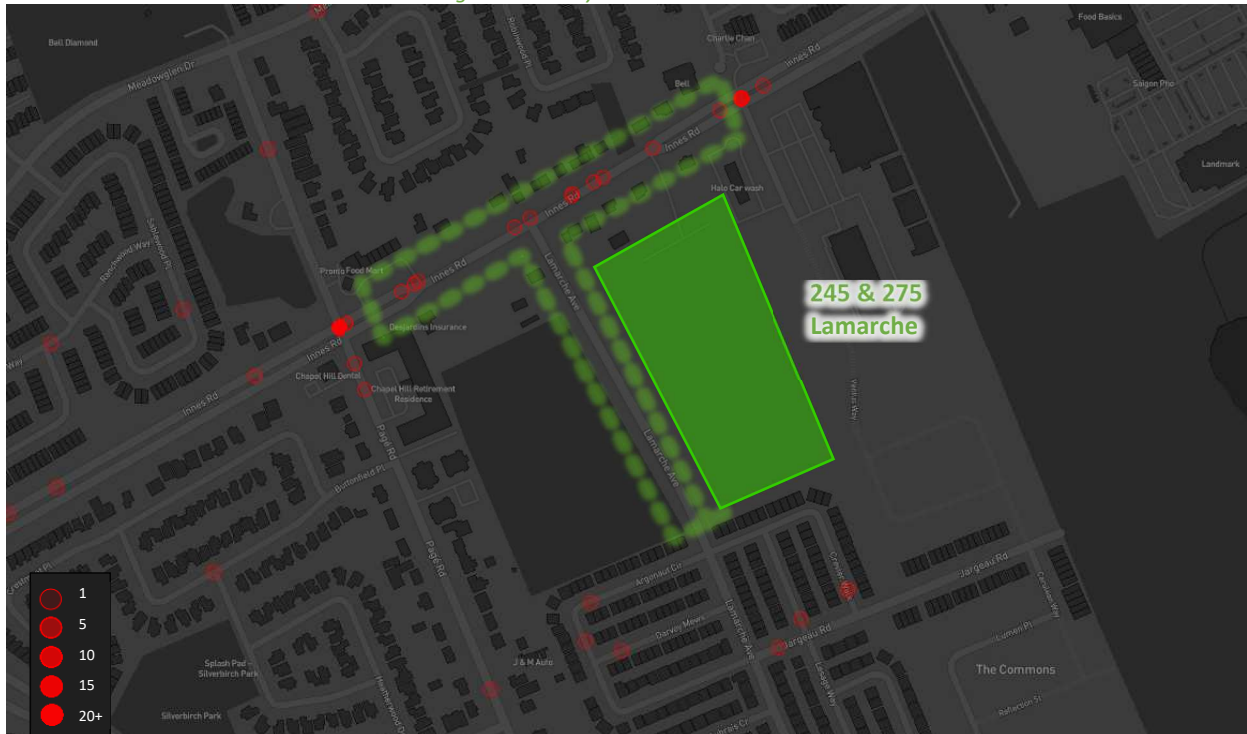


Table 4: Summary of Collision Locations, 2018-2022

	Number	%
Intersections / Segments	13	100%
Innes Rd btwn Page Rd & Ventus Way	12	92%
Lamarche Ave at Innes Rd	1	8%

Within the study area, the segment of Innes Road between Page Road and Ventus Way excludes the intersection of Lamarche Avenue at Innes Road is noted to have experienced twelve collisions, and one cyclist collision is noted at Lamarche Avenue at Innes Road intersection. Table 5 and Table 6 summarize the collision types and conditions for each of the locations.

Table 5: Segment of Innes Rd between Page Road and Ventus Way Collision Summary

		Number	%
Total Collisions		12	100%
Classification	Fatality	0	0%
	Non-Fatal Injury	2	17%
	Property Damage Only	10	83%
Initial Impact Type	Angle	5	42%
	Rear end	1	8%
	Sideswipe	2	17%
	Turning Movement	1	8%
	SMV Other	3	25%
Road Surface Condition	Dry	8	67%
	Wet	1	8%
	Slush	1	8%
	Packed Snow	1	8%
	Ice	1	8%
Pedestrian Involved		0	0%
Cyclists Involved		0	0%

The segment of Innes Road between Page Road and Ventus Way (exclude Lamarche Avenue at Innes Road intersection) during the 2018-2022 time period, with ten involving property damage only and the remaining two having non-fatal injuries. The collision types are most represented by angle with five collisions, followed by SMV other with three collisions, sideswipe with two collisions, and the remaining one collision each for rear end and turning movement. Two out of five angle collisions and one out of three SMV other collisions were observed to occur under winter road conditions. These conditions, including ice, packed snow, and slush, are considered as the primary contributing factors to these collisions. No further examination is required as part of this study.

Table 6: Lamarche Avenue at Innes Road Collision Summary

		Number	%
Total Collisions		1	100%
Classification	Fatality	0	0%
	Non-Fatal Injury	1	100%
	Property Damage Only	0	0%
Initial Impact Type	Angle	1	100%
Road Surface Condition	Dry	1	100%
Pedestrian Involved		0	0%
Cyclists Involved		1	100%

During the 2018-2022 period, there was one cyclist angle collision at the Lamarche Avenue and Innes Road intersection, which occurred under dry conditions. The absence of cycling crossings at this intersection may have

contributed to the collision. With the planned construction of cycling crossings at this intersection by 2025, it is expected that such collisions will be reduced. No further examination is required as part of this study.

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

2.3.1.1 *Transportation Master Plan Update – Part 1 (2023)*

No projects are identified within the study area in the Transportation Master Plan Part 1. Part 2 of the Transportation Master Plan will identify the road network concept and transit network concept, including the affordable network. This is expected to be released by the end of 2024. The Transportation Master Plan (2013) is instructive to how the transportation facilities are planned and can be referenced during the interim.

The Rapid Transit and Transit Priority Network's Network Concept diagram identifies an isolated transit priority measures along Innes Road.

2.3.1.2 *Traffic Control Signals at Innes Road and Lamarche Avenue*

The intersection of Innes Road and Lamarche Avenue is listed on the City's DC By-law funded projects and is anticipated to be constructed by spring of 2025. The design of the intersection includes signalization of the existing minor stop control, an auxiliary westbound left-turn lane, an auxiliary northbound left-turn lane, an auxiliary eastbound right-turn lane, and protected intersection features for bi-directional cycling crossing on the west side of the intersection and an unidirectional crossing on the south. The design of Innes Road and Lamarche Avenue intersection modification is provided in Appendix F.

2.3.2 Other Study Area Developments

3817-3843 Innes Road

The proposed development application includes a site plan application for three apartment buildings with a total of 110 residential units. The development was assumed to be built out in 2024 and will be included in the future conditions. The development is predicted to generate 40 new AM and 51 new PM two-way peak hour auto trips. (D. J. Halpenny & Associates Ltd, 2022)

3484 Innes Road, 240 & 270 Lamarche Avenue

The proposed development application includes a zoning by-law amendment and plan of subdivision. The current option includes five seven-storey with a total of 525 residential units, 10,600 ft² of commercial space, a 26,900 ft² grocery store, a 2,200 ft² coffee shop with drive-thru, and a 1,550 ft² gas bar. The full buildout is currently estimated by 2031 and is forecasted to generate 261 new AM and 276 new PM two-way peak hour auto trips. (Parsons, 2023)

3604 Innes Road

The proposed development application includes a plan of subdivision for the construction of 180 single detached homes, 109 townhouse units and 168 stacked townhouses in two phases. Phase 1 was anticipated to be built by 2021 and was forecasted to generate 70 new AM and 92 new PM two-way peak-hour auto trips. Phase 2 was anticipated to be built by 2023 and was forecasted to generate 200 new AM two-way peak hour auto trips and 256 new PM two-way peak hour auto trips. Full buildout will be included in the future conditions. (Novatech, 2019)

3443 Innes Road & 3437 Innes Road

The proposed development application includes a site plan application to include a six-storey, mixed-use building with ground floor commercial and 35 residential units. The development is forecasted to generate 24 new AM

and 27 new PM two-way peak hour auto trips. The development was expected to be completed by 2019, and there have been no updates since 2018. (Novatech, 2018)

3672 Innes Road, 3730 Innes Road, and 3828 Innes Road

The proposed development application includes a zoning by-law amendment to permit the construction of 340 singles detached homes, 529 townhouses, 114 back-to-back townhomes, and 1,060 apartment units. Phase 1, which is anticipated to be built by 2037, is forecasted to generate 312-341 new AM and 380-415 new PM two-way peak hour auto trips. Phase 2, which is anticipated to be built by 2042, is forecasted to generate 603-659 new AM and 725-793 new PM two-way peak hour auto trips. Phase 3, which is anticipated to be built by 2047, is forecasted to generate 968-1,056 new AM and 1,166-1,275 new PM two-way peak hour auto trips. (Castleglenn Consultants, 2021)

3493-3499 Innes Road

The proposed development application includes a zoning by-law amendment and site plan control applications for two single-storey commercial buildings, with gross floor areas of 821 m² each (i.e. 1,642 m² GFA in total) constructed in two phases. Phase 1 was assumed to be built out in 2023 and Phase 2 was assumed to be built out in 2025. Full buildout will be included in the future conditions. The development is predicted to generate 23 new AM and 60 new PM two-way peak hour auto trips. (Novatech, 2022)

3 Study Area and Time Periods

3.1 Study Area

The study area will include the intersections of:

- Innes Road at:
 - Orleans Boulevard
 - Page Road
 - Lamarche Avenue
 - Ventus Way
 - Viseneau Drive

The boundary road will be Lamarche Avenue and SL 47 screenlines is present within proximity to the site but will not be analyzed as part of this study.

3.2 Time Periods

As the proposed development is composed entirely of residential units the AM and PM peak hours will be examined.

3.3 Horizon Years

The anticipated build-out year is 2026. As a result, the full build-out plus five years horizon year is 2031.

4 Development-Generated Travel Demand

4.1 Mode Shares

Examining the mode shares recommended in the TRANS Trip Generation Manual (2020) for the subject district, derived from the most recent National Capital Region Origin-Destination survey (OD Survey), the existing average district mode shares by land use for Orleans have been summarized in Table 7.

Table 7: TRANS Trip Generation Manual Recommended Mode Shares – Orleans

Travel Mode	Multi-Unit (Low-Rise)	
	AM	PM
Auto Driver	47%	51%
Auto Passenger	15%	19%
Transit	29%	24%
Cycling	1%	1%
Walking	9%	6%
Total	100%	100%

4.2 Trip Generation

This TIA has been prepared using the person trip rates for the residential dwellings using the TRANS Trip Generation Manual (2020). Table 8 summarizes the person trip rates for the proposed residential land for each peak period.

Table 8: Trip Generation Person Trip Rates by Peak Period

Land Use	Land Use Code	Peak Period	Person Trip Rates
Multi-Unit (Low-Rise)	220 (TRANS)	AM	1.35
		PM	1.58

Using the above person trip rates, the total person trip generation has been estimated. Table 9 summarizes the total person trip generation for the residential land use.

Table 9: Person Trip Generation by Peak Period

Land Use	Units	AM Peak Period			PM Peak Period		
		In	Out	Total	In	Out	Total
Multi-Unit (Low-Rise)	476	193	450	643	421	331	752

Trip generation by peak hour has been forecasted using the prescribed peak period conversion factors presented in the TRANS Trip Generation Manual (2020) for the residential component. Table 10 summarizes the residential trip generation by mode and peak hour.

Table 10: Trip Generation by Mode

Travel Mode		AM Peak Hour				PM Peak Hour			
		Mode Share	In	Out	Total	Mode Share	In	Out	Total
Multi-Unit (Low-Rise)	Auto Driver	47%	44	102	145	51%	95	74	169
	Auto Passenger	15%	14	32	46	19%	35	28	63
	Transit	29%	31	71	102	24%	48	37	85
	Cycling	1%	1	2	3	1%	2	2	4
	Walking	9%	10	24	34	6%	13	10	23
	Total	100%	100	231	330	100%	193	151	344

As shown above, a total of 145 AM and 169 PM new peak hour two-way vehicle trips are projected as a result of the proposed development.

4.3 Trip Distribution

To understand the travel patterns of the subject development, the OD Survey has been reviewed to determine the travel for the residential component, and these patterns were applied based on the build-out of Orleans. Table 11 below summarizes the distributions.

Table 11: OD Survey Distribution – Orleans

To/From	Residential % of Trips
North	15%
South	0%
East	40%
West	45%
Total	100%

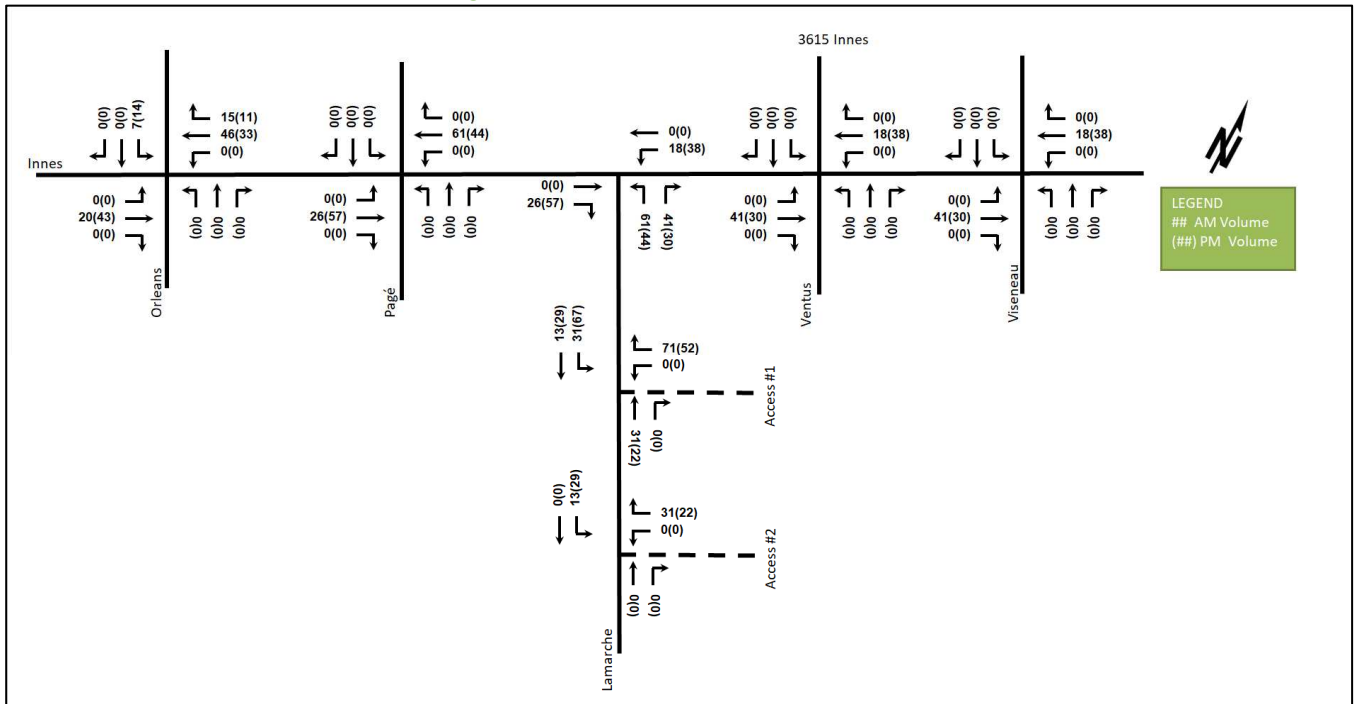
4.4 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the study area road network. Table 12 summarizes the proportional assignment to the study area roadways, and Figure 12 illustrates the new site generated volumes.

Table 12: Trip Assignment

To/From	Via
North	15% Orleans Boulevard (N)
South	-
East	40% Innes Road (E)
West	45% Innes Road (W)
Total	100%

Figure 12: New Site Generation Auto Volumes



5 Exemption Review

Table 13 summarizes the exemptions for this TIA.

Table 13: Exemption Review

Module	Element	Explanation	Exempt/Required
Site Design and TDM			
Development Design	4.1.2 Circulation and Access	Only required for site plan and zoning by-law applications	Required
	4.1.3 New Street Networks	Only required for plans of subdivision	Exempt
Parking	4.2.1 Parking Supply	Only required for site plan and zoning by-law applications	Required
Boundary Street Design		All applications	Required
Transportation Demand Management	All Elements	Only required when the development generates more than 60 person-trips	Required
Network Impact			
Background Network Travel Demand	All Elements	Only required when one or more other Network Impact Modules are triggered when the development generates more than 75 auto or transit trips	Required
Demand Rationalization		Only required when one or more other Network Impact Modules when the development generates more than 75 auto trips	Required
Neighbourhood Traffic Calming	4.6.1 Adjacent Neighbourhoods	<p>If the development meets all of the following criteria along the route(s) site generated traffic is expected to utilize between an arterial road and the site's access:</p> <ol style="list-style-type: none"> 1. Access to Collector or Local; 2. "Significant sensitive land use presence" exists, where there is at least two of the following adjacent to the subject street segment: <ul style="list-style-type: none"> • School (within 250m walking distance); • Park; • Retirement / Older Adult Facility (i.e. long-term care and retirement homes); • Licenced Child Care Centre; • Community Centre; or • 50%, or greater, of adjacent property along the route(s) is occupied by residential lands and a minimum of 10 occupied residential units are present on the route. 3. Application is for Zoning By-Law Amendment or Draft Plan of Subdivision; 4. At least 75 site-generated auto trips; 5. Site Trip Infiltration is expected. Site traffic will increase peak hour vehicle volumes along the route by 50% or more. 	Exempt
Transit	4.7.1 Transit Route Capacity	Only required when the development generates more than 75 transit trips	Required
	4.7.2 Transit Priority Requirements	Only required when the development generates more than 75 auto trips	Required

Module	Element	Explanation	Exempt/Required
Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Exempt
Intersection Design	4.4.1-2/4.9.1 Intersection Control	Only required when the development generates more than 75 auto trips	Required
	4.4.3/4.9.2 Intersection Design	Only required when the development generates more than 75 auto trips	Required

6 Development Design

6.1 Design for Sustainable Modes

The proposed development is a residential development where surface vehicle and bicycle parking spaces are provided. Walkways are provided within the site including connections to the public park and existing sidewalk along Lamarche Avenue. Pedestrians and cyclists can access the site via the existing MUP and sidewalks on Lamarche Avenue. This route will also connect to the future pedestrian and cycling crossings at Innes Road and Lamarche Avenue, linking to the existing sidewalks and bike lanes on Innes Road.

The infrastructure TDM checklist is provided in Appendix G.

6.2 Circulation and Access

Access is provided via the two full-movement accesses on Lamarche Avenue. Garbage is expected to be collected from the waste management areas. The garbage collection vehicle was reviewed to confirm movements will be permitted on site, and the turning templates are provided in Appendix H.

Standard fire lanes are recommended to permit emergency vehicles to circulate the site, meeting the 6 metres width and 12 metre centre radii.

7 Parking

7.1 Parking Supply

The site provides a total of 476 residential vehicle parking spaces, 36 visitor parking spaces, and 238 bicycle parking spaces.

The parking by-law minimum residential parking provisions requirement is 1.0 space per dwelling unit, totaling 476 spaces, while the minimum visitor parking requirement is 0.1 spaces per dwelling unit, totaling 48 spaces. The residential vehicle parking meets the requirement, and the site provides ten less visitor parking spaces than the parking provisions by-law requirement. On-street parking will be available adjacent to the site that may accommodate any additional vehicles.

The minimum bicycle parking provisions by-law requirement is 0.5 spaces per dwelling unit, totaling 238 spaces. The proposed bicycle parking meets the minimum bicycle parking by-law requirement.

8 Boundary Street Design

Table 14 summarizes the MMLOS analysis for the boundary street of Lamarche Avenue. The existing and future conditions for both streets will be the same and are considered in one row. The boundary street analysis is based on the land use of general urban area. The MMLOS worksheets has been provided in Appendix I.

Table 14: Boundary Street MMLOS Analysis

Segment	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target
Lamarche Avenue (Existing/ Future)	A	C	A	D	N/A	N/A	N/A	N/A

Lamarche Avenue meets MMLOS targets for the area and no mitigation or additional elements are required.

9 Transportation Demand Management

9.1 Context for TDM

The mode shares used within the TIA represent the unmodified district mode shares. Overall, the modal shares are likely to be achieved and supporting TDM measures should be provided to encourage shifts towards sustainable modes.

The subject site is not within a design priority area. The total bedroom count within the development is subject to the final unit breakdown and layout selections by purchasers. No age restrictions are noted.

9.2 Need and Opportunity

The subject site has been assumed to rely predominantly on auto travel and those assumptions have been carried through the analysis. As the unmodified district mode shares have been applied, risks to other network users from failing to meet mode share targets are low.

9.3 TDM Program

The “suite of post occupancy TDM measures” has been summarized in the TDM checklists for the residential land uses. The checklist is provided in Appendix G. The key TDM measures recommended include:

- Inclusion of a 1-year Presto card for first time new townhome purchase, with a set time frame for this offer (e.g. 6-months) from the initial opening of the site
- Provide a multimodal travel option information package to new residents

10 Background Network Travel Demands

10.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3. The intersection of Innes Road and Lamarche Avenue is anticipated to become a signalized intersection with an auxiliary westbound left-turn lane, an auxiliary northbound left-turn lane, an auxiliary eastbound right-turn lane, and protected intersection features for pedestrian and cycling crossings.

10.2 Background Growth

A review of the background projections from the City’s TRANS Regional Model for the 2011 and 2031 horizons was completed to determine the background growth for each of the study area roadways. The background TRANS model growth rates are summarized in Table 15 and the TRANS model plots are provided in Appendix J.

Table 15: TRANS Regional Model Projections – Study Area Growth Rates

Street	Average TRANS Rate		Existing to 2031	
	Eastbound	Westbound	Eastbound	Westbound
Innes Road	-0.28%	-1.64%	-3.14%	-5.02%
	Northbound	Southbound	Northbound	Southbound
Orleans Boulevard	4.02%	-0.95%	0.45%	1.92%

In general, the growth rates in the study area derived from the two TRANS model horizons are projected to be negative along Innes Road in the eastbound and westbound directions and slightly positive along Orleans Boulevard in the northbound direction. The existing volumes are noted to be exceed the TRANS 2031 model forecasts for Innes Road.

As the continued development is expected in Orleans and result in additional volumes along the area road network, beyond the developments considered in Section 6.3, it is assumed that a 1.00% growth rate will be applied to Innes Road and a 2.00% growth rate will be applied on Orleans Boulevard in peak directions. The modified growth rates have been applied to the study area network, and it is summarized in Table 16 .

Table 16: Recommended Area Growth Rates

Street	AM Peak Hour		PM Peak Hour	
	Eastbound	Westbound	Eastbound	Westbound
Innes Road	1.00%	1.00%	1.00%	1.00%
	Northbound	Southbound	Northbound	Southbound
Orleans Boulevard	2.00%	-	-	2.00%

10.3 Other Developments

The background developments explicitly considered in the background conditions (Section 10.2) include:

- 3817-3843 Innes Road
- 3484 Innes Road, 240 & 270 Lamarche Avenue
- 3604 Innes Road
- 3443 Innes Road & 3437 Innes Road
- 3493-3499 Innes Road

The background development volumes within the study area have been provided in Appendix K.

11 Demand Rationalization

11.1 2026 Future Background Intersection Operations

Given that the intersections were counted on different dates, volumes were balanced along Innes Road. The intersection of Innes Road at Lamarche Avenue is anticipated to be signalized by 2026 and has been modelled as a signalized intersection for all future horizons. A cycle length of 120 seconds during the AM peak hour and of 110 seconds during the PM peak hour have been assumed. The intersection does not meet signalization warrants, which have been provided in Appendix D.

Figure 13 illustrates the 2026 background volumes and Table 17 summarizes the 2026 background intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection. The synchro worksheets for the 2026 future background horizon are provided in Appendix L.

Figure 13: 2026 Future Background Volumes

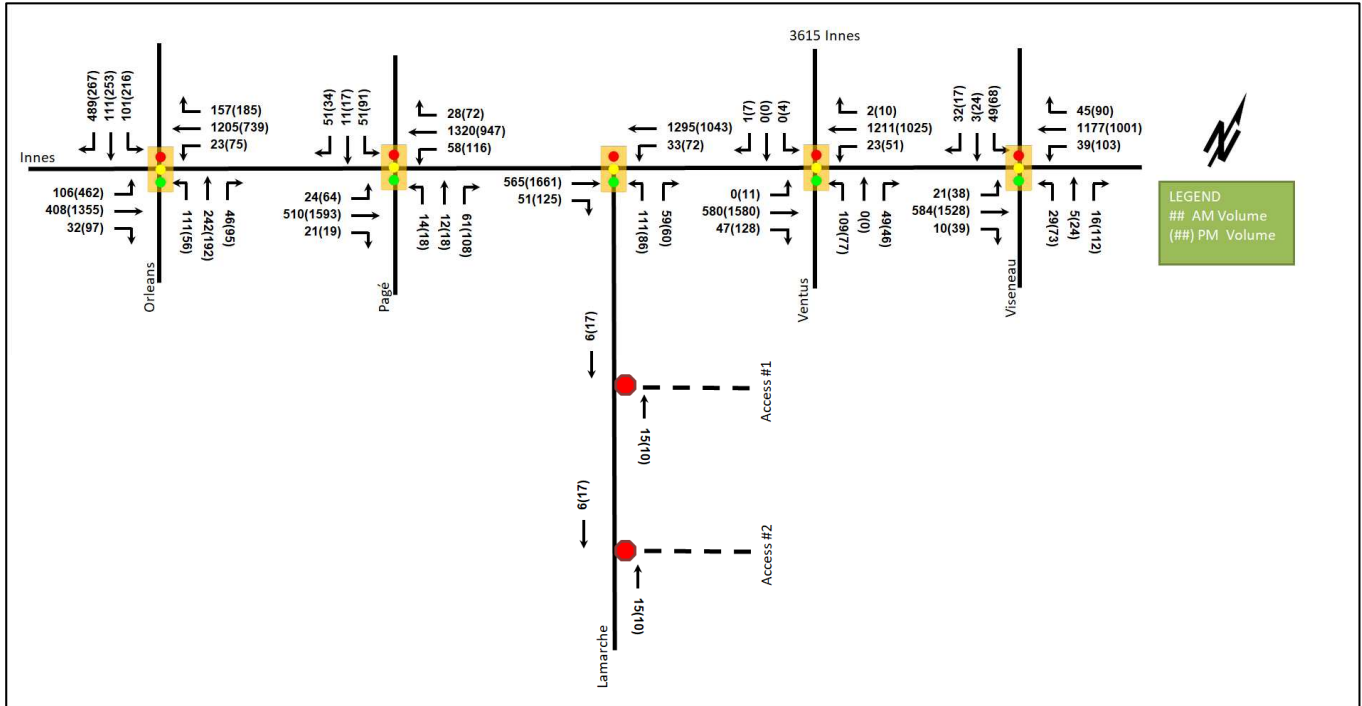


Table 17: 2026 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Innes Road at Orleans Boulevard <i>Signalized</i>	EBL	B	0.69	83.8	#27.1	C	0.77	51.3	63.6
	EBT	A	0.27	20.9	45.7	E	0.97	51.3	#208.7
	EBR	A	0.04	0.1	0.0	A	0.14	0.6	0.8
	WBL	A	0.28	68.3	15.1	A	0.57	56.0	32.5
	WBT	C	0.80	35.8	166.0	C	0.80	52.0	#119.3
	WBR	A	0.22	5.0	14.2	A	0.32	14.2	41.3
	NBL	A	0.29	31.8	34.0	A	0.17	25.7	16.8
	NBT	A	0.21	30.5	33.1	A	0.17	25.3	23.2
	NBR	A	0.09	1.5	2.2	A	0.16	0.9	1.3
	SBL	A	0.47	53.9	41.7	C	0.76	57.6	#84.5
	SBT	A	0.16	43.4	20.9	A	0.30	34.8	35.3
SBR	F	1.04	81.8	#159.0	A	0.47	7.2	20.5	
Overall		D	0.81	40.9	-	E	0.92	42.1	-
Innes Road at Page Road <i>Signalized</i>	EBL	A	0.12	8.5	7.0	A	0.21	3.2	m2.5
	EBT/R	A	0.22	5.7	38.8	B	0.69	5.6	m32.5
	WBL	A	0.10	8.5	m10.9	D	0.87	70.6	#55.8
	WBT/R	A	0.54	9.9	147.5	A	0.45	7.3	0.0
	NB	A	0.35	19.3	16.6	A	0.52	38.9	35.6
	SB	A	0.53	39.5	29.2	B	0.70	54.3	39.3
Overall		A	0.53	10.7	-	D	0.82	12.3	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Innes Road at Lamarche Avenue Signalized	EBT	A	0.27	14.0	74.8	D	0.88	24.4	#231.0
	EBR	A	0.05	15.0	18.3	A	0.15	14.7	m17.7
	WBL	A	0.30	59.1	m16.6	A	0.47	52.1	28.7
	WBT	A	0.54	8.0	108.0	A	0.45	10.3	106.9
	NBL	A	0.60	63.6	41.9	A	0.42	50.3	32.3
	NBR	A	0.26	45.8	23.7	A	0.22	41.2	23.0
	Overall	A	0.58	14.5	-	C	0.78	20.9	-
Innes Road at Ventus Way Signalized	EBL	-	-	-	-	A	0.03	3.0	m0.9
	EBT/R	A	0.26	7.6	84.2	B	0.66	12.6	230.0
	WBL	A	0.05	9.9	m7.5	A	0.36	16.0	17.9
	WBT/R	A	0.50	12.7	160.0	A	0.39	5.5	67.9
	NBL	B	0.68	67.7	40.6	A	0.47	51.6	26.8
	NBT/R	A	0.10	0.4	0.0	A	0.21	16.6	10.3
	SB	A	0.00	0.0	0.0	A	0.05	2.4	1.2
Overall	A	0.53	13.7	-	B	0.66	11.2	-	
Innes Road at Viseneau Drive Signalized	EBL	A	0.26	88.0	14.0	A	0.37	67.2	20.5
	EBT	A	0.26	2.7	25.6	C	0.75	23.2	#246.6
	EBR	A	0.01	0.0	0.1	A	0.04	0.1	0.0
	WBL	A	0.36	61.3	19.8	B	0.61	70.3	42.8
	WBT/R	A	0.51	11.5	144.7	A	0.51	14.1	122.5
	NBL	A	0.20	47.1	13.3	A	0.46	59.4	29.8
	NBT	A	0.03	41.0	4.2	A	0.10	46.8	12.3
	NBR	A	0.06	0.4	0.0	A	0.39	11.6	15.2
	SB	A	0.47	41.7	25.1	B	0.62	63.3	40.0
Overall	A	0.56	12.4	-	C	0.73	23.8	-	

Notes: Saturation flow rate of 1800 veh/h/lane
 Queue is measured in metres
 Peak Hour Factor = 1.00
 Delay = average driver delay in seconds
 m = metered queue
 # = volume for the 95th %ile cycle exceeds capacity
 v/c = volume to capacity ratio

Compared to the existing condition, the study area intersections will have incremental improvement to the intersection operations. These improvements are primarily due to the adjustment of the peak hour factor to 1.00 for forecasted conditions and the balancing of traffic along Innes Road.

At the intersection of Innes Road at Orleans Boulevard intersection, the capacity issue on the right-turn movement during AM peak hour remains as noted in the existing condition, with V/C decreasing from 1.20 to 1.04.

Compared to existing conditions, the operation at the intersection of Innes Road and Page Road will see slight improvements. However, extended queues may still occur on the westbound left-turn movement during the PM peak hour.

With signalized control at the intersection of Innes Road and Lamarche Avenue, the northbound capacity issue observed under existing conditions is expected to be resolved. However, the eastbound through movement may experience extended queues during the PM peak hour. The operations are influenced by the bi-directional crossing of Innes Road as it reduces the available green time for other movements phases.

Compared to the existing condition, at the intersection of Innes Road at Viseneau Drive, the eastbound left-turn movement may experience high delays during the AM peak hour, and the eastbound through movement may exhibit extended queues during the PM peak hour at this horizon.

11.2 2031 Future Background Intersection Operations

As noted in the 2026 future background conditions, volumes were balanced along Innes Road, and the intersection of Innes Road at Lamarche Avenue has been modelled as a signalized intersection for all future horizons. The signal timing is assumed to be consistent with the 2026 future background conditions. The intersection of Innes Road at Lamarche Avenue is expected to meet signalization warrants by 2031. The signal warrants have been provided in Appendix D.

Figure 14 illustrates the 2031 background volumes and Table 18 summarizes the 2031 background intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection. The synchro worksheets for the 2031 future background horizon are provided in Appendix M.

Figure 14: 2031 Future Background Volumes

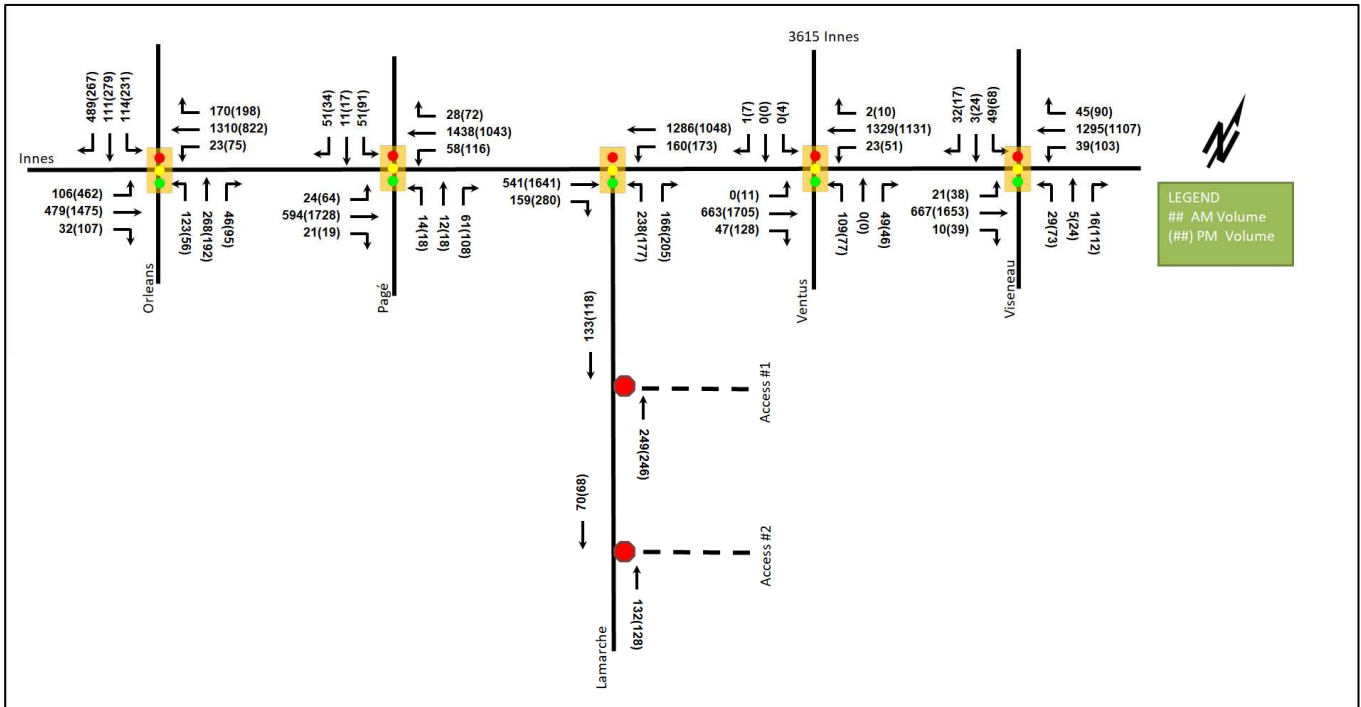


Table 18: 2031 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Innes Road at Orleans Boulevard <i>Signalized</i>	EBL	B	0.69	83.8	#27.1	C	0.77	51.3	63.6
	EBT	A	0.31	21.5	54.0	F	1.06	73.9	#237.3
	EBR	A	0.04	0.1	0.0	A	0.15	1.2	2.5
	WBL	A	0.28	68.3	15.1	A	0.57	56.0	32.1
	WBT	D	0.87	40.1	189.2	D	0.89	56.1	#140.8
	WBR	A	0.24	5.9	16.8	A	0.34	14.9	43.4
	NBL	A	0.31	32.4	37.2	A	0.18	25.8	16.8
	NBT	A	0.24	30.8	36.3	A	0.17	25.3	23.2
	NBR	A	0.09	1.5	2.2	A	0.16	0.9	1.3
	SBL	A	0.55	57.7	46.8	D	0.81	62.9	#92.6
	SBT	A	0.17	43.5	20.9	A	0.33	35.2	38.5
SBR	F	1.07	91.5	#164.2	A	0.47	7.2	20.5	
Overall	D	0.87	43.6	-	E	0.98	51.4	-	
Innes Road at Page Road <i>Signalized</i>	EBL	A	0.14	9.2	7.4	A	0.23	3.0	m2.4
	EBT/R	A	0.26	5.9	45.8	C	0.75	7.5	m32.0
	WBL	A	0.11	11.5	m14.5	F	1.08	134.5	m#59.8
	WBT/R	A	0.59	15.5	201.8	A	0.49	8.9	37.4
	NB	A	0.35	19.3	16.6	A	0.53	41.5	37.0
	SB	A	0.53	39.5	29.2	B	0.70	54.3	39.3
	Overall	A	0.57	14.2	-	F	1.01	15.8	-
Innes Road at Lamarche Avenue <i>Signalized</i>	EBT	A	0.36	27.9	87.6	E	0.97	35.3	#227.4
	EBR	A	0.24	28.9	59.9	A	0.38	18.3	m36.4
	WBL	B	0.69	59.3	60.8	D	0.82	71.4	#71.0
	WBT	A	0.60	13.3	121.4	A	0.45	10.4	111.2
	NBL	C	0.77	61.8	75.3	C	0.77	68.3	#70.2
	NBR	A	0.48	43.5	50.7	C	0.74	120.8	#74.8
	Overall	B	0.68	26.7	-	E	0.92	34.9	-
Innes Road at Ventus Way <i>Signalized</i>	EBL	-	-	-	-	A	0.03	2.4	m0.7
	EBT/R	A	0.30	0.8	1.2	C	0.71	10.7	m226.2
	WBL	A	0.05	9.8	m6.1	A	0.44	23.3	#26.1
	WBT/R	A	0.55	13.6	176.3	A	0.43	5.9	78.2
	NBL	B	0.68	67.7	40.6	A	0.47	51.6	26.8
	NBT/R	A	0.11	0.5	0.0	A	0.22	21.0	11.8
	SB	A	0.00	0.0	0.0	A	0.05	2.4	1.2
	Overall	A	0.57	11.8	-	B	0.70	10.2	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Innes Road at Viseneau Drive Signalized	EBL	A	0.26	78.3	14.2	A	0.37	67.2	20.5
	EBT	A	0.30	4.5	18.0	D	0.81	25.6	#281.9
	EBR	A	0.01	0.0	m0.0	A	0.04	0.1	0.0
	WBL	A	0.36	61.3	19.8	B	0.61	70.3	42.8
	WBT/R	A	0.56	12.4	168.4	A	0.56	15.0	141.2
	NBL	A	0.20	47.1	13.3	A	0.46	59.4	29.8
	NBT	A	0.03	41.0	4.2	A	0.10	46.8	12.3
	NBR	A	0.06	0.4	0.0	A	0.39	11.6	15.2
	SB	A	0.47	41.7	25.1	B	0.62	63.3	40.0
Overall	B	0.61	13.0	-	C	0.78	25.0	-	

Notes: Saturation flow rate of 1800 veh/h/lane
 Queue is measured in metres
 Peak Hour Factor = 1.00
 Delay = average driver delay in seconds

m = metered queue
 # = volume for the 95th %ile cycle exceeds capacity
 v/c = volume to capacity ratio

At the intersection of Innes Road at Orleans Boulevard, the capacity and queues issues noted in the 2026 future background conditions remain, with the additional eastbound through movement expected to be over theoretical capacity during the PM peak hour.

At the intersection of Innes Road at Page Road, the westbound left-turn movement is anticipated to be over theoretical capacity with high delays and extended queues during the PM peak hour. A protected phase for the westbound left-turn may resolve the capacity issue at this intersection.

At the intersection of Innes Road at Lamarche Avenue, the eastbound through, westbound left-turn, northbound left-turn, and northbound right-turn movements may experience extended queues during the PM peak hour, and high delays are expected on the northbound right-turn movement during the PM peak hour. The operations are influenced by the bi-directional crossing of Innes Road as it reduces the available green time for other movements phases.

During the PM peak hour, the westbound left-turn movement at the Innes Road and Ventus Way intersection and the eastbound through movement at the Innes Road and Viseneau Drive intersection may experience extended queues.

11.3 Modal Share Sensitivity

Capacity constraints have been noted along Innes Road during the existing and background horizons, which are subject to regional travel not associated with the development traffic. No further demand rationalization is required for this development.

12 Transit

12.1 Route Capacity

In Section 5.1 the trip generation by mode was estimated, including an estimate of the number of transit trips that will be generated by the proposed development. Table 19 summarizes the transit trip generation.

Table 19: Trip Generation by Transit Mode

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Transit	29% (24%)	31	71	102	48	37	85

The proposed development is anticipated to generate an additional 32 AM and 28 PM peak hour two-way transit trips. From the trip distribution found in section 5.3, these values can be further broken down. Table 20 summarizes forecasted site-generated transit ridership trips by direction and the equivalent bus loads.

Table 20: Forecasted Site-Generated Transit Ridership

Direction	AM Peak Hour		PM Peak Hour		Service Type	Approximate Equivalent Peak Hour/Direction Bus Loads
	In	Out	In	Out		
North	5	11	7	6	Bus	Negligible
South	0	0	0	0	-	-
East	12	28	19	14	Bus	Half of a standard bus
West	14	32	22	17	Bus	Half of a standard bus

It is anticipated that the existing service will accommodate site-generated transit trips. However, if all forecasted site-generated trips use Route #25, and considering the current service of four to six buses per peak hour, ridership could increase by about ten passengers per bus. Consequently, if the capacity is unavailable on Route #25, an additional standard bus may be required during peak hours.

12.2 Transit Priority

Examining the study area’s intersection operations, slight increases in delays are anticipated for transit movements at the study area intersections due to traffic from the development site. When comparing the 2031 background and future conditions, the most significant increase will be on the westbound through movements at the Orleans Boulevard intersection. The existing queue jump permits transit vehicles to bypass the majority of the queuing and delay at this location.

13 Access Intersections Design

13.1 Location and Design of Access

The site is proposed to have two full-movement access. A 2.0 metre-sidewalk is present along the boundary Street of Lamarche Avenue. Access #1 is proposed to be 8.0 metres wide, and Access # 2 is proposed to be 8.6 metres wide. Both accesses meet the minimum and maximum width in the private approach by law.

Access #1 is approximately 80 metres from the intersection of Innes Road at Lamarche Avenue, and it meets the minimum distance of 60 metres between the private approach and nearest intersecting street line in the private approach by law and TAC requirement of 15 metres. The distance between two accesses are 157 metres, and it meets the private approach by law distance between two-way private approaches to the same property.

Although site accesses meet the TAC and private approach by law requirements, the accesses will need to comply with the City of Ottawa standard drawing SC7.1.

13.2 Intersection Control

The site accesses will have stop-control on the minor approach.

13.3 Access Intersection Design

13.3.1 2026 Future Total Access Intersection Operations

Figure 15 illustrates the 2026 future total volumes and Table 21 summarizes the 2026 future total access intersection operations. Synchro 11 has been used to model the unsignalized intersections and HCM 2010 methodology was used for unsignalized intersection operation. The synchro worksheets have been provided in Appendix N.

Figure 15: 2026 Future Total Volumes

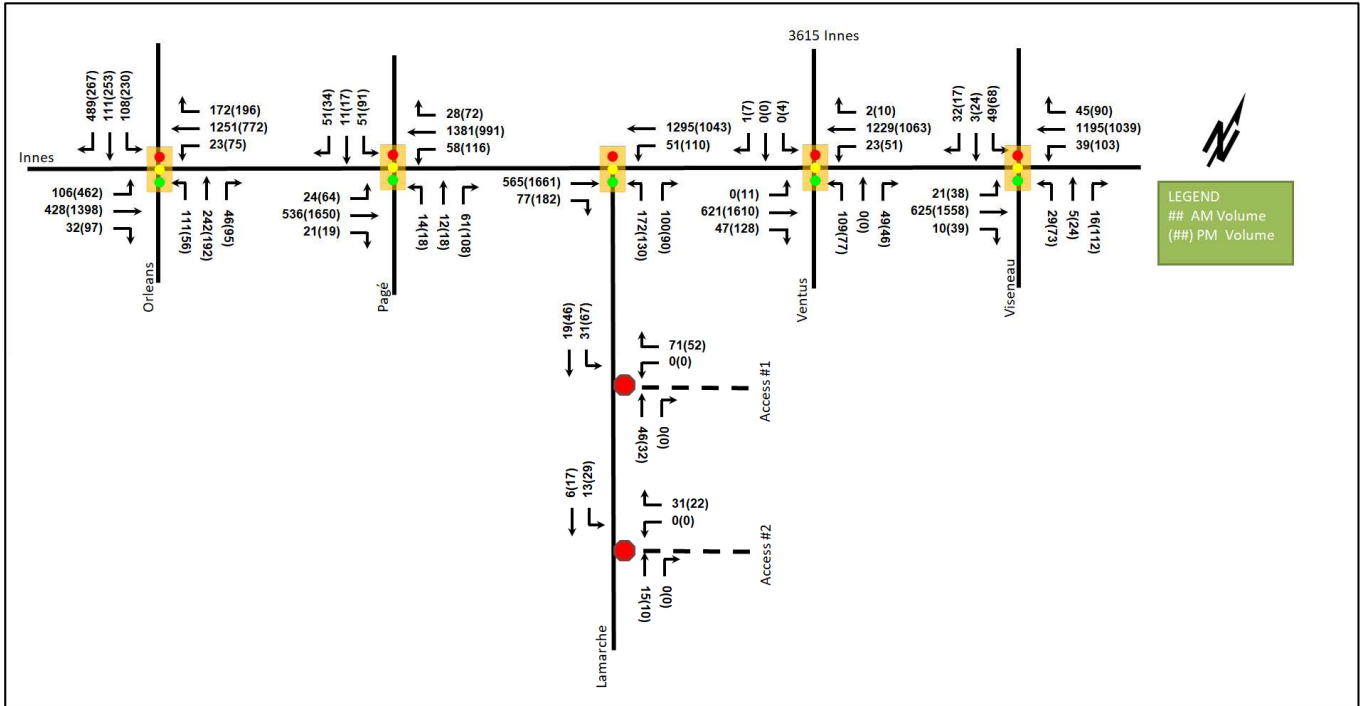


Table 21: 2026 Future Total Access Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Access #1 at Lamarche Avenue Unsignalized	WB	A	0.07	8.8	1.5	A	0.05	8.6	1.5
	NB	-	-	-	-	-	-	-	-
	SB	A	0.02	7.4	0.8	A	0.04	7.4	0.8
	Overall	A	-	5.1	-	A	-	4.8	-
Access #2 at Lamarche Avenue Unsignalized	WB	A	0.03	8.5	0.8	A	0.02	8.4	0.8
	NB	-	-	-	-	-	-	-	-
	SB	A	0.01	7.3	0.0	A	0.02	7.3	0.8
	Overall	A	-	5.5	-	A	-	5.1	-

Notes: Saturation flow rate of 1800 veh/h/lane
 Queue is measured in metres
 Peak Hour Factor = 1.00
 Delay = average driver delay in seconds

m = metered queue
 # = volume for the 95th %ile cycle exceeds capacity
 v/c = volume to capacity ratio

The access intersections are anticipated to operate well at the 2026 future total horizon.

13.3.2 2031 Future Total Access Intersection Operations

Figure 16 illustrates the 2031 future total volumes and Table 22 summarizes the 2031 future total access intersection operations. Synchro 11 has been used to model the unsignalized intersections and HCM 2010 methodology was used for unsignalized intersection operation. The synchro worksheets have been provided in Appendix O.

Figure 16: 2031 Future Total Volumes

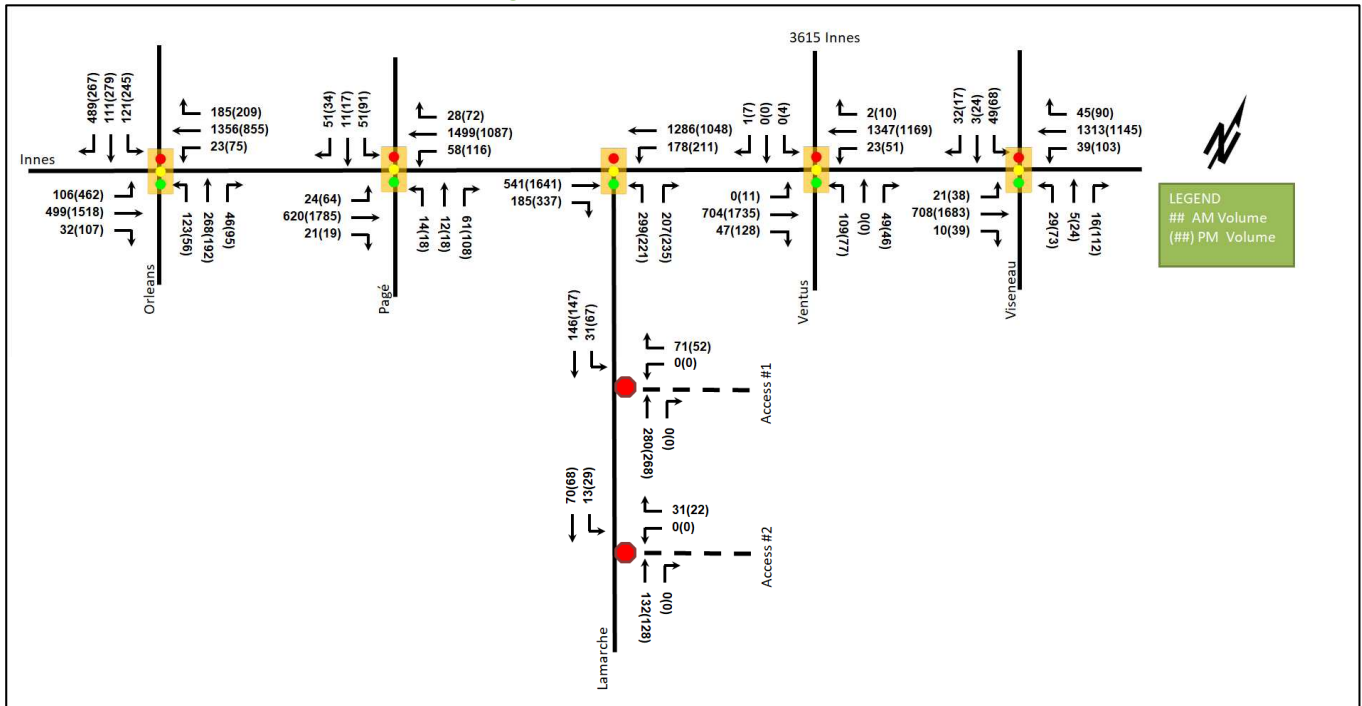


Table 22: 2031 Future Total Access Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Access #1 at Lamarche Avenue <i>Unsignalized</i>	WB	B	0.09	10.2	2.3	B	0.07	10.0	1.5
	NB	-	-	-	-	-	-	-	-
	SB	A	0.02	7.9	0.8	A	0.05	7.9	1.5
	Overall	A	-	1.8	-	A	-	2.0	-
Access #2 at Lamarche Avenue <i>Unsignalized</i>	WB	A	0.03	9.1	0.8	A	0.02	9.0	0.8
	NB	-	-	-	-	-	-	-	-
	SB	A	0.01	7.5	0.0	A	0.02	7.5	0.8
	Overall	A	-	1.6	-	A	-	1.7	-

Notes: Saturation flow rate of 1800 veh/h/lane
 Queue is measured in metres
 Peak Hour Factor = 1.00
 Delay = average driver delay in seconds

m = metered queue
 # = volume for the 95th %ile cycle exceeds capacity
 v/c = volume to capacity ratio

The access intersections are anticipated to operate well at the 2031 future total horizon.

13.3.3 Access Intersection MMLoS

Based upon the projected volumes, the site access will have stop-control on the minor approach.

13.3.4 Recommended Design Elements

The accesses will need to comply with the City of Ottawa standard drawing SC7.1.

14 Network Intersection Design

14.1 Network Intersection Control

The intersection of Innes Road at Lamarche Avenue is expected to meet signalization warrants by 2031 and the proposed signalization underway addresses this warrant.

14.2 Network Intersection Design

14.2.1 2026 Future Total Intersection Operations

As noted in the 2026 future background conditions, volumes were balanced along Innes Road, and the intersection of Innes Road at Lamarche Avenue has been modelled as a signalized intersection for all future horizons. The signal timing is assumed to be consistent with the 2026 future background conditions. Similar to the 2026 future background conditions, the intersection does not meet signalization warrants, which have been provided in Appendix D.

Table 23 summarizes the 2026 future total intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection. The synchro worksheets have been provided in Appendix N.

Table 23: 2026 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Innes Road at Orleans Boulevard <i>Signalized</i>	EBL	B	0.69	83.8	#27.1	C	0.77	51.3	63.6
	EBT	A	0.28	21.0	48.0	E	1.00	58.3	#219.1
	EBR	A	0.04	0.1	0.0	A	0.14	0.6	0.8
	WBL	A	0.28	68.3	15.1	A	0.57	56.1	32.3
	WBT	D	0.83	37.5	175.8	D	0.83	53.1	#127.8
	WBR	A	0.25	6.0	17.1	A	0.34	14.8	43.6
	NBL	A	0.29	31.8	34.0	A	0.17	25.7	16.8
	NBT	A	0.21	30.5	33.1	A	0.17	25.3	23.2
	NBR	A	0.09	1.5	2.2	A	0.16	0.9	1.3
	SBL	A	0.50	55.2	44.4	D	0.81	62.5	#92.1
	SBT	A	0.16	43.4	20.9	A	0.30	34.8	35.3
	SBR	F	1.05	83.8	#160.3	A	0.47	7.2	20.5
	Overall	D	0.83	41.7	-	E	0.95	45.2	-
Innes Road at Page Road <i>Signalized</i>	EBL	A	0.13	8.8	7.2	A	0.22	3.2	m2.5
	EBT/R	A	0.23	5.8	41.0	C	0.72	6.2	m33.3
	WBL	A	0.10	10.2	m12.3	E	0.94	90.1	#58.5
	WBT/R	A	0.57	12.6	173.7	A	0.46	8.1	0.0
	NB	A	0.35	19.3	16.6	A	0.52	40.0	36.2
	SB	A	0.53	39.5	29.2	B	0.70	54.3	39.3
	Overall	A	0.55	12.4	-	D	0.89	13.5	-
Innes Road at Lamarche Avenue <i>Signalized</i>	EBT	A	0.30	18.4	80.3	E	0.95	31.8	#232.7
	EBR	A	0.09	18.9	27.5	A	0.24	16.3	m24.8
	WBL	A	0.41	59.7	m25.0	B	0.61	55.8	40.3
	WBT	A	0.57	10.3	109.7	A	0.45	10.4	108.1
	NBL	B	0.70	63.0	58.5	A	0.57	54.7	45.8
	NBR	A	0.35	44.0	34.3	A	0.32	44.3	31.8
	Overall	B	0.63	19.2	-	D	0.82	26.1	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Innes Road at Ventus Way Signalized	EBL	-	-	-	-	A	0.03	2.6	m0.8
	EBT/R	A	0.28	4.7	84.0	B	0.67	11.8	m224.0
	WBL	A	0.05	9.9	m7.2	A	0.38	17.2	19.1
	WBT/R	A	0.51	12.8	162.3	A	0.41	5.7	71.5
	NBL	B	0.68	67.7	40.6	A	0.47	51.6	26.8
	NBT/R	A	0.10	0.4	0.0	A	0.21	17.7	10.7
	SB	A	0.00	0.0	0.0	A	0.05	2.4	1.2
	Overall	A	0.53	12.7	-	B	0.67	10.7	-
Innes Road at Viseneau Drive Signalized	EBL	A	0.26	85.4	14.1	A	0.37	67.2	20.5
	EBT	A	0.28	3.5	53.1	C	0.77	23.7	#255.3
	EBR	A	0.01	0.0	0.0	A	0.04	0.1	0.0
	WBL	A	0.36	61.3	19.8	B	0.61	70.3	42.8
	WBT/R	A	0.52	11.6	148.0	A	0.53	14.4	129.2
	NBL	A	0.20	47.1	13.3	A	0.46	59.4	29.8
	NBT	A	0.03	41.0	4.2	A	0.10	46.8	12.3
	NBR	A	0.06	0.4	0.0	A	0.39	11.6	15.2
	SB	A	0.47	41.7	25.1	B	0.62	63.3	40.0
	Overall	A	0.57	12.5	-	C	0.74	24.1	-

Notes: Saturation flow rate of 1800 veh/h/lane
 Queue is measured in metres
 Peak Hour Factor = 1.00
 Delay = average driver delay in seconds

m = metered queue
 # = volume for the 95th %ile cycle exceeds capacity
 v/c = volume to capacity ratio

During both peak hours, the capacity and queues issues at the study intersections noted in the 2026 future background conditions remain, with a slight decrease due to development traffic. The capacity issues were noted during the existing and background conditions, and no additional capacity issues are noted due to the development trips.

The site traffic will contribute less than 5% of the total eastbound volumes and should be an acceptable increase for any roadway. The volumes along Innes Road may be reduced once the LRT is active and could be further reduced once Brian Coburn Boulevard is extended west to Blair Road. No mitigation is required for the subject site

14.2.2 2031 Future Total Intersection Operations

As noted in the 2026 future background conditions, volumes were balanced along Innes Road, and the intersection of Innes Road at Lamarche Avenue has been modelled as a signalized intersection for all future horizons. The signal timing is assumed to be consistent with the 2026 future background conditions. Similar to the 2031 future background conditions, the intersection of Innes Road at Lamarche Avenue is expected to meet signalization warrants by 2031. The signal warrants have been provided in Appendix D.

Table 24 summarizes the 2031 future total intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection. The synchro worksheets have been provided in Appendix O.

Table 24: 2031 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Innes Road at Orleans Boulevard <i>Signalized</i>	EBL	B	0.69	83.8	#27.1	C	0.77	51.3	63.6
	EBT	A	0.33	21.7	56.4	F	1.09	84.5	#247.8
	EBR	A	0.04	0.1	0.0	A	0.15	1.2	2.5
	WBL	A	0.28	68.3	15.1	A	0.57	55.8	32.4
	WBT	D	0.90	42.8	#202.5	E	0.92	59.0	#149.1
	WBR	A	0.26	6.9	20.1	A	0.36	15.7	45.8
	NBL	A	0.31	32.4	37.2	A	0.18	25.8	16.8
	NBT	A	0.24	30.8	36.3	A	0.17	25.3	23.2
	NBR	A	0.09	1.5	2.2	A	0.16	0.9	1.3
	SBL	A	0.58	59.4	49.6	D	0.86	69.2	#99.7
	SBT	A	0.17	43.5	20.9	A	0.33	35.2	38.5
SBR	F	1.07	93.0	#165.1	A	0.47	7.2	20.5	
Overall	D	0.89	44.8	-	F	1.02	56.2	-	
Innes Road at Page Road <i>Signalized</i>	EBL	A	0.15	9.8	7.6	A	0.25	2.7	m2.3
	EBT/R	A	0.27	6.0	48.1	C	0.77	8.1	m33.0
	WBL	A	0.11	10.6	m12.9	F	1.22	181.2	m#59.5
	WBT/R	B	0.61	16.7	202.6	A	0.51	9.7	m0.0
	NB	A	0.35	19.3	16.6	A	0.53	42.2	37.3
	SB	A	0.53	39.5	29.2	B	0.70	54.3	39.3
	Overall	A	0.59	14.8	-	F	1.10	17.7	-
Innes Road at Lamarche Avenue <i>Signalized</i>	EBT	A	0.40	32.3	88.5	E	0.98	37.2	#227.4
	EBR	A	0.31	33.9	68.6	A	0.46	19.3	m42.3
	WBL	C	0.71	61.9	64.9	E	0.96	94.0	#91.8
	WBT	B	0.64	16.0	127.2	A	0.45	10.5	112.3
	NBL	D	0.81	60.7	90.4	E	0.96	98.2	#93.9
	NBR	A	0.52	41.1	59.0	D	0.85	127.7	#90.5
	Overall	C	0.73	30.4	-	E	0.98	40.6	-
Innes Road at Ventus Way <i>Signalized</i>	EBL	-	-	-	-	A	0.04	2.5	m0.7
	EBT/R	A	0.32	0.9	2.9	C	0.72	10.7	m227.5
	WBL	A	0.05	9.9	m5.9	A	0.46	25.7	#27.1
	WBT/R	A	0.56	13.8	178.7	A	0.45	6.0	82.1
	NBL	B	0.68	67.7	40.6	A	0.47	51.6	26.8
	NBT/R	A	0.11	0.5	0.0	A	0.22	21.0	11.8
	SB	A	0.00	0.0	0.0	A	0.05	2.4	1.2
	Overall	A	0.58	11.8	-	C	0.71	10.3	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Innes Road at Viseneau Drive <i>Signalized</i>	EBL	A	0.26	74.0	14.2	A	0.37	67.2	20.5
	EBT	A	0.32	5.6	23.5	D	0.83	26.3	#290.1
	EBR	A	0.01	0.0	m0.0	A	0.04	0.1	0.0
	WBL	A	0.36	61.3	19.8	B	0.61	70.3	42.8
	WBT/R	A	0.57	12.5	172.3	A	0.58	15.4	148.5
	NBL	A	0.20	47.1	13.3	A	0.46	59.4	29.8
	NBT	A	0.03	41.0	4.2	A	0.10	46.8	12.3
	NBR	A	0.06	0.4	0.0	A	0.39	11.6	15.2
	SB	A	0.47	41.7	25.1	B	0.62	63.3	40.0
Overall	B	0.61	13.2	-	C	0.79	25.4	-	

Notes: Saturation flow rate of 1800 veh/h/lane
 Queue is measured in metres
 Peak Hour Factor = 1.00
 Delay = average driver delay in seconds

m = metered queue
 # = volume for the 95th %ile cycle exceeds capacity
 v/c = volume to capacity ratio

During both peak hours, the capacity and queues issues at the study intersections noted in the 2031 future background conditions remain, with a slight decrease due to development traffic.

At the intersection of Innes Road and Orleans Boulevard, the westbound through movement may experience extended queues during the AM peak hour, and the V/C of the overall intersection at intersection of Innes Road and Orleans Boulevard will increase from 0.98 to 1.02 when compared to the 2031 future background conditions.

The intersection of Innes Road at Lamarche Avenue is anticipated to experience increased delays in the northbound direction during the PM peak hour, with the left-turn increasing by approximately 30 seconds and the right-turn increasing by approximately 7 seconds. The bi-directional cycling crossing on the west side of the intersection limits the ability to mitigate the northbound delays.

The peak operations in the eastbound direction along Innes Road will be at or over capacity at a number of locations and is a result on the background conditions for the corridor. The site traffic will contribute less than 5% of the total eastbound volumes and should be an acceptable increase for any roadway. As noted in the 2026 future total conditions, the volumes along Innes Road may be reduced once the LRT is active and could be further reduced once Brian Coburn Boulevard is extended west of Navan Road. No mitigation is required for the subject site.

14.2.3 Intersection MMLOS

Table 25 summarizes the MMLOS analysis for the network intersections within the study area. The existing and future conditions for both intersections will be the same and are considered in one row. The intersection analysis of Innes Road at Orleans Boulevard is based on the land use of general urban area, and other intersections analysis are based on the land use of arterial main street. The MMLOS worksheets has been provided in Appendix I.

Table 25: Study Area Intersection MMLOS Analysis

Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
Innes Road at Orleans Boulevard	F	C	F	B	F	D	A	D	F	D
Innes Road at Page Road	F	C	F	B	C	D	N/A	N/A	F	D
Innes Road at Lamarche Avenue (Future)	E	C	A	B	E	D	N/A	N/A	E	D

Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
Innes Road at Access 3615 Innes Road/3636 Innes Road	F	C	F	B	C	D	N/A	N/A	C	D
Innes Road at Viseneau Drive	F	C	F	B	F	D	N/A	N/A	C	D

The design of the intersection of Innes Road at Lamarche Avenue is currently proceeding. The current design will not meet the pedestrian, transit or auto LOS targets. The crossing distance would need to be reduced to three lane-widths on the west approach to meet pedestrian LOS targets. As typical for arterial roads, the crossing distance does not permit the targets to be met. Notwithstanding the crossing distance not meeting the target, the pedestrian delay is expected to be C, which would meet the pedestrian LOS target. To meet the transit LOS targets, the delay at the intersections would need to be reduced to below 30 seconds.

The pedestrian LOS targets will not be met at the remaining existing or future intersections within the study area. To meet pedestrian LOS targets, the maximum crossing distance would need to be reduced to three lane-widths on all pedestrian crossings. As typical for arterial roads, the crossing distance does not permit the targets to be met.

The bicycle LOS targets will not be met at the remaining existing or future intersections within the study area. To meet bicycle LOS targets, the left-turn configurations would need to be two-stage, turn boxes or protected facilities.

The transit LOS targets will not be met in the existing or future condition at the intersections of Innes Road at Orleans Boulevard and Innes Road at Viseneau Drive. To meet transit LOS, the delay at the intersections would need to be reduced to below 30 seconds. It is noted that the westbound transit movement at the Innes Road at Orleans Boulevard intersection likely meets the transit LOS due to the queue jump provided.

Any improvements for these intersections would be subject to City planning and improvements along Innes Road.

14.2.4 Recommended Design Elements

No study area intersection design elements are proposed for the network intersections as part of this study.

15 Summary of Improvements Indicated and Modifications Options

The following summarizes the analysis and results presented in this TIA report:

Proposed Site and Screening

- The proposed development consists of 476 stacked dwellings, 476 residential vehicle parking spaces, 36 visitor parking spaces, and 238 bicycle parking spaces
- The concept plan includes two full-movement accesses onto Lamarche Avenue
- The anticipated full build-out and occupancy horizon is 2026 with construction occurring in phases
- The trip generation and safety triggers were met for the TIA Screening

Existing Conditions

- Innes Road and Orleans Boulevard are arterial roads, and Viseneau Drive is a collector road in the study area
- Page Road, Lamarche Avenue, and Ventus Way are local roads in the study area

- Sidewalks are present along both sides of Innes Road, east of Orleans Boulevard, and along Orleans Boulevard, north of Silverbirch Street
- Sidewalks are present on the west side of Orleans Boulevard, Viseneau Drive, Page Road, and Lamarche Avenue, between Argonaut Circle/Jargeau Road and Ponthieu Circle/Beaugency Street. Additionally, sidewalks are present on the east side of Page Road, extending 205 meters south of Innes Road, and on Lamarche Avenue, north of Argonaut Circle/Jargeau Road
- Bike lanes are present along both side of Innes Road east of Orleans Boulevard
- A MUP is present on the west side of Lamarche Avenue north of Argonaut Circle/Jargeau Road and on the north side of Jargeau Road between Lamarche Avenue and Crevier Walk
- Innes Road, Boyer Road, and Orleans Boulevard north of Innes Road are cross-town bikeways in the Transportation Master Plan – Part 1 (2023)
- During both the AM and PM peak hours, capacity issues are noted at the intersection of Innes Road at Orleans Boulevard
- At the intersection of Innes Road at Lamarche Avenue, the northbound movement experiences delays of over 180 seconds during the PM peak hour
- Within the study area, the segment of Innes Road between Page Road and Ventus Way excludes the intersection of Lamarche Avenue at Innes Road is noted to have experienced twelve collisions, and one cyclist collision is noted at Lamarche Avenue at Innes Road intersection
- No further collision examination is required as part of this study

Planned Conditions

- The intersection of Innes Road and Lamarche Avenue is listed on the City's DC By-law funded projects and is anticipated to be constructed by 2025, which includes signalization of the existing minor stop control, an auxiliary westbound left-turn lane, an auxiliary northbound left-turn lane, an auxiliary eastbound right-turn lane, and protected intersection features for bi-directional cycling crossing on the west side of the intersection and on the west and an unidirectional crossing on the south

Development Generated Travel Demand

- The proposed development is forecasted produce 330 two-way people trips during the AM peak hour and 344 two-way people trips during the PM peak hour
- Of the forecasted people trips, 145 two-way trips will be vehicle trips during the AM peak hour and 169 two-way trips will be vehicle trips during the PM peak hour
- Of the forecasted people trips, 102 two-way trips will be transit trips during the AM peak hour and 85 two-way trips will be transit trips during the PM peak hour
- Of the forecasted trips, 15 % are anticipated to travel north, 40% to the east, and 45 % to the west

Development Design

- The proposed development is a residential development where surface vehicle and bicycle parking spaces are provided
- Walkways are provided within the site to provide connections to the public park within the site and existing sidewalk along Lamarche Avenue
- Pedestrians and cyclists can access the site via the existing MUP and sidewalks on Lamarche Avenue. This route will also connect to the future pedestrian and cycling crossings at Innes Road and Lamarche Avenue, linking to the existing sidewalks and bike lanes on Innes Road

- Access is provided via the two full-movement accesses on Lamarche Avenue
- Garbage is expected to be collected from the waste management areas
- The garbage collection vehicle was reviewed to confirm movements will be permitted on site
- Within the site, it is recommended that the fire route requirements be met and provide a 6-metre-wide drive aisle with 12-metre centre radii

Parking

- The site provides a total of 476 residential vehicle parking spaces, 36 visitor parking spaces, and 238 bicycle parking spaces
- The residential vehicle parking meets the parking provisions by-law requirement, and the site provides ten less visitor parking spaces than the parking provisions by-law requirement
- It is anticipated that on-street parking will also present along Lamarche Avenue, and it provides additional parking for the visitors
- The proposed bicycle parking meets the minimum bicycle parking by-law requirement

Boundary Street Design

- Lamarche Avenue meets MMLOS targets for the area and no mitigation or additional elements are required

TDM

- Supportive TDM measures to be included within the proposed development should include:
 - Inclusion of a 1-year Presto card for first time new townhome purchase, with a set time frame for this offer (e.g. 6-months) from the initial opening of the site
 - Provide a multimodal travel option information package to new residents

Background Conditions

- It is assumed that a 1.00% growth rate will be applied to Innes Road and a 2.00% growth rate will be applied on Orleans Boulevard in peak directions
- Given that the intersections were counted on different dates, volumes were balanced along Innes Road
- The southbound right-turn movement during AM peak hour and the eastbound through movement during PM peak hour at the intersection of Innes Road at Orleans Boulevard is anticipated to be over theoretical capacity in the 2031 future background horizon
- The westbound left-turn movement during PM peak hour at the intersection of Innes Road at Page Road is anticipated to be over theoretical capacity in the 2031 future background horizon
- The intersection of Innes Road at Lamarche Avenue meets a signal warrant in the 2031 future background horizon
- Capacity constraints have been noted along Innes Road during the existing and background horizons, which are subject to regional travel not associated with the development traffic

Transit

- The proposed development is anticipated to generate an additional 102 AM peak hour transit trips and 85 PM peak hour transit trips
- Peak hour increases in transit ridership resulting from the site equate to a half of a standard bus load easterly and westerly of the site, and negligible impact northerly of the site

- It is anticipated that the existing service will accommodate site-generated transit trips
- If all forecasted site-generated trips use Route #25, and considering the current service of four to six buses per peak hour, ridership could increase by about ten passengers per bus
- Examining the study area's intersection operations, slight increases in delays are anticipated for transit movements at the study area intersections due to traffic from the development site
- Although the most significant increase will be in the westbound through movements at the Orleans Boulevard intersection when comparing the 2031 background and future conditions, the existing queue jump allows transit vehicles to bypass most of the queuing and delays in these westbound movements

Access Design

- Although site accesses meet the TAC and private approach by law requirements, the accesses will need to comply with the City of Ottawa standard drawing SC7.1
- The site accesses will have stop-control on the minor approach
- The access intersections are anticipated to operate well at the future total horizons

Network Intersection Design

- The intersection of Innes Road at Lamarche Avenue is expected to meet signalization warrants by 2031 and the proposed signalization underway addresses this warrant
- Compared to the background conditions, no additional capacity issues were noted
- The site traffic will contribute less than 5% of the total eastbound volumes and should be an acceptable increase for any roadway
- It is expected that the volumes along Innes Road may be reduced once the LRT is active and could be further reduced once Brian Coburn Boulevard is extended west to Blair Road. No mitigation is required for the subject site
- The design of the intersection of Innes Road at Lamarche Avenue is currently proceeding. The current design will not meet the pedestrian, transit or auto LOS targets
- The pedestrian LOS targets will not be met at the existing or future intersections within the study area, and no mitigation is recommended as the crossing distances would need to be reduced to equal or less than three lane widths
- Except for the future Innes Road at Lamarche Avenue intersection, the bicycle LOS targets will not be met at the existing or future intersections within the study area, and it is limited by the lack of dedicated facilities and improved left-turn configurations
- The transit LOS targets will not be met in the existing or future condition at the intersections of Innes Road at Orleans Boulevard and Innes Road at Viseneau Drive, and the delay is required to be below 30 seconds to meet the targets
- Any improvements for these intersections would be subject to City planning and improvements along Innes Road

16 Conclusion

It is recommended that, from a transportation perspective, the proposed development applications proceed.

Prepared By:



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Transportation Engineering-Intern

Reviewed By:



Andrew Harte, P.Eng.
Senior Transportation Engineer

Appendix A

TIA Screening Form and PM Certification Form

City of Ottawa 2023 Revisions to 2017 TIA Guidelines
Step 1 - Screening Form

Date: 3-Sep-24
Project Number: 2024-106

Project Reference: 245 and 275 Lamarche Avenue

1.1 Description of Proposed Development	
Municipal Address	245 and 275 Lamarche Avenue
Description of Location	Ward 2. East of Lamarche Avenue, approximately 60 metres south of Innes Road
Land Use Classification	Development Reserve (DR)
Development Size	Approximately 476 stacked dwellings
Accesses	Two accesses on Lamarche Avenue
Phase of Development	Multiple
Buildout Year	2026
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger	
Land Use Type	Multi-Family (Low-Rise)
Development Size	476 Units
Trip Generation Trigger	Yes

1.3 Location Triggers	
Does the development propose a new driveway to a boundary street that is designated as part of the Transit Priority Network, Rapid Transit network or Cross-Town Bikeways?	No
Is the development in a Hub, a Protected Major Transit Station Area (PMTSA), or a Design Priority Area (DPA)?	No
Location Trigger	No

1.4. Safety Triggers	
Are posted speed limits on a boundary street 80 km/hr or greater?	No
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	No
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)?	Yes Innes Road at Lamarche Avenue (Future)
Is the proposed driveway within auxiliary lanes of an intersection?	No
Does the proposed driveway make use of an existing median break that serves an existing site?	No
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	No
Does the development include a drive-thru facility?	No
Safety Trigger	Yes



Certification Form for TIA Study PM

TIA Plan Reports

On April 14, 2022, the Province's Bill 109 received Royal Assent providing legislative direction to implement the More Homes for Everyone Act, 2022 aiming to increase the supply of a range of housing options to make housing more affordable. Revisions have been made to the TIA guidelines to comply with Bill 109 and streamline the process for applicants and staff.

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 they meet the four criteria listed below.

CERTIFICATION



I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines; (Update effective July 2023)



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;



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



I am either a licensed or registered¹ professional in good standing, whose field of expertise



is either transportation engineering



or transportation planning.

¹ 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.

Dated at Ottawa this 17 day of August, 20 23.
(City)

Name : Andrew Harte

Professional title: Senior Transportation Engineer / Vice-President Ottawa



Signature of individual certifier that s/he/they meet the above criteria

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Stamp



Revision Date: June 2023

Appendix B

Turning Movement Counts



Project #24-128 - CGH Transportation

Intersection Count Report

Intersection: Innes Rd & Orleans Blvd
Municipality: Ottawa
Count Date: Wednesday, Apr 24, 2024
Site Code: 241280003
Count Categories: Cars, Trucks, Bicycles, Pedestrians
Count Period: 07:00-10:00, 11:30-13:30, 15:00-18:00
Weather: Clear
Comments:



Traffic Count Summary

Intersection: Innes Rd & Orleans Blvd
Site Code: 241280003
Municipality: Ottawa
Count Date: Apr 24, 2024

Orleans Blvd - Traffic Summary

Hour	North Approach Totals						South Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	74	70	454	0	598	7	111	181	34	0	326	6	924
08:00 - 09:00	130	143	415	0	688	12	96	210	56	0	362	4	1050
09:00 - 10:00	149	114	252	1	516	7	71	153	70	0	294	1	810
BREAK													
11:30 - 12:00	91	60	95	0	246	2	21	55	40	0	116	0	362
12:00 - 13:00	166	153	209	0	528	2	47	117	63	0	227	3	755
13:00 - 13:30	83	64	111	0	258	1	23	35	33	0	91	3	349
BREAK													
15:00 - 16:00	229	219	249	0	697	11	46	154	87	0	287	6	984
16:00 - 17:00	203	236	249	2	690	5	62	198	86	0	346	6	1036
17:00 - 18:00	220	218	224	0	662	7	55	183	119	0	357	5	1019
GRAND TOTAL	1345	1277	2258	3	4883	54	532	1286	588	0	2406	34	7289



Traffic Count Data

Intersection: Innes Rd & Orleans Blvd
 Site Code: 2412800003
 Municipality: Ottawa
 Count Date: Apr 24, 2024

South Approach - Orleans Blvd

Start Time	Cars				Total	Trucks				Total	Bicycles				Total	Total Peds
	←	↑	→	↻		←	↑	→	↻		←	↑	→	↻		
15:00	13	34	9	0	56	0	1	0	0	1	0	0	0	0	0	2
15:15	13	31	21	0	65	0	0	0	0	0	0	0	0	0	0	3
15:30	14	42	23	0	79	0	1	0	0	1	0	0	0	0	0	0
15:45	6	44	33	0	83	0	1	1	0	2	0	0	0	0	0	1
16:00	23	47	20	0	90	0	2	0	0	2	0	0	0	0	0	2
16:15	15	49	23	0	87	1	2	0	0	3	0	1	0	0	1	2
16:30	11	46	16	0	73	0	1	0	0	1	0	0	0	0	0	2
16:45	12	50	27	0	89	0	0	0	0	0	0	0	0	0	0	0
17:00	14	49	34	0	97	0	1	1	0	2	0	0	0	0	0	1
17:15	14	48	18	0	80	1	2	0	0	3	0	0	0	0	0	4
17:30	14	33	29	0	76	0	0	0	0	0	0	0	0	0	0	0
17:45	12	50	37	0	99	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	161	523	290	0	974	2	11	2	0	15	0	1	0	0	1	17
GRAND TOTAL	519	1241	580	0	2340	13	42	8	0	63	0	3	0	0	3	34



Traffic Count Data

Intersection: Innes Rd & Orleans Blvd
 Site Code: 2412800003
 Municipality: Ottawa
 Count Date: Apr 24, 2024

East Approach - Innes Rd

Start Time	Cars				Total	Trucks				Total	Bicycles				Total	Total Peds
	←	↑	→	↻		←	↑	→	↻		←	↑	→	↻		
07:00	3	242	16	0	261	0	9	0	0	9	0	0	0	0	0	2
07:15	4	314	24	0	342	0	3	0	0	3	0	0	0	0	0	4
07:30	3	327	37	0	367	0	11	2	0	13	0	0	0	0	0	5
07:45	8	312	37	1	358	0	4	2	0	6	0	0	0	0	0	6
08:00	5	329	38	0	372	0	11	4	0	15	0	0	0	0	0	3
08:15	6	333	35	0	374	0	6	1	0	7	0	0	0	0	0	3
08:30	6	288	32	0	326	0	5	1	0	6	0	0	0	0	0	1
08:45	8	198	38	1	245	1	12	1	0	14	0	0	0	0	0	1
09:00	12	161	33	0	206	1	9	3	0	13	0	0	0	0	0	1
09:15	5	154	20	0	179	0	11	0	0	11	0	0	0	0	0	1
09:30	7	135	17	0	159	0	4	0	0	4	0	0	0	0	0	1
09:45	9	142	19	0	170	0	6	0	0	6	0	0	0	0	0	0
SUBTOTAL	76	2935	346	2	3359	2	91	14	0	107	0	0	0	0	0	28



Traffic Count Data

Intersection: Innes Rd & Orleans Blvd
 Site Code: 2412800003
 Municipality: Ottawa
 Count Date: Apr 24, 2024

West Approach - Innes Rd

Start Time	Cars				Total	Trucks				Total	Bicycles				Total	Total Peds
	←	↑	→	↻		←	↑	→	↻		←	↑	→	↻		
15:00	80	211	14	0	305	2	9	0	0	11	0	0	0	0	0	4
15:15	92	242	26	0	360	0	4	2	0	6	0	0	0	0	0	10
15:30	100	282	22	0	404	1	4	0	0	5	0	0	0	0	0	2
15:45	125	295	24	0	444	0	7	1	0	8	0	0	0	0	0	8
16:00	123	290	23	0	436	4	9	2	0	15	0	0	0	0	0	2
16:15	108	315	21	0	444	0	4	1	0	5	0	0	0	0	0	5
16:30	102	297	21	0	420	0	4	0	0	4	0	0	0	0	0	1
16:45	114	318	25	0	457	2	3	0	0	5	0	0	0	0	0	6
17:00	119	290	27	0	436	1	3	0	0	4	0	0	0	0	0	2
17:15	97	242	18	0	357	0	3	1	0	4	0	0	0	0	0	3
17:30	86	252	27	0	365	1	3	0	0	4	0	0	0	0	0	1
17:45	58	215	15	0	288	0	3	1	0	4	0	0	0	0	0	3
SUBTOTAL	1204	3249	263	0	4716	11	56	8	0	75	0	0	0	0	0	47
GRAND TOTAL	1867	5419	467	0	7753	37	165	12	0	214	0	0	0	0	0	68



Peak Hour Diagram

Specified Period
 From: 07:00:00
 To: 10:00:00

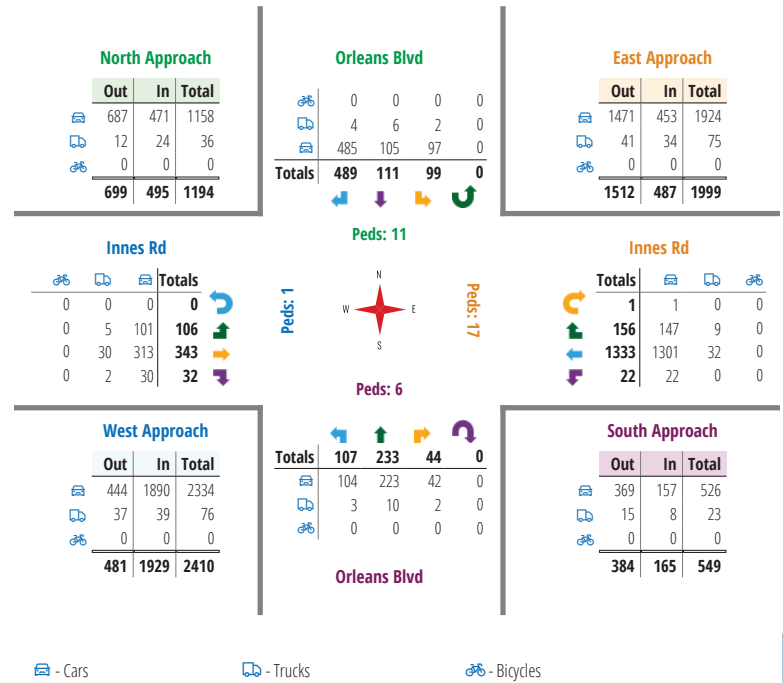
One Hour Peak
 From: 07:30:00
 To: 08:30:00

Intersection: Innes Rd & Orleans Blvd
 Site Code: 2412800003
 Count Date: Apr 24, 2024

Weather conditions: Clear

** Signalized Intersection **

Major Road: Innes Rd runs E/W



Comments



Peak Hour Summary

Intersection: Innes Rd & Orleans Blvd
 Site Code: 2412800003
 Count Date: Apr 24, 2024
 Period: 07:00 - 10:00

Peak Hour Data (07:30 - 08:30)

Start Time	North Approach Orleans Blvd				South Approach Orleans Blvd				East Approach Innes Rd				West Approach Innes Rd				Total Vehicles								
	Peds	Total	Peds	Total	Peds	Total	Peds	Total	Peds	Total	Peds	Total	Peds	Total											
07:30	20	22	146	0	1	188	33	56	8	0	3	97	3	338	39	0	5	380	24	83	11	0	0	118	783
07:45	22	28	109	0	3	159	20	68	10	0	2	98	8	316	39	1	6	364	29	83	8	0	0	120	741
08:00	20	30	115	0	6	165	26	46	16	0	0	88	5	340	42	0	3	387	27	88	7	0	1	122	762
08:15	37	31	119	0	1	187	28	63	10	0	1	101	6	339	36	0	3	381	26	89	6	0	0	121	790
Grand Total	99	111	489	0	11	699	107	233	44	0	6	384	22	1333	156	1	17	1512	106	343	32	0	1	481	3076
Approach %	14.2	15.9	70	0	-	27.9	60.7	11.5	0	-	1.5	88.2	10.3	0.1	-	22	71.3	6.7	0	-	-	-	-		
Totals %	3.2	3.6	15.9	0	22.7	3.5	7.6	1.4	0	12.5	0.7	43.3	5.1	0	49.2	3.4	11.2	1	0	15.6	-	-			
PHF	0.67	0.9	0.84	0	0.93	0.81	0.86	0.69	0	0.95	0.69	0.98	0.93	0.25	0.98	0.91	0.96	0.73	0	0.99	0.97	-	-		
Cars	97	105	485	0	687	104	223	42	0	369	22	1301	147	1	1471	101	313	30	0	444	2971	-			
% Cars	98	94.6	99.2	0	98.3	97.2	95.7	95.5	0	96.1	100	97.6	94.2	100	97.3	95.3	91.3	93.8	0	92.3	96.6	-	-		
Trucks	2	6	4	0	12	3	10	2	0	15	0	32	9	0	41	5	30	2	0	37	105	-			
% Trucks	2	5.4	0.8	0	1.7	2.8	4.3	4.5	0	3.9	0	2.4	5.8	0	2.7	4.7	8.7	6.3	0	7.7	3.4	-	-		
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
% Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Peds					11	-				6	-				17	-				1	-	35	-		
% Peds					31.4	-				17.1	-				48.6	-				2.9	-	-	-		



Peak Hour Diagram

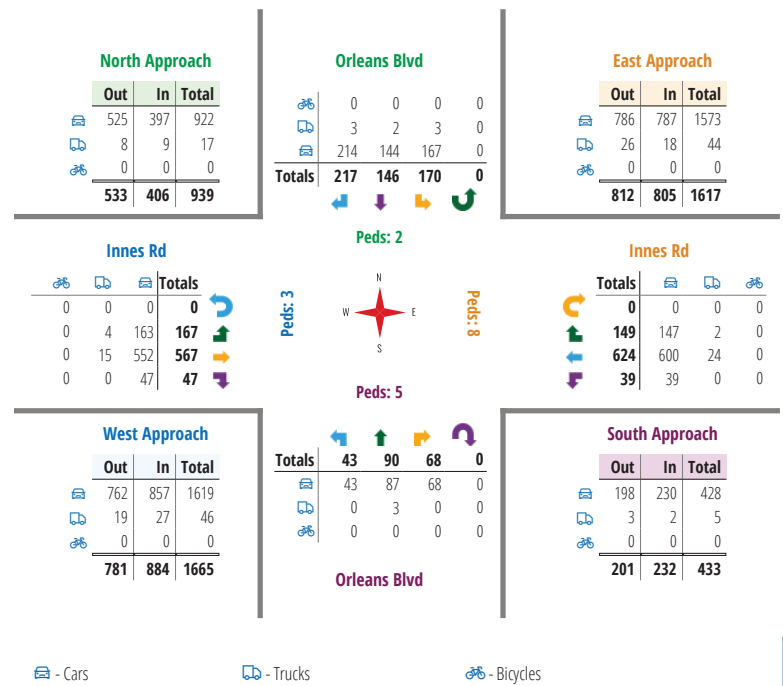
Specified Period
 From: 11:30:00
 To: 13:30:00
One Hour Peak
 From: 12:30:00
 To: 13:30:00

Intersection: Innes Rd & Orleans Blvd
Site Code: 2412800003
Count Date: Apr 24, 2024

Weather conditions: Clear

** Signalized Intersection **

Major Road: Innes Rd runs E/W



Comments



Peak Hour Summary

Intersection: Innes Rd & Orleans Blvd
 Site Code: 2412800003
 Count Date: Apr 24, 2024
 Period: 11:30 - 13:30

Peak Hour Data (12:30 - 13:30)

Start Time	North Approach Orleans Blvd				South Approach Orleans Blvd				East Approach Innes Rd				West Approach Innes Rd				Total Vehicles									
	Peds	Total	Peds	Total	Peds	Total	Peds	Total	Peds	Total	Peds	Total	Peds	Total												
12:30	43	40	55	0	1	138	10	25	21	0	1	56	8	150	34	0	1	192	35	130	10	0	1	175	561	
12:45	44	42	51	0	0	137	10	30	14	0	1	54	13	153	35	0	4	201	51	154	10	0	0	215	607	
13:00	40	41	47	0	1	128	14	19	17	0	3	50	14	144	43	0	2	201	51	132	14	0	2	197	576	
13:15	43	23	64	0	0	130	9	16	16	0	0	41	4	177	37	0	1	218	30	151	13	0	0	194	583	
Grand Total	170	146	217	0	2	533	43	90	68	0	5	201	39	624	149	0	8	812	167	567	47	0	3	781	2327	
Approach %	31.9	27.4	40.7	0	-	21.4	44.8	33.8	0	-	4.8	76.8	18.3	0	-	21.4	72.6	6	0	-	-	-	-	-	-	-
Totals %	7.3	6.3	9.3	0	0.2	22.9	1.8	3.9	2.9	0	0.2	8.6	1.7	26.8	6.4	0	0.3	34.9	7.2	24.4	2	0	0	33.6		
PHF	0.97	0.87	0.85	0	0.01	0.97	0.77	0.75	0.81	0	0.10	0.9	0.7	0.88	0.87	0	0.10	0.93	0.82	0.92	0.84	0	0.01	0.91	0.96	
Cars	167	144	214	0	1	525	43	87	68	0	198	39	600	147	0	786	163	552	47	0	762	2271				
% Cars	98.2	98.6	98.6	0	0	98.5	100	96.7	100	0	98.5	100	96.2	98.7	0	96.8	97.6	97.4	100	0	97.6	97.6				
Trucks	3	2	3	0	0	8	0	3	0	0	3	0	24	2	0	26	4	15	0	0	19	56				
% Trucks	1.8	1.4	1.4	0	0	1.5	0	3.3	0	0	1.5	0	3.8	1.3	0	3.2	2.4	2.6	0	0	2.4	2.4				
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
% Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Peds	0	0	0	0	2	-	0	0	0	0	5	-	0	0	0	0	8	-	0	0	0	0	3	-	18	
% Peds	0	0	0	0	1.1	-	0	0	0	0	2.3	-	0	0	0	0	4.4	-	0	0	0	0	1.6	-	0.8	



Peak Hour Diagram

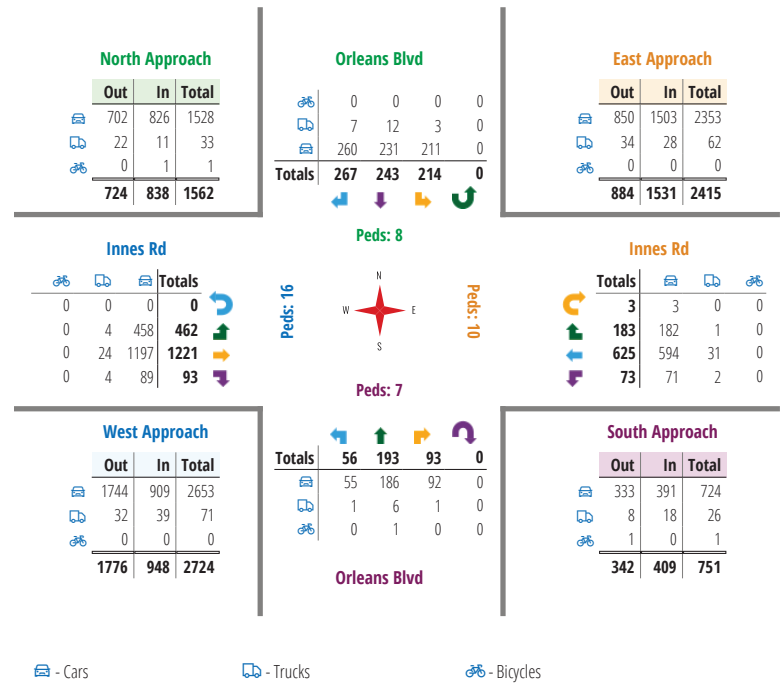
Specified Period **One Hour Peak**
 From: 15:00:00 From: 15:45:00
 To: 18:00:00 To: 16:45:00

Intersection: Innes Rd & Orleans Blvd
Site Code: 2412800003
Count Date: Apr 24, 2024

Weather conditions: Clear

** Signalized Intersection **

Major Road: Innes Rd runs E/W



Comments

Turning Movement Count - Study Results

INNES RD @ PAGE RD

Survey Date: Thursday, May 09, 2024

WO No: 41758

Start Time: 07:00

Device: Miovision



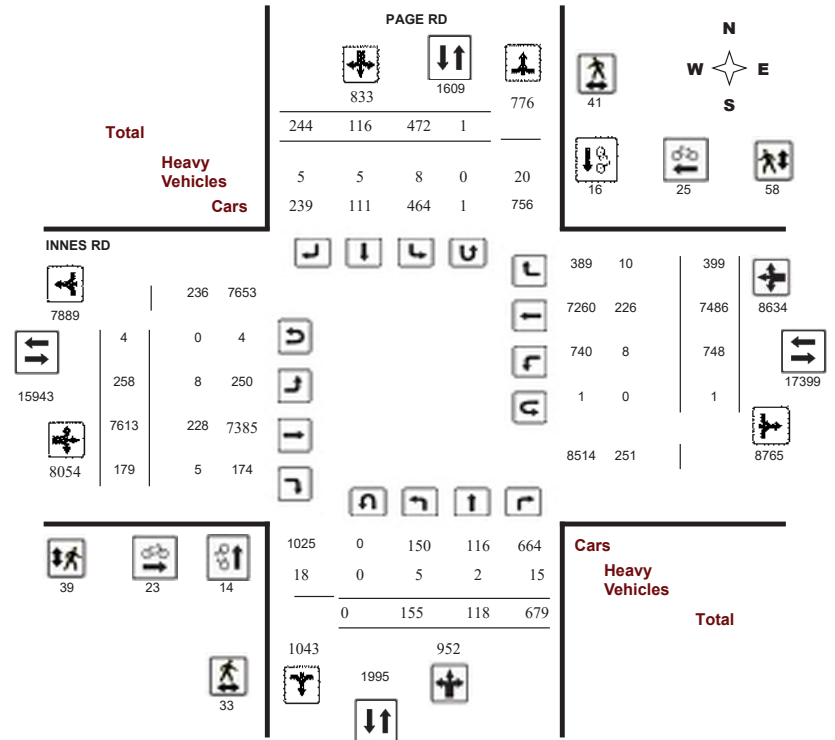
Peak Hour Summary

Intersection: Innes Rd & Orleans Blvd
 Site Code: 2412800003
 Count Date: Apr 24, 2024
 Period: 15:00 - 18:00

Peak Hour Data (15:45 - 16:45)

Start Time	North Approach Orleans Blvd				South Approach Orleans Blvd				East Approach Innes Rd				West Approach Innes Rd				Total Vehicles									
	Peds	Total	Peds	Total	Peds	Total	Peds	Total	Peds	Total	Peds	Total	Peds	Total												
15:45	68	67	74	0	4	209	6	45	34	0	1	85	18	144	50	0	0	212	125	302	25	0	8	452	958	
16:00	56	47	62	0	4	165	23	49	20	0	2	92	18	170	33	2	7	223	127	299	25	0	2	451	931	
16:15	44	68	58	0	0	170	16	52	23	0	2	91	19	152	48	1	1	220	108	319	22	0	5	449	930	
16:30	46	61	73	0	0	180	11	47	16	0	2	74	18	159	52	0	2	229	102	301	21	0	1	424	907	
Grand Total	214	243	267	0	8	724	56	193	93	0	7	342	73	625	183	3	10	884	462	1221	93	0	16	1776	3726	
Approach %	29.6	33.6	36.9	0	-	16.4	56.4	27.2	0	-	8.3	70.7	20.7	0.3	-	26	68.8	5.2	0	-	-	-	-	-	-	-
Totals %	5.7	6.5	7.2	0	19.4	1.5	5.2	2.5	0	9.2	2	16.8	4.9	0.1	23.7	12.4	32.8	2.5	0	47.7	-	-	-	-	-	
PHF	0.79	0.89	0.9	0	0.87	0.61	0.93	0.68	0	0.93	0.96	0.92	0.88	0.38	0.97	0.91	0.96	0.93	0	0.98	0.97	0	0.98	0.97	0.97	
Cars	211	231	260	0	702	55	186	92	0	333	71	594	182	3	850	458	1197	89	0	1744	3629	-	-	-	-	
% Cars	98.6	95.1	97.4	0	97	98.2	96.4	98.9	0	97.4	97.3	95	99.5	100	96.2	99.1	98	95.7	0	98.2	97.4	-	-	-	-	
Trucks	3	12	7	0	22	1	6	1	0	8	2	31	1	0	34	4	24	4	0	32	96	-	-	-	-	
% Trucks	1.4	4.9	2.6	0	3	1.8	3.1	1.1	0	2.3	2.7	5	0.5	0	3.8	0.9	2	4.3	0	1.8	2.6	-	-	-	-	
Bicycles	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Bicycles	0	0	0	0	0	0	0.5	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	0	0	0	8	-	-	-	-	7	-	-	-	-	10	-	-	-	-	16	-	-	41	-	-	
% Peds	0	0	0	0	19.5	-	-	-	-	17.1	-	-	-	-	24.4	-	-	-	-	39	-	-	-	-	-	

Full Study Diagram





Transportation Services - Traffic Services

Turning Movement Count - Study Results

INNES RD @ PAGE RD

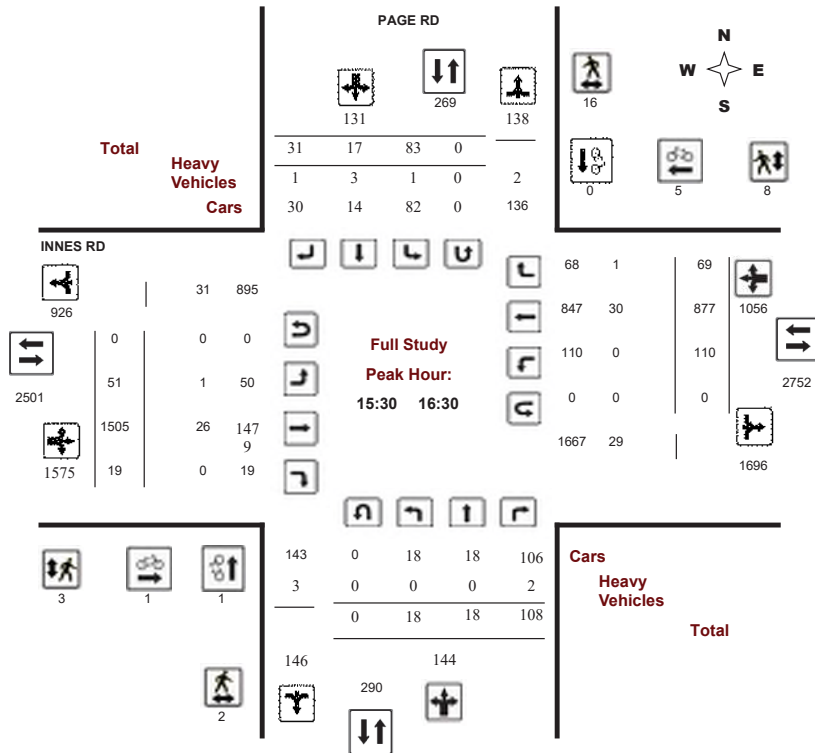
Survey Date: Thursday, May 09, 2024

WO No: 41758

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram



Transportation Services - Traffic Services

Turning Movement Count - Study Results

INNES RD @ PAGE RD

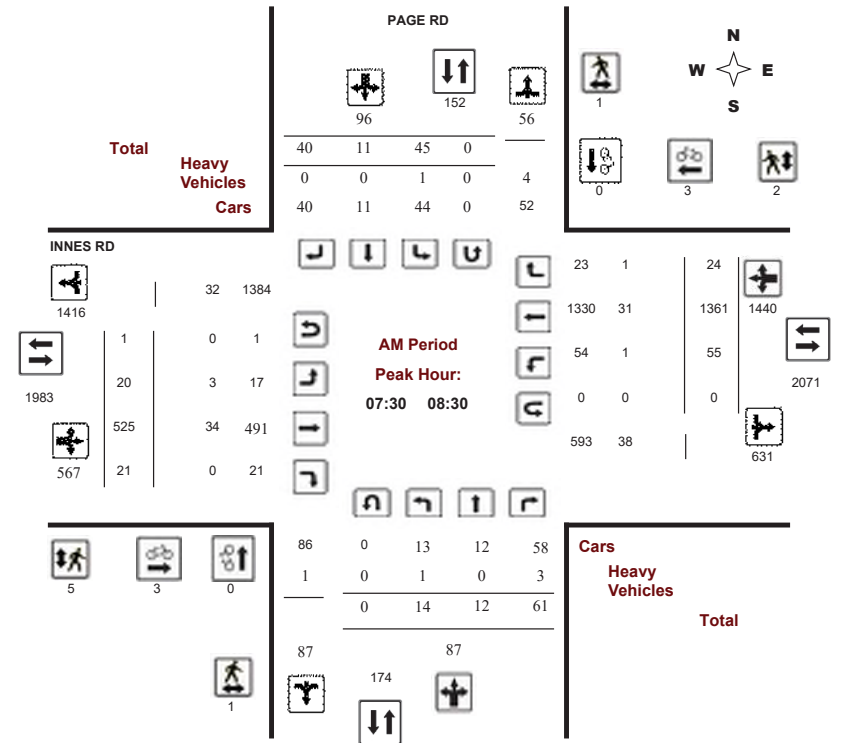
Survey Date: Thursday, May 09, 2024

WO No: 41758

Start Time: 07:00

Device: Miovision

AM Period Peak Hour Diagram





Transportation Services - Traffic Services

Turning Movement Count - Study Results

INNES RD @ PAGE RD

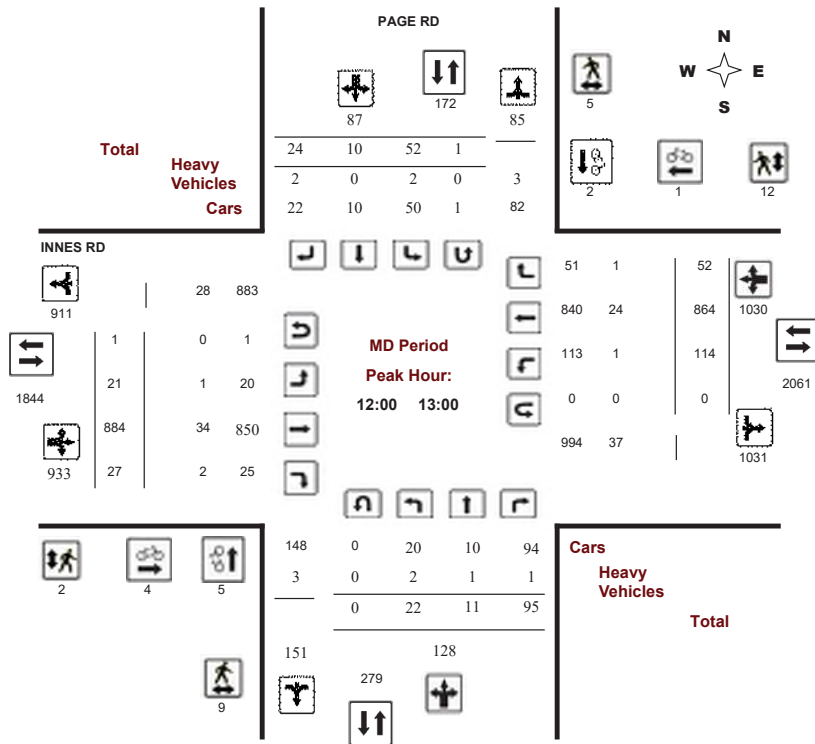
Survey Date: Thursday, May 09, 2024

WO No: 41758

Start Time: 07:00

Device: Miovision

MD Period Peak Hour Diagram



Transportation Services - Traffic Services

Turning Movement Count - Study Results

INNES RD @ PAGE RD

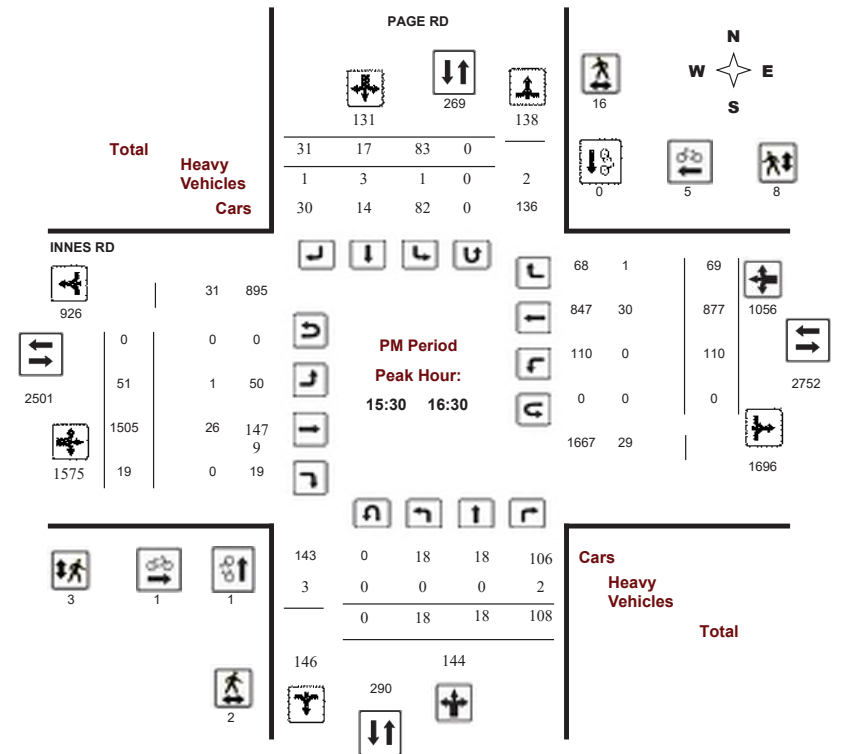
Survey Date: Thursday, May 09, 2024

WO No: 41758

Start Time: 07:00

Device: Miovision

PM Period Peak Hour Diagram





Transportation Services - Traffic Services

Turning Movement Count - Study Results

INNES RD @ PAGE RD

Survey Date: Thursday, May 09, 2024

WO No: 41758

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

Time Period	PAGE RD			INNES RD			Grand Total
	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00 07:15	2	0	2	0	0	0	2
07:15 07:30	0	1	1	0	1	1	2
07:30 07:45	0	0	0	1	2	3	3
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	2	1	3	3
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	1	1	0	0	0	1
08:45 09:00	0	0	0	2	2	4	4
09:00 09:15	0	0	0	1	2	3	3
09:15 09:30	1	0	1	1	1	2	3
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	1	2	3	0	1	1	4
11:30 11:45	1	1	2	1	1	2	4
11:45 12:00	0	0	0	1	3	4	4
12:00 12:15	1	1	2	0	0	0	2
12:15 12:30	2	0	2	1	0	1	3
12:30 12:45	1	1	2	0	1	1	3
12:45 13:00	1	0	1	3	0	3	4
13:00 13:15	0	1	1	1	0	1	2
13:15 13:30	1	0	1	0	0	0	1
15:00 15:15	1	1	2	2	1	3	5
15:15 15:30	0	2	2	0	1	1	3
15:30 15:45	0	0	0	0	2	2	2
15:45 16:00	0	0	0	0	1	1	1
16:00 16:15	0	0	0	0	1	1	1
16:15 16:30	1	0	1	1	1	2	3
16:30 16:45	0	1	1	2	0	2	3
16:45 17:00	0	1	1	1	0	1	2
17:00 17:15	0	1	1	1	1	2	3
17:15 17:30	1	0	1	1	0	1	2
17:30 17:45	0	2	2	1	2	3	5
17:45 18:00	0	0	0	0	0	0	0
Total	14	16	30	23	25	48	78



Transportation Services - Traffic Services

Turning Movement Count - Study Results

INNES RD @ PAGE RD

Survey Date: Thursday, May 09, 2024

WO No: 41758

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

Time Period	PAGE RD			INNES RD			Grand Total
	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	
07:00 07:15	1	1	2	0	0	0	2
07:15 07:30	0	1	1	0	0	0	1
07:30 07:45	0	0	0	1	0	1	1
07:45 08:00	0	0	0	2	1	3	3
08:00 08:15	0	1	1	2	0	2	3
08:15 08:30	1	0	1	0	1	1	2
08:30 08:45	1	0	1	0	1	1	2
08:45 09:00	1	2	3	3	0	3	6
09:00 09:15	1	1	2	4	1	5	7
09:15 09:30	0	0	0	1	2	3	3
09:30 09:45	2	0	2	1	1	2	4
09:45 10:00	1	0	1	0	1	1	2
11:30 11:45	1	0	1	1	0	1	2
11:45 12:00	0	1	1	1	0	1	2
12:00 12:15	2	3	5	0	2	2	7
12:15 12:30	2	1	3	1	2	3	6
12:30 12:45	3	1	4	1	5	6	10
12:45 13:00	2	0	2	0	3	3	5
13:00 13:15	2	1	3	1	0	1	4
13:15 13:30	0	0	0	3	1	4	4
15:00 15:15	0	2	2	3	4	7	9
15:15 15:30	2	4	6	2	4	6	12
15:30 15:45	1	1	2	0	0	0	2
15:45 16:00	0	3	3	0	3	3	6
16:00 16:15	0	11	11	2	3	5	16
16:15 16:30	1	1	2	1	2	3	5
16:30 16:45	0	0	0	0	0	0	0
16:45 17:00	4	0	4	3	6	9	13
17:00 17:15	1	0	1	1	2	3	4
17:15 17:30	2	3	5	2	12	14	19
17:30 17:45	1	0	1	2	0	2	3
17:45 18:00	1	3	4	1	1	2	6
Total	33	41	74	39	58	97	171



Project #24-346 - CGH Transportation

Intersection Count Report

Intersection: Innes Rd & Lamarche Ave
Municipality: Ottawa
Count Date: Wednesday, Aug 21, 2024
Site Code: 2434600002
Count Categories: Cars, Trucks, Bicycles, Pedestrians
Count Period: 07:00-10:00, 11:30-13:30, 15:00-18:00
Weather: Clear
Comments:



Traffic Count Summary

Intersection: Innes Rd & Lamarche Ave
Site Code: 2434600002
Municipality: Ottawa
Count Date: Aug 21, 2024

Lamarche Ave - Traffic Summary

Hour	North Approach Totals						South Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	0	0	0	0	0	0	117	0	24	1	142	0	142
08:00 - 09:00	0	0	0	0	0	0	96	0	59	0	155	1	155
09:00 - 10:00	0	0	0	0	0	0	80	0	42	0	122	5	122
BREAK													
11:30 - 12:00	0	0	0	0	0	0	29	0	32	0	61	4	61
12:00 - 13:00	0	0	0	0	0	0	65	0	46	0	111	8	111
13:00 - 13:30	0	0	0	0	0	0	30	0	20	0	50	4	50
BREAK													
15:00 - 16:00	0	0	0	0	0	0	74	0	57	0	131	10	131
16:00 - 17:00	0	0	0	0	0	0	76	0	60	0	136	3	136
17:00 - 18:00	0	0	0	0	0	0	53	0	77	0	130	6	130
GRAND TOTAL	0	0	0	0	0	0	620	0	417	1	1038	41	1038



Traffic Count Data

Intersection: Innes Rd & Lamarche Ave
 Site Code: 2434600002
 Municipality: Ottawa
 Count Date: Aug 21, 2024

South Approach - Lamarche Ave

Start Time	Cars				Total	Trucks				Total	Bicycles				Total	Total Peds
	←	↑	→	↻		←	↑	→	↻		←	↑	→	↻		
11:30	10	0	15	0	25	0	0	0	0	0	0	0	0	0	0	1
11:45	18	0	16	0	34	1	0	1	0	2	0	0	0	0	0	3
12:00	17	0	13	0	30	0	0	0	0	0	0	0	0	0	0	2
12:15	16	0	13	0	29	0	0	0	0	0	0	0	0	0	0	3
12:30	17	0	10	0	27	0	0	0	0	0	0	0	0	0	0	1
12:45	15	0	10	0	25	0	0	0	0	0	0	0	0	0	0	2
13:00	12	0	11	0	23	0	0	0	0	0	0	0	0	0	0	2
13:15	18	0	8	0	26	0	0	1	0	1	0	0	0	0	0	2
SUBTOTAL	123	0	96	0	219	1	0	2	0	3	0	0	0	0	0	16



Traffic Count Data

Intersection: Innes Rd & Lamarche Ave
 Site Code: 2434600002
 Municipality: Ottawa
 Count Date: Aug 21, 2024

South Approach - Lamarche Ave

Start Time	Cars				Total	Trucks				Total	Bicycles				Total	Total Peds
	←	↑	→	↻		←	↑	→	↻		←	↑	→	↻		
15:00	15	0	13	0	28	0	0	0	0	0	0	0	0	0	0	3
15:15	20	0	11	0	31	0	0	0	0	0	0	0	0	0	0	2
15:30	18	0	20	0	38	0	0	0	0	0	0	0	0	0	0	1
15:45	21	0	13	0	34	0	0	0	0	0	0	0	0	0	0	4
16:00	21	0	16	0	37	0	0	0	0	0	0	0	0	0	0	1
16:15	18	0	18	0	36	1	0	0	0	1	0	0	0	0	0	1
16:30	18	0	11	0	29	0	0	1	0	1	0	0	0	0	0	0
16:45	18	0	14	0	32	0	0	0	0	0	0	0	0	0	0	1
17:00	10	0	14	0	24	0	0	0	0	0	0	0	0	0	0	0
17:15	13	0	15	0	28	0	0	0	0	0	0	0	0	0	0	1
17:30	19	0	22	0	41	0	0	0	0	0	0	0	0	0	0	1
17:45	11	0	26	0	37	0	0	0	0	0	0	0	0	0	0	4
SUBTOTAL	202	0	193	0	395	1	0	1	0	2	0	0	0	0	0	19
GRAND TOTAL	611	0	410	1	1022	9	0	7	0	16	0	0	0	0	0	41



Traffic Count Data

Intersection: Innes Rd & Lamarche Ave
 Site Code: 2434600002
 Municipality: Ottawa
 Count Date: Aug 21, 2024

East Approach - Innes Rd

Start Time	Cars				Trucks				Bicycles				Total Peds
	←	↑	↻	Total	←	↑	↻	Total	←	↑	↻	Total	
07:00	8	172	0	180	0	1	0	1	0	0	0	0	0
07:15	4	222	0	226	0	3	0	3	0	0	0	0	0
07:30	10	229	0	240	0	9	0	9	0	0	0	0	0
07:45	5	228	0	233	1	11	0	12	0	1	0	1	0
08:00	9	234	0	243	0	7	0	7	0	1	0	1	0
08:15	6	250	0	256	0	15	0	15	0	0	0	0	0
08:30	9	232	0	241	0	12	0	12	0	0	0	0	0
08:45	9	173	0	182	0	13	0	13	0	0	0	0	0
09:00	13	168	0	181	1	14	0	15	0	0	0	0	0
09:15	10	170	0	180	0	8	0	8	0	0	0	0	0
09:30	7	162	0	169	0	11	0	11	0	0	0	0	0
09:45	7	162	0	169	0	11	0	11	0	0	0	0	0
SUBTOTAL	97	2402	0	2500	2	115	0	117	0	2	0	2	0



Traffic Count Data

Intersection: Innes Rd & Lamarche Ave
 Site Code: 2434600002
 Municipality: Ottawa
 Count Date: Aug 21, 2024

East Approach - Innes Rd

Start Time	Cars				Trucks				Bicycles				Total Peds
	←	↑	↻	Total	←	↑	↻	Total	←	↑	↻	Total	
11:30	10	186	0	196	0	9	0	9	0	0	0	0	0
11:45	12	197	0	209	0	11	0	11	0	0	0	0	0
12:00	8	215	0	223	0	10	0	10	0	1	0	1	0
12:15	7	233	0	240	0	13	0	13	0	0	0	0	0
12:30	7	217	0	224	0	9	0	9	0	0	0	0	0
12:45	11	196	0	207	0	8	0	8	0	0	0	0	0
13:00	22	225	0	248	0	12	0	12	0	0	0	0	0
13:15	14	225	0	239	0	5	0	5	0	0	0	0	0
SUBTOTAL	91	1694	0	1786	0	77	0	77	0	1	0	1	0



Traffic Count Data

Intersection: Innes Rd & Lamarche Ave
 Site Code: 2434600002
 Municipality: Ottawa
 Count Date: Aug 21, 2024

East Approach - Innes Rd

Start Time	Cars				Trucks				Bicycles				Total Peds	
	←	↑	→	↻	←	↑	→	↻	←	↑	→	↻		
15:00	7	181	0	0	188	0	5	0	0	5	0	0	0	0
15:15	10	220	0	0	230	0	9	0	0	9	0	0	0	0
15:30	11	209	0	0	220	0	14	0	0	14	0	0	0	0
15:45	11	207	0	0	218	0	5	0	0	5	0	0	0	0
16:00	12	209	0	0	221	0	8	0	0	8	0	0	0	0
16:15	17	241	0	0	258	0	4	0	0	4	0	0	0	0
16:30	22	215	0	0	237	0	5	0	0	5	0	0	0	0
16:45	21	211	0	0	232	0	5	0	0	5	0	0	0	0
17:00	12	203	0	0	215	0	5	0	0	5	0	0	0	0
17:15	17	207	0	0	224	0	1	0	0	1	0	0	0	0
17:30	14	195	0	0	209	0	4	0	0	4	0	0	0	0
17:45	14	187	0	0	201	0	2	0	0	2	0	0	0	0
SUBTOTAL	168	2485	0	0	2653	0	67	0	0	67	0	0	0	0
GRAND TOTAL	356	6581	0	2	6939	2	259	0	0	261	0	3	0	3



Traffic Count Data

Intersection: Innes Rd & Lamarche Ave
 Site Code: 2434600002
 Municipality: Ottawa
 Count Date: Aug 21, 2024

West Approach - Innes Rd

Start Time	Cars				Trucks				Bicycles				Total Peds	
	←	↑	→	↻	←	↑	→	↻	←	↑	→	↻		
07:00	0	64	7	0	71	0	10	0	0	10	0	0	0	0
07:15	0	68	7	0	75	0	13	0	0	13	0	0	0	0
07:30	0	91	7	0	98	0	10	0	0	10	0	0	0	0
07:45	0	93	13	0	106	0	8	1	0	9	0	0	0	0
08:00	0	98	9	0	107	0	10	1	0	11	0	0	0	0
08:15	0	108	13	0	121	0	4	0	0	4	0	0	0	0
08:30	0	110	13	0	123	0	7	1	0	8	0	0	0	0
08:45	0	166	8	0	174	0	9	0	0	9	0	0	0	1
09:00	0	144	18	0	162	0	13	2	0	15	0	0	0	0
09:15	0	129	13	0	142	0	9	1	0	10	0	0	0	0
09:30	0	125	14	0	139	0	11	0	0	11	0	0	0	0
09:45	0	175	7	0	182	0	4	0	0	4	0	0	0	0
SUBTOTAL	0	1371	129	0	1500	0	108	6	0	114	0	0	0	1



Traffic Count Data

Intersection: Innes Rd & Lamarche Ave
 Site Code: 2434600002
 Municipality: Ottawa
 Count Date: Aug 21, 2024

West Approach - Innes Rd

Start Time	Cars				Trucks				Bicycles				Total Peds		
	←	↑	↻	Total	←	↑	↻	Total	←	↑	↻	Total			
11:30	0	198	18	0	216	0	10	1	0	11	0	1	0	0	1
11:45	0	246	9	0	255	0	8	1	0	9	0	1	0	0	1
12:00	0	236	17	0	253	0	9	0	0	9	0	1	0	0	1
12:15	0	207	14	0	221	0	7	0	0	7	0	0	0	0	0
12:30	0	215	17	0	232	0	11	1	0	12	0	2	0	0	2
12:45	0	207	6	0	213	0	10	0	0	10	0	0	0	0	0
13:00	0	227	20	0	247	0	14	0	0	14	0	0	0	0	0
13:15	0	224	9	0	233	0	13	0	0	13	0	0	0	0	0
SUBTOTAL	0	1760	110	0	1870	0	82	3	0	85	0	5	0	0	5



Traffic Count Data

Intersection: Innes Rd & Lamarche Ave
 Site Code: 2434600002
 Municipality: Ottawa
 Count Date: Aug 21, 2024

West Approach - Innes Rd

Start Time	Cars				Trucks				Bicycles				Total Peds		
	←	↑	↻	Total	←	↑	↻	Total	←	↑	↻	Total			
15:00	0	268	25	0	293	0	4	0	0	4	0	0	0	0	0
15:15	0	276	25	0	301	0	11	0	0	11	0	0	0	0	0
15:30	0	306	22	0	328	0	6	1	0	7	0	0	0	0	0
15:45	0	329	17	0	346	0	1	0	0	1	0	0	0	0	0
16:00	0	336	22	0	358	0	6	0	0	6	0	1	0	0	1
16:15	0	345	37	0	382	0	4	0	0	4	0	0	0	0	0
16:30	0	362	20	0	382	0	3	0	0	3	0	2	0	0	2
16:45	0	338	29	0	367	0	3	0	0	3	0	0	0	0	0
17:00	0	338	32	0	370	0	1	0	0	1	0	0	0	0	0
17:15	0	309	40	0	349	0	7	0	0	7	0	1	0	0	1
17:30	0	344	37	0	381	0	2	0	0	2	0	1	0	0	1
17:45	0	293	30	0	323	0	4	0	0	4	0	0	0	0	0
SUBTOTAL	0	3844	336	0	4180	0	52	1	0	53	0	5	0	0	5
GRAND TOTAL	0	6975	575	0	7550	0	242	10	0	252	0	10	0	0	10



Peak Hour Diagram

Specified Period	One Hour Peak
From: 07:00:00	From: 08:00:00
To: 10:00:00	To: 09:00:00

Intersection: Innes Rd & Lamarche Ave
Site Code: 2434600002
Count Date: Aug 21, 2024

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Innes Rd runs E/W

East Approach

	Out	In	Total
	922	539	1461
	47	32	79
	1	0	1
Totals	970	571	1541

Innes Rd

	Out	In	Total
	0	0	0
	0	30	482
	0	2	43
Totals	0	512	512

Peds: 0

Peds: 1

Peds: 1

Innes Rd

	Out	In	Total
	0	0	0
	937	889	47
	33	33	0
Totals	970	922	1892

West Approach

	Out	In	Total
	525	982	1507
	32	50	82
	0	1	1
Totals	557	1033	1590

Totals	96	59	0
	93	57	0
	3	2	0
	0	0	0

Lamarche Ave

South Approach

	Out	In	Total
	150	76	226
	5	2	7
	0	0	0
Totals	155	78	233

- Cars

- Trucks

- Bicycles

Comments



Peak Hour Summary

Intersection: Innes Rd & Lamarche Ave
Site Code: 2434600002
Count Date: Aug 21, 2024
Period: 07:00 - 10:00

Peak Hour Data (08:00 - 09:00)

Start Time	North Approach			South Approach Lamarche Ave			East Approach Innes Rd			West Approach Innes Rd			Total Vehicles						
08:00	0	0	0	28	15	0	0	43	9	242	0	0	251	108	10	0	0	118	412
08:15	0	0	0	22	20	0	0	42	6	265	0	0	271	112	13	0	0	125	438
08:30	0	0	0	23	10	0	1	33	9	244	0	0	253	117	14	0	0	131	417
08:45	0	0	0	23	14	0	0	37	9	186	0	0	195	175	8	0	1	183	415
Grand Total	0	0	0	96	59	0	1	155	33	937	0	0	970	512	45	0	1	557	1682
Approach %	-	-	-	61.9	38.1	0	-	3.4	96.6	0	-	-	91.9	8.1	0	-	-	-	-
Totals %	0	0	0	5.7	3.5	0	0.2	9.2	2	55.7	0	0	57.7	30.4	2.7	0	0	33.1	
PHF	0	0	0	0.86	0.74	0	0	0.9	0.92	0.88	0	0	0.89	0.73	0.8	0	0	0.76	0.96
% Cars	0	0	0	93	57	0	0	150	33	889	0	0	922	482	43	0	0	525	1597
% Trucks	0	0	0	96.9	96.6	0	0	96.8	100	94.9	0	0	95.1	94.1	95.6	0	0	94.3	94.9
% Bicycles	0	0	0	3	2	0	0	5	0	47	0	0	47	30	2	0	0	32	84
% Peds	0	0	0	3.1	3.4	0	0	3.2	0	5	0	0	4.8	5.9	4.4	0	0	5.7	5
% Bicycles	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
% Peds	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0.1	0.1
Peds	0	-	-	-	-	-	1	-	-	-	0	-	-	-	-	-	1	-	2
% Peds	0	-	-	-	-	-	50	-	-	-	0	-	-	-	-	-	50	-	-



Peak Hour Diagram

Specified Period	One Hour Peak
From: 11:30:00	From: 11:45:00
To: 13:30:00	To: 12:45:00

Intersection: Innes Rd & Lamarche Ave
 Site Code: 2434600002
 Count Date: Aug 21, 2024

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Innes Rd runs E/W

East Approach

	Out	In	Total
	896	956	1852
	43	36	79
	1	4	5
Totals	940	996	1936

Innes Rd

	Out	In	Total
	0	0	0
	4	35	904
	0	2	57
Totals	0	943	943

Peds: 0

Peds: 0

Peds: 9

Innes Rd

	Out	In	Total
	0	0	0
	906	862	43
	34	34	0
Totals	940	896	1836

West Approach

	Out	In	Total
	961	930	1891
	37	44	81
	4	1	5
Totals	1002	975	1977

Totals	69	53	0
	68	52	0
	1	1	0
	0	0	0

Lamarche Ave

South Approach

	Out	In	Total
	120	91	211
	2	2	4
	0	0	0
Totals	122	93	215

- Cars

- Trucks

- Bicycles

Comments



Peak Hour Summary

Intersection: Innes Rd & Lamarche Ave
 Site Code: 2434600002
 Count Date: Aug 21, 2024
 Period: 11:30 - 13:30

Peak Hour Data (11:45 - 12:45)

Start Time	North Approach			South Approach Lamarche Ave			East Approach Innes Rd			West Approach Innes Rd			Total Vehicles						
11:45	0	0	0	19	17	0	3	36	12	208	0	0	220	255	10	0	0	265	521
12:00	0	0	0	17	13	0	2	30	8	226	0	0	234	246	17	0	0	263	527
12:15	0	0	0	16	13	0	3	29	7	246	0	0	253	214	14	0	0	228	510
12:30	0	0	0	17	10	0	1	27	7	226	0	0	233	228	18	0	0	246	506
Grand Total	0	0	0	69	53	0	9	122	34	906	0	0	940	943	59	0	0	1002	2064
Approach %	-	-	-	56.6	43.4	0	-	3.6	96.4	0	-	-	94.1	5.9	0	-	-	-	-
Totals %	0	0	0	3.3	2.6	0	0	5.9	1.6	43.9	0	0	45.5	45.7	2.9	0	0	48.5	48.5
PHF	0	0	0	0.91	0.78	0	0	0.85	0.71	0.92	0	0	0.93	0.92	0.82	0	0	0.95	0.98
Cars	0	68	52	0	120	34	862	0	896	904	57	0	961	1977					
% Cars	0	98.6	98.1	0	98.4	100	95.1	0	95.3	95.9	96.6	0	95.9	95.8					
Trucks	0	1	1	0	2	0	43	0	43	35	2	0	37	82					
% Trucks	0	1.4	1.9	0	1.6	0	4.7	0	4.6	3.7	3.4	0	3.7	4					
Bicycles	0	0	0	0	0	0	1	0	1	4	0	0	4	5					
% Bicycles	0	0	0	0	0	0	0.1	0	0.1	0.4	0	0	0.4	0.2					
Peds	0	-	-	9	-	-	-	0	-	0	-	-	0	9					
% Peds	0	-	-	100	-	-	-	0	-	0	-	-	0	100					



Peak Hour Diagram

Specified Period	One Hour Peak
From: 15:00:00	From: 16:00:00
To: 18:00:00	To: 17:00:00

Intersection: Innes Rd & Lamarche Ave
 Site Code: 2434600002
 Count Date: Aug 21, 2024

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Innes Rd runs E/W

East Approach

	Out	In	Total
	948	1440	2388
	22	17	39
	0	3	3
Totals	970	1460	2430

Innes Rd

	Out	In	Total
	0	0	0
	3	16	1381
	0	0	108
Totals	0	1400	108

Peds: 0

Peds: 0

Peds: 3

Innes Rd

	Out	In	Total
	0	0	0
	898	876	22
	72	72	0
Totals	0	898	876

West Approach

	Out	In	Total
	1489	951	2440
	16	23	39
	3	0	3
Totals	1508	974	2482

Totals	76	60	0
	75	59	0
	1	1	0
	0	0	0

Lamarche Ave

South Approach

	Out	In	Total
	134	180	314
	2	0	2
	0	0	0
Totals	136	180	316

- Cars

- Trucks

- Bicycles

Comments



Peak Hour Summary

Intersection: Innes Rd & Lamarche Ave
 Site Code: 2434600002
 Count Date: Aug 21, 2024
 Period: 15:00 - 18:00

Peak Hour Data (16:00 - 17:00)

Start Time	North Approach			South Approach Lamarche Ave			East Approach Innes Rd			West Approach Innes Rd			Total Vehicles						
16:00	0	0	0	21	16	0	1	37	12	217	0	0	229	343	22	0	0	365	631
16:15	0	0	0	19	18	0	1	37	17	245	0	0	262	349	37	0	0	386	695
16:30	0	0	0	18	12	0	0	30	22	220	0	0	242	357	20	0	0	387	659
16:45	0	0	0	18	14	0	1	32	21	216	0	0	237	341	29	0	0	370	639
Grand Total	0	0	0	76	60	0	3	136	72	898	0	0	970	1400	108	0	0	1508	2614
Approach %	-	-	-	55.9	44.1	0	-	7.4	92.6	0	-	-	92.8	7.2	0	-	-	-	-
Totals %	0	0	0	2.9	2.3	0	0	5.2	2.8	34.4	0	0	37.1	53.6	4.1	0	0	57.7	
PHF	0	0	0	0.9	0.83	0	0	0.92	0.82	0.92	0	0	0.93	0.95	0.73	0	0	0.97	0.95
Cars	0	0	0	75	59	0	134	72	876	0	948	1381	108	0	1489	0	0	1489	2571
% Cars	0	0	0	98.7	98.3	0	98.5	100	97.6	0	97.7	98.6	100	0	98.7	0	0	98.7	98.4
Trucks	0	0	0	1	1	0	2	0	22	0	22	16	0	0	16	0	0	16	40
% Trucks	0	0	0	1.3	1.7	0	1.5	0	2.4	0	2.3	1.1	0	0	1.1	0	0	1.1	1.5
Bicycles	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	3	3
% Bicycles	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0.2	0	0	0.2	0.1
Peds	0	-	-	-	-	-	3	-	-	-	0	-	-	-	0	-	-	0	3
% Peds	0	-	-	-	-	-	100	-	-	-	0	-	-	-	0	-	-	0	-



Project #24-346 - CGH Transportation

Intersection Count Report

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
Municipality: Ottawa
Count Date: Wednesday, Aug 21, 2024
Site Code: 2434600001
Count Categories: Cars, Trucks, Bicycles, Pedestrians
Count Period: 07:00-10:00, 11:30-13:30, 15:00-18:00
Weather: Clear
Comments:



Traffic Count Summary

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
Site Code: 2434600001
Municipality: Ottawa
Count Date: Aug 21, 2024

Boyer Rd - Traffic Summary

Hour	North Approach Totals						South Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	0	0	1	0	1	3	10	0	10	0	20	6	21
08:00 - 09:00	0	0	1	0	1	6	10	0	11	0	21	2	22
09:00 - 10:00	0	1	3	0	4	1	9	0	18	0	27	2	31
BREAK													
11:30 - 12:00	1	1	2	0	4	2	18	0	26	0	44	4	48
12:00 - 13:00	1	1	10	0	12	5	37	1	54	0	92	10	104
13:00 - 13:30	3	0	2	0	5	3	17	0	33	0	50	4	55
BREAK													
15:00 - 16:00	4	0	5	0	9	2	22	0	41	0	63	11	72
16:00 - 17:00	4	0	7	0	11	3	16	0	23	0	39	4	50
17:00 - 18:00	15	0	9	0	24	0	14	0	17	0	31	6	55
GRAND TOTAL	28	3	40	0	71	25	153	1	233	0	387	49	458



Traffic Count Data

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
 Site Code: 2434600001
 Municipality: Ottawa
 Count Date: Aug 21, 2024

North Approach - Boyer Rd

Start Time	Cars				Total	Trucks				Total	Bicycles				Total	Total Peds
	←	↑	→	↻		←	↑	→	↻		←	↑	→	↻		
11:30	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
11:45	1	1	1	0	3	0	0	0	0	0	0	0	0	0	0	2
12:00	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	1
12:30	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	2
12:45	0	1	3	0	4	0	0	0	0	0	0	0	0	0	0	2
13:00	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	1
13:15	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2
SUBTOTAL	5	2	14	0	21	0	0	0	0	0	0	0	0	0	0	10



Traffic Count Data

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
 Site Code: 2434600001
 Municipality: Ottawa
 Count Date: Aug 21, 2024

North Approach - Boyer Rd

Start Time	Cars				Total	Trucks				Total	Bicycles				Total	Total Peds
	←	↑	→	↻		←	↑	→	↻		←	↑	→	↻		
15:00	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	1
15:15	1	0	2	0	3	0	0	0	0	0	1	0	0	0	1	0
15:30	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
15:45	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	1
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
16:30	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	3
16:45	2	0	5	0	7	0	0	0	0	0	0	0	0	0	0	0
17:00	6	0	4	0	10	0	0	0	0	0	0	0	0	0	0	0
17:15	5	0	2	0	7	0	0	0	0	0	0	0	0	0	0	0
17:30	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
17:45	3	0	2	0	5	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	22	0	20	0	42	0	0	1	0	1	1	0	0	0	1	5
GRAND TOTAL	27	3	39	0	69	0	0	1	0	1	1	0	0	0	1	25



Traffic Count Data

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
 Site Code: 2434600001
 Municipality: Ottawa
 Count Date: Aug 21, 2024

South Approach - Builders Warehouse

Start Time	Cars				Total	Trucks				Total	Bicycles				Total	Total Peds
	←	↑	→	↻		←	↑	→	↻		←	↑	→	↻		
07:00	3	0	1	0	4	0	0	0	0	0	0	0	0	0	0	1
07:15	2	0	1	0	3	0	0	1	0	1	0	0	0	0	0	2
07:30	2	0	4	0	6	0	0	1	0	1	0	0	0	0	0	0
07:45	2	0	1	0	3	1	0	1	0	2	0	0	0	0	0	3
08:00	4	0	3	0	7	0	0	0	0	0	0	0	0	0	0	1
08:15	1	0	2	0	3	2	0	0	0	2	0	0	0	0	0	0
08:30	1	0	3	0	4	0	0	0	0	0	0	0	0	0	0	0
08:45	2	0	2	0	4	0	0	1	0	1	0	0	0	0	0	1
09:00	1	0	3	0	4	0	0	1	0	1	0	0	0	0	0	1
09:15	3	0	3	0	6	0	0	2	0	2	0	0	0	0	0	0
09:30	3	0	5	0	8	0	0	1	0	1	0	0	0	0	0	1
09:45	2	0	3	0	5	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	26	0	31	0	57	3	0	8	0	11	0	0	0	0	0	10



Traffic Count Data

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
 Site Code: 2434600001
 Municipality: Ottawa
 Count Date: Aug 21, 2024

South Approach - Builders Warehouse

Start Time	Cars				Total	Trucks				Total	Bicycles				Total	Total Peds
	←	↑	→	↻		←	↑	→	↻		←	↑	→	↻		
11:30	7	0	8	0	15	1	0	2	0	3	0	0	0	0	0	1
11:45	9	0	16	0	25	1	0	0	0	1	0	0	0	0	0	3
12:00	8	0	16	0	24	1	0	0	0	1	0	0	0	0	0	1
12:15	4	0	13	0	17	0	0	0	0	0	0	0	0	0	0	5
12:30	15	0	13	0	28	1	0	0	0	1	0	0	0	0	0	1
12:45	8	1	11	0	20	0	0	1	0	1	0	0	0	0	0	3
13:00	6	0	13	0	19	0	0	1	0	1	0	0	0	0	0	3
13:15	11	0	18	0	29	0	0	1	0	1	0	0	0	0	0	1
SUBTOTAL	68	1	108	0	177	4	0	5	0	9	0	0	0	0	0	18



Traffic Count Data

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
 Site Code: 2434600001
 Municipality: Ottawa
 Count Date: Aug 21, 2024

South Approach - Builders Warehouse

Start Time	Cars				Total	Trucks				Total	Bicycles				Total	Total Peds
	←	↑	→	↻		←	↑	→	↻		←	↑	→	↻		
15:00	6	0	15	0	21	0	0	1	0	1	0	0	0	0	0	4
15:15	6	0	11	0	17	0	0	1	0	1	0	0	0	0	0	1
15:30	6	0	7	0	13	2	0	1	0	3	0	0	0	0	0	5
15:45	2	0	5	0	7	0	0	0	0	0	0	0	0	0	0	1
16:00	5	0	0	0	5	0	0	2	0	2	0	0	0	0	0	1
16:15	1	0	6	0	7	0	0	0	0	0	0	0	0	0	0	2
16:30	3	0	8	0	11	0	0	0	0	0	0	0	0	0	0	0
16:45	6	0	7	0	13	1	0	0	0	1	0	0	0	0	0	1
17:00	1	0	5	0	6	0	0	0	0	0	0	0	0	0	0	1
17:15	5	0	4	0	9	1	0	0	0	1	0	0	0	0	0	0
17:30	6	0	3	0	9	0	0	0	0	0	0	0	0	0	0	1
17:45	1	0	5	0	6	0	0	0	0	0	0	0	0	0	0	4
SUBTOTAL	48	0	76	0	124	4	0	5	0	9	0	0	0	0	0	21
GRAND TOTAL	142	1	215	0	358	11	0	18	0	29	0	0	0	0	0	49



Traffic Count Data

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
 Site Code: 2434600001
 Municipality: Ottawa
 Count Date: Aug 21, 2024

East Approach - Innes Rd

Start Time	Cars				Total	Trucks				Total	Bicycles				Total	Total Peds
	←	↑	→	↻		←	↑	→	↻		←	↑	→	↻		
07:00	6	178	0	0	184	0	2	0	0	2	0	0	0	0	0	1
07:15	3	226	0	0	229	0	2	0	0	2	0	0	0	0	0	0
07:30	3	235	0	0	238	0	9	0	0	9	0	0	0	0	0	0
07:45	3	229	1	0	233	1	11	0	0	12	0	1	0	0	1	0
08:00	1	239	0	0	240	0	7	0	0	7	0	1	0	0	1	0
08:15	1	253	1	0	255	0	13	0	5	18	0	0	0	0	0	0
08:30	3	236	1	0	240	0	13	0	0	13	0	0	0	0	0	1
08:45	1	180	0	0	181	1	11	0	0	12	0	0	0	0	0	1
09:00	4	178	1	0	183	0	16	0	0	16	0	0	0	0	0	1
09:15	3	177	2	0	182	0	8	0	1	9	0	0	0	0	0	1
09:30	1	163	0	0	164	0	11	0	2	13	0	0	0	0	0	0
09:45	5	171	1	1	178	1	11	0	0	12	0	0	0	0	0	1
SUBTOTAL	34	2465	7	1	2507	3	114	0	8	125	0	2	0	0	2	6



Traffic Count Data

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
 Site Code: 2434600001
 Municipality: Ottawa
 Count Date: Aug 21, 2024

East Approach - Innes Rd

Start Time	Cars				Total	Trucks				Total	Bicycles				Total	Total Peds
	←	↑	→	↻		←	↑	→	↻		←	↑	→	↻		
11:30	6	189	1	2	198	0	8	0	0	8	0	0	0	0	0	1
11:45	4	196	3	0	203	0	10	0	2	12	0	0	0	0	0	0
12:00	5	213	3	0	221	0	9	0	1	10	0	1	0	0	1	0
12:15	12	232	0	0	244	0	12	0	0	12	0	0	0	0	0	0
12:30	16	208	1	0	225	0	8	0	0	8	0	0	0	0	0	0
12:45	18	191	2	0	211	1	7	0	0	8	0	0	0	0	0	0
13:00	16	242	0	1	259	4	13	0	0	17	0	0	0	0	0	0
13:15	13	227	1	1	242	0	6	0	0	6	0	1	0	0	1	0
SUBTOTAL	90	1698	11	4	1803	5	73	0	3	81	0	2	0	0	2	1



Traffic Count Data

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
 Site Code: 2434600001
 Municipality: Ottawa
 Count Date: Aug 21, 2024

East Approach - Innes Rd

Start Time	Cars				Total	Trucks				Total	Bicycles				Total	Total Peds
	←	↑	→	↻		←	↑	→	↻		←	↑	→	↻		
15:00	9	178	2	1	190	1	6	0	0	7	0	0	0	0	0	1
15:15	3	222	2	1	228	3	8	0	0	11	0	0	0	0	0	1
15:30	4	218	0	0	222	0	12	0	2	14	0	0	0	0	0	0
15:45	4	213	0	0	217	0	4	0	0	4	0	0	0	0	0	0
16:00	1	218	0	0	219	0	6	0	0	6	0	0	0	0	0	0
16:15	2	254	3	0	259	0	6	0	0	6	0	0	0	0	0	0
16:30	4	228	2	0	234	0	6	0	0	6	0	0	0	0	0	0
16:45	1	223	5	2	231	1	5	0	0	6	0	0	0	0	0	0
17:00	4	211	3	0	218	0	5	0	0	5	0	0	0	0	0	1
17:15	2	220	4	1	227	0	1	0	0	1	0	0	0	0	0	0
17:30	6	201	0	1	208	0	4	0	0	4	0	0	0	0	0	0
17:45	3	197	5	2	207	1	2	0	0	3	0	0	0	0	0	0
SUBTOTAL	43	2583	26	8	2660	6	65	0	2	73	0	0	0	0	0	3
GRAND TOTAL	167	6746	44	13	6970	14	252	0	13	279	0	4	0	0	4	10



Traffic Count Data

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
 Site Code: 2434600001
 Municipality: Ottawa
 Count Date: Aug 21, 2024

West Approach - Innes Rd

Start Time	Cars				Total	Trucks				Total	Bicycles				Total	Total Peds
	←	↑	→	↻		←	↑	→	↻		←	↑	→	↻		
07:00	0	71	3	0	74	0	10	0	0	10	0	0	0	0	0	1
07:15	1	71	3	0	75	0	13	1	0	14	0	0	0	0	0	0
07:30	0	86	6	0	92	0	8	1	0	9	0	0	0	0	0	0
07:45	0	94	3	0	97	0	7	1	0	8	0	0	0	0	0	0
08:00	0	107	5	0	112	0	10	0	0	10	0	0	0	0	0	0
08:15	0	128	2	0	130	0	6	0	0	6	0	0	0	0	0	0
08:30	0	117	5	0	122	0	7	0	0	7	0	0	0	0	0	1
08:45	0	175	4	0	179	0	8	0	0	8	0	0	0	0	0	0
09:00	0	148	2	0	150	0	12	3	0	15	0	0	0	0	0	0
09:15	0	132	5	0	137	0	8	1	0	9	0	0	0	0	0	1
09:30	3	131	3	0	137	0	11	0	0	11	0	0	0	0	0	0
09:45	0	182	6	0	188	0	4	0	0	4	0	0	0	0	0	0
SUBTOTAL	4	1442	47	0	1493	0	104	7	0	111	0	0	0	0	0	3



Traffic Count Data

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
 Site Code: 2434600001
 Municipality: Ottawa
 Count Date: Aug 21, 2024

West Approach - Innes Rd

Start Time	Cars				Total	Trucks				Total	Bicycles				Total	Total Peds
	←	↑	→	↻		←	↑	→	↻		←	↑	→	↻		
11:30	1	198	14	0	213	0	10	0	0	10	0	1	0	0	1	1
11:45	1	243	19	0	263	0	9	0	0	9	0	2	0	0	2	0
12:00	0	237	12	0	249	0	9	0	0	9	0	0	0	0	0	0
12:15	0	210	9	0	219	0	8	0	0	8	0	0	0	0	0	0
12:30	1	212	12	0	225	0	9	0	1	10	0	1	0	0	1	0
12:45	1	208	7	1	217	0	8	1	0	9	0	0	0	0	0	2
13:00	0	225	11	0	236	0	14	0	0	14	0	0	0	0	0	8
13:15	2	217	11	0	230	1	13	0	0	14	0	0	0	0	0	3
SUBTOTAL	6	1750	95	1	1852	1	80	1	1	83	0	4	0	0	4	14



Traffic Count Data

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
 Site Code: 2434600001
 Municipality: Ottawa
 Count Date: Aug 21, 2024

West Approach - Innes Rd

Start Time	Cars				Trucks				Bicycles				Total Peds			
	←	↑	→	↻	←	↑	→	↻	←	↑	→	↻				
15:00	2	273	10	0	285	0	4	0	0	4	0	0	0	0	0	1
15:15	0	277	9	0	286	0	10	1	0	11	0	0	0	0	0	0
15:30	0	323	7	0	330	0	5	1	0	6	0	0	0	0	0	3
15:45	1	340	2	0	343	1	1	0	0	2	0	0	0	0	0	0
16:00	1	348	6	1	356	0	6	1	0	7	0	1	0	0	1	1
16:15	3	352	4	1	360	0	1	1	0	2	0	0	0	0	0	0
16:30	2	363	9	1	375	0	4	0	0	4	0	2	0	0	2	1
16:45	2	344	2	0	348	0	3	0	0	3	0	0	0	0	0	1
17:00	6	344	4	0	354	0	2	0	0	2	0	0	0	0	0	0
17:15	0	318	8	0	326	0	6	0	0	6	0	1	0	0	1	5
17:30	1	358	3	1	363	0	1	0	0	1	0	0	0	0	0	3
17:45	4	313	3	0	320	0	4	0	0	4	0	0	0	0	0	0
SUBTOTAL	22	3953	67	4	4046	1	47	4	0	52	0	4	0	0	4	15
GRAND TOTAL	32	7145	209	5	7391	2	231	12	1	246	0	8	0	0	8	32



Peak Hour Diagram

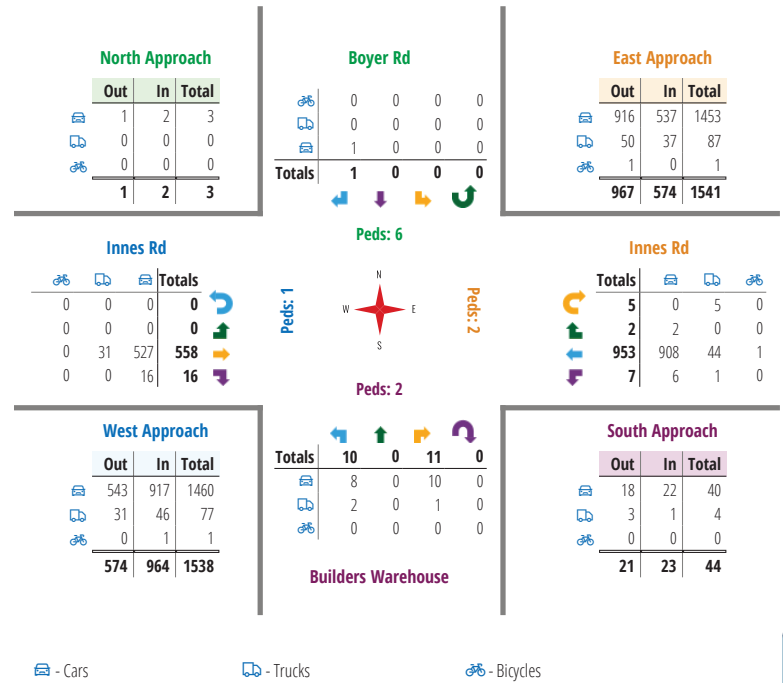
Specified Period
 From: 07:00:00
 To: 10:00:00
One Hour Peak
 From: 08:00:00
 To: 09:00:00

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
Site Code: 2434600001
Count Date: Aug 21, 2024

Weather conditions: Clear

** Signalized Intersection **

Major Road: Innes Rd runs E/W



Comments



Peak Hour Summary

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
 Site Code: 2434600001
 Count Date: Aug 21, 2024
 Period: 07:00 - 10:00

Peak Hour Data (08:00 - 09:00)

Start Time	North Approach Boyer Rd				South Approach Builders Warehouse				East Approach Innes Rd				West Approach Innes Rd				Total Vehicles						
	Peds	Total	Peds	Total	Peds	Total	Peds	Total	Peds	Total	Peds	Total	Peds	Total									
08:00	0	0	0	0	4	0	3	0	1	7	1	247	0	0	0	248	0	117	5	0	0	122	377
08:15	0	0	1	0	2	1	3	0	0	5	1	266	1	5	0	273	0	134	2	0	0	136	415
08:30	0	0	0	0	0	0	1	0	0	4	3	249	1	0	1	253	0	124	5	0	1	129	386
08:45	0	0	0	0	4	0	2	0	1	5	2	191	0	0	1	193	0	183	4	0	0	187	385
Grand Total	0	0	1	0	6	1	10	0	2	21	7	953	2	5	2	967	0	558	16	0	1	574	1563
Approach %	0	0	100	0	-	47.6	0	52.4	0	-	0.7	98.6	0.2	0.5	-	0	97.2	2.8	0	-	-	-	-
Totals %	0	0	0.1	0	0.1	0.6	0	0.7	0	1.3	0.4	61	0.1	0.3	61.9	0	35.7	1	0	0	0	36.7	36.7
PHF	0	0	0.25	0	0.25	0.63	0	0.92	0	0.75	0.58	0.9	0.5	0.25	0.89	0	0.76	0.8	0	0	0	0.77	0.94
Cars	0	0	1	0	1	8	0	10	0	18	6	908	2	0	916	0	527	16	0	543	1478		
% Cars	0	0	100	0	100	80	0	90.9	0	85.7	85.7	95.3	100	0	94.7	0	94.4	100	0	94.6	94.6	94.6	
Trucks	0	0	0	0	0	2	0	1	0	3	1	44	0	5	50	0	31	0	0	31	84		
% Trucks	0	0	0	0	0	20	0	9.1	0	14.3	14.3	4.6	0	100	5.2	0	5.6	0	0	5.4	5.4		
Bicycles	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	
% Bicycles	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0	0.1	
Peds	6	-	-	-	-	-	2	-	-	2	-	2	-	-	-	-	-	-	-	1	-	11	
% Peds	54.5	-	-	-	-	-	18.2	-	-	18.2	-	18.2	-	-	-	-	-	-	-	9.1	-	11	



Peak Hour Diagram

Specified Period
 From: 11:30:00
 To: 13:30:00

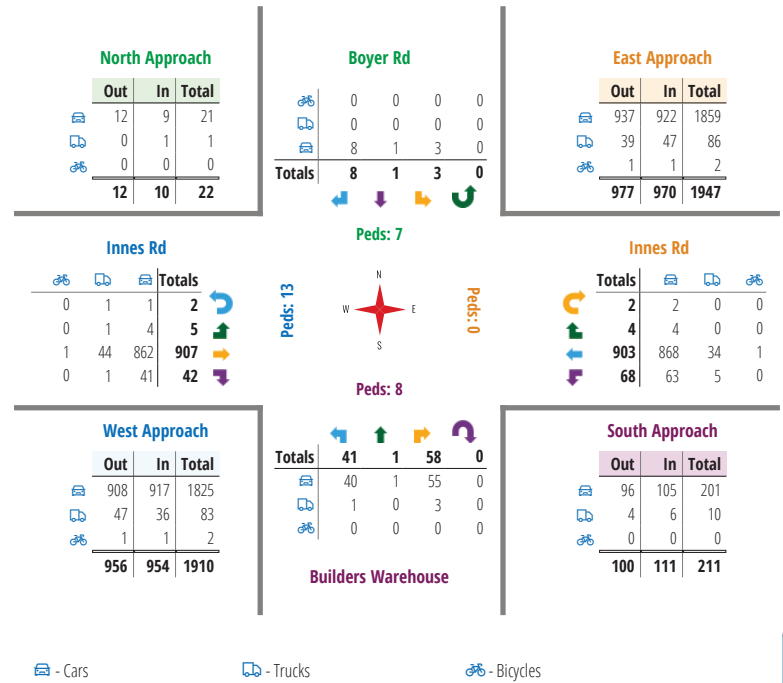
One Hour Peak
 From: 12:30:00
 To: 13:30:00

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
 Site Code: 2434600001
 Count Date: Aug 21, 2024

Weather conditions: Clear

** Signalized Intersection **

Major Road: Innes Rd runs E/W



Comments



Peak Hour Summary

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
 Site Code: 2434600001
 Count Date: Aug 21, 2024
 Period: 11:30 - 13:30

Peak Hour Data (12:30 - 13:30)

Start Time	North Approach Boyer Rd				South Approach Builders Warehouse				East Approach Innes Rd				West Approach Innes Rd				Total Vehicles								
	Peds	Total	Peds	Total	Peds	Total	Peds	Total	Peds	Total	Peds	Total	Peds	Total											
12:30	0	0	3	0	2	3	16	0	13	0	1	29	16	216	1	0	0	233	1	222	12	1	0	236	501
12:45	0	1	3	0	2	4	8	1	12	0	3	21	19	198	2	0	0	219	1	216	8	1	2	226	470
13:00	3	0	0	0	1	3	6	0	14	0	3	20	20	255	0	1	0	276	0	239	11	0	8	250	549
13:15	0	0	2	0	2	2	11	0	19	0	1	30	13	234	1	1	0	249	3	230	11	0	3	244	525
Grand Total	3	1	8	0	7	12	41	1	58	0	8	100	68	903	4	2	0	977	5	907	42	2	13	956	2045
Approach %	25	8.3	66.7	0	-	-	41	1	58	0	-	-	7	92.4	0.4	0.2	-	0.5	94.9	4.4	0.2	-	-	-	
Totals %	0.1	0	0.4	0	0.6	2	0	2.8	0	4.9	3.3	44.2	0.2	0.1	47.8	0.2	44.4	2.1	0.1	46.7	-				
PHF	0.25	0.25	0.67	0	0.75	0.64	0.25	0.76	0	0.83	0.85	0.89	0.5	0.5	0.88	0.42	0.95	0.88	0.5	0.96	0.93				
Cars	3	1	8	0	12	40	1	55	0	96	63	868	4	2	937	4	862	41	1	908	1953				
% Cars	100	100	100	0	100	97.6	100	94.8	0	96	92.6	96.1	100	100	95.9	80	95	97.6	50	95	95.5				
Trucks	0	0	0	0	0	1	0	3	0	4	5	34	0	0	39	1	44	1	1	47	90				
% Trucks	0	0	0	0	0	2.4	0	5.2	0	4	7.4	3.8	0	0	4	20	4.9	2.4	50	4.9	4.4				
Bicycles	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2				
% Bicycles	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0.1	0	0	0	0.1				
Peds			7	-				8	-			8	-		0	-			13	-	28				
% Peds			25	-				28.6	-			28.6	-		0	-			46.4	-	28				



Peak Hour Diagram

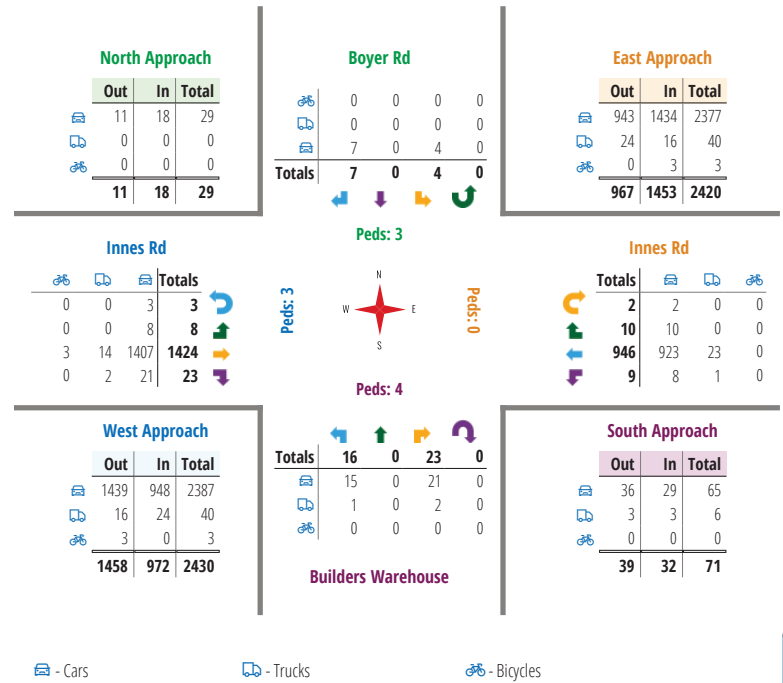
Specified Period **One Hour Peak**
 From: 15:00:00 From: 16:00:00
 To: 18:00:00 To: 17:00:00

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
Site Code: 2434600001
Count Date: Aug 21, 2024

Weather conditions: Clear

** Signalized Intersection **

Major Road: Innes Rd runs E/W



Comments



Peak Hour Summary

Intersection: Innes Rd & Boyer Rd - Builders Warehouse
 Site Code: 2434600001
 Count Date: Aug 21, 2024
 Period: 15:00 - 18:00

Peak Hour Data (16:00 - 17:00)

Start Time	North Approach Boyer Rd				South Approach Builders Warehouse				East Approach Innes Rd				West Approach Innes Rd				Total Vehicles					
	←	↑	↓	→	←	↑	↓	→	←	↑	↓	→	←	↑	↓	→						
16:00	0	0	0	0	5	0	2	0	1	224	0	0	1	355	7	1	364	596				
16:15	1	0	1	0	3	0	6	0	2	260	3	0	3	353	5	1	362	636				
16:30	1	0	1	0	3	0	8	0	4	224	2	0	2	369	9	1	381	634				
16:45	2	0	5	0	7	0	7	0	2	228	5	2	2	347	2	0	351	609				
Grand Total	4	0	7	0	16	0	23	0	9	946	10	2	8	1424	23	3	1458	2475				
Approach %	36.4	0	63.6	0	-	41	0	59	0	0.9	97.8	1	0.2	-	0.5	97.7	1.6	0.2	-	-		
Totals %	0.2	0	0.3	0	0.4	0.6	0	0.9	0	1.6	0.4	38.2	0.4	0.1	39.1	0.3	57.5	0.9	0.1	58.9	-	
PHF	0.5	0	0.35	0	0.39	0.57	0	0.72	0	0.7	0.56	0.91	0.5	0.25	0.91	0.67	0.96	0.64	0.75	0.96	0.97	
Cars	4	0	7	0	11	15	0	21	0	36	8	923	10	2	943	8	1407	21	3	1459	2429	
% Cars	100	0	100	0	100	93.8	0	91.3	0	92.3	88.9	97.6	100	100	97.5	100	98.8	91.3	100	98.7	98.1	
Trucks	0	0	0	0	0	1	0	2	0	3	1	23	0	0	24	0	14	2	0	16	43	
% Trucks	0	0	0	0	0	6.3	0	8.7	0	7.7	11.1	2.4	0	0	2.5	0	1	8.7	0	1.1	1.7	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3	
% Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0.2	0.1	
Peds			3	-				4	-					0	-				3	-		10
% Peds			30	-				40	-					0	-				30	-		-



Transportation Services - Traffic Services

Turning Movement Count - Study Results

INNES RD @ VISENEAU DR

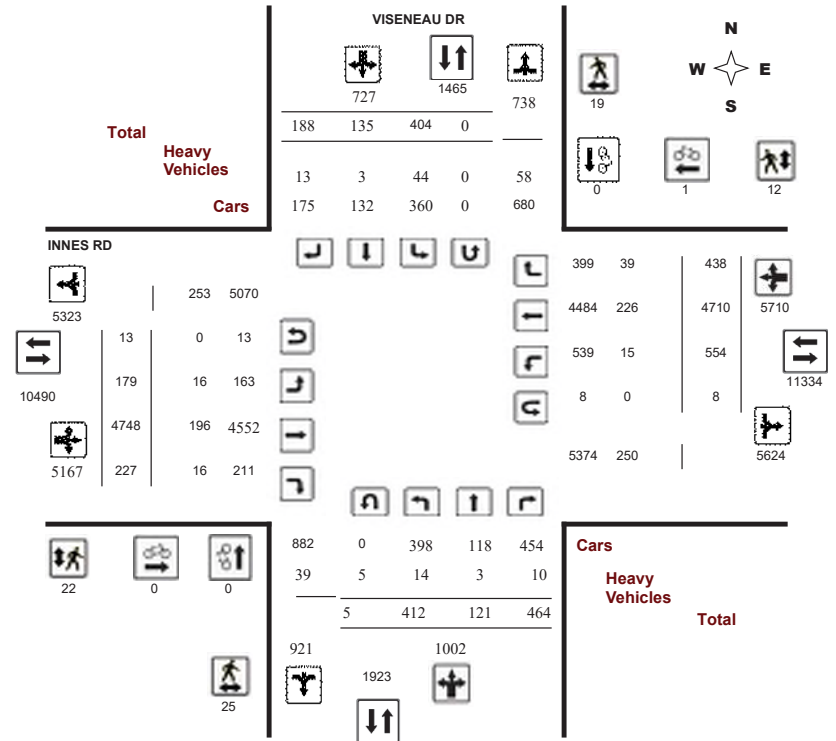
Survey Date: Wednesday, January 19, 2022

WO No: 40054

Start Time: 07:00

Device: Miovision

Full Study Diagram





Transportation Services - Traffic Services

Turning Movement Count - Study Results

INNES RD @ VISENEAU DR

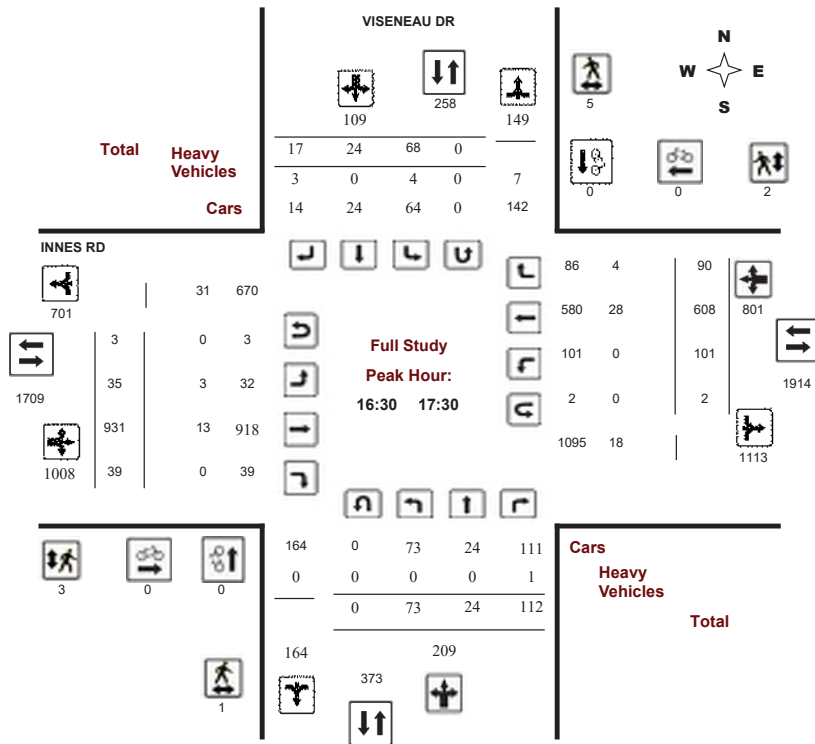
Survey Date: Wednesday, January 19, 2022

WO No: 40054

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

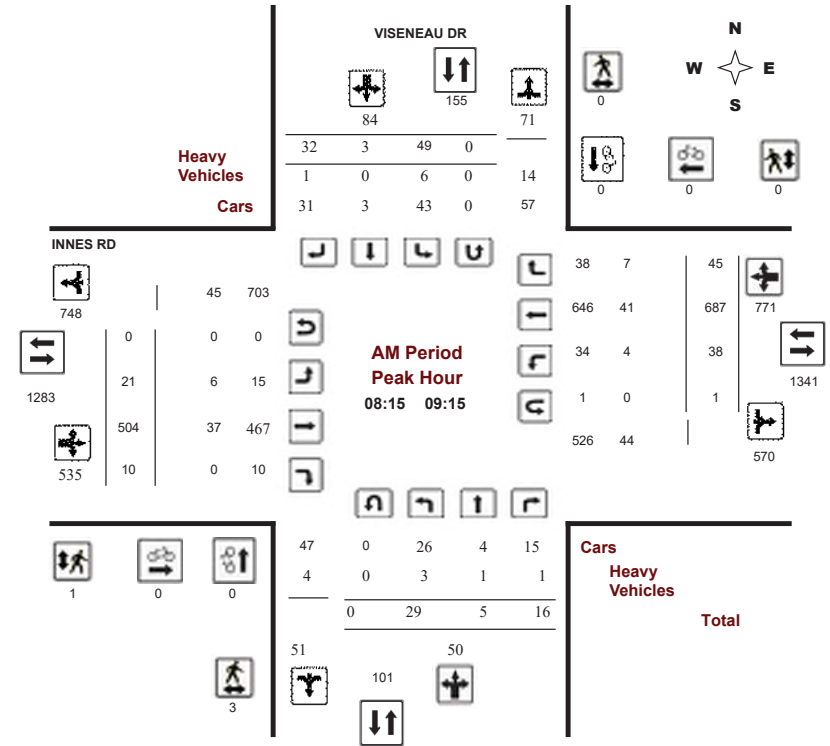
INNES RD @ VISENEAU DR

Survey Date: Wednesday, January 19, 2022

WO No: 40054

Start Time: 07:00

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

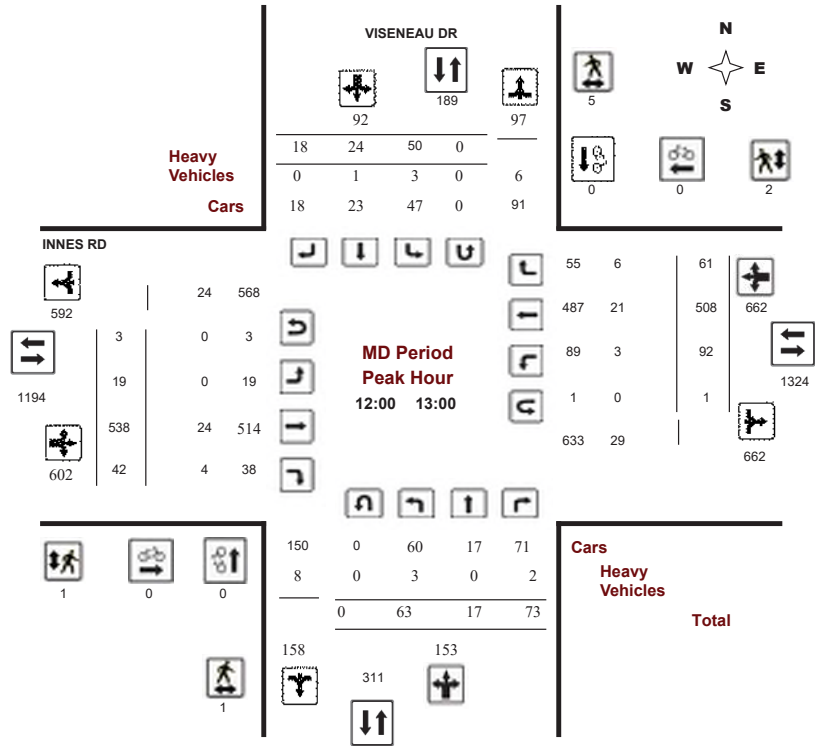
INNES RD @ VISENEAU DR

Survey Date: Wednesday, January 19, 2022

Start Time: 07:00

WO No: 40054

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

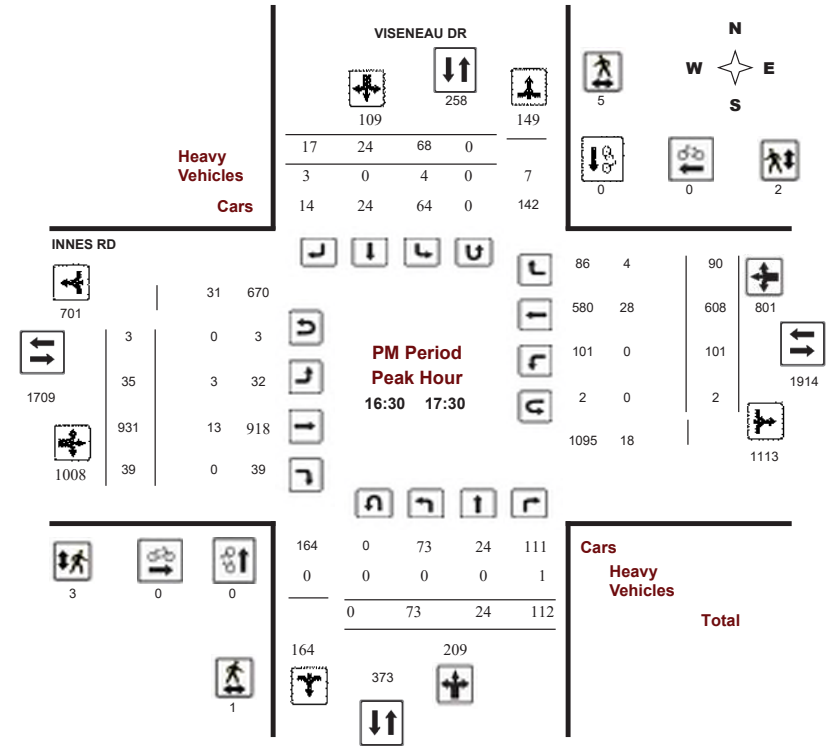
INNES RD @ VISENEAU DR

Survey Date: Wednesday, January 19, 2022

Start Time: 07:00

WO No: 40054

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Study Results

INNES RD @ VISENEAU DR

Survey Date: Wednesday, January 19, 2022

WO No: 40054

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, January 19, 2022

Total Observed U-Turns AADT Factor
Northbound: 5 Southbound: 0 Eastbound: 13 Westbound: 8 1.00

Table with columns for Period, VISENEAU DR (Northbound, Southbound), INNES RD (Eastbound, Westbound), and Grand Total.

Note: These values are calculated by multiplying the totals by the appropriate expansion factor. 1.39

AVG 12Hr 573 168 645 1393 562 188 261 1011 2403 249 6600 316 7182 770 6547 609 7937 15119 17522

Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. 1.00

AVG 24Hr 751 220 845 1825 736 322 448 1324 3148 326 8646 414 9408 1009 8577 798 10397 19806 22954

Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. 1.31

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

INNES RD @ VISENEAU DR

Survey Date: Wednesday, January 19, 2022

WO No: 40054

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

Table with columns for Time Period, VISENEAU DR (Northbound, Southbound), INNES RD (Eastbound, Westbound), and Grand Total.

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

INNES RD @ VISENEAU DR

Survey Date: Wednesday, January 19, 2022

WO No: 40054

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

Time Period	VISENEAU DR			INNES RD			Grand Total
	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	0	0	0	0
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	0	0	0	0	0	0
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
12:30 12:45	0	0	0	0	0	0	0
13:00 13:15	0	0	0	0	0	0	0
15:15 15:30	0	0	0	0	0	0	0
16:00 16:15	0	0	0	0	0	0	0
16:30 16:45	0	0	0	0	0	0	0
17:15 17:30	0	0	0	0	0	0	0
17:00 17:15	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	0	0	0
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	0	0	0	0
12:00 12:15	0	0	0	0	0	0	0
08:15 08:30	0	0	0	0	0	0	0
09:00 09:15	0	0	0	0	0	0	0
13:15 13:30	0	0	0	0	0	0	0
09:15 09:30	0	0	0	1	1	1	1
15:30 15:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
15:00 15:15	0	0	0	0	0	0	0
12:45 13:00	0	0	0	0	0	0	0
15:45 16:00	0	0	0	0	0	0	0
16:15 16:30	0	0	0	0	0	0	0
17:30 17:45	0	0	0	0	0	0	0
16:45 17:00	0	0	0	0	0	0	0
Total	0	0	0	0	1	1	1



Transportation Services - Traffic Services

Turning Movement Count - Study Results

INNES RD @ VISENEAU DR

Survey Date: Wednesday, January 19, 2022

WO No: 40054

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

Time Period	VISENEAU DR			INNES RD			Grand Total
	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	
07:00 07:15	0	1	1	1	1	2	3
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	1	0	1	0	0	0	1
08:30 08:45	1	0	1	0	0	0	1
08:45 09:00	0	0	0	0	0	0	0
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	1	0	1	2	0	2	3
11:30 11:45	2	1	3	0	0	0	3
12:30 12:45	1	2	3	0	0	0	3
13:00 13:15	2	1	3	0	1	1	4
15:15 15:30	1	0	1	0	0	0	1
16:00 16:15	4	0	4	2	0	2	6
16:30 16:45	0	2	2	1	1	2	4
17:15 17:30	1	2	3	0	1	1	4
17:00 17:15	0	0	0	0	0	0	0
17:45 18:00	1	0	1	1	0	1	2
07:45 08:00	0	0	0	1	0	1	1
08:00 08:15	0	0	0	0	0	0	0
12:00 12:15	0	1	1	0	0	0	1
08:15 08:30	0	0	0	0	0	0	0
09:00 09:15	2	0	2	1	0	1	3
13:15 13:30	0	0	0	1	0	1	1
09:15 09:30	0	0	0	0	0	0	0
15:30 15:45	3	1	4	2	2	4	8
11:45 12:00	0	1	1	1	3	4	5
12:15 12:30	0	1	1	0	0	0	1
15:00 15:15	2	2	4	2	0	2	6
12:45 13:00	0	1	1	1	2	3	4
15:45 16:00	3	1	4	1	1	2	6
16:15 16:30	0	1	1	1	0	1	2
17:30 17:45	0	0	0	2	0	2	2
16:45 17:00	0	1	1	2	0	2	3
Total	25	19	44	22	12	34	78



Transportation Services - Traffic Services

Turning Movement Count - Study Results

INNES RD @ VISENEAU DR

Survey Date: Wednesday, January 19, 2022

WO No: 40054

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

Table with columns for Time Period, Northbound (LT, ST, RT, N TOT), Southbound (LT, ST, RT, S TOT, STR TOT), Eastbound (LT, ST, RT, E TOT), Westbound (LT, ST, RT, W TOT, STR TOT), and Grand Total.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

INNES RD @ VISENEAU DR

Survey Date: Wednesday, January 19, 2022

WO No: 40054

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

Table with columns for Time Period, Northbound U-Turn Total, Southbound U-Turn Total, Eastbound U-Turn Total, Westbound U-Turn Total, and Total.

Appendix C

Synchro Intersection Worksheets – Existing Conditions

Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

Existing
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	106	343	32	22	1333	156	107	233	44	99	111	489
Future Volume (vph)	106	343	32	22	1333	156	107	233	44	99	111	489
Satd. Flow (prot)	3124	3103	1427	1658	3316	1427	1642	3252	1441	1658	3221	1483
Fit Permitted	0.950			0.950			0.540			0.592		
Satd. Flow (perm)	3110	3103	1394	1646	3316	1380	932	3252	1388	1015	3221	1463
Satd. Flow (RTOR)			143			143			82			190
Lane Group Flow (vph)	118	381	36	24	1481	173	119	259	49	110	123	543
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4				8
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.6	26.2	26.2	11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	32.7
Total Split (s)	13.0	65.0	65.0	13.0	65.0	65.0	19.0	52.0	52.0	33.0	33.0	33.0
Total Split (%)	10.0%	50.0%	50.0%	10.0%	50.0%	50.0%	14.6%	40.0%	40.0%	25.4%	25.4%	25.4%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.2	6.2	6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	6.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	6.4	64.0	64.0	6.4	58.8	58.8	45.3	45.3	45.3	27.0	27.0	27.0
Actuated g/C Ratio	0.05	0.49	0.49	0.05	0.45	0.45	0.35	0.35	0.35	0.21	0.21	0.21
v/c Ratio	0.77	0.25	0.05	0.30	0.99	0.25	0.31	0.23	0.09	0.52	0.18	1.20
Control Delay	91.7	20.6	0.1	68.9	55.9	6.1	32.2	30.7	1.9	56.4	43.7	137.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.7	20.6	0.1	68.9	55.9	6.1	32.2	30.7	1.9	56.4	43.7	137.1
LOS	F	C	A	E	E	A	C	C	A	E	D	F
Approach Delay		34.9			51.0			27.8			110.9	
Approach LOS		C			D			C			F	
Queue Length 50th (m)	15.7	31.4	0.0	6.0	193.9	4.2	21.3	24.6	0.0	25.5	13.8	~129.1
Queue Length 95th (m)	#31.2	42.7	0.0	15.1	#247.3	17.3	36.1	35.1	2.9	45.5	22.7	#198.3
Internal Link Dist (m)		265.9			463.6			69.4			101.9	
Turn Bay Length (m)	135.5		87.0	106.0		57.0	48.0		43.5	50.0		53.0
Base Capacity (vph)	153	1527	758	86	1499	702	391	1133	537	211	669	454
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.25	0.05	0.28	0.99	0.25	0.30	0.23	0.09	0.52	0.18	1.20

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 99 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

Scenario 1 245 and 275 Lamarche Avenue 11:59 pm 08/06/2024 Existing

Synchro 11 Report
Page 1

Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

Existing
AM Peak Hour

Maximum v/c Ratio: 1.20	Intersection LOS: E
Intersection Signal Delay: 59.2	ICU Level of Service F
Intersection Capacity Utilization 93.6%	
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Orleans Blvd & Innes Rd



Scenario 1 245 and 275 Lamarche Avenue 11:59 pm 08/06/2024 Existing

Synchro 11 Report
Page 2

Lanes, Volumes, Timings
2: Page Rd & Innes Rd

Existing
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↕	↕	↕	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	21	525	21	55	1361	24	14	12	61	45	11	40
Future Volume (vph)	21	525	21	55	1361	24	14	12	61	45	11	40
Satd. Flow (prot)	1483	3173	0	1658	3303	0	0	1508	0	0	1598	0
Fit Permitted	0.134			0.422				0.941			0.794	
Satd. Flow (perm)	209	3173	0	736	3303	0	0	1429	0	0	1298	0
Satd. Flow (RTOR)		6			3			68			30	
Lane Group Flow (vph)	23	606	0	61	1539	0	0	97	0	0	106	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	42.2	42.2		42.2	42.2		41.8	41.8		41.8	41.8	
Total Split (s)	78.0	78.0		78.0	78.0		42.0	42.0		42.0	42.0	
Total Split (%)	65.0%	65.0%		65.0%	65.0%		35.0%	35.0%		35.0%	35.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.8	6.8		6.8	6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	90.5	90.5		90.5	90.5		16.5	16.5		16.5	16.5	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.14	0.14		0.14	0.14	
v/c Ratio	0.15	0.25		0.11	0.62		0.38	0.52		0.38	0.52	
Control Delay	9.8	5.9		5.3	9.3		19.5	41.1		19.5	41.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	9.8	5.9		5.3	9.3		19.5	41.1		19.5	41.1	
LOS	A	A		A	A		B	D		B	D	
Approach Delay		6.0			9.1			19.5			41.1	
Approach LOS		A			A			B			D	
Queue Length 50th (m)	1.1	15.8		1.9	28.7			6.4			17.4	
Queue Length 95th (m)	7.3	45.1		7.0	205.2			17.7			28.4	
Internal Link Dist (m)		463.6			206.5			143.5			112.1	
Turn Bay Length (m)	104.5			106.0								
Base Capacity (vph)	157	2395		555	2493			467			401	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.15	0.25		0.11	0.62			0.21			0.26	

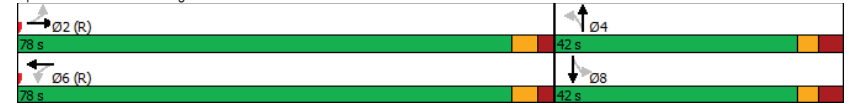
Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	26 (22%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle:	85
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings
2: Page Rd & Innes Rd

Existing
AM Peak Hour

Maximum v/c Ratio: 0.62	Intersection LOS: B
Intersection Signal Delay: 10.1	ICU Level of Service D
Intersection Capacity Utilization 74.3%	
Analysis Period (min) 15	

Splits and Phases: 2: Page Rd & Innes Rd



Lanes, Volumes, Timings
3: Ventus Way/3615 Innes Rd & Innes Rd

Existing
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	0	558	16	12	952	2	10	0	11	0	0	1
Future Volume (vph)	0	558	16	12	952	2	10	0	11	0	0	1
Satd. Flow (prot)	1745	3179	0	1566	3221	0	1409	1368	0	0	1489	0
Fit Permitted				0.410			0.757					
Satd. Flow (perm)	1745	3179	0	675	3221	0	1121	1368	0	0	1489	0
Satd. Flow (RTOR)		5						329				134
Lane Group Flow (vph)	0	638	0	13	1060	0	11	12	0	0	1	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			4				8
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8		8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0		10.0
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3		32.3
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0		33.0
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%		27.5%
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3		3.3
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0		3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0		0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.3	6.3		6.3		6.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None		None
Act Effct Green (s)	103.4	103.4		103.4	103.4		13.2	13.2		13.2		13.2
Actuated g/C Ratio	0.86	0.86		0.86	0.86		0.11	0.11		0.11		0.11
v/c Ratio	0.23	0.23		0.02	0.38		0.09	0.03		0.00		0.00
Control Delay	3.0	3.0		8.2	7.6		45.9	0.1		0.0		0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0		0.0
Total Delay	3.0	3.0		8.2	7.6		45.9	0.1		0.0		0.0
LOS	A	A		A	A		D	A		A		A
Approach Delay	3.0	3.0		7.6	7.6		22.0	22.0		22.0		22.0
Approach LOS	A	A		A	A		C	C		C		C
Queue Length 50th (m)	13.2	13.2		0.4	26.6		2.5	0.0		0.0		0.0
Queue Length 95th (m)	32.0	32.0		m5.0	122.1		7.1	0.0		0.0		0.0
Internal Link Dist (m)	221.9	221.9		561.5	561.5		129.3	129.3		129.3		67.7
Turn Bay Length (m)				40.0	40.0							
Base Capacity (vph)	2739	2739		581	2774		249	560		435		435
Starvation Cap Reductn	0	0		0	0		0	0		0		0
Spillback Cap Reductn	0	0		0	0		0	0		0		0
Storage Cap Reductn	0	0		0	0		0	0		0		0
Reduced v/c Ratio	0.23	0.23		0.02	0.38		0.04	0.02		0.00		0.00

Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	65
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings
3: Ventus Way/3615 Innes Rd & Innes Rd

Existing
AM Peak Hour

Maximum v/c Ratio:	0.38
Intersection Signal Delay:	6.1
Intersection LOS:	A
Intersection Capacity Utilization:	47.4%
ICU Level of Service:	A
Analysis Period (min):	15
m	Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Ventus Way/3615 Innes Rd & Innes Rd



Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

Existing
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	21	504	10	39	687	45	29	5	16	49	3	32
Future Volume (vph)	21	504	10	39	687	45	29	5	16	49	3	32
Satd. Flow (prot)	1311	3161	1483	1537	3144	0	1537	1483	1427	0	1508	0
Fit Permitted	0.950			0.950			0.720				0.818	
Satd. Flow (perm)	1311	3161	1444	1532	3144	0	1164	1483	1427	0	1269	0
Satd. Flow (RTOR)			115		8				105		25	
Lane Group Flow (vph)	23	560	11	43	813	0	32	6	18	0	93	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			4				8
Permitted Phases			2				4		4		8	
Detector Phase	5	2	2	1	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.3	32.3	32.3	11.3	32.3		36.3	36.3	36.3	36.3	36.3	
Total Split (s)	12.0	66.0	66.0	12.0	66.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	10.0%	55.0%	55.0%	10.0%	55.0%		30.8%	30.8%	30.8%	30.8%	30.8%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6		4.3	4.3	4.3	4.3	4.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.3	6.3	6.3	6.3		7.3	7.3	7.3		7.3	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lag	Lag	Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None	None	
Act Effct Green (s)	7.7	78.6	78.6	8.9	82.2		15.1	15.1	15.1		15.1	
Actuated g/C Ratio	0.06	0.66	0.66	0.07	0.68		0.13	0.13	0.13		0.13	
v/c Ratio	0.27	0.27	0.01	0.38	0.38		0.22	0.03	0.07		0.51	
Control Delay	77.0	9.0	0.1	61.8	10.9		47.4	41.0	0.5		43.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	77.0	9.0	0.1	61.8	10.9		47.4	41.0	0.5		43.8	
LOS	E	A	A	E	B		D	D	A		D	
Approach Delay		11.4			13.4			31.7			43.8	
Approach LOS		B			B			C			D	
Queue Length 50th (m)	5.7	9.8	0.0	9.8	40.0		7.1	1.3	0.0		15.5	
Queue Length 95th (m)	14.9	54.6	0.0	21.2	81.6		14.4	4.6	0.0		27.8	
Internal Link Dist (m)		561.5			183.4			77.4			48.4	
Turn Bay Length (m)	47.5		58.5	58.5			48.5		20.0			
Base Capacity (vph)	84	2070	985	113	2156		288	367	432		332	
Starvation Cap Reductn	0	0	0	0	0		0	0	0		0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0		0	
Storage Cap Reductn	0	0	0	0	0		0	0	0		0	
Reduced v/c Ratio	0.27	0.27	0.01	0.38	0.38		0.11	0.02	0.04		0.28	

Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 40 (33%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 85												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

Existing
AM Peak Hour

Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Fit Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	3.0	4.0
Total Split (s)	5.0	5.0
Total Split (%)	4%	4%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary		

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

Existing
AM Peak Hour

Maximum v/c Ratio: 0.51	Intersection LOS: B
Intersection Signal Delay: 15.1	ICU Level of Service B
Intersection Capacity Utilization 56.3%	
Analysis Period (min) 15	

Splits and Phases: 4: Innes Rd & Viseneau Dr



HCM 2010 TWSC
5: Lamarche Ave & Innes Rd

Existing
AM Peak Hour

Intersection						
Int Delay, s/veh	2.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↔		↕↔	↕↔	↕↔	↕↔
Traffic Vol, veh/h	512	45	33	937	96	59
Future Vol, veh/h	512	45	33	937	96	59
Conflicting Peds, #/hr	0	1	1	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	6	4	2	5	3	3
Mvmt Flow	569	50	37	1041	107	66

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	620
Stage 1	-	-	595
Stage 2	-	-	596
Critical Hdwy	-	4.14	6.86
Critical Hdwy Stg 1	-	-	5.86
Critical Hdwy Stg 2	-	-	5.86
Follow-up Hdwy	-	2.22	3.53
Pot Cap-1 Maneuver	-	956	179
Stage 1	-	-	511
Stage 2	-	-	510
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	955	172
Mov Cap-2 Maneuver	-	-	307
Stage 1	-	-	510
Stage 2	-	-	490

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	21.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	388	-	-	955	-
HCM Lane V/C Ratio	0.444	-	-	0.038	-
HCM Control Delay (s)	21.5	-	-	8.9	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	2.2	-	-	0.1	-

Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

Existing
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	462	1221	93	73	625	183	56	192	93	214	243	267
Future Volume (vph)	462	1221	93	73	625	183	56	192	93	214	243	267
Satd. Flow (prot)	3216	3316	1455	1642	3221	1483	1658	3283	1483	1658	3221	1469
Fit Permitted	0.950			0.950			0.470			0.618		
Satd. Flow (perm)	3189	3316	1421	1639	3221	1446	810	3283	1446	1068	3221	1422
Satd. Flow (RTOR)			165				230			159		297
Lane Group Flow (vph)	513	1357	103	81	694	203	62	213	103	238	270	297
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	16.6	26.2	26.2	11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	32.7
Total Split (s)	31.0	49.0	49.0	16.0	34.0	34.0	12.0	45.0	45.0	33.0	33.0	33.0
Total Split (%)	28.2%	44.5%	44.5%	14.5%	30.9%	30.9%	10.9%	40.9%	40.9%	30.0%	30.0%	30.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.2	6.2	6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	6.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	Max	Max	Max
Act Effct Green (s)	21.8	46.2	46.2	9.0	30.4	30.4	38.3	38.3	38.3	28.7	28.7	28.7
Actuated g/C Ratio	0.20	0.42	0.42	0.08	0.28	0.28	0.35	0.35	0.35	0.26	0.26	0.26
v/c Ratio	0.81	0.98	0.15	0.61	0.78	0.36	0.19	0.19	0.17	0.86	0.32	0.50
Control Delay	52.4	52.0	0.9	56.7	48.3	14.5	26.0	25.5	1.4	68.5	35.1	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.4	52.0	0.9	56.7	48.3	14.5	26.0	25.5	1.4	68.5	35.1	7.3
LOS	D	D	A	E	D	B	C	C	A	E	D	A
Approach Delay		49.4			42.0			19.0			34.7	
Approach LOS		D			D			B			C	
Queue Length 50th (m)	54.0	~167.7	0.0	13.9	53.8	3.6	8.9	16.6	0.0	50.3	25.4	0.0
Queue Length 95th (m)	71.0	#209.4	1.8	#34.9	#107.6	44.9	18.3	25.4	2.8	#97.3	37.5	21.6
Internal Link Dist (m)		265.9			463.6			166.8			210.2	
Turn Bay Length (m)	135.5		87.0	106.0		57.0	48.0		43.5	50.0		53.0
Base Capacity (vph)	713	1391	691	146	890	566	322	1143	607	278	840	590
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.98	0.15	0.55	0.78	0.36	0.19	0.19	0.17	0.86	0.32	0.50

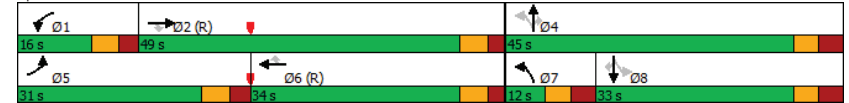
Intersection Summary	
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle:	100
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

Existing
PM Peak Hour

Maximum v/c Ratio: 0.98	Intersection LOS: D
Intersection Signal Delay: 42.0	ICU Level of Service F
Intersection Capacity Utilization 95.6%	
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Orleans Blvd & Innes Rd



Lanes, Volumes, Timings
2: Page Rd & Innes Rd

Existing
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↕	↕	↕	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	51	1505	19	110	877	69	18	18	108	83	17	31
Future Volume (vph)	51	1505	19	110	877	69	18	18	108	83	17	31
Satd. Flow (prot)	1658	3308	0	1658	3238	0	0	1536	0	0	1595	0
Fit Permitted	0.243			0.095				0.950			0.629	
Satd. Flow (perm)	422	3308	0	166	3238	0	0	1468	0	0	1031	0
Satd. Flow (RTOR)		2			12			19			15	
Lane Group Flow (vph)	57	1693	0	122	1051	0	0	160	0	0	145	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	42.2	42.2		42.2	42.2		41.8	41.8		41.8	41.8	
Total Split (s)	68.0	68.0		68.0	68.0		42.0	42.0		42.0	42.0	
Total Split (%)	61.8%	61.8%		61.8%	61.8%		38.2%	38.2%		38.2%	38.2%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.8	6.8		6.8	6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	77.2	77.2		77.2	77.2		19.8	19.8		19.8	19.8	
Actuated g/C Ratio	0.70	0.70		0.70	0.70		0.18	0.18		0.18	0.18	
v/c Ratio	0.19	0.73		1.05	0.46		0.57	0.57		0.74	0.74	
Control Delay	3.6	6.5		127.9	14.1		42.3	42.3		57.5	57.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.6	6.5		127.9	14.1		42.3	42.3		57.5	57.5	
LOS	A	A		F	B		D	D		E	E	
Approach Delay		6.4			25.9			42.3			57.5	
Approach LOS		A			C			D			E	
Queue Length 50th (m)	1.4	30.8		~23.1	41.8		28.5	28.5		27.2	27.2	
Queue Length 95th (m)	m2.6	m38.8		#64.1	142.0		40.5	40.5		40.6	40.6	
Internal Link Dist (m)		463.6			206.5			143.5			112.1	
Turn Bay Length (m)	104.5			106.0								
Base Capacity (vph)		296		116	2276			482			340	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.19	0.73		1.05	0.46		0.33	0.33		0.43	0.43	

Intersection Summary	
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	2 (2%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	145
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings
2: Page Rd & Innes Rd

Existing
PM Peak Hour

Maximum v/c Ratio:	1.05
Intersection Signal Delay:	17.6
Intersection Capacity Utilization:	96.4%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	F
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	



Lanes, Volumes, Timings
3: Ventus Way/3615 Innes Rd & Innes Rd

Existing
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↕	↕	↔	↕	↕	↔	↔	↕	↔
Traffic Volume (vph)	11	1421	23	11	946	10	16	0	23	4	0	7
Future Volume (vph)	11	1421	23	11	946	10	16	0	23	4	0	7
Satd. Flow (prot)	1658	3304	0	1551	3308	0	1595	1388	0	0	1546	0
Fit Permitted	0.258			0.133			0.750				0.892	
Satd. Flow (perm)	450	3304	0	217	3308	0	1255	1388	0	0	1402	0
Satd. Flow (RTOR)		3			2			40			31	
Lane Group Flow (vph)	12	1605	0	12	1062	0	18	26	0	0	12	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4				8
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8		8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0		10.0
Minimum Split (s)	34.1	34.1		32.1	32.1		32.3	32.3		32.3		32.3
Total Split (s)	77.0	77.0		77.0	77.0		33.0	33.0		33.0		33.0
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%		30.0%
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3		3.3
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0		3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0		0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.3	6.3		6.3		6.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None		None
Act Effct Green (s)	93.4	93.4		93.4	93.4		13.2	13.2		13.2		13.2
Actuated g/C Ratio	0.85	0.85		0.85	0.85		0.12	0.12		0.12		0.12
v/c Ratio	0.03	0.57		0.07	0.38		0.12	0.13		0.06		0.06
Control Delay	1.9	3.2		5.9	4.5		41.8	7.0		3.3		3.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0		0.0
Total Delay	1.9	3.2		5.9	4.5		41.8	7.0		3.3		3.3
LOS	A	A		A	A		D	A		A		A
Approach Delay		3.2			4.5			21.2				3.3
Approach LOS		A			A			C				A
Queue Length 50th (m)	0.1	36.4		0.4	28.4		3.6	0.0		0.0		0.0
Queue Length 95th (m)	m0.4	78.8		3.5	70.6		8.9	4.5		1.7		1.7
Internal Link Dist (m)		221.9			561.5			129.3				71.7
Turn Bay Length (m)	85.0			40.0								
Base Capacity (vph)	382	2804		184	2807		304	367		363		363
Starvation Cap Reductn	0	0		0	0		0	0		0		0
Spillback Cap Reductn	0	0		0	0		0	0		0		0
Storage Cap Reductn	0	0		0	0		0	0		0		0
Reduced v/c Ratio	0.03	0.57		0.07	0.38		0.06	0.07		0.03		0.03

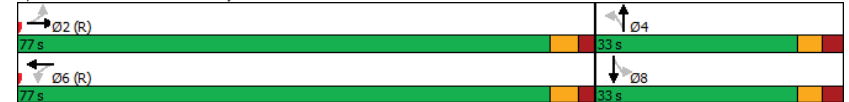
Intersection Summary	
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	36 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	80
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings
3: Ventus Way/3615 Innes Rd & Innes Rd

Existing
PM Peak Hour

Maximum v/c Ratio: 0.57	Intersection Signal Delay: 4.0	Intersection LOS: A
Intersection Capacity Utilization 62.2%	ICU Level of Service B	
Analysis Period (min) 15		
m Volume for 95th percentile queue is metered by upstream signal.		

Splits and Phases: 3: Ventus Way/3615 Innes Rd & Innes Rd



Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

Existing
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	38	931	39	103	608	90	73	24	112	68	24	17
Future Volume (vph)	38	931	39	103	608	90	73	24	112	68	24	17
Satd. Flow (prot)	1566	3316	1483	1658	3150	0	1658	1745	1483	0	1576	0
Fit Permitted	0.950			0.950			0.674			0.794		
Satd. Flow (perm)	1559	3316	1450	1657	3150	0	1172	1745	1462	0	1288	0
Satd. Flow (RTOR)			106		17				124		7	
Lane Group Flow (vph)	42	1034	43	114	776	0	81	27	124	0	122	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2				4		4	8		
Detector Phase	5	2	2	1	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.3	32.3	32.3	11.3	32.3		36.3	36.3	36.3	36.3	36.3	
Total Split (s)	20.0	68.0	68.0	20.0	68.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	15.4%	52.3%	52.3%	15.4%	52.3%		28.5%	28.5%	28.5%	28.5%	28.5%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6		4.3	4.3	4.3	4.3	4.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.3	6.3	6.3	6.3		7.3	7.3	7.3		7.3	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lag	Lag	Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None	None	
Act Effct Green (s)	8.9	77.8	77.8	14.3	85.6		18.0	18.0	18.0	18.0	18.0	
Actuated g/C Ratio	0.07	0.60	0.60	0.11	0.66		0.14	0.14	0.14		0.14	
v/c Ratio	0.39	0.52	0.05	0.63	0.37		0.50	0.11	0.40		0.66	
Control Delay	67.6	18.2	0.1	69.8	12.4		60.5	46.4	11.3		65.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	67.6	18.2	0.1	69.8	12.4		60.5	46.4	11.3		65.8	
LOS	E	B	A	E	B		E	D	B		E	
Approach Delay		19.4			19.7			32.5			65.8	
Approach LOS		B			B			C			E	
Queue Length 50th (m)	10.5	75.6	0.0	28.3	44.4		19.7	6.2	0.0		28.6	
Queue Length 95th (m)	22.0	126.9	0.0	46.0	77.6		32.7	13.6	15.6		44.6	
Internal Link Dist (m)		561.5			183.0			137.2			125.4	
Turn Bay Length (m)	47.5		58.5	58.5			48.5		20.0			
Base Capacity (vph)	165	1984	910	198	2079		267	398	429		299	
Starvation Cap Reductn	0	0	0	0	0		0	0	0		0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0		0	
Storage Cap Reductn	0	0	0	0	0		0	0	0		0	
Reduced v/c Ratio	0.25	0.52	0.05	0.58	0.37		0.30	0.07	0.29		0.41	

Intersection Summary
 Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 105 (81%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

Existing
PM Peak Hour

Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Fit Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	3.0	3.0
Total Split (s)	5.0	5.0
Total Split (%)	4%	4%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

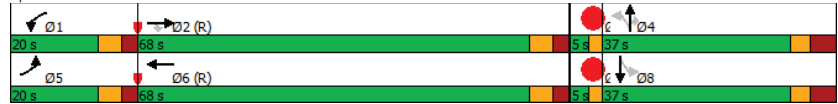
Intersection Summary

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

Existing
PM Peak Hour

Maximum v/c Ratio: 0.66	Intersection LOS: C
Intersection Signal Delay: 23.2	ICU Level of Service B
Intersection Capacity Utilization 63.9%	
Analysis Period (min) 15	

Splits and Phases: 4: Innes Rd & Viseneau Dr



HCM 2010 TWSC
5: Lamarche Ave & Innes Rd

Existing
PM Peak Hour

Intersection						
Int Delay, s/veh	10.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	↑↑
Traffic Vol, veh/h	1397	108	72	898	76	60
Future Vol, veh/h	1397	108	72	898	76	60
Conflicting Peds, #/hr	0	3	3	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1552	120	80	998	84	67

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	1675
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.22
Pot Cap-1 Maneuver	-	-	379
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	378
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	184.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	133	-	-	378	-
HCM Lane V/C Ratio	1.136	-	-	0.212	-
HCM Control Delay (s)	184.3	-	-	17.1	-
HCM Lane LOS	F	-	-	C	-
HCM 95th %tile Q(veh)	8.7	-	-	0.8	-

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

Appendix D

Signal Warrant Sheets

Input Data Sheet

Analysis Sheet

Results Sheet

Proposed Collision

GO TO Justification:

What are the intersecting roadways?

What is the direction of the Main Road street?

When was the data collected?

Justification 1 - 4: Volume Warrants

- a.- Number of lanes on the Main Road?
- b.- Number of lanes on the Minor Road?
- c.- How many approaches?
- d.- What is the operating environment? Population >= 10,000 AND Speed < 70 km/hr
- e.- What is the eight hour vehicle volume at the intersection? (Please fill in table below)

Hour Ending	Main Eastbound Approach			Minor Northbound Approach			Main Westbound Approach			Minor Southbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:00	0	316	34	115	0	24	27	851	0	0	0	0	0
8:00	0	482	43	93	0	57	33	889	0	0	0	0	1
9:00	0	573	52	78	0	40	37	662	0	0	0	0	5
10:00	0	887	58	61	0	57	37	831	0	0	0	0	9
15:00	0	904	57	68	0	52	34	862	0	0	0	0	9
16:00	0	1,179	89	74	0	57	39	817	0	0	0	0	10
17:00	0	1,381	108	75	0	59	72	876	0	0	0	0	3
18:00	0	1,284	139	53	0	77	57	792	0	0	0	0	6
Total	0	7,006	580	617	0	423	336	6,580	0	0	0	0	43

Results Sheet

Input Sheet

Analysis Sheet

Proposed Collision

GO TO Justification:

Intersection: Innes Rd / Lamarche Ave Count Date: 2024-08-21

Summary Results

Justification	Compliance	Signal Justified?		
		YES	NO	
1. Minimum Vehicular Volume	A Total Volume	100 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Volume	51 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Delay to Cross Traffic	A Main Road	100 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Road	97 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Innes Rd @ Lamarche Ave
2026 Future Background

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance		Entire %	Signal
		1 Lane Highway		2 or More Lanes		Sectional			
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	1296	144%	70%	No
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	119	70%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	1217	135%	66%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	49	66%		

- Notes
1. Refer to OTM Book 12, pg 92, Mar 2012
 2. Lowest section percentage governs justification
 3. Average hourly volumes estimated from peak hour volumes, $AHV = PM/2$ or $(AM + PM) / 4$, including amplification factors
 4. T-intersection factor corrected, applies only to 1B

Innes Rd @ Lamarche Ave
2031 Future Background

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance		Entire %	Signal
		1 Lane Highway		2 or More Lanes		Sectional			
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	1524	169%	169%	Yes
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	295	173%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	1327	147%	147%	Yes
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	145	194%		

- Notes
1. Refer to OTM Book 12, pg 92, Mar 2012
 2. Lowest section percentage governs justification
 3. Average hourly volumes estimated from peak hour volumes, $AHV = PM/2$ or $(AM + PM) / 4$, including amplification factors
 4. T-intersection factor corrected, applies only to 1B

Innes Rd @ Lamarche Ave
2026 Future Total

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance		Entire %	Signal
		1 Lane Highway		2 or More Lanes		Sectional			
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	1374	153%	109%	No
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	185	109%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	1251	139%	101%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	76	101%		

- Notes
1. Refer to OTM Book 12, pg 92, Mar 2012
 2. Lowest section percentage governs justification
 3. Average hourly volumes estimated from peak hour volumes, $AHV = PM/2$ or $(AM + PM) / 4$, including amplification factors
 4. T-intersection factor corrected, applies only to 1B

Innes Rd @ Lamarche Ave
2031 Future Total

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance		Entire %	Signal
		1 Lane Highway		2 or More Lanes		Sectional			
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	1603	178%	178%	Yes
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	361	212%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	1362	151%	151%	Yes
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	179	238%		

- Notes
1. Refer to OTM Book 12, pg 92, Mar 2012
 2. Lowest section percentage governs justification
 3. Average hourly volumes estimated from peak hour volumes, $AHV = PM/2$ or $(AM + PM) / 4$, including amplification factors
 4. T-intersection factor corrected, applies only to 1B

Appendix E

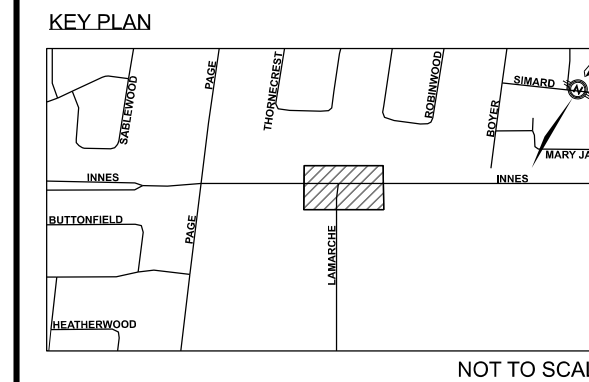
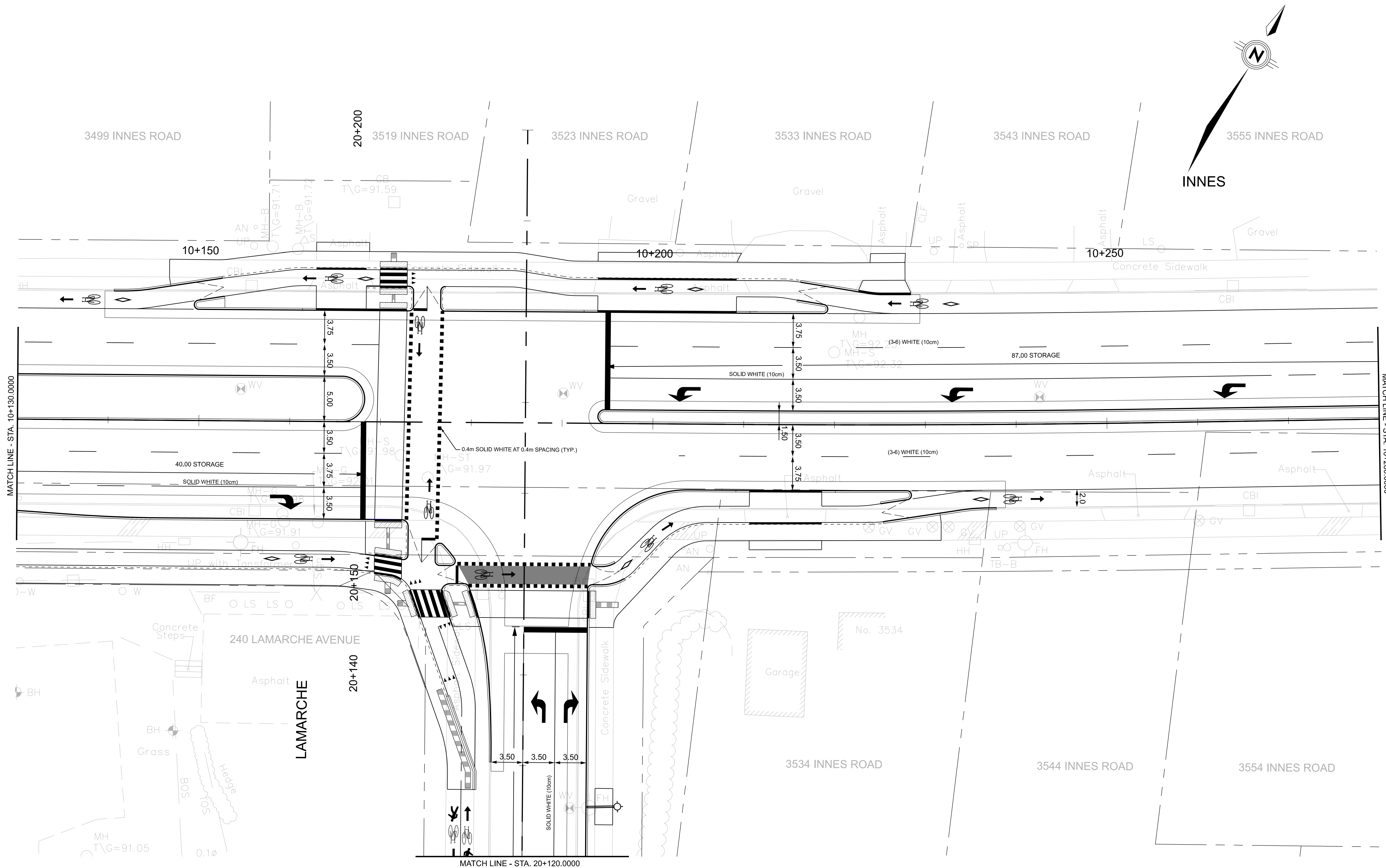
Collision Data

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Traffic Control Condition	Classification Of Accident	Initial Impact Type	Road Surface Condition	# Vehicles	# Motorcycles	# Bicycles	# Pedestrians
4/26/2018	2018	18:06	INNES RD (_3ZAYFDA)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	05 - Turning movement	01 - Dry	0	0	0	0
11/22/2018	2018	14:37	INNES RD (_3ZAYFDA)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	02 - Angle	01 - Dry	0	0	0	0
12/31/2018	2018	21:30	INNES RD (_3ZAYFDA)	03 - Snow	07 - Dark	10 - No control	0	03 - P.D. only	02 - Angle	05 - Packed snow	0	0	0	0
4/21/2019	2019	19:26	INNES RD (_3ZAYFDA)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	07 - SMV other	01 - Dry	0	0	0	0
7/10/2019	2019	7:15	INNES RD (_3ZAYFDA)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	02 - Angle	01 - Dry	0	0	0	0
1/25/2020	2020	17:00	INNES RD (_3ZAYFDA)	03 - Snow	05 - Dusk	10 - No control	0	03 - P.D. only	07 - SMV other	04 - Slush	0	0	0	0
4/20/2020	2020	19:59	INNES RD (_3ZAYFDA)	01 - Clear	05 - Dusk	10 - No control	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
7/6/2020	2020	7:05	INNES RD (_3ZAYFDA)	01 - Clear	01 - Daylight	10 - No control	0	02 - Non-fatal injury	07 - SMV other	01 - Dry	0	1	0	0
1/9/2021	2021	14:20	INNES RD (_3ZAYFDA)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	04 - Sideswipe	01 - Dry	0	0	0	0
2/16/2021	2021	12:36	INNES RD (_3ZAYFDA)	03 - Snow	01 - Daylight	10 - No control	0	02 - Non-fatal injury	02 - Angle	06 - Ice	0	0	0	0
6/25/2021	2021	17:01	DE LAMARCHE AVE @ INNES RD (0018480)	01 - Clear	01 - Daylight	02 - Stop sign	0	02 - Non-fatal injury	02 - Angle	01 - Dry	0	0	1	0
9/15/2021	2021	17:00	INNES RD (_3ZAYFDA)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	04 - Sideswipe	01 - Dry	0	0	0	0
9/25/2021	2021	9:06	INNES RD (_3ZAYFDA)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	02 - Angle	02 - Wet	0	0	0	0

Appendix F

Innes Road and Lamarche Avenue Intersection Modification

Consultant's Information: p:\V\AA\01\PW\01\Parsons.com\Ontario Provincial\Documents\City of Ottawa Projects\478567-1-Sheets\478567-011-P\MK-001-004
 Last Saved: 5/1/2024 3:16:34 PM
 Plot Date: 2024-05-03



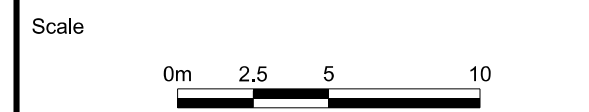
NOTES

PRELIMINARY
 NOT FOR CONSTRUCTION
 May 3, 2024



01	ISSUED FOR PRELIMINARY CIRCULATION	MH	03/05/24
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No.	Revision	By	Date (dd/mm/yyyy)



Project Title

INNES ROAD AND LAMARCHE AVENUE INTERSECTION MODIFICATION

Drawing Title

**PAVEMENT MARKINGS 2
INNES ROAD
STA. 10+130 TO STA. 10+280**

Designed by:	DDC	Datum	
Drawn by:	DDC		
Approved by:	MH		
Project No.	478567	Drawing No.	

Appendix G

TDM Checklist

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

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

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		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	<input type="checkbox"/>
BASIC	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	<input type="checkbox"/>
BASIC	1.1.3 Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	<input type="checkbox"/>
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 <i>Official Plan policy 4.3.3</i>)	<input type="checkbox"/>
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 <i>Official Plan policy 4.3.12</i>)	<input checked="" type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		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 <i>Official Plan policy 4.3.10</i>)	<input checked="" type="checkbox"/>
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 <i>Official Plan policy 4.3.10</i>)	<input checked="" type="checkbox"/>
REQUIRED	1.2.5 Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians (see <i>Official Plan policy 4.3.11</i>)	<input checked="" type="checkbox"/>
BASIC	1.2.6 Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	<input type="checkbox"/>
BASIC	1.2.7 Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	<input type="checkbox"/>
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	<input type="checkbox"/>
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	<input type="checkbox"/>
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)	<input type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
2. WALKING & CYCLING: END-OF-TRIP FACILITIES		
2.1 Bicycle parking		
REQUIRED	2.1.1 Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible (see <i>Official Plan policy 4.3.6</i>)	<input checked="" type="checkbox"/>
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 <i>Zoning By-law Section 111</i>)	<input checked="" type="checkbox"/>
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 <i>Zoning By-law Section 111</i>)	<input checked="" type="checkbox"/>
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	<input type="checkbox"/>
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 <i>Zoning By-law Section 111</i>)	<input type="checkbox"/>
BETTER	2.2.2 Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	<input type="checkbox"/>
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)	<input type="checkbox"/>
3. TRANSIT		
3.1 Customer amenities		
BASIC	3.1.1 Provide shelters, lighting and benches at any on-site transit stops	<input type="checkbox"/>
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	<input type="checkbox"/>
BETTER	3.1.3 Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	<input type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		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	<input type="checkbox"/>
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 <i>Zoning By-law Section 94</i>)	<input type="checkbox"/>
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	<input type="checkbox"/>
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	<input checked="" type="checkbox"/>
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	<input type="checkbox"/>
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 <i>Zoning By-law Section 104</i>)	<input type="checkbox"/>
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 <i>Zoning By-law Section 111</i>)	<input type="checkbox"/>
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)	<input type="checkbox"/>

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

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

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

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

TDM measures: <i>Residential developments</i>		Check if proposed & add descriptions
6. TDM MARKETING & COMMUNICATIONS		
6.1 Multimodal travel information		
BASIC ★	6.1.1 Provide a multimodal travel option information package to new residents	<input checked="" type="checkbox"/>
6.2 Personalized trip planning		
BETTER ★	6.2.1 Offer personalized trip planning to new residents	<input type="checkbox"/>

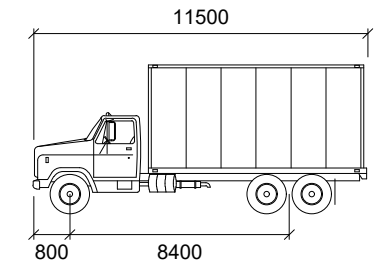
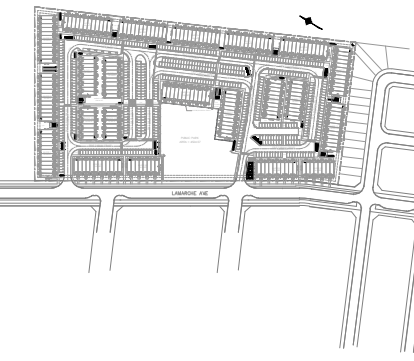
Appendix H

Turning Templates



Notes:

Key Plan:



- HSU**
- Width : 2600 mm
 - Track : 2600 mm
 - Lock to Lock Time : 6.0
 - Steering Angle : 40.0

- FORWARD MOVEMENTS
- REVERSE MOVEMENTS

01	Issued for Review:	AN	2024-08-27
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			

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

CLIENT: Cavian

ARCHITECT:

SITE: Orleans Village Phase 4

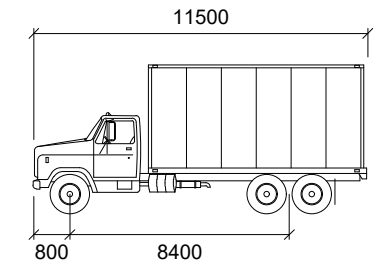
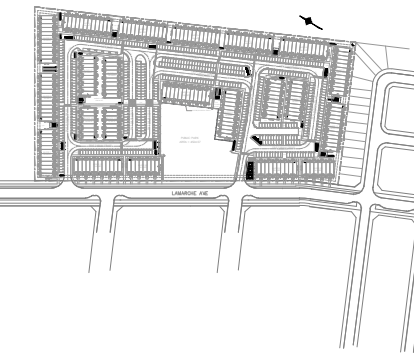
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 Site Circulation Movements (1)

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NTS	2024-08-27	AN	AH
PROJECT NO:	DRAWING NO:	REVISION:	
2021-106	001	01	



Notes:

Key Plan:



- HSU**
- Width : 2600 mm
 - Track : 2600 mm
 - Lock to Lock Time : 6.0
 - Steering Angle : 40.0

- FORWARD MOVEMENTS
- REVERSE MOVEMENTS

01	Issued for Review:	AN	2024-08-27
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			

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

CLIENT: Cavian

ARCHITECT:

SITE: Orleans Village Phase 4

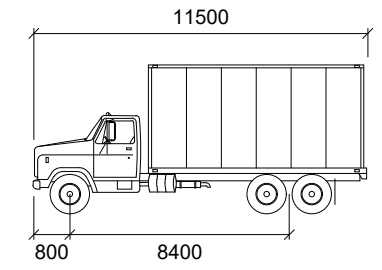
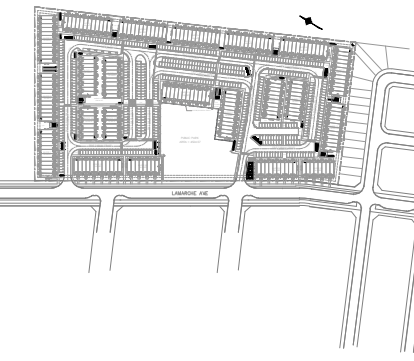
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Site Circulation Movements (2)

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
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PROJECT NO:	DRAWING NO:	REVISION:	
2021-106	002	01	

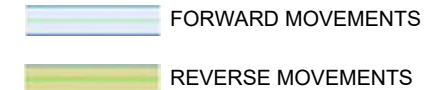


Notes:

Key Plan:



- HSU**
- Width : 2600 mm
 - Track : 2600 mm
 - Lock to Lock Time : 6.0
 - Steering Angle : 40.0



01	Issued for Review:	AN	2024-08-27
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			



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

CLIENT: Cavian

ARCHITECT:

SITE: Orleans Village Phase 4

TITLE: Garbage Turning Movements
Pick-up Movements - Inbound

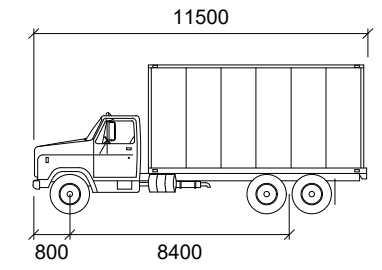
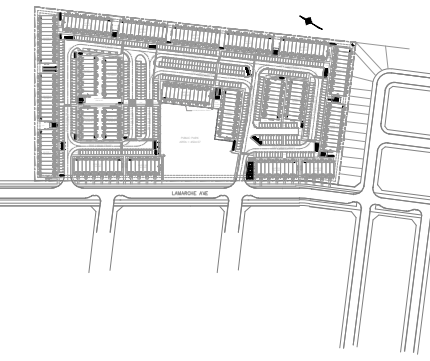
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NTS	2024-08-27	AN	AH
PROJECT NO:	DRAWING NO:	REVISION:	
2021-106	003	01	



LAMARCHE AVE

Notes:

Key Plan:



- HSU**
- Width : 2600 mm
 - Track : 2600 mm
 - Lock to Lock Time : 6.0
 - Steering Angle : 40.0

- FORWARD MOVEMENTS
- REVERSE MOVEMENTS

01	Issued for Review:	AN	2024-08-27
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			



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

CLIENT: Cavian

ARCHITECT:

SITE: Orleans Village Phase 4

TITLE: Garbage Turning Movements
Pick-up Movements - Inbound

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2024-08-27	AN	AH
PROJECT NO:	DRAWING NO:	REVISION:	
2021-106	004	01	

Appendix I

MMLOS Analysis

Multi-Modal Level of Service - Intersections Form

Consultant Scenario	OSH Transportation Inc.	Project	245 and 275 Lamarche Avenue
Comments	Existing/Future	Date	5/28/2024

INTERSECTIONS	Innes Road at Orleans Boulevard								Innes Road at Page Road				Innes Road at Lamarche Avenue (Future)				Innes Road at Access 3615 Innes Road/3636 Innes Road				Innes Road at Viseneau Drive					
	Crossing Side		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST				
Pedestrian	Lanes	6	6	8	8	6	6	8	8	3		7		4	5	7	7	5	7	9	9	5	7	9	9	
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m		No Median - 2.4 m		No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	Median > 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	
	Conflicting Left Turns	Protected	Protected	Permissive	Protected/ Permissive	Permissive	Permissive	Permissive	Permissive	Protected		Protected		Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control		No right turn		Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	
	Right Turns on Red (RTOR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR prohibited		RTOR prohibited		RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	
	Ped Signal Leading Interval?	No	No	No	No	No	No	No	No	No		No		No	No	No	No	No	No	Yes	Yes	No	No	Yes	Yes	
	Right Turn Channel	Conventional with Receiving Lane	Conventional with Receiving Lane	Conventional with Receiving Lane	Conv't without Receiving Lane	No Channel	No Channel	No Channel	No Channel	No Channel		No Right Turn		No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	
	Corner Radius	15-25m	15-25m	15-25m	15-25m	10-15m	10-15m	10-15m	10-15m	3-5m		No Right Turn		3-5m	5-10m	10-15m	5-10m	5-10m	10-15m	10-15m	10-15m	5-10m	10-15m	10-15m	10-15m	
	Crosswalk Type	Std transverse markings	Std transverse markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings		Std transverse markings		Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Std transverse markings	Std transverse markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	
	PETSI Score	27	27	-16	-7	26	26	-12	-12	83		36		55	36	4	11	36	4	24	24	36	4	24	24	
	Ped. Exposure to Traffic LoS	F	F	F	F	F	F	F	F	B		E		D	E	F	F	E	F	#N/A	#N/A	E	F	#N/A	#N/A	
	Cycle Length	110	110	110	110	110	110	110	110	120		120		110	110	110	110	120	120	120	120	120	120	120	120	
Effective Walk Time	7	19	15	26	7	7	41	41	45		45		8	8	57	57	8	8	43	26	8	8	43	26		
Average Pedestrian Delay	48	38	41	32	48	48	22	22	23		23		47	47	13	13	82	82	26	37	82	82	26	37		
Pedestrian Delay LoS	E	D	E	D	E	E	C	C	-		-		E	E	B	B	E	E	C	D	E	E	C	D		
Level of Service	F	F	F	F	F	F	F	F	-		B		E	E	F	F	E	E	#N/A	#N/A	E	E	#N/A	#N/A		
Bicycle	Approach From																									
	Approach From		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
	Bicycle Lane Arrangement on Approach	Mixed Traffic	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	
	Right Turn Lane Configuration	> 50 m	≤ 50 m	> 50 m	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	≤ 50 m	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	
	Right Turning Speed	>25 km/h	>25 km/h	>25 km/h	Not Applicable	#N/A	#N/A	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	≤ 25 km/h	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	
	Cyclist relative to RT motorists	F	E	F	Not Applicable	#N/A	#N/A	Not Applicable	Not Applicable	-		-		#N/A	#N/A	Not Applicable	Not Applicable	D	#N/A	Not Applicable	Not Applicable	D	#N/A	Not Applicable	Not Applicable	
	Separated or Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Separated	Mixed Traffic	Mixed Traffic	Separated	Separated	-		Separated	Separated	Mixed Traffic	Mixed Traffic	Separated	Separated	Mixed Traffic	Mixed Traffic	Separated	Separated	Mixed Traffic	Mixed Traffic	Separated	Separated	
	Left Turn Approach	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed	No lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	2-stage, LT box	2-stage, LT box	2-stage, LT box	No lane crossed	No lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	
	Operating Speed	≥ 60 km/h	> 50 to < 60 km/h	≥ 60 km/h	≥ 60 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	≥ 60 km/h	≥ 60 km/h	> 50 to < 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	≥ 60 km/h	≥ 60 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	≥ 60 km/h	≥ 60 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	≥ 60 km/h	≥ 60 km/h	
	Left Turning Cyclist	F	F	F	F	B	B	F	F	-		A	A	C	C	F	F	B	E	F	F	D	#N/A	F	F	
	Level of Service	F	F	F	F	#N/A	#N/A	F	F	-		A	A	#N/A	#N/A	F	F	D	#N/A	F	F	D	#N/A	F	F	
	Transit	Average Signal Delay	> 40 sec	≤ 40 sec	> 40 sec	≤ 30 sec			≤ 20 sec	≤ 10 sec			≤ 20 sec	≤ 40 sec			≤ 20 sec	≤ 20 sec	> 40 sec		> 40 sec	≤ 20 sec	> 40 sec		> 40 sec	≤ 20 sec
Level of Service		F	E	F	D	-	-	C	B	-		-	E	-	-	C	E	-	-	C	C	F	-	F	C	
Truck	Effective Corner Radius	> 15 m		> 15 m																						
	Number of Receiving Lanes on Departure from Intersection	≥ 2		≥ 2																						
	Level of Service	A	-	A	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Auto	Volume to Capacity Ratio		> 1.00					> 1.00				0.91 - 1.00				0.71 - 0.80								0.71 - 0.80		
	Level of Service		F					F				E				C								C		

Multi-Modal Level of Service - Segments Form

Consultant	CGH Transportation Inc.	Project	245 and 275 Lamarche Avenue
Scenario	Existing/Future	Date	8/28/2024
Comments			

SEGMENTS			Lamarche Ave			
			Existing/Future			
Pedestrian	Sidewalk Width	-	≥ 2 m			
	Boulevard Width		> 2 m			
	Avg Daily Curb Lane Traffic Volume		≤ 3000			
	Operating Speed		> 50 to 60 km/h			
	On-Street Parking		yes			
	Exposure to Traffic PLoS		A	-	-	-
	Effective Sidewalk Width					
	Pedestrian Volume					
	Crowding PLoS	-	-	-	-	
	Level of Service	-	-	-	-	
Bicycle	Type of Cycling Facility	A	Physically Separated			
	Number of Travel Lanes					
	Operating Speed					
	# of Lanes & Operating Speed LoS		-	-	-	
	Bike Lane (+ Parking Lane) Width					
	Bike Lane Width LoS		-	-	-	
	Bike Lane Blockages					
	Blockage LoS		-	-	-	
	Median Refuge Width (no median = < 1.8 m)					
	No. of Lanes at Unsignalized Crossing					
	Sidestreet Operating Speed					
Unsignalized Crossing - Lowest LoS	A	-	-	-		
	Level of Service	A	-	-	-	
Transit	Facility Type	-				
	Friction or Ratio Transit:Posted Speed					
	Level of Service	-	-	-	-	
Truck	Truck Lane Width	-				
	Travel Lanes per Direction					
	Level of Service	-	-	-	-	

Appendix J

TRANS Model Plots

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

245 and 275 Lamarche Avenue

2011 Model - Basecase

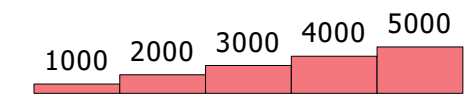
N/A

User Initials: TIMW
Plot Prepared: Feb, 2022
EMME Scenario: 21713

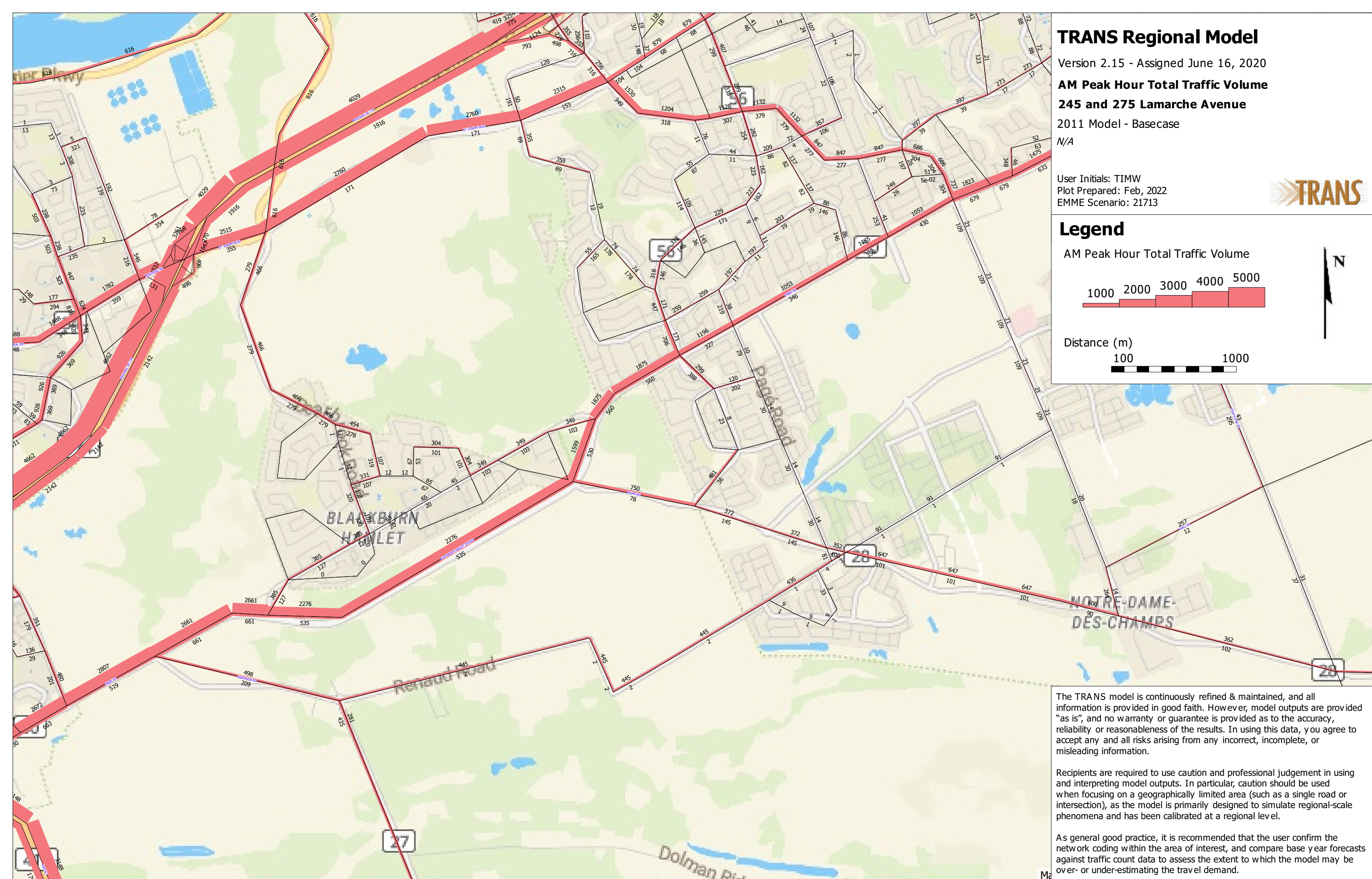


Legend

AM Peak Hour Total Traffic Volume



Distance (m)



The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.

As general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

245 and 275 Lamarche Avenue

2031 Model - Basecase

N/A

User Initials: TIMW

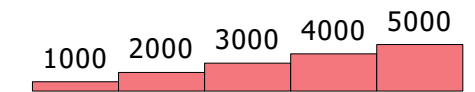
Plot Prepared: Feb, 2022

EMME Scenario: 21714

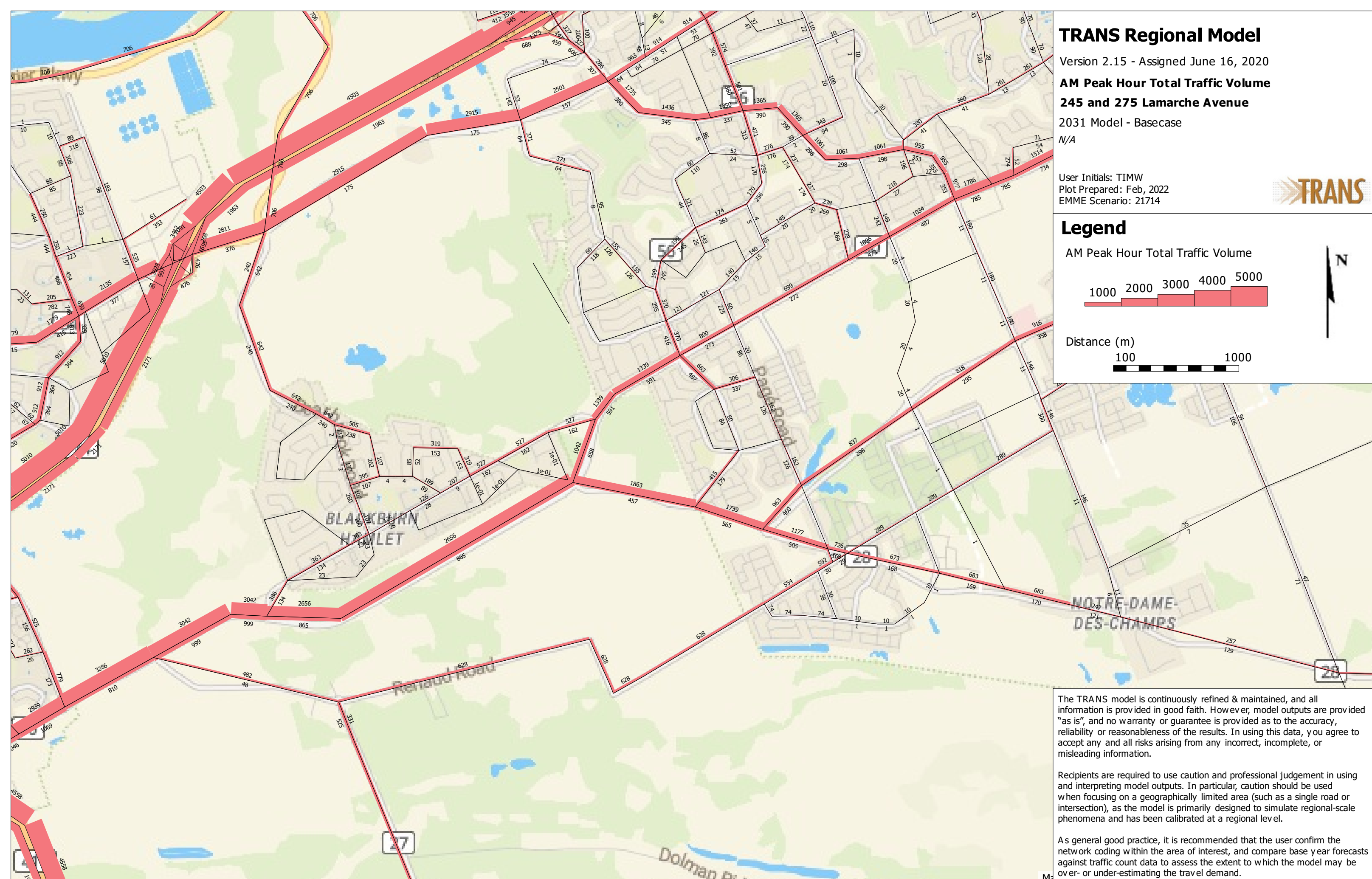


Legend

AM Peak Hour Total Traffic Volume



Distance (m)



The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

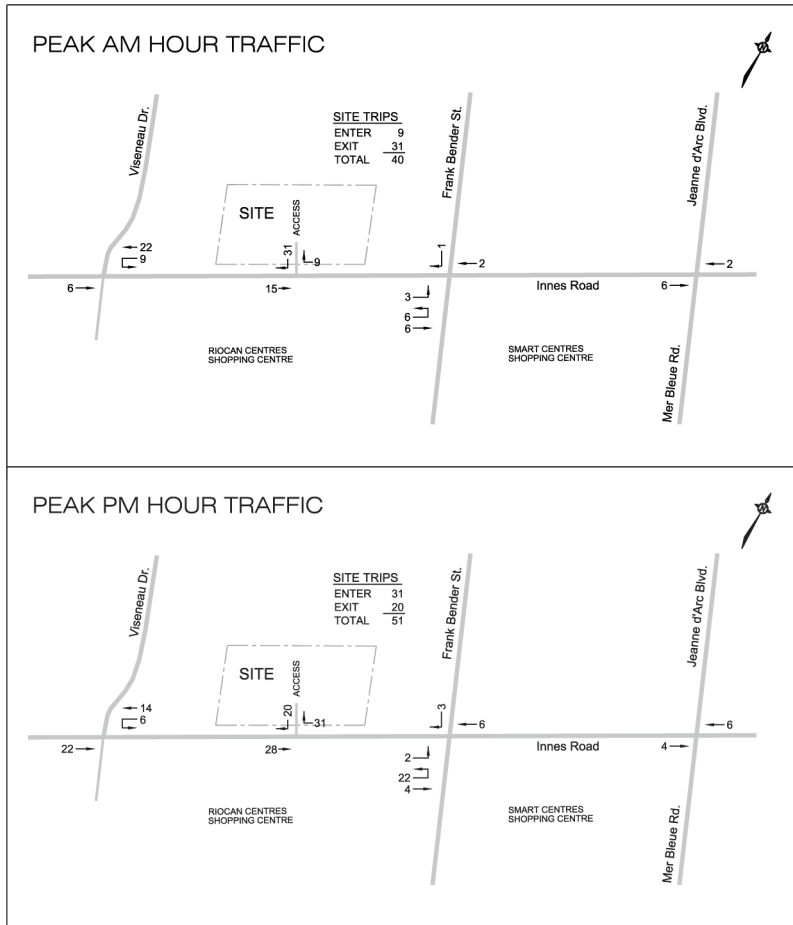
Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.

As a general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.

Appendix K

Background Developments

**FIGURE 3.1
 PEAK AM AND PM HOUR SITE GENERATED TRIPS**



NOT TO SCALE

Figure 4: Site Generated Traffic Volumes

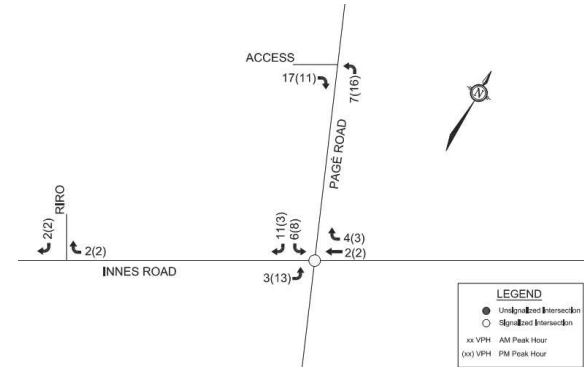


Figure 6: 2023/2028 Site-Generated Traffic

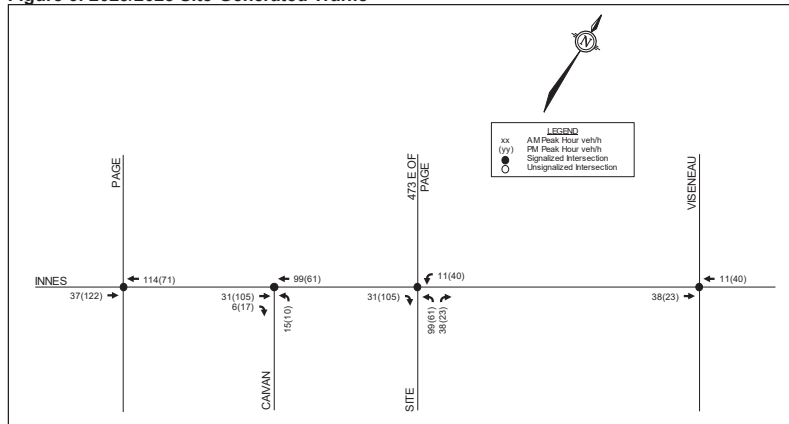


Figure 8: Proposed Site-Generated Primary Traffic Volumes

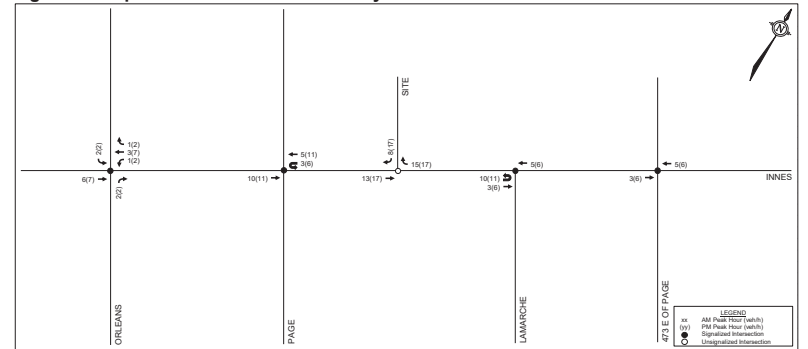


Figure 9: Proposed Site-Generated Pass-by Traffic Volumes

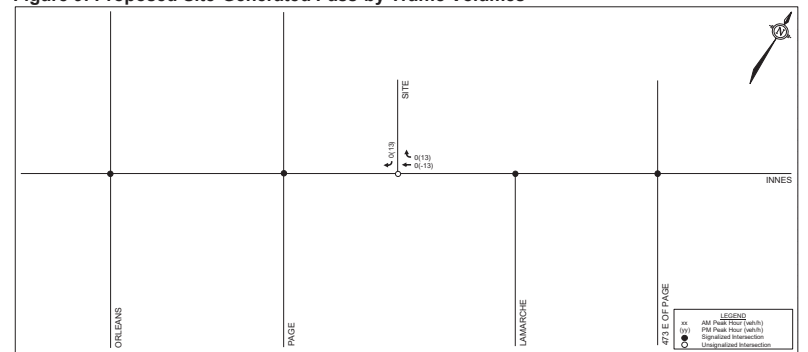
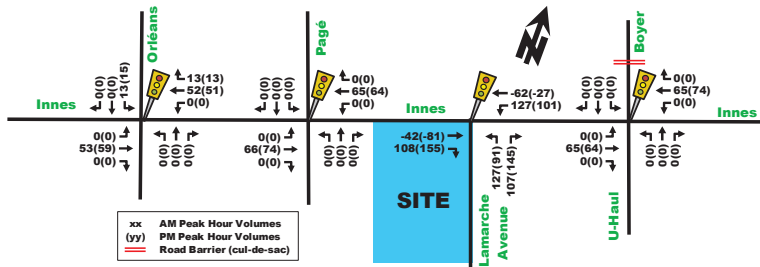


Figure 16: 'New' Site-Generated Peak Hour Traffic



Note: negative values reflect pass-by trip diversions.

Appendix L

Synchro Intersection Worksheets – 2026 Future Background Conditions

Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

2026 Future Background
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	106	408	32	23	1205	157	111	242	46	101	111	489
Future Volume (vph)	106	408	32	23	1205	157	111	242	46	101	111	489
Satd. Flow (prot)	3124	3103	1427	1658	3316	1427	1642	3252	1441	1658	3221	1483
Fit Permitted	0.950			0.950			0.547			0.601		
Satd. Flow (perm)	3103	3103	1394	1647	3316	1380	944	3252	1388	1030	3221	1463
Satd. Flow (RTOR)			143			143			82			207
Lane Group Flow (vph)	106	408	32	23	1205	157	111	242	46	101	111	489
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.6	26.2	26.2	11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	32.7
Total Split (s)	13.0	65.0	65.0	13.0	65.0	65.0	19.0	52.0	52.0	33.0	33.0	33.0
Total Split (%)	10.0%	50.0%	50.0%	10.0%	50.0%	50.0%	14.6%	40.0%	40.0%	25.4%	25.4%	25.4%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.2	6.2	6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	6.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	6.4	64.0	64.0	6.4	58.8	58.8	45.3	45.3	45.3	27.2	27.2	27.2
Actuated g/C Ratio	0.05	0.49	0.49	0.05	0.45	0.45	0.35	0.35	0.35	0.21	0.21	0.21
v/c Ratio	0.69	0.27	0.04	0.28	0.80	0.22	0.29	0.21	0.09	0.47	0.16	1.04
Control Delay	83.8	20.9	0.1	68.3	35.8	5.0	31.8	30.5	1.5	53.9	43.4	81.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.8	20.9	0.1	68.3	35.8	5.0	31.8	30.5	1.5	53.9	43.4	81.8
LOS	F	C	A	E	D	A	C	C	A	D	D	F
Approach Delay		31.9			32.8			27.5			71.7	
Approach LOS		C			C			C			E	
Queue Length 50th (m)	14.0	34.0	0.0	5.8	137.1	2.0	19.8	22.8	0.0	23.1	12.4	~92.5
Queue Length 95th (m)	#27.1	45.7	0.0	15.1	166.0	14.2	34.0	33.1	2.2	41.7	20.9	#159.0
Internal Link Dist (m)		265.9			463.6			69.4			101.9	
Turn Bay Length (m)	135.5		87.0	106.0		57.0	48.0		43.5	50.0		53.0
Base Capacity (vph)	153	1527	758	86	1499	702	394	1133	537	215	673	469
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.27	0.04	0.27	0.80	0.22	0.28	0.21	0.09	0.47	0.16	1.04

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

Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

2026 Future Background
AM Peak Hour

Maximum v/c Ratio: 1.04	Intersection LOS: D
Intersection Signal Delay: 40.9	ICU Level of Service E
Intersection Capacity Utilization 90.1%	
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Orleans Blvd & Innes Rd



Lanes, Volumes, Timings
2: Page Rd & Innes Rd

2026 Future Background
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	24	510	21	58	1320	28	14	12	61	51	11	51
Future Volume (vph)	24	510	21	58	1320	28	14	12	61	51	11	51
Satd. Flow (prot)	1483	3173	0	1658	3303	0	0	1508	0	0	1590	0
Fit Permitted	0.173			0.455				0.943			0.824	
Satd. Flow (perm)	270	3173	0	793	3303	0	0	1433	0	0	1339	0
Satd. Flow (RTOR)		6			3			61			35	
Lane Group Flow (vph)	24	531	0	58	1348	0	0	87	0	0	113	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	42.2	42.2		42.2	42.2		41.8	41.8		41.8	41.8	
Total Split (s)	78.0	78.0		78.0	78.0		42.0	42.0		42.0	42.0	
Total Split (%)	65.0%	65.0%		65.0%	65.0%		35.0%	35.0%		35.0%	35.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.8	6.8		6.8	6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	90.4	90.4		90.4	90.4		16.6	16.6		16.6	16.6	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.14	0.14		0.14	0.14	
v/c Ratio	0.12	0.22		0.10	0.54		0.35	0.53		0.35	0.53	
Control Delay	8.5	5.7		8.5	9.8		19.3	39.5		19.3	39.5	
Queue Delay	0.0	0.0		0.0	0.1		0.0	0.0		0.0	0.0	
Total Delay	8.5	5.7		8.5	9.9		19.3	39.5		19.3	39.5	
LOS	A	A		A	A		B	D		B	D	
Approach Delay		5.8			9.8			19.3			39.5	
Approach LOS		A			A			B			D	
Queue Length 50th (m)	1.1	13.6		2.6	40.7			5.7			17.8	
Queue Length 95th (m)	7.0	38.8		m10.9	147.5			16.6			29.2	
Internal Link Dist (m)		463.6			206.5			143.5			112.1	
Turn Bay Length (m)	104.5			106.0								
Base Capacity (vph)	203	2392		597	2490		463	417		463	417	
Starvation Cap Reductn	0	0		0	272		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.12	0.22		0.10	0.61		0.19	0.27		0.19	0.27	

Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	26 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	85
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings
2: Page Rd & Innes Rd

2026 Future Background
AM Peak Hour

Maximum v/c Ratio: 0.54	Intersection LOS: B
Intersection Signal Delay: 10.7	ICU Level of Service D
Intersection Capacity Utilization 77.9%	
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 2: Page Rd & Innes Rd



Lanes, Volumes, Timings

2026 Future Background

3: Ventus Way/3615 Innes Rd & Innes Rd

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	0	580	47	23	1211	2	109	0	49	0	0	1
Future Volume (vph)	0	580	47	23	1211	2	109	0	49	0	0	1
Satd. Flow (prot)	1745	3159	0	1566	3221	0	1409	1368	0	0	1489	0
Fit Permitted				0.411			0.757					
Satd. Flow (perm)	1745	3159	0	676	3221	0	1121	1368	0	0	1489	0
Satd. Flow (RTOR)		15						355				98
Lane Group Flow (vph)	0	627	0	23	1213	0	109	49	0	0	1	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			4				8
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8		8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0		10.0
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3		32.3
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0		33.0
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%		27.5%
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3		3.3
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0		3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0		0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.3	6.3				6.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None		None
Act Effct Green (s)		90.2			90.2		17.4	17.4				17.4
Actuated g/C Ratio		0.75			0.75		0.14	0.14				0.14
v/c Ratio		0.26			0.05		0.50	0.68		0.10		0.00
Control Delay		7.6			9.9		12.7	67.7		0.4		0.0
Queue Delay		0.0			0.0		0.0	0.0		0.0		0.0
Total Delay		7.6			9.9		12.7	67.7		0.4		0.0
LOS		A			A		B	E		A		A
Approach Delay		7.6			12.6			46.8				
Approach LOS		A			B			D				
Queue Length 50th (m)		36.7			1.1		47.2	24.8		0.0		0.0
Queue Length 95th (m)		84.2			m7.5		160.0	40.6		0.0		0.0
Internal Link Dist (m)		221.9					561.5			129.3		33.2
Turn Bay Length (m)					40.0							
Base Capacity (vph)		2379			508		2422	249		580		407
Starvation Cap Reductn		0			0		0	0		0		0
Spillback Cap Reductn		0			0		0	0		0		0
Storage Cap Reductn		0			0		0	0		0		0
Reduced v/c Ratio		0.26			0.05		0.50	0.44		0.08		0.00

Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	65
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings

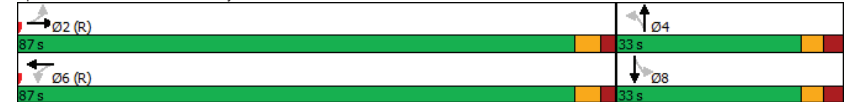
2026 Future Background

3: Ventus Way/3615 Innes Rd & Innes Rd

AM Peak Hour

Maximum v/c Ratio:	0.68
Intersection Signal Delay:	13.7
Intersection LOS:	B
Intersection Capacity Utilization:	59.3%
ICU Level of Service:	B
Analysis Period (min):	15
m	Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Ventus Way/3615 Innes Rd & Innes Rd



Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2026 Future Background
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↕	↕	↕	↕↕		↕	↕	↕	↕	↕↕	
Traffic Volume (vph)	21	584	10	39	1177	45	29	5	16	49	3	32
Future Volume (vph)	21	584	10	39	1177	45	29	5	16	49	3	32
Satd. Flow (prot)	1311	3161	1483	1537	3160	0	1537	1483	1427	0	1510	0
Fit Permitted	0.950			0.950			0.741			0.818		
Satd. Flow (perm)	1311	3161	1444	1533	3160	0	1198	1483	1427	0	1270	0
Satd. Flow (RTOR)			115		4				105		25	
Lane Group Flow (vph)	21	584	10	39	1222	0	29	5	16	0	84	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2				4		4	8		
Detector Phase	5	2	2	1	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		10.0	10.0	10.0	10.0		
Minimum Split (s)	11.3	32.3	32.3	11.3	32.3		36.3	36.3	36.3	36.3		
Total Split (s)	12.0	66.0	66.0	12.0	66.0		37.0	37.0	37.0	37.0		
Total Split (%)	10.0%	55.0%	55.0%	10.0%	55.0%		30.8%	30.8%	30.8%	30.8%		
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.0	3.0	3.0	3.0		
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6		4.3	4.3	4.3	4.3		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.3	6.3	6.3	6.3	6.3		7.3	7.3	7.3		7.3	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lag	Lag	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None		
Act Effct Green (s)	7.5	84.0	84.0	8.6	90.2		14.7	14.7	14.7		14.7	
Actuated g/C Ratio	0.06	0.70	0.70	0.07	0.75		0.12	0.12	0.12		0.12	
v/c Ratio	0.26	0.26	0.01	0.36	0.51		0.20	0.03	0.06		0.47	
Control Delay	88.0	2.7	0.0	61.3	11.5		47.1	41.0	0.4		41.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	88.0	2.7	0.0	61.3	11.5		47.1	41.0	0.4		41.7	
LOS	F	A	A	E	B		D	D	A		D	
Approach Delay		5.6			13.0			31.6			41.7	
Approach LOS		A			B			C			D	
Queue Length 50th (m)	5.3	2.4	0.0	8.9	41.1		6.5	1.1	0.0		13.5	
Queue Length 95th (m)	14.0	25.6	0.1	19.8	144.7		13.3	4.2	0.0		25.1	
Internal Link Dist (m)		561.5			183.4			77.4			48.4	
Turn Bay Length (m)	47.5		58.5	58.5			48.5		20.0			
Base Capacity (vph)	82	2211	1045	110	2375		296	367	432		333	
Starvation Cap Reductn	0	0	0	0	0		0	0	0		0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0		0	
Storage Cap Reductn	0	0	0	0	0		0	0	0		0	
Reduced v/c Ratio	0.26	0.26	0.01	0.35	0.51		0.10	0.01	0.04		0.25	

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 40 (33%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2026 Future Background
AM Peak Hour

Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Fit Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	3.0	4.0
Total Split (s)	5.0	5.0
Total Split (%)	4%	4%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

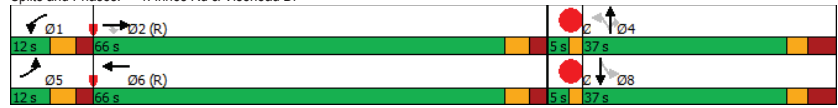
Intersection Summary

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2026 Future Background
AM Peak Hour

Maximum v/c Ratio: 0.51	Intersection LOS: B
Intersection Signal Delay: 12.4	ICU Level of Service B
Intersection Capacity Utilization 59.4%	
Analysis Period (min) 15	

Splits and Phases: 4: Innes Rd & Viseneau Dr



Lanes, Volumes, Timings
5: Lamarche Ave & Innes Rd

2026 Future Background
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Lane Configurations	↔↔	↔	↔	↔↔	↔	↔	
Traffic Volume (vph)	565	51	33	1295	111	59	
Future Volume (vph)	565	51	33	1295	111	59	
Satd. Flow (prot)	3191	1455	1658	3221	1642	1469	
Fit Permitted			0.950		0.950		
Satd. Flow (perm)	3191	1419	1654	3221	1640	1469	
Satd. Flow (RTOR)							
Lane Group Flow (vph)	565	51	33	1295	111	59	
Turn Type	NA	Perm	Prot	NA	Prot	Perm	
Protected Phases	2		1	6	7		8
Permitted Phases		2				4	
Detector Phase	2	2	1	6	7	4	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	5.0	5.0	1.0
Minimum Split (s)	22.5	22.5	11.7	22.5	22.5	22.5	5.5
Total Split (s)	41.5	41.5	30.0	71.5	43.0	48.5	5.5
Total Split (%)	34.6%	34.6%	25.0%	59.6%	35.8%	40.4%	5%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.5	2.0
All-Red Time (s)	2.3	2.3	3.0	2.3	3.0	3.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.7	6.0	6.3	6.5	
Lead/Lag	Lag	Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes
Recall Mode	C-Max	C-Max	None	C-Max	None	None	Max
Act Effct Green (s)	79.2	79.2	7.9	88.7	13.5	18.8	
Actuated g/C Ratio	0.66	0.66	0.07	0.74	0.11	0.16	
v/c Ratio	0.27	0.05	0.30	0.54	0.60	0.26	
Control Delay	14.0	15.0	59.1	8.0	63.6	45.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	14.0	15.0	59.1	8.0	63.6	45.8	
LOS	B	B	E	A	E	D	
Approach Delay	14.1			9.2	57.4		
Approach LOS	B			A	E		
Queue Length 50th (m)	27.3	4.1	6.9	71.4	25.3	12.4	
Queue Length 95th (m)	74.8	18.3	116.6	108.0	41.9	23.7	
Internal Link Dist (m)	206.5			221.9	196.1		
Turn Bay Length (m)		40.0	87.0		80.0		
Base Capacity (vph)	2106	936	321	2380	502	514	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.27	0.05	0.10	0.54	0.22	0.11	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

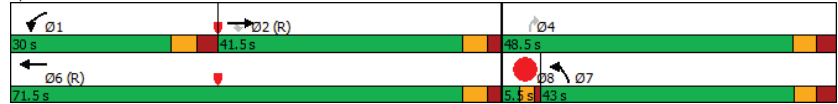
Lanes, Volumes, Timings
5: Lamarche Ave & Innes Rd

2026 Future Background
AM Peak Hour

Maximum v/c Ratio: 0.60	Intersection LOS: B
Intersection Signal Delay: 14.5	ICU Level of Service A
Intersection Capacity Utilization 54.5%	
Analysis Period (min) 15	

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

Splits and Phases: 5: Lamarche Ave & Innes Rd



Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

2026 Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	462	1355	97	75	739	185	56	192	95	216	253	267
Future Volume (vph)	462	1355	97	75	739	185	56	192	95	216	253	267
Satd. Flow (prot)	3216	3316	1455	1642	3221	1483	1658	3283	1483	1658	3221	1469
Fit Permitted	0.950			0.950			0.482			0.631		
Satd. Flow (perm)	3191	3316	1421	1639	3221	1446	831	3283	1446	1090	3221	1422
Satd. Flow (RTOR)			165			230			159			267
Lane Group Flow (vph)	462	1355	97	75	739	185	56	192	95	216	253	267
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4		8		8
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	16.6	26.2	26.2	11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	32.7
Total Split (s)	31.0	49.0	49.0	16.0	34.0	34.0	12.0	45.0	45.0	33.0	33.0	33.0
Total Split (%)	28.2%	44.5%	44.5%	14.5%	30.9%	30.9%	10.9%	40.9%	40.9%	30.0%	30.0%	30.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.2	6.2	6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	6.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	Max	Max	Max
Act Effct Green (s)	20.6	46.2	46.2	8.8	31.6	31.6	38.3	38.3	38.3	28.7	28.7	28.7
Actuated g/C Ratio	0.19	0.42	0.42	0.08	0.29	0.29	0.35	0.35	0.35	0.26	0.26	0.26
v/c Ratio	0.77	0.97	0.14	0.57	0.80	0.32	0.17	0.17	0.16	0.76	0.30	0.47
Control Delay	51.3	51.3	0.6	56.0	52.0	14.2	25.7	25.3	0.9	57.6	34.8	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.3	51.3	0.6	56.0	52.0	14.2	25.7	25.3	0.9	57.6	34.8	7.2
LOS	D	D	A	E	D	B	C	C	A	E	C	A
Approach Delay		48.7			45.3			18.6			31.5	
Approach LOS		D			D			B			C	
Queue Length 50th (m)	48.8	~167.3	0.0	13.4	66.6	3.3	8.1	14.8	0.0	44.2	23.7	0.0
Queue Length 95th (m)	63.6	#208.7	0.8	32.5	#119.3	41.3	16.8	23.2	1.3	#84.5	35.3	20.5
Internal Link Dist (m)		265.9			463.6			172.9			182.9	
Turn Bay Length (m)	135.5		87.0	106.0		57.0	48.0		43.5	50.0		53.0
Base Capacity (vph)	713	1394	692	146	926	579	329	1143	607	284	840	568
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.97	0.14	0.51	0.80	0.32	0.17	0.17	0.16	0.76	0.30	0.47

Intersection Summary

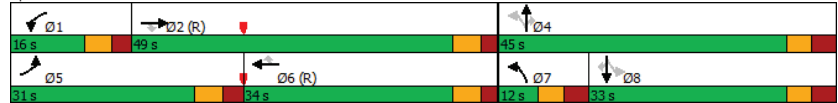
Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

2026 Future Background
PM Peak Hour

Maximum v/c Ratio: 0.97	Intersection LOS: D
Intersection Signal Delay: 42.1	ICU Level of Service F
Intersection Capacity Utilization 99.7%	
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Orleans Blvd & Innes Rd



Lanes, Volumes, Timings
2: Page Rd & Innes Rd

2026 Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↕	↕	↔	↕	↕	↕
Traffic Volume (vph)	64	1593	19	116	947	72	18	18	108	91	17	34
Future Volume (vph)	64	1593	19	116	947	72	18	18	108	91	17	34
Satd. Flow (prot)	1658	3308	0	1658	3239	0	0	1536	0	0	1597	0
Fit Permitted	0.254			0.109				0.952			0.659	
Satd. Flow (perm)	441	3308	0	190	3239	0	0	1471	0	0	1082	0
Satd. Flow (RTOR)		2			12			23			15	
Lane Group Flow (vph)	64	1612	0	116	1019	0	0	144	0	0	142	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	42.2	42.2		42.2	42.2		41.8	41.8		41.8	41.8	
Total Split (s)	68.0	68.0		68.0	68.0		42.0	42.0		42.0	42.0	
Total Split (%)	61.8%	61.8%		61.8%	61.8%		38.2%	38.2%		38.2%	38.2%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.8	6.8		6.8	6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	77.6	77.6		77.6	77.6		19.4	19.4		19.4	19.4	
Actuated g/C Ratio	0.71	0.71		0.71	0.71		0.18	0.18		0.18	0.18	
v/c Ratio	0.21	0.69		0.87	0.45		0.52	0.70		0.52	0.70	
Control Delay	3.2	5.6		70.6	7.3		38.9	54.3		38.9	54.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.2	5.6		70.6	7.3		38.9	54.3		38.9	54.3	
LOS	A	A		E	A		D	D		D	D	
Approach Delay		5.5			13.7		38.9	54.3		38.9	54.3	
Approach LOS		A			B		D	D		D	D	
Queue Length 50th (m)	1.5	27.0		19.7	14.3		24.2	26.6		24.2	26.6	
Queue Length 95th (m)	m2.5	m32.5		#55.8	0.0		35.6	39.3		35.6	39.3	
Internal Link Dist (m)		463.6			206.5		143.5	112.1		143.5	112.1	
Turn Bay Length (m)	104.5			106.0								
Base Capacity (vph)	311	2334		134	2289		486	356		486	356	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.21	0.69		0.87	0.45		0.30	0.40		0.30	0.40	

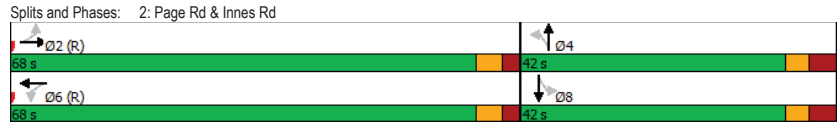
Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 2 (2%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
2: Page Rd & Innes Rd

2026 Future Background
PM Peak Hour

Maximum v/c Ratio: 0.87	Intersection LOS: B
Intersection Signal Delay: 12.3	ICU Level of Service G
Intersection Capacity Utilization 101.4%	
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	



Lanes, Volumes, Timings
3: Ventus Way/3615 Innes Rd & Innes Rd

2026 Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	11	1580	128	51	1025	10	77	0	46	4	0	7
Future Volume (vph)	11	1580	128	51	1025	10	77	0	46	4	0	7
Satd. Flow (prot)	1658	3255	0	1551	3312	0	1595	1388	0	0	1551	0
Fit Permitted	0.261			0.109			0.750					0.901
Satd. Flow (perm)	455	3255	0	178	3312	0	1255	1388	0	0	1423	0
Satd. Flow (RTOR)		15			2			39				31
Lane Group Flow (vph)	11	1708	0	51	1035	0	77	46	0	0	11	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4				8
Permitted Phases	2			6			4				8	
Detector Phase	2	2		6	6		4	4			8	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	34.1	34.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	77.0	77.0		77.0	77.0		33.0	33.0		33.0	33.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.3	6.3		6.3	6.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	87.6	87.6		87.6	87.6		14.5	14.5		14.5	14.5	
Actuated g/C Ratio	0.80	0.80		0.80	0.80		0.13	0.13		0.13	0.13	
v/c Ratio	0.03	0.66		0.36	0.39		0.47	0.21		0.05	0.05	
Control Delay	3.0	12.1		16.0	5.5		51.6	16.6		2.4	2.4	
Queue Delay	0.0	0.6		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.0	12.6		16.0	5.5		51.6	16.6		2.4	2.4	
LOS	A	B		B	A		D	B		A	A	
Approach Delay		12.6			6.0			38.5			2.4	
Approach LOS		B			A			D			A	
Queue Length 50th (m)	0.2	201.3		2.8	30.9		15.9	1.4		0.0	0.0	
Queue Length 95th (m)	m0.9	230.0		17.9	67.9		26.8	10.3		1.2	1.2	
Internal Link Dist (m)		221.9			561.5			129.3			33.2	
Turn Bay Length (m)	85.0			40.0								
Base Capacity (vph)	362	2595		141	2637		304	366			368	
Starvation Cap Reductn	0	453		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.03	0.80		0.36	0.39		0.25	0.13		0.03	0.03	

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

Lanes, Volumes, Timings
3: Ventus Way/3615 Innes Rd & Innes Rd

2026 Future Background
PM Peak Hour

Maximum v/c Ratio: 0.66	Intersection LOS: B
Intersection Signal Delay: 11.2	ICU Level of Service C
Intersection Capacity Utilization 71.2%	
Analysis Period (min) 15	

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

Splits and Phases: 3: Ventus Way/3615 Innes Rd & Innes Rd



Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2026 Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	38	1528	39	103	1001	90	73	24	112	68	24	17
Future Volume (vph)	38	1528	39	103	1001	90	73	24	112	68	24	17
Satd. Flow (prot)	1566	3316	1483	1658	3176	0	1658	1745	1483	0	1576	0
Fit Permitted	0.950			0.950			0.688				0.796	
Satd. Flow (perm)	1561	3316	1450	1657	3176	0	1197	1745	1462	0	1291	0
Satd. Flow (RTOR)			106		10				112		7	
Lane Group Flow (vph)	38	1528	39	103	1091	0	73	24	112	0	109	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2				4		4	8		
Detector Phase	5	2	2	1	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.3	32.3	32.3	11.3	32.3		36.3	36.3	36.3	36.3	36.3	
Total Split (s)	20.0	68.0	68.0	20.0	68.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	15.4%	52.3%	52.3%	15.4%	52.3%		28.5%	28.5%	28.5%	28.5%	28.5%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6		4.3	4.3	4.3	4.3	4.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.3	6.3	6.3	6.3		7.3	7.3	7.3		7.3	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lag	Lag	Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None	None	
Act Effct Green (s)	8.6	79.6	79.6	13.3	86.7		17.2	17.2	17.2		17.2	
Actuated g/C Ratio	0.07	0.61	0.61	0.10	0.67		0.13	0.13	0.13		0.13	
v/c Ratio	0.37	0.75	0.04	0.61	0.51		0.46	0.10	0.39		0.62	
Control Delay	67.2	23.2	0.1	70.3	14.1		59.4	46.8	11.6		63.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	67.2	23.2	0.1	70.3	14.1		59.4	46.8	11.6		63.3	
LOS	E	C	A	E	B		E	D	B		E	
Approach Delay		23.7			18.9			32.4			63.3	
Approach LOS		C			B			C			E	
Queue Length 50th (m)	9.5	135.0	0.0	25.7	69.6		17.8	5.6	0.0		25.4	
Queue Length 95th (m)	20.5	#246.6	0.0	42.8	122.5		29.8	12.3	15.2		40.0	
Internal Link Dist (m)		561.5			183.0			77.4			48.4	
Turn Bay Length (m)	47.5		58.5	58.5			48.5		20.0			
Base Capacity (vph)	165	2029	928	191	2120		273	398	420		300	
Starvation Cap Reductn	0	0	0	0	0		0	0	0		0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0		0	
Storage Cap Reductn	0	0	0	0	0		0	0	0		0	
Reduced v/c Ratio	0.23	0.75	0.04	0.54	0.51		0.27	0.06	0.27		0.36	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 105 (81%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

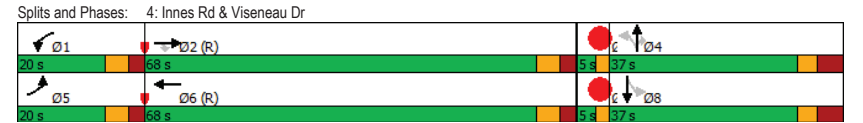
2026 Future Background
PM Peak Hour

Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Fit Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	3.0	3.0
Total Split (s)	5.0	5.0
Total Split (%)	4%	4%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2026 Future Background
PM Peak Hour

Maximum v/c Ratio: 0.75	Intersection LOS: C
Intersection Signal Delay: 23.8	ICU Level of Service D
Intersection Capacity Utilization 81.4%	
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	



Lanes, Volumes, Timings
5: Lamarche Ave & Innes Rd

2026 Future Background
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Lane Configurations	↕↕	↕	↕	↕↕	↕	↕	
Traffic Volume (vph)	1661	125	72	1043	86	60	
Future Volume (vph)	1661	125	72	1043	86	60	
Satd. Flow (prot)	3316	1483	1658	3316	1658	1483	
Fit Permitted			0.950		0.950		
Satd. Flow (perm)	3316	1437	1656	3316	1658	1483	
Satd. Flow (RTOR)							
Lane Group Flow (vph)	1661	125	72	1043	86	60	
Turn Type	NA	Perm	Prot	NA	Prot	Perm	
Protected Phases	2		1	6	7		8
Permitted Phases		2				4	
Detector Phase	2	2	1	6	7	4	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	5.0	5.0	1.0
Minimum Split (s)	24.0	24.0	11.7	16.0	11.3	22.5	5.5
Total Split (s)	61.6	61.6	21.3	82.9	21.6	27.1	5.5
Total Split (%)	56.0%	56.0%	19.4%	75.4%	19.6%	24.6%	5%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.5	2.0
All-Red Time (s)	2.3	2.3	3.0	2.3	3.0	3.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.7	6.0	6.3	6.5	
Lead/Lag	Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	None	C-Max	None	Max	Max
Act Effct Green (s)	62.7	62.7	10.1	76.9	13.6	20.6	
Actuated g/C Ratio	0.57	0.57	0.09	0.70	0.12	0.19	
v/c Ratio	0.88	0.15	0.47	0.45	0.42	0.22	
Control Delay	24.3	14.7	52.1	10.3	50.3	40.3	
Queue Delay	0.1	0.0	0.0	0.0	0.0	0.8	
Total Delay	24.4	14.7	52.1	10.3	50.3	41.2	
LOS	C	B	D	B	D	D	
Approach Delay	23.7			13.0	46.6		
Approach LOS	C			B	D		
Queue Length 50th (m)	108.4	11.4	15.1	41.4	17.0	11.0	
Queue Length 95th (m)	#231.0	m17.7	28.7	106.9	32.3	23.0	
Internal Link Dist (m)	206.5			221.9	196.1		
Turn Bay Length (m)		40.0	87.0		80.0		
Base Capacity (vph)	1888	818	220	2318	230	277	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	12	0	0	0	0	92	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.89	0.15	0.33	0.45	0.37	0.32	

Intersection Summary

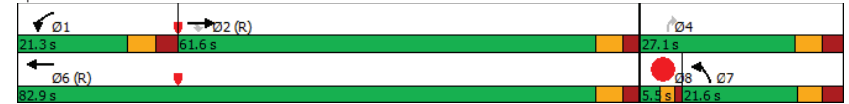
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
5: Lamarche Ave & Innes Rd

2026 Future Background
PM Peak Hour

Maximum v/c Ratio: 0.88	Intersection LOS: C
Intersection Signal Delay: 20.9	ICU Level of Service D
Intersection Capacity Utilization 73.5%	
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 5: Lamarche Ave & Innes Rd



Appendix M

Synchro Intersection Worksheets – 2031 Future Background Conditions

Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

2031 Future Background
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	106	479	32	23	1310	170	123	268	46	114	111	489
Future Volume (vph)	106	479	32	23	1310	170	123	268	46	114	111	489
Satd. Flow (prot)	3124	3103	1427	1658	3316	1427	1642	3252	1441	1658	3221	1483
Fit Permitted	0.950			0.950			0.546			0.587		
Satd. Flow (perm)	3106	3103	1394	1648	3316	1380	943	3252	1388	1006	3221	1463
Satd. Flow (RTOR)			143			143			82			195
Lane Group Flow (vph)	106	479	32	23	1310	170	123	268	46	114	111	489
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4				8
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.6	26.2	26.2	11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	32.7
Total Split (s)	13.0	65.0	65.0	13.0	65.0	65.0	19.0	52.0	52.0	33.0	33.0	33.0
Total Split (%)	10.0%	50.0%	50.0%	10.0%	50.0%	50.0%	14.6%	40.0%	40.0%	25.4%	25.4%	25.4%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.2	6.2	6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	6.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	6.4	64.0	64.0	6.4	58.8	58.8	45.3	45.3	45.3	26.9	26.9	26.9
Actuated g/C Ratio	0.05	0.49	0.49	0.05	0.45	0.45	0.35	0.35	0.35	0.21	0.21	0.21
v/c Ratio	0.69	0.31	0.04	0.28	0.87	0.24	0.31	0.24	0.09	0.55	0.17	1.07
Control Delay	83.8	21.5	0.1	68.3	40.1	5.9	32.4	30.8	1.5	57.7	43.5	91.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.8	21.5	0.1	68.3	40.1	5.9	32.4	30.8	1.5	57.7	43.5	91.5
LOS	F	C	A	E	D	A	C	C	A	E	D	F
Approach Delay		31.1			36.7			28.2			78.6	
Approach LOS		C			D			C			E	
Queue Length 50th (m)	14.0	41.0	0.0	5.8	156.8	3.8	22.1	25.5	0.0	26.5	12.4	~97.7
Queue Length 95th (m)	#27.1	54.0	0.0	15.1	189.2	16.8	37.2	36.3	2.2	46.8	20.9	#164.2
Internal Link Dist (m)		265.9			463.6			173.7			101.9	
Turn Bay Length (m)	135.5		87.0	106.0		57.0	48.0		43.5	50.0		53.0
Base Capacity (vph)	153	1527	758	86	1499	702	394	1133	537	208	667	457
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.31	0.04	0.27	0.87	0.24	0.31	0.24	0.09	0.55	0.17	1.07

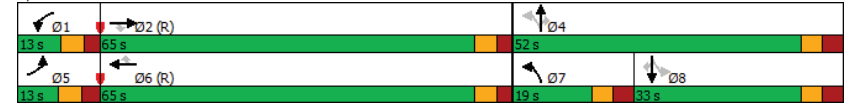
Intersection Summary	
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	99 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle:	105
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

2031 Future Background
AM Peak Hour

Maximum v/c Ratio: 1.07	Intersection LOS: D
Intersection Signal Delay: 43.6	ICU Level of Service F
Intersection Capacity Utilization 93.8%	
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Orleans Blvd & Innes Rd



Lanes, Volumes, Timings
2: Page Rd & Innes Rd

2031 Future Background
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↕	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	24	594	21	58	1438	28	14	12	61	51	11	51
Future Volume (vph)	24	594	21	58	1438	28	14	12	61	51	11	51
Satd. Flow (prot)	1483	3176	0	1658	3303	0	0	1508	0	0	1590	0
Fit Permitted	0.148			0.418				0.943			0.824	
Satd. Flow (perm)	231	3176	0	729	3303	0	0	1433	0	0	1339	0
Satd. Flow (RTOR)		5			3			61			35	
Lane Group Flow (vph)	24	615	0	58	1466	0	0	87	0	0	113	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	42.2	42.2		42.2	42.2		41.8	41.8		41.8	41.8	
Total Split (s)	78.0	78.0		78.0	78.0		42.0	42.0		42.0	42.0	
Total Split (%)	65.0%	65.0%		65.0%	65.0%		35.0%	35.0%		35.0%	35.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.8	6.8		6.8	6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	90.4	90.4		90.4	90.4		16.6	16.6		16.6	16.6	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.14	0.14		0.14	0.14	
v/c Ratio	0.14	0.26		0.11	0.59		0.35	0.53		0.35	0.53	
Control Delay	9.2	5.9		11.5	15.2		19.3	39.5		19.3	39.5	
Queue Delay	0.0	0.0		0.0	0.3		0.0	0.0		0.0	0.0	
Total Delay	9.2	5.9		11.5	15.5		19.3	39.5		19.3	39.5	
LOS	A	A		B	B		B	D		B	D	
Approach Delay		6.1			15.4			19.3			39.5	
Approach LOS		A			B			B			D	
Queue Length 50th (m)	1.1	16.3		4.9	71.7			5.7			17.8	
Queue Length 95th (m)	7.4	45.8		14.5	201.8			16.6			29.2	
Internal Link Dist (m)		463.6			206.5			143.5			112.1	
Turn Bay Length (m)	104.5			106.0								
Base Capacity (vph)	173	2395		549	2490		463	417		463	417	
Starvation Cap Reductn	0	0		0	424		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.14	0.26		0.11	0.71		0.19	0.27		0.19	0.27	

Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	26 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	85
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings
2: Page Rd & Innes Rd

2031 Future Background
AM Peak Hour

Maximum v/c Ratio: 0.59	Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 77.9%	ICU Level of Service D	
Analysis Period (min) 15		
m Volume for 95th percentile queue is metered by upstream signal.		

Splits and Phases: 2: Page Rd & Innes Rd



Lanes, Volumes, Timings

2031 Future Background

3: Ventus Way/3615 Innes Rd & Innes Rd

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	0	663	47	23	1329	2	109	0	49	0	0	1
Future Volume (vph)	0	663	47	23	1329	2	109	0	49	0	0	1
Satd. Flow (prot)	1745	3161	0	1566	3221	0	1409	1368	0	0	1489	0
Fit Permitted				0.374			0.757					
Satd. Flow (perm)	1745	3161	0	615	3221	0	1121	1368	0	0	1489	0
Satd. Flow (RTOR)		13						302				77
Lane Group Flow (vph)	0	710	0	23	1331	0	109	49	0	0	1	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			4				8
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8		8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0		10.0
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3		32.3
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0		33.0
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%		27.5%
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3		3.3
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0		3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0		0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.3	6.3		6.3		6.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None		None
Act Effct Green (s)		90.2		90.2	90.2		17.4	17.4		17.4		17.4
Actuated g/C Ratio		0.75		0.75	0.75		0.14	0.14		0.14		0.14
v/c Ratio		0.30		0.05	0.55		0.68	0.11		0.00		0.00
Control Delay		0.8		9.8	13.6		67.7	0.5		0.0		0.0
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0		0.0
Total Delay		0.8		9.8	13.6		67.7	0.5		0.0		0.0
LOS		A		A	B		E	A		A		A
Approach Delay		0.8			13.5			46.9				
Approach LOS		A			B			D				
Queue Length 50th (m)		0.2		1.1	55.1		24.8	0.0		0.0		0.0
Queue Length 95th (m)		1.2		m6.1	176.3		40.6	0.0		0.0		0.0
Internal Link Dist (m)		221.9			561.5			129.3				33.2
Turn Bay Length (m)				40.0								
Base Capacity (vph)		2380		462	2422		249	539				391
Starvation Cap Reductn		0		0	0		0	0		0		0
Spillback Cap Reductn		0		0	0		0	0		0		0
Storage Cap Reductn		0		0	0		0	0		0		0
Reduced v/c Ratio		0.30		0.05	0.55		0.44	0.09		0.00		0.00

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

Lanes, Volumes, Timings

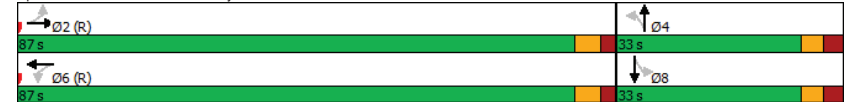
2031 Future Background

3: Ventus Way/3615 Innes Rd & Innes Rd

AM Peak Hour

Maximum v/c Ratio:	0.68
Intersection Signal Delay:	11.8
Intersection LOS:	B
Intersection Capacity Utilization:	62.8%
ICU Level of Service:	B
Analysis Period (min):	15
m	Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Ventus Way/3615 Innes Rd & Innes Rd



Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2031 Future Background
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	21	667	10	39	1295	45	29	5	16	49	3	32
Future Volume (vph)	21	667	10	39	1295	45	29	5	16	49	3	32
Satd. Flow (prot)	1311	3161	1483	1537	3165	0	1537	1483	1427	0	1510	0
Fit Permitted	0.950			0.950			0.741				0.818	
Satd. Flow (perm)	1311	3161	1444	1533	3165	0	1198	1483	1427	0	1270	0
Satd. Flow (RTOR)			115		4				105		25	
Lane Group Flow (vph)	21	667	10	39	1340	0	29	5	16	0	84	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2				4		4	8		
Detector Phase	5	2	2	1	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.3	32.3	32.3	11.3	32.3		36.3	36.3	36.3	36.3	36.3	
Total Split (s)	12.0	66.0	66.0	12.0	66.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	10.0%	55.0%	55.0%	10.0%	55.0%		30.8%	30.8%	30.8%	30.8%	30.8%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6		4.3	4.3	4.3	4.3	4.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.3	6.3	6.3	6.3		7.3	7.3	7.3		7.3	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lag	Lag	Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None	None	
Act Effct Green (s)	7.5	84.0	84.0	8.6	90.2		14.7	14.7	14.7		14.7	
Actuated g/C Ratio	0.06	0.70	0.70	0.07	0.75		0.12	0.12	0.12		0.12	
v/c Ratio	0.26	0.30	0.01	0.36	0.56		0.20	0.03	0.06		0.47	
Control Delay	78.3	4.5	0.0	61.3	12.4		47.1	41.0	0.4		41.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	78.3	4.5	0.0	61.3	12.4		47.1	41.0	0.4		41.7	
LOS	E	A	A	E	B		D	D	A		D	
Approach Delay		6.6			13.8			31.6			41.7	
Approach LOS		A			B			C			D	
Queue Length 50th (m)	5.2	9.1	0.0	8.9	47.8		6.5	1.1	0.0		13.5	
Queue Length 95th (m)	14.2	18.0	m0.0	19.8	168.4		13.3	4.2	0.0		25.1	
Internal Link Dist (m)		561.5			183.4			77.4			48.4	
Turn Bay Length (m)	47.5		58.5	58.5			48.5		20.0			
Base Capacity (vph)	82	2211	1045	110	2379		296	367	432		333	
Starvation Cap Reductn	0	0	0	0	0		0	0	0		0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0		0	
Storage Cap Reductn	0	0	0	0	0		0	0	0		0	
Reduced v/c Ratio	0.26	0.30	0.01	0.35	0.56		0.10	0.01	0.04		0.25	

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 40 (33%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2031 Future Background
AM Peak Hour

Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Fit Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	3.0	4.0
Total Split (s)	5.0	5.0
Total Split (%)	4%	4%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2031 Future Background
AM Peak Hour

Maximum v/c Ratio: 0.56	Intersection LOS: B
Intersection Signal Delay: 13.0	ICU Level of Service B
Intersection Capacity Utilization 62.8%	
Analysis Period (min) 15	

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

Splits and Phases: 4: Innes Rd & Viseneau Dr



Lanes, Volumes, Timings
5: Lamarche Ave & Innes Rd

2031 Future Background
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Lane Configurations	↔↔	↔	↔	↔↔	↔	↔	
Traffic Volume (vph)	541	159	160	1286	238	166	
Future Volume (vph)	541	159	160	1286	238	166	
Satd. Flow (prot)	3191	1455	1658	3221	1642	1469	
Fit Permitted			0.950		0.950		
Satd. Flow (perm)	3191	1419	1654	3221	1640	1469	
Satd. Flow (RTOR)							
Lane Group Flow (vph)	541	159	160	1286	238	166	
Turn Type	NA	Perm	Prot	NA	Prot	Perm	
Protected Phases	2		1	6	7		8
Permitted Phases		2				4	
Detector Phase	2	2	1	6	7	4	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	5.0	5.0	1.0
Minimum Split (s)	22.5	22.5	11.7	22.5	22.5	22.5	5.5
Total Split (s)	41.5	41.5	30.0	71.5	43.0	48.5	5.5
Total Split (%)	34.6%	34.6%	25.0%	59.6%	35.8%	40.4%	5%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.5	2.0
All-Red Time (s)	2.3	2.3	3.0	2.3	3.0	3.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.7	6.0	6.3	6.5	
Lead/Lag	Lag	Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes
Recall Mode	C-Max	C-Max	None	C-Max	None	None	Max
Act Effct Green (s)	55.9	55.9	16.8	79.4	22.8	28.1	
Actuated g/C Ratio	0.47	0.47	0.14	0.66	0.19	0.23	
v/c Ratio	0.36	0.24	0.69	0.60	0.77	0.48	
Control Delay	27.9	28.9	59.3	13.3	61.6	43.5	
Queue Delay	0.0	0.0	0.0	0.0	0.3	0.0	
Total Delay	27.9	28.9	59.3	13.3	61.8	43.5	
LOS	C	C	E	B	E	D	
Approach Delay	28.2			18.4	54.3		
Approach LOS	C			B	D		
Queue Length 50th (m)	38.4	20.3	36.9	89.2	53.6	33.9	
Queue Length 95th (m)	87.6	59.9	60.8	121.4	75.3	50.7	
Internal Link Dist (m)	206.5			221.9	196.1		
Turn Bay Length (m)		40.0	87.0		80.0		
Base Capacity (vph)	1487	661	321	2131	502	514	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	41	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.36	0.24	0.50	0.60	0.52	0.32	

Intersection Summary

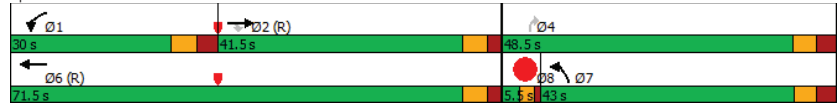
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
5: Lamarche Ave & Innes Rd

2031 Future Background
AM Peak Hour

Maximum v/c Ratio: 0.77	Intersection LOS: C
Intersection Signal Delay: 26.7	ICU Level of Service B
Intersection Capacity Utilization 61.7%	
Analysis Period (min) 15	

Splits and Phases: 5: Lamarche Ave & Innes Rd



Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

2031 Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	462	1475	107	75	822	198	56	192	95	231	279	267
Future Volume (vph)	462	1475	107	75	822	198	56	192	95	231	279	267
Satd. Flow (prot)	3216	3316	1455	1642	3221	1483	1658	3283	1483	1658	3221	1469
Fit Permitted	0.950			0.950			0.462			0.631		
Satd. Flow (perm)	3194	3316	1421	1639	3221	1446	797	3283	1446	1090	3221	1422
Satd. Flow (RTOR)			165			230			159			
Lane Group Flow (vph)	462	1475	107	75	822	198	56	192	95	231	279	267
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4		8	8	
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	16.6	26.2	26.2	11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	32.7
Total Split (s)	31.0	49.0	49.0	16.0	34.0	34.0	12.0	45.0	45.0	33.0	33.0	33.0
Total Split (%)	28.2%	44.5%	44.5%	14.5%	30.9%	30.9%	10.9%	40.9%	40.9%	30.0%	30.0%	30.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.2	6.2	6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	6.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	Max	Max	Max
Act Effct Green (s)	20.6	46.2	46.2	8.8	31.6	31.6	38.3	38.3	38.3	28.7	28.7	28.7
Actuated g/C Ratio	0.19	0.42	0.42	0.08	0.29	0.29	0.35	0.35	0.35	0.26	0.26	0.26
v/c Ratio	0.77	1.06	0.15	0.57	0.89	0.34	0.18	0.17	0.16	0.81	0.33	0.47
Control Delay	51.3	73.9	1.2	56.0	56.1	14.9	25.8	25.3	0.9	62.9	35.2	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.3	73.9	1.2	56.0	56.1	14.9	25.8	25.3	0.9	62.9	35.2	7.2
LOS	D	E	A	E	E	B	C	C	A	E	D	A
Approach Delay		65.0			48.6			18.6			33.8	
Approach LOS		E			D			B			C	
Queue Length 50th (m)	48.8	~195.5	0.0	14.0	68.8	3.5	8.1	14.8	0.0	48.1	26.3	0.0
Queue Length 95th (m)	63.6	#237.3	2.5	32.1	#140.8	43.4	16.8	23.2	1.3	#92.6	38.5	20.5
Internal Link Dist (m)		265.9			463.6			320.4			270.5	
Turn Bay Length (m)	135.5		87.0	106.0		57.0	48.0		43.5	50.0		53.0
Base Capacity (vph)	713	1394	692	146	926	579	318	1143	607	284	840	568
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	1.06	0.15	0.51	0.89	0.34	0.18	0.17	0.16	0.81	0.33	0.47

Intersection Summary

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

Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

2031 Future Background
PM Peak Hour

Maximum v/c Ratio: 1.06	Intersection LOS: D
Intersection Signal Delay: 51.4	ICU Level of Service G
Intersection Capacity Utilization 104.1%	
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Orleans Blvd & Innes Rd



Lanes, Volumes, Timings
2: Page Rd & Innes Rd

2031 Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↕	↕	↔	↕	↕	↕
Traffic Volume (vph)	64	1728	19	116	1043	72	18	18	108	91	17	34
Future Volume (vph)	64	1728	19	116	1043	72	18	18	108	91	17	34
Satd. Flow (prot)	1658	3308	0	1658	3243	0	0	1536	0	0	1597	0
Fit Permitted	0.224			0.087				0.952			0.659	
Satd. Flow (perm)	389	3308	0	152	3243	0	0	1471	0	0	1082	0
Satd. Flow (RTOR)		2			10			16			15	
Lane Group Flow (vph)	64	1747	0	116	1115	0	0	144	0	0	142	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	42.2	42.2		42.2	42.2		41.8	41.8		41.8	41.8	
Total Split (s)	68.0	68.0		68.0	68.0		42.0	42.0		42.0	42.0	
Total Split (%)	61.8%	61.8%		61.8%	61.8%		38.2%	38.2%		38.2%	38.2%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.8	6.8		6.8	6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	77.6	77.6		77.6	77.6		19.4	19.4		19.4	19.4	
Actuated g/C Ratio	0.71	0.71		0.71	0.71		0.18	0.18		0.18	0.18	
v/c Ratio	0.23	0.75		1.08	0.49		0.53	0.70		0.53	0.70	
Control Delay	3.0	7.5		134.5	8.9		41.5	54.3		41.5	54.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.0	7.5		134.5	8.9		41.5	54.3		41.5	54.3	
LOS	A	A		F	A		D	D		D	D	
Approach Delay		7.4			20.7		41.5	54.3		41.5	54.3	
Approach LOS		A			C		D	D		D	D	
Queue Length 50th (m)	1.4	27.3		~24.1	24.8		25.8	26.6		25.8	26.6	
Queue Length 95th (m)	m2.4	m32.0		m#59.8	37.4		37.0	39.3		37.0	39.3	
Internal Link Dist (m)		463.6			206.5		143.5	112.1		143.5	112.1	
Turn Bay Length (m)	104.5			106.0								
Base Capacity (vph)	274	2334		107	2291		481	356		481	356	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.23	0.75		1.08	0.49		0.30	0.40		0.30	0.40	

Intersection Summary

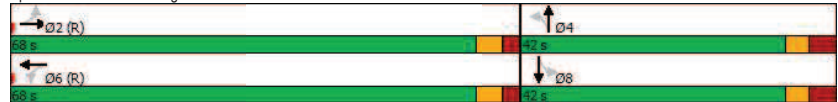
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 2 (2%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
2: Page Rd & Innes Rd

2031 Future Background
PM Peak Hour

Maximum v/c Ratio: 1.08	Intersection LOS: B
Intersection Signal Delay: 15.8	ICU Level of Service G
Intersection Capacity Utilization 105.3%	
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 2: Page Rd & Innes Rd



Lanes, Volumes, Timings
3: Ventus Way/3615 Innes Rd & Innes Rd

2031 Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	11	1705	128	51	1131	10	77	0	46	4	0	7
Future Volume (vph)	11	1705	128	51	1131	10	77	0	46	4	0	7
Satd. Flow (prot)	1658	3260	0	1551	3312	0	1595	1388	0	0	1551	0
Fit Permitted	0.230			0.090			0.750					0.901
Satd. Flow (perm)	401	3260	0	147	3312	0	1255	1388	0	0	1423	0
Satd. Flow (RTOR)		14			2			31				31
Lane Group Flow (vph)	11	1833	0	51	1141	0	77	46	0	0	11	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	34.1	34.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	77.0	77.0		77.0	77.0		33.0	33.0		33.0	33.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.3	6.3		6.3	6.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	87.6	87.6		87.6	87.6		14.5	14.5		14.5	14.5	
Actuated g/C Ratio	0.80	0.80		0.80	0.80		0.13	0.13		0.13	0.13	
v/c Ratio	0.03	0.71		0.44	0.43		0.47	0.22		0.05	0.05	
Control Delay	2.4	10.0		23.3	5.9		51.6	21.0		2.4	2.4	
Queue Delay	0.0	0.7		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.4	10.7		23.3	5.9		51.6	21.0		2.4	2.4	
LOS	A	B		C	A		D	C		A	A	
Approach Delay		10.6			6.6			40.2			2.4	
Approach LOS		B			A			D			A	
Queue Length 50th (m)	0.0	198.2		3.1	35.7		15.9	2.9		0.0	0.0	
Queue Length 95th (m)	m0.7	m226.2		#26.1	78.2		26.8	11.8		1.2	1.2	
Internal Link Dist (m)		221.9			561.5			129.3			33.2	
Turn Bay Length (m)	85.0			40.0								
Base Capacity (vph)	319	2599		117	2637		304	360		368	368	
Starvation Cap Reductn	0	398		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.03	0.83		0.44	0.43		0.25	0.13		0.03	0.03	

Intersection Summary

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

Lanes, Volumes, Timings
3: Ventus Way/3615 Innes Rd & Innes Rd

2031 Future Background
PM Peak Hour

Maximum v/c Ratio: 0.71	Intersection LOS: B
Intersection Signal Delay: 10.2	ICU Level of Service D
Intersection Capacity Utilization 74.9%	
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 3: Ventus Way/3615 Innes Rd & Innes Rd



Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2031 Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	38	1653	39	103	1107	90	73	24	112	68	24	17
Future Volume (vph)	38	1653	39	103	1107	90	73	24	112	68	24	17
Satd. Flow (prot)	1566	3316	1483	1658	3180	0	1658	1745	1483	0	1576	0
Fit Permitted	0.950			0.950			0.688				0.796	
Satd. Flow (perm)	1562	3316	1450	1657	3180	0	1197	1745	1462	0	1291	0
Satd. Flow (RTOR)			106		9				112		7	
Lane Group Flow (vph)	38	1653	39	103	1197	0	73	24	112	0	109	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2				4		4	8		
Detector Phase	5	2	2	1	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.3	32.3	32.3	11.3	32.3		36.3	36.3	36.3	36.3	36.3	
Total Split (s)	20.0	68.0	68.0	20.0	68.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	15.4%	52.3%	52.3%	15.4%	52.3%		28.5%	28.5%	28.5%	28.5%	28.5%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6		4.3	4.3	4.3	4.3	4.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.3	6.3	6.3	6.3		7.3	7.3	7.3	7.3	7.3	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lag	Lag	Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None	None	
Act Effct Green (s)	8.6	79.6	79.6	13.3	86.7		17.2	17.2	17.2	17.2	17.2	
Actuated g/C Ratio	0.07	0.61	0.61	0.10	0.67		0.13	0.13	0.13	0.13	0.13	
v/c Ratio	0.37	0.81	0.04	0.61	0.56		0.46	0.10	0.39	0.62	0.62	
Control Delay	67.2	25.6	0.1	70.3	15.0		59.4	46.8	11.6	63.3	63.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	67.2	25.6	0.1	70.3	15.0		59.4	46.8	11.6	63.3	63.3	
LOS	E	C	A	E	B		E	D	B	E	E	
Approach Delay		25.9			19.4			32.4			63.3	
Approach LOS		C			B			C			E	
Queue Length 50th (m)	9.5	157.3	0.0	25.7	80.6		17.8	5.6	0.0	25.4	25.4	
Queue Length 95th (m)	20.5	#281.9	0.0	42.8	141.2		29.8	12.3	15.2	40.0	40.0	
Internal Link Dist (m)		561.5			183.0			77.4			48.4	
Turn Bay Length (m)	47.5		58.5	58.5			48.5	20.0				
Base Capacity (vph)	165	2029	928	191	2122		273	398	420	300	300	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.23	0.81	0.04	0.54	0.56		0.27	0.06	0.27	0.36	0.36	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 105 (81%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2031 Future Background
PM Peak Hour

Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Fit Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	3.0	3.0
Total Split (s)	5.0	5.0
Total Split (%)	4%	4%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2031 Future Background
PM Peak Hour

Maximum v/c Ratio: 0.81	Intersection LOS: C
Intersection Signal Delay: 25.0	ICU Level of Service E
Intersection Capacity Utilization 85.0%	
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 4: Innes Rd & Viseneau Dr



Lanes, Volumes, Timings
5: Lamarche Ave & Innes Rd

2031 Future Background
PM Peak Hour

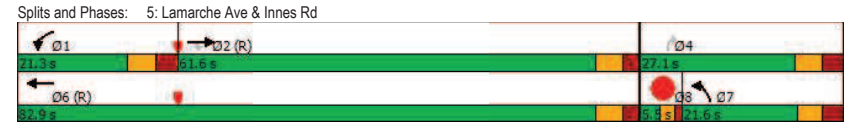
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Lane Configurations	↔↔	↔	↔↔	↔↔	↔	↔	
Traffic Volume (vph)	1641	280	173	1048	177	205	
Future Volume (vph)	1641	280	173	1048	177	205	
Satd. Flow (prot)	3316	1483	1658	3316	1658	1483	
Fit Permitted			0.950		0.950		
Satd. Flow (perm)	3316	1437	1656	3316	1658	1483	
Satd. Flow (RTOR)							
Lane Group Flow (vph)	1641	280	173	1048	177	205	
Turn Type	NA	Perm	Prot	NA	Prot	Perm	
Protected Phases	2		1	6	7		8
Permitted Phases		2				4	
Detector Phase	2	2	1	6	7	4	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	5.0	5.0	1.0
Minimum Split (s)	24.0	24.0	11.7	16.0	11.3	22.5	5.5
Total Split (s)	61.6	61.6	21.3	82.9	21.6	27.1	5.5
Total Split (%)	56.0%	56.0%	19.4%	75.4%	19.6%	24.6%	5%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.5	2.0
All-Red Time (s)	2.3	2.3	3.0	2.3	3.0	3.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.7	6.0	6.3	6.5	
Lead/Lag	Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	None	C-Max	None	Max	Max
Act Effct Green (s)	56.2	56.2	14.0	76.9	15.3	20.6	
Actuated g/C Ratio	0.51	0.51	0.13	0.70	0.14	0.19	
v/c Ratio	0.97	0.38	0.82	0.45	0.77	0.74	
Control Delay	35.1	18.3	71.4	10.4	68.3	59.5	
Queue Delay	0.1	0.0	0.0	0.0	0.0	61.4	
Total Delay	35.3	18.3	71.4	10.4	68.3	120.8	
LOS	D	B	E	B	E	F	
Approach Delay	32.8			19.1	96.5		
Approach LOS	C			B	F		
Queue Length 50th (m)	114.5	35.6	36.9	42.1	37.1	41.9	
Queue Length 95th (m)	#227.4	m36.4	#71.0	111.2	#70.2	#74.8	
Internal Link Dist (m)	206.5			221.9	196.1		
Turn Bay Length (m)		40.0	87.0		80.0		
Base Capacity (vph)	1695	734	220	2318	230	277	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	2	0	0	0	0	92	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.97	0.38	0.79	0.45	0.77	1.11	

Intersection Summary	
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings
5: Lamarche Ave & Innes Rd

2031 Future Background
PM Peak Hour

Maximum v/c Ratio: 0.97	Intersection Signal Delay: 34.9	Intersection LOS: C
Intersection Capacity Utilization 84.2%	ICU Level of Service E	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		
m Volume for 95th percentile queue is metered by upstream signal.		



Appendix N

Synchro Intersection Worksheets – 2026 Future Total Conditions

Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

2026 Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	106	428	32	23	1251	172	111	242	46	108	111	489
Future Volume (vph)	106	428	32	23	1251	172	111	242	46	108	111	489
Satd. Flow (prot)	3124	3103	1427	1658	3316	1427	1642	3252	1441	1658	3221	1483
Fit Permitted	0.950			0.950			0.547			0.601		
Satd. Flow (perm)	3105	3103	1394	1647	3316	1380	944	3252	1388	1030	3221	1463
Satd. Flow (RTOR)			143			143			82			204
Lane Group Flow (vph)	106	428	32	23	1251	172	111	242	46	108	111	489
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4				8
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.6	26.2	26.2	11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	32.7
Total Split (s)	13.0	65.0	65.0	13.0	65.0	65.0	19.0	52.0	52.0	33.0	33.0	33.0
Total Split (%)	10.0%	50.0%	50.0%	10.0%	50.0%	50.0%	14.6%	40.0%	40.0%	25.4%	25.4%	25.4%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.2	6.2	6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	6.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	6.4	64.0	64.0	6.4	58.8	58.8	45.3	45.3	45.3	27.2	27.2	27.2
Actuated g/C Ratio	0.05	0.49	0.49	0.05	0.45	0.45	0.35	0.35	0.35	0.21	0.21	0.21
v/c Ratio	0.69	0.28	0.04	0.28	0.83	0.25	0.29	0.21	0.09	0.50	0.16	1.05
Control Delay	83.8	21.0	0.1	68.3	37.5	6.0	31.8	30.5	1.5	55.2	43.4	83.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.8	21.0	0.1	68.3	37.5	6.0	31.8	30.5	1.5	55.2	43.4	83.8
LOS	F	C	A	E	D	A	C	C	A	E	D	F
Approach Delay		31.6			34.2			27.5			73.1	
Approach LOS		C			C			C			E	
Queue Length 50th (m)	14.0	36.0	0.0	5.8	145.6	4.1	19.8	22.8	0.0	24.9	12.4	~93.8
Queue Length 95th (m)	#27.1	48.0	0.0	15.1	175.8	17.1	34.0	33.1	2.2	44.4	20.9	#160.3
Internal Link Dist (m)		265.9			463.6			69.4			101.9	
Turn Bay Length (m)	135.5		87.0	106.0		57.0	48.0		43.5	50.0		53.0
Base Capacity (vph)	153	1527	758	86	1499	702	394	1133	537	215	673	467
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.28	0.04	0.27	0.83	0.25	0.28	0.21	0.09	0.50	0.16	1.05

Intersection Summary

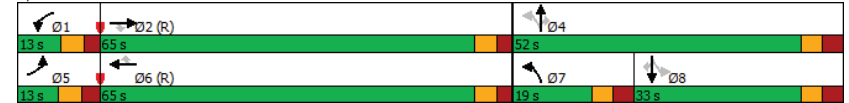
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 99 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

2026 Future Total
AM Peak Hour

Maximum v/c Ratio: 1.05	Intersection LOS: D
Intersection Signal Delay: 41.7	ICU Level of Service F
Intersection Capacity Utilization 91.4%	
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Orleans Blvd & Innes Rd



Lanes, Volumes, Timings
2: Page Rd & Innes Rd

2026 Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↕	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	24	536	21	58	1381	28	14	12	61	51	11	51
Future Volume (vph)	24	536	21	58	1381	28	14	12	61	51	11	51
Satd. Flow (prot)	1483	3173	0	1658	3303	0	0	1508	0	0	1590	0
Fit Permitted	0.160			0.443				0.943			0.824	
Satd. Flow (perm)	250	3173	0	773	3303	0	0	1433	0	0	1339	0
Satd. Flow (RTOR)		6			3			61			35	
Lane Group Flow (vph)	24	557	0	58	1409	0	0	87	0	0	113	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	42.2	42.2		42.2	42.2		41.8	41.8		41.8	41.8	
Total Split (s)	78.0	78.0		78.0	78.0		42.0	42.0		42.0	42.0	
Total Split (%)	65.0%	65.0%		65.0%	65.0%		35.0%	35.0%		35.0%	35.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.8	6.8		6.8	6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	90.4	90.4		90.4	90.4		16.6	16.6		16.6	16.6	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.14	0.14		0.14	0.14	
v/c Ratio	0.13	0.23		0.10	0.57		0.35	0.53		0.35	0.53	
Control Delay	8.8	5.8		10.2	12.4		19.3	39.5		19.3	39.5	
Queue Delay	0.0	0.0		0.0	0.2		0.0	0.0		0.0	0.0	
Total Delay	8.8	5.8		10.2	12.6		19.3	39.5		19.3	39.5	
LOS	A	A		B	B		B	D		B	D	
Approach Delay		5.9			12.5			19.3			39.5	
Approach LOS		A			B			B			D	
Queue Length 50th (m)	1.1	14.4		3.7	56.6			5.7			17.8	
Queue Length 95th (m)	7.2	41.0		12.3	173.7			16.6			29.2	
Internal Link Dist (m)		463.6			206.5			143.5			112.1	
Turn Bay Length (m)	104.5			106.0								
Base Capacity (vph)	188	2392		582	2490		463	417		463	417	
Starvation Cap Reductn	0	0		0	355		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.13	0.23		0.10	0.66		0.19	0.27		0.19	0.27	

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 26 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
2: Page Rd & Innes Rd

2026 Future Total
AM Peak Hour

Maximum v/c Ratio: 0.57
 Intersection Signal Delay: 12.4
 Intersection Capacity Utilization 77.9%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Page Rd & Innes Rd



Lanes, Volumes, Timings

2026 Future Total

3: Ventus Way/3615 Innes Rd & Innes Rd

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↕	↕	↔	↕	↕	↔	↔	↕	↔
Traffic Volume (vph)	0	621	47	23	1229	2	109	0	49	0	0	1
Future Volume (vph)	0	621	47	23	1229	2	109	0	49	0	0	1
Satd. Flow (prot)	1745	3158	0	1566	3221	0	1409	1368	0	0	1489	0
Fit Permitted				0.393			0.757					
Satd. Flow (perm)	1745	3158	0	647	3221	0	1121	1368	0	0	1489	0
Satd. Flow (RTOR)		14						328				95
Lane Group Flow (vph)	0	668	0	23	1231	0	109	49	0	0	1	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			4				8
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8		8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0		10.0
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3		32.3
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0		33.0
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%		27.5%
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3		3.3
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0		3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0		0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.3	6.3				6.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None		None
Act Effct Green (s)		90.2			90.2		17.4	17.4				17.4
Actuated g/C Ratio		0.75			0.75		0.14	0.14				0.14
v/c Ratio		0.28			0.05		0.51	0.68		0.10		0.00
Control Delay		4.7			9.9		12.8	67.7		0.4		0.0
Queue Delay		0.0			0.0		0.0	0.0		0.0		0.0
Total Delay		4.7			9.9		12.8	67.7		0.4		0.0
LOS		A			A		B	E		A		A
Approach Delay		4.7			12.7			46.8				
Approach LOS		A			B			D				
Queue Length 50th (m)		37.1			1.1		48.3	24.8		0.0		0.0
Queue Length 95th (m)		84.0			m7.2		162.3	40.6		0.0		0.0
Internal Link Dist (m)		221.9					561.5			129.3		33.2
Turn Bay Length (m)					40.0							
Base Capacity (vph)		2378			486		2422	249		559		405
Starvation Cap Reductn		0			0		0	0		0		0
Spillback Cap Reductn		0			0		0	0		0		0
Storage Cap Reductn		0			0		0	0		0		0
Reduced v/c Ratio		0.28			0.05		0.51	0.44		0.09		0.00

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings

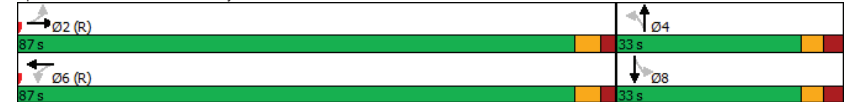
2026 Future Total

3: Ventus Way/3615 Innes Rd & Innes Rd

AM Peak Hour

Maximum v/c Ratio: 0.68	Intersection Signal Delay: 12.7	Intersection LOS: B
Intersection Capacity Utilization 59.9%	ICU Level of Service B	
Analysis Period (min) 15		
m Volume for 95th percentile queue is metered by upstream signal.		

Splits and Phases: 3: Ventus Way/3615 Innes Rd & Innes Rd



Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2026 Future Total
AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖	↖	↖	↖↖		↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	21	625	10	39	1195	45	29	5	16	49	3	32
Future Volume (vph)	21	625	10	39	1195	45	29	5	16	49	3	32
Satd. Flow (prot)	1311	3161	1483	1537	3164	0	1537	1483	1427	0	1510	0
Fit Permitted	0.950			0.950			0.741			0.818		
Satd. Flow (perm)	1311	3161	1444	1533	3164	0	1198	1483	1427	0	1270	0
Satd. Flow (RTOR)			115		4				105		25	
Lane Group Flow (vph)	21	625	10	39	1240	0	29	5	16	0	84	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2				4		4	8		
Detector Phase	5	2	2	1	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.3	32.3	32.3	11.3	32.3		36.3	36.3	36.3	36.3	36.3	
Total Split (s)	12.0	66.0	66.0	12.0	66.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	10.0%	55.0%	55.0%	10.0%	55.0%		30.8%	30.8%	30.8%	30.8%	30.8%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6		4.3	4.3	4.3	4.3	4.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.3	6.3	6.3	6.3		7.3	7.3	7.3		7.3	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lag	Lag	Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None	None	
Act Effct Green (s)	7.5	84.0	84.0	8.6	90.2		14.7	14.7	14.7		14.7	
Actuated g/C Ratio	0.06	0.70	0.70	0.07	0.75		0.12	0.12	0.12		0.12	
v/c Ratio	0.26	0.28	0.01	0.36	0.52		0.20	0.03	0.06		0.47	
Control Delay	85.4	3.5	0.0	61.3	11.6		47.1	41.0	0.4		41.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	85.4	3.5	0.0	61.3	11.6		47.1	41.0	0.4		41.7	
LOS	F	A	A	E	B		D	D	A		D	
Approach Delay		6.1			13.1			31.6			41.7	
Approach LOS		A			B			C			D	
Queue Length 50th (m)	5.3	3.3	0.0	8.9	42.0		6.5	1.1	0.0		13.5	
Queue Length 95th (m)	14.1	53.1	0.0	19.8	148.0		13.3	4.2	0.0		25.1	
Internal Link Dist (m)		561.5			183.4			77.4			48.4	
Turn Bay Length (m)	47.5		58.5	58.5			48.5		20.0			
Base Capacity (vph)	82	2211	1045	110	2378		296	367	432		333	
Starvation Cap Reductn	0	0	0	0	0		0	0	0		0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0		0	
Storage Cap Reductn	0	0	0	0	0		0	0	0		0	
Reduced v/c Ratio	0.26	0.28	0.01	0.35	0.52		0.10	0.01	0.04		0.25	

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 40 (33%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2026 Future Total
AM Peak Hour

	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Fit Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	3.0	4.0
Total Split (s)	5.0	5.0
Total Split (%)	4%	4%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

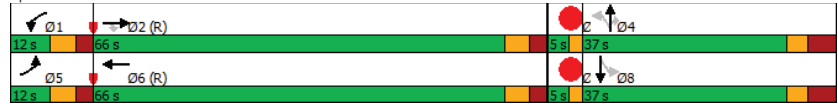
Intersection Summary

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2026 Future Total
AM Peak Hour

Maximum v/c Ratio: 0.52	Intersection LOS: B
Intersection Signal Delay: 12.5	ICU Level of Service B
Intersection Capacity Utilization 59.9%	
Analysis Period (min) 15	

Splits and Phases: 4: Innes Rd & Viseneau Dr



Lanes, Volumes, Timings
5: Lamarche Ave & Innes Rd

2026 Future Total
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Lane Configurations	↔↔	↔	↔	↔↔	↔	↔	
Traffic Volume (vph)	565	77	51	1295	172	100	
Future Volume (vph)	565	77	51	1295	172	100	
Satd. Flow (prot)	3191	1455	1658	3221	1642	1469	
Fit Permitted			0.950		0.950		
Satd. Flow (perm)	3191	1419	1654	3221	1640	1469	
Satd. Flow (RTOR)							
Lane Group Flow (vph)	565	77	51	1295	172	100	
Turn Type	NA	Perm	Prot	NA	Prot	Perm	
Protected Phases	2		1	6	7		8
Permitted Phases		2				4	
Detector Phase	2	2	1	6	7	4	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	5.0	5.0	1.0
Minimum Split (s)	22.5	22.5	11.7	22.5	22.5	22.5	5.5
Total Split (s)	41.5	41.5	30.0	71.5	43.0	48.5	5.5
Total Split (%)	34.6%	34.6%	25.0%	59.6%	35.8%	40.4%	5%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.5	2.0
All-Red Time (s)	2.3	2.3	3.0	2.3	3.0	3.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.7	6.0	6.3	6.5	
Lead/Lag	Lag	Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes
Recall Mode	C-Max	C-Max	None	C-Max	None	None	Max
Act Effct Green (s)	70.9	70.9	9.1	84.2	18.0	23.3	
Actuated g/C Ratio	0.59	0.59	0.08	0.70	0.15	0.19	
v/c Ratio	0.30	0.09	0.41	0.57	0.70	0.35	
Control Delay	18.4	18.9	59.7	10.3	63.0	44.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	18.4	18.9	59.7	10.3	63.0	44.0	
LOS	B	B	E	B	E	D	
Approach Delay	18.5			12.1	56.0		
Approach LOS	B			B	E		
Queue Length 50th (m)	31.5	7.2	11.5	80.3	39.0	20.6	
Queue Length 95th (m)	80.3	27.5	m25.0	109.7	58.5	34.3	
Internal Link Dist (m)	206.5			221.9	77.9		
Turn Bay Length (m)		40.0	87.0		80.0		
Base Capacity (vph)	1884	838	321	2260	502	514	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.30	0.09	0.16	0.57	0.34	0.19	

Intersection Summary

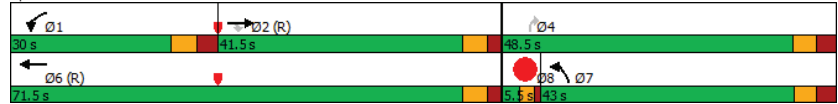
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
5: Lamarche Ave & Innes Rd

2026 Future Total
AM Peak Hour

Maximum v/c Ratio: 0.70	Intersection LOS: B
Intersection Signal Delay: 19.2	ICU Level of Service B
Intersection Capacity Utilization 58.1%	
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 5: Lamarche Ave & Innes Rd



HCM 2010 TWSC
6: Lamarche Ave & Access #1

2026 Future Total
AM Peak Hour

Intersection						
Int Delay, s/veh	5.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	0	71	46	0	31	19
Future Vol, veh/h	0	71	46	0	31	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	71	46	0	31	19

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	127	46	0 46 0
Stage 1	46	-	- - -
Stage 2	81	-	- - -
Critical Hdwy	6.42	6.22	- - 4.12 -
Critical Hdwy Stg 1	5.42	-	- - - -
Critical Hdwy Stg 2	5.42	-	- - - -
Follow-up Hdwy	3.518	3.318	- - 2.218 -
Pot Cap-1 Maneuver	868	1023	- - 1562 -
Stage 1	976	-	- - - -
Stage 2	942	-	- - - -
Platoon blocked, %	-	-	- - - -
Mov Cap-1 Maneuver	851	1023	- - 1562 -
Mov Cap-2 Maneuver	851	-	- - - -
Stage 1	976	-	- - - -
Stage 2	923	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	4.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 1023	1562	-
HCM Lane V/C Ratio	-	- 0.069	0.02	-
HCM Control Delay (s)	-	- 8.8	7.4	0
HCM Lane LOS	-	- A	A	A
HCM 95th %tile Q(veh)	-	- 0.2	0.1	-

HCM 2010 TWSC
7: Lamarche Ave & Access #2

2026 Future Total
AM Peak Hour

Intersection						
Int Delay, s/veh	5.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	
Traffic Vol, veh/h	0	31	15	0	13	6
Future Vol, veh/h	0	31	15	0	13	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	31	15	0	13	6
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	47	15	0	0	15	0
Stage 1	15	-	-	-	-	-
Stage 2	32	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	963	1065	-	-	1603	-
Stage 1	1008	-	-	-	-	-
Stage 2	991	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	955	1065	-	-	1603	-
Mov Cap-2 Maneuver	955	-	-	-	-	-
Stage 1	1008	-	-	-	-	-
Stage 2	983	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	8.5	0	5			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	1065	1603		
HCM Lane V/C Ratio	-	-	0.029	0.008		
HCM Control Delay (s)	-	-	8.5	7.3	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

2026 Future Total
PM Peak Hour

Lane Group												
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	462	1398	97	75	772	196	56	192	95	230	253	267
Future Volume (vph)	462	1398	97	75	772	196	56	192	95	230	253	267
Satd. Flow (prot)	3216	3316	1455	1642	3221	1483	1658	3283	1483	1658	3221	1469
Fit Permitted	0.950			0.950			0.482			0.631		
Satd. Flow (perm)	3192	3316	1421	1639	3221	1446	831	3283	1446	1090	3221	1422
Satd. Flow (RTOR)			165			230			159			267
Lane Group Flow (vph)	462	1398	97	75	772	196	56	192	95	230	253	267
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	16.6	26.2	26.2	11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	32.7
Total Split (s)	31.0	49.0	49.0	16.0	34.0	34.0	12.0	45.0	45.0	33.0	33.0	33.0
Total Split (%)	28.2%	44.5%	44.5%	14.5%	30.9%	30.9%	10.9%	40.9%	40.9%	30.0%	30.0%	30.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.2	6.2	6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	6.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	Max	Max	Max
Act Effct Green (s)	20.6	46.2	46.2	8.8	31.6	31.6	38.3	38.3	38.3	28.7	28.7	28.7
Actuated g/C Ratio	0.19	0.42	0.42	0.08	0.29	0.29	0.35	0.35	0.35	0.26	0.26	0.26
v/c Ratio	0.77	1.00	0.14	0.57	0.83	0.34	0.17	0.17	0.16	0.81	0.30	0.47
Control Delay	51.3	58.3	0.6	56.1	53.1	14.8	25.7	25.3	0.9	62.5	34.8	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.3	58.3	0.6	56.1	53.1	14.8	25.7	25.3	0.9	62.5	34.8	7.2
LOS	D	E	A	E	D	B	C	C	A	E	C	A
Approach Delay	53.8			46.1				18.6			33.5	
Approach LOS	D			D				B			C	
Queue Length 50th (m)	48.8	~177.4	0.0	13.7	67.0	3.6	8.1	14.8	0.0	47.8	23.7	0.0
Queue Length 95th (m)	63.6	#219.1	0.8	32.3	#127.8	43.6	16.8	23.2	1.3	#92.1	35.3	20.5
Internal Link Dist (m)	265.9			463.6						172.9		
Turn Bay Length (m)	135.5		87.0		106.0		57.0		48.0		53.0	
Base Capacity (vph)	713	1394	692	146	926	579	329	1143	607	284	840	568
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	1.00	0.14	0.51	0.83	0.34	0.17	0.17	0.16	0.81	0.30	0.47

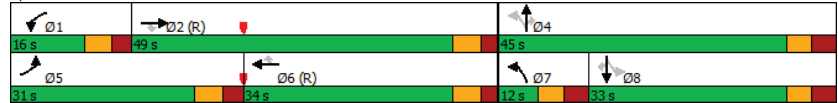
Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	

Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

2026 Future Total
PM Peak Hour

Maximum v/c Ratio: 1.00	Intersection Signal Delay: 45.2	Intersection LOS: D
Intersection Capacity Utilization 101.8%	ICU Level of Service G	
Analysis Period (min) 15		
~ Volume exceeds capacity, queue is theoretically infinite.		
Queue shown is maximum after two cycles.		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		

Splits and Phases: 1: Orleans Blvd & Innes Rd



Lanes, Volumes, Timings
2: Page Rd & Innes Rd

2026 Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	64	1650	19	116	991	72	18	18	108	91	17	34
Future Volume (vph)	64	1650	19	116	991	72	18	18	108	91	17	34
Satd. Flow (prot)	1658	3308	0	1658	3242	0	0	1536	0	0	1597	0
Fit Permitted	0.240			0.100				0.952			0.659	
Satd. Flow (perm)	417	3308	0	175	3242	0	0	1471	0	0	1082	0
Satd. Flow (RTOR)		2			11			20			15	
Lane Group Flow (vph)	64	1669	0	116	1063	0	0	144	0	0	142	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	42.2	42.2		42.2	42.2		41.8	41.8		41.8	41.8	
Total Split (s)	68.0	68.0		68.0	68.0		42.0	42.0		42.0	42.0	
Total Split (%)	61.8%	61.8%		61.8%	61.8%		38.2%	38.2%		38.2%	38.2%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.8	6.8		6.8	6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	77.6	77.6		77.6	77.6		19.4	19.4		19.4	19.4	
Actuated g/C Ratio	0.71	0.71		0.71	0.71		0.18	0.18		0.18	0.18	
v/c Ratio	0.22	0.72		0.94	0.46		0.52	0.70		0.52	0.70	
Control Delay	3.2	6.2		90.1	8.1		40.0	54.3		40.0	54.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.2	6.2		90.1	8.1		40.0	54.3		40.0	54.3	
LOS	A	A		F	A		D	D		D	D	
Approach Delay		6.1			16.1		40.0	54.3		40.0	54.3	
Approach LOS		A			B		D	D		D	D	
Queue Length 50th (m)	1.4	27.2		21.2	19.2		24.9	26.6		24.9	26.6	
Queue Length 95th (m)	m2.5	m33.3		#58.5	0.0		36.2	39.3		36.2	39.3	
Internal Link Dist (m)		463.6			206.5		143.5	112.1		143.5	112.1	
Turn Bay Length (m)	104.5			106.0								
Base Capacity (vph)	294	2334		123	2291		484	356		484	356	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.22	0.72		0.94	0.46		0.30	0.40		0.30	0.40	

Intersection Summary

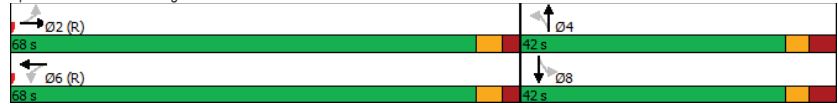
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 2 (2%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
2: Page Rd & Innes Rd

2026 Future Total
PM Peak Hour

Maximum v/c Ratio: 0.94	Intersection LOS: B
Intersection Signal Delay: 13.5	ICU Level of Service G
Intersection Capacity Utilization 103.0%	
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 2: Page Rd & Innes Rd



Lanes, Volumes, Timings
3: Ventus Way/3615 Innes Rd & Innes Rd

2026 Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	11	1610	128	51	1063	10	77	0	46	4	0	7
Future Volume (vph)	11	1610	128	51	1063	10	77	0	46	4	0	7
Satd. Flow (prot)	1658	3256	0	1551	3312	0	1595	1388	0	0	1551	0
Fit Permitted	0.250			0.105			0.750					0.901
Satd. Flow (perm)	436	3256	0	171	3312	0	1255	1388	0	0	1423	0
Satd. Flow (RTOR)		15			2			37				31
Lane Group Flow (vph)	11	1738	0	51	1073	0	77	46	0	0	11	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	34.1	34.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	77.0	77.0		77.0	77.0		33.0	33.0		33.0	33.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.3	6.3		6.3	6.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	87.6	87.6		87.6	87.6		14.5	14.5		14.5	14.5	
Actuated g/C Ratio	0.80	0.80		0.80	0.80		0.13	0.13		0.13	0.13	
v/c Ratio	0.03	0.67		0.38	0.41		0.47	0.21		0.05	0.05	
Control Delay	2.6	11.2		17.2	5.7		51.6	17.7		2.4	2.4	
Queue Delay	0.0	0.6		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.6	11.8		17.2	5.7		51.6	17.7		2.4	2.4	
LOS	A	B		B	A		D	B		A	A	
Approach Delay		11.7			6.2			39.0			2.4	
Approach LOS		B			A			D			A	
Queue Length 50th (m)	0.1	201.4		2.8	32.6		15.9	1.8		0.0	0.0	
Queue Length 95th (m)	m0.8	m224.0		19.1	71.5		26.8	10.7		1.2	1.2	
Internal Link Dist (m)		221.9			561.5			129.3			33.2	
Turn Bay Length (m)	85.0			40.0								
Base Capacity (vph)	347	2596		136	2637		304	364		368	368	
Starvation Cap Reductn	0	431		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.03	0.80		0.38	0.41		0.25	0.13		0.03	0.03	

Intersection Summary

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

Lanes, Volumes, Timings
3: Ventus Way/3615 Innes Rd & Innes Rd

2026 Future Total
PM Peak Hour

Maximum v/c Ratio: 0.67	Intersection LOS: B
Intersection Signal Delay: 10.7	ICU Level of Service C
Intersection Capacity Utilization 72.1%	
Analysis Period (min) 15	

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

Splits and Phases: 3: Ventus Way/3615 Innes Rd & Innes Rd



Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2026 Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↕	↔	↔	↕↕	↔	↔	↕	↕	↔	↕↕	↔
Traffic Volume (vph)	38	1558	39	103	1039	90	73	24	112	68	24	17
Future Volume (vph)	38	1558	39	103	1039	90	73	24	112	68	24	17
Satd. Flow (prot)	1566	3316	1483	1658	3177	0	1658	1745	1483	0	1576	0
Fit Permitted	0.950			0.950			0.688				0.796	
Satd. Flow (perm)	1562	3316	1450	1657	3177	0	1197	1745	1462	0	1291	0
Satd. Flow (RTOR)			106		9				112		7	
Lane Group Flow (vph)	38	1558	39	103	1129	0	73	24	112	0	109	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2				4		4	8		
Detector Phase	5	2	2	1	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.3	32.3	32.3	11.3	32.3		36.3	36.3	36.3	36.3	36.3	
Total Split (s)	20.0	68.0	68.0	20.0	68.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	15.4%	52.3%	52.3%	15.4%	52.3%		28.5%	28.5%	28.5%	28.5%	28.5%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6		4.3	4.3	4.3	4.3	4.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.3	6.3	6.3	6.3		7.3	7.3	7.3		7.3	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lag	Lag	Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None	None	
Act Effct Green (s)	8.6	79.6	79.6	13.3	86.7		17.2	17.2	17.2		17.2	
Actuated g/C Ratio	0.07	0.61	0.61	0.10	0.67		0.13	0.13	0.13		0.13	
v/c Ratio	0.37	0.77	0.04	0.61	0.53		0.46	0.10	0.39		0.62	
Control Delay	67.2	23.7	0.1	70.3	14.4		59.4	46.8	11.6		63.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	67.2	23.7	0.1	70.3	14.4		59.4	46.8	11.6		63.3	
LOS	E	C	A	E	B		E	D	B		E	
Approach Delay		24.2			19.1			32.4			63.3	
Approach LOS		C			B			C			E	
Queue Length 50th (m)	9.5	140.3	0.0	25.7	73.5		17.8	5.6	0.0		25.4	
Queue Length 95th (m)	20.5	#255.3	0.0	42.8	129.2		29.8	12.3	15.2		40.0	
Internal Link Dist (m)		561.5			183.0			77.4			48.4	
Turn Bay Length (m)	47.5		58.5	58.5			48.5		20.0			
Base Capacity (vph)	165	2029	928	191	2120		273	398	420		300	
Starvation Cap Reductn	0	0	0	0	0		0	0	0		0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0		0	
Storage Cap Reductn	0	0	0	0	0		0	0	0		0	
Reduced v/c Ratio	0.23	0.77	0.04	0.54	0.53		0.27	0.06	0.27		0.36	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 105 (81%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

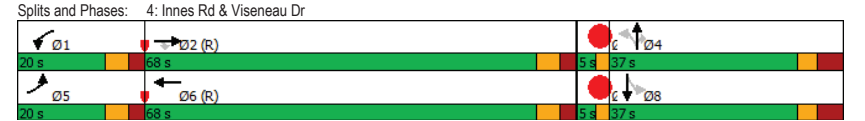
2026 Future Total
PM Peak Hour

Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Fit Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	3.0	3.0
Total Split (s)	5.0	5.0
Total Split (%)	4%	4%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2026 Future Total
PM Peak Hour

Maximum v/c Ratio: 0.77	Intersection LOS: C
Intersection Signal Delay: 24.1	ICU Level of Service E
Intersection Capacity Utilization 82.2%	
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	



Lanes, Volumes, Timings
5: Lamarche Ave & Innes Rd

2026 Future Total
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Lane Configurations	↕↕	↕	↕↕	↕↕	↕	↕	
Traffic Volume (vph)	1661	182	110	1043	130	90	
Future Volume (vph)	1661	182	110	1043	130	90	
Satd. Flow (prot)	3316	1483	1658	3316	1658	1483	
Fit Permitted			0.950		0.950		
Satd. Flow (perm)	3316	1437	1656	3316	1658	1483	
Satd. Flow (RTOR)							
Lane Group Flow (vph)	1661	182	110	1043	130	90	
Turn Type	NA	Perm	Prot	NA	Prot	Perm	
Protected Phases	2		1	6	7		8
Permitted Phases		2				4	
Detector Phase	2	2	1	6	7	4	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	5.0	5.0	1.0
Minimum Split (s)	24.0	24.0	11.7	16.0	11.3	22.5	5.5
Total Split (s)	61.6	61.6	21.3	82.9	21.6	27.1	5.5
Total Split (%)	56.0%	56.0%	19.4%	75.4%	19.6%	24.6%	5%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.5	2.0
All-Red Time (s)	2.3	2.3	3.0	2.3	3.0	3.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.7	6.0	6.3	6.5	
Lead/Lag	Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	None	C-Max	None	Max	Max
Act Effct Green (s)	58.2	58.2	12.0	76.9	15.3	20.6	
Actuated g/C Ratio	0.53	0.53	0.11	0.70	0.14	0.19	
v/c Ratio	0.95	0.24	0.61	0.45	0.57	0.32	
Control Delay	31.4	16.3	55.8	10.4	54.7	42.5	
Queue Delay	0.5	0.0	0.0	0.0	0.0	1.8	
Total Delay	31.8	16.3	55.8	10.4	54.7	44.3	
LOS	C	B	E	B	D	D	
Approach Delay	30.3			14.7	50.5		
Approach LOS	C			B	D		
Queue Length 50th (m)	111.8	17.0	23.0	41.5	26.4	16.9	
Queue Length 95th (m)	#232.7	m24.8	40.3	108.1	45.8	31.8	
Internal Link Dist (m)	206.5			221.9	87.7		
Turn Bay Length (m)		40.0	87.0		80.0		
Base Capacity (vph)	1754	760	220	2318	230	277	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	11	0	0	0	0	92	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.95	0.24	0.50	0.45	0.57	0.49	

Intersection Summary

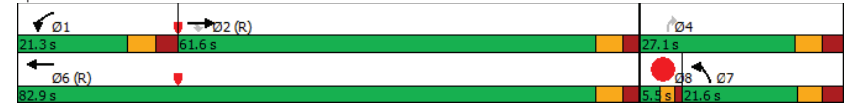
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
5: Lamarche Ave & Innes Rd

2026 Future Total
PM Peak Hour

Maximum v/c Ratio: 0.95	Intersection Signal Delay: 26.1	Intersection LOS: C
Intersection Capacity Utilization 78.3%	ICU Level of Service D	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		
m Volume for 95th percentile queue is metered by upstream signal.		

Splits and Phases: 5: Lamarche Ave & Innes Rd



HCM 2010 TWSC
6: Lamarche Ave & Access #1

2026 Future Total
PM Peak Hour

Intersection						
Int Delay, s/veh	4.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Vol, veh/h	0	52	32	0	67	46
Future Vol, veh/h	0	52	32	0	67	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	52	32	0	67	46

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	212	32	0
Stage 1	32	-	-
Stage 2	180	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3,518	3,318	-
Pot Cap-1 Maneuver	776	1042	-
Stage 1	991	-	-
Stage 2	851	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	742	1042	-
Mov Cap-2 Maneuver	742	-	-
Stage 1	991	-	-
Stage 2	814	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.6	0	4.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1042	1580
HCM Lane V/C Ratio	-	-	0.05	0.042
HCM Control Delay (s)	-	-	8.6	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1

HCM 2010 TWSC
7: Lamarche Ave & Access #2

2026 Future Total
PM Peak Hour

Intersection						
Int Delay, s/veh	5.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Vol, veh/h	0	22	10	0	29	17
Future Vol, veh/h	0	22	10	0	29	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	22	10	0	29	17

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	85	10	0
Stage 1	10	-	-
Stage 2	75	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3,518	3,318	-
Pot Cap-1 Maneuver	916	1071	-
Stage 1	1013	-	-
Stage 2	948	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	900	1071	-
Mov Cap-2 Maneuver	900	-	-
Stage 1	1013	-	-
Stage 2	931	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.4	0	4.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1071	1610
HCM Lane V/C Ratio	-	-	0.021	0.018
HCM Control Delay (s)	-	-	8.4	7.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1

Appendix O

Synchro Intersection Worksheets – 2031 Future Total Conditions

Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

2031 Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	106	499	32	23	1356	185	123	268	46	121	111	489
Future Volume (vph)	106	499	32	23	1356	185	123	268	46	121	111	489
Satd. Flow (prot)	3124	3103	1427	1658	3316	1427	1642	3252	1441	1658	3221	1483
Fit Permitted	0.950			0.950			0.546			0.587		
Satd. Flow (perm)	3107	3103	1394	1648	3316	1380	943	3252	1388	1006	3221	1463
Satd. Flow (RTOR)			143			143			82			193
Lane Group Flow (vph)	106	499	32	23	1356	185	123	268	46	121	111	489
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4				8
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.6	26.2	26.2	11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	32.7
Total Split (s)	13.0	65.0	65.0	13.0	65.0	65.0	19.0	52.0	52.0	33.0	33.0	33.0
Total Split (%)	10.0%	50.0%	50.0%	10.0%	50.0%	50.0%	14.6%	40.0%	40.0%	25.4%	25.4%	25.4%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.2	6.2	6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	6.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	6.4	64.0	64.0	6.4	58.8	58.8	45.3	45.3	45.3	26.9	26.9	26.9
Actuated g/C Ratio	0.05	0.49	0.49	0.05	0.45	0.45	0.35	0.35	0.35	0.21	0.21	0.21
v/c Ratio	0.69	0.33	0.04	0.28	0.90	0.26	0.31	0.24	0.09	0.58	0.17	1.07
Control Delay	83.8	21.7	0.1	68.3	42.8	6.9	32.4	30.8	1.5	59.4	43.5	93.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.8	21.7	0.1	68.3	42.8	6.9	32.4	30.8	1.5	59.4	43.5	93.0
LOS	F	C	A	E	D	A	C	C	A	E	D	F
Approach Delay		30.9			38.9			28.2			79.8	
Approach LOS		C			D			C			E	
Queue Length 50th (m)	14.0	43.1	0.0	5.8	166.2	6.0	22.1	25.5	0.0	28.4	12.4	~98.6
Queue Length 95th (m)	#27.1	56.4	0.0	15.1	#202.5	20.1	37.2	36.3	2.2	49.6	20.9	#165.1
Internal Link Dist (m)		265.9			463.6			69.4			101.9	
Turn Bay Length (m)	135.5		87.0	106.0		57.0	48.0		43.5	50.0		53.0
Base Capacity (vph)	153	1527	758	86	1499	702	394	1133	537	208	667	455
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.33	0.04	0.27	0.90	0.26	0.31	0.24	0.09	0.58	0.17	1.07

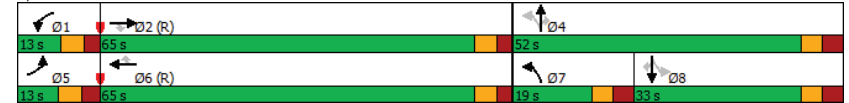
Intersection Summary	
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	99 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle:	105
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

2031 Future Total
AM Peak Hour

Maximum v/c Ratio:	1.07	Intersection LOS:	D
Intersection Signal Delay:	44.8	ICU Level of Service:	F
Intersection Capacity Utilization:	95.2%		
Analysis Period (min):	15		
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Orleans Blvd & Innes Rd



Lanes, Volumes, Timings
2: Page Rd & Innes Rd

2031 Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↕	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	24	620	21	58	1499	28	14	12	61	51	11	51
Future Volume (vph)	24	620	21	58	1499	28	14	12	61	51	11	51
Satd. Flow (prot)	1483	3176	0	1658	3303	0	0	1508	0	0	1590	0
Fit Permitted	0.136			0.406				0.943			0.824	
Satd. Flow (perm)	212	3176	0	708	3303	0	0	1433	0	0	1339	0
Satd. Flow (RTOR)		5			3			61			35	
Lane Group Flow (vph)	24	641	0	58	1527	0	0	87	0	0	113	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	42.2	42.2		42.2	42.2		41.8	41.8		41.8	41.8	
Total Split (s)	78.0	78.0		78.0	78.0		42.0	42.0		42.0	42.0	
Total Split (%)	65.0%	65.0%		65.0%	65.0%		35.0%	35.0%		35.0%	35.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.8	6.8		6.8	6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	90.4	90.4		90.4	90.4		16.6	16.6		16.6	16.6	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.14	0.14		0.14	0.14	
v/c Ratio	0.15	0.27		0.11	0.61		0.35	0.53		0.35	0.53	
Control Delay	9.8	6.0		10.6	16.3		19.3	39.5		19.3	39.5	
Queue Delay	0.0	0.0		0.0	0.4		0.0	0.0		0.0	0.0	
Total Delay	9.8	6.0		10.6	16.7		19.3	39.5		19.3	39.5	
LOS	A	A		B	B		B	D		B	D	
Approach Delay		6.1			16.5			19.3			39.5	
Approach LOS		A			B			B			D	
Queue Length 50th (m)	1.1	17.2		5.8	127.3			5.7			17.8	
Queue Length 95th (m)	7.6	48.1		12.9	202.6			16.6			29.2	
Internal Link Dist (m)		463.6			206.5			143.5			112.1	
Turn Bay Length (m)	104.5			106.0								
Base Capacity (vph)	159	2395		533	2490		463	417		463	417	
Starvation Cap Reductn	0	0		0	443		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.15	0.27		0.11	0.75		0.19	0.27		0.19	0.27	

Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	26 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	85
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings
2: Page Rd & Innes Rd

2031 Future Total
AM Peak Hour

Maximum v/c Ratio: 0.61	Intersection LOS: B
Intersection Signal Delay: 14.8	ICU Level of Service D
Intersection Capacity Utilization 77.9%	
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 2: Page Rd & Innes Rd



Lanes, Volumes, Timings

2031 Future Total

3: Ventus Way/3615 Innes Rd & Innes Rd

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↕	↕	↕	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	0	704	47	23	1347	2	109	0	49	0	0	1
Future Volume (vph)	0	704	47	23	1347	2	109	0	49	0	0	1
Satd. Flow (prot)	1745	3164	0	1566	3221	0	1409	1368	0	0	1489	0
Fit Permitted				0.357			0.757					
Satd. Flow (perm)	1745	3164	0	588	3221	0	1121	1368	0	0	1489	0
Satd. Flow (RTOR)		12						278				74
Lane Group Flow (vph)	0	751	0	23	1349	0	109	49	0	0	1	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	NA	NA	NA	NA	NA	NA
Protected Phases		2		6		6	4	4		8		8
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8		8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0		10.0
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3		32.3
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0		33.0
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%		27.5%
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3		3.3
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0		3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0		0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.3	6.3		6.3		6.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None		None
Act Effct Green (s)		90.2		90.2	90.2		17.4	17.4		17.4		17.4
Actuated g/C Ratio		0.75		0.75	0.75		0.14	0.14		0.14		0.14
v/c Ratio		0.32		0.05	0.56		0.68	0.11		0.00		0.00
Control Delay		0.9		9.9	13.8		67.7	0.5		0.0		0.0
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0		0.0
Total Delay		0.9		9.9	13.8		67.7	0.5		0.0		0.0
LOS		A		A	B		E	A		A		A
Approach Delay		0.9			13.7			46.9				
Approach LOS		A			B			D				
Queue Length 50th (m)		0.4		1.1	56.5		24.8	0.0		0.0		0.0
Queue Length 95th (m)		2.9		m5.9	178.7		40.6	0.0		0.0		0.0
Internal Link Dist (m)		221.9			561.5			129.3				33.2
Turn Bay Length (m)				40.0								
Base Capacity (vph)		2382		442	2422		249	520				388
Starvation Cap Reductn		0		0	0		0	0		0		0
Spillback Cap Reductn		0		0	0		0	0		0		0
Storage Cap Reductn		0		0	0		0	0		0		0
Reduced v/c Ratio		0.32		0.05	0.56		0.44	0.09		0.00		0.00

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

Lanes, Volumes, Timings

2031 Future Total

3: Ventus Way/3615 Innes Rd & Innes Rd

AM Peak Hour

Maximum v/c Ratio:	0.68
Intersection Signal Delay:	11.8
Intersection LOS:	B
Intersection Capacity Utilization:	63.3%
ICU Level of Service:	B
Analysis Period (min):	15
m	Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Ventus Way/3615 Innes Rd & Innes Rd



Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2031 Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	21	708	10	39	1313	45	29	5	16	49	3	32
Future Volume (vph)	21	708	10	39	1313	45	29	5	16	49	3	32
Satd. Flow (prot)	1311	3161	1483	1537	3165	0	1537	1483	1427	0	1510	0
Fit Permitted	0.950			0.950			0.741			0.818		
Satd. Flow (perm)	1311	3161	1444	1533	3165	0	1198	1483	1427	0	1270	0
Satd. Flow (RTOR)			115		4				105		25	
Lane Group Flow (vph)	21	708	10	39	1358	0	29	5	16	0	84	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2				4		4	8		
Detector Phase	5	2	2	1	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		10.0	10.0	10.0	10.0		
Minimum Split (s)	11.3	32.3	32.3	11.3	32.3		36.3	36.3	36.3	36.3		
Total Split (s)	12.0	66.0	66.0	12.0	66.0		37.0	37.0	37.0	37.0		
Total Split (%)	10.0%	55.0%	55.0%	10.0%	55.0%		30.8%	30.8%	30.8%	30.8%		
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.0	3.0	3.0	3.0		
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6		4.3	4.3	4.3	4.3		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.3	6.3	6.3	6.3	6.3		7.3	7.3	7.3		7.3	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lag	Lag	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None		
Act Effct Green (s)	7.5	84.0	84.0	8.6	90.2		14.7	14.7	14.7		14.7	
Actuated g/C Ratio	0.06	0.70	0.70	0.07	0.75		0.12	0.12	0.12		0.12	
v/c Ratio	0.26	0.32	0.01	0.36	0.57		0.20	0.03	0.06		0.47	
Control Delay	74.0	5.6	0.0	61.3	12.5		47.1	41.0	0.4		41.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	74.0	5.6	0.0	61.3	12.5		47.1	41.0	0.4		41.7	
LOS	E	A	A	E	B		D	D	A		D	
Approach Delay		7.5			13.9			31.6			41.7	
Approach LOS		A			B			C			D	
Queue Length 50th (m)	5.2	13.0	0.0	8.9	49.0		6.5	1.1	0.0		13.5	
Queue Length 95th (m)	14.2	23.5	m0.0	19.8	172.3		13.3	4.2	0.0		25.1	
Internal Link Dist (m)		561.5			183.4			77.4			48.4	
Turn Bay Length (m)	47.5		58.5	58.5			48.5		20.0			
Base Capacity (vph)	82	2211	1045	110	2379		296	367	432		333	
Starvation Cap Reductn	0	0	0	0	0		0	0	0		0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0		0	
Storage Cap Reductn	0	0	0	0	0		0	0	0		0	
Reduced v/c Ratio	0.26	0.32	0.01	0.35	0.57		0.10	0.01	0.04		0.25	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 40 (33%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2031 Future Total
AM Peak Hour

Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Fit Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	3.0	4.0
Total Split (s)	5.0	5.0
Total Split (%)	4%	4%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2031 Future Total
AM Peak Hour

Maximum v/c Ratio: 0.57	Intersection Signal Delay: 13.2	Intersection LOS: B
Intersection Capacity Utilization 63.4%	ICU Level of Service B	
Analysis Period (min) 15		

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

Splits and Phases: 4: Innes Rd & Viseneau Dr



Lanes, Volumes, Timings
5: Lamarche Ave & Innes Rd

2031 Future Total
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Lane Configurations	↔↔	↔	↔	↔↔	↔	↔	
Traffic Volume (vph)	541	185	178	1286	299	207	
Future Volume (vph)	541	185	178	1286	299	207	
Satd. Flow (prot)	3191	1455	1658	3221	1642	1469	
Fit Permitted			0.950		0.950		
Satd. Flow (perm)	3191	1419	1654	3221	1640	1469	
Satd. Flow (RTOR)							
Lane Group Flow (vph)	541	185	178	1286	299	207	
Turn Type	NA	Perm	Prot	NA	Prot	Perm	
Protected Phases	2		1	6	7		8
Permitted Phases		2				4	
Detector Phase	2	2	1	6	7	4	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	5.0	5.0	1.0
Minimum Split (s)	22.5	22.5	11.7	22.5	22.5	22.5	5.5
Total Split (s)	41.5	41.5	30.0	71.5	43.0	48.5	5.5
Total Split (%)	34.6%	34.6%	25.0%	59.6%	35.8%	40.4%	5%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.5	2.0
All-Red Time (s)	2.3	2.3	3.0	2.3	3.0	3.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.7	6.0	6.3	6.5	
Lead/Lag	Lag	Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes
Recall Mode	C-Max	C-Max	None	C-Max	None	None	Max
Act Effct Green (s)	50.4	50.4	18.0	75.1	27.1	32.4	
Actuated g/C Ratio	0.42	0.42	0.15	0.63	0.23	0.27	
v/c Ratio	0.40	0.31	0.71	0.64	0.81	0.52	
Control Delay	32.3	33.9	61.9	16.0	60.1	41.1	
Queue Delay	0.0	0.0	0.0	0.0	0.6	0.0	
Total Delay	32.3	33.9	61.9	16.0	60.7	41.1	
LOS	C	C	E	B	E	D	
Approach Delay	32.7			21.6	52.7		
Approach LOS	C			C	D		
Queue Length 50th (m)	42.4	26.4	42.1	90.0	67.0	41.5	
Queue Length 95th (m)	88.5	68.6	64.9	127.2	90.4	59.0	
Internal Link Dist (m)	206.5			221.9	77.9		
Turn Bay Length (m)		40.0	87.0		80.0		
Base Capacity (vph)	1339	595	324	2015	502	514	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	42	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.40	0.31	0.55	0.64	0.65	0.40	

Intersection Summary

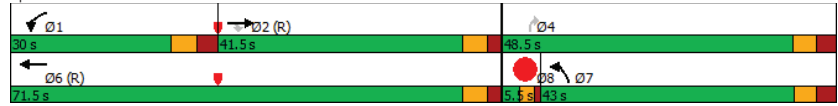
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
5: Lamarche Ave & Innes Rd

2031 Future Total
AM Peak Hour

Maximum v/c Ratio: 0.81	Intersection LOS: C
Intersection Signal Delay: 30.4	ICU Level of Service C
Intersection Capacity Utilization 65.3%	
Analysis Period (min) 15	

Splits and Phases: 5: Lamarche Ave & Innes Rd



HCM 2010 TWSC
6: Lamarche Ave & Access #1

2031 Future Total
AM Peak Hour

Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	0	71	280	0	31	146
Future Vol, veh/h	0	71	280	0	31	146
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	71	280	0	31	146

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	488	280	0
Stage 1	280	-	-
Stage 2	208	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	539	759	-
Stage 1	767	-	-
Stage 2	827	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	525	759	-
Mov Cap-2 Maneuver	525	-	-
Stage 1	767	-	-
Stage 2	805	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.2	0	1.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	759	1283
HCM Lane V/C Ratio	-	-	0.094	0.024
HCM Control Delay (s)	-	-	10.2	7.9
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1

HCM 2010 TWSC
7: Lamarche Ave & Access #2

2031 Future Total
AM Peak Hour

Intersection						
Int Delay, s/veh	1.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	
Traffic Vol, veh/h	0	31	132	0	13	70
Future Vol, veh/h	0	31	132	0	13	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	31	132	0	13	70
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	228	132	0	0	132	0
Stage 1	132	-	-	-	-	-
Stage 2	96	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	760	917	-	-	1453	-
Stage 1	894	-	-	-	-	-
Stage 2	928	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	753	917	-	-	1453	-
Mov Cap-2 Maneuver	753	-	-	-	-	-
Stage 1	894	-	-	-	-	-
Stage 2	920	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	9.1	0	1.2			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	917	1453		
HCM Lane V/C Ratio	-	-	0.034	0.009		
HCM Control Delay (s)	-	-	9.1	7.5		
HCM Lane LOS	-	-	A	A		
HCM 95th %tile Q(veh)	-	-	0.1	0		

Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

2031 Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔		↔		↔		↔		↔	
Traffic Volume (vph)	462	1518	107	75	855	209	56	192	95	245	279	267
Future Volume (vph)	462	1518	107	75	855	209	56	192	95	245	279	267
Satd. Flow (prot)	3216	3316	1455	1642	3221	1483	1658	3283	1483	1658	3221	1469
Fit Permitted	0.950		0.950		0.950		0.462		0.631			
Satd. Flow (perm)	3195	3316	1421	1639	3221	1446	797	3283	1446	1090	3221	1422
Satd. Flow (RTOR)	165		230		159		8		8		8	
Lane Group Flow (vph)	462	1518	107	75	855	209	56	192	95	245	279	267
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	2	1	6	6	7	4	4	8	8	8
Permitted Phases	5		2		6		4		4		8	
Detector Phase	5	2	2	1	6	6	7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	16.6	26.2	26.2	11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	32.7
Total Split (s)	31.0	49.0	49.0	16.0	34.0	34.0	12.0	45.0	45.0	33.0	33.0	33.0
Total Split (%)	28.2%	44.5%	44.5%	14.5%	30.9%	30.9%	10.9%	40.9%	40.9%	30.0%	30.0%	30.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.2	6.2	6.2	6.2	6.2	6.7	6.7	6.7	6.7	6.7	6.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	Max	Max	Max
Act Effct Green (s)	20.6	46.2	46.2	8.8	31.6	31.6	38.3	38.3	38.3	28.7	28.7	28.7
Actuated g/C Ratio	0.19	0.42	0.42	0.08	0.29	0.29	0.35	0.35	0.35	0.26	0.26	0.26
v/c Ratio	0.77	1.09	1.15	0.57	0.92	0.36	0.18	0.17	0.16	0.86	0.33	0.47
Control Delay	51.3	84.5	1.2	55.8	59.0	15.7	25.8	25.3	0.9	69.2	35.2	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.3	84.5	1.2	55.8	59.0	15.7	25.8	25.3	0.9	69.2	35.2	7.2
LOS	D	F	A	E	E	B	C	C	A	E	D	A
Approach Delay	72.9		50.8		18.6		36.3					
Approach LOS	E		D		B		D					
Queue Length 50th (m)	48.8	~205.7	0.0	14.3	69.1	3.8	8.1	14.8	0.0	51.9	26.3	0.0
Queue Length 95th (m)	63.6	#247.8	2.5	32.4	#149.1	45.8	16.8	23.2	1.3	#99.7	38.5	20.5
Internal Link Dist (m)	265.9		463.6		172.9		182.9					
Turn Bay Length (m)	135.5		87.0	106.0		57.0	48.0		43.5	50.0		53.0
Base Capacity (vph)	713	1394	692	146	926	579	318	1143	607	284	840	568
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	1.09	0.15	0.51	0.92	0.36	0.18	0.17	0.16	0.86	0.33	0.47

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

Lanes, Volumes, Timings
1: Orleans Blvd & Innes Rd

2031 Future Total
PM Peak Hour

Maximum v/c Ratio: 1.09	Intersection Signal Delay: 56.2	Intersection LOS: E
Intersection Capacity Utilization 106.2%	ICU Level of Service G	
Analysis Period (min) 15		
~ Volume exceeds capacity, queue is theoretically infinite.		
Queue shown is maximum after two cycles.		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		

Splits and Phases: 1: Orleans Blvd & Innes Rd



Lanes, Volumes, Timings
2: Page Rd & Innes Rd

2031 Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	64	1785	19	116	1087	72	18	18	108	91	17	34
Future Volume (vph)	64	1785	19	116	1087	72	18	18	108	91	17	34
Satd. Flow (prot)	1658	3308	0	1658	3246	0	0	1536	0	0	1597	0
Fit Permitted	0.212			0.078				0.952			0.659	
Satd. Flow (perm)	369	3308	0	136	3246	0	0	1471	0	0	1082	0
Satd. Flow (RTOR)		2			10			14			15	
Lane Group Flow (vph)	64	1804	0	116	1159	0	0	144	0	0	142	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	42.2	42.2		42.2	42.2		41.8	41.8		41.8	41.8	
Total Split (s)	68.0	68.0		68.0	68.0		42.0	42.0		42.0	42.0	
Total Split (%)	61.8%	61.8%		61.8%	61.8%		38.2%	38.2%		38.2%	38.2%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.8	6.8		6.8	6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	77.6	77.6		77.6	77.6		19.4	19.4		19.4	19.4	
Actuated g/C Ratio	0.71	0.71		0.71	0.71		0.18	0.18		0.18	0.18	
v/c Ratio	0.25	0.77		1.22	0.51		0.53	0.70		0.70	0.70	
Control Delay	2.7	8.1		181.2	9.7		42.2	54.3		54.3	54.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.7	8.1		181.2	9.7		42.2	54.3		54.3	54.3	
LOS	A	A		F	A		D	D		D	D	
Approach Delay		7.9			25.3		42.2	54.3		54.3	54.3	
Approach LOS		A			C		D	D		D	D	
Queue Length 50th (m)	1.3	31.6		-28.9	30.0		26.2	26.6		26.6	26.6	
Queue Length 95th (m)	m2.3	m33.0		m#59.5	m0.0		37.3	39.3		39.3	39.3	
Internal Link Dist (m)		463.6			206.5		143.5	112.1		112.1	112.1	
Turn Bay Length (m)	104.5			106.0								
Base Capacity (vph)	260	2334		95	2293		480	356		356	356	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.25	0.77		1.22	0.51		0.30	0.40		0.40	0.40	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 2 (2%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
2: Page Rd & Innes Rd

2031 Future Total
PM Peak Hour

Maximum v/c Ratio: 1.22	Intersection LOS: B
Intersection Signal Delay: 17.7	ICU Level of Service G
Intersection Capacity Utilization 107.0%	
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 2: Page Rd & Innes Rd



Lanes, Volumes, Timings
3: Ventus Way/3615 Innes Rd & Innes Rd

2031 Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↕		↔	↕↕		↔	↕↕		↔	↕↕	
Traffic Volume (vph)	11	1735	128	51	1169	10	77	0	46	4	0	7
Future Volume (vph)	11	1735	128	51	1169	10	77	0	46	4	0	7
Satd. Flow (prot)	1658	3260	0	1551	3312	0	1595	1388	0	0	1551	0
Fit Permitted	0.220			0.086			0.750				0.901	
Satd. Flow (perm)	384	3260	0	140	3312	0	1255	1388	0	0	1423	0
Satd. Flow (RTOR)		14			2			31				31
Lane Group Flow (vph)	11	1863	0	51	1179	0	77	46	0	0	11	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	34.1	34.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	77.0	77.0		77.0	77.0		33.0	33.0		33.0	33.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.3	6.3		6.3	6.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	87.6	87.6		87.6	87.6		14.5	14.5		14.5	14.5	
Actuated g/C Ratio	0.80	0.80		0.80	0.80		0.13	0.13		0.13	0.13	
v/c Ratio	0.04	0.72		0.46	0.45		0.47	0.22		0.05	0.05	
Control Delay	2.5	9.9		25.7	6.0		51.6	21.0		2.4	2.4	
Queue Delay	0.0	0.8		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.5	10.7		25.7	6.0		51.6	21.0		2.4	2.4	
LOS	A	B		C	A		D	C		A	A	
Approach Delay		10.7			6.8			40.2			2.4	
Approach LOS		B			A			D			A	
Queue Length 50th (m)	0.0	198.4		3.2	37.6		15.9	2.9		0.0	0.0	
Queue Length 95th (m)	m0.7	m227.5		#27.1	82.1		26.8	11.8		1.2	1.2	
Internal Link Dist (m)		221.9			561.5			129.3			33.2	
Turn Bay Length (m)	85.0			40.0								
Base Capacity (vph)	305	2599		111	2637		304	360		368	368	
Starvation Cap Reductn	0	398		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.04	0.85		0.46	0.45		0.25	0.13		0.03	0.03	

Intersection Summary

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

Lanes, Volumes, Timings
3: Ventus Way/3615 Innes Rd & Innes Rd

2031 Future Total
PM Peak Hour

Maximum v/c Ratio: 0.72	Intersection Signal Delay: 10.3	Intersection LOS: B
Intersection Capacity Utilization 75.8%	ICU Level of Service D	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		
m Volume for 95th percentile queue is metered by upstream signal.		

Splits and Phases: 3: Ventus Way/3615 Innes Rd & Innes Rd



Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2031 Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	38	1683	39	103	1145	90	73	24	112	68	24	17
Future Volume (vph)	38	1683	39	103	1145	90	73	24	112	68	24	17
Satd. Flow (prot)	1566	3316	1483	1658	3180	0	1658	1745	1483	0	1576	0
Fit Permitted	0.950			0.950			0.688				0.796	
Satd. Flow (perm)	1562	3316	1450	1657	3180	0	1197	1745	1462	0	1291	0
Satd. Flow (RTOR)			106		8				112		7	
Lane Group Flow (vph)	38	1683	39	103	1235	0	73	24	112	0	109	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2				4		4	8		
Detector Phase	5	2	2	1	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.3	32.3	32.3	11.3	32.3		36.3	36.3	36.3	36.3	36.3	
Total Split (s)	20.0	68.0	68.0	20.0	68.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	15.4%	52.3%	52.3%	15.4%	52.3%		28.5%	28.5%	28.5%	28.5%	28.5%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6		4.3	4.3	4.3	4.3	4.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.3	6.3	6.3	6.3		7.3	7.3	7.3	7.3	7.3	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lag	Lag	Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None	None	
Act Effct Green (s)	8.6	79.6	79.6	13.3	86.7		17.2	17.2	17.2	17.2	17.2	
Actuated g/C Ratio	0.07	0.61	0.61	0.10	0.67		0.13	0.13	0.13	0.13	0.13	
v/c Ratio	0.37	0.83	0.04	0.61	0.58		0.46	0.10	0.39	0.62	0.62	
Control Delay	67.2	26.3	0.1	70.3	15.4		59.4	46.8	11.6	63.3	63.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	67.2	26.3	0.1	70.3	15.4		59.4	46.8	11.6	63.3	63.3	
LOS	E	C	A	E	B		E	D	B	E	E	
Approach Delay		26.6			19.6			32.4			63.3	
Approach LOS		C			B			C			E	
Queue Length 50th (m)	9.5	163.0	0.0	25.7	84.8		17.8	5.6	0.0		25.4	
Queue Length 95th (m)	20.5	#290.1	0.0	42.8	148.5		29.8	12.3	15.2		40.0	
Internal Link Dist (m)		561.5			183.0			77.4			48.4	
Turn Bay Length (m)	47.5		58.5	58.5			48.5		20.0			
Base Capacity (vph)	165	2029	928	191	2122		273	398	420		300	
Starvation Cap Reductn	0	0	0	0	0		0	0	0		0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0		0	
Storage Cap Reductn	0	0	0	0	0		0	0	0		0	
Reduced v/c Ratio	0.23	0.83	0.04	0.54	0.58		0.27	0.06	0.27		0.36	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 105 (81%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2031 Future Total
PM Peak Hour

Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Fit Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	3.0	3.0
Total Split (s)	5.0	5.0
Total Split (%)	4%	4%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

Lanes, Volumes, Timings
4: Innes Rd & Viseneau Dr

2031 Future Total
PM Peak Hour

Maximum v/c Ratio: 0.83	Intersection LOS: C
Intersection Signal Delay: 25.4	ICU Level of Service E
Intersection Capacity Utilization 85.9%	
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 4: Innes Rd & Viseneau Dr



Lanes, Volumes, Timings
5: Lamarche Ave & Innes Rd

2031 Future Total
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Lane Configurations	↔↔	↔	↔	↔↔	↔	↔	
Traffic Volume (vph)	1641	337	211	1048	221	235	
Future Volume (vph)	1641	337	211	1048	221	235	
Satd. Flow (prot)	3316	1483	1658	3316	1658	1483	
Fit Permitted			0.950		0.950		
Satd. Flow (perm)	3316	1437	1656	3316	1658	1483	
Satd. Flow (RTOR)							
Lane Group Flow (vph)	1641	337	211	1048	221	235	
Turn Type	NA	Perm	Prot	NA	Prot	Perm	
Protected Phases	2		1	6	7		8
Permitted Phases		2				4	
Detector Phase	2	2	1	6	7	4	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	5.0	5.0	1.0
Minimum Split (s)	24.0	24.0	11.7	16.0	11.3	22.5	5.5
Total Split (s)	61.6	61.6	21.3	82.9	21.6	27.1	5.5
Total Split (%)	56.0%	56.0%	19.4%	75.4%	19.6%	24.6%	5%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.5	2.0
All-Red Time (s)	2.3	2.3	3.0	2.3	3.0	3.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.7	6.0	6.3	6.5	
Lead/Lag	Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	None	C-Max	None	Max	Max
Act Effct Green (s)	55.6	55.6	14.6	76.9	15.3	20.6	
Actuated g/C Ratio	0.51	0.51	0.13	0.70	0.14	0.19	
v/c Ratio	0.98	0.46	0.96	0.45	0.96	0.85	
Control Delay	37.0	19.3	94.0	10.5	98.2	70.6	
Queue Delay	0.2	0.0	0.0	0.0	0.0	57.1	
Total Delay	37.2	19.3	94.0	10.5	98.2	127.7	
LOS	D	B	F	B	F	F	
Approach Delay	34.2			24.5	113.4		
Approach LOS	C			C	F		
Queue Length 50th (m)	117.1	45.0	45.9	42.2	47.8	49.2	
Queue Length 95th (m)	#227.4	m42.3	#91.8	112.3	#93.9	#90.5	
Internal Link Dist (m)	206.5			221.9	87.7		
Turn Bay Length (m)		40.0	87.0		80.0		
Base Capacity (vph)	1676	726	220	2318	230	277	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	2	0	0	0	0	92	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.98	0.46	0.96	0.45	0.96	1.27	

Intersection Summary

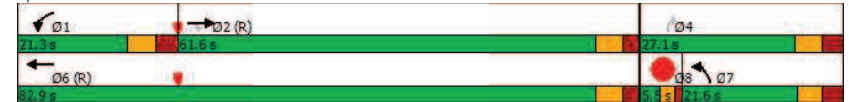
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
5: Lamarche Ave & Innes Rd

2031 Future Total
PM Peak Hour

Maximum v/c Ratio: 0.98	Intersection LOS: D
Intersection Signal Delay: 40.6	ICU Level of Service E
Intersection Capacity Utilization 89.0%	
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 5: Lamarche Ave & Innes Rd



HCM 2010 TWSC
6: Lamarche Ave & Access #1

2031 Future Total
PM Peak Hour

Intersection						
Int Delay, s/veh	2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Vol, veh/h	0	52	268	0	67	147
Future Vol, veh/h	0	52	268	0	67	147
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	52	268	0	67	147

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	549	268	0
Stage 1	268	-	-
Stage 2	281	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3,518	3,318	-
Pot Cap-1 Maneuver	497	771	-
Stage 1	777	-	-
Stage 2	767	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	469	771	-
Mov Cap-2 Maneuver	469	-	-
Stage 1	777	-	-
Stage 2	724	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	2.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	771	1296
HCM Lane V/C Ratio	-	-	0.067	0.052
HCM Control Delay (s)	-	-	10	7.9
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0.2

HCM 2010 TWSC
7: Lamarche Ave & Access #2

2031 Future Total
PM Peak Hour

Intersection						
Int Delay, s/veh	1.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Vol, veh/h	0	22	128	0	29	68
Future Vol, veh/h	0	22	128	0	29	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	22	128	0	29	68

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	254	128	0
Stage 1	128	-	-
Stage 2	126	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3,518	3,318	-
Pot Cap-1 Maneuver	735	922	-
Stage 1	898	-	-
Stage 2	900	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	720	922	-
Mov Cap-2 Maneuver	720	-	-
Stage 1	898	-	-
Stage 2	881	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	2.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	922	1458
HCM Lane V/C Ratio	-	-	0.024	0.02
HCM Control Delay (s)	-	-	9	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1