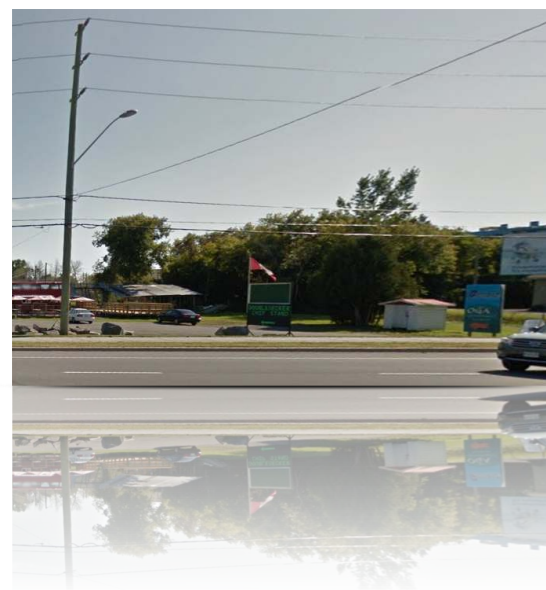
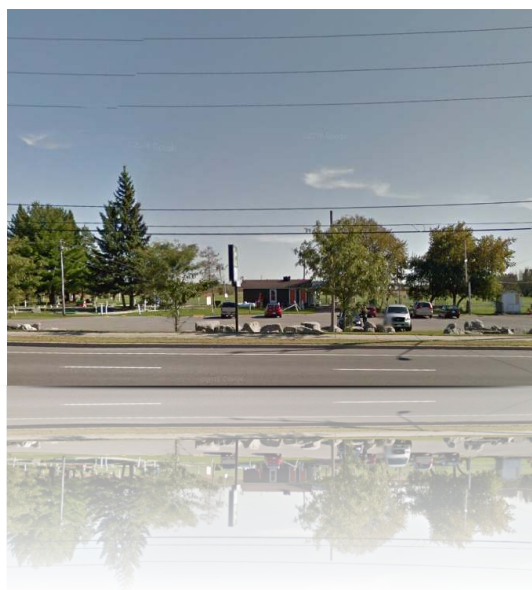




Site

Transportation Impact Study 3490 Innes Road



3490 Innes Road

TIA Strategy Report

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TIA Plan Reports

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

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

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

CERTIFICATION

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

1,2 License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.

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

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TIA Strategy Report

Parsons has been retained by Lépine Corp. to prepare a TIA in support of a Zoning By-Law Amendment application for a residential development located at 3490 Innes Road. The following report represents Step 4 – Strategy, of the TIA process. City comments from the previous submission have been provided in Appendix A

1. SCREENING FORM

The screening form confirmed the need for a TIA based on the Trip Generation, Location and Safety triggers, given that the proposed development consists of eight buildings with a total of 1,320 apartment units, located in a Design Priority Area (DPA) and proposed new access to Lamarche Avenue which is in close proximity to a proposed/planned signalized intersection. The screening form has been provided in Appendix B.

2. SCOPING REPORT

2.1. EXISTING AND PLANNED CONDITIONS

2.1.1. PROPOSED DEVELOPMENT

It is our understanding that Lépine is proposing a residential development with supportive ground floor commercial space located at 3490 Innes Road, as shown in **Figure 1**. The site is bound by Innes Road to the north, existing developments to the east and west and low-density residential subdivision to the south. It is zoned as DR – Development Reserve Zone and is currently occupied by an insurance company, food truck, mini-put facility and driving range.

Figure 1: Local Context



The current Site Plan is provided in **Figure 2**. The proposed development includes eight residential buildings ranging from nine to sixteen storeys with 1,320 units total and approximately 2,600 m² of commercial space. The site is expected be phased in gradually, Phase 1 is anticipated by 2022 and full buildout is currently estimated by 2031.

Figure 2: Proposed Site Plan



Phase 1 will include Buildings D and E (436 units) and approximately 2,600 m² of commercial space. The remaining six buildings (884 units) will consist only of residential use. A unit breakdown of the proposed development has been provided in **Table 1**.

Table 1: Unit Breakdown

Building	# of Storeys	# of Units	Size of Retail (sq.m)	Buildout Horizon
Building D	12	207	1,350	2022
Building E	12	229	1,262	
Phase 1 Subtotal	-	436	2,612	-
Building A	16	263	-	2024 - 2031
Building B	9	125	-	
Building C	9	105	-	
Building F	9	97	-	
Building G	9	150	-	
Building H	9	144	-	
Future Phases Subtotal	-	884	-	-
Full Buildout Total	-	1320	2,612	-

The main access to the site is proposed via Lamarche Avenue. A second access is proposed approximately 200m to the west that is intended for emergency and service access only.

2.1.2. EXISTING CONDITIONS

Area Road Network

Innes Road is an east-west arterial roadway with a 4-lane cross-section and auxiliary turn lanes at major intersections. It extends from St. Laurent Boulevard in the west to Dunning Road in the east. Beyond St. Laurent Boulevard, Innes Road continues as Industrial Avenue, and beyond Dunning Road, it continues as Beaton Road. Within the study area, the posted speed limit is 60 km/h.

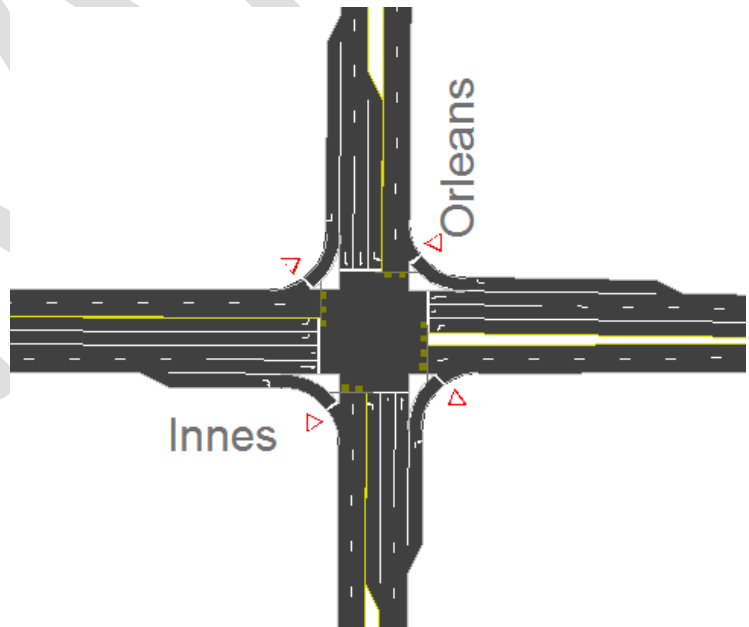
Orléans Boulevard is a north-south arterial roadway that extends from Navan Road in the south to Cairine Wilson Secondary School in the north. The posted speed limit is 50 km/h south of Innes Road and 60 km/h north of Innes Road. Within the study area, Orléans Boulevard has a four-lane cross-section with auxiliary turn lanes provided at major intersections. South of Silverbirch Street, Orléans Boulevard has a two-lane cross-section.

Pagé Road is a north-south collector roadway south of Innes Road and a local roadway north of Innes Road. Within the study area, it has a two-lane cross-section with auxiliary turn lanes provided at major intersections. The posted speed limit is 40 km/h.

Existing Study Area Intersections

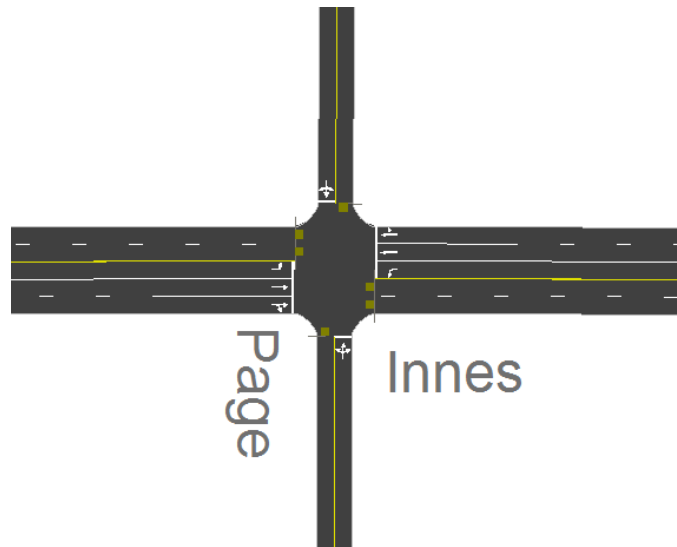
Orléans/Innes

The Orléans/ Innes intersection is a signalized four-legged intersection. The eastbound approach consists of dual left-turn lanes, two through lanes and a channelized right-turn lane. The westbound approach consists of a single left-turn lane, two through lanes, and a channelized right-turn lane. The north and southbound approaches both consist of a single left-turn lane, two through lanes and a channelized right-turn lane. All movements are permitted at this location.



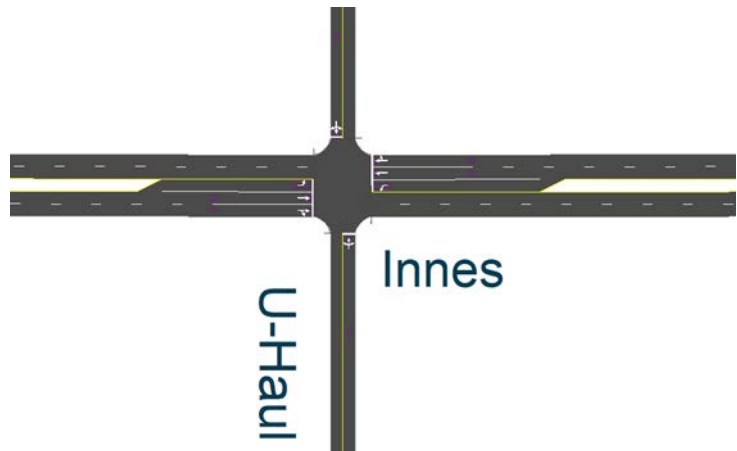
Pagé/Innes

The Pagé/Innes intersection is a signalized four-legged intersection. The west and eastbound approaches both consist of a single left-turn lane, a through lane and a shared through/right-turn lane. The north and southbound approaches both consist of a single full-movement lane. All movements are permitted at this location.



U-Haul/Innes

The U-Haul/Innes access (former BMR access) intersection is a signalized four-legged intersection. The west and eastbound approaches both consist of a single left-turn lane, a through lane and a shared through/right-turn lane. The north and southbound approaches both consist of a single full-movement lane. All movements are permitted at this location.



Existing Driveways to Adjacent Developments

There are six private driveways located on the south side of Innes Road between the proposed site and the U-Haul/Innes intersection. There are no existing driveways between the proposed site and the Pagé/Innes intersection. There are three existing full-movement driveways to the existing land uses on the subject property (one for the insurance office, and two for the golf range/food truck). Along the north side of Innes Road, there are approximately 14 private driveways between Pagé Road and the U-Haul intersection.

Pedestrian/Cycling Network

Sidewalk facilities in the vicinity of the site are provided along the both sides of Innes Road, Orléans Boulevard and Pagé Road (north of Innes Road, sidewalks are provided along the west side of Pagé Road only).

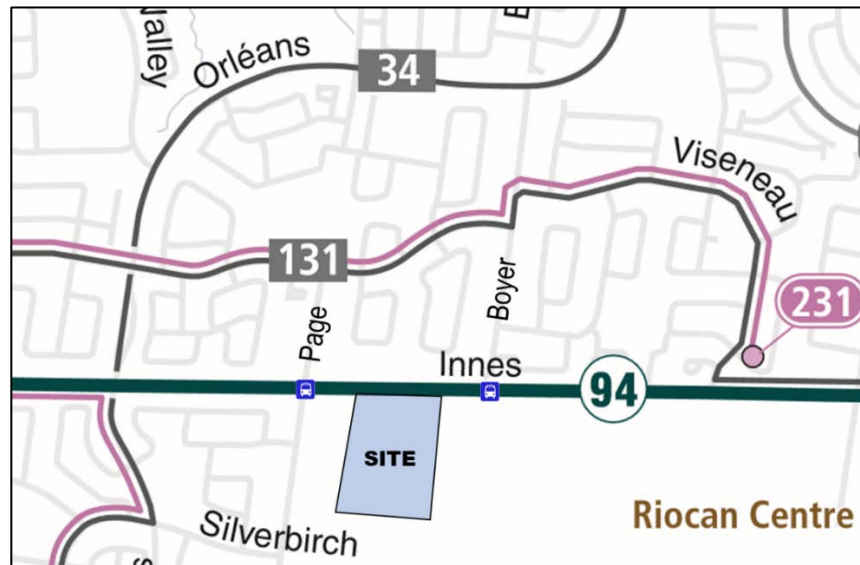
According to the City's Cycling Plan, Pagé Road and Innes Road are classified as "Spine Routes" and Orléans Boulevard and Boyer Road are classified as "Local Routes". Dedicated bicycle facilities are currently provided in the form of bike lanes in both directions along Innes Road. Pagé Road and Boyer Road, north of Innes Road, are "suggested routes".

Transit Network

The current transit area network is provided as **Figure 3**. Transit service within the vicinity of the site is currently provided by OC Transpo Route #94 which provides frequent all-day service. Bus stops for Routes #94 are located at the Innes/Pagé and Innes/U-Haul intersections, all within 300m of the subject site.

Isolated transit priority measures are currently provided along Innes Road within the study area, e.g. queue jumps at Innes/Orléans.

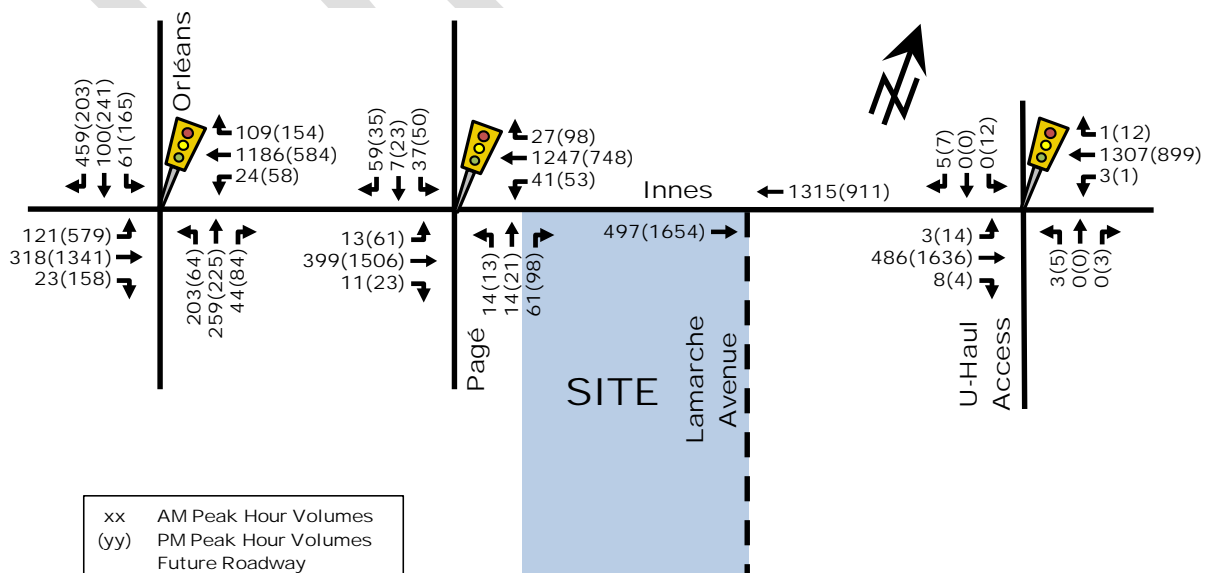
Figure 3: Area Transit Network



Peak hour travel demands

The existing peak hour traffic volumes within the study area are shown in **Figure 4**. The Innes/Orléans count was completed in 2017, obtained from the City of Ottawa. The remaining intersections were collected by Parsons in May 2019. The raw count data has been included in Appendix C. Note: traffic volumes on Innes were balanced to the 2019 counts.

Figure 4: Existing Peak Hour Traffic Volumes



Existing Road Safety Conditions

Collision history for study area intersections and roads (2012 to 2016, inclusive) was obtained from the City of Ottawa and most collisions (71%) involved only property damage, indicating low impact speeds, and 29% involved personal injuries. The primary causes of collisions cited by police include; rear end (48%), turning movement (23%) and angle (17%) type collisions.

A standard unit of measure for assessing collisions at an intersection is based on the number collisions per million entering vehicles (MEV). At intersections within the study area, reported collisions have historically take place at a rate of:

- 0.11/MEV at the U-Haul/Innes intersection;
- 1.05/MEV at the Orléans/Innes intersection; and,
- 0.38/MEV at the Pagé/Innes intersection.

Orléans/Innes is a major intersection of two arterial roads, which translates to a high number of vehicles during the peak periods leading to congestion. This is the likely cause for the higher MEV index. It is noteworthy that within the five-years of recorded collision data there were 2 collisions involving pedestrians resulting in property damage only and no collisions involving cyclists.

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

2.1.3. PLANNED CONDITIONS

Planned Study Area Transportation Network Changes

Within the study area, notable transportation network changes are illustrated in **Figure 5** (excerpt from the 2013 TMP) and are described as follows:

Blackburn Bypass Extension – Brian Coburn Boulevard

The extension of the Blackburn Bypass will provide an additional east-west arterial roadway through Orléans, south of the subject site. This extension, known as Brian Coburn Boulevard, is currently constructed from Trim Road to Navan Road. As shown in **Figure 5**, Brian Coburn will continue past Navan and connect to the Blackburn Bypass. It has been initially constructed as a two-lane arterial and ultimately is planned to be a four-lane divided arterial. The timing of the widening of Brian Coburn Boulevard from two to four lanes will likely depend on the amount and timing of development within the vicinity of the arterial roadway. The widening is currently not identified as a planned project within the City's 2013 TMP, which indicates that the widening of Brian Coburn Boulevard will likely be completed post 2031.

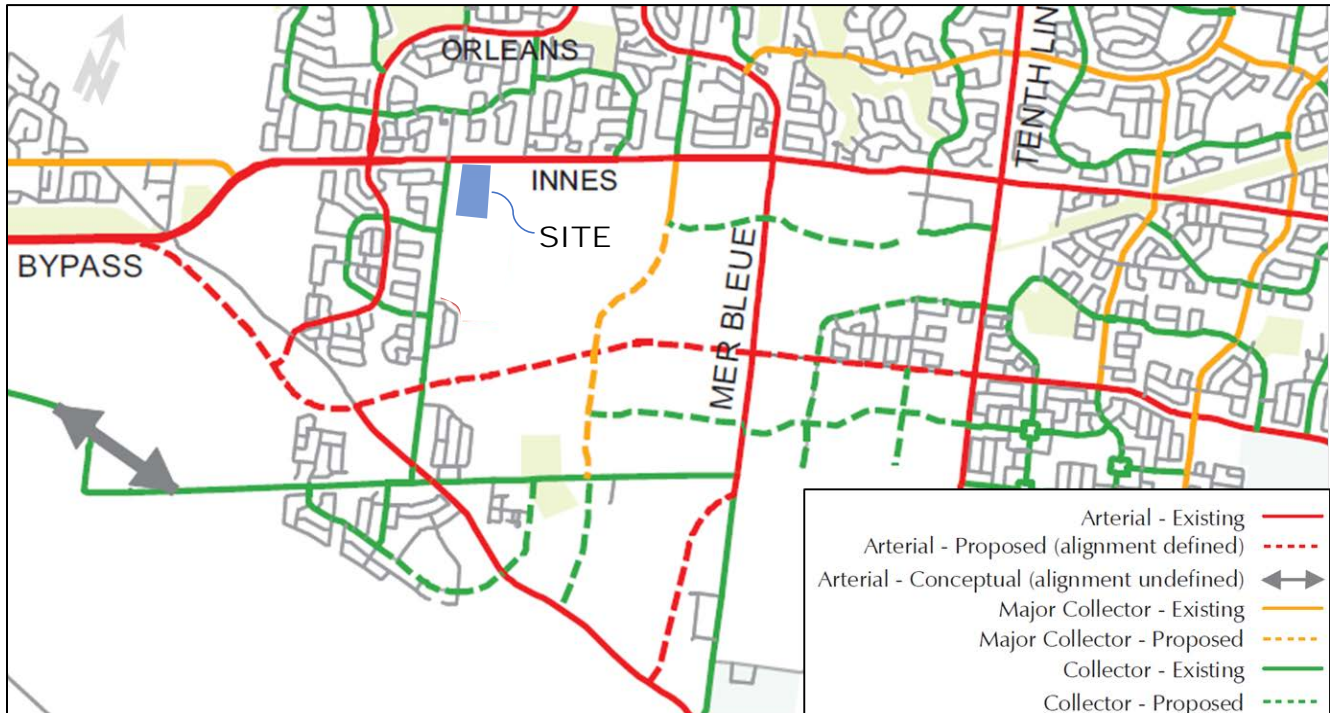
Future Collector Roads

The transportation master plan (TMP) outlines future collector roadways in the vicinity of the proposed development. Three collector roadway extensions within the vicinity of the site are shown on **Figure 5**, the Frank Bender Street (major north-south collector), and Harvest Valley Avenue (east-west collector) extensions. Vanguard Drive is currently underway (east-west collector) which will extend from Lanthier Drive in the east to Mer Bleue Road in the west and will serve as one of the primary east-west collectors through the proposed Orléans Industrial Park.

Transit

Within the TMP's affordable network, transit priority (isolated measures) are proposed along Innes Road and Brian Coburn Boulevard. Transit priority (continuous lanes) are proposed along the Blackburn Bypass, west of the site.

Figure 5: Transportation Master Plan Road Network (Map 6)



Other Area Development

According to the City's development application search tool, the following developments are planned within the vicinity of the subject site and are illustrated in **Figure 6**.

East Urban Community Mixed Use Centre CDP

The City is currently engaged in the East Urban Community Mixed Use Centre Community Design Plan (EUC MUC CDP) process. The CDP area is located between Mer Bleue Road, the hydro corridor and Brian Coburn Boulevard. The aim of the CDP is to create a mixed used community with an area of approximately 570 hectares. Though still in its infancy, it is noteworthy due to its size and proximity to Lépine's proposed site.

3443 Innes Road

The proposed development is a six-storey, mixed-use building with commercial uses at grade and residential units above. A total of six commercial units are being proposed on the ground floor with four units facing Innes Road and two units facing Pagé Road. A total of 35 residential units are proposed from the remainder of the storeys. The Transportation Brief (prepared by Novatech) projects an increase in two-way traffic volumes of approximately 25 to 30 veh/h during peak hours.

3817-3843 Innes Road

Four four-storey apartment buildings are proposed at the above noted addresses, located approximately 1 km east of the subject site. The Transportation Brief (prepared by Novatech) projects an increase in two-way traffic volumes of approximately 30 to 40 veh/h during peak hours.

3490 Innes Road (south of site)

Innes Road Development Corporation is proposing a residential development at the above-noted address, which is located south of the subject development. The Transportation Impact Assessment (prepared by Parsons) projected an increase in vehicle traffic of approximately 245 and 300 veh/h during both the morning and afternoon peak hours.

Figure 6: Other Area Development



2.2. STUDY AREA AND TIME PERIODS

As the proposed site is largely a residential development, the time periods assessed will be the weekday morning and afternoon peak hours. The proposed study area is outlined below and highlighted in **Figure 7**.

- Pagé/Innes intersection;
- Orléans/Innes intersection;
- U-Haul/Innes intersection;
- Planned Site/Innes intersection (referred to Lamarche/Innes from herein); and
- Innes Road adjacent to the site.

Figure 7: Study Area



2.3. EXEMPTION REVIEW

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

Table 2: Exemptions Review Summary

Module	Element	Exemption Consideration
4.2 Parking	4.2.2 Spillover Parking	The parking is expected to meet By-Law requirements.
4.6 Neighbourhood Traffic Management	All elements	The site relies on arterial roadways for access.
4.8 Review of Network Concept	All elements	The site is not expected to generate 200 trips more than the established zoning. This will be confirmed in Step 3.

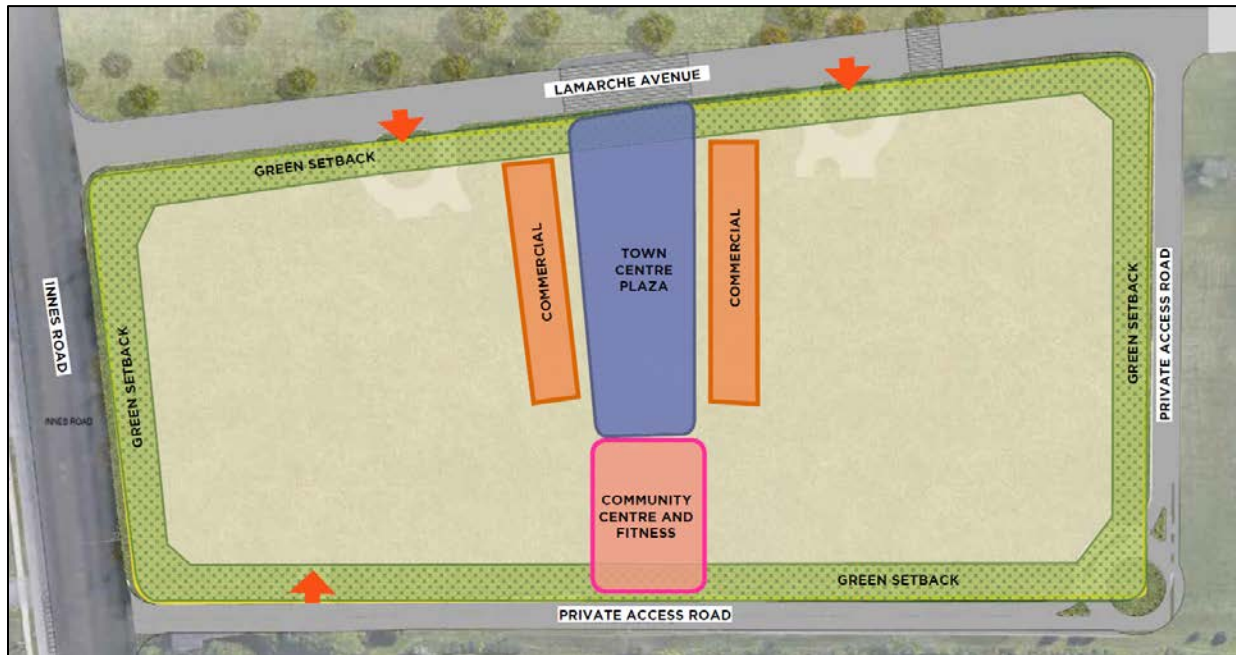
3. FORECASTING REPORT

3.1. DEVELOPMENT GENERATED TRAVEL DEMAND

3.1.1. TRIP GENERATION AND MODE SHARES

Trip generation rates for the proposed development, consisting of 699 high-rise apartment units and 621 mid-rise apartment units, were obtained from the City's TRANS Trip Generation Report. For the purpose of this study, all 1,320 apartment units were treated as mid-rise apartment units as it has a slightly higher trip generation rate than high-rise units and offers a more conservative analysis. It was assumed the approximate 2,600 sq.m of ground floor commercial space would cater to local residents and would not generate new primary trips. The basis for this assumption was based on the proposed location and orientation of the commercial area, as shown in **Figure 8**.

Figure 8: Commercial Area



The proposed commercial area will not front Innes Road, but will be split between two buildings straddling the Town Centre Plaza. The location is far removed from Innes Road, which is expected to deter pass-by travel for regional commuters. The orientation along the plaza caters directly to local residents. Therefore, any trips generated by the commercial space are expected to be generated from within the development or from nearby developments using non-auto modes. **Table 3** provides the appropriate trip generation rates for residential use.

Table 3: Vehicle Trip Generation Rates

Land Use	Data Source	Trip Rates	
		AM Peak	PM Peak
Mid-Rise Apartments	TRANS (Table 3.18)	T = 0.29(du)	T = 0.37(du)
Notes: T = Average Vehicle Trip Ends			

Using the TRANS Trip Generation rates, the total amount of vehicle trips generated by the proposed Phase 1 development (consisting of 436 units and 2,612 sq. meters of commercial) and full buildout development (consisting of an additional 884 units) was calculated. The results are summarized in **Table 4**.

Table 4: TRANS Vehicle Trip Generation

Land Use	Data Source	Units	AM Peak (veh/h)			PM Peak (veh/h)		
			In	Out	Total	In	Out	Total
Phase 1 - Buildings D and E	TRANS (Table 3.13)	436	30	96	126	99	62	161
Remaining Buildings		884	61	196	257	203	124	327
Total Full Buildout			91	292	383	302	186	488

Using the TRANS trip projections in **Table 4** and the mode share percentages from the TRANS Trip Generation Report (Table 3.13), the total projected number of person trips by mode for interim phase and ultimate buildout of the site development are summarized in **Table 5** and **Table 7** respectively. The person trips were then used to calculate the vehicle trips generated based on mode shares for Orleans extracted from the OD-Survey conducted in 2011 as seen in **Table 6** and **Table 8** for interim and ultimate buildout respectively.

Table 5: Phase 1 Site Person Trip Generation – Buildings D and E

Travel Mode	AM Mode Share	AM Peak (persons/h)			PM Mode Share	PM Peak (persons/h)		
		In	Out	Total		In	Out	Total
Auto Driver	44%	30	96	126	44%	99	62	161
Auto Passenger	9%	6	19	25	14%	32	20	52
Transit	34%	24	74	98	33%	76	45	121
Non-motorized	13%	9	28	37	9%	19	13	32
Total People Trips	100%	69	217	286	100%	226	140	366

Table 6: Phase 1 Site Vehicle Trip Generation Using OD Mode Shares – Buildings D and E

Travel Mode	AM Mode Share	AM Peak (veh/h)			PM Mode Share	PM Peak (veh/h)		
		In	Out	Total		In	Out	Total
Auto Driver	40%	27	87	114	55%	124	77	201
Auto Passenger	20%	14	43	57	20%	45	28	73
Transit	25%	17	55	72	15%	35	20	55
Non-motorized	15%	11	32	43	10%	22	15	37
Total People Trips	100%	69	217	286	100%	226	140	366
Total 'New' Interim Auto Trips		27	87	114	-	124	77	201

As per **Table 6**, Phase 1 of the subject site is projected to generated approximately 115 and 200 vehicles in the AM and PM peaks respectively.

Table 7: Full Buildout Site Person Trip Generation – All Buildings

Travel Mode	AM Mode Share	AM Peak (persons/h)			PM Mode Share	PM Peak (persons/h)		
		In	Out	Total		In	Out	Total
Auto Driver	44%	91	292	383	44%	302	186	488
Auto Passenger	9%	19	59	78	14%	97	58	155
Transit	34%	72	224	296	33%	226	140	366
Non-motorized	13%	28	85	113	9%	62	38	100
Total People Trips	100%	210	660	870	100%	687	422	1,109

Table 8: Full Buildout Site Vehicle Trip Generation Using OD Mode Shares – (All Buildings)

Travel Mode	AM Mode Share	AM Peak (veh/h)			PM Mode Share	PM Peak (veh/h)		
		In	Out	Total		In	Out	Total
Auto Driver	40%	83	265	348	55%	377	232	609
Auto Passenger	20%	42	132	174	20%	138	84	222
Transit	25%	53	164	217	15%	104	63	167
Non-motorized	15%	32	99	131	10%	68	43	111
Total People Trips	100%	210	660	870	100%	687	422	1,109
Total 'New' Full Buildout Auto Trips		83	265	348	-	377	232	609

As per **Table 8**, full buildout of the site is projected to generate approximately 350 and 610 vehicles in the AM and PM peaks respectively.

Adjusted Mode Shares

Considering the location of the site on major bus route #94 with frequent service and planned transit investments in the future, the mode shares from the OD-Survey 2011 for Orléans demonstrate a relatively conservative transit assumption for local residents by the 2031 horizon. Within the TMP Affordable Network, transit priority (isolated measures) are proposed along Innes Road and the future Brian Coburn Boulevard extension, plus continuous lanes along the Blackburn

Bypass west of the site. The TMP Network Concept includes the Cumberland Transitway that would provide fully exclusive bus rapid transit between Blair Station and Frank Kenny Road by 2031. While the funding for the Transitway is currently uncertain, there is growing demand for this infrastructure since the City approved the Mer-Bleue Expansion CDP; residential development south of Innes between Navan and Tenth Line is expected to accelerate in the next 10 years. If constructed, the subject site would be located within 600m of the proposed Belcourt (now Fern Casey) Extension Station.

From a capacity perspective, Innes Road is not expected to be widened by 2031, so potential traffic will be constrained and eventually plateau. It is unlikely that future growth along this corridor will maintain the existing mode share, particularly with the City's focus on investing in alternate modes, as described above.

Therefore, the mode share assumptions for the proposed development at 2031 were adjusted to reflect lower auto-driver mode share, and higher transit mode share targets, as shown in **Table 9**.

Table 9: Future Mode Share Targets for Proposed Development

Travel Mode	Mode Share Target	Rationale
Auto Driver	35%	Given the close proximity to transit and commercial services, the driver and passenger mode splits are forecasted to be lower than other areas of the City.
Auto Passenger	5%	
Transit	45%	Development is located in close proximity to major bus route #94. Innes Road is in the TMP's affordable network for transit priority with major updates in transit services in the near future.
Walking	10%	This is consistent with the City's TMP and existing mode shares shown in Tables 5 through 9.
Biking	5%	

The future mode shares summarized in **Table 9** were applied to the total person-trips outlined in **Table 7**, to estimate future trip generation at ultimate buildout, as shown in **Table 10**.

Table 10: Future Trip Generation with Mode Share Assumptions - Ultimate Buildout (2031)

Travel Mode	AM Mode Share	AM Peak (persons/h)			PM Mode Share	PM Peak (persons/h)		
		In	Out	Total		In	Out	Total
Auto Driver	35%	73	231	304	35%	240	148	388
Auto Passenger	5%	11	33	44	5%	35	21	56
Transit	45%	94	297	391	45%	309	190	499
Non-motorized	15%	32	99	131	15%	103	63	166
Total People Trips	100%	210	660	870	100%	687	422	1,109
Total 'New' Full Buildout Auto Trips		73	231	304	-	240	148	388

Assuming the adjusted mode share targets, two-way transit trips were estimated to be approximately 390 to 500 trips per hour and bike/walk trips were estimated to be approximately 130 to 165 trips per hour, in the AM and PM peak hour periods respectively at full buildout. The number of 'new' vehicular trips generated by the proposed development at full buildout was projected to be approximately 305 to 390 vehicles per hour during the AM and PM peak hour periods respectively.

3.1.2. TRIP DISTRIBUTION

Traffic distribution was based on the existing volume splits at study area intersections, land use types, time of day, and our knowledge of the surrounding area. During the morning peak hour, it is assumed that the majority of drivers are travelling to/from employment; however, during the afternoon peak hour, there is a greater percentage of drivers travelling to/from retail land uses and communities located to the east of the subject site. As such, the morning and afternoon peak hour distributions differ slightly, as outlined below:

AM Peak Hour

- 70% to/from the west;
- 25% to/from the north;

PM Peak Hour

- 60% to/from the west;
- 20% to/from the north;

- 5% to/from the east.
- 20% to/from the east.

3.1.3. TRIP ASSIGNMENT

Based on this assumed distribution, site-generated traffic at interim phase (2022) was assigned to the adjacent network, as shown in **Figure 9**. Site-generated traffic at ultimate buildout (2031) was assigned to the planned adjacent network as shown in **Figure 10**.

Figure 9: Phase 1 Site-Generated Traffic (Buildings D and E, 2022)

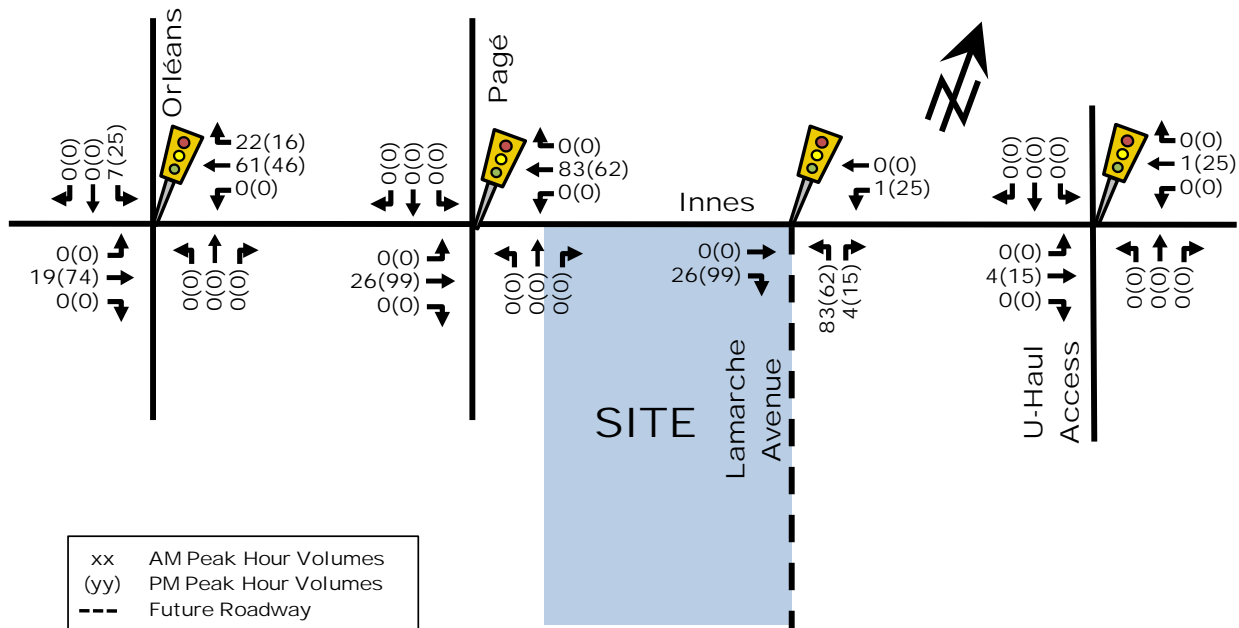
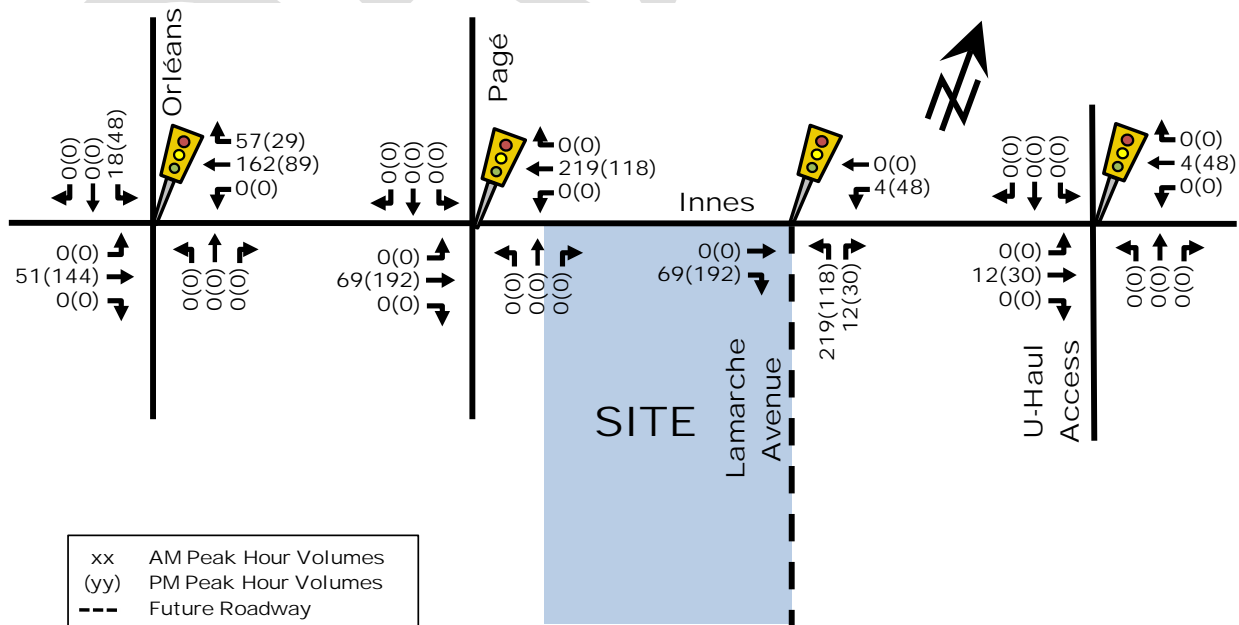


Figure 10: Ultimate Site-Generated Traffic 2031 (All Buildings)



3.2. BACKGROUND NETWORK TRAVEL DEMAND

3.2.1. TRANSPORTATION NETWORK PLANS

The transportation network changes have been discussed within Section 2.1.3., and none were anticipated to impact the transportation analysis for this development.

3.2.2. BACKGROUND GROWTH

The background traffic growth through the immediate study area (summarized in **Table 11**) was calculated based on historical traffic count data (years 2003, 2004, 2014, and 2017) provided by the City of Ottawa at the Orléans/Innes intersection. Detailed analysis of the background growth is included in Appendix E.

Table 11: Orléans/Innes Historical Background Growth (2003 – 2017)

Time Period	Percent Annual Change				
	North Leg	South Leg	East Leg	West Leg	Overall
8 hrs	1.35%	-0.20%	4.38%	2.53%	2.70%
AM Peak	0.69%	0.14%	3.81%	1.75%	2.08%
PM Peak	0.01%	-0.68%	3.45%	1.60%	1.66%

As shown in **Table 11**, in past years Innes Road and Orléans Boulevard has experienced an average annual growth ranging from +1.66% to +2.70%. Overall, minimal growth was observed on north-south movement and growth rates ranging from +1.6% to +4.38% were observed on Innes Road on east-west travel. These high traffic growth rates were a direct result of urban expansion along the Innes corridor towards Trim Road since 2003. Today, there are few undeveloped areas left along Innes to fuel significant traffic growth. The few nearby developments that are expected to contribute traffic within the study area were accounted for independently. This process is discussed in further detail in the following section.

Additionally, the City is focused on constructing new connections (e.g. Brian Coburn) and alternative infrastructure (e.g. transit priority measures and strengthening pedestrian/cycling facilities) to increase capacity for future developments south of Innes rather than increasing capacity on Innes. Therefore, a 1% annual growth rate for traffic on Innes Road east-west through movement will be applied in the future analysis.

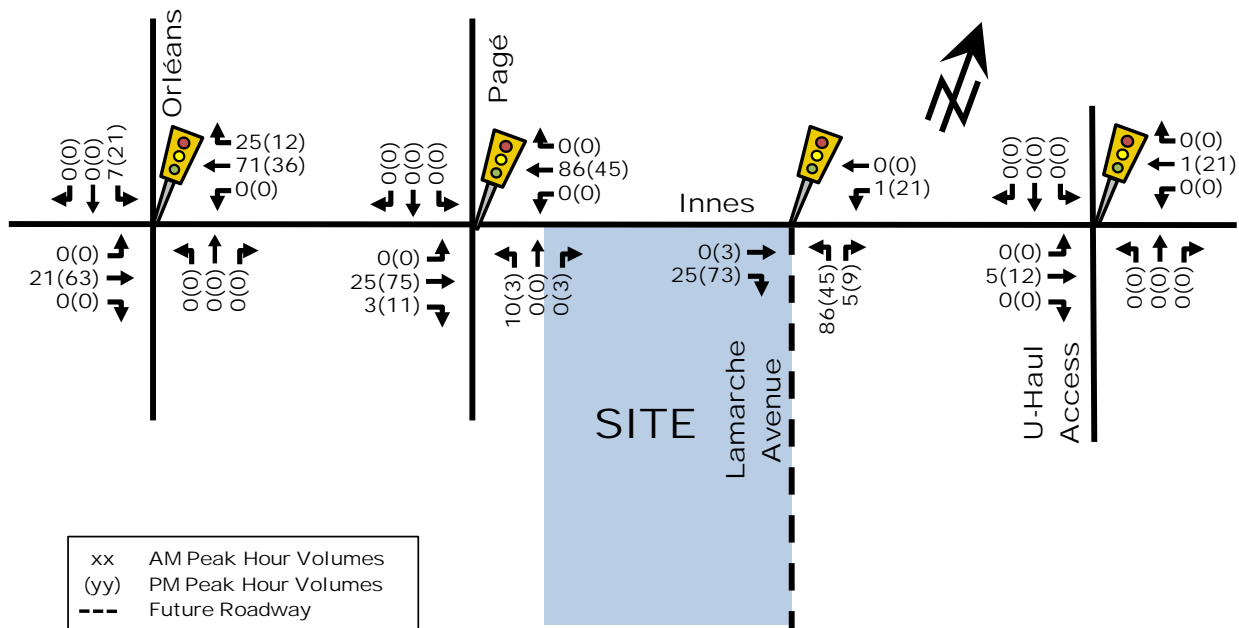
3.2.3. OTHER AREA DEVELOPMENTS

Trips generated by other area developments were accounted within the study area. A summary of each development was provided in Section 2.1.3.

3490 Innes south of site - Phase 1

Figure 11 illustrates the projected traffic volumes for 3490 Innes located just south of site and expected to be at full occupancy by 2020 for interim Phase 1.

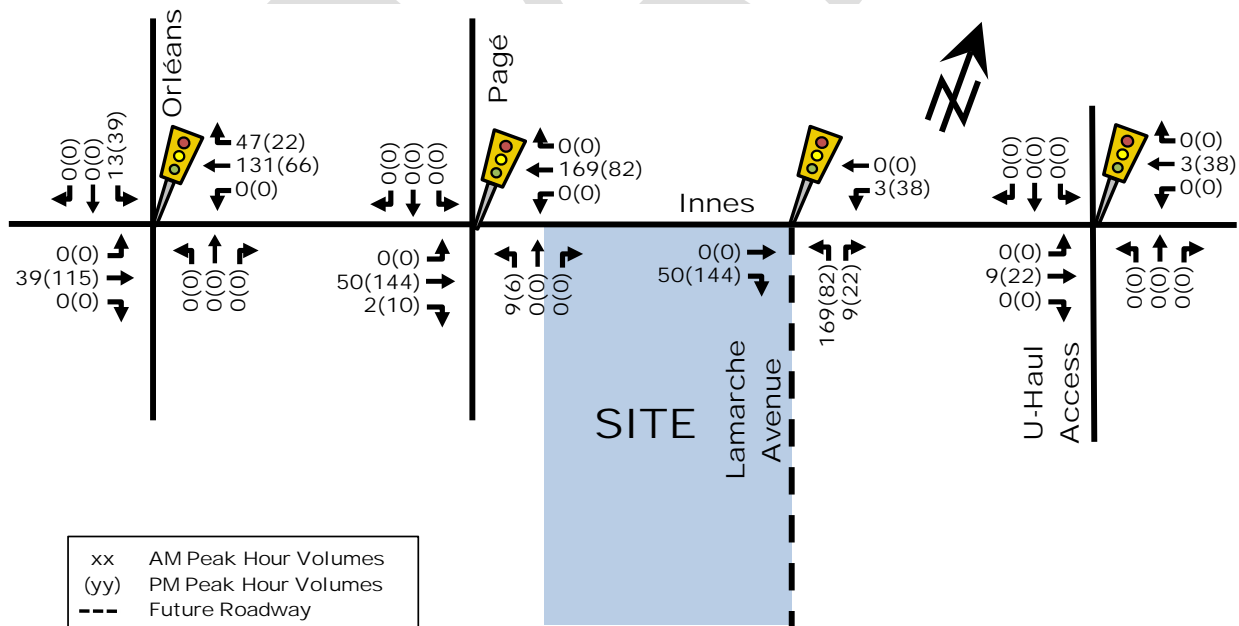
Figure 11: 3490 Innes Projected Traffic Volumes – 2020



3490 Innes south of site - Phase 1 and 2

Figure 12 illustrates the projected traffic volumes for 3490 Innes located just south of site and expected to be at full occupancy by 2024 for full buildout Phase 2.

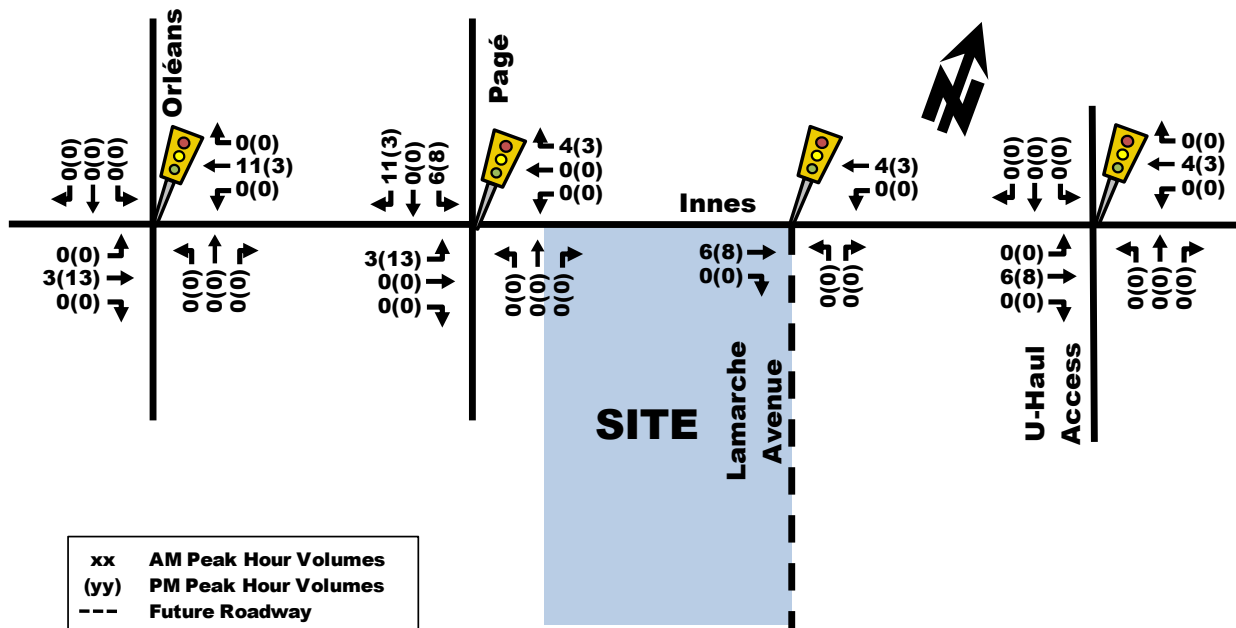
Figure 12: 3490 Innes Projected Traffic Volumes – 2024



3443 Innes

Figure 13 illustrates the projected traffic volumes for 3443 Innes located on the north west corner of Innes Road and Pagé Road and expected to be at full occupancy by 2020.

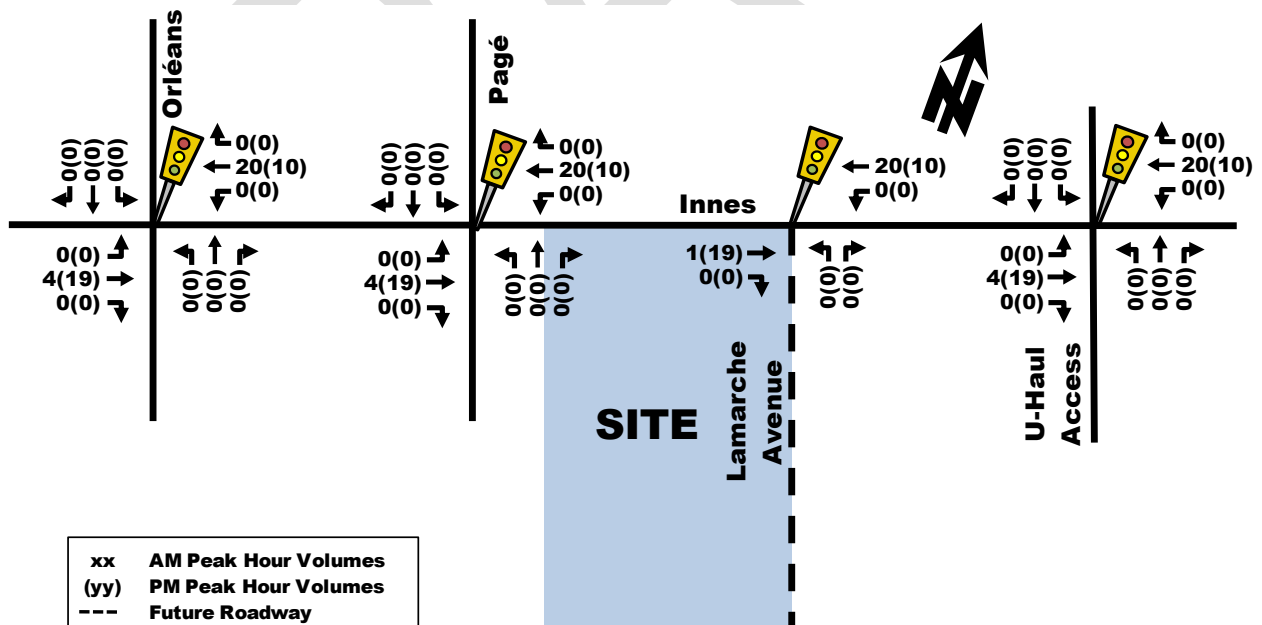
Figure 13: 3443 Innes Projected Traffic Volumes – 2020



3817-3843 Innes

Figure 14 illustrates the projected traffic volumes for 3817 Innes located on the north west corner of Innes Road and Pagé Road and expected to be at full occupancy by 2016; however, as of late 2018, there had still been no ground-break. Assumed occupancy by 2020.

Figure 14: 3817 Innes Projected Traffic Volumes – 2020



3.2.4. BACKGROUND TRAFFIC GROWTH

The future background volumes were calculated by superimposing other area developments on to the network and adding a background growth of 1% along the east-west through lanes on Innes Road. Background volumes were created for the

Phase 1 buildout year 2022 and for full buildout year 2031. The resulting background traffic volumes for Phase 1 and full buildout are depicted in **Figure 15** and **Figure 16**.

Figure 15: 2022 Background Traffic Volumes

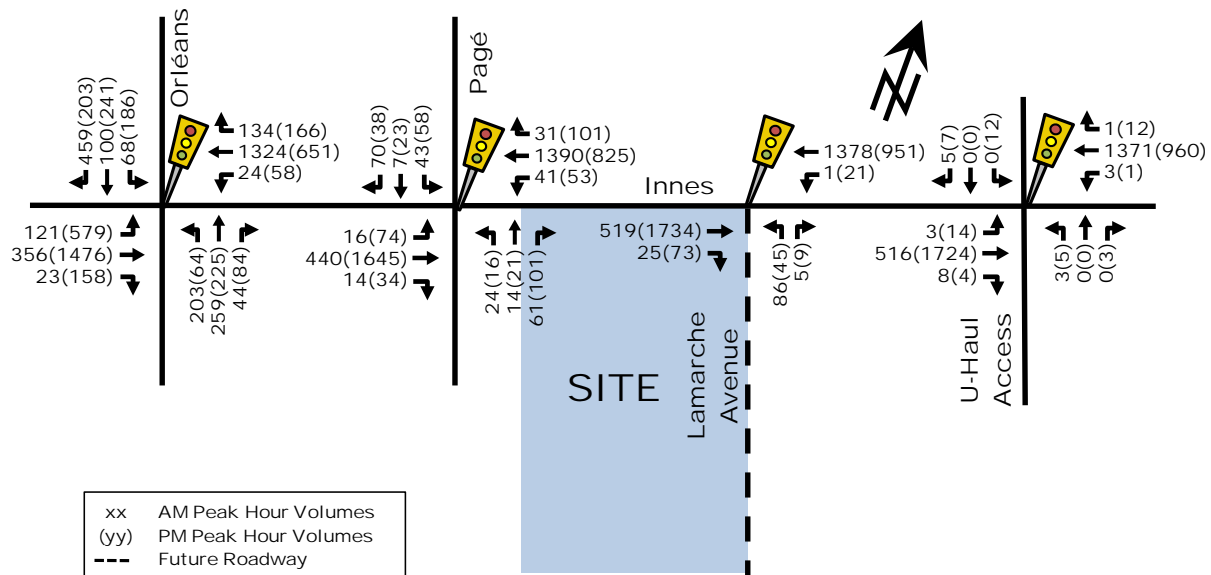
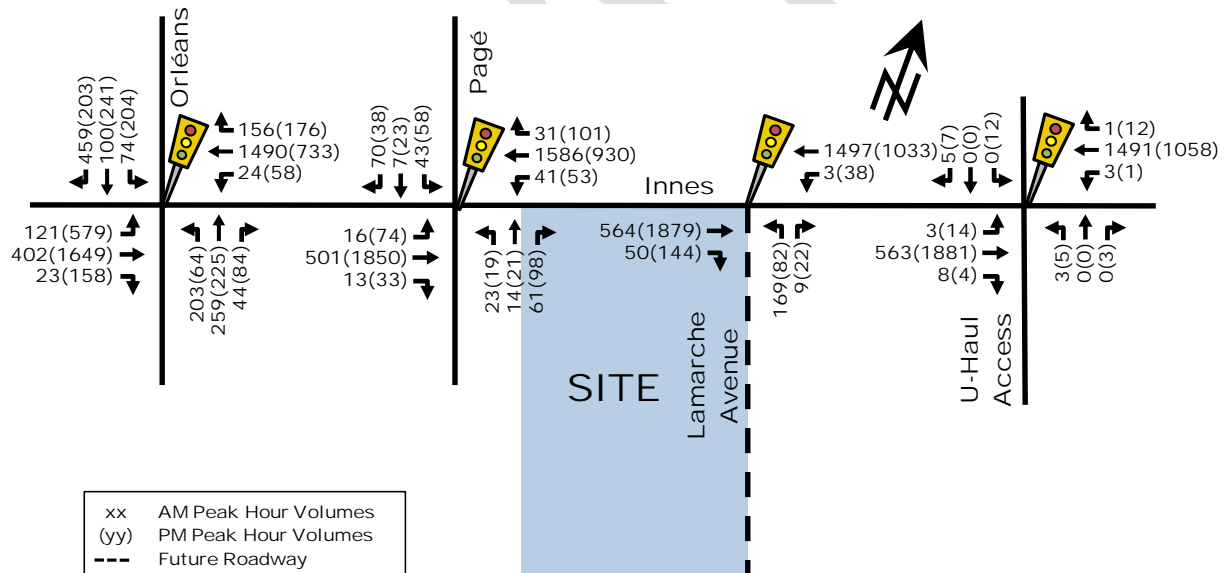


Figure 16: 2031 Background Traffic Volumes



3.3. DEMAND RATIONALIZATION

3.3.1. EXISTING CAPACITY CONDITIONS

The following **Table 12** provides a summary of the existing traffic operations at the study area intersection based on the Synchro (V10) traffic analysis software. The subject intersections were assessed in terms of the volume-to-capacity (v/c) ratio and the corresponding Level of Service (LoS) for the critical movement(s). The Synchro model outputs of existing conditions are provided within Appendix F.

Table 12: Existing Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Orléans/Innes	B(F)	0.69(1.02)	WBT(EBT)	25(41)	B(D)	0.63(0.87)
Pagé/Innes	A(B)	0.57(0.66)	SBT(SBT)	5(8)	A(B)	0.51(0.64)
U-Haul/Innes	A(B)	0.52(0.66)	WBT(EBT)	3(5)	A(B)	0.52(0.65)
Note: Analysis of signalized intersections assumes a PHF of 0.90 and a saturation flow rate of 1800 veh/h/lane.						

As shown in **Table 12**, all the intersections within the subject area are currently operating ‘as a whole’ at good LoS ‘D’ or better during the AM and PM peak hours. The majority of the ‘critical movements’ at study area intersections are currently operating at a good LoS ‘B’ or better during both peak hours with the exception of Orléans/Innes which has a critical movement of ‘F’.

It is important to note that the side street volumes at the Orléans/Innes intersection correspond to 2017 counts completed prior to the opening of Brian Coburn Boulevard in 2018, which may lead to higher traffic volume estimates at the intersection.

Overall, the existing Synchro analysis indicates there are no capacity constraints in the network.

4. STRATEGY REPORT

4.1. DEVELOPMENT DESIGN

Location of Transit Facilities

The furthest Buildings from OC-Transpo major bus route #94 bus-stop on Innes Road are Buildings G and H which are located approximately 350 meters walking distance from existing stops. All other Buildings are located less than 350 meters walking distance, with the closest Buildings, A and B, which directly front Innes Road.

Pedestrian Routes and Facilities

The buildings will have at-grade access directly onto Innes Road and Lamarche Avenue. Sidewalks are located on both sides of Innes Road (east-west arterial) and Lamarche Avenue (north-south collector road). Internal pedestrian walkways are proposed through landscaped courtyards which connect all the buildings.

Bicycle Parking

The proponent is providing bicycle parking spaces at a rate of 0.5 per unit which equates to 660 parking spaces plus 11 additional parking spaces for retail visitors for a total of 671 bicycle parking spaces; thus, meeting the City’s By-Law requirements. It is anticipated that the majority of bicycle parking spaces will be provided indoors in a secure, well-lit area.

Vehicle Access

The proposed development access will be provided through two vehicular loops connecting the parking lots to Lamarche Avenue. It is anticipated that on-site vehicle circulation and parking lot circulation will meet the City’s By-Law requirements.

It is anticipated that garbage pick-up will take place on-site from the rear (west) via the controlled-access internal service road.

4.2. PARKING SUPPLY

Based on the City of Ottawa parking bylaws, vehicle and bicycle parking requirements were calculated based on the site's location and are summarized in **Table 13** and **Table 14** respectively.

Table 13: Vehicle Parking Spaces Requirements

Building / Units		Mixed-Use Rate (spaces/unit)	Required # of Parking Spaces			Proposed # of Parking Spaces
			Mixed-Use	Visitor	Total	
Building A	263	1.0	263	26	289	289
Building B	125		125	13	138	138
Building C	105		105	11	116	116
Building D	207		207	26	233	247
Building E	229		229	29	258	272
Building F	97		97	10	107	107
Building G	150		150	15	165	165
Building H	144		144	14	158	158
Total			1,320	144	1,464	1,491

According to **Table 13**, the subject development is required to provide 1,320 parking spaces for residents and commercial (mixed use), and 144 parking spaces for visitors, for a total of 1,464 parking spaces. With a total of 1,491 proposed underground and surface parking spaces, the subject development meets City requirements.

Table 14 summarizes bicycle parking requirements as per City of Ottawa Zoning By-Law-Part 4, sections 100-114.

Table 14: Bicycle Parking Requirements

Land Use	Units	# of Bicycle Spaces	
		Required	Proposed
Buildings A to H	1,320	660	660
Retail	-	11	11
Total	1,320	671	671

4.3. BOUNDARY STREET DESIGN

The boundary streets for the development are Innes Road and Lamarche Avenue. Lamarche Avenue has not been complete yet and is subject to changes; however, it is expected that this road segment will be built to collector road standards with appropriate pedestrian and cycling facilities. Furthermore, there are internal pedestrian walkways proposed at the site which will connect the proposed development to Innes Road. The existing roadway geometry consists of the following features:

- Innes Road
 - 2 vehicle travel lane in each direction;
 - 1.8m sidewalk with 1.5m boulevard on both sides of the roadway; and,
 - More than 3,000 vehicles per day.

The multi-modal level of service analysis for the subject road segments adjacent to the site is summarized in

Table 15 with detail analysis provided in Appendix G.

Table 15: MMLOS – Road Segments Adjacent to the Site

Road Segment	Level of Service			
	Pedestrian (PLOS)		Bicycle (BLOS)	
	PLOS	Target	BLOS	Target
Innes Road between Pagé & U-Haul	E	C	C	D

Pedestrian PLOS targets were not met on Innes Road. The triggers were due to high vehicle volumes, and high operating speeds. MMLOS targets would be met if the speeds were reduced, the volumes were reduced or on-street parking was provided; however, this may not be feasible, or it would highly affect vehicle flow on a major arterial.

Cyclist BLOS targets were met on Innes Road.

4.4. ACCESS INTERSECTION DESIGN

The proposed development will make use of a new collector road for access, Lamarche Avenue, which connects to Innes Road on the north and Silverbirch to the south. The site will be connected via two access loops to ground and underground parking. Internal surface sidewalks are proposed within the site which offers pedestrian connectivity between the buildings and to Innes Road, Lamarche Avenue and the truck/emergency access only roadway.

A road around the south and west perimeter of the site will offer delivery, drop off and emergency vehicle only access and will be controlled by a 24-hour on site security system gate. **Figure 17** illustrates the proposed access for the development.

Figure 17: Site Access Plan



4.4.1. ACCESS DESIGN – SIGNAL WARRANT

A traffic signal warrant was completed, and it was determined that traffic signal controls are required both for phase 1 interim and ultimate buildout. A traffic signal was not warranted for ultimate background; however, very little traffic was needed to tip the warrant from not needed to traffic signals needed. The warrant calculations are shown in Appendix H.

4.5. TRANSPORTATION DEMAND MANAGEMENT

The development generated travel demand has been estimated in Section 3.1.1 using modal shares from the 2011 TRANS O-D survey for Orléans. These modal shares reflect conditions for a wide variety of transportation services supply within Orléans. Given site location near major arterial Innes Road, they might not reflect site's current conditions. However, considering development phasing (full occupancy by 2031) and consideration of the TMP's affordable network plans proposing isolated transit priority on Innes Road and future Brian Coburn transit priority corridor, it is anticipated that transit shares will increase, and auto shares will decrease for the subject site within the horizon analysis.

Once the envisioned transit priority corridors are completed, and to support the anticipated rise in transit ridership, post-occupancy TDM measures are recommended and attached as Appendix I.

4.6. ROUTE CAPACITY

It is anticipated that there will be sufficient transit capacity due to the high frequency route 94 located at the frontage of the proposed development. Route 94 operates at approximately 5-minute intervals during peak hours and approximately 15-minute intervals during non-peak hours with service from as early as 4:33am until midnight.

4.7. INTERSECTION DESIGN

4.7.1. PROJECTED BACKGROUND INTERIM OPERATIONS

The interim background volumes from Section 3.2.4 and **Figure 15** were inputted in Synchro to analyze the future interim background conditions. Results are summarized in **Table 16** with detailed analyses provided in Appendix J.

Table 16: Projected 2022 Background Operations at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Orléans/Innes	B(D)	0.70(0.84)	WBT(EBT)	24(32)	B(C)	0.64(0.78)
Pagé/Innes	A(C)	0.57(0.77)	SBT(SBT)	6(8)	A(B)	0.51(0.68)
U-Haul/Innes	A(B)	0.49(0.63)	WBT(EBT)	3(5)	A(B)	0.49(0.62)
Lamarche/Innes	A(B)	0.50(0.65)	WBT(EBT)	5(5)	A(B)	0.50(0.63)
Note: Analysis of signalized intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane.						

As shown in **Table 16**, all the intersections within the subject area are projected to operate 'as a whole' at acceptable LoS 'C' or better during the AM and PM peak hours. All of the 'critical movements' at study area intersections are projected to operate at acceptable LoS 'D' or better during both peak. Note that the timing plans for the intersections were optimized to improve critical turning movements while still keeping the original cycle lengths. No significant changes between existing conditions and interim background were noted.

Multi-Modal Level of Service

It is anticipated that when Lamarche Avenue is completed, it will be built to accommodate adequate pedestrian and cycling facilities to meet MMLoS requirements.

4.7.2. PROJECTED BACKGROUND ULTIMATE BUILDOUT OPERATIONS

The ultimate buildout background volumes from Section 3.2.4 and **Figure 16** were inputted in Synchro to analyze the future ultimate background conditions. Results are summarized in **Table 17** with detailed analyses provided in Appendix J.

Table 17: Projected Background Ultimate Buildout Operations at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Orléans/Innes	C(E)	0.76(0.92)	WBT(EBT)	25(35)	B(D)	0.70(0.85)
Pagé/Innes	A(E)	0.60(0.98)	WBT(EBT)	7(19)	A(D)	0.58(0.88)
U-Haul/Innes	A(D)	0.53(0.83)	WBT(EBT)	3(28)	A(D)	0.53(0.82)
Lamarche/Innes	B(D)	0.62(0.83)	NBL(EBT)	8(15)	A(C)	0.58(0.80)
Note: Analysis of signalized intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane.						

As shown in **Table 17**, all the intersections within the subject area are projected to operate ‘as a whole’ at acceptable LoS ‘D’ or better during the AM and PM peak hours. The majority of the ‘critical movements’ at study area intersections are projected to operate at acceptable LoS ‘D’ or better during both peak hours with the exception of Pagé/Innes and Orléans/Innes which have critical movements of LoS ‘E’ in the PM. Note that the timing plans for the intersections were optimized to improve critical turning movements while still keeping the original cycle lengths. Some changes between existing conditions and ultimate buildout background future were noted, predominantly in the PM peak hour.

Multi-Modal Level of Service

It is anticipated that when Lamarche Avenue is completed, it will be built to accommodate adequate pedestrian and cycling facilities to meet MMLOS requirements.

4.7.3. FUTURE PROJECTED INTERIM CONDITIONS

The total future projected interim conditions were derived by superimposing the interim background volumes onto the interim site-generated volumes and are illustrated in **Figure 18**. Synchro results for study area intersection performance are summarized in **Table 18** with detailed analyses provided in Appendix K.

Figure 18: Future Projected Phase 1 Conditions

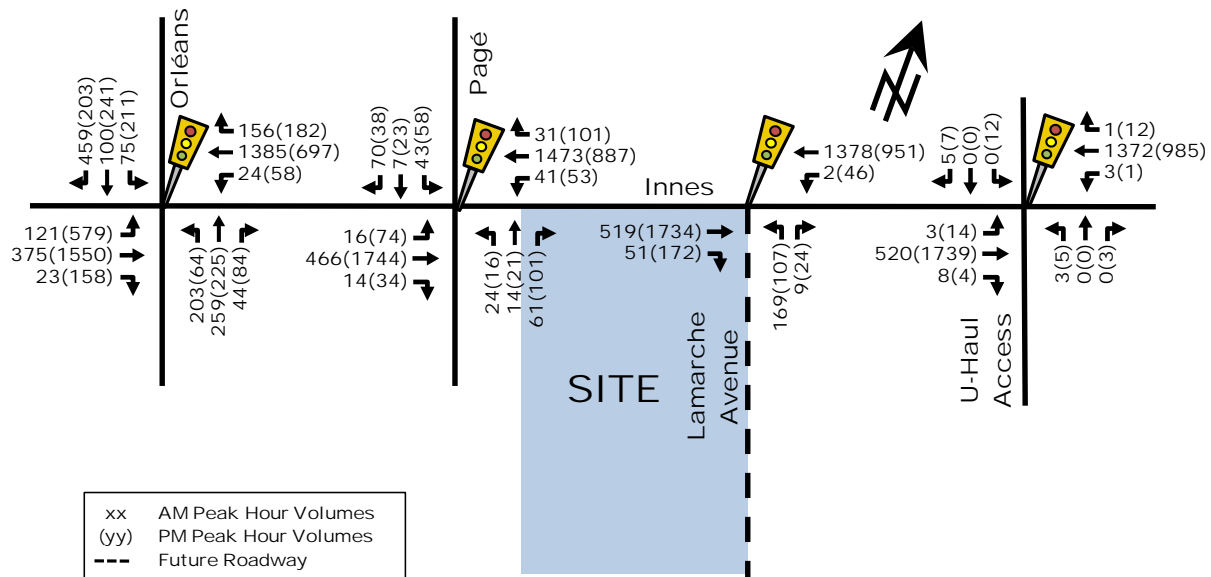


Table 18: Future Projected Phase 1 Operations at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Orléans/Innes	C(E)	0.73(0.92)	WBT(SBL)	25(34)	B(D)	0.67(0.81)
Pagé/Innes	A(C)	0.58(0.77)	SBT(SBT)	7(8)	A(C)	0.54(0.71)
U-Haul/Innes	A(B)	0.49(0.63)	WBT(EBT)	3(5)	A(B)	0.49(0.62)
Lamarche/Innes	B(C)	0.62(0.75)	NBL(EBT)	9(13)	A(C)	0.54(0.73)

Note: Analysis of signalized intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane.

As shown in **Table 18**, all the intersections within the subject area are projected to operate ‘as a whole’ at acceptable LoS ‘D’ or better during the AM and PM peak hours. The majority of the ‘critical movements’ at study area intersections are projected to operate at good LoS ‘C’ or better during both peak hours with the exception of Orléans/Innes which has a critical movements of LoS ‘E’ in the PM. Note that the timing plans for the intersections were optimized to improve critical turning movements while still keeping the original cycle lengths. No significant changes between interim background conditions and interim future conditions were noted.

Multi-Modal Level of Service

It is anticipated that when Lamarche Avenue is completed, it will be built to accommodate adequate pedestrian and cycling facilities to meet MMLoS requirements.

4.7.4. FUTURE PROJECTED FULL BUILDOUT CONDITIONS

The total future projected ultimate buildout conditions were derived by superimposing the ultimate buildout background volumes onto the ultimate buildout site-generated volumes and are illustrated in **Figure 19**. Synchro results for study area intersection performance are summarized in **Table 19** with detailed analyses provided in Appendix K.

Figure 19: Future Projected Full Buildout Conditions

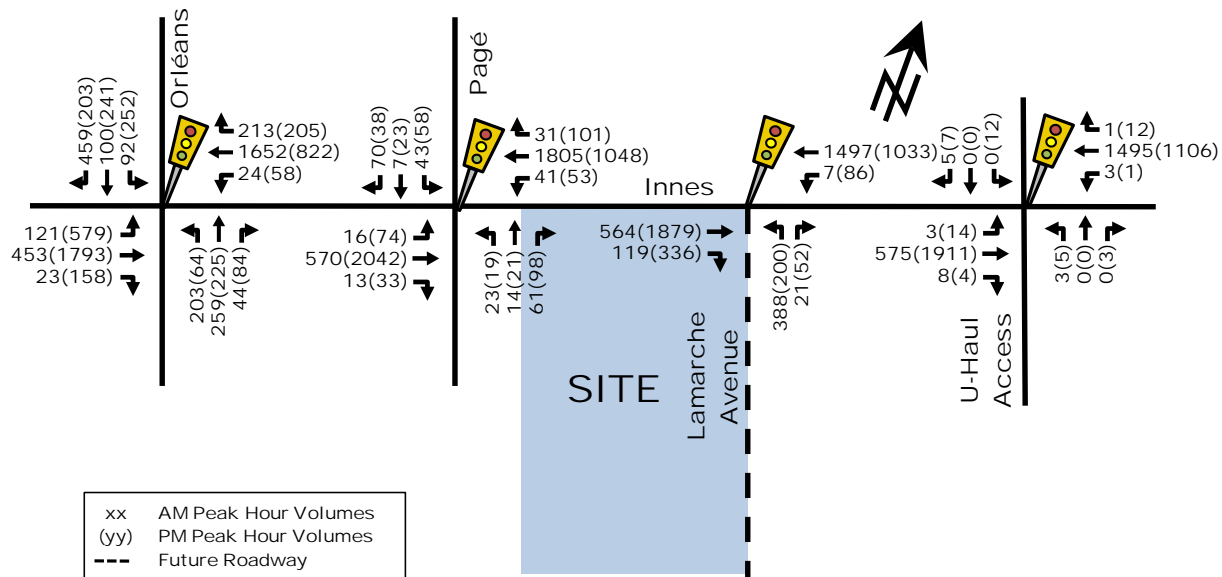


Table 19: Future Projected Full Buildout Operations at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Orléans/Innes	D(F)	0.84(1.15)	WBT(EBT)	26.3(62.1)	C(F)	0.77(1.04)
Pagé/Innes	B(D)	0.69(0.89)	WBT(EBT)	8.8(15.7)	B(D)	0.66(0.84)
U-Haul/Innes	A(B)	0.53(0.69)	WBT(EBT)	2.9(4.0)	A(B)	0.53(0.68)
Lamarche/Innes	C(E)	0.78(0.98)	NBL(EBT)	18.3(18.4)	C(E)	0.71(0.94)
Lamarche/Innes with EBR Lane	C(D)	0.80(0.83)	WBT(EBT)	19.3(10.7)	C(C)	0.76(0.80)
Note: Analysis of signalized intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane.						

As shown in **Table 19**, the majority of the intersections within the subject area are projected to operate 'as a whole' at acceptable LoS 'D' or better during the AM and PM peak hours with the exception of Orléans/Innes and Lamarche/Innes which are projected to operate at LoS 'F' and LoS 'E' in the PM peak respectively.

The majority of the 'critical movements' at study area intersections are projected to operate at acceptable LoS 'D' or better during both peak hours with the exception of Orléans/Innes and Lamarche/Innes which have critical movements of LoS 'E' or LoS 'F' in the PM peaks. Major improvements at Lamarche/Innes can be achieved if a right-turn lane is built on the eastbound movement. The overall vehicle capacity ratio (v/c) can be lowered from 0.94 (LoS 'E') to 0.80 (LoS 'C') while lowering the critical movement from 0.98 (LoS 'E') to 0.83 (LoS 'D') in the PM.

Note, the timing plans for the intersections were optimized to improve critical turning movements while still keeping the original cycle lengths. No significant change between background and buildout conditions were noted, indicating that the majority of vehicles impacting the operations at the study area intersections were more affected by background growth.

It is anticipated that when Lamarche Avenue is completed, it will be built to accommodate adequate pedestrian and cycling facilities to meet MMLOS requirements.

5. SUMMARY OF FINDINGS

Proposed Development

- The proposed development is located at 3490 Innes Road
- The site is currently occupied by an insurance company, food truck, mini-put facility and driving range which are no longer operating
- The proposed development will consist of an interim residential and commercial Buildings D and E expected to have occupancy by 2022, and ultimate residential Buildings A to H by 2031
- The proposed development will consist of the following:
 - Building D: 12-storey building with 207 units and 1,395 sq. m of commercial
 - Building E: 12-storeys building with 229 units and 1,312 sq. m of commercial
 - Building A: 16-storeys building with 263 units
 - Building B: 9-storeys building with 125 units
 - Building C: 9-storeys building with 105 units
 - Building F: 9-storeys building with 97 units
 - Building G: 9-storeys building with 150 units
 - Building H: 9-storeys building with 144 units
- Full buildout will consist of 1,320 units and approximately 2,600 sq. m of commercial space

Existing Conditions

- The Orléans/Innes intersection 'as a whole' is currently operating at an LoS 'D' in the PM peak hours, with critical movement of LoS 'F' in the PM peak
- The Pagé/Innes and U-Haul/Innes intersections operate at a LoS 'B' or better in both peak periods

Background Conditions

- A 1% annual growth rate was applied to study Innes Road through movements
- Other area developments noted in the study included:
 - East Urban Community Mixed Use Centre CDP
 - 3490 Innes Road residential development, south of this development (245-300 veh/h)
 - 3817 Innes Road residential development (30-40 veh/h)
 - 3443 Innes Road mixed use buildings (25-30 veh/h)
- The other area developments, except the EUC MUC CDP, were accounted for separately in the traffic analysis

Trip Generation and Parking

- Phase 1 (2022) of the proposed development was expected to generate approximately 115 and 200 vehicle trips in the weekday morning and afternoon peak hours respectively
- Full buildout (2031) modal share percentages were adjusted to reflect higher transit share targets based on the location and proximity of future transit infrastructure
- Full buildout of the proposed development was expected to generate approximately 305 and 390 vehicle trips during the weekday morning and afternoon periods respectively
- The subject development will provide a total of 1,491 underground and surface vehicle parking spaces, which meets City parking bylaws
- The subject development will provide a total of 671 bicycle parking spaces, which meets City bicycle parking bylaws

Projected Conditions

- Projected Phase 1 (2022) traffic condition 'as a whole' was projected to operate at a LoS 'D' or better during peak hours with critical movements operating at a LoS 'C' or better with the exception of Orléans/Innes which has a critical movement of 'E' in the PM. Overall, the intersections will operate similarly to existing levels of operation.
- Projected full buildout (2031) traffic conditions were shown to be similar to the 2031 background traffic conditions, indicating the impacts to network operations were triggered by background traffic growth.
- The proposed Lamarch/Innes intersection should be constructed with a westbound and a northbound left-turn lane to meet arterial level-of-service requirements ($v/c \leq 1.00$). If right-of-way permits, an eastbound right-turn lane at Lamarche/Innes should be considered at that intersection to meet optimal City of Ottawa standards ($v/c \leq 0.90$).
- The MMLOS road segment analysis showed cyclist levels-of-service (BLoS) targets were met on Innes Road. However, the south side of Innes Road between Pagé and U-Haul was not expected to meet minimum targets for pedestrians due to high operating speeds, high vehicle volumes and a lack of on-street parking. There are no plans to modify Innes Road, which is a 4-lane major arterial. Therefore, it is unlikely any mitigation could be accommodated within the current horizons.
- It is anticipated that when Lamarche Avenue is completed, it will be built to accommodate adequate pedestrian and cycling facilities to meet MMLOS requirements.

Transit

- Site-generated transit trips at Phase 1 (2022) were approximately 70 and 55 during the weekday morning and afternoon peak hours, respectively
- Site-generated transit trips at full buildout (2031) were approximately 390 to 500 during the weekday morning and afternoon peak hours
- The estimated transit trips could be accommodated by high frequency route #94 during the AM and PM peak hour periods, with buses every 5 minutes during rush hours and every 15 minutes during off peak hours
- There are plans in the TMP Affordable Network to expand and improve public transit within the study area and also in nearby Brian Coburn Boulevard which is expected to have sufficient capacity to accommodate anticipated development transit demand
- The TMP Network Concept includes the Cumberland Transitway that would provide fully exclusive bus rapid transit between Blair Station and Frank Kenny Road by 2031. While the funding for the Transitway is currently uncertain, there is growing demand for this infrastructure since the City approved the Mer-Bleue Expansion CDP and the ongoing development of the East Urban Community Mixed Use Centre CDP. If constructed, the subject site would be located within 600m of the proposed Belcourt (now Fern Casey) Extension Station.

Site Access, Circulation and Connectivity

- The proposed development will be accessed on Lamarche Avenue, which has a connection to Innes Road, approximately 220m east of the Pagé/Innes intersection
- A traffic signal control is warranted at Lamarche/Innes for interim and ultimate buildout
- Vehicle access to site consists of two loops which connect the parking lots to Lamarche Avenue. Access of municipal and emergency services HSU vehicles will be provided via a private loop around the perimeter of the site which is closed to general public and is monitored by a 24-hour security service on site
- The proposed rezoning is considered supportive of pedestrian connectivity by providing a network of internal pathways that connect all buildings to Innes Road south sidewalk
- The proposed rezoning is anticipated to be supportive of cycling connectivity by providing a road network layout that is consistent with traffic calming principles and safe sharing of the road with bike users

Based on the foregoing, the proposed 3490 Innes Road development is recommended from a transportation perspective.

Prepared By:

Reviewed By:



Juan Lavin, E.I.T.



Austin Shih, P.Eng.
Senior Transportation Engineer

DRAFT

Appendix A

City Comments

Transportation Engineering Services

2707 square-m of commercial space is significant. Provide confirmation that all generated trips are expected to be internal trips. Consider any additional site features required to address internal trips. **Commercial space was reduced to 2,612 square meters. Further discussion on the commercial trip generation has been added to the Strategy Report.**

The proposed Belcourt transit station is not within 600m of this development. Therefore, a 65% transit modal share target may not be feasible without significant TDM measures, especially since the Cumberland Transitway is only a network concept. **Noted, modal shares were updated in section 3.1.1.**

The existing modal share should be gathered from the Orleans Traffic Assessment Zone in the 2011 OD Survey. See the modal shares used for the southern portion of the 3490 Innes Road development. **Noted, report and analysis updated to reflect 2011 OD Survey for this development.**

A re-evaluation of possible alternative access(es) to the development should be completed since Innes Road is already operating near capacity. Full build-out of all of the 3490 Innes Road development could add up to 443 AM peak and 503 PM peak trips by 2022, and 849 AM peak and 909 PM peak vehicle trips by 2031 with 44% auto mode share. **Noted, updates made.**

Another traffic count on Innes Road could be considered to evaluate the impact of Brian Coburn Boulevard on Innes Road's traffic volumes since the traffic counts referenced in the document were obtained in years 2015-2017, prior to build-out of Brian Coburn. **Noted, new counts used.**

In Table 1, the future phases subtotal is incorrect. **Noted, corrections made.**

There is a reference error in section 3.1.1 **Noted, corrections made.**

In section 3.2.3, the description of 3817 Innes Road does not refer to the correct development location. **Noted**

Traffic Signal Operations

Provide traffic signal warrant analysis for the proposed signalization of the Lamarche intersection. **Noted**

We agree with Transportation Engineering Services that the 65% transit modal share is unrealistic based on the proximity to transit facilities that remain in the conceptual phase. Address the impacts to the network of trip generation/modal shares following

the 2011 OD Survey including the capacity issue along Innes Road. **Noted, updates made.**

Apply background growth. Development of the surrounding area is not complete. Do not isolate one intersection as a justification, evaluate based on the network. **Noted, updates made.**

The Synchro modelling provided contains multiple errors, please review and correct. **Noted, updates made.**

Appendix B

Screening Form

City of Ottawa 2017 TIA Guidelines

TIA Screening Form

Date

7/3/2018

Project

3490 Innes Road TIA

Project Number

476731-01000

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

Module 1.1 - Description of Proposed Development	
Municipal Address	3490 Innes Road
Description of location	Located on the south side of Innes Road, midblock between Pagé Road and Boyer Road
Land Use	The lot is currently used for an insurance business, food truck, a mini-put facility/driving range
Development Size	8 residential towers totalling 1,320 units with approximately 2,707 sq. m of ground floor commercial space
Number of Accesses and Locations	The main access is proposed via two one-way loops on a new access road connecting to Innes Road A secondary access will be provided for emergency and service vehicles only.
Development Phasing	Multi-phased from 2022 to 2031
Buildout Year	2031
Sketch Plan / Site Plan	See attached

Module 1.2 - Trip Generation Trigger		
Land Use Type	Townhomes or Apartments	
Development Size	1,320	Units
Trip Generation Trigger Met?	Yes	

Module 1.3 - Location Triggers	
Development Proposes a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit, or Spine Bicycle Networks (See Sheet 3)	No
Development is in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone. (See Sheet 3)	Yes
Location Trigger Met?	Yes

Module 1.4 - Safety Triggers		
Posted Speed Limit on any boundary road	<80	km/h
Horizontal / Vertical Curvature on a boundary street limits sight lines at a proposed driveway	No	
A proposed driveway is within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions) or within auxiliary lanes of an intersection;	Yes	
A proposed driveway makes use of an existing median break that serves an existing site	No	
There is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development	No	
The development includes a drive-thru facility	No	
Safety Trigger Met?	Yes	



Appendix C

Traffic Counts



Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

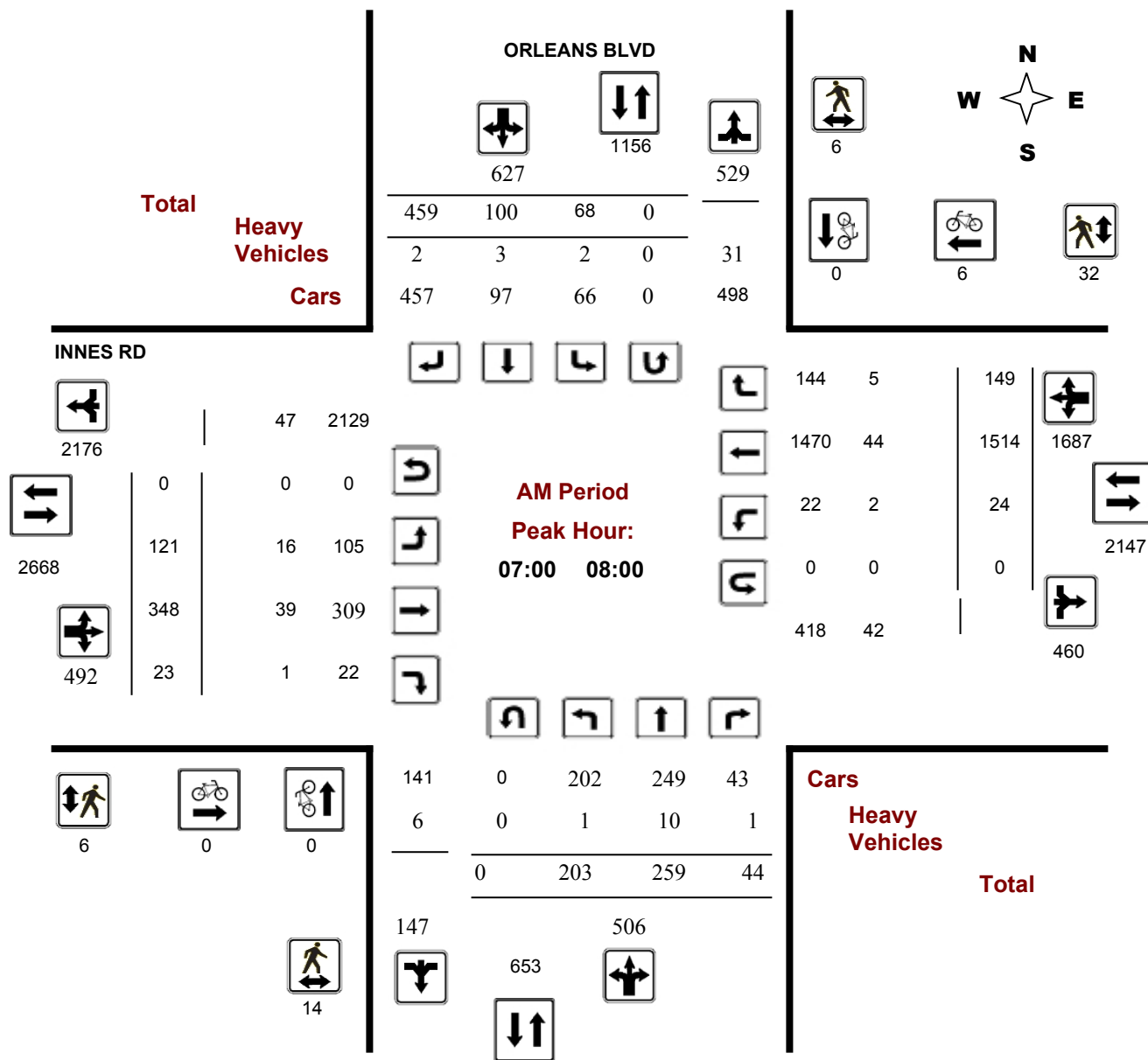
INNES RD @ ORLEANS BLVD

Survey Date: Wednesday, May 03, 2017

Start Time: 07:00

WO No: 36978

Device: Miovision

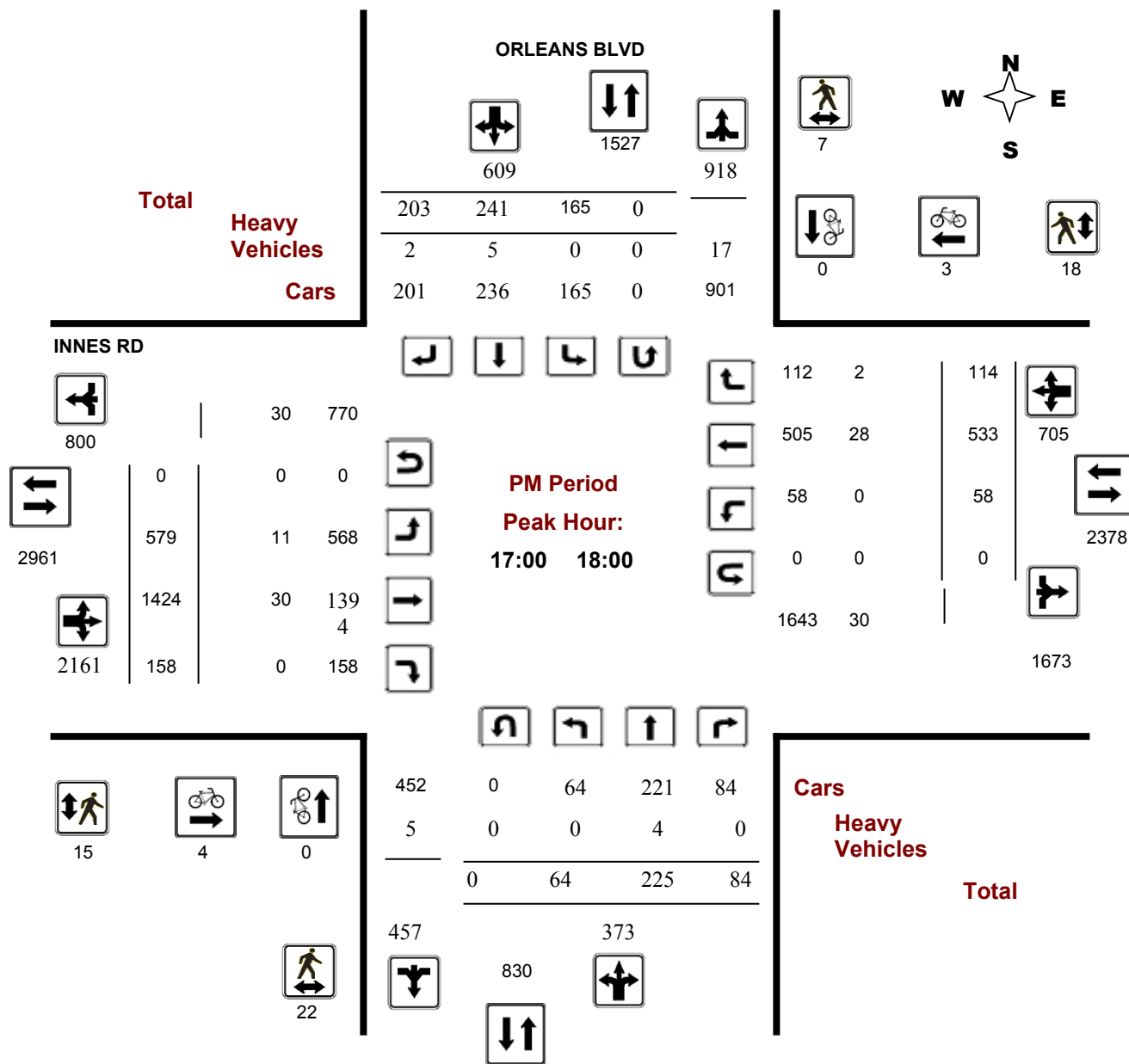


Survey Date: Wednesday, May 03, 2017

Start Time: 07:00

WO No: 36978

Device: Miovision





Turning Movement Count Summary, AM and PM Peak Hour Flow Diagrams

Automobiles, Taxis, Light
Trucks, Vans, SUV's,
Motorcycles, Heavy Trucks,
Buses, and School Buses

Innes Road & Pagé Road

Orléans, ON

All Vehicles

(Except Bicycles & Electric Scooters)

Wednesday, 22 May 2019

0700-1000, 1130-1330 & 1500-1800

8 Hour Survey

City of Ottawa Ward 2

Innes Rd.

Innes Rd.

Pagé Rd.

Pagé Rd.

Total Volume

17255

Approaching Intersection

(A+B+C+D)

(D) 7671

16087

8416

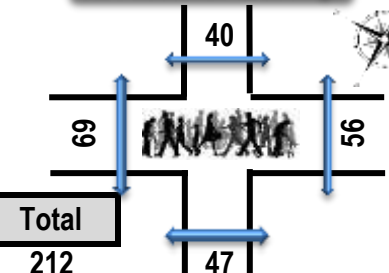
7205

14983

7778 (B)

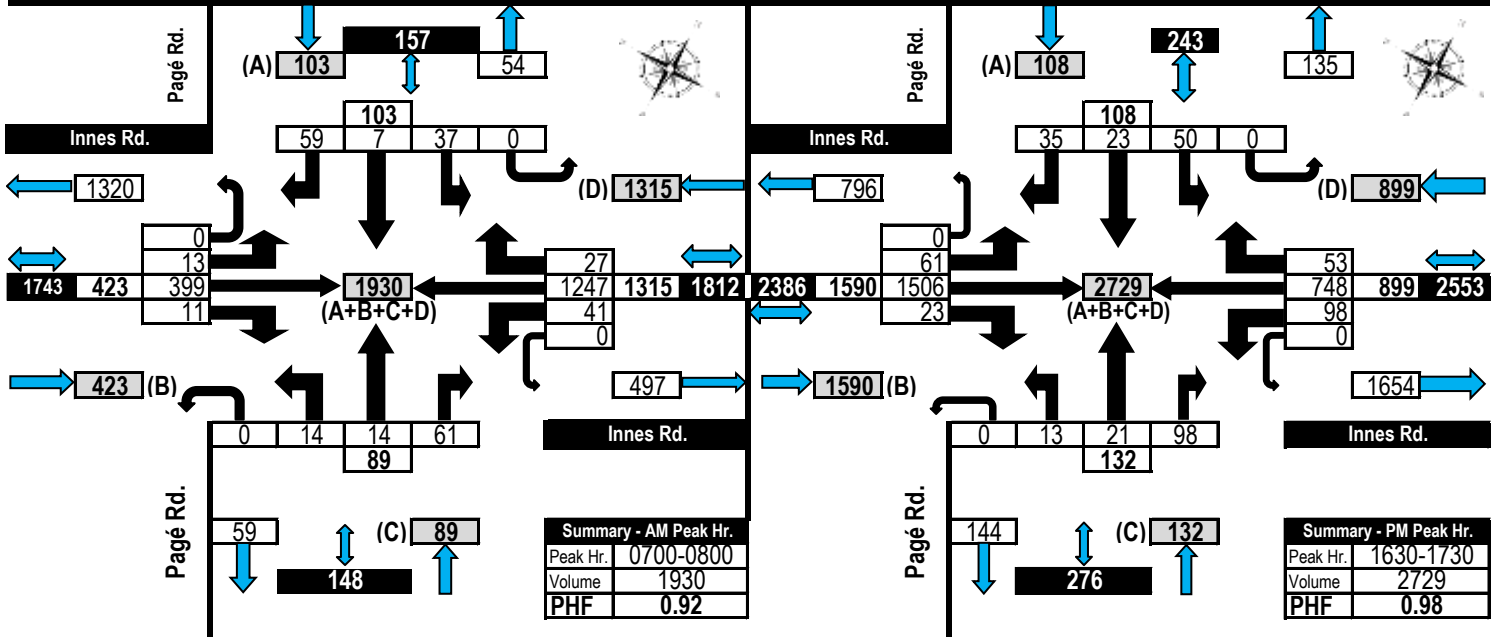


All Pedestrian Crossings



AM Peak Hour Flow Diagram

PM Peak Hour Flow Diagram





Turning Movement Count Summary, AM and PM Peak Hour Flow Diagrams

Automobiles, Taxis, Light
Trucks, Vans, SUV's,
Motorcycles, Heavy Trucks,
Buses, and School Buses

Innes Road & U-Haul Access (3636 Innes Road)

Orléans, ON

All Vehicles

(Except Bicycles & Electric Scooters)

Wednesday, 22 May 2019

0700-1000, 1130-1330 & 1500-1800

8 Hour Survey

City of Ottawa Ward 2

Innes Rd.

3615 Innes Rd.

Innes Rd.

Total Volume

16346

Approaching Intersection

(A+B+C+D)

(D) 7749

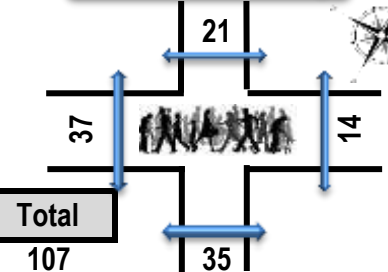
16164

8415



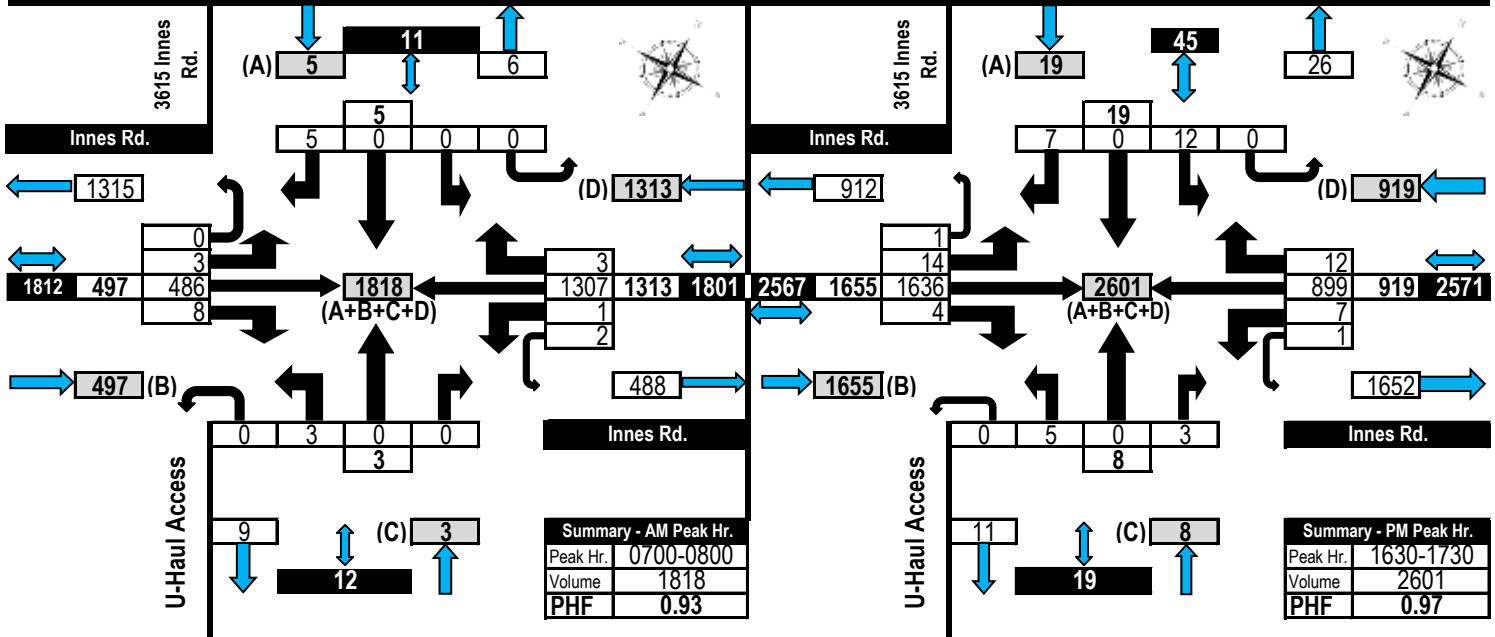
U-Haul Access

All Pedestrian Crossings



AM Peak Hour Flow Diagram

PM Peak Hour Flow Diagram



Appendix D

Collision Data



City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2012 **To:** December 31, 2016

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

Traffic Control: Traffic signal

Total Collisions: 6

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2015-Jan-21, Wed,08:18	Rain	Rear end	P.D. only	Wet	West	Slowing or stopping	Pick-up truck	Other motor vehicle	
					West	Stopped	Passenger van	Other motor vehicle	
2016-Jun-30, Thu,06:35	Clear	Rear end	Non-fatal injury	Dry	West	Slowing or stopping	Motorcycle	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2013-Mar-19, Tue,20:08	Snow	Rear end	Non-fatal injury	Ice	West	Slowing or stopping	Automobile, station wagon	Skidding/sliding	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2013-Feb-27, Wed,15:15	Snow	Angle	P.D. only	Loose snow	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2012-Apr-05, Thu,17:30	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Passenger van	Other motor vehicle	
					East	Stopped	Passenger van	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	

2012-Jul-02, Mon,01:14 Clear SMV other P.D. only Dry East Going ahead Automobile, station wagon Pole (utility, power)

Location: INNES RD @ ORLEANS BLVD

Traffic Control: Traffic signal

Total Collisions: 77

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Jan-07, Tue,10:08	Clear	Angle	P.D. only	Slush	South	Turning right	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Municipal transit bus	Other motor vehicle	
2014-Jan-08, Wed,07:37	Clear	Rear end	P.D. only	Ice	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2014-Apr-01, Tue,08:10	Clear	Rear end	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	
					North	Turning left	Pick-up truck	Other motor vehicle	
2014-May-29, Thu,08:20	Clear	Rear end	Non-fatal injury	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	
					South	Turning right	Pick-up truck	Other motor vehicle	
2014-Jun-04, Wed,07:34	Clear	Angle	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Municipal transit bus	Other motor vehicle	
2014-Jun-10, Tue,08:40	Clear	Rear end	P.D. only	Dry	South	Turning left	Passenger van	Other motor vehicle	
					South	Turning left	Automobile, station wagon	Other motor vehicle	

2014-Jul-06, Sun,14:27	Clear	Angle	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Municipal transit bus	Other motor vehicle
2014-Aug-12, Tue,12:11	Clear	Rear end	Non-fatal injury	Dry	North	Turning right	Truck - open	Other motor vehicle
					North	Turning right	Delivery van	Other motor vehicle
2014-Sep-22, Mon,14:50	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2014-Dec-09, Tue,07:50	Clear	Angle	P.D. only	Dry	South	Turning right	Pick-up truck	Other motor vehicle
					West	Going ahead	Municipal transit bus	Other motor vehicle
2014-Dec-01, Mon,21:10	Clear	Rear end	Non-fatal injury	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2014-Oct-17, Fri,07:25	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Dec-10, Wed,15:40	Snow	Rear end	P.D. only	Loose snow	West	Slowing or stopping	Pick-up truck	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle

2014-Aug-25, Mon,18:19	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Passenger van	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2014-Nov-17, Mon,19:54	Clear	Turning movement	Non-fatal injury	Wet	West	Going ahead	Pick-up truck	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
2014-Jul-09, Wed,19:26	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Municipal transit bus	Other motor vehicle
2015-Oct-18, Sun,09:49	Clear	Angle	P.D. only	Dry	South	Turning right	Pick-up truck	Other motor vehicle
					West	Going ahead	Municipal transit bus	Other motor vehicle
2015-May-03, Sun,17:07	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Pick-up truck	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2015-Jan-27, Tue,11:59	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2015-Jan-06, Tue,08:51	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2015-Jan-31, Sat,14:30	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle

					South	Turning right	Automobile, station wagon	Other motor vehicle
2015-Jul-14, Tue,08:10	Clear	Rear end	Non-fatal injury	Dry	South	Turning right	Pick-up truck	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle
2015-Sep-01, Tue,11:55	Clear	Angle	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Municipal transit bus	Other motor vehicle
2015-Aug-27, Thu,18:04	Clear	SMV other	P.D. only	Dry	South	Turning right	Automobile, station wagon	Pole (sign, parking meter)
2015-Jul-09, Thu,17:10	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2015-May-22, Fri,16:27	Clear	Angle	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Municipal transit bus	Other motor vehicle
2016-Jan-19, Tue,18:45	Clear	Rear end	P.D. only	Dry	North	Unknown	Automobile, station wagon	Other motor vehicle
					North	Stopped	Pick-up truck	Other motor vehicle
2016-Oct-26, Wed,11:22	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle

2016-Oct-22, Sat,01:34	Clear	Rear end	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					East	Turning left	Passenger van	Other motor vehicle
2015-Oct-21, Wed,15:45	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Passenger van	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2015-Oct-28, Wed,13:51	Rain	Turning movement	P.D. only	Wet	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Jan-25, Mon,18:40	Clear	Rear end	P.D. only	Dry	West	Unknown	Unknown	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2016-Feb-23, Tue,19:59	Clear	Rear end	Non-fatal injury	Packed snow	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Passenger van	Other motor vehicle
2016-May-22, Sun,11:04	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Apr-28, Thu,10:30	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Mar-12, Sat,21:07	Clear	Angle	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle

					West	Going ahead	Pick-up truck	Other motor vehicle
2016-Jul-28, Thu,16:00	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Pick-up truck	Other motor vehicle
					East	Slowing or stopping	Pick-up truck	Other motor vehicle
2016-Apr-12, Tue,18:41	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Jun-09, Thu,19:16	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle
					North	Turning right	Passenger van	Other motor vehicle
2016-Jul-21, Thu,13:08	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2016-Oct-13, Thu,09:41	Rain	Turning movement	Non-fatal injury	Wet	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Oct-14, Fri,08:16	Clear	Angle	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Municipal transit bus	Other motor vehicle
2016-Jul-10, Sun,21:52	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle

					South	Going ahead	Pick-up truck	Other motor vehicle
2016-Nov-02, Wed,17:03	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
					East	Turning left	Pick-up truck	Other motor vehicle
2016-Dec-08, Thu,19:01	Snow	Turning movement	Non-fatal injury	Slush	North	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Turning left	Automobile, station wagon	Other motor vehicle
2013-Mar-19, Tue,06:14	Snow	Angle	P.D. only	Loose snow	North	Turning right	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Jan-13, Sun,16:43	Rain	Turning movement	P.D. only	Wet	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Mar-08, Fri,15:45	Clear	Rear end	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
2013-Feb-22, Fri,17:56	Clear	Turning movement	P.D. only	Dry	North	Turning left	Pick-up truck	Other motor vehicle

					South	Going ahead	Automobile, station wagon	Other motor vehicle
2013-May-30, Thu,16:19	Clear	Turning movement	P.D. only	Dry	South	Turning left	Pick-up truck	Other motor vehicle
					North	Going ahead	Truck - closed	Other motor vehicle
2013-Jun-12, Wed,07:20	Clear	Angle	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Municipal transit bus	Other motor vehicle
2013-Jul-18, Thu,08:54	Clear	Rear end	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					South	Turning left	Automobile, station wagon	Other motor vehicle
2013-Aug-08, Thu,23:21	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Sep-14, Sat,12:29	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Truck - closed	Other motor vehicle
					West	Stopped	Delivery van	Other motor vehicle
2013-Aug-17, Sat,20:42	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Sep-09, Mon,07:15	Clear	Rear end	P.D. only	Dry	South	Turning right	Passenger van	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle

2013-Sep-14, Sat,13:11	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Nov-01, Fri,08:01	Rain	Rear end	P.D. only	Wet	South	Turning right	Passenger van	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle
2013-Dec-07, Sat,09:45	Clear	Sideswipe	P.D. only	Dry	East	Turning left	Pick-up truck	Other motor vehicle
					East	Turning left	Pick-up truck	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
2013-Dec-02, Mon,16:27	Clear	Turning movement	Non-fatal injury	Dry	North	Turning left	Passenger van	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Dec-22, Sun,05:45	Freezing Rain	SMV other	P.D. only	Packed snow	West	Slowing or stopping	Automobile, station wagon	Skidding/sliding
2012-Jan-16, Mon,08:30	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					South	Turning right	Passenger van	Other motor vehicle
2012-Jan-12, Thu,22:30	Snow	SMV other	P.D. only	Loose snow	East	Going ahead	Automobile, station wagon	Snowbank/drift
2012-Feb-03, Fri,07:10	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle

					West	Stopped	Pick-up truck	Other motor vehicle
2012-Apr-14, Sat,21:54	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2012-Apr-27, Fri,20:54	Clear	Rear end	Non-fatal injury	Dry	North	Turning right	Pick-up truck	Other motor vehicle
					North	Turning right	Automobile, station wagon	Other motor vehicle
2012-Apr-23, Mon,09:23	Rain	Rear end	Non-fatal injury	Wet	South	Turning right	Pick-up truck	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle
2012-Jun-05, Tue,22:04	Rain	Turning movement	Non-fatal injury	Wet	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2012-Dec-26, Wed,15:15	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Pick-up truck	Other motor vehicle
2012-Jul-10, Tue,11:20	Clear	Rear end	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2012-Jul-20, Fri,16:33	Clear	Turning movement	P.D. only	Dry	South	Turning left	Pick-up truck	Other motor vehicle
					North	Going ahead	Passenger van	Other motor vehicle

2012-Aug-17, Fri,16:45	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle
2012-Sep-08, Sat,01:11	Clear	Turning movement	Non-fatal injury	Wet	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2012-Oct-11, Thu,14:45	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2012-Sep-14, Fri,16:00	Rain	Rear end	P.D. only	Wet	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Changing lanes	Automobile, station wagon	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle
2012-Dec-20, Thu,17:32	Clear	Rear end	P.D. only	Ice	West	Turning right	Truck - dump	Other motor vehicle
					West	Turning right	Pick-up truck	Other motor vehicle
2012-Dec-13, Thu,06:55	Fog, mist, smoke, dust	Turning movement	Non-fatal injury	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Turning left	Pick-up truck	Other motor vehicle

Location: INNES RD @ PAGE RD

Traffic Control: Traffic signal

Total Collisions: 28

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-May-03, Sat,15:48	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Aug-19, Tue,11:06	Clear	Angle	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Oct-20, Mon,20:40	Rain	Turning movement	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Turning left	Pick-up truck	Other motor vehicle	
2014-Dec-07, Sun,11:15	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Nov-18, Tue,16:45	Clear	Rear end	P.D. only	Ice	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Pick-up truck	Other motor vehicle	
2014-Nov-18, Tue,17:39	Clear	Rear end	P.D. only	Ice	North	Turning right	Automobile, station wagon	Other motor vehicle	
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2014-Dec-10, Wed,20:15	Snow	Rear end	P.D. only	Loose snow	West	Turning left	Passenger van	Other motor vehicle	

					West	Turning left	Pick-up truck	Other motor vehicle
2015-Jan-14, Wed,08:40	Clear	Rear end	P.D. only	Ice	West	Slowing or stopping	Pick-up truck	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2015-Jul-21, Tue,13:20	Clear	Rear end	Non-fatal injury	Dry	East	Slowing or stopping	Pick-up truck	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2015-Feb-20, Fri,07:15	Clear	Rear end	P.D. only	Loose snow	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2015-Jul-14, Tue,18:58	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2015-Jul-30, Thu,20:45	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Oct-22, Sat,11:07	Rain	Sideswipe	P.D. only	Wet	East	Changing lanes	Pick-up truck	Other motor vehicle
					East	Going ahead	Pick-up truck	Other motor vehicle
2015-Sep-28, Mon,08:12	Clear	Angle	P.D. only	Dry	West	Turning right	School bus	Other motor vehicle

					North	Stopped	Construction equipment	Other motor vehicle	
2015-Oct-11, Sun,17:24	Clear	Turning movement	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Dec-04, Fri,17:43	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Pick-up truck	Other motor vehicle	
2016-Mar-23, Wed,10:52	Clear	Rear end	P.D. only	Dry	West	Going ahead	Delivery van	Other motor vehicle	
					West	Stopped	Truck - closed	Other motor vehicle	
2016-Nov-23, Wed,06:45	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	
2016-Nov-03, Thu,07:05	Clear	SMV other	Non-fatal injury	Dry	North	Turning left	Pick-up truck	Pedestrian	1
2016-Nov-04, Fri,21:47	Clear	Turning movement	P.D. only	Dry	West	Turning left	Pick-up truck	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2013-Jun-19, Wed,19:49	Clear	SMV other	Non-fatal injury	Dry	North	Turning left	Automobile, station wagon	Pedestrian	1
2013-Oct-17, Thu,16:35	Clear	Angle	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	

					North	Going ahead	Pick-up truck	Other motor vehicle
2013-Nov-10, Sun,18:37	Rain	Turning movement	P.D. only	Wet	South	Turning right	Automobile, station wagon	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle
2012-Mar-16, Fri,16:11	Clear	Rear end	Non-fatal injury	Dry	East	Slowing or stopping	Passenger van	Other motor vehicle
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2012-Jan-19, Thu,22:47	Snow	Angle	Non-fatal injury	Slush	North	Turning right	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2012-May-04, Fri,07:51	Clear	Rear end	P.D. only	Dry	East	Going ahead	Passenger van	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2012-Nov-16, Fri,16:28	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Municipal transit bus	Other motor vehicle
					West	Changing lanes	Automobile, station wagon	Other motor vehicle
2012-Dec-22, Sat,15:15	Snow	Rear end	P.D. only	Packed snow	South	Slowing or stopping	Pick-up truck	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle

Location: INNES RD btwn INNES RD & PAGE RD

Traffic Control: No control

Total Collisions: 21

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Mar-06, Thu,07:29	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Pick-up truck	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Jun-19, Thu,16:53	Clear	Rear end	P.D. only	Dry	West	Going ahead	Passenger van	Other motor vehicle	
					West	Stopped	Truck - dump	Other motor vehicle	
2015-Jan-22, Thu,08:53	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2015-May-13, Wed,07:45	Clear	Rear end	P.D. only	Dry	West	Unknown	Unknown	Other motor vehicle	
					West	Going ahead	Pick-up truck	Other motor vehicle	
					West	Going ahead	Pick-up truck	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-May-05, Tue,07:24	Clear	Rear end	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	

2015-Oct-08, Thu,15:19	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Pick-up truck	Other motor vehicle
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Changing lanes	Automobile, station wagon	Other motor vehicle
2015-Jul-16, Thu,08:07	Clear	Sideswipe	P.D. only	Dry	East	Unknown	Unknown	Other motor vehicle
					East	Stopped	Municipal transit bus	Other motor vehicle
2015-Oct-03, Sat,15:49	Clear	Sideswipe	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Nov-19, Sat,18:49	Clear	Rear end	Non-reportable	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2013-Jan-31, Thu,07:51	Clear	Rear end	P.D. only	Wet	West	Changing lanes	Passenger van	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2013-Feb-02, Sat,19:10	Snow	Turning movement	Non-fatal injury	Wet	West	Making "U" turn	Pick-up truck	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Feb-09, Sat,13:37	Clear	Rear end	P.D. only	Dry	East	Going ahead	Farm tractor	Other motor vehicle
					East	Slowing or stopping	Pick-up truck	Farm tractor

2013-Apr-27, Sat,00:38	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Pick-up truck	Other motor vehicle
					South	Reversing	Pick-up truck	Other motor vehicle
2013-May-10, Fri,10:56	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2013-May-05, Sun,14:40	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2013-Jul-08, Mon,11:04	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Sep-23, Mon,07:55	Clear	Sideswipe	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle
					East	Stopped	Municipal transit bus	Other motor vehicle
2012-Jan-04, Wed,16:18	Snow	Sideswipe	P.D. only	Loose snow	East	Going ahead	Unknown	Other motor vehicle
					East	Stopped	Municipal transit bus	Other motor vehicle
2012-Feb-07, Tue,17:34	Clear	Rear end	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle

2012-Feb-02, Thu,15:52	Clear	Sideswipe	P.D. only	Dry	East	Overtaking	Passenger van	Other motor vehicle
					East	Stopped	Municipal transit bus	Other motor vehicle

2012-Jun-28, Thu,16:47	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Slowing or stopping	Pick-up truck	Other motor vehicle

Location: INNES RD btwn PAGE RD & 473 E OF PAGE RD/BUILDERS' WAREHOUSE SC

Traffic Control: No control

Total Collisions: 15

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Mar-06, Thu,07:58	Clear	Angle	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Nov-20, Thu,16:56	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Passenger van	Other motor vehicle	
					East	Stopped	Passenger van	Other motor vehicle	
2015-Jan-14, Wed,09:38	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	
2016-Feb-17, Wed,20:46	Clear	Angle	P.D. only	Packed snow	South	Turning right	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Sep-30, Fri,18:25	Clear	Rear end	Non-fatal injury	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	

					East	Stopped	Passenger van	Other motor vehicle
2015-Nov-30, Mon,09:51	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle
2016-Apr-20, Wed,16:58	Clear	Sideswipe	P.D. only	Dry	West	Overtaking	Pick-up truck	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle
2016-Oct-19, Wed,17:00	Clear	Angle	Non-fatal injury	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Jan-25, Fri,07:05	Clear	Rear end	Non-fatal injury	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
					West	Stopped	Municipal transit bus	Other motor vehicle
					West	Slowing or stopping	Pick-up truck	Other motor vehicle
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2013-May-17, Fri,18:45	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Municipal transit bus	Other motor vehicle
2013-Sep-29, Sun,18:00	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle

					West	Turning right	Automobile, station wagon	Other motor vehicle
2013-Dec-21, Sat,13:11	Clear	Angle	P.D. only	Wet	South	Turning right	Automobile, station wagon	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2012-Apr-05, Thu,11:30	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2012-Jun-20, Wed,14:05	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2012-Sep-27, Thu,17:52	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle

Location: INNES RD EB btwn ORLEANS BLVD & INNES RD

Traffic Control: No control

Total Collisions: 4

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Apr-29, Tue,11:45	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Oct-05, Mon,18:56	Clear	Sideswipe	Non-fatal injury	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle	

					East	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Dec-07, Mon,17:05	Clear	Sideswipe	P.D. only	Dry	East	Unknown	Unknown	Other motor vehicle
					East	Going ahead	Pick-up truck	Other motor vehicle
2016-Mar-20, Sun,16:55	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle

Location: INNES RD WB btwn ORLEANS BLVD & INNES RD

Traffic Control: No control

Total Collisions: 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-May-21, Sat,16:15	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					West	Slowing or stopping	Pick-up truck	Other motor vehicle	
2016-Jan-19, Tue,18:20	Snow	Rear end	P.D. only	Slush	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Changing lanes	Pick-up truck	Other motor vehicle	
2016-Dec-04, Sun,06:02	Clear	SMV other	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Ran off road	

Appendix E

Background Traffic Growth

Innes/Orleans
8 hrs

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

North Leg

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

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

West Leg

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

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

East Leg

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

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

South Leg

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

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

Innes/Orleans
AM Peak

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

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

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

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

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

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

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

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

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

Innes/Orleans
PM Peak

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

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

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

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

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

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

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

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






























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

Appendix F

Synchro Analysis: Existing Conditions

Lanes, Volumes, Timings
1: Orleans & Innes

Existing AM
05/30/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 			 			 	
Traffic Volume (vph)	121	318	23	24	1186	109	203	259	44	61	100	459
Future Volume (vph)	121	318	23	24	1186	109	203	259	44	61	100	459
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.603			0.584		
Satd. Flow (perm)	3288	3390	1517	1695	3390	1517	1076	3390	1517	1042	3390	1517
Satd. Flow (RTOR)			143			143			82			176
Lane Group Flow (vph)	127	335	24	25	1248	115	214	273	46	64	105	483
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			2			6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	4	4	4
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)	-2.6	-2.2	-2.2	-2.2	-2.2	-2.2	-2.7	-2.7	-2.7	-2.7	-2.7	-2.7
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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)	9.0	66.2	66.2	8.6	61.0	61.0	48.0	48.0	48.0	29.2	29.2	29.2
Actuated g/C Ratio	0.07	0.51	0.51	0.07	0.47	0.47	0.37	0.37	0.37	0.22	0.22	0.22
v/c Ratio	0.56	0.19	0.03	0.22	0.78	0.15	0.46	0.22	0.08	0.27	0.14	1.01
Control Delay	68.6	18.7	0.0	62.3	33.4	1.9	33.3	28.7	1.4	45.6	41.1	76.4
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	68.6	18.7	0.0	62.3	33.4	1.9	33.3	28.7	1.4	45.6	41.1	76.4
LOS	E	B	A	E	C	A	C	C	A	D	D	E
Approach Delay		30.8			31.3			28.2			67.7	
Approach LOS		C			C			C			E	
Queue Length 50th (m)	16.5	26.0	0.0	6.2	138.3	0.0	39.3	25.0	0.0	13.7	11.4	~93.2
Queue Length 95th (m)	27.0	35.7	0.0	15.4	166.7	6.0	60.2	35.5	2.1	27.2	19.4	#159.7
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	227	1726	842	117	1590	787	468	1251	611	233	761	477
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	0.56	0.19	0.03	0.21	0.78	0.15	0.46	0.22	0.08	0.27	0.14	1.01

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

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

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 38.4

Intersection LOS: D

Intersection Capacity Utilization 86.5%

ICU Level of Service E

Analysis Period (min) 15

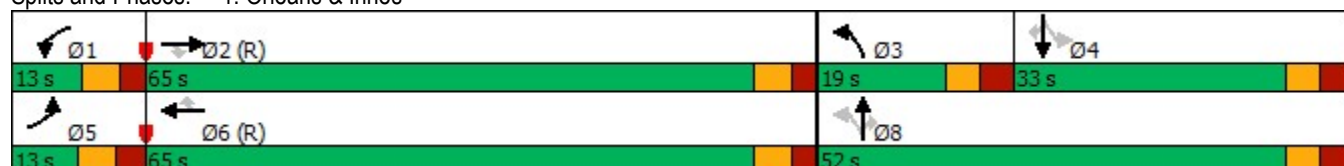
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

























Queue shown is maximum after two cycles.

Splits and Phases: 1: Orleans & Innes



Lanes, Volumes, Timings
1: Orleans & Innes

Existing PM
05/30/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	579	1341	158	58	584	154	64	225	84	165	241	203
Future Volume (vph)	579	1341	158	58	584	154	64	225	84	165	241	203
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.489			0.604		
Satd. Flow (perm)	3288	3390	1517	1695	3390	1517	873	3390	1517	1078	3390	1517
Satd. Flow (RTOR)			165			230			159			225
Lane Group Flow (vph)	609	1412	166	61	615	162	67	237	88	174	254	214
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			2			6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	4	4	4
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)	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)	-2.6	-2.2	-2.2	-2.2	-2.2	-2.2	-2.7	-2.7	-2.7	-2.7	-2.7	-2.7
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	Max	C-Max	C-Max	Max	C-Max	C-Max	None	Max	Max	Max	Max	Max
Act Effct Green (s)	27.0	45.0	45.0	12.0	30.0	30.0	41.0	41.0	41.0	31.4	31.4	31.4
Actuated g/C Ratio	0.25	0.41	0.41	0.11	0.27	0.27	0.37	0.37	0.37	0.29	0.29	0.29
v/c Ratio	0.75	1.02	0.23	0.33	0.67	0.28	0.17	0.19	0.13	0.57	0.26	0.36
Control Delay	45.3	61.8	4.1	41.6	60.3	16.2	23.9	23.8	0.4	43.3	32.2	5.5
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	45.3	61.8	4.1	41.6	60.3	16.2	23.9	23.8	0.4	43.3	32.2	5.5
LOS	D	E	A	D	E	B	C	C	A	D	C	A
Approach Delay		52.9			50.4			18.5			26.3	
Approach LOS		D			D			B			C	
Queue Length 50th (m)	62.6	~163.5	0.1	12.4	74.2	8.4	9.3	17.8	0.0	32.9	22.8	0.0
Queue Length 95th (m)	82.4	#211.0	12.4	25.5	92.5	22.2	18.7	26.7	0.0	56.5	34.0	15.5
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	807	1386	718	184	924	581	385	1263	665	307	967	593
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	0.75	1.02	0.23	0.33	0.67	0.28	0.17	0.19	0.13	0.57	0.26	0.36

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: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 44.8

Intersection LOS: D

Intersection Capacity Utilization 74.6%

ICU Level of Service D

Analysis Period (min) 15

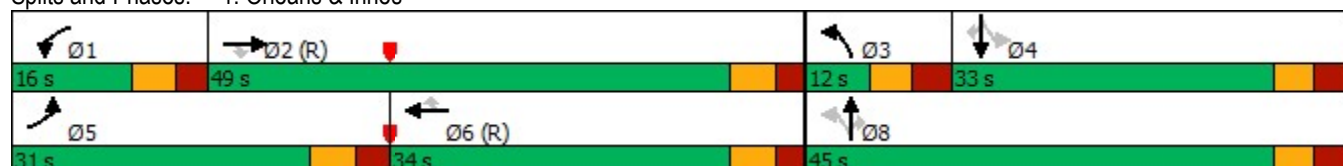
~ Volume exceeds capacity, queue is theoretically infinite.



















Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Orleans & Innes



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	399	11	41	1247	27	14	14	61	37	7	59
Future Volume (vph)	13	399	11	41	1247	27	14	14	61	37	7	59
Satd. Flow (prot)	1695	3377	0	1695	3380	0	0	1607	0	0	1617	0
Flt Permitted	0.127			0.474				0.951			0.874	
Satd. Flow (perm)	227	3377	0	846	3380	0	0	1541	0	0	1439	0
Satd. Flow (RTOR)		5			4			68			56	
Lane Group Flow (vph)	14	455	0	46	1416	0	0	100	0	0	115	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		39.2	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	82.0	82.0		82.0	82.0		38.0	38.0		38.0	38.0	
Total Split (%)	68.3%	68.3%		68.3%	68.3%		31.7%	31.7%		31.7%	31.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	-2.2	-2.2		-2.2	-2.2			-2.8			-2.8	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)	78.0	78.0		78.0	78.0			34.0			34.0	
Actuated g/C Ratio	0.65	0.65		0.65	0.65			0.28			0.28	
v/c Ratio	0.10	0.21		0.08	0.64			0.21			0.26	
Control Delay	9.8	8.7		2.4	3.5			13.8			19.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	9.8	8.7		2.4	3.6			13.8			19.3	
LOS	A	A		A	A			B			B	
Approach Delay		8.7			3.5			13.8			19.3	
Approach LOS		A			A			B			B	
Queue Length 50th (m)	1.2	20.7		1.2	20.0			5.5			10.4	
Queue Length 95th (m)	4.0	27.8		m2.2	22.4			18.7			25.5	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	147	2196		549	2198			485			447	
Starvation Cap Reductn	0	0		0	16			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.10	0.21		0.08	0.65			0.21			0.26	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 26 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 80												
Control Type: Actuated-Coordinated												

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 6.0

Intersection LOS: A

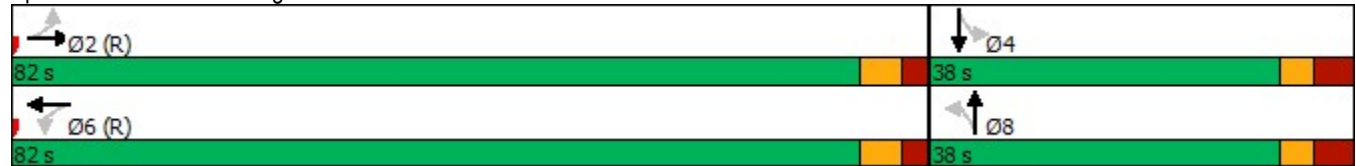
Intersection Capacity Utilization 56.5%



















ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 2: Page & Innes



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	1506	23	53	748	98	13	21	98	50	23	35
Future Volume (vph)	61	1506	23	53	748	98	13	21	98	50	23	35
Satd. Flow (prot)	1695	3383	0	1695	3333	0	0	1596	0	0	1667	0
Flt Permitted	0.251			0.064				0.971			0.831	
Satd. Flow (perm)	448	3383	0	114	3333	0	0	1558	0	0	1418	0
Satd. Flow (RTOR)		3			24			28			23	
Lane Group Flow (vph)	68	1699	0	59	940	0	0	146	0	0	121	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		39.2	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	72.0	72.0		72.0	72.0		38.0	38.0		38.0	38.0	
Total Split (%)	65.5%	65.5%		65.5%	65.5%		34.5%	34.5%		34.5%	34.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	-2.2	-2.2		-2.2	-2.2			-2.8			-2.8	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)	68.0	68.0		68.0	68.0			34.0			34.0	
Actuated g/C Ratio	0.62	0.62		0.62	0.62			0.31			0.31	
v/c Ratio	0.25	0.81		0.84	0.45			0.29			0.27	
Control Delay	4.0	7.5		95.8	11.7			25.0			24.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	4.0	7.5		95.8	11.7			25.0			24.9	
LOS	A	A		F	B			C			C	
Approach Delay		7.4			16.6			25.0			24.9	
Approach LOS		A			B			C			C	
Queue Length 50th (m)	2.1	28.7		9.3	50.8			18.9			15.6	
Queue Length 95th (m)	m2.5	m29.0		#22.1	64.6			35.5			30.7	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	276	2092		70	2069			500			454	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.25	0.81		0.84	0.45			0.29			0.27	
Intersection Summary												
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 2 (2%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 12.0

Intersection LOS: B

Intersection Capacity Utilization 73.3%

ICU Level of Service D

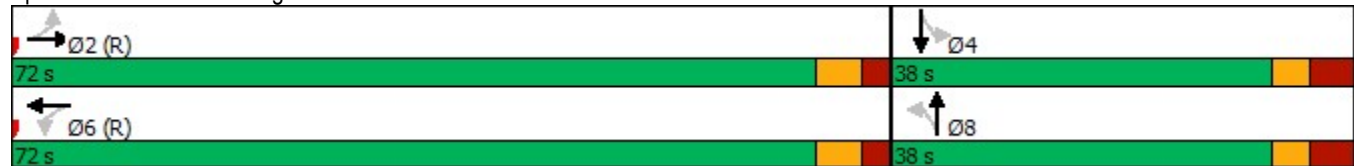
Analysis Period (min) 15

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: 2: Page & Innes



Lanes, Volumes, Timings
3: U-Haul Access/Convenience Store & Innes

Existing AM
05/30/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	486	8	3	1307	1	3	0	0	0	0	5
Future Volume (vph)	3	486	8	3	1307	1	3	0	0	0	0	5
Satd. Flow (prot)	1695	3383	0	1695	3390	0	0	1695	0	0	1543	0
Flt Permitted	0.131			0.430				0.754				
Satd. Flow (perm)	234	3383	0	767	3390	0	0	1345	0	0	1543	0
Satd. Flow (RTOR)		3									66	
Lane Group Flow (vph)	3	549	0	3	1453	0	0	3	0	0	6	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0	33.0	
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%	27.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-2.1	-2.1		-2.1	-2.1			-2.3			-2.3	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effect Green (s)	83.0	83.0		83.0	83.0			29.0			29.0	
Actuated g/C Ratio	0.69	0.69		0.69	0.69			0.24			0.24	
v/c Ratio	0.02	0.23		0.01	0.62			0.01			0.01	
Control Delay	5.0	5.4		5.7	11.4			35.0			0.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	5.0	5.4		5.7	11.4			35.0			0.0	
LOS	A	A		A	B			C			A	
Approach Delay		5.4			11.4			35.0				
Approach LOS		A			B			C				
Queue Length 50th (m)	0.2	13.3		0.2	87.7			0.6			0.0	
Queue Length 95th (m)	m0.7	16.3		1.1	106.5			3.1			0.0	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	161	2340		530	2344			325			422	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.02	0.23		0.01	0.62			0.01			0.01	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 70												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings 3: U-Haul Access/Convenience Store & Innes

Existing AM
05/30/2019

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 9.8

Intersection LOS: A

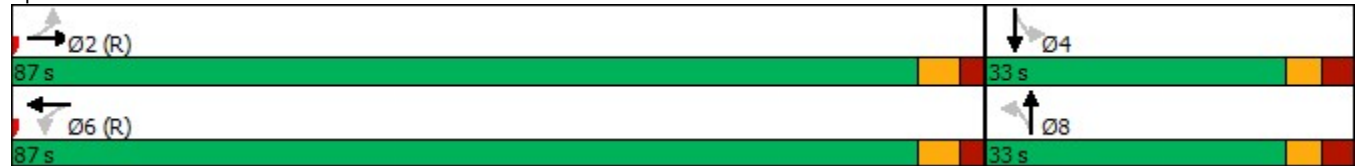
Intersection Capacity Utilization 53.2%

ICU Level of Service A

Analysis Period (min) 15



















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

Splits and Phases: 3: U-Haul Access/Convenience Store & Innes



Lanes, Volumes, Timings
3: U-Haul Access/Convenience Store & Innes

Existing PM
05/30/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1636	4	1	899	12	5	0	3	12	0	7
Future Volume (vph)	14	1636	4	1	899	12	5	0	3	12	0	7
Satd. Flow (prot)	1695	3390	0	1695	3383	0	0	1649	0	0	1643	0
Flt Permitted	0.238			0.059				0.903			0.890	
Satd. Flow (perm)	425	3390	0	105	3383	0	0	1539	0	0	1507	0
Satd. Flow (RTOR)					2			31			31	
Lane Group Flow (vph)	16	1822	0	1	1012	0	0	9	0	0	21	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	77.0	77.0		77.0	77.0		33.0	33.0		33.0	33.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-2.1	-2.1		-2.1	-2.1			-2.3			-2.3	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)	73.0	73.0		73.0	73.0			29.0			29.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.26			0.26	
v/c Ratio	0.06	0.81		0.01	0.45			0.02			0.05	
Control Delay	7.1	17.2		7.0	9.6			0.1			7.4	
Queue Delay	0.0	0.8		0.0	0.0			0.0			0.0	
Total Delay	7.1	18.1		7.0	9.6			0.1			7.4	
LOS	A	B		A	A			A			A	
Approach Delay		18.0			9.6			0.1			7.4	
Approach LOS		B			A			A			A	
Queue Length 50th (m)	1.1	135.7		0.1	49.6			0.0			0.0	
Queue Length 95th (m)	3.6	168.5		0.7	62.2			0.3			4.4	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	282	2249		69	2245			428			420	
Starvation Cap Reductn	0	180		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	0.06	0.88		0.01	0.45			0.02			0.05	
Intersection Summary												
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 36 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 80												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings
3: U-Haul Access/Convenience Store & Innes

Existing PM
05/30/2019

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 14.9

Intersection LOS: B

Intersection Capacity Utilization 62.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: U-Haul Access/Convenience Store & Innes



Appendix G

MMLOS Analysis: Road Segments

Appendix H

Traffic Signal Warrants

Innes/Lamarche - (peak hour signal warrant BACKGROUND)

Signal Warrant		Description		Minimum Requirement for Two Lane Roadways	Compliance		
				Restricted Flow - Operating Speed Less Than 70 km/h	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	900	153%	28%	84% No
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	28%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	900	145%	84%	
		(2) B	Combined Vehicle and Pedestrian Volume <u>Crossing</u> the Major Street for Each of the Same 8 Hours	75	84%		

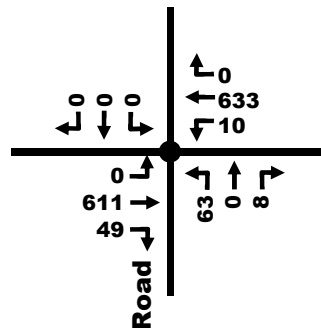
Notes

- 1 Vehicle Volume Warrants (1A), (2A) and (5B) for Roadways Having Two or More Moving Lanes in one Direction Should Be 25% Higher Than Values Given Above
- 2 For Definition of Crossing Volume Refer to Note 4 on the Signal Warrant Analysis Form B2.03.08
- 3 The Lowest Sectional Percentage Governs the Entire Warrant
- 4 For "T" Intersections the Warrant Values for Minor Street Should be Increased by 50% (Warrant 1B only)

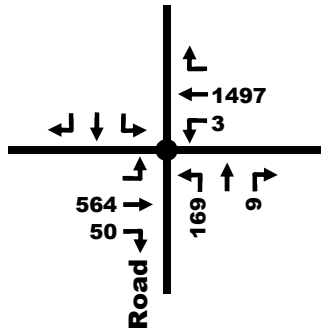
Yes

Yes

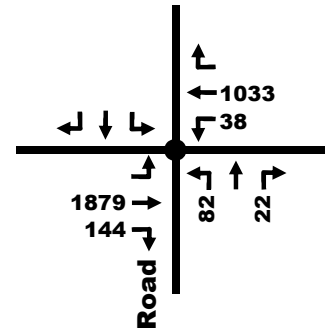
Average 8 Hour Volumes



AM Peak Hour Volumes



PM Peak Hour Volumes



Innes/Lamarche - (peak hour signal warrant INTERIM BUILDOUT)

Signal Warrant		Description		Minimum Requirement for Two Lane Roadways	Compliance		
				Restricted Flow - Operating Speed Less Than 70 km/h	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	900	147%	38%	100% Yes
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	38%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	900	136%	113%	
		(2) B	Combined Vehicle and Pedestrian Volume <u>Crossing</u> the Major Street for Each of the Same 8 Hours	75	113%		

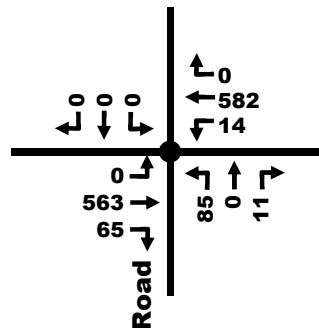
Notes

- 1 Vehicle Volume Warrants (1A), (2A) and (5B) for Roadways Having Two or More Moving Lanes in one Direction Should Be 25% Higher Than Values Given Above
- 2 For Definition of Crossing Volume Refer to Note 4 on the Signal Warrant Analysis Form B2.03.08
- 3 The Lowest Sectional Percentage Governs the Entire Warrant
- 4 For "T" Intersections the Warrant Values for Minor Street Should be Increased by 50% (Warrant 1B only)

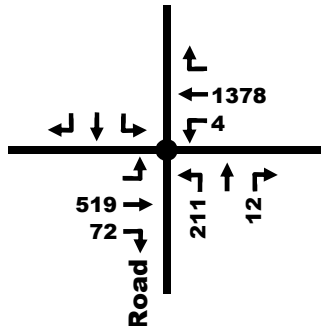
Yes

Yes

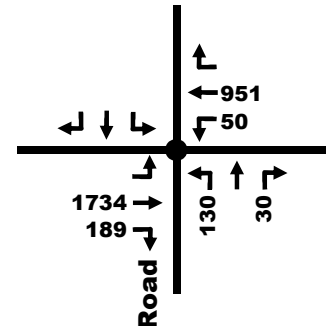
Average 8 Hour Volumes



AM Peak Hour Volumes



PM Peak Hour Volumes



Innes/Lamarche - (peak hour signal warrant ULTIMATE BUILDOUT)

Signal Warrant		Description		Minimum Requirement for Two Lane Roadways	Compliance		
				Restricted Flow - Operating Speed Less Than 70 km/h	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	900	180%	82%	100% Yes
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	82%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	900	156%	156%	
		(2) B	Combined Vehicle and Pedestrian Volume <u>Crossing</u> the Major Street for Each of the Same 8 Hours	75	248%		

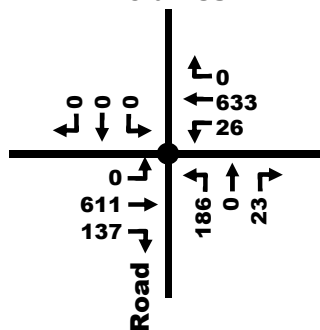
Notes

- 1 Vehicle Volume Warrants (1A), (2A) and (5B) for Roadways Having Two or More Moving Lanes in one Direction Should Be 25% Higher Than Values Given Above
- 2 For Definition of Crossing Volume Refer to Note 4 on the Signal Warrant Analysis Form B2.03.08
- 3 The Lowest Sectional Percentage Governs the Entire Warrant
- 4 For "T" Intersections the Warrant Values for Minor Street Should be Increased by 50% (Warrant 1B only)

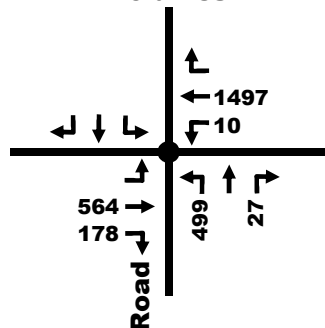
Yes

Yes

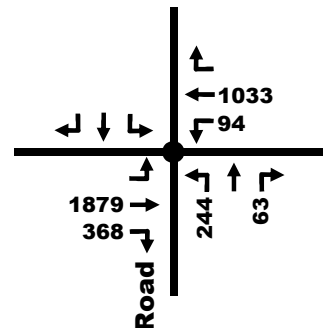
Average 8 Hour Volumes



AM Peak Hour Volumes



PM Peak Hour Volumes



Appendix I

TDM Measures

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 checked="" type="checkbox"/>
BASIC	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	<input checked="" 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 checked="" 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 (<i>see Official Plan policy 4.3.3</i>)	<input checked="" 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 (<i>see 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 (<i>see 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 (<i>see 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 (<i>see 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 checked="" type="checkbox"/>
BASIC	1.2.7 Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	<input checked="" 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 checked="" 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 checked="" 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 checked="" 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 checked="" 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 checked="" 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 checked="" 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 checked="" 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 checked="" 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 checked="" 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"/>






























Appendix J

Synchro Analysis: Background Conditions

Lanes, Volumes, Timings
1: Orleans & Innes

Background Interim AM

05/30/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 			 			 	
Traffic Volume (vph)	121	346	23	24	1288	134	203	259	44	68	100	459
Future Volume (vph)	121	346	23	24	1288	134	203	259	44	68	100	459
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.622			0.584		
Satd. Flow (perm)	3288	3390	1517	1695	3390	1517	1110	3390	1517	1042	3390	1517
Satd. Flow (RTOR)			139			139			79			135
Lane Group Flow (vph)	127	364	24	25	1356	141	214	273	46	72	105	483
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			2			6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	4	4	4
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)	11.6	63.4	63.4	11.2	63.0	63.0	12.2	55.4	55.4	43.2	43.2	43.2
Total Split (%)	8.9%	48.8%	48.8%	8.6%	48.5%	48.5%	9.4%	42.6%	42.6%	33.2%	33.2%	33.2%
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)	-2.6	-2.2	-2.2	-2.2	-2.2	-2.2	-2.7	-2.7	-2.7	-2.7	-2.7	-2.7
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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)	7.6	63.9	63.9	7.2	59.0	59.0	51.4	51.4	51.4	39.2	39.2	39.2
Actuated g/C Ratio	0.06	0.49	0.49	0.06	0.45	0.45	0.40	0.40	0.40	0.30	0.30	0.30
v/c Ratio	0.66	0.22	0.03	0.27	0.88	0.18	0.45	0.20	0.07	0.23	0.10	0.88
Control Delay	76.8	20.1	0.1	66.5	40.4	4.0	31.2	26.4	1.6	36.5	33.1	49.0
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	76.8	20.1	0.1	66.5	40.4	4.0	31.2	26.4	1.6	36.5	33.1	49.0
LOS	E	C	A	E	D	A	C	C	A	D	C	D
Approach Delay		33.1			37.5			26.2			45.1	
Approach LOS		C			D			C			D	
Queue Length 50th (m)	16.7	29.2	0.0	6.3	163.2	0.3	37.6	23.9	0.0	13.9	10.2	88.9
Queue Length 95th (m)	#29.3	39.7	0.0	15.6	196.1	11.8	57.5	33.9	2.5	26.8	17.4	#150.3
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	192	1665	816	93	1538	764	475	1340	647	314	1022	551
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	0.66	0.22	0.03	0.27	0.88	0.18	0.45	0.20	0.07	0.23	0.10	0.88

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

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

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 36.5

Intersection LOS: D

Intersection Capacity Utilization 89.5%

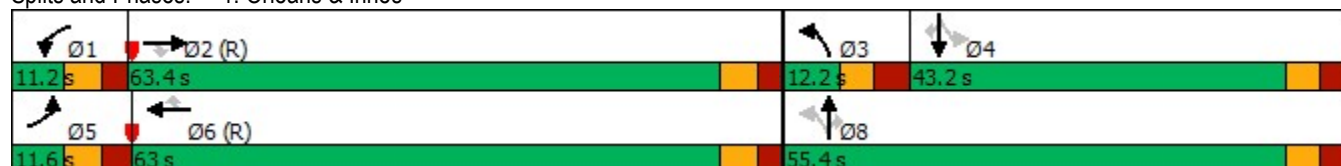
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.






























Splits and Phases: 1: Orleans & Innes



Lanes, Volumes, Timings
1: Orleans & Innes

Background Interim PM

05/30/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 			 			 	
Traffic Volume (vph)	579	1436	158	58	633	166	64	225	84	186	241	203
Future Volume (vph)	579	1436	158	58	633	166	64	225	84	186	241	203
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.487			0.604		
Satd. Flow (perm)	3288	3390	1517	1695	3390	1517	869	3390	1517	1078	3390	1517
Satd. Flow (RTOR)			165			230			159			225
Lane Group Flow (vph)	609	1512	166	61	666	175	67	237	88	196	254	214
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			2			6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	4	4	4
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)	28.3	54.4	54.4	11.2	37.3	37.3	11.7	44.4	44.4	32.7	32.7	32.7
Total Split (%)	25.7%	49.5%	49.5%	10.2%	33.9%	33.9%	10.6%	40.4%	40.4%	29.7%	29.7%	29.7%
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)	-2.6	-2.2	-2.2	-2.2	-2.2	-2.2	-2.7	-2.7	-2.7	-2.7	-2.7	-2.7
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	Max	C-Max	C-Max	Max	C-Max	C-Max	None	Max	Max	Max	Max	Max
Act Effct Green (s)	24.3	50.4	50.4	7.2	33.3	33.3	40.4	40.4	40.4	31.0	31.0	31.0
Actuated g/C Ratio	0.22	0.46	0.46	0.07	0.30	0.30	0.37	0.37	0.37	0.28	0.28	0.28
v/c Ratio	0.84	0.97	0.21	0.55	0.65	0.28	0.18	0.19	0.13	0.64	0.27	0.36
Control Delay	52.7	47.1	3.4	58.7	59.9	17.5	24.3	24.2	0.4	47.4	32.5	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.7	47.1	3.4	58.7	59.9	17.5	24.3	24.2	0.4	47.4	32.5	5.6
LOS	D	D	A	E	E	B	C	C	A	D	C	A
Approach Delay		45.4			51.6			18.9			28.2	
Approach LOS		D			D			B			C	
Queue Length 50th (m)	64.8	162.5	0.1	12.9	80.3	9.8	9.4	18.0	0.0	38.1	22.9	0.0
Queue Length 95th (m)	#90.8	#215.2	11.2	#29.1	99.0	25.3	18.9	27.0	0.0	#69.1	34.1	15.6
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	726	1553	784	110	1026	619	376	1245	657	304	956	589
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	0.84	0.97	0.21	0.55	0.65	0.28	0.18	0.19	0.13	0.64	0.27	0.36

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 41.6

Intersection LOS: D

Intersection Capacity Utilization 78.6%

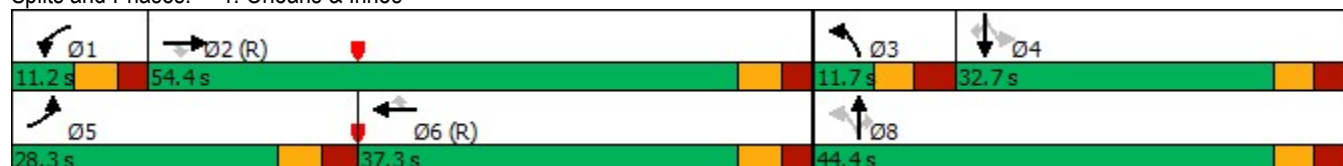
ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



















Splits and Phases: 1: Orleans & Innes



Lanes, Volumes, Timings
2: Page & Innes

Background Interim AM

05/30/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	428	14	41	1353	31	24	14	61	43	7	70
Future Volume (vph)	16	428	14	41	1353	31	24	14	61	43	7	70
Satd. Flow (prot)	1695	3373	0	1695	3380	0	0	1617	0	0	1614	0
Flt Permitted	0.102			0.454				0.912			0.864	
Satd. Flow (perm)	182	3373	0	810	3380	0	0	1492	0	0	1420	0
Satd. Flow (RTOR)		6			4			66			49	
Lane Group Flow (vph)	18	492	0	46	1537	0	0	111	0	0	134	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		39.2	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	82.0	82.0		82.0	82.0		38.0	38.0		38.0	38.0	
Total Split (%)	68.3%	68.3%		68.3%	68.3%		31.7%	31.7%		31.7%	31.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	-2.2	-2.2		-2.2	-2.2			-2.8			-2.8	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)	78.0	78.0		78.0	78.0			34.0			34.0	
Actuated g/C Ratio	0.65	0.65		0.65	0.65			0.28			0.28	
v/c Ratio	0.15	0.22		0.09	0.70			0.24			0.31	
Control Delay	11.9	8.8		3.2	5.6			16.2			23.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	11.9	8.8		3.2	5.6			16.2			23.3	
LOS	B	A		A	A			B			C	
Approach Delay		8.9			5.5			16.2			23.3	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	1.5	22.7		1.7	33.0			7.9			15.3	
Queue Length 95th (m)	5.2	30.2		m2.8	36.6			22.0			32.1	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	118	2194		526	2198			470			437	
Starvation Cap Reductn	0	0		0	15			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	0.22		0.09	0.70			0.24			0.31	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 26 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 80												
Control Type: Actuated-Coordinated												

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 7.8

Intersection LOS: A

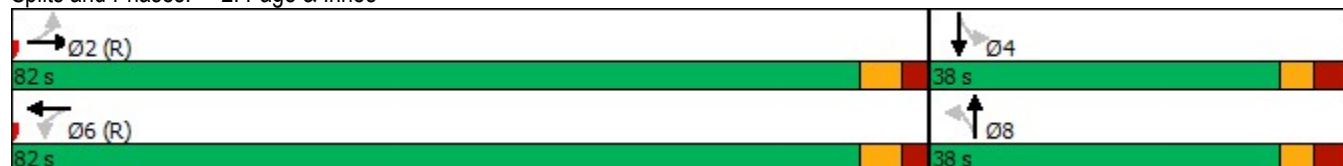
Intersection Capacity Utilization 58.9%

ICU Level of Service B

Analysis Period (min) 15

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



















Splits and Phases: 2: Page & Innes



Lanes, Volumes, Timings
2: Page & Innes

Background Interim PM

05/30/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	1600	34	53	803	101	16	21	101	58	23	38
Future Volume (vph)	74	1600	34	53	803	101	16	21	101	58	23	38
Satd. Flow (prot)	1695	3380	0	1695	3333	0	0	1598	0	0	1667	0
Flt Permitted	0.229			0.059				0.961			0.810	
Satd. Flow (perm)	409	3380	0	105	3333	0	0	1545	0	0	1383	0
Satd. Flow (RTOR)		4			23			22			22	
Lane Group Flow (vph)	82	1816	0	59	1004	0	0	153	0	0	132	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		39.2	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	72.0	72.0		72.0	72.0		38.0	38.0		38.0	38.0	
Total Split (%)	65.5%	65.5%		65.5%	65.5%		34.5%	34.5%		34.5%	34.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	-2.2	-2.2		-2.2	-2.2			-2.8			-2.8	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)	68.0	68.0		68.0	68.0			34.0			34.0	
Actuated g/C Ratio	0.62	0.62		0.62	0.62			0.31			0.31	
v/c Ratio	0.33	0.87		0.92	0.49			0.31			0.30	
Control Delay	4.6	8.3		120.0	12.1			26.8			26.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	4.6	8.3		120.0	12.1			26.8			26.1	
LOS	A	A		F	B			C			C	
Approach Delay		8.2			18.1			26.8			26.1	
Approach LOS		A			B			C			C	
Queue Length 50th (m)	2.6	31.7		10.3	56.0			21.2			17.7	
Queue Length 95th (m)	m2.9	m33.2		#24.6	70.7			38.2			33.7	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	252	2090		64	2069			492			442	
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	0.33	0.87		0.92	0.49			0.31			0.30	
Intersection Summary												
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 2 (2%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 13.0

Intersection LOS: B

Intersection Capacity Utilization 86.5%

ICU Level of Service E

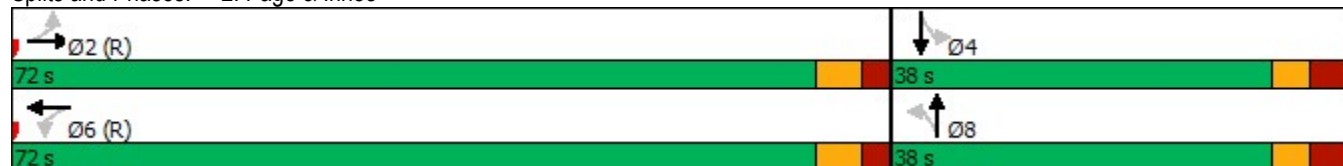
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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



















Splits and Phases: 2: Page & Innes



Lanes, Volumes, Timings
3: U-Haul Access/Convenience Store & Innes

Background Interim AM

05/30/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	501	8	3	1332	1	3	0	0	0	0	5
Future Volume (vph)	3	501	8	3	1332	1	3	0	0	0	0	5
Satd. Flow (prot)	1695	3383	0	1695	3390	0	0	1695	0	0	1543	0
Flt Permitted	0.125			0.422				0.754				
Satd. Flow (perm)	223	3383	0	753	3390	0	0	1345	0	0	1543	0
Satd. Flow (RTOR)		3									62	
Lane Group Flow (vph)	3	566	0	3	1481	0	0	3	0	0	6	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0	33.0	
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%	27.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-2.1	-2.1		-2.1	-2.1			-2.3			-2.3	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)	83.0	83.0		83.0	83.0			29.0			29.0	
Actuated g/C Ratio	0.69	0.69		0.69	0.69			0.24			0.24	
v/c Ratio	0.02	0.24		0.01	0.63			0.01			0.01	
Control Delay	5.0	4.9		5.7	11.7			35.0			0.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	5.0	4.9		5.7	11.7			35.0			0.0	
LOS	A	A		A	B			C			A	
Approach Delay		4.9			11.6			35.0				
Approach LOS		A			B			C				
Queue Length 50th (m)	0.1	12.8		0.2	90.7			0.6			0.0	
Queue Length 95th (m)	m0.5	15.7		1.1	110.1			3.1			0.0	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	154	2340		520	2344			325			419	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.02	0.24		0.01	0.63			0.01			0.01	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 70												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings

3: U-Haul Access/Convenience Store & Innes

Background Interim AM

05/30/2019

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 9.8

Intersection LOS: A

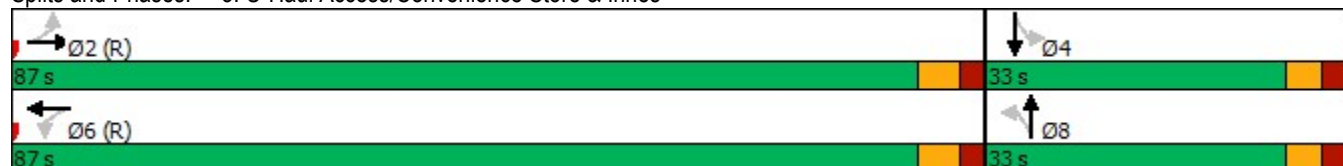
Intersection Capacity Utilization 53.9%

ICU Level of Service A

Analysis Period (min) 15

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



















Splits and Phases: 3: U-Haul Access/Convenience Store & Innes



Lanes, Volumes, Timings
3: U-Haul Access/Convenience Store & Innes

Background Interim PM

05/30/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1675	4	1	933	12	5	0	3	12	0	7
Future Volume (vph)	14	1675	4	1	933	12	5	0	3	12	0	7
Satd. Flow (prot)	1695	3390	0	1695	3383	0	0	1649	0	0	1643	0
Flt Permitted	0.226			0.055				0.903			0.890	
Satd. Flow (perm)	403	3390	0	98	3383	0	0	1539	0	0	1507	0
Satd. Flow (RTOR)					2			31			31	
Lane Group Flow (vph)	16	1865	0	1	1050	0	0	9	0	0	21	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	77.0	77.0		77.0	77.0		33.0	33.0		33.0	33.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-2.1	-2.1		-2.1	-2.1			-2.3			-2.3	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)	73.0	73.0		73.0	73.0			29.0			29.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.26			0.26	
v/c Ratio	0.06	0.83		0.02	0.47			0.02			0.05	
Control Delay	7.2	18.1		7.0	9.8			0.1			7.4	
Queue Delay	0.0	1.1		0.0	0.0			0.0			0.0	
Total Delay	7.2	19.1		7.0	9.8			0.1			7.4	
LOS	A	B		A	A			A			A	
Approach Delay		19.0			9.8			0.1			7.4	
Approach LOS		B			A			A			A	
Queue Length 50th (m)	1.1	142.8		0.1	52.3			0.0			0.0	
Queue Length 95th (m)	3.7	177.4		0.7	65.5			0.3			4.4	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	267	2249		65	2245			428			420	
Starvation Cap Reductn	0	175		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	0.06	0.90		0.02	0.47			0.02			0.05	
Intersection Summary												
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 36 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings 3: U-Haul Access/Convenience Store & Innes

Background Interim PM

05/30/2019

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 15.6

Intersection LOS: B

Intersection Capacity Utilization 64.0%

ICU Level of Service C

Analysis Period (min) 15







Splits and Phases: 3: U-Haul Access/Convenience Store & Innes



Lanes, Volumes, Timings
4: Lamarche & Innes

Background Interim AM

05/30/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵
Traffic Volume (vph)	504	25	1	1339	86	5
Future Volume (vph)	504	25	1	1339	86	5
Satd. Flow (prot)	3366	0	1695	3390	1695	1517
Flt Permitted			0.417		0.950	
Satd. Flow (perm)	3366	0	744	3390	1695	1517
Satd. Flow (RTOR)	11					6
Lane Group Flow (vph)	588	0	1	1488	96	6
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases			6			8
Detector Phase	2		6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0
Minimum Split (s)	24.0		24.0	24.0	24.0	24.0
Total Split (s)	92.0		92.0	92.0	28.0	28.0
Total Split (%)	76.7%		76.7%	76.7%	23.3%	23.3%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	0.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max		C-Max	C-Max	Max	Max
Act Effct Green (s)	88.0		88.0	88.0	24.0	22.0
Actuated g/C Ratio	0.73		0.73	0.73	0.20	0.18
v/c Ratio	0.24		0.00	0.60	0.28	0.02
Control Delay	4.7		4.0	3.8	43.4	23.2
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	4.7		4.0	3.8	43.4	23.2
LOS	A		A	A	D	C
Approach Delay	4.7			3.8	42.2	
Approach LOS	A			A	D	
Queue Length 50th (m)	17.9		0.0	20.3	19.3	0.0
Queue Length 95th (m)	21.9		m0.1	22.6	35.0	3.7
Internal Link Dist (m)	206.4			215.4	157.2	
Turn Bay Length (m)			50.0		50.0	
Base Capacity (vph)	2471		545	2486	339	283
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.24		0.00	0.60	0.28	0.02
Intersection Summary						
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green						
Natural Cycle: 60						
Control Type: Actuated-Coordinated						

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 5.8

Intersection LOS: A

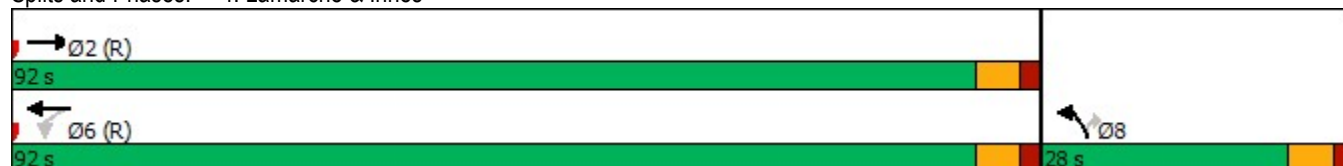
Intersection Capacity Utilization 54.1%

ICU Level of Service A

Analysis Period (min) 15

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












Splits and Phases: 4: Lamarche & Innes



Lanes, Volumes, Timings
4: Lamarche & Innes

Background Interim PM

05/30/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1684	73	21	924	45	9
Future Volume (vph)	1684	73	21	924	45	9
Satd. Flow (prot)	3370	0	1695	3390	1695	1517
Flt Permitted			0.070		0.950	
Satd. Flow (perm)	3370	0	125	3390	1695	1517
Satd. Flow (RTOR)	11					10
Lane Group Flow (vph)	1952	0	23	1027	50	10
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases			6			8
Detector Phase	2		6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0
Minimum Split (s)	24.0		24.0	24.0	24.0	24.0
Total Split (s)	96.0		96.0	96.0	24.0	24.0
Total Split (%)	80.0%		80.0%	80.0%	20.0%	20.0%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	0.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max		C-Max	C-Max	Max	Max
Act Effct Green (s)	92.0		92.0	92.0	20.0	18.0
Actuated g/C Ratio	0.77		0.77	0.77	0.17	0.15
v/c Ratio	0.75		0.24	0.40	0.18	0.04
Control Delay	10.1		11.0	5.2	44.9	22.2
Queue Delay	1.1		0.0	0.0	0.0	0.0
Total Delay	11.2		11.0	5.2	44.9	22.2
LOS	B		B	A	D	C
Approach Delay	11.2			5.3	41.1	
Approach LOS	B			A	D	
Queue Length 50th (m)	112.7		1.3	36.0	10.2	0.0
Queue Length 95th (m)	138.2		5.2	44.5	21.8	4.9
Internal Link Dist (m)	206.4			215.4	157.2	
Turn Bay Length (m)			50.0		50.0	
Base Capacity (vph)	2586		95	2599	282	236
Starvation Cap Reductn	375		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.88		0.24	0.40	0.18	0.04
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: 70						
Control Type: Actuated-Coordinated						

Lanes, Volumes, Timings
4: Lamarche & Innes

Background Interim PM

05/30/2019

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 9.8

Intersection LOS: A

Intersection Capacity Utilization 68.3%

ICU Level of Service C

























Analysis Period (min) 15













Splits and Phases: 4: Lamarche & Innes



Lanes, Volumes, Timings
1: Orleans & Innes

Background_Full_AM
05/30/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	364	23	24	1348	156	203	259	44	74	100	459
Future Volume (vph)	121	364	23	24	1348	156	203	259	44	74	100	459
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.620			0.584		
Satd. Flow (perm)	3288	3390	1517	1695	3390	1517	1106	3390	1517	1042	3390	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139			139			79			135
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		196.6			470.9			90.6			249.1	
Travel Time (s)		14.2			33.9			6.5			17.9	
Lane Group Flow (vph)	127	383	24	25	1419	164	214	273	46	78	105	483
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			2			6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	4	4	4
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)	11.6	64.6	64.6	11.2	64.2	64.2	12.2	54.2	54.2	42.0	42.0	42.0
Total Split (%)	8.9%	49.7%	49.7%	8.6%	49.4%	49.4%	9.4%	41.7%	41.7%	32.3%	32.3%	32.3%
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)	-2.6	-2.2	-2.2	-2.2	-2.2	-2.2	-2.7	-2.7	-2.7	-2.7	-2.7	-2.7
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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 Effect Green (s)	7.6	65.1	65.1	7.2	60.2	60.2	50.2	50.2	50.2	38.0	38.0	38.0
Actuated g/C Ratio	0.06	0.50	0.50	0.06	0.46	0.46	0.39	0.39	0.39	0.29	0.29	0.29
v/c Ratio	0.66	0.23	0.03	0.27	0.90	0.21	0.46	0.21	0.07	0.26	0.11	0.90
Control Delay	76.8	19.5	0.0	66.5	41.7	5.4	32.3	27.2	1.6	38.0	34.0	52.5
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	76.8	19.5	0.0	66.5	41.7	5.4	32.3	27.2	1.6	38.0	34.0	52.5
LOS	E	B	A	E	D	A	C	C	A	D	C	D
Approach Delay		32.3			38.4			27.0			47.9	
Approach LOS		C			D			C			D	
Queue Length 50th (m)	16.7	30.4	0.0	6.3	173.0	3.4	38.2	24.3	0.0	15.3	10.3	90.2
Queue Length 95th (m)	#29.3	41.0	0.0	15.6	#207.9	15.8	58.4	34.4	2.5	29.1	17.6	#153.4
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	192	1697	829	93	1569	777	464	1309	634	304	990	538
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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.66	0.23	0.03	0.27	0.90	0.21	0.46	0.21	0.07	0.26	0.11	0.90

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

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

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 37.5

Intersection LOS: D

Intersection Capacity Utilization 91.2%

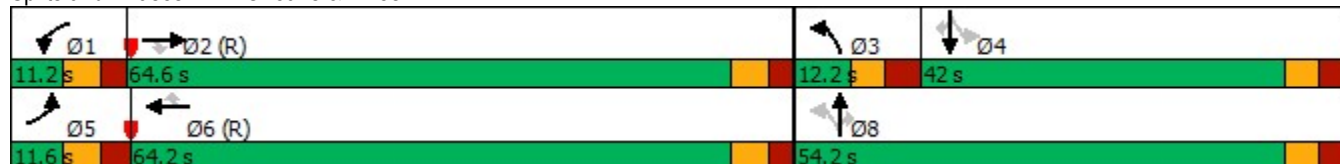
ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

























Splits and Phases: 1: Orleans & Innes



Lanes, Volumes, Timings
1: Orleans & Innes

Background Full Buildout PM

05/30/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	579	1488	158	58	663	176	64	225	84	204	241	203
Future Volume (vph)	579	1488	158	58	663	176	64	225	84	204	241	203
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.487			0.604		
Satd. Flow (perm)	3288	3390	1517	1695	3390	1517	869	3390	1517	1078	3390	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			165			230			159			225
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		196.6			470.9			90.6			249.1	
Travel Time (s)		14.2			33.9			6.5			17.9	
Lane Group Flow (vph)	609	1566	166	61	698	185	67	237	88	215	254	214
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			2			6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	4	4	4
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)	28.3	54.4	54.4	11.2	37.3	37.3	11.7	44.4	44.4	32.7	32.7	32.7
Total Split (%)	25.7%	49.5%	49.5%	10.2%	33.9%	33.9%	10.6%	40.4%	40.4%	29.7%	29.7%	29.7%
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)	-2.6	-2.2	-2.2	-2.2	-2.2	-2.2	-2.7	-2.7	-2.7	-2.7	-2.7	-2.7
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	Max	C-Max	C-Max	Max	C-Max	C-Max	None	Max	Max	Max	Max	Max
Act Effect Green (s)	24.3	50.4	50.4	7.2	33.3	33.3	40.4	40.4	40.4	31.0	31.0	31.0
Actuated g/C Ratio	0.22	0.46	0.46	0.07	0.30	0.30	0.37	0.37	0.37	0.28	0.28	0.28
v/c Ratio	0.84	1.01	0.21	0.55	0.68	0.30	0.18	0.19	0.13	0.71	0.27	0.36
Control Delay	52.7	55.2	3.4	58.3	60.6	18.7	24.3	24.2	0.4	51.1	32.5	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.7	55.2	3.4	58.3	60.6	18.7	24.3	24.2	0.4	51.1	32.5	5.6
LOS	D	E	A	E	E	B	C	C	A	D	C	A
Approach Delay		50.9			52.2			18.9			29.9	
Approach LOS		D			D			B			C	
Queue Length 50th (m)	64.8	~176.0	0.1	12.9	84.3	11.2	9.4	18.0	0.0	42.7	22.9	0.0
Queue Length 95th (m)	#90.8	#228.0	11.2	m#29.7	103.3	28.2	18.9	27.0	0.0	#79.4	34.1	15.6
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	726	1553	784	110	1026	619	376	1245	657	304	956	589
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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.84	1.01	0.21	0.55	0.68	0.30	0.18	0.19	0.13	0.71	0.27	0.36

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 45.0

Intersection LOS: D

Intersection Capacity Utilization 81.2%

ICU Level of Service D

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: 1: Orleans & Innes



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	453	13	41	1436	31	23	14	61	43	7	70
Future Volume (vph)	16	453	13	41	1436	31	23	14	61	43	7	70
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	110.0		0.0	75.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1695	3377	0	1695	3380	0	0	1617	0	0	1614	0
Flt Permitted	0.085			0.440				0.915			0.864	
Satd. Flow (perm)	152	3377	0	785	3380	0	0	1497	0	0	1420	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			4			68			40	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		470.9			230.4			211.2			246.4	
Travel Time (s)		33.9			16.6			15.2			17.7	
Lane Group Flow (vph)	18	517	0	46	1630	0	0	110	0	0	134	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		39.2	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	82.0	82.0		82.0	82.0		38.0	38.0		38.0	38.0	
Total Split (%)	68.3%	68.3%		68.3%	68.3%		31.7%	31.7%		31.7%	31.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	-2.2	-2.2		-2.2	-2.2			-2.8			-2.8	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effect Green (s)	78.0	78.0		78.0	78.0			34.0			34.0	
Actuated g/C Ratio	0.65	0.65		0.65	0.65			0.28			0.28	
v/c Ratio	0.18	0.24		0.09	0.74			0.23			0.31	
Control Delay	13.8	8.9		4.9	10.8			15.6			25.7	
Queue Delay	0.0	0.0		0.0	0.2			0.0			0.0	
Total Delay	13.8	8.9		4.9	11.0			15.6			25.7	
LOS	B	A		A	B			B			C	
Approach Delay		9.1			10.9			15.6			25.7	
Approach LOS		A			B			B			C	
Queue Length 50th (m)	1.6	24.1		2.3	24.2			7.3			17.0	
Queue Length 95th (m)	5.7	31.9		m3.7	26.7			21.4			34.0	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	98	2196		510	2198			472			431	
Starvation Cap Reductn	0	0		0	108			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.18	0.24		0.09	0.78			0.23			0.31	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 26 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 11.5

Intersection LOS: B







Intersection Capacity Utilization 61.5%



















ICU Level of Service B













Analysis Period (min) 15

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

Splits and Phases: 2: Page & Innes

		Ø2 (R)		Ø4
82 s			38 s	
		Ø6 (R)		Ø8
82 s			38 s	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	1669	33	53	840	101	19	21	98	58	23	38
Future Volume (vph)	74	1669	33	53	840	101	19	21	98	58	23	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	110.0		0.0	75.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1695	3380	0	1695	3336	0	0	1602	0	0	1667	0
Flt Permitted	0.216			0.059				0.953			0.810	
Satd. Flow (perm)	385	3380	0	105	3336	0	0	1537	0	0	1383	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			22			18			22	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		470.9			230.4			211.2			246.4	
Travel Time (s)		33.9			16.6			15.2			17.7	
Lane Group Flow (vph)	82	1891	0	59	1045	0	0	153	0	0	132	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		39.2	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	72.0	72.0		72.0	72.0		38.0	38.0		38.0	38.0	
Total Split (%)	65.5%	65.5%		65.5%	65.5%		34.5%	34.5%		34.5%	34.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	-2.2	-2.2		-2.2	-2.2			-2.8			-2.8	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effect Green (s)	68.0	68.0		68.0	68.0			34.0			34.0	
Actuated g/C Ratio	0.62	0.62		0.62	0.62			0.31			0.31	
v/c Ratio	0.34	0.90		0.92	0.50			0.31			0.30	
Control Delay	4.8	10.0		120.0	12.4			27.7			26.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	4.8	10.0		120.0	12.4			27.7			26.1	
LOS	A	A		F	B			C			C	
Approach Delay		9.8			18.2			27.7			26.1	
Approach LOS		A			B			C			C	
Queue Length 50th (m)	2.7	34.3		10.3	59.4			21.9			17.7	
Queue Length 95th (m)	m3.0	m34.7		#24.6	74.7			39.0			33.7	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	238	2090		64	2070			487			442	
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	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.34	0.90		0.92	0.50			0.31			0.30	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 2 (2%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 14.0

Intersection LOS: B

Intersection Capacity Utilization 81.9%

ICU Level of Service D

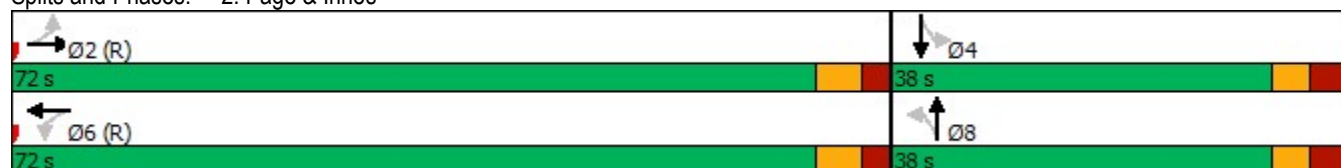
Analysis Period (min) 15

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: 2: Page & Innes














Lanes, Volumes, Timings
3: U-Haul Access/Convenience Store & Innes

Background_Full_AM
05/30/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	505	8	3	1334	1	3	0	0	0	0	5
Future Volume (vph)	3	505	8	3	1334	1	3	0	0	0	0	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		0.0	50.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1695	3383	0	1695	3390	0	0	1695	0	0	1543	0
Flt Permitted	0.125			0.420				0.754				
Satd. Flow (perm)	223	3383	0	749	3390	0	0	1345	0	0	1543	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3									62	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		239.4			221.0			208.8			61.6	
Travel Time (s)		17.2			15.9			15.0			4.4	
Lane Group Flow (vph)	3	570	0	3	1483	0	0	3	0	0	6	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0	33.0	
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%	27.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-2.1	-2.1		-2.1	-2.1			-2.3			-2.3	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effect Green (s)	83.0	83.0		83.0	83.0			29.0			29.0	
Actuated g/C Ratio	0.69	0.69		0.69	0.69			0.24			0.24	
v/c Ratio	0.02	0.24		0.01	0.63			0.01			0.01	
Control Delay	4.3	4.4		5.7	11.7			35.0			0.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	4.3	4.4		5.7	11.7			35.0			0.0	
LOS	A	A		A	B			C			A	
Approach Delay		4.4			11.7			35.0				
Approach LOS		A			B			C				
Queue Length 50th (m)	0.1	10.9		0.2	90.8			0.6			0.0	
Queue Length 95th (m)	m0.4	13.6		1.1	110.4			3.1			0.0	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	154	2340		518	2344			325			419	
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	

Lanes, Volumes, Timings
3: U-Haul Access/Convenience Store & Innes

Background_Full_AM
05/30/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.02	0.24		0.01	0.63			0.01			0.01	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 9.7

Intersection LOS: A

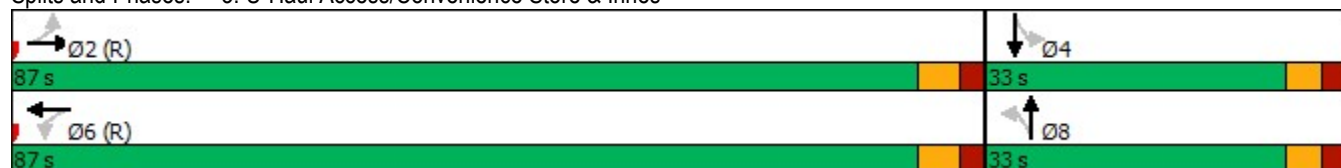
Intersection Capacity Utilization 54.0%

ICU Level of Service A

Analysis Period (min) 15

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



















Splits and Phases: 3: U-Haul Access/Convenience Store & Innes



Lanes, Volumes, Timings
3: U-Haul Access/Convenience Store & Innes

Background Full Buildout PM













05/30/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1685	4	1	950	12	5	0	3	12	0	7
Future Volume (vph)	14	1685	4	1	950	12	5	0	3	12	0	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		0.0	50.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1695	3390	0	1695	3383	0	0	1649	0	0	1643	0
Flt Permitted	0.221			0.055				0.903			0.890	
Satd. Flow (perm)	394	3390	0	98	3383	0	0	1539	0	0	1507	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					2			31			31	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		239.4			221.0			208.8			61.6	
Travel Time (s)		17.2			15.9			15.0			4.4	
Lane Group Flow (vph)	16	1876	0	1	1069	0	0	9	0	0	21	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	77.0	77.0		77.0	77.0		33.0	33.0		33.0	33.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-2.1	-2.1		-2.1	-2.1			-2.3			-2.3	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)	73.0	73.0		73.0	73.0			29.0			29.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.26			0.26	
v/c Ratio	0.06	0.83		0.02	0.48			0.02			0.05	
Control Delay	7.2	18.3		7.0	9.9			0.1			7.4	
Queue Delay	0.0	1.1		0.0	0.0			0.0			0.0	
Total Delay	7.2	19.4		7.0	9.9			0.1			7.4	
LOS	A	B		A	A			A			A	
Approach Delay		19.3			9.9			0.1			7.4	
Approach LOS		B			A			A			A	
Queue Length 50th (m)	1.1	144.7		0.1	53.7			0.0			0.0	
Queue Length 95th (m)	3.7	180.3		0.7	67.3			0.3			4.4	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	261	2249		65	2245			428			420	
Starvation Cap Reductn	0	173		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	

Lanes, Volumes, Timings
3: U-Haul Access/Convenience Store & Innes

Background Full Buildout PM

05/30/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.06	0.90		0.02	0.48			0.02			0.05	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 36 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 15.8

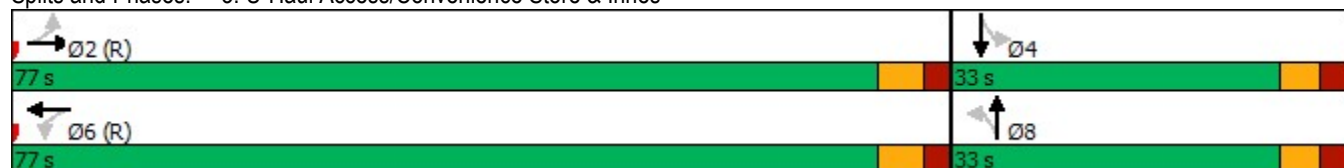
Intersection LOS: B

Intersection Capacity Utilization 64.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: U-Haul Access/Convenience Store & Innes



Lanes, Volumes, Timings
4: Lamarche & Innes

Background_Full_AM
05/30/2019

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	↗
Traffic Volume (vph)	504	50	3	1339	169	9
Future Volume (vph)	504	50	3	1339	169	9
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	50.0		50.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Satd. Flow (prot)	3343	0	1695	3390	1695	1517
Flt Permitted			0.399		0.950	
Satd. Flow (perm)	3343	0	712	3390	1695	1517
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	21					10
Link Speed (k/h)	50			50	50	
Link Distance (m)	230.4			239.4	181.2	
Travel Time (s)	16.6			17.2	13.0	
Lane Group Flow (vph)	616	0	3	1488	188	10
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases			6			8
Detector Phase	2		6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0
Minimum Split (s)	24.0		24.0	24.0	24.0	24.0
Total Split (s)	88.0		88.0	88.0	32.0	32.0
Total Split (%)	73.3%		73.3%	73.3%	26.7%	26.7%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	0.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max		C-Max	C-Max	Max	Max
Act Effect Green (s)	84.0		84.0	84.0	28.0	26.0
Actuated g/C Ratio	0.70		0.70	0.70	0.23	0.22
v/c Ratio	0.26		0.01	0.63	0.48	0.03
Control Delay	5.9		4.0	5.3	44.4	18.8
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	5.9		4.0	5.3	44.4	18.8
LOS	A		A	A	D	B
Approach Delay	5.9			5.3	43.1	
Approach LOS	A			A	D	
Queue Length 50th (m)	21.3		0.1	27.0	38.4	0.0
Queue Length 95th (m)	25.9		m0.2	30.0	61.2	4.5
Internal Link Dist (m)	206.4			215.4	157.2	
Turn Bay Length (m)			50.0		50.0	
Base Capacity (vph)	2346		498	2373	395	336
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0

Lanes, Volumes, Timings

4: Lamarche & Innes

Background_Full_AM
05/30/2019

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Reduced v/c Ratio	0.26		0.01	0.63	0.48	0.03

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 8.7

Intersection LOS: A

Intersection Capacity Utilization 55.6%

ICU Level of Service B

Analysis Period (min) 15

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














Splits and Phases: 4: Lamarche & Innes



Lanes, Volumes, Timings
4: Lamarche & Innes







Background Full Buildout PM

05/30/2019

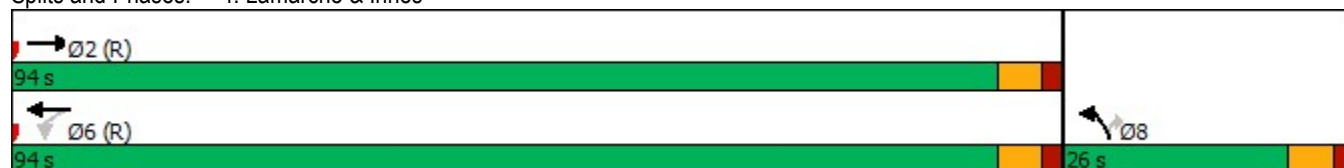
						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	 			 		
Traffic Volume (vph)	1681	144	38	924	82	22
Future Volume (vph)	1681	144	38	924	82	22
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	50.0		50.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Satd. Flow (prot)	3350	0	1695	3390	1695	1517
Flt Permitted			0.071		0.950	
Satd. Flow (perm)	3350	0	127	3390	1695	1517
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	21					24
Link Speed (k/h)	50			50	50	
Link Distance (m)	230.4			239.4	181.2	
Travel Time (s)	16.6			17.2	13.0	
Lane Group Flow (vph)	2028	0	42	1027	91	24
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases			6			8
Detector Phase	2		6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0
Minimum Split (s)	24.0		24.0	24.0	24.0	24.0
Total Split (s)	94.0		94.0	94.0	26.0	26.0
Total Split (%)	78.3%		78.3%	78.3%	21.7%	21.7%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	0.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max		C-Max	C-Max	None	None
Act Effect Green (s)	97.6		97.6	97.6	14.4	12.4
Actuated g/C Ratio	0.81		0.81	0.81	0.12	0.10
v/c Ratio	0.74		0.41	0.37	0.45	0.14
Control Delay	7.7		17.6	3.6	55.8	18.7
Queue Delay	0.9		0.0	0.0	0.0	0.0
Total Delay	8.6		17.6	3.6	55.8	18.7
LOS	A		B	A	E	B
Approach Delay	8.6			4.1	48.1	
Approach LOS	A			A	D	
Queue Length 50th (m)	89.0		2.1	25.8	20.4	0.0
Queue Length 95th (m)	142.1		13.3	41.2	35.4	7.8
Internal Link Dist (m)	206.4			215.4	157.2	
Turn Bay Length (m)			50.0		50.0	
Base Capacity (vph)	2729		103	2758	310	272
Starvation Cap Reductn	394		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0

Lanes, Volumes, Timings 4: Lamarche & Innes

Background Full Buildout PM
05/30/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Reduced v/c Ratio	0.87		0.41	0.37	0.29	0.09
Intersection Summary						
Area Type:	Other					
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green						
Natural Cycle: 75						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.74						
Intersection Signal Delay: 8.5				Intersection LOS: A		
Intersection Capacity Utilization 70.6%				ICU Level of Service C		
Analysis Period (min) 15						

Splits and Phases: 4: Lamarche & Innes



























Appendix K

Synchro Analysis: Future Conditions

Lanes, Volumes, Timings
1: Orleans & Innes

Future_Interim AM
06/25/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	375	23	24	1385	156	203	259	44	75	100	459
Future Volume (vph)	121	375	23	24	1385	156	203	259	44	75	100	459
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.562			0.592		
Satd. Flow (perm)	3288	3390	1517	1695	3390	1517	1003	3390	1517	1056	3390	1517
Satd. Flow (RTOR)			191			139			79			240
Lane Group Flow (vph)	121	375	23	24	1385	156	203	259	44	75	100	459
Turn Type	Prot	NA	Free	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Free
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			Free			6	8		8	4		Free
Detector Phase	5	2		1	6	6	3	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.6	26.2		11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	
Total Split (s)	12.0	71.1		11.2	70.3	70.3	15.0	47.7	47.7	32.7	32.7	
Total Split (%)	9.2%	54.7%		8.6%	54.1%	54.1%	11.5%	36.7%	36.7%	25.2%	25.2%	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.9	2.5		2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	
Lost Time Adjust (s)	-2.6	-2.2		-2.2	-2.2	-2.2	-2.7	-2.7	-2.7	-2.7	-2.7	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Min	Min	Min	Min	
Act Effct Green (s)	12.1	80.6	130.0	9.5	73.2	73.2	32.7	32.7	32.7	17.7	17.7	130.0
Actuated g/C Ratio	0.09	0.62	1.00	0.07	0.56	0.56	0.25	0.25	0.25	0.14	0.14	1.00
v/c Ratio	0.40	0.18	0.02	0.19	0.73	0.17	0.65	0.30	0.10	0.52	0.22	0.30
Control Delay	59.2	12.5	0.0	59.6	24.8	3.9	51.6	39.6	1.9	64.2	49.7	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.2	12.5	0.0	59.6	24.8	3.9	51.6	39.6	1.9	64.2	49.7	0.5
LOS	E	B	A	E	C	A	D	D	A	E	D	A
Approach Delay		22.9			23.3			41.2			15.8	
Approach LOS		C			C			D			B	
Queue Length 50th (m)	15.2	22.3	0.0	5.9	132.5	1.9	44.7	28.5	0.0	18.2	12.2	0.0
Queue Length 95th (m)	25.0	36.1	0.0	14.5	180.0	12.9	63.4	37.7	2.2	32.6	19.6	0.0
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	306	2100	1517	124	1907	914	310	1139	562	233	748	1517
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	0.40	0.18	0.02	0.19	0.73	0.17	0.65	0.23	0.08	0.32	0.13	0.30

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

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

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 24.5

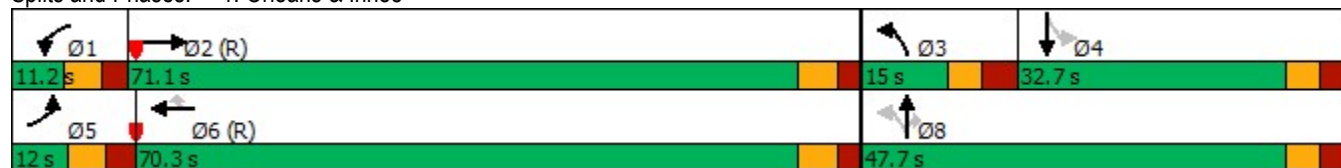
Intersection LOS: C

Intersection Capacity Utilization 78.1%

ICU Level of Service D






























Analysis Period (min) 15













Splits and Phases: 1: Orleans & Innes



Lanes, Volumes, Timings
1: Orleans & Innes

Future Interim PM
06/25/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 			 			 	
Traffic Volume (vph)	579	1550	158	58	697	182	64	225	84	211	241	203
Future Volume (vph)	579	1550	158	58	697	182	64	225	84	211	241	203
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.480			0.488		
Satd. Flow (perm)	3288	3390	1517	1695	3390	1517	856	3390	1517	871	3390	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			248			195			190			248
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		196.6			470.9			90.6			249.1	
Travel Time (s)		14.2			33.9			6.5			17.9	
Lane Group Flow (vph)	579	1550	158	58	697	182	64	225	84	211	241	203
Turn Type	Prot	NA	Free	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			6	8		8	4		Free
Detector Phase	5	2		1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	11.6	26.2		11.2	26.2	26.2	11.7	32.7	32.7	11.0	32.7	
Total Split (s)	35.1	70.3		11.2	46.4	46.4	11.7	33.5	33.5	11.0	32.8	
Total Split (%)	27.9%	55.8%		8.9%	36.8%	36.8%	9.3%	26.6%	26.6%	8.7%	26.0%	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3	3.3	4.0	3.3	
All-Red Time (s)	2.9	2.5		2.5	2.5	2.5	3.4	3.4	3.4	2.0	3.4	
Lost Time Adjust (s)	-2.6	-2.2		-2.2	-2.2	-2.2	-2.7	-2.7	-2.7	-2.7	-2.7	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	3.3	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	Max	C-Max		Max	C-Max	C-Max	None	Min	Min	None	Min	
Act Effect Green (s)	43.1	66.3	126.0	19.2	42.4	42.4	25.2	17.5	17.5	26.0	19.1	126.0
Actuated g/C Ratio	0.34	0.53	1.00	0.15	0.34	0.34	0.20	0.14	0.14	0.21	0.15	1.00
v/c Ratio	0.51	0.87	0.10	0.22	0.61	0.28	0.29	0.48	0.22	0.92	0.47	0.13
Control Delay	35.7	32.7	0.1	48.3	33.2	3.2	41.6	53.0	1.4	87.8	52.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	32.7	0.1	48.3	33.2	3.2	41.6	53.0	1.4	87.8	52.3	0.2
LOS	D	C	A	D	C	A	D	D	A	F	D	A
Approach Delay		31.2			28.3			39.4			47.6	
Approach LOS		C			C			D			D	
Queue Length 50th (m)	58.9	170.4	0.0	12.9	54.3	0.0	12.8	27.4	0.0	46.1	29.6	0.0
Queue Length 95th (m)	80.1	205.0	0.0	27.3	65.3	8.6	24.1	38.7	0.0	#83.9	41.6	0.0
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	1125	1783	1517	258	1140	639	222	793	500	229	774	1517
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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.51	0.87	0.10	0.22	0.61	0.28	0.29	0.28	0.17	0.92	0.31	0.13

Intersection Summary

Area Type: Other

Cycle Length: 126

Actuated Cycle Length: 126

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 33.8

Intersection LOS: C

Intersection Capacity Utilization 83.4%

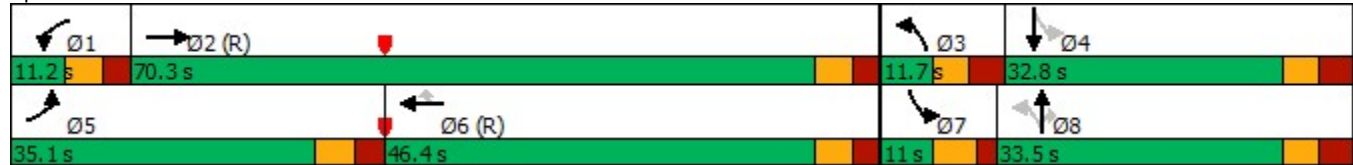
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



















Splits and Phases: 1: Orleans & Innes



Lanes, Volumes, Timings
2: Page & Innes

Future_Interim AM

06/25/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	466	14	41	1473	31	24	14	61	43	7	70
Future Volume (vph)	16	466	14	41	1473	31	24	14	61	43	7	70
Satd. Flow (prot)	1695	3377	0	1695	3380	0	0	1617	0	0	1614	0
Flt Permitted	0.147			0.478				0.859			0.773	
Satd. Flow (perm)	262	3377	0	853	3380	0	0	1406	0	0	1270	0
Satd. Flow (RTOR)		5			3			61			50	
Lane Group Flow (vph)	16	480	0	41	1504	0	0	99	0	0	120	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		39.2	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	81.0	81.0		81.0	81.0		39.0	39.0		39.0	39.0	
Total Split (%)	67.5%	67.5%		67.5%	67.5%		32.5%	32.5%		32.5%	32.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	-2.2	-2.2		-2.2	-2.2			-2.8			-2.8	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Min	Min		Min	Min	
Act Effct Green (s)	96.5	96.5		96.5	96.5			15.5			15.5	
Actuated g/C Ratio	0.80	0.80		0.80	0.80			0.13			0.13	
v/c Ratio	0.08	0.18		0.06	0.55			0.42			0.58	
Control Delay	4.1	3.0		2.0	4.4			26.1			39.8	
Queue Delay	0.0	0.0		0.0	0.1			0.0			0.0	
Total Delay	4.1	3.0		2.0	4.5			26.1			39.8	
LOS	A	A		A	A			C			D	
Approach Delay		3.1			4.4			26.1			39.8	
Approach LOS		A			A			C			D	
Queue Length 50th (m)	0.6	9.9		0.9	17.2			8.2			15.6	
Queue Length 95th (m)	2.8	18.7		m1.9	21.0			23.5			33.5	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	210	2716		686	2718			453			405	
Starvation Cap Reductn	0	0		0	174			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.08	0.18		0.06	0.59			0.22			0.30	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 26 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 80												
Control Type: Actuated-Coordinated												

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 7.0

Intersection LOS: A

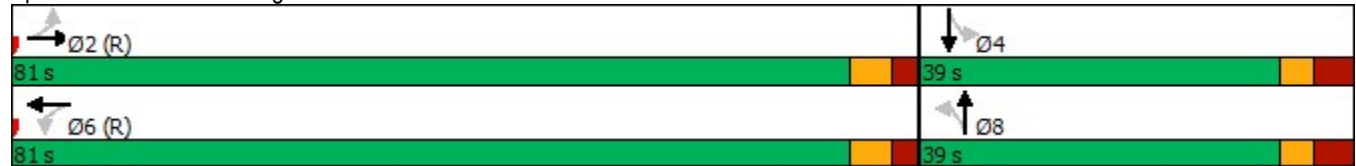
Intersection Capacity Utilization 62.4%



















ICU Level of Service B













Analysis Period (min) 15

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

Splits and Phases: 2: Page & Innes



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	1744	34	53	887	101	16	21	101	58	23	38
Future Volume (vph)	74	1744	34	53	887	101	16	21	101	58	23	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	110.0		0.0	75.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			0.0			0.0		
Satd. Flow (prot)	1695	3380	0	1695	3339	0	0	1598	0	0	1667	0
Flt Permitted	0.290			0.074				0.955			0.574	
Satd. Flow (perm)	517	3380	0	132	3339	0	0	1535	0	0	980	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			21			89			18	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		470.9			230.4			211.2			246.4	
Travel Time (s)		33.9			16.6			15.2			17.7	
Lane Group Flow (vph)	74	1778	0	53	988	0	0	138	0	0	119	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		11.0	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	77.2	77.2		11.0	88.2		37.8	37.8		37.8	37.8	
Total Split (%)	61.3%	61.3%		8.7%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	3.7	3.7		4.0	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.0	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	-2.2	-2.2		-2.2	-2.2			-2.8			-2.8	
Total Lost Time (s)	4.0	4.0		3.8	4.0			4.0			4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	C-Max	C-Max		None	C-Max		Min	Min		Min	Min	
Act Effect Green (s)	89.7	89.7		100.2	100.0			18.0			18.0	
Actuated g/C Ratio	0.71	0.71		0.80	0.79			0.14			0.14	
v/c Ratio	0.20	0.74		0.25	0.37			0.47			0.77	
Control Delay	4.2	4.8		6.2	4.5			23.7			73.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	4.2	4.8		6.2	4.5			23.7			73.2	
LOS	A	A		A	A			C			E	
Approach Delay		4.8			4.6			23.7			73.2	
Approach LOS		A			A			C			E	
Queue Length 50th (m)	2.6	34.1		2.3	29.7			11.0			24.6	
Queue Length 95th (m)	m3.3	40.0		6.3	50.0			28.7			43.9	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	368	2407		213	2653			476			276	
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	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.20	0.74		0.25	0.37			0.29			0.43	

Intersection Summary

Area Type: Other

Cycle Length: 126

Actuated Cycle Length: 126

Offset: 2 (2%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 8.1

Intersection LOS: A






Intersection Capacity Utilization 86.5%

ICU Level of Service E

Analysis Period (min) 15

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



















Splits and Phases: 2: Page & Innes

 Ø1	 Ø2 (R)	 Ø4
11 s	77.2 s	37.8 s
 Ø6 (R)		 Ø8
88.2 s		37.8 s

Lanes, Volumes, Timings
3: U-Haul Access/Convenience Store & Innes

Future_Interim AM

06/25/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	520	8	3	1372	1	3	0	0	0	0	5
Future Volume (vph)	3	520	8	3	1372	1	3	0	0	0	0	5
Satd. Flow (prot)	1695	3383	0	1695	3390	0	0	1695	0	0	1543	0
Flt Permitted	0.178			0.456				0.754				
Satd. Flow (perm)	318	3383	0	814	3390	0	0	1345	0	0	1543	0
Satd. Flow (RTOR)		3									80	
Lane Group Flow (vph)	3	528	0	3	1373	0	0	3	0	0	5	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	87.7	87.7		87.7	87.7		32.3	32.3		32.3	32.3	
Total Split (%)	73.1%	73.1%		73.1%	73.1%		26.9%	26.9%		26.9%	26.9%	
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)	-2.1	-2.1		-2.1	-2.1			-2.3			-2.3	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Min	Min		Min	Min	
Act Effct Green (s)	99.7	99.7		99.7	99.7			12.3			12.3	
Actuated g/C Ratio	0.83	0.83		0.83	0.83			0.10			0.10	
v/c Ratio	0.01	0.19		0.00	0.49			0.02			0.02	
Control Delay	1.7	1.7		1.7	3.5			49.0			0.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	1.7	1.7		1.7	3.5			49.0			0.2	
LOS	A	A		A	A			D			A	
Approach Delay		1.7			3.5			49.0			0.2	
Approach LOS		A			A			D			A	
Queue Length 50th (m)	0.1	7.3		0.1	36.8			0.7			0.0	
Queue Length 95th (m)	m0.3	8.6		0.5	44.6			3.7			0.0	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	264	2811		676	2816			317			425	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.01	0.19		0.00	0.49			0.01			0.01	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 65												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings

3: U-Haul Access/Convenience Store & Innes

Future_Interim AM

06/25/2019

Maximum v/c Ratio: 0.49

Intersection Signal Delay: 3.1

Intersection LOS: A

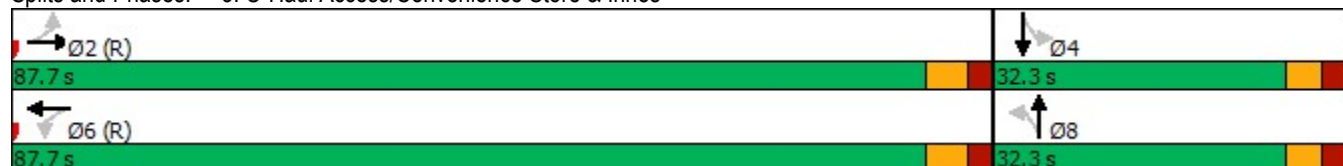
Intersection Capacity Utilization 55.1%

ICU Level of Service B

Analysis Period (min) 15

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



















Splits and Phases: 3: U-Haul Access/Convenience Store & Innes



Lanes, Volumes, Timings
3: U-Haul Access/Convenience Store & Innes













Future Interim PM

06/25/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1739	4	1	985	12	5	0	3	12	0	7
Future Volume (vph)	14	1739	4	1	985	12	5	0	3	12	0	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		0.0	50.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			0.0			0.0		
Satd. Flow (prot)	1695	3390	0	1695	3383	0	0	1643	0	0	1643	0
Flt Permitted	0.274			0.110				0.859			0.841	
Satd. Flow (perm)	489	3390	0	196	3383	0	0	1455	0	0	1426	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					2			31			31	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		239.4			221.0			208.8			61.6	
Travel Time (s)		17.2			15.9			15.0			4.4	
Lane Group Flow (vph)	14	1743	0	1	997	0	0	8	0	0	19	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	77.7	77.7		77.7	77.7		32.3	32.3		32.3	32.3	
Total Split (%)	70.6%	70.6%		70.6%	70.6%		29.4%	29.4%		29.4%	29.4%	
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)	-2.1	-2.1		-2.1	-2.1			-2.3			-2.3	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Min	Min		Min	Min	
Act Effct Green (s)	89.7	89.7		89.7	89.7			12.3			12.3	
Actuated g/C Ratio	0.82	0.82		0.82	0.82			0.11			0.11	
v/c Ratio	0.04	0.63		0.01	0.36			0.04			0.10	
Control Delay	2.1	5.1		2.0	3.1			0.4			9.6	
Queue Delay	0.0	0.3		0.0	0.0			0.0			0.0	
Total Delay	2.1	5.4		2.0	3.1			0.4			9.6	
LOS	A	A		A	A			A			A	
Approach Delay		5.4			3.1			0.4			9.6	
Approach LOS		A			A			A			A	
Queue Length 50th (m)	0.4	57.2		0.0	22.3			0.0			0.0	
Queue Length 95th (m)	1.5	70.5		0.3	28.2			0.2			4.5	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	398	2764		159	2759			397			389	
Starvation Cap Reductn	0	424		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	

Lanes, Volumes, Timings
 3: U-Haul Access/Convenience Store & Innes

Future Interim PM
 06/25/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.04	0.74		0.01	0.36			0.02			0.05	

Intersection Summary

Area Type: Other

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

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 4.6

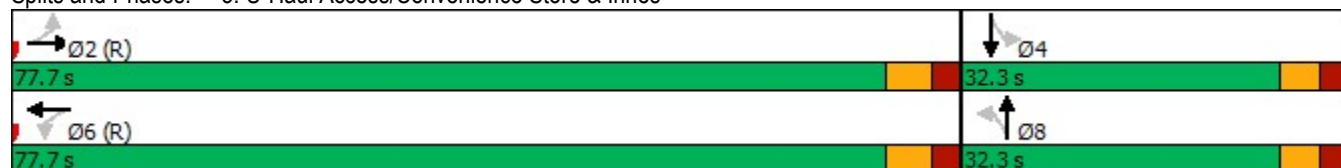
Intersection LOS: A

Intersection Capacity Utilization 65.9%

ICU Level of Service C

Analysis Period (min) 15












Splits and Phases: 3: U-Haul Access/Convenience Store & Innes



Lanes, Volumes, Timings
4: Lamarche & Innes

Future_Interim AM

06/25/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	519	51	2	1378	169	9
Future Volume (vph)	519	51	2	1378	169	9
Satd. Flow (prot)	3346	0	1695	3390	1695	1517
Flt Permitted			0.431		0.950	
Satd. Flow (perm)	3346	0	769	3390	1695	1517
Satd. Flow (RTOR)	18					9
Lane Group Flow (vph)	570	0	2	1378	169	9
Turn Type	NA		Perm	NA	Perm	Perm
Protected Phases	2			6		
Permitted Phases			6		8	8
Detector Phase	2		6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0
Minimum Split (s)	24.0		24.0	24.0	24.0	24.0
Total Split (s)	84.0		84.0	84.0	36.0	36.0
Total Split (%)	70.0%		70.0%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	0.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max		C-Max	C-Max	Min	Min
Act Effct Green (s)	92.7		92.7	92.7	19.3	17.3
Actuated g/C Ratio	0.77		0.77	0.77	0.16	0.14
v/c Ratio	0.22		0.00	0.53	0.62	0.04
Control Delay	3.7		4.0	4.7	56.4	21.4
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	3.7		4.0	4.7	56.4	21.4
LOS	A		A	A	E	C
Approach Delay	3.7			4.7	54.6	
Approach LOS	A			A	D	
Queue Length 50th (m)	14.0		0.1	32.1	37.5	0.0
Queue Length 95th (m)	22.5		m0.2	36.0	56.5	4.5
Internal Link Dist (m)	206.4			215.4	157.2	
Turn Bay Length (m)			50.0		50.0	
Base Capacity (vph)	2589		594	2619	452	386
Starvation Cap Reductn	0		0	21	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.22		0.00	0.53	0.37	0.02
Intersection Summary						
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green						
Natural Cycle: 55						
Control Type: Actuated-Coordinated						

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 8.6

Intersection LOS: A

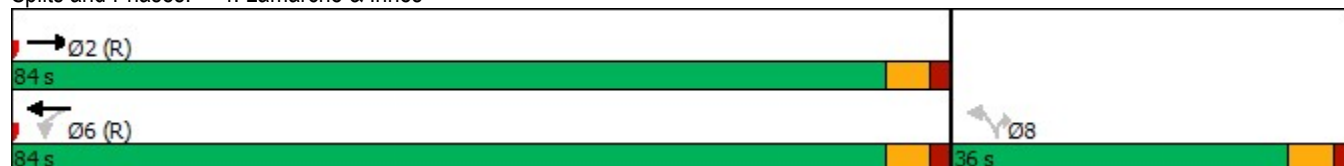
Intersection Capacity Utilization 56.8%

ICU Level of Service B

Analysis Period (min) 15














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

Splits and Phases: 4: Lamarche & Innes



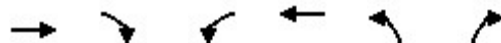
Lanes, Volumes, Timings
4: Lamarche & Innes

Future Interim PM
06/25/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	 			 		
Traffic Volume (vph)	1734	172	46	951	107	24
Future Volume (vph)	1734	172	46	951	107	24
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	50.0		50.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		0.0	
Satd. Flow (prot)	3343	0	1695	3390	1695	1517
Flt Permitted			0.067		0.950	
Satd. Flow (perm)	3343	0	120	3390	1695	1517
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	19					24
Link Speed (k/h)	50			50	50	
Link Distance (m)	230.4			239.4	181.2	
Travel Time (s)	16.6			17.2	13.0	
Lane Group Flow (vph)	1906	0	46	951	107	24
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			6		8	8
Detector Phase	2		1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0		5.0	10.0	10.0	10.0
Minimum Split (s)	24.0		11.0	24.0	24.0	24.0
Total Split (s)	101.0		11.0	112.0	24.0	24.0
Total Split (%)	74.3%		8.1%	82.4%	17.6%	17.6%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	0.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	6.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		None	C-Max	Min	Min
Act Effect Green (s)	102.6		112.1	112.1	15.9	13.9
Actuated g/C Ratio	0.75		0.82	0.82	0.12	0.10
v/c Ratio	0.75		0.24	0.34	0.54	0.14
Control Delay	13.0		5.6	3.5	66.2	20.1
Queue Delay	1.5		0.0	0.0	0.0	0.0
Total Delay	14.5		5.6	3.5	66.2	20.1
LOS	B		A	A	E	C
Approach Delay	14.5			3.6	57.8	
Approach LOS	B			A	E	
Queue Length 50th (m)	146.3		1.8	26.3	27.5	0.0
Queue Length 95th (m)	191.7		4.6	39.3	45.6	8.5
Internal Link Dist (m)	206.4			215.4	157.2	
Turn Bay Length (m)			50.0		50.0	
Base Capacity (vph)	2526		189	2793	249	221
Starvation Cap Reductn	404		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0

Lanes, Volumes, Timings 4: Lamarche & Innes

Future Interim PM
06/25/2019



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Reduced v/c Ratio	0.90		0.24	0.34	0.43	0.11

Intersection Summary

Area Type: Other

Cycle Length: 136

Actuated Cycle Length: 136

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 12.8

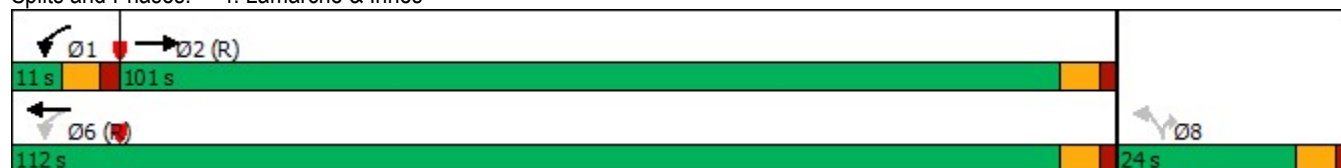
Intersection LOS: B

Intersection Capacity Utilization 73.0%

ICU Level of Service D

























Analysis Period (min) 15

Splits and Phases: 4: Lamarche & Innes



Lanes, Volumes, Timings
1: Orleans & Innes

Future Full Buildout AM
06/25/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	453	23	24	1652	213	203	259	44	92	100	459
Future Volume (vph)	121	453	23	24	1652	213	203	259	44	92	100	459
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.572			0.592		
Satd. Flow (perm)	3288	3390	1517	1695	3390	1517	1021	3390	1517	1056	3390	1517
Satd. Flow (RTOR)			191			150			79			209
Lane Group Flow (vph)	121	453	23	24	1652	213	203	259	44	92	100	459
Turn Type	Prot	NA	Free	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Free
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			Free			6	8		8	4		Free
Detector Phase	5	2		1	6	6	3	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.6	26.2		11.2	26.2	26.2	11.7	32.7	32.7	32.7	32.7	
Total Split (s)	11.6	74.3		11.2	73.9	73.9	11.8	44.5	44.5	32.7	32.7	
Total Split (%)	8.9%	57.2%		8.6%	56.8%	56.8%	9.1%	34.2%	34.2%	25.2%	25.2%	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.9	2.5		2.5	2.5	2.5	3.4	3.4	3.4	3.4	3.4	
Lost Time Adjust (s)	-2.6	-2.2		-2.2	-2.2	-2.2	-2.7	-2.7	-2.7	-2.7	-2.7	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Min	Min	Min	Min	
Act Effct Green (s)	11.4	82.5	130.0	9.0	75.2	75.2	31.3	31.3	31.3	19.5	19.5	130.0
Actuated g/C Ratio	0.09	0.63	1.00	0.07	0.58	0.58	0.24	0.24	0.24	0.15	0.15	1.00
v/c Ratio	0.42	0.21	0.02	0.21	0.84	0.23	0.71	0.32	0.10	0.58	0.20	0.30
Control Delay	60.9	11.9	0.0	61.3	28.6	5.4	56.9	40.7	1.9	65.0	47.6	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.9	11.9	0.0	61.3	28.6	5.4	56.9	40.7	1.9	65.0	47.6	0.5
LOS	E	B	A	E	C	A	E	D	A	E	D	A
Approach Delay		21.4			26.4			43.8			16.8	
Approach LOS		C			C			D			B	
Queue Length 50th (m)	15.2	27.0	0.0	5.9	178.3	6.9	45.2	28.9	0.0	22.3	12.0	0.0
Queue Length 95th (m)	25.7	41.1	0.0	14.9	231.7	19.8	63.7	37.8	2.2	38.1	19.0	0.0
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	289	2151	1517	116	1961	941	286	1056	526	233	748	1517
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	0.42	0.21	0.02	0.21	0.84	0.23	0.71	0.25	0.08	0.39	0.13	0.30

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

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

Natural Cycle: 115

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 26.3

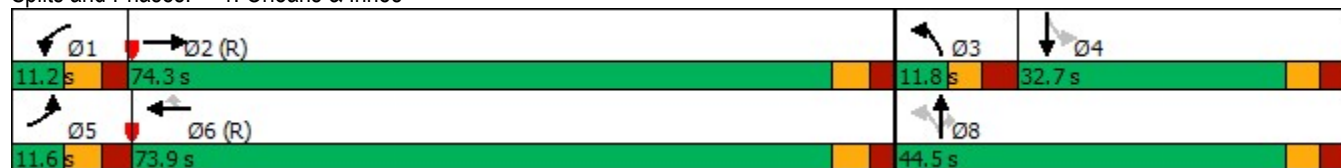
Intersection LOS: C

Intersection Capacity Utilization 84.9%

ICU Level of Service E






























Analysis Period (min) 15

Splits and Phases: 1: Orleans & Innes



Lanes, Volumes, Timings
1: Orleans & Innes

Future Full Buildout PM
06/25/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 			 			 	
Traffic Volume (vph)	579	1793	158	58	822	205	64	225	84	252	241	203
Future Volume (vph)	579	1793	158	58	822	205	64	225	84	252	241	203
Satd. Flow (prot)	3288	3390	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.512			0.517		
Satd. Flow (perm)	3288	3390	1517	1695	3390	1517	914	3390	1517	922	3390	1517
Satd. Flow (RTOR)			285			223			218			285
Lane Group Flow (vph)	579	1793	158	58	822	205	64	225	84	252	241	203
Turn Type	Prot	NA	Free	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			6	8		8	4		Free
Detector Phase	5	2		1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	11.6	26.2		11.2	26.2	26.2	11.7	32.7	32.7	11.0	32.7	
Total Split (s)	27.1	54.4		11.2	38.5	38.5	11.7	33.4	33.4	11.0	32.7	
Total Split (%)	24.6%	49.5%		10.2%	35.0%	35.0%	10.6%	30.4%	30.4%	10.0%	29.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3	3.3	4.0	3.3	
All-Red Time (s)	2.9	2.5		2.5	2.5	2.5	3.4	3.4	3.4	2.0	3.4	
Lost Time Adjust (s)	-2.6	-2.2		-2.2	-2.2	-2.2	-2.7	-2.7	-2.7	-2.7	-2.7	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	3.3	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	Max	C-Max		Max	C-Max	C-Max	None	Min	Min	None	Min	
Act Effct Green (s)	36.0	50.4	110.0	20.1	34.5	34.5	24.2	16.5	16.5	25.0	18.1	110.0
Actuated g/C Ratio	0.33	0.46	1.00	0.18	0.31	0.31	0.22	0.15	0.15	0.23	0.16	1.00
v/c Ratio	0.54	1.15	0.10	0.19	0.77	0.33	0.25	0.44	0.20	0.96	0.43	0.13
Control Delay	33.0	106.7	0.1	44.2	38.6	7.4	33.8	44.9	1.1	85.8	44.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	106.7	0.1	44.2	38.6	7.4	33.8	44.9	1.1	85.8	44.4	0.2
LOS	C	F	A	D	D	A	C	D	A	F	D	A
Approach Delay		83.2			33.0			33.1			46.5	
Approach LOS		F			C			C			D	
Queue Length 50th (m)	52.0	~239.5	0.0	12.7	76.6	5.3	10.8	23.4	0.0	47.4	25.4	0.0
Queue Length 95th (m)	72.5	#281.7	0.0	25.9	67.3	15.7	20.7	33.9	0.0	#89.7	36.4	0.0
Internal Link Dist (m)		172.6			446.9			66.6			225.1	
Turn Bay Length (m)	150.0		85.0	120.0		70.0	50.0		45.0	65.0		60.0
Base Capacity (vph)	1076	1553	1517	309	1063	628	255	906	565	263	884	1517
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	0.54	1.15	0.10	0.19	0.77	0.33	0.25	0.25	0.15	0.96	0.27	0.13

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 115

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.15

Intersection Signal Delay: 62.1

Intersection LOS: E

Intersection Capacity Utilization 92.9%

ICU Level of Service F

Analysis Period (min) 15

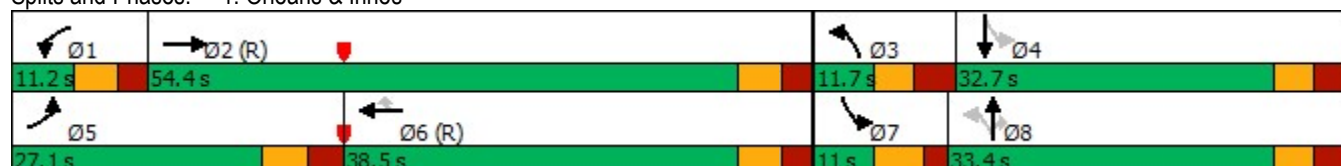
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.



















Queue shown is maximum after two cycles.

Splits and Phases: 1: Orleans & Innes



Lanes, Volumes, Timings
2: Page & Innes

Future Full Buildout AM
06/25/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	570	13	41	1805	31	23	14	61	43	7	70
Future Volume (vph)	16	570	13	41	1805	31	23	14	61	43	7	70
Satd. Flow (prot)	1695	3380	0	1695	3380	0	0	1615	0	0	1614	0
Flt Permitted	0.091			0.427				0.883			0.800	
Satd. Flow (perm)	162	3380	0	762	3380	0	0	1443	0	0	1315	0
Satd. Flow (RTOR)		4			3			61			25	
Lane Group Flow (vph)	16	583	0	41	1836	0	0	98	0	0	120	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		39.2	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	82.0	82.0		82.0	82.0		38.0	38.0		38.0	38.0	
Total Split (%)	68.3%	68.3%		68.3%	68.3%		31.7%	31.7%		31.7%	31.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	-2.2	-2.2		-2.2	-2.2			-2.8			-2.8	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Min	Min		Min	Min	
Act Effct Green (s)	95.1	95.1		95.1	95.1			16.9			16.9	
Actuated g/C Ratio	0.79	0.79		0.79	0.79			0.14			0.14	
v/c Ratio	0.12	0.22		0.07	0.69			0.38			0.58	
Control Delay	6.2	3.6		2.0	6.7			23.9			48.8	
Queue Delay	0.0	0.0		0.0	0.5			0.0			0.0	
Total Delay	6.2	3.6		2.0	7.2			23.9			48.8	
LOS	A	A		A	A			C			D	
Approach Delay		3.7			7.1			23.9			48.8	
Approach LOS		A			A			C			D	
Queue Length 50th (m)	0.7	14.2		0.7	15.8			7.8			21.2	
Queue Length 95th (m)	3.5	25.1		m1.6	27.6			22.4			38.6	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	128	2680		604	2680			452			390	
Starvation Cap Reductn	0	0		0	400			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.13	0.22		0.07	0.81			0.22			0.31	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 26 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 8.8

Intersection LOS: A

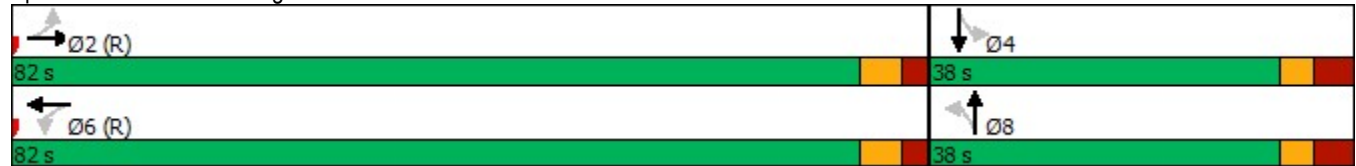
Intersection Capacity Utilization 72.3%

ICU Level of Service C

Analysis Period (min) 15

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



















Splits and Phases: 2: Page & Innes



Lanes, Volumes, Timings
2: Page & Innes

Future Full Buildout PM

06/25/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	2042	33	53	1048	101	19	21	98	58	23	38
Future Volume (vph)	74	2042	33	53	1048	101	19	21	98	58	23	38
Satd. Flow (prot)	1695	3383	0	1695	3346	0	0	1602	0	0	1667	0
Flt Permitted	0.247			0.051				0.946			0.616	
Satd. Flow (perm)	441	3383	0	91	3346	0	0	1526	0	0	1052	0
Satd. Flow (RTOR)		2			17			95			22	
Lane Group Flow (vph)	74	2075	0	53	1149	0	0	138	0	0	119	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	39.2	39.2		11.0	39.2		37.8	37.8		37.8	37.8	
Total Split (s)	61.2	61.2		11.0	72.2		37.8	37.8		37.8	37.8	
Total Split (%)	55.6%	55.6%		10.0%	65.6%		34.4%	34.4%		34.4%	34.4%	
Yellow Time (s)	3.7	3.7		4.0	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.5		2.0	2.5		3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	-2.2	-2.2		-2.2	-2.2			-2.8			-2.8	
Total Lost Time (s)	4.0	4.0		3.8	4.0			4.0			4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	C-Max	C-Max		None	C-Max		Min	Min		Min	Min	
Act Effct Green (s)	75.5	75.5		85.7	85.5			16.5			16.5	
Actuated g/C Ratio	0.69	0.69		0.78	0.78			0.15			0.15	
v/c Ratio	0.25	0.89		0.27	0.44			0.45			0.68	
Control Delay	8.3	16.9		14.5	6.3			19.5			54.6	
Queue Delay	0.0	1.9		0.0	0.0			0.0			0.0	
Total Delay	8.3	18.8		14.5	6.3			19.5			54.6	
LOS	A	B		B	A			B			D	
Approach Delay		18.4			6.7			19.5			54.6	
Approach LOS		B			A			B			D	
Queue Length 50th (m)	4.5	97.3		3.1	39.8			8.3			20.0	
Queue Length 95th (m)	m4.5	m71.5		m9.8	56.1			24.7			37.6	
Internal Link Dist (m)		446.9			206.4			187.2			222.4	
Turn Bay Length (m)	110.0			75.0								
Base Capacity (vph)	302	2321		195	2605			534			338	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	128		0	0			3			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.25	0.95		0.27	0.44			0.26			0.35	
Intersection Summary												
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 2 (2%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 120												
Control Type: Actuated-Coordinated												

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 15.7

Intersection LOS: B

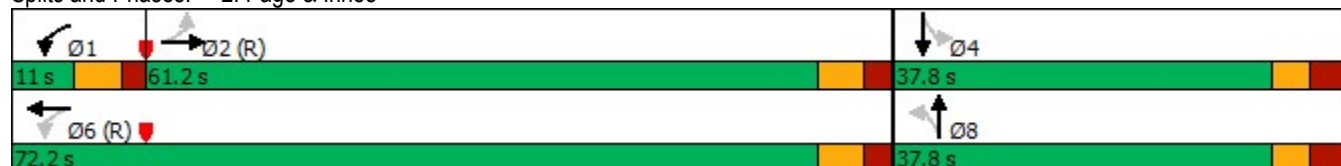
Intersection Capacity Utilization 85.4%

ICU Level of Service E

Analysis Period (min) 15

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



















Splits and Phases: 2: Page & Innes



Lanes, Volumes, Timings
3: U-Haul Access/Convenience Store & Innes

Future Full Buildout AM

06/25/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	575	8	3	1495	1	3	0	0	0	0	5
Future Volume (vph)	3	575	8	3	1495	1	3	0	0	0	0	5
Satd. Flow (prot)	1695	3383	0	1695	3390	0	0	1695	0	0	1543	0
Flt Permitted	0.154			0.431				0.754				
Satd. Flow (perm)	275	3383	0	769	3390	0	0	1345	0	0	1543	0
Satd. Flow (RTOR)		3									62	
Lane Group Flow (vph)	3	583	0	3	1496	0	0	3	0	0	5	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	87.7	87.7		87.7	87.7		32.3	32.3		32.3	32.3	
Total Split (%)	73.1%	73.1%		73.1%	73.1%		26.9%	26.9%		26.9%	26.9%	
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)	-2.1	-2.1		-2.1	-2.1			-2.3			-2.3	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Min	Min		Min	Min	
Act Effct Green (s)	99.7	99.7		99.7	99.7			12.3			12.3	
Actuated g/C Ratio	0.83	0.83		0.83	0.83			0.10			0.10	
v/c Ratio	0.01	0.21		0.00	0.53			0.02			0.02	
Control Delay	0.3	0.4		1.7	3.9			49.0			0.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	0.3	0.4		1.7	3.9			49.0			0.2	
LOS	A	A		A	A			D			A	
Approach Delay		0.4			3.9			49.0			0.2	
Approach LOS		A			A			D			A	
Queue Length 50th (m)	0.0	0.7		0.1	42.6			0.7			0.0	
Queue Length 95th (m)	m0.0	2.1		0.5	51.7			3.7			0.0	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	228	2811		638	2816			317			411	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.01	0.21		0.00	0.53			0.01			0.01	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 70												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings 3: U-Haul Access/Convenience Store & Innes

Future Full Buildout AM
06/25/2019

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 2.9

Intersection LOS: A

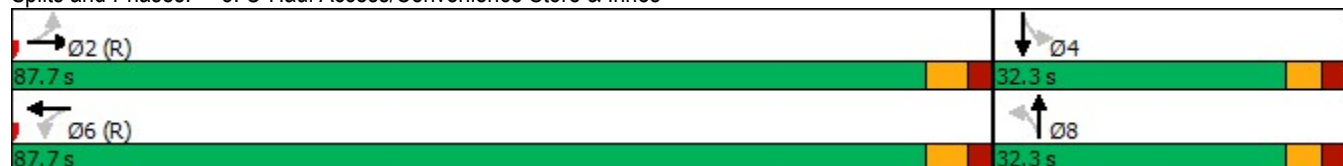
Intersection Capacity Utilization 58.7%

ICU Level of Service B

Analysis Period (min) 15

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



















Splits and Phases: 3: U-Haul Access/Convenience Store & Innes



Lanes, Volumes, Timings
3: U-Haul Access/Convenience Store & Innes

Future Full Buildout PM

06/25/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1911	4	1	1106	12	5	0	3	12	0	7
Future Volume (vph)	14	1911	4	1	1106	12	5	0	3	12	0	7
Satd. Flow (prot)	1695	3390	0	1695	3383	0	0	1643	0	0	1643	0
Flt Permitted	0.238			0.086				0.859			0.841	
Satd. Flow (perm)	425	3390	0	153	3383	0	0	1455	0	0	1426	0
Satd. Flow (RTOR)					2			31			31	
Lane Group Flow (vph)	14	1915	0	1	1118	0	0	8	0	0	19	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	77.7	77.7		77.7	77.7		32.3	32.3		32.3	32.3	
Total Split (%)	70.6%	70.6%		70.6%	70.6%		29.4%	29.4%		29.4%	29.4%	
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)	-2.1	-2.1		-2.1	-2.1			-2.3			-2.3	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Min	Min		Min	Min	
Act Effct Green (s)	89.7	89.7		89.7	89.7			12.3			12.3	
Actuated g/C Ratio	0.82	0.82		0.82	0.82			0.11			0.11	
v/c Ratio	0.04	0.69		0.01	0.41			0.04			0.10	
Control Delay	0.2	2.8		2.0	3.3			0.4			9.6	
Queue Delay	0.0	1.6		0.0	0.0			0.0			0.0	
Total Delay	0.2	4.5		2.0	3.3			0.4			9.6	
LOS	A	A		A	A			A			A	
Approach Delay		4.4			3.3			0.4			9.6	
Approach LOS		A			A			A			A	
Queue Length 50th (m)	0.0	1.3		0.0	26.4			0.0			0.0	
Queue Length 95th (m)	m0.0	m1.0		0.3	33.1			0.2			4.5	
Internal Link Dist (m)		215.4			197.0			184.8			37.6	
Turn Bay Length (m)	45.0			50.0								
Base Capacity (vph)	346	2764		124	2759			397			389	
Starvation Cap Reductn	0	627		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.04	0.90		0.01	0.41			0.02			0.05	
Intersection Summary												
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 36 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings 3: U-Haul Access/Convenience Store & Innes

Future Full Buildout PM
06/25/2019

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 4.0

Intersection LOS: A

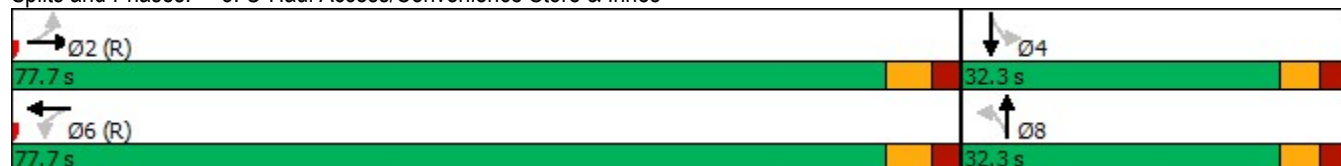
Intersection Capacity Utilization 70.9%

ICU Level of Service C

Analysis Period (min) 15

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












Splits and Phases: 3: U-Haul Access/Convenience Store & Innes



Lanes, Volumes, Timings
4: Lamarche & Innes

Future Full Buildout AM

06/25/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	564	119	7	1497	388	21
Future Volume (vph)	564	119	7	1497	388	21
Satd. Flow (prot)	3302	0	1695	3390	1695	1517
Flt Permitted			0.357		0.950	
Satd. Flow (perm)	3302	0	637	3390	1695	1517
Satd. Flow (RTOR)	32					21
Lane Group Flow (vph)	683	0	7	1497	388	21
Turn Type	NA		Perm	NA	Perm	Perm
Protected Phases	2			6		
Permitted Phases			6		8	8
Detector Phase	2		6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0
Minimum Split (s)	24.0		24.0	24.0	24.0	24.0
Total Split (s)	69.0		69.0	69.0	51.0	51.0
Total Split (%)	57.5%		57.5%	57.5%	42.5%	42.5%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	0.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max		C-Max	C-Max	Min	Min
Act Effct Green (s)	76.8		76.8	76.8	35.2	33.2
Actuated g/C Ratio	0.64		0.64	0.64	0.29	0.28
v/c Ratio	0.32		0.02	0.69	0.78	0.05
Control Delay	9.4		9.9	14.4	49.7	10.5
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	9.4		9.9	14.4	49.7	10.5
LOS	A		A	B	D	B
Approach Delay	9.4			14.4	47.7	
Approach LOS	A			B	D	
Queue Length 50th (m)	30.2		0.5	59.9	83.5	0.0
Queue Length 95th (m)	43.7		m1.0	168.1	106.9	5.4
Internal Link Dist (m)	206.4			215.4	157.2	
Turn Bay Length (m)			50.0		65.0	
Base Capacity (vph)	2126		407	2170	663	582
Starvation Cap Reductn	0		0	1	0	0
Spillback Cap Reductn	0		0	17	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.32		0.02	0.70	0.59	0.04
Intersection Summary						
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green						
Natural Cycle: 60						
Control Type: Actuated-Coordinated						

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 18.3

Intersection LOS: B

Intersection Capacity Utilization 73.0%

ICU Level of Service D

Analysis Period (min) 15

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







Splits and Phases: 4: Lamarche & Innes



Lanes, Volumes, Timings
4: Lamarche & Innes

Future Full Buildout PM

06/25/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵
Traffic Volume (vph)	1879	336	86	1033	200	52
Future Volume (vph)	1879	336	86	1033	200	52
Satd. Flow (prot)	3312	0	1695	3390	1695	1517
Flt Permitted			0.052		0.950	
Satd. Flow (perm)	3312	0	93	3390	1695	1517
Satd. Flow (RTOR)	37					52
Lane Group Flow (vph)	2215	0	86	1033	200	52
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			6		8	8
Detector Phase	2		1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0		5.0	10.0	10.0	10.0
Minimum Split (s)	24.0		11.0	24.0	24.0	24.0
Total Split (s)	75.0		11.0	86.0	24.0	24.0
Total Split (%)	68.2%		10.0%	78.2%	21.8%	21.8%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	0.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	6.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		None	C-Max	Min	Min
Act Effct Green (s)	74.7		83.8	83.8	18.2	16.2
Actuated g/C Ratio	0.68		0.76	0.76	0.17	0.15
v/c Ratio	0.98		0.48	0.40	0.71	0.19
Control Delay	18.8		24.6	5.2	57.9	13.0
Queue Delay	2.2		0.0	0.0	0.0	0.0
Total Delay	20.9		24.6	5.2	57.9	13.0
LOS	C		C	A	E	B
Approach Delay	20.9			6.7	48.6	
Approach LOS	C			A	D	
Queue Length 50th (m)	~262.2		6.8	36.3	40.2	0.0
Queue Length 95th (m)	#304.0		20.2	45.6	64.6	10.6
Internal Link Dist (m)	206.4			215.4	157.2	
Turn Bay Length (m)			50.0		65.0	
Base Capacity (vph)	2261		178	2582	308	291
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	29		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.99		0.48	0.40	0.65	0.18
Intersection Summary						
Cycle Length: 110						
Actuated Cycle Length: 110						
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green						
Natural Cycle: 110						
Control Type: Actuated-Coordinated						

Lanes, Volumes, Timings

4: Lamarche & Innes

Future Full Buildout PM

06/25/2019

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 18.4

Intersection LOS: B

Intersection Capacity Utilization 92.9%

ICU Level of Service F

Analysis Period (min) 15

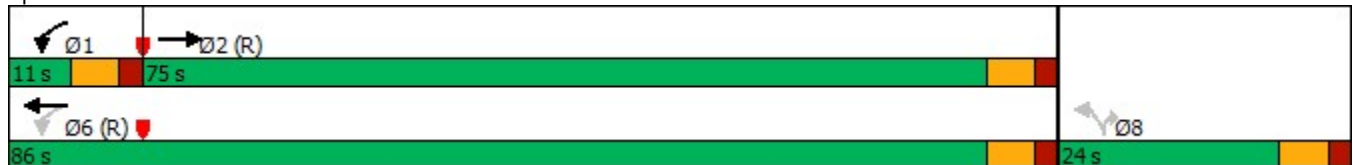
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.







Splits and Phases: 4: Lamarche & Innes



Lanes, Volumes, Timings
4: Lamarche & Innes

Future Full Buildout PM

06/25/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑
Traffic Volume (vph)	1879	336	86	1033	200	52
Future Volume (vph)	1879	336	86	1033	200	52
Satd. Flow (prot)	3390	1517	1695	3390	1695	1517
Flt Permitted			0.053		0.950	
Satd. Flow (perm)	3390	1517	95	3390	1695	1517
Satd. Flow (RTOR)		226				52
Lane Group Flow (vph)	1879	336	86	1033	200	52
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0
Total Split (s)	75.0	75.0	11.0	86.0	24.0	24.0
Total Split (%)	68.2%	68.2%	10.0%	78.2%	21.8%	21.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	0.0	-2.0	-2.0	-2.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	4.0	6.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max
Act Effct Green (s)	73.2	71.2	82.0	82.0	20.0	18.0
Actuated g/C Ratio	0.67	0.65	0.75	0.75	0.18	0.16
v/c Ratio	0.83	0.32	0.50	0.41	0.65	0.18
Control Delay	8.0	1.2	26.2	7.1	52.7	12.7
Queue Delay	1.1	0.0	0.0	0.0	0.0	0.2
Total Delay	9.1	1.2	26.2	7.1	52.7	12.9
LOS	A	A	C	A	D	B
Approach Delay	7.9			8.5	44.5	
Approach LOS	A			A	D	
Queue Length 50th (m)	31.0	1.0	10.7	37.1	40.2	0.0
Queue Length 95th (m)	m27.1	m0.7	23.6	66.3	64.6	10.6
Internal Link Dist (m)	206.4			215.4	157.2	
Turn Bay Length (m)		50.0	50.0		65.0	
Base Capacity (vph)	2256	1061	172	2527	308	291
Starvation Cap Reductn	68	0	0	0	0	0
Spillback Cap Reductn	177	0	0	0	0	49
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.32	0.50	0.41	0.65	0.21
Intersection Summary						
Cycle Length: 110						
Actuated Cycle Length: 110						
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green						
Natural Cycle: 90						
Control Type: Actuated-Coordinated						

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 10.7

Intersection LOS: B

Intersection Capacity Utilization 81.6%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 4: Lamarche & Innes

