

211 Centrum Boulevard

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Strategy Report

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1 Screening

This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for the TIA Study PM. As shown in the Screening Form, the trip generation, location and safety triggers were met and a TIA is required including the Design Review component and the Network Impact Component.

2 Existing and Planned Conditions

2.1 Proposed Development

The proposed development located at 211 Centrum Boulevard, currently zoned as Mixed-Use Centre (MC), is planned to include 397 retirement home units across one nine- and one 17-storey building connected by a four-storey podium to be built in a single phase for occupancy by 2024. The proposed design includes 282 underground parking spaces and 21 space surface lot accommodating visitor parking. Access to the underground garage will be via an access to Brisebois Crescent and an access to the surface lot will be via a drop-off loop on Brisebois Crescent. Figure 1 illustrates the Study Area Context and Figure 2 illustrates the proposed concept plan.

Figure 1: Area Context Plan



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: December 4, 2019

2.2 Existing Conditions

2.2.1 Area Road Network

OR 174: OR 174 is a City of Ottawa freeway with a divided, four-lane rural cross-section. The posted speed limit is 100 km/h and the city-protected right of way is designated as having Existing Corridor Protection within study area. OR 174 is a designated truck route.

St. Joseph Boulevard: St. Joseph Boulevard is a City of Ottawa arterial road with divided, four-lane cross-section and sidewalks on both sides of the road. The posted speed limit is 50 km/h, west of Prestone Drive and is 60km/h, east of Prestone Drive. The City protected right-of-way is 32.0m from Gabriel Street to 130 m west of Duford Drive and 37.5 metres west to Trim Road. St. Joseph Boulevard is a designated truck route.

Place d'Orléans Drive: Place d'Orléans Drive is a City of Ottawa arterial road with a four-lane urban cross-section with sidewalks primarily on one side, and is divided on the north side of Place d'Orléans Shopping Centre. The posted speed limit is 50 km/h and a City protected right-of-way of 37.5 metres north of St Joseph Boulevard. Place d'Orléans Drive is a designated truck route.

Centrum Boulevard: Centrum Boulevard is a City of Ottawa collector road with a two-lane urban cross-section, sidewalks on both side of the road and angle parking is provided on both sides of the road. The posted speed limit is 40 km/h and the existing right of way is 26.0 metres.

Prestone Drive: Prestone Drive is a City of Ottawa collector road north of St. Joseph Boulevard and a major collector road south of St. Joseph Boulevard. North of St. Joseph Boulevard it has a four-lane urban cross-section and south of St. Joseph Boulevard it has a two-lane urban cross-section. Throughout the study area sidewalks are on both sides of the road. The posted speed limit is 40 km/h and the existing right of way is 26.0 metres within the study area.

Duford Drive: Duford Drive is a City of Ottawa collector road with a two-lane urban cross-section and sidewalks on both sides of the road throughout the study area. The posted speed limit is 40 km/h and the City protects a right of way of 24 metres throughout the study area.

Brisebois Crescent: Brisebois Crescent is a City of Ottawa local road with a sidewalk on one side of the road and perpendicular parking provided on the south side of the road. The unposted speed limit is 50 km/h and the existing right of way is approximately 11.5 metres at the eastern and western limits and 18.0 metres between these points.

2.2.2 Existing Intersections

The existing area intersections adjacent to the proposed site and additional signalized intersections within 400 metres of the site have been summarized below:

OR 174 & Place d'Orléans Drive

The intersection of OR 174 and Place d'Orléans drive is a signalized intersection. The northbound approach consists of two left-turn lanes and an auxiliary, channelized right-turn lane. The eastbound approach consists of an auxiliary through lane and two right-turn lanes. No turn restrictions are noted, although pedestrians and cyclists are not permitted onto OR 174.

Centrum Boulevard & Place d'Orléans Drive

The intersection of Centrum Boulevard and Place d'Orléans Drive is a signalized intersection. The northbound and southbound approaches each consists of a shared left-turn/through lane and a shared through/right-turn lane. The private eastbound approach consists of an auxiliary left-turn lane, a through lane, and an auxiliary, channelized

right-turn lane. The westbound approach consists of a left-turn lane and a shared through/channelized right-turn lane. No turn restrictions are noted.

Centrum Boulevard & Brisebois Crescent W

The intersection of Centrum Boulevard and Brisebois Crescent W is a minor-road-only stop-controlled intersection. All approaches are shared-movement lanes, with a yellow centreline and gore area along Centrum Boulevard from the median to the west. No turn restrictions are noted.

Centrum Boulevard and Prestone Drive

The intersection of Centrum Boulevard and Prestone Drive is a stop-controlled intersection. The northbound approach consists of a left-turn lane and a right-turn lane. The eastbound approach consists of a shared through/right-turn lane and the westbound approach consists of a shared left-turn/through lane. No turn restrictions are noted.

St. Joseph Boulevard & Place d'Orléans Drive / Duford Drive

The intersection of St. Joseph Boulevard, Place d'Orléans Drive, and Duford Drive is a signalized intersection. The northbound approach consists of an auxiliary left-turn lane and a shared through/right-turn lane and the southbound approach consists of an auxiliary left-turn lane, a through lane, and a right-turn lane. The eastbound and westbound approaches each consists of an auxiliary left-turn lane, a through lane and a shared through/channelized right-turn lane. No turn restrictions are noted.

St. Joseph Boulevard & Prestone Drive

The intersection of St. Joseph Boulevard and Prestone Drive is a signalized intersection. The northbound approach consists of an auxiliary left-turn lane and a shared through/channelized right-turn lane and the southbound approach consists of a left-turn lane and a shared through/channelized right-turn lane. The eastbound and westbound approaches each consists of an auxiliary left-turn lane, two through lanes, and an auxiliary, channelized right-turn lane. No turn restrictions are noted.

2.2.3 Existing Driveways

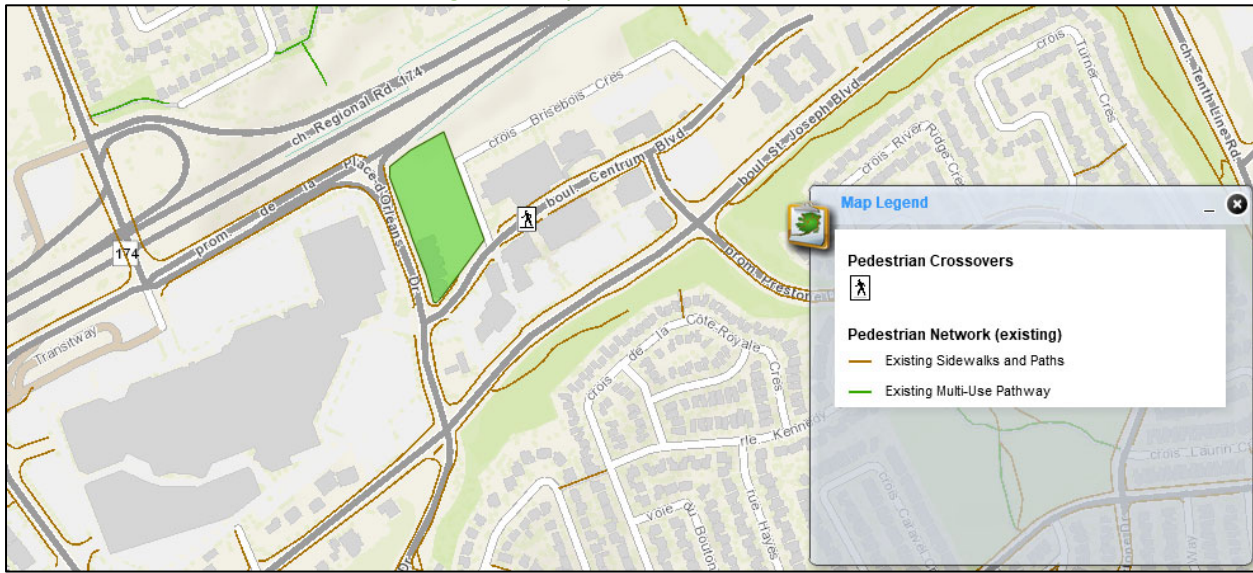
Within 200 metres of the proposed site accesses, driveways exist on the south side of Centrum Boulevard and on both sides of Brisebois Crescent's northern alignment, including access to a hotel, Shenkman arts Centre, YMCA, and retail plaza.

2.2.4 Cycling and Pedestrian Facilities

Figure 3 illustrates the pedestrian facilities in the study area and Figure 4 illustrates the cycling facilities.

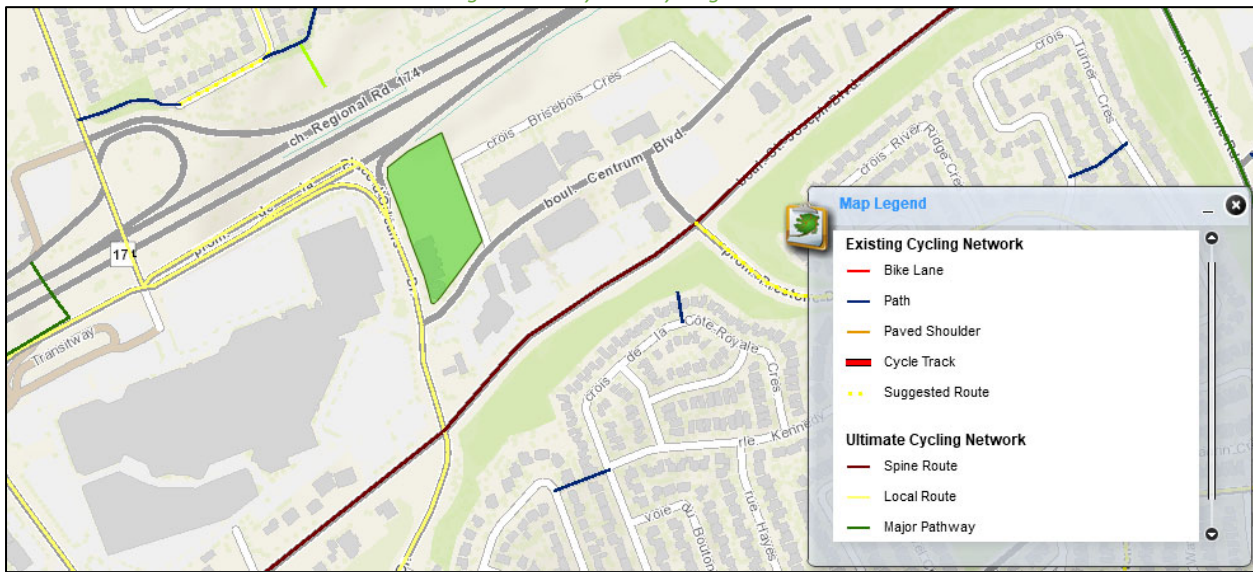
Sidewalks are provided along the roads surrounding the site (although the Brisebois Crescent sidewalks are not depicted in Figure 3) and a pedestrian crossover is located on Centrum Boulevard, east of the proposed site. Place d'Orléans Drive, Duford Drive, and Prestone Drive are local cycling routes and St. Joseph Boulevard is a spine route.

Figure 3: Study Area Pedestrian Facilities



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: December 4, 2019

Figure 4: Study Area Cycling Facilities



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: December 4, 2019

2.2.5 Existing Transit

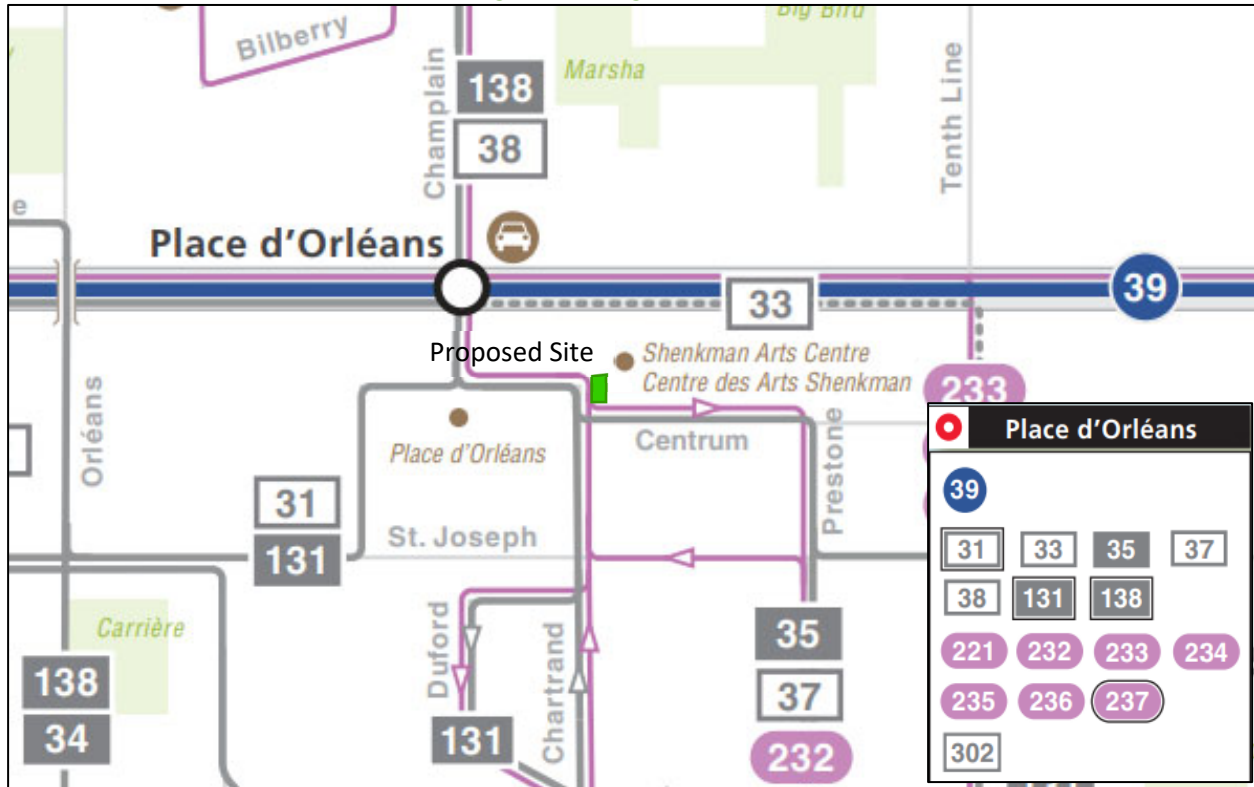
Within the study area, routes #31, 33, 35, 37, 131, 232, 234, 302, and 636 travel along the adjacent roadways of Centrum Boulevard, Place d'Orléans Drive and St Joseph Boulevard. Figure 5 illustrates the study area transit service and Figure 6 illustrates the transit stops.

The frequency of these routes within proximity of the proposed site currently are:

- Route #33 – 30-minute service asymmetrically at peak periods, periodic off-peak service
- Route #35 – 30-minute service all day
- Route #37 – 30-minute service during peak periods, 1-2-hour service all day
- Route #131 – 30-minute service all day

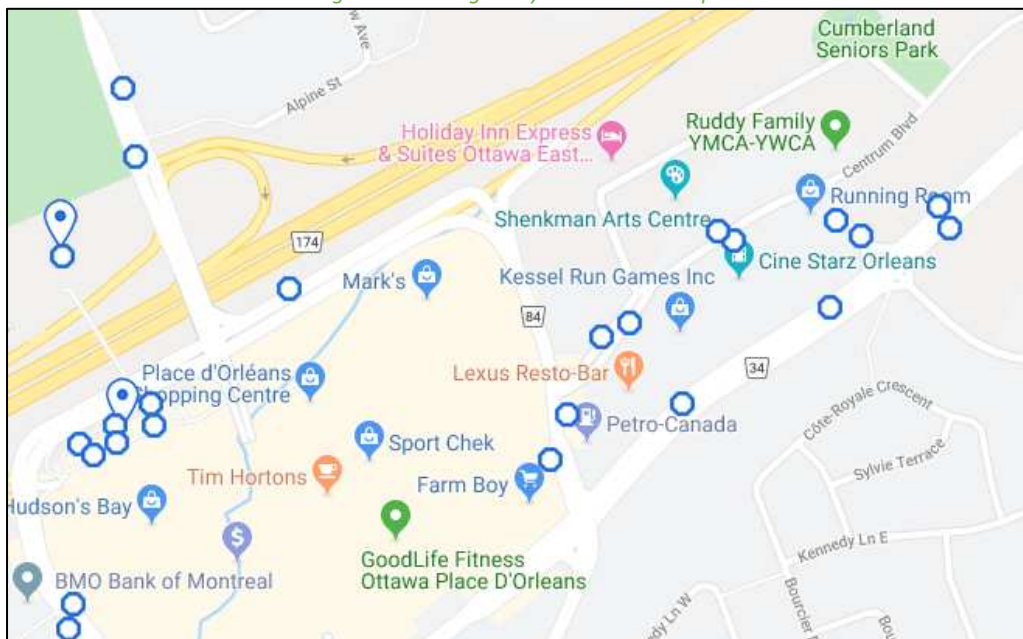
- Route #232 – 15-20-minute service asymmetrically during peak periods only
- Route #234 – 15-20-minute service asymmetrically during peak periods only
- Route #636 – Service from Sir Wilfrid Laurier Secondary School to Place d'Orléans Station

Figure 5: Existing Transit Service



Source: <http://www.octranspo.com/> Accessed: December 4, 2019

Figure 6: Existing Study Area Transit Stops



Source: <http://www.octranspo.com/> Accessed: December 4, 2019

2.2.6 Existing Area Traffic Management Measures

There are no existing area traffic management measures within the Study Area.

2.2.7 Existing Peak Hour Travel Demand

Existing turning movement counts were acquired from City counts for the existing Study Area intersections. Table 1 summarizes the intersection count dates.

Table 1: Intersection Count Date

Intersection	Count Date	Source
OR 174 & Place d'Orléans Drive	Wednesday, February 21, 2018	City of Ottawa
Centrum Boulevard & Place d'Orléans Drive	Thursday, January 31, 2019	City of Ottawa
Centrum Boulevard & Prestone Drive	Friday, July 4, 2014	City of Ottawa
St. Joseph Boulevard & Place d'Orléans Drive & Duford Drive	Tuesday, March 20, 2018	City of Ottawa
St. Joseph Boulevard & Prestone Drive	Tuesday, March 20, 2018	City of Ottawa
Centrum Boulevard & Brisebois Crescent	Thursday, March 12, 2020	Traffic Specialists

Figure 7 illustrates the existing traffic counts and Table 2 summarizes the existing intersection operations. The level of service for signalized intersections is based on HCM 2010 v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and HCM 2010 average delay for unsignalized intersections. Detailed turning movement count data is included in Appendix B and the Synchro worksheets are provided in Appendix C.

Figure 7: Existing Traffic Counts

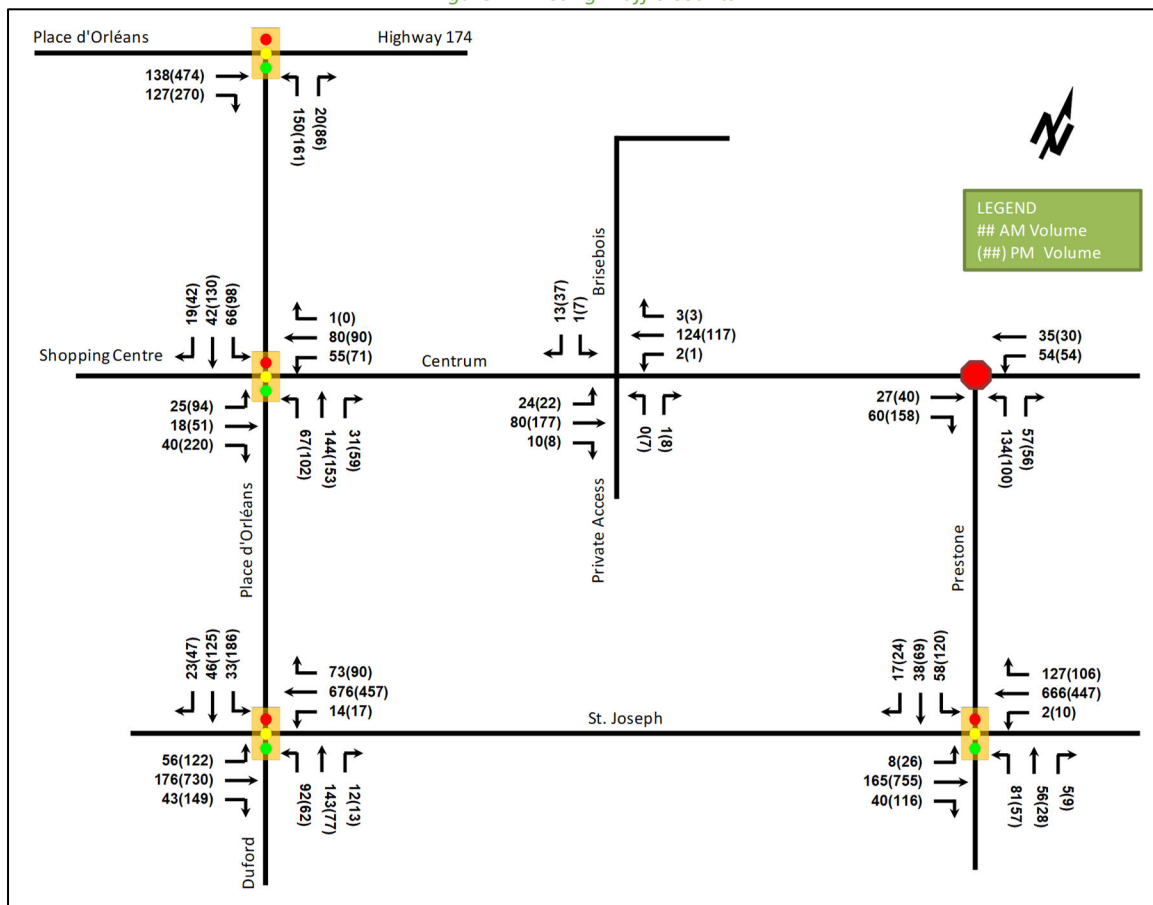


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
OR 174 & Place d'Orléans Drive <i>Signalized</i>	EBT	A	0.30	11.4	19.4	B	0.69	14.5	65.6
	EBR	A	0.16	3.3	4.6	A	0.23	1.7	5.2
	NBL	A	0.13	7.1	6.2	A	0.19	13.0	13.4
	NBR	A	0.04	3.5	2.2	A	0.20	5.1	8.2
	Overall	A	0.20	7.2	-	A	0.48	10.0	-
Centrum Boulevard & Place d'Orléans Drive <i>Signalized</i>	EBL	A	0.13	24.8	7.8	A	0.51	39.1	26.1
	EBT	A	0.07	23.2	6.2	A	0.21	29.4	16.1
	EBR	A	0.15	8.3	6.2	A	0.54	8.4	15.7
	WBL	A	0.29	28.4	14.0	A	0.37	34.2	20.5
	WBT/R	A	0.32	27.9	18.3	A	0.33	32.1	23.8
	NB	A	0.13	5.1	15.2	A	0.21	5.3	18.6
	SB	A	0.08	5.1	8.6	A	0.19	5.3	16.4
	Overall	B	0.17	12.0	-	B	0.26	14.0	-
St. Joseph Boulevard & Place d'Orléans Drive / Duford Drive <i>Signalized</i>	EBL	A	0.19	14.3	15.9	A	0.40	21.2	#34.8
	EBT/R	A	0.14	14.5	27.6	B	0.64	26.6	#164.1
	WBL	A	0.03	14.1	6.1	A	0.08	17.4	7.2
	WBT/R	A	0.50	22.5	#115.6	A	0.50	27.7	78.0
	NBL	A	0.53	53.5	35.5	A	0.45	53.6	26.3
	NBT/R	A	0.52	41.5	43.1	A	0.42	41.8	28.7
	SBL	A	0.30	51.5	16.9	D	0.82	65.2	#77.8
	SBT	A	0.23	39.8	17.0	A	0.37	36.0	38.6
	SBR	A	0.08	0.5	0.0	A	0.12	0.5	0.0
	Overall	C	0.53	25.9	-	C	0.68	31.6	-
St. Joseph Boulevard & Prestone Drive <i>Signalized</i>	EBL	A	0.02	6.2	2.4	A	0.05	5.9	4.6
	EBT	A	0.08	5.2	10.4	A	0.38	6.8	41.8
	EBR	A	0.04	2.4	3.9	A	0.13	1.6	5.7
	WBL	A	0.00	6.0	1.0	A	0.03	5.9	2.5
	WBT	A	0.31	6.1	41.6	A	0.23	5.8	23.2
	WBR	A	0.13	1.7	6.8	A	0.12	1.6	5.5
	NBL	A	0.40	30.3	22.1	A	0.29	27.8	16.8
	NBT/R	A	0.21	23.7	16.0	A	0.13	19.8	10.6
	SBL	A	0.28	27.5	16.6	A	0.58	36.7	31.5
	SBT/R	A	0.19	19.0	13.1	A	0.33	22.1	21.2
	Overall	A	0.35	9.3	-	A	0.43	9.7	-
Centrum Boulevard & Prestone Drive <i>Unsignalized</i>	EB	A	0.11	7.7	3.0	A	0.25	8.3	7.5
	WB	A	0.13	8.4	3.0	A	0.12	8.4	3.0
	NBL	A	0.23	9.8	6.8	A	0.18	9.7	4.5
	NBR	A	0.08	7.3	1.5	A	0.08	7.6	2.3
	Overall	A	-	8.6	-	A	-	8.5	-
Centrum Boulevard & Brisebois Crescent <i>Unsignalized</i>	EB	A	0.02	1.6	0.8	A	0.02	7.0	0.8
	WB	A	0.00	0.1	0.0	A	0.00	7.6	0.0
	NB	A	0.00	8.8	0.0	B	0.03	10.7	0.8
	SB	A	0.02	9.2	0.8	A	0.06	9.7	1.5
	Overall	A	-	1.3	-	A	-	1.9	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 0.90

= queue exceeds storage or mid-block length

Overall, the study area intersections operate well during the peak hours. It is noted that at the St Joseph Boulevard and Place d'Orléans Drive intersection that the westbound queues block the left-turn lane during the AM peak, and during the PM peak the eastbound left-turn and southbound left-turn queues exceed the available storage and the eastbound through may block access to the left-turn lane.

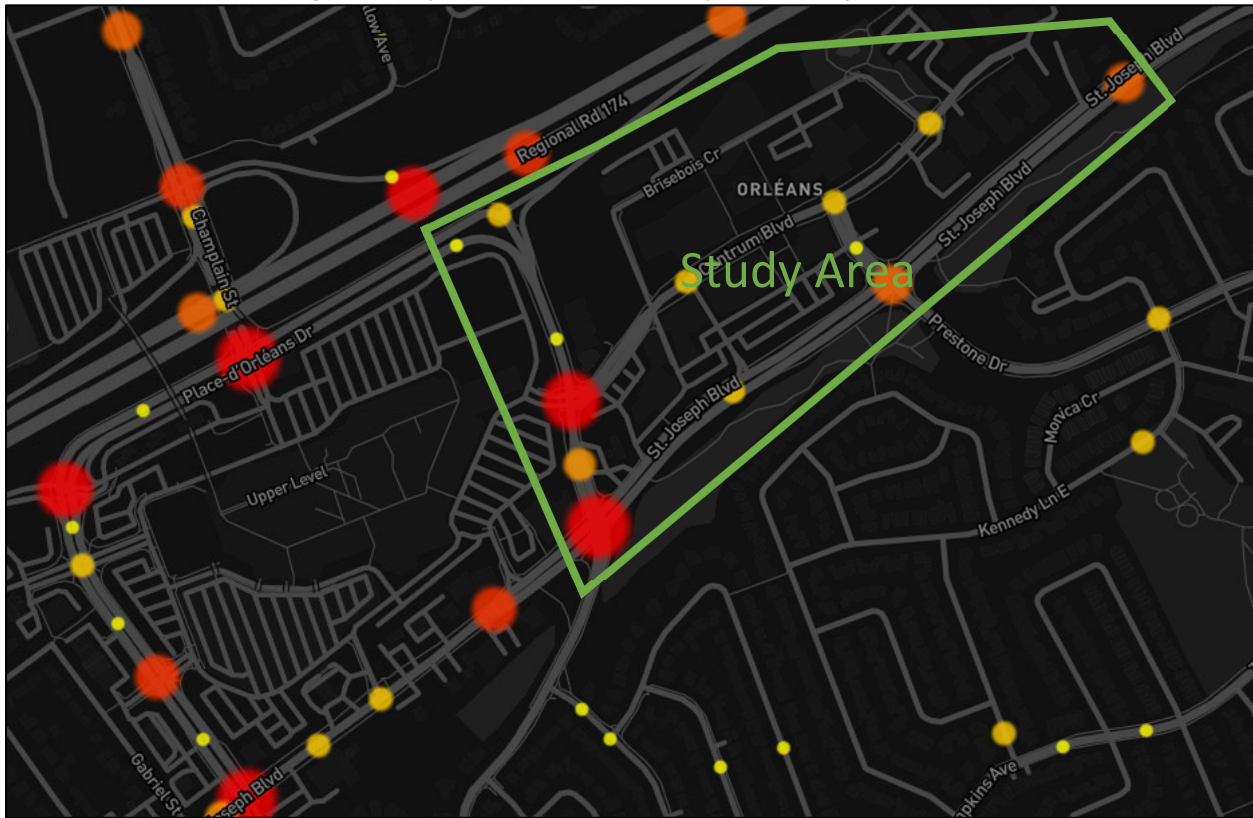
2.2.8 Collision Analysis

Collision data has been acquired from the City of Ottawa open data website (data.ottawa.ca) for five years prior to the commencement of this TIA for the surrounding road network. Table 3 summarizes the collision types and conditions in the study area, Figure 8 illustrates the intersections and segments analyzed, and Table 4 summarizes the total collisions for each of these locations. Collision data is included in Appendix D.

Table 3: Study Area Collision Summary, 2014-2018

		Number	%
Total Collisions		82	100%
Classification	Fatality	0	0%
	Non-Fatal Injury	28	34%
	Property Damage Only	54	66%
Initial Impact Type	Approaching	0	0%
	Angled	16	20%
	Rear end	17	21%
	Sideswipe	11	13%
	Turning Movement	22	27%
	SMV Unattended	0	0%
	SMV Other	14	17%
	Other	2	2%
Road Surface Condition	Dry	57	70%
	Wet	20	24%
	Loose Snow	3	4%
	Slush	0	0%
	Packed Snow	2	2%
	Ice	0	0%
Pedestrian Involved		7	9%
Cyclists Involved		1	1%

Figure 8: Study Area Collision Records – Representation of 2014-2016



Source: <https://maps.bikeottawa.ca/collisions/> Accessed: December 4, 2019

Table 4: Summary of Collision Locations, 2014-2018

Intersections / Segments	Number	%
OR174 IC102 Ramp15 @ Place d'Orléans Dr	82	100%
Place d'Orléans @ Centrum Blvd/Place d'Orléans	4	5%
Centrum Blvd @ Prestone Dr	12	15%
St. Joseph Blvd @ Duford Dr/Place d'Orléans Dr	2	2%
St. Joseph Blvd @ Prestone Dr	21	26%
Centrum Blvd btwn Place d'Orléans Dr & Prestone Dr	10	12%
Centrum Blvd btwn Prestone Dr & End	3	4%
St. Joseph Blvd btwn St. Joseph Blvd & Place d'Orléans Dr	2	2%
St. Joseph Blvd btwn Place d'Orléans Dr & Prestone Dr	9	11%
St. Joseph Blvd btwn Prestone Dr & Tenth Line Rd	2	2%
Place d'Orléans Dr btwn To Be Determined & Turn Lane	7	9%
Place d'Orléans Dr btwn Turn Lane & Centrum Blvd	1	1%
Place d'Orléans Dr btwn Centrum Blvd & St. Joseph Blvd	1	1%
Prestone Dr btwn Centrum Blvd & St. Joseph Blvd	7	9%
	1	1%

Within the study area, the intersections of Centrum Boulevard and Place d'Orléans Drive, St. Joseph Boulevard and Place d'Orléans Drive / Duford Drive are noted to have experienced higher collisions than other intersections. Table 5 and Table 6 summarize the collision types and conditions for both of the locations listed.

The pedestrian related collisions are noted to occur prior to 2017 through five separate incidents at the Centrum Boulevard and Prestone Drive intersection and the Place d'Orléans Drive at Centrum Boulevard. At Centrum

Boulevard and Prestone Drive, one collision involved three pedestrians on a drive completing a left-turn movement in 2014 and a single pedestrian on a going through movement in 2016. At the Place d'Orleans Drive and Centrum Boulevard intersection, two occurred in 2015 and one in 2016 and all three were on left-turn movements. Overall, all five collisions occurred in the westbound direction and within daylight hours. No sight-line issues are noted at the two intersections and no geometric mitigation is required.

Table 5: Centrum Boulevard at Place d'Orléans Drive Collision Summary

Total Collisions		Number	%
		12	100%
Classification	Fatality	0	0%
	Non-Fatal Injury	4	33%
	Property Damage Only	8	67%
Initial Impact Type	Angle	3	25%
	Rear end	1	8%
	Turning Movement	5	42%
	SMV Other	3	25%
Road Surface Condition	Dry	8	67%
	Wet	2	17%
	Loose Snow	1	8%
	Packed Snow	1	8%
Pedestrian Involved		3	25%
Cyclists Involved		0	0%

The Centrum Boulevard at Place d'Orléans Drive intersection had a total of 12 collisions during the 2014-2018 period, with 8 involving property damage only, and the remaining 4 having non-fatal injuries. The collision types are shared between five turning movement, three each angle and SMV other and one rear end. Two of the four right-turns at this intersection are channelized, with no dedicated receiving lane. Weather conditions are not considered to impact collisions at this location.

Table 6: St. Joseph Boulevard at Place d'Orléans Drive at Duford Drive

Total Collisions		Number	%
		21	100%
Classification	Fatality	0	0%
	Non-Fatal Injury	11	52%
	Property Damage Only	10	48%
Initial Impact Type	Angle	3	14%
	Rear end	9	43%
	Turning Movement	6	29%
	SMV Other	2	10%
	Other	1	5%
Road Surface Condition	Dry	15	71%
	Wet	5	24%
	Loose Snow	1	5%
Pedestrian Involved		1	5%
Cyclists Involved		0	0%

The St. Joseph Boulevard at Place d'Orléans Drive at Duford Drive intersection had a total of 21 collisions during the 2017-2018 period, with 10 involving property damage only, and the remaining 11 involving non-fatal injuries. Nine of the collisions were rear end, six were turning movement and the rest are split amongst angle, SMV other, and other. The rear end and turning movement (right-turns) collisions may be related to the queues noted in the

operational analysis or the multiple access for the adjacent gas station. Weather conditions are not considered to impact collisions at this location.

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

Within the study area, the Transportation Master Plan identifies the future extension of LRT to Place d'Orléans as part of the Rapid Transit and Transit Priority Affordable Network. The widening of OR 174 is identified as part of the Network Concept, but not the Affordable Network.

The LRT extension to Place d'Orléans includes the current construction of a new LRT station and a future station at the east end of Brisebois Crescent. In addition, a MUP is proposed along the north side of Place d'Orléans Drive to the OR 174 on-ramp intersection and on the east side of Place d'Orléans Drive to Centrum Boulevard with the associated cross-rides.

2.3.2 Other Study Area Developments

3030 St. Joseph Boulevard

The application includes a zoning amendment to seek a height increase for the construction of a 16-storey mixed-use building with 165 residential units and over 426 m² of ground floor retail. The original plan was expected to generate 40 two-way AM peak hour auto trips and 60 two-way PM peak hour auto trips (Parsons 2017).

110 Place d'Orléans Drive

The application includes a site plan for a one storey bank approximately 464 m² with a drive through facility. This development was completed in 2018.

3 Study Area and Time Periods

3.1 Study Area

The study area will include the intersections:

- OR 174 at Place d'Orléans Drive
- Centrum Boulevard at:
 - Place d'Orléans Drive
 - Brisebois Crescent (west)
 - Prestone Drive
- St. Joseph Boulevard at:
 - Place d'Orléans Drive at Duford Drive
 - Prestone Drive

The boundary roads are Place d'Orléans Drive, Centrum Boulevard and Brisebois Crescent. No screenlines are present near the proposed site and none will be reviewed as part of this study.

3.2 Time Periods

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

3.3 Horizon Years

The anticipated build-out year is 2024. As a result, the full build-out plus five years horizon year is 2029.

4 Exemption Review

Table 7 summarizes the exemptions for this TIA.

Table 7: Exemption Review

Module	Element	Explanation	Exempt/Required
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plans	Required
	4.2.3 New Street Networks	Only required for plans of subdivision	Exempt
4.2 Parking	4.2.1 Parking Supply	Only required for site plans	Required
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Exempt
Network Impact Component			
4.5 Transportation Demand Management	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Required
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Exempt
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Exempt

5 Development Generated Travel Demand

5.1 Trip Generation and Travel Modes

This TIA has been prepared using the vehicle and person trip rates for Senior Adult Housing – Attached using the ITE Trip Generation Manual 10th Edition (2017), using the fitted curve equation. As the source rates are provided in vehicle trips alone, conversion to person trips is required via the City-prescribed adjustment factor of 1.28. Table 8 summarizes the person trip rates for the proposed land use.

Table 8: Trip Generation Person Trip Rates

Dwelling Type	Land Use Code	Peak Hour	Vehicle Trip Rate	Adjusted Person Trip Rates
Senior Adult Housing – Attached	252 (ITE)	AM	0.20	0.26
		PM	0.25	0.32

Using the above Person Trip rates, the total person trip generation has been estimated with given ratios of inbound and outbound trips (Inbound AM = 35%, Inbound PM = 55%). Table 9 below illustrates the total person trip generation.

Table 9: Total Person Trip Generation

Land Use	Units/ sq ft	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Mid-rise Apartments	397	36	67	103	70	57	127

Using the most recent National Capital Region Origin-Destination survey (OD Survey), the existing mode shares for Orleans have been summarized in Table 10, along with the typical BRT modal shares. Given the nature of the site, a proposed modal share is also included which increases the active mode trips, the proximity to a major retail centre and recreation facilities will likely reduce the auto mode. It is also noted that the roadway peak hours likely do not represent the site peak auto travel and the auto modal share should not be interpreted as a justification for lower parking rates.

Table 10: Mode Share

Travel Mode	Orleans OD Survey	BRT	Proposed Modal Share Targets
Auto Driver	60%	50%	45%
Auto Passenger	15%	10%	5%
Transit	20%	35%	35%
Cycling	1%	1%	2%
Walking	4%	4%	13%
Total	100%	100%	100%

Using the above mode shares and person trip rates the person trips by mode have been projected. Table 11 summarizes the trip generation by mode.

Table 11: Trip Generation by Mode

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Auto Driver	45%	16	30	46	32	26	57
Auto Passenger	5%	2	3	5	4	3	6
Transit	35%	13	23	36	25	20	44
Cycling	2%	1	1	2	1	1	3
Walking	13%	5	9	13	9	7	17
Total	100%	36	67	103	70	57	127

As shown above, 46 AM and 57 PM new peak hour two-way vehicle trips are projected as a result of the proposed development.

5.2 Trip Distribution

To understand the travel patterns of the subject development the OD Survey has been reviewed to determine the travel for the residential development patterns were applied based on the build-out of Orleans. Table 12 below summarizes the distributions.

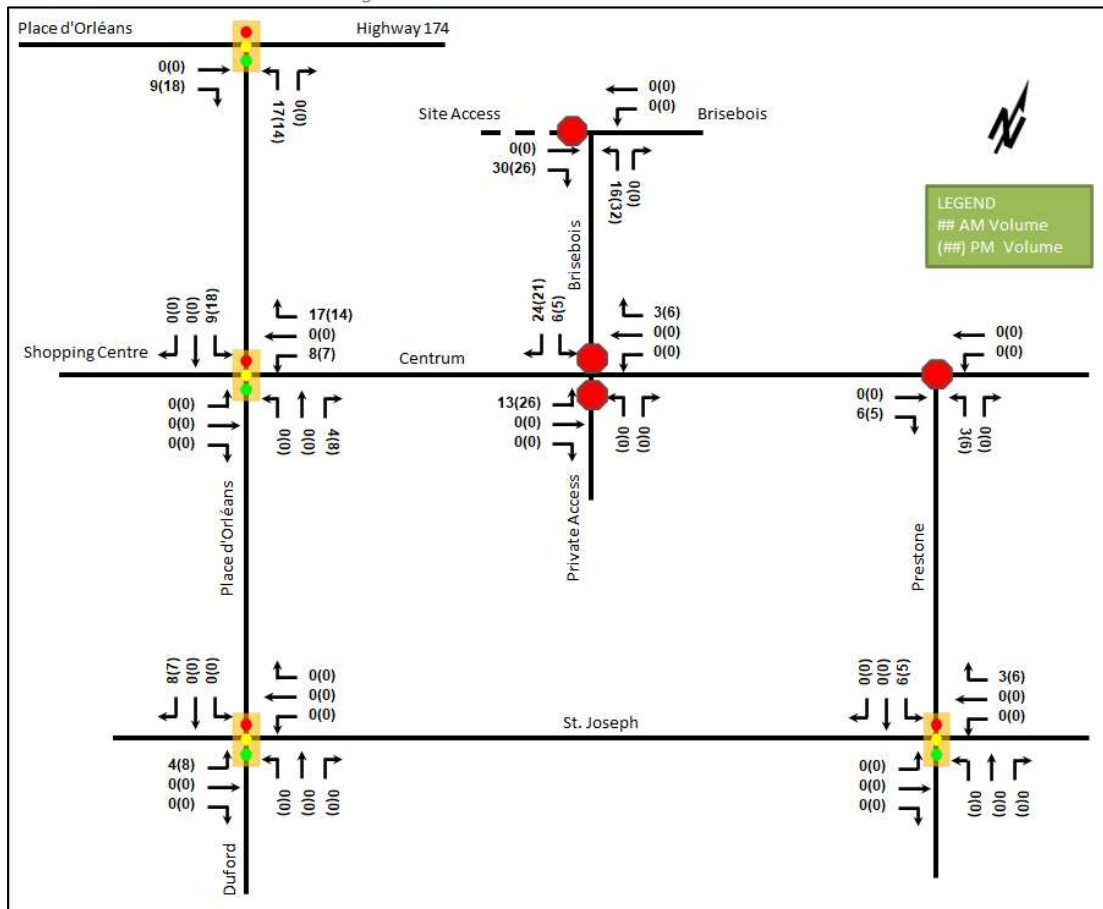
Table 12: OD Survey Existing Mode Share – Orleans

To/From	% of Trips
North	0%
South	15%
East	5%
West	80%
Total	100%

5.3 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the Study Area road network. Figure 9 illustrates the new site generated volumes.

Figure 9: New Site Generation Auto Volumes



6 Background Network Travel Demand

6.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3.1 and are not anticipated to impact to site, trip generation, or distribution.

6.2 Background Growth

A review of the background projections from the City's TRANS Regional Model for the 2011 and 2031 horizons was completed to determine the background growth for each of the study area roadways. Table 13 summarizes the results of the model and the projections are provided in Appendix E.

Table 13: TRANS Regional AM Peak Hour Model Projections – Study Area Growth Rates

Street	Direction Growth Percentage	
	Eastbound	Westbound
St. Joseph	0.21%	2.60%
Centrum	0.10%	0.46%
	Northbound	Southbound
Place d'Orléans	2.40%	0.40%
Prestone	-0.36%	-0.52%

In general, the growth rates in the study area are projected to be low on all road segments with the exception of the westbound St. Joseph Boulevard and northbound Place d'Orléans Drive segments. To capture the effects of the overall growth pattern, the mainline volumes on arterials will be grown at 2.5% and mainline volumes on Centrum Boulevard and Prestone Drive will be grown at 0.5% with specific turning movements additionally grown where appropriate using the applicable growth rate.

6.3 Other Developments

The other area developments are noted in Section 2.3.2. The development of 3030 St. Joseph Boulevard will be explicitly accounted for in the formulation of background scenarios.

7 Demand Rationalization

7.1 2023 Future Background Intersection Operations

Figure 10 illustrates the 2024 background volumes and Table 14 summarizes the background intersection operations for the study area network. The level of service for signalized intersections is based on HCM 2010 v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and HCM 2010 average delay for unsignalized intersections. The synchro worksheets for the 2024 future background scenario are provided in Appendix F.

Figure 10: 2024 Future Background Volumes

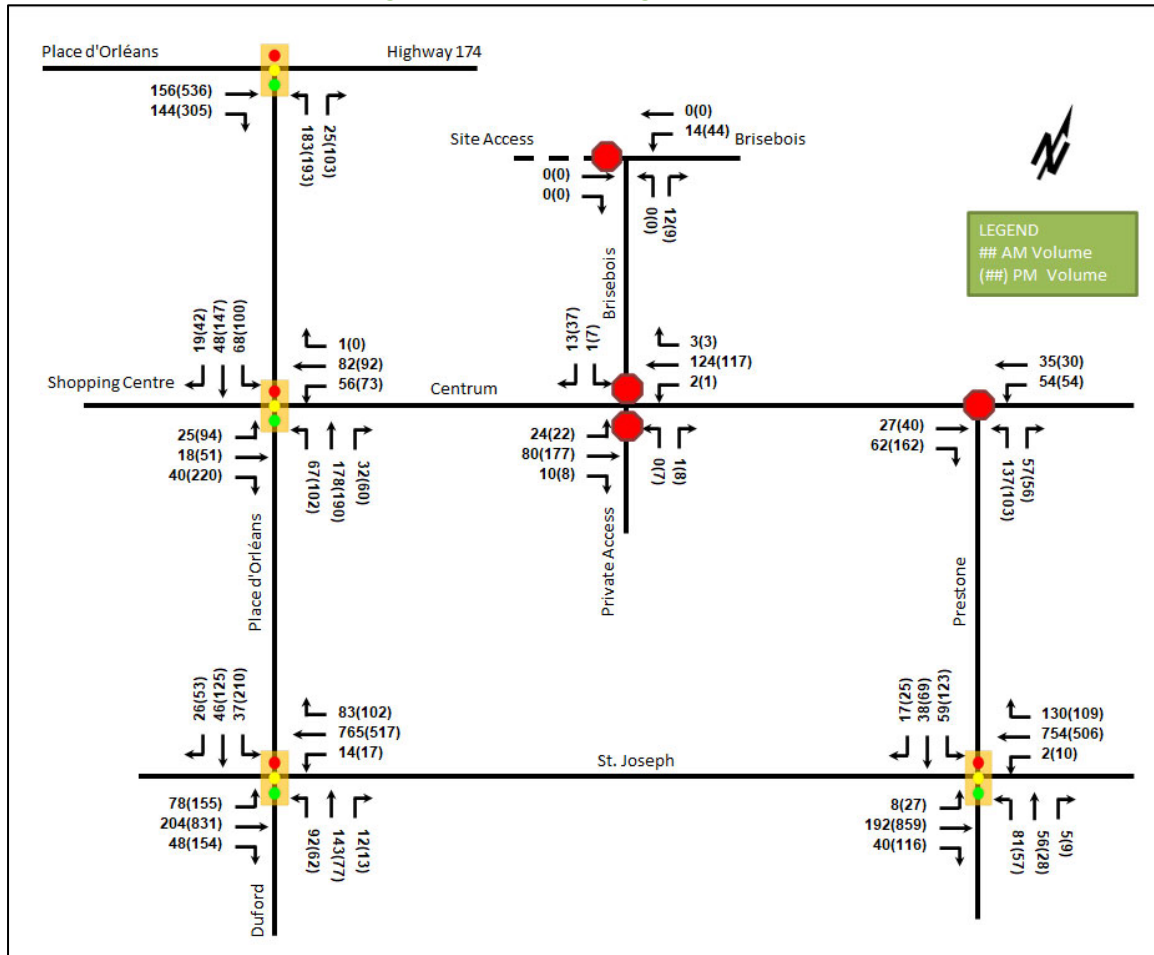


Table 14: 2024 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
OR 174 & Place d'Orléans Drive <i>Signalized</i>	EBT	A	0.30	11.4	19.7	B	0.69	14.6	67.1
	EBR	A	0.16	3.3	4.6	A	0.23	1.6	5.2
	NBL	A	0.14	7.2	6.8	A	0.21	13.3	14.5
	NBR	A	0.04	3.4	2.3	A	0.21	5.1	8.6
	Overall	A	0.21	7.2	-	B	0.49	10.0	-
Centrum Boulevard & Place d'Orléans Drive <i>Signalized</i>	EBL	A	0.12	24.6	7.3	A	0.47	37.9	23.9
	EBT	A	0.06	23.1	5.7	A	0.17	29.2	13.9
	EBR	A	0.14	7.7	5.5	A	0.52	8.5	15.1
	WBL	A	0.27	28.0	13.1	A	0.35	33.9	19.2
	WBT/R	A	0.29	27.5	17.2	A	0.31	32.0	22.3
	NB	A	0.14	5.1	15.7	A	0.20	5.3	19.1
	SB	A	0.08	5.1	8.3	A	0.17	5.2	16.0
	Overall	B	0.17	11.5	-	B	0.25	13.4	-
St. Joseph Boulevard & Place d'Orléans Drive / Duford Drive <i>Signalized</i>	EBL	A	0.24	14.3	19.2	A	0.39	20.5	#41.6
	EBT/R	A	0.14	14.4	28.7	B	0.60	24.6	#166.2
	WBL	A	0.02	14.0	5.5	A	0.07	17.1	6.7
	WBT/R	A	0.51	22.4	#119.3	A	0.47	26.7	79.3
	NBL	A	0.53	54.8	32.6	A	0.42	53.3	24.4

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
	NBT/R	A	0.48	40.9	39.3	A	0.38	40.0	25.2
	SBL	A	0.30	51.4	16.9	C	0.78	62.5	#69.7
	SBT	A	0.20	39.3	15.7	A	0.36	37.0	32.1
	SBR	A	0.08	0.5	0.0	A	0.13	0.6	0.0
	Overall	C	0.53	25.3	-	C	0.65	29.8	-
St. Joseph Boulevard & Prestone Drive Signalized	EBL	A	0.02	6.1	2.3	A	0.05	5.6	4.3
	EBT	A	0.08	5.1	10.9	A	0.36	6.1	41.9
	EBR	A	0.04	2.4	3.7	A	0.11	1.6	5.3
	WBL	A	0.00	6.0	1.0	A	0.03	5.6	2.2
	WBT	A	0.32	6.0	42.5	A	0.21	5.3	22.8
	WBR	A	0.12	1.7	6.5	A	0.10	1.6	5.2
	NBL	A	0.36	29.5	20.0	A	0.26	27.3	15.6
	NBT/R	A	0.20	23.7	14.8	A	0.12	19.9	9.8
	SBL	A	0.26	27.3	15.6	A	0.53	34.5	29.3
	SBT/R	A	0.18	19.0	12.2	A	0.29	21.6	19.2
	Overall	A	0.35	9.0	-	A	0.43	8.8	-
Centrum Boulevard & Prestone Drive Unsignalized	EB	A	0.10	7.6	2.3	A	0.25	8.4	7.5
	WB	A	0.12	8.3	3.0	A	0.12	8.4	3.0
	NBL	A	0.21	9.6	6.0	A	0.18	9.7	5.3
	NBR	A	0.07	7.3	1.5	A	0.08	7.6	2.3
	Overall	A	-	8.4	-	A	-	8.4	-
Centrum Boulevard & Brisebois Crescent Unsignalized	EB	A	0.02	7.5	0.8	A	0.02	7.5	0.0
	WB	A	0.00	7.4	0.0	A	0.00	7.6	0.0
	NB	A	0.00	8.8	0.0	B	0.02	10.3	0.8
	SB	A	0.02	9.1	0.8	A	0.05	9.4	1.5
	Overall	A	-	1.3	-	A	-	1.9	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00

= queue exceeds storage or mid-block length

The intersection operations for the 2024 future background horizon generally operate well during the peak hours and similarly to existing. As in the existing intersection operations, the intersection of St. Joseph Boulevard and Place D'Orléans Drive is noted to experience queuing on several movements, specifically during the PM peak hour which may block access to turn lanes. No new capacity issues are noted.

7.2 2029 Future Background Intersection Operations

Figure 11 illustrates the 2029 background volumes and Table 15 summarizes the background intersection operations for the study area network. The level of service for signalized intersections is based on HCM 2010 v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and HCM 2010 average delay for unsignalized intersections. The synchro worksheets for the 2029 future background scenario are provided in Appendix G.

Figure 11: 2029 Future Background Volumes

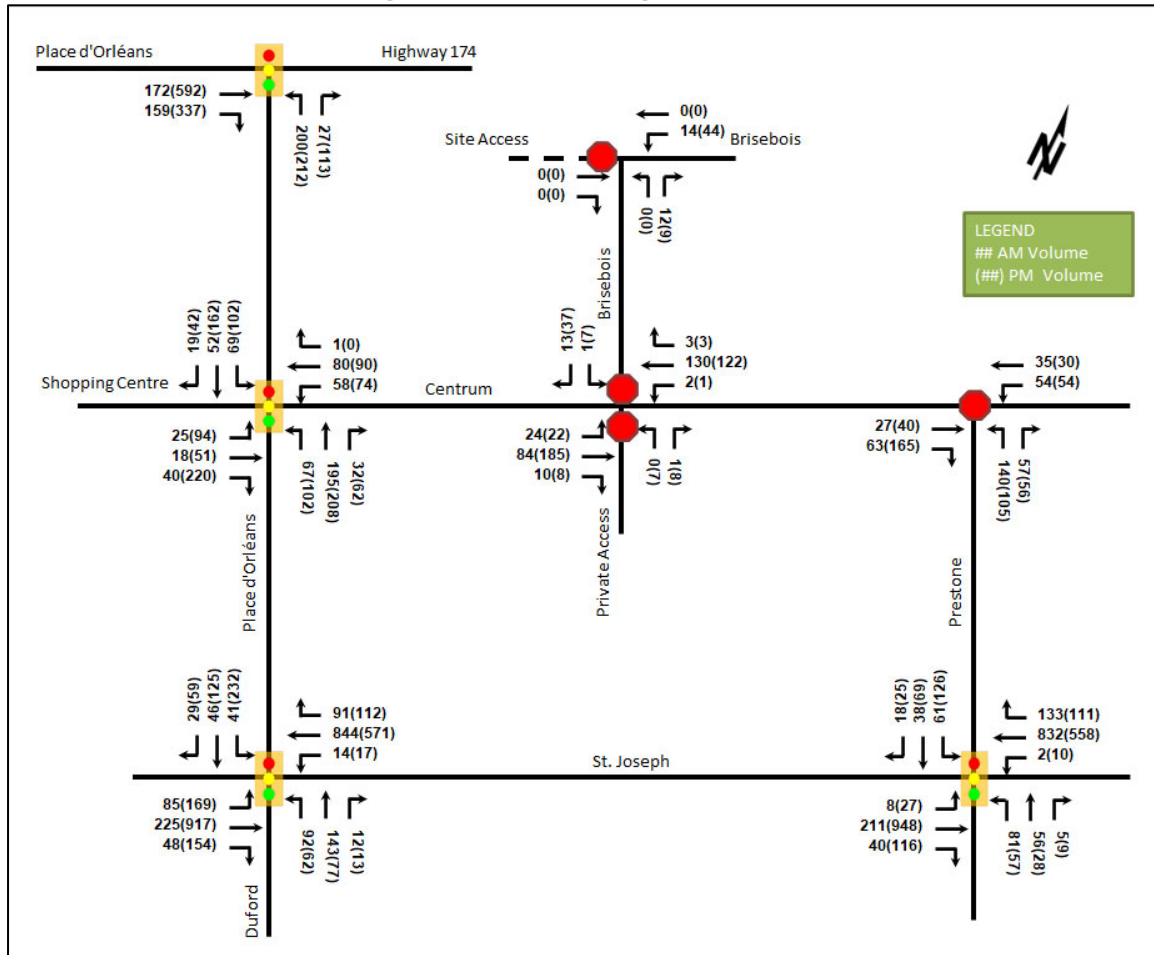


Table 15: 2029 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
OR 174 & Place d'Orléans Drive <i>Signalized</i>	EBT	A	0.32	11.5	21.4	C	0.72	14.8	76.2
	EBR	A	0.17	3.2	4.8	A	0.24	1.5	5.2
	NBL	A	0.16	7.3	7.5	A	0.24	14.9	17.2
	NBR	A	0.05	3.4	2.5	A	0.24	5.5	9.6
	Overall	A	0.23	7.3	-	B	0.54	10.4	-
Centrum Boulevard & Place d'Orléans Drive <i>Signalized</i>	EBL	A	0.12	24.6	7.3	A	0.47	37.9	23.8
	EBT	A	0.06	23.1	5.7	A	0.17	29.2	13.9
	EBR	A	0.14	7.7	5.5	A	0.52	8.5	15.1
	WBL	A	0.28	28.2	13.5	A	0.35	34.0	19.3
	WBT/R	A	0.29	27.3	17.0	A	0.31	31.9	21.9
	NB	A	0.14	5.2	16.7	A	0.21	5.4	20.3
	SB	A	0.08	5.1	8.7	A	0.19	5.3	17.1
	Overall	B	0.18	11.3	-	B	0.26	13.2	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
St. Joseph Boulevard & Place d'Orléans Drive / Duford Drive <i>Signalized</i>	EBL	A	0.29	15.2	20.6	A	0.44	22.5	#54.6
	EBT/R	A	0.15	14.8	31.3	B	0.66	26.2	#186.7
	WBL	A	0.02	14.1	5.5	A	0.07	17.5	6.7
	WBT/R	A	0.56	23.7	#140.3	A	0.57	30.3	#90.4
	NBL	A	0.53	54.8	32.6	A	0.42	53.3	24.4
	NBT/R	A	0.48	41.0	39.5	A	0.38	40.0	25.2
	SBL	A	0.32	51.9	18.3	D	0.83	66.7	#80.8
	SBT	A	0.20	39.1	15.7	A	0.35	36.3	32.1
	SBR	A	0.09	0.6	0.0	A	0.14	0.7	0.0
	Overall	C	0.57	25.8	-	C	0.70	31.8	-
St. Joseph Boulevard & Prestone Drive <i>Signalized</i>	EBL	A	0.02	6.2	2.3	A	0.05	5.7	4.3
	EBT	A	0.09	5.1	11.8	A	0.40	6.4	47.6
	EBR	A	0.04	2.4	3.7	A	0.11	1.6	5.3
	WBL	A	0.00	6.0	1.0	A	0.03	5.7	2.2
	WBT	A	0.35	6.2	48.0	A	0.24	5.4	25.2
	WBR	A	0.12	1.7	6.6	A	0.10	1.6	5.2
	NBL	A	0.36	29.5	20.0	A	0.26	27.2	15.6
	NBT/R	A	0.20	23.7	14.8	A	0.12	19.8	9.8
	SBL	A	0.27	27.5	15.9	A	0.54	34.8	30.0
	SBT/R	A	0.18	18.8	12.3	A	0.29	21.6	19.2
	Overall	A	0.38	8.9	-	A	0.46	8.8	-
Centrum Boulevard & Prestone Drive <i>Unsignalized</i>	EB	A	0.10	7.6	2.3	A	0.23	8.1	6.8
	WB	A	0.12	8.3	3.0	A	0.11	8.3	3.0
	NBL	A	0.21	9.6	6.0	A	0.17	9.5	4.5
	NBR	A	0.07	7.3	1.5	A	0.07	7.5	1.5
	Overall	A	-	8.4	-	A	-	8.4	-
Centrum Boulevard & Brisebois Crescent <i>Unsignalized</i>	EB	A	0.02	7.6	0.8	A	0.02	7.5	0.0
	WB	A	0.00	7.4	0.0	A	0.00	7.6	0.0
	NB	A	0.00	8.8	0.0	B	0.02	10.4	0.8
	SB	A	0.02	9.2	0.0	A	0.05	9.5	1.5
	Overall	A	-	1.2	-	A	-	1.9	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00

= queue exceeds storage or mid-block length

The intersection operations for the 2029 future background horizon generally operate well during the peak hours as in the 2024 background horizon. Queue lengths on the same movements as existing, but including the westbound through/right movement, at the intersection of St. Joseph Boulevard and Place D'Orléans Drive continue to lead to the potential blockage of turn lanes in the concerned directions. No new capacity issues are noted.

7.3 Demand Rationalization Conclusions

No capacity constraints were noted in the background network. The proposed modal share percentages are likely achievable given the nature of the site and study area. No additional rationalization is required, and the future horizons will be assessed within the TIA Guidelines Step 4 Modules.

8 Development Design

8.1 Design for Sustainable Modes

The proposed development is a retirement home with parking primarily provided underground and with a small surface lot for visitor parking, and internal bike parking (via underground parking ramp). Hard surface connections are provided between building entrances and surrounding pedestrian facilities, which include a new 1.8 metre sidewalk along the east side of the property on Brisebois Crescent and reconstruction of the Centrum Boulevard sidewalk to a 1.8 metre sidewalk. Bike racks are located adjacent to the main entrance and within the courtyard. All bus routes referenced in section 2.2.5 are within a 400-metre walk of building entrances and Place d'Orléans Station is within an 800-metre walk.

8.2 Circulation and Access

No issues are noted with garbage or underground garage access from Brisebois Crescent. The drop-off loop is also designated as a fire lane.

9 Parking

9.1 Parking Supply

Parking for tenants, consisting of 282 spaces located in two levels of underground parking, including four accessible spaces, and 21 visitor spaces including four accessible spaces are located on the surface lot. This does not exceed the maximum amount within a TOD area. A proposed total of 60 bicycle parking spaces, with 52 located in the underground parking and on the ground level of the building, 8 spaces located externally, is below the minimum 100 spaces required. The site programming is consistent with similar sites managed by the proponent and the bicycle parking is above the other comparative sites.

10 Boundary Street Design

Table 16 summarizes the MMLOS analysis for the site boundary streets of Place d'Orléans Drive, Centrum Boulevard and Brisebois Crescent. The existing and future conditions are considered in separate rows and the analysis is based on the policy area of "within 600m of a rapid transit station" for all boundary streets. MMLOS worksheets are provided in Appendix H.

Table 16: Boundary Street Segment MMLOS Analysis

Segment	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TkLOS	Target
Place d'Orléans Drive (present)	E	A	E	B	D	D	A	D
Place d'Orléans Drive (future)	D	A	A	B	D	D	A	D
Centrum Boulevard (present)	E	A	D	D	D	D	N/A	N/A
Centrum Boulevard (future)	B	A	D	D	D	D	N/A	N/A
Brisebois Crescent (present)	F	A	B	D	N/A	N/A	N/A	N/A
Brisebois Crescent (future)	B	A	B	D	N/A	N/A	N/A	N/A

The pedestrian LOS targets will not be met for all segments in the present or future. Along Place d'Orléans Drive, the addition of the MUP by LRT Stage 2 on the east side of the road will not meet the required PLOS A target and would require reduction of travel speeds to below 30 km/h and reduction of traffic to below 3000 AADT. For Centrum Boulevard, a PLOS A could be achieved through a 2.0 metre sidewalk for the exposure component but the crowding would require a 3.0 metre or wider pedestrian width to achieve a PLOS A. Brisebois Crescent would similarly need a 3.0 metre or wider pedestrian width to meet the crowding target of A and a boulevard width of

greater than 2.0 metre or a sidewalk width of 2.0 metre and boulevard width greater than 0.0 metre to meet the exposure target of A. Additionally, if the traffic speed was reduced to below 30 km/h, it would meet the exposure target without any changes to the sidewalk or boulevard widths.

It is not recommended for the sidewalks to be widened beyond the proposed new sidewalk along Brisebois Crescent and the utility and tree locations restrict the ability to widen the proposed sidewalk along Centrum Boulevard. As no access is provided along the Place d'Orleans Drive, the City should consult with the Stage 2 LRT project to ensure the MUP achieves the City's MMLOS goals.

11 Access Intersections Design

11.1 Location and Design of Access

The site will access Brisebois Crescent via one full-movement access at the location of Brisebois Crescent's western 90-degree bend, and a one-way drop-off loop on Brisebois Crescent, south of the first access. No existing driveways are found along this length of Brisebois Crescent. The existing accesses on Centrum Boulevard will be reinstated to full height curb and boulevard.

The one-way loop is proposed at 6.7-6.9 metres wide and will flare at Brisebois Crescent to accommodate emergency vehicle turning movements.

11.2 Access Intersection Control

Based upon the projected volumes, the northern site access will have stop-control on the minor approach, and the drop-off loop's outlet will be stop controlled. One-way signage will be placed at the one-way loop locations. No further traffic control is necessary to address operational issues.

11.3 Access Intersection Design

11.3.1 2024 Future Total Access Conditions

The 2024 future total future traffic volumes are illustrated in Figure 12 and the access intersection operations are summarized in Table 17. The level of service is based on the HCM 2010 average delay for unsignalized intersections. The synchro worksheets have been provided in Appendix I.

Figure 12: 2024 Future Total Traffic Volumes

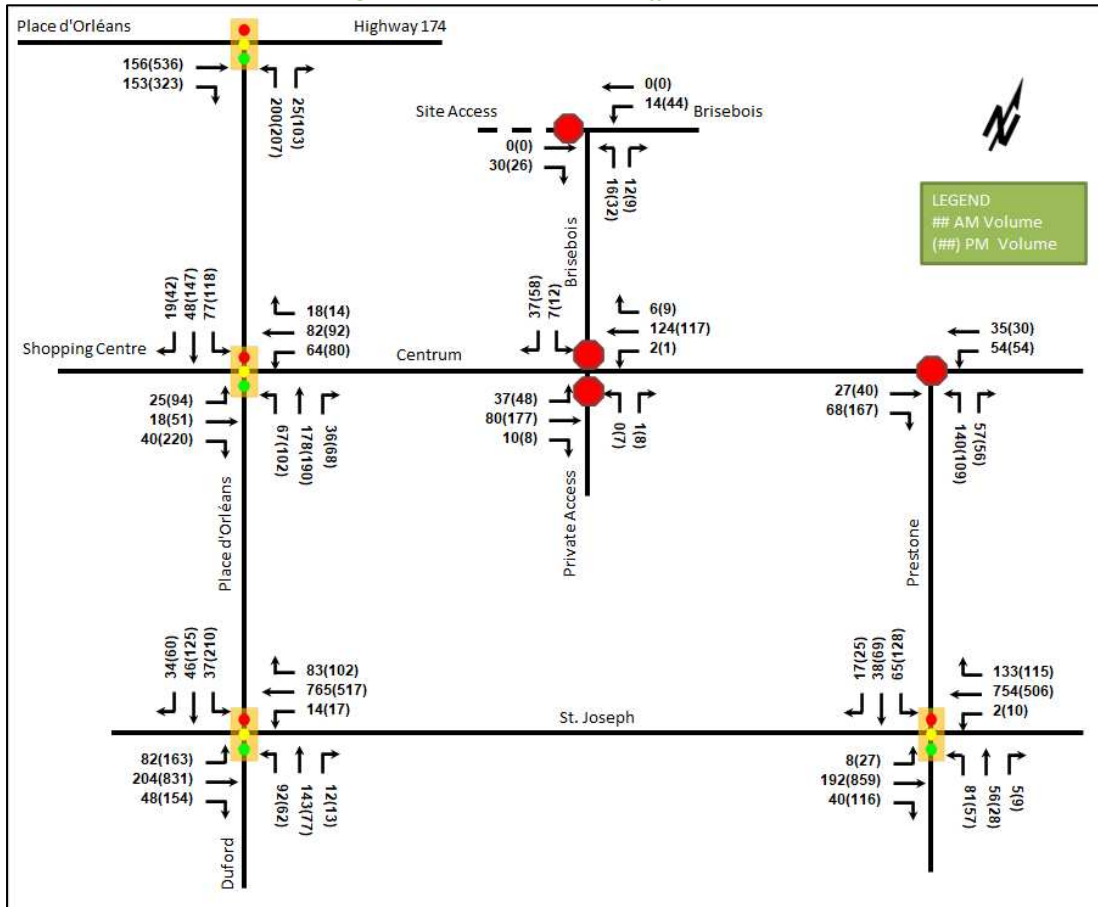


Table 17: 2024 Future Total Access Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Brisebois Crescent & Site Access Unsignalized	EBL/R	A	0.03	8.5	0.8	A	0.02	8.4	0.8
	NBL/T	A	0.01	7.3	0.0	A	0.02	7.3	0.8
	SBT/R	-	-	-	-	-	-	-	-
	Overall	A	-	6.2	-	A	-	7.7	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00

The 2024 future total access intersection operates satisfactorily. No mitigation is required.

11.3.2 2029 Future Total Access Conditions

The 2029 future total future traffic volumes are illustrated in Figure 13 and the access intersection operations are summarized in Table 18. The level of service is based on the HCM 2010 average delay for unsignalized intersections. The synchro worksheets have been provided in Appendix J.

Figure 13: 2029 Future Total Traffic Volumes

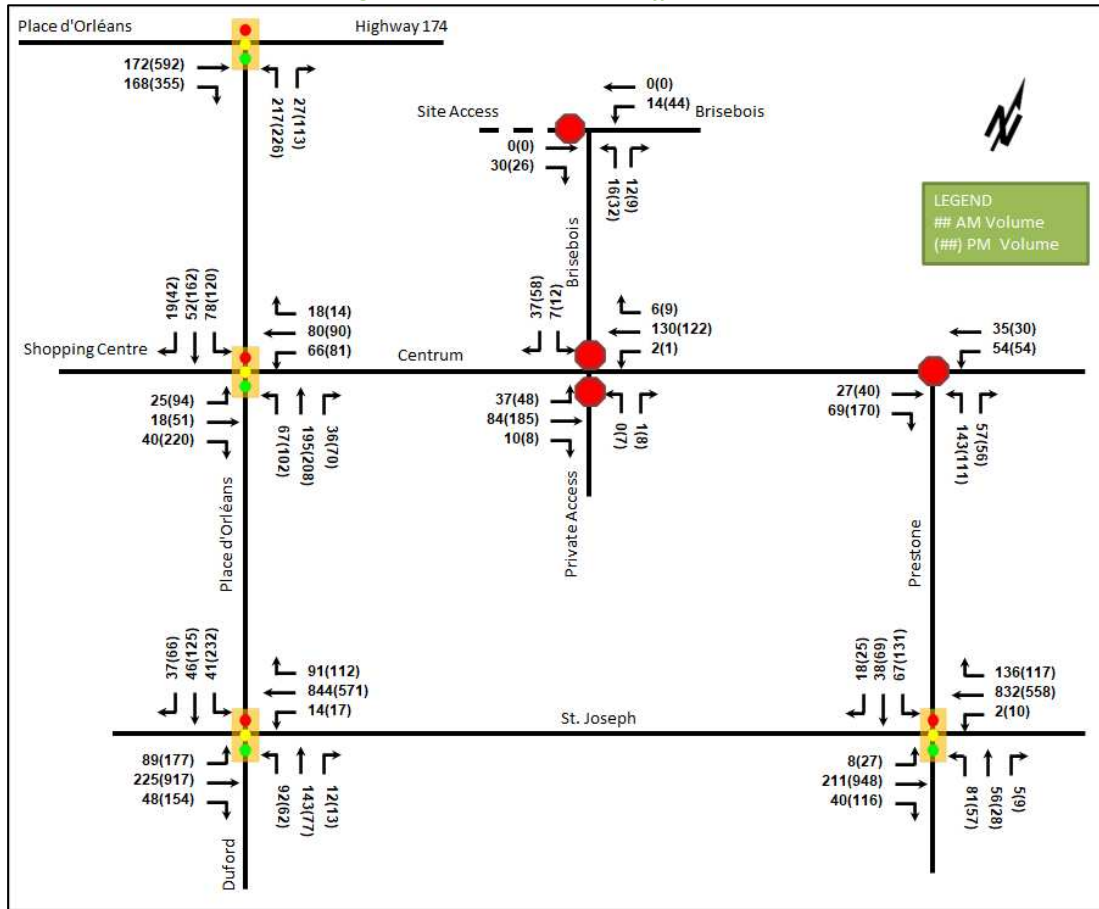


Table 18: 2029 Future Total Access Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Brisebois Crescent & Site Access Unsignalized	EBL/R	A	0.03	8.5	0.8	A	0.02	8.4	0.8
	NBL/T	A	0.01	7.3	0.0	A	0.02	7.3	0.8
	SBT/R	-	-	-	-	-	-	-	-
	Overall	A	-	6.2	-	A	-	7.7	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00

The 2029 future total access intersection operates satisfactorily. No mitigation is required.

11.3.3 Access Intersection MMLOS

The access intersection is unsignalized, and therefore no access intersection MMLOS analysis has been conducted.

11.3.4 Recommended Design Elements

No access intersection design elements are proposed as part of this study beyond the typical private approach standards along Brisebois Crescent.

12 Transportation Demand Management

12.1 Context for TDM

The proposed modal share targets focus on active modes and transit use, therefore it is not anticipated that this development will have an undue impact on the adjacent road network.

The total of 576 bedrooms (225 one-bedroom or bachelor units (including 20 assisted living bachelor units), 165 two-bedroom units and seven three-bedroom units) is anticipated for the development. As the development is a retirement home, the tenants will be seniors, and no age restrictions will be considered for staff.

12.2 Need and Opportunity

The mode shares have been proposed within the context of the Place d'Orléans mall, transit facilities and adjacent retail and recreational facilities. The focus of the development will be on transit and active modes with a lower anticipated auto mode share.

12.3 TDM Program

The “suite of post occupancy TDM measures” has been summarized in the TDM checklists for both the residential and non-residential land uses. The checklist is provided in Appendix K.

The key TDM measures recommended include:

- Designate an internal program coordinator
- Posting of pedestrian, cycling, and transit information and maps at primary entrances/exits
- Unbundle parking from rental costs
- Provide a multimodal travel option information package to new residents
- Inclusion of a 1-year Presto card for first time new apartment rental, with a set time frame for this offer (e.g. 6-months) from the initial opening of the site

13 Transit

13.1 Route Capacity

The transit ridership in the area was provided by OC Transpo for the study area routes, including boarding, alighting, and average loads.

Table 19: OC Transpo Peak Ridership Summary

Routes/Locations			AM Peak Period			PM Peak Period		
Intersection	Stop	Route	Total Boardings	Total Alighting	Average Load at Departure	Total Boardings	Total Alighting	Average Load at Departure
Place d'Orléans / Centrum	5637	37 WB	3	1	7	0	0	2
		131 NB	0	1	5	2	0	4
		234 IN	3	1	27	-	-	-
Place d'Orléans / Centrum	8532	131 SB	2	3	3	1	0	8
		234 OB	-	-	-	2	3	24
St Joseph / Place d'Orléans Mall	2626	232 IN	5	0	31	-	-	-
Centrum / Place d'Orléans	8893	33 EB	0	2	4	-	-	-
		35 OB	5	1	5	0	0	14
		37 EB	0	0	2	0	0	12
		232 OB	-	-	-	0	1	18
Centrum / Place d'Orléans	5925	33 WB	-	-	-	2	0	6
		35 IN	0	0	17	3	1	10

The proposed development is anticipated to generate an additional 36 AM peak hour transit trips and 44 PM peak hour transit trips. Of these trips, 23 outbound AM trips and 25 inbound PM trips are anticipated. From the trip distribution found in Section 5.2, these values can be further broken down.

Site-generated AM peak hour outbound trips break down to three trips to the south, one trip to the east, and 18 trips to the west. Site-generated PM peak hour inbound trips break down to four trips from the south, one trip from the east, and 20 trips from the west. The north-south route has adequate capacity to accommodate these additional trips. As six routes servicing the site area have 30-minute service or better during the peak hours, the resultant transit trips generated from the proposed development would be marginal, no more than two trips per route if evenly split, and given the existing capacity on these routes, no service change requirement is anticipated.

13.2 Transit Priority

No transit routes travel along Brisebois Crescent, and no undue impact on the area transit system are anticipated from site-generated ridership increases.

14 Network Intersection Design

14.1 Network Intersection Control

The network intersections include all existing study area intersections, which are all signalized except for Centrum Boulevard at Brisebois Crescent and Centrum Boulevard at Prestone Drive.

14.2 Network Intersection Design

14.2.1 2024 Future Total Network Conditions

The 2024 future total traffic volumes have been illustrated in Figure 12 and the intersection operations are summarized in Table 20. The level of service for signalized intersections is based on HCM 2010 v/c calculations for

individual lane movements and HCM 2000 v/c calculations for the overall intersection, and HCM 2010 average delay for unsignalized intersections. The synchro worksheets have been provided in Appendix I.

Table 20: 2024 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
OR 174 & Place d'Orléans Drive <i>Signalized</i>	EBT	A	0.30	11.4	19.7	B	0.69	14.6	67.1
	EBR	A	0.17	3.3	4.8	A	0.24	1.6	5.3
	NBL	A	0.16	7.2	7.2	A	0.22	13.3	15.4
	NBR	A	0.04	3.4	2.3	A	0.21	5.1	8.6
	Overall	A	0.22	7.1	-	A	0.50	10.0	-
Centrum Boulevard & Place d'Orléans Drive <i>Signalized</i>	EBL	A	0.12	24.5	7.3	A	0.47	38.2	23.9
	EBT	A	0.06	23.0	5.7	A	0.17	29.2	13.9
	EBR	A	0.14	7.6	5.5	A	0.52	8.5	15.1
	WBL	A	0.30	28.7	14.6	A	0.38	34.8	20.6
	WBT/R	A	0.35	24.6	18.4	A	0.36	30.3	23.7
	NB	A	0.14	5.1	15.8	A	0.21	5.2	19.2
	SB	A	0.08	5.2	8.9	A	0.19	5.4	17.4
	Overall	B	0.18	11.6	-	B	0.25	13.5	-
St. Joseph Boulevard & Place d'Orléans Drive / Duford Drive <i>Signalized</i>	EBL	A	0.25	14.5	19.9	A	0.41	21.0	#45.6
	EBT/R	A	0.14	14.4	28.7	A	0.60	24.6	#166.2
	WBL	A	0.02	14.0	5.5	A	0.07	17.1	6.7
	WBT/R	A	0.51	22.5	#119.3	A	0.48	27.1	79.3
	NBL	A	0.53	54.8	32.6	A	0.42	53.3	24.4
	NBT/R	A	0.48	40.9	39.3	A	0.38	40.0	25.2
	SBL	A	0.30	51.4	16.9	C	0.78	62.5	#69.7
	SBT	A	0.20	39.3	15.7	A	0.36	37.0	32.1
	SBR	A	0.10	0.6	0.0	A	0.15	0.8	0.0
	Overall	C	0.53	25.1	-	C	0.65	29.7	-
St. Joseph Boulevard & Prestone Drive <i>Signalized</i>	EBL	A	0.02	6.1	2.3	A	0.05	5.7	4.3
	EBT	A	0.08	5.1	10.9	A	0.36	6.2	42.3
	EBR	A	0.04	2.4	3.7	A	0.11	1.6	5.4
	WBL	A	0.00	6.0	1.0	A	0.03	5.8	2.2
	WBT	A	0.32	6.0	42.5	A	0.21	5.3	23.0
	WBR	A	0.12	1.7	6.6	A	0.11	1.6	5.3
	NBL	A	0.36	29.5	20.0	A	0.26	27.1	15.6
	NBT/R	A	0.20	23.7	14.8	A	0.12	19.8	9.8
	SBL	A	0.29	27.9	16.9	A	0.54	34.9	30.4
	SBT/R	A	0.18	19.0	12.2	A	0.29	21.5	19.2
	Overall	A	0.35	9.1	-	A	0.43	8.9	-
Centrum Boulevard & Prestone Drive <i>Unsignalized</i>	EB	A	0.11	7.6	3.0	A	0.23	8.2	6.8
	WB	A	0.12	8.3	3.0	A	0.11	8.3	3.0
	NBL	A	0.21	9.6	6.0	A	0.17	9.6	4.5
	NBR	A	0.07	7.3	1.5	A	0.07	7.5	1.5
	Overall	A	-	8.4	-	A	-	8.5	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Centrum Boulevard & Brisebois Crescent Unsignalized	EB	A	0.03	7.6	0.8	A	0.03	7.5	0.8
	WB	A	0.00	7.4	0.0	A	0.00	7.6	0.0
	NB	A	0.00	8.8	0.0	B	0.02	10.8	0.8
	SB	A	0.05	9.5	1.5	A	0.09	9.8	2.3
	Overall	A	-	2.4	-	A	-	2.8	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00

= queue exceeds storage or mid-block length

The 2024 future total intersection operations are similar to the 2024 future background conditions. No mitigation is recommended.

14.2.2 2029 Future Total Network Conditions

The 2029 future total traffic volumes have been illustrated in Figure 12 and the intersection operations are summarized in Table 21. The level of service for signalized intersections is based on HCM 2010 v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and HCM 2010 average delay for unsignalized intersections. The synchro worksheets have been provided in Appendix J.

Table 21: 2029 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
OR 174 & Place d'Orléans Drive Signalized	EBT	A	0.32	11.5	21.4	C	0.72	14.8	76.2
	EBR	A	0.18	3.1	5.0	A	0.25	1.5	5.3
	NBL	A	0.18	7.4	8.0	A	0.26	14.9	18.1
	NBR	A	0.05	3.4	2.5	A	0.24	5.5	9.6
	Overall	A	0.24	7.2	-	B	0.54	10.3	-
Centrum Boulevard & Place d'Orléans Drive Signalized	EBL	A	0.12	24.4	7.3	A	0.47	38.2	23.9
	EBT	A	0.06	22.9	5.7	A	0.17	29.2	13.9
	EBR	A	0.14	7.6	5.5	A	0.52	8.5	15.1
	WBL	A	0.31	28.8	15.0	A	0.39	35.0	20.8
	WBT/R	A	0.34	24.1	17.9	A	0.35	30.1	23.4
	NB	A	0.15	5.2	16.9	A	0.22	5.3	20.6
	SB	A	0.09	5.2	9.2	A	0.20	5.5	18.4
	Overall	B	0.18	11.4	-	B	0.26	13.3	-
St. Joseph Boulevard & Place d'Orléans Drive / Duford Drive Signalized	EBL	A	0.30	15.5	21.3	A	0.46	23.1	#58.4
	EBT/R	A	0.15	14.8	31.3	B	0.66	26.2	#186.7
	WBL	A	0.02	14.1	5.5	A	0.07	17.5	6.7
	WBT/R	A	0.56	23.8	#140.3	A	0.55	29.7	#90.4
	NBL	A	0.53	54.8	32.6	A	0.42	53.3	24.4
	NBT/R	A	0.48	41.0	39.5	A	0.38	40.0	25.2
	SBL	A	0.32	51.9	18.3	D	0.83	66.7	#80.8
	SBT	A	0.20	39.1	15.7	A	0.35	36.3	32.1
	SBR	A	0.11	0.7	0.0	A	0.16	0.8	0.0
	Overall	C	0.58	25.7	-	C	0.70	31.6	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
St. Joseph Boulevard & Prestone Drive <i>Signalized</i>	EBL	A	0.02	6.2	2.3	A	0.05	5.8	4.4
	EBT	A	0.09	5.1	11.8	A	0.43	7.2	48.3
	EBR	A	0.04	2.4	3.7	A	0.12	1.6	5.4
	WBL	A	0.00	6.0	1.0	A	0.03	5.9	2.3
	WBT	A	0.35	6.2	48.0	A	0.26	5.9	25.7
	WBR	A	0.12	1.7	6.7	A	0.12	1.6	5.4
	NBL	A	0.36	29.5	20.0	A	0.26	27.3	15.6
	NBT/R	A	0.20	23.7	14.8	A	0.12	19.8	9.8
	SBL	A	0.30	28.0	17.1	A	0.57	36.6	31.0
	SBT/R	A	0.18	18.8	12.3	A	0.30	21.2	19.2
	Overall	A	0.38	9.0	-	A	0.46	9.4	-
Centrum Boulevard & Prestone Drive <i>Unsignalized</i>	EB	A	0.11	7.6	3.0	A	0.23	8.2	6.8
	WB	A	0.12	8.3	3.0	A	0.11	8.3	3.0
	NBL	A	0.22	9.7	6.0	A	0.18	9.6	4.5
	NBR	A	0.07	7.3	1.5	A	0.07	7.5	1.5
	Overall	A	-	8.5	-	A	-	8.5	-
Centrum Boulevard & Brisebois Crescent <i>Unsignalized</i>	EB	A	0.03	7.6	0.8	A	0.03	7.6	0.8
	WB	A	0.00	7.4	0.0	A	0.00	7.6	0.0
	NB	A	0.00	8.8	0.0	B	0.02	10.9	0.8
	SB	A	0.05	9.5	1.5	A	0.09	9.8	2.3
	Overall	A	-	2.3	-	A	-	2.7	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00

= queue exceeds storage or mid-block length

The 2029 future total intersection operations are similar to the 2029 future background conditions. No mitigation is recommended.

14.2.3 Network Intersection MMLOS

Table 22 summarizes the MMLOS analysis for the signalized network intersections. The existing and future conditions will be the same and are considered in one row. The analysis is based on the Official Plan designation of “within 600m of a rapid transit station” for all examined intersections. The MMLOS worksheets has been provided in Appendix H.

Table 22: Study Area Intersection MMLOS Analysis

Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
OR 174 & Place d'Orléans Drive	A	A	E	B	C	D	C	D	A	E
Centrum Boulevard & Place d'Orléans Drive	F	A	E	B	E	D	B	D	A	E
St. Joseph Boulevard & Place d'Orléans Drive / Duford Drive	F	A	F	B	F	D	D	D	B	E
St. Joseph Boulevard & Prestone Drive	F	A	F	B	D	D	C	D	A	E

The MMLOS targets for the pedestrian and bicycle LOS will not generally be met at the signalized network intersections. Typical with arterial roads, the pedestrian level of service is very limited due to the geometry of the

roadways. The intersection of OR 174 and Place d'Orléans Drive has a single, one-lane crossing on the east leg, and therefore meets the area target. Mixed flow conditions, vehicle speeds and left-turn configurations limit the bicycle level of service on the network intersections. The transit level of service is restricted by the delay at the signals and needs a reduction to 30 seconds or below to achieve the targets. Truck and auto levels of service are generally adequate and meet targets.

While the following treatments would not achieve pedestrian targets, the City should explore the removal of the right-turn configurations channels or conversion to smart channels and zebra pedestrian crossing markings would help improve the pedestrian environment at the study area intersections. Physically separated cycling facilities on all arterials and bike lanes elsewhere should be considered by the City to meet the bicycle targets and two-stage left-turn boxes should be considered where possible.

14.2.4 Design Elements

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

15 Summary of Improvements Indicated and Modification Options

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

Proposed Site and Screening

- The proposed site is a retirement home consisting of 397 dwelling units and is located across from Place d'Orléans Mall
- The site accesses Brisebois Crescent via a full-movement access and a drop-off loop
- The development is proposed to be completed as a single phase by 2024
- The Trip Generation, Location, and Safety triggers were all met through the TIA Screening
- The application for the proposed site is a Site Plan Application

Existing Conditions

- Place d'Orléans Drive (arterial), St. Joseph Boulevard (arterial), and Centrum Boulevard (collector) are the major study area roadways
- The study area roads have sidewalks on both sides of the arterials and collectors
- Place d'Orléans Drive is a local cycling route and St. Joseph Boulevard is a spine route
- The existing transit routes #33, 35, 37, 131, 232, and 234 service the site
- No operational issues are noted for the study area intersections

Development Generated Travel Demand

- The proposed development is forecasted to generate 103 people two-way trips during the AM peak and 127 people two-way trips during the PM peak
- Based on the proposed site-specific mode shares, a total of 46 two-way vehicle trips will be generated during the AM peak and 57 two-way vehicle trips during the PM peak
- The distribution of the site trips is estimated to be 0% to the north, 15% to the south, 5% to the east, and 80% to the west

Background Conditions

- Adjacent developments that have either been completed or are under construction have been accounted for in the existing and background conditions

- Growth on the study area transportation network is applied as 2.5% along mainline arterial volumes and 0.5% on collectors, with major turning movements grown at applicable rates
- The future background intersection operations are similar to the existing intersection operations with no new operational issues identified

Development Design

- The site provides hard surface connections to the surrounding pedestrian facilities and proposes a new sidewalk along Brisebois Crescent
- The drop-off loop provides access to emergency vehicles and trucks, no issues are noted for the access or garbage pickup

Parking

- The site provides 282 vehicle parking spaces for residents within two levels of underground parking and 21 vehicle parking spaces for visitors within a surface parking lot
- The parking provisions do not exceed the maximum provision rates for a TOD area
- 60 bicycle parking spaces are currently proposed, including 8 external spaces
- The provided parking is below the by-law-requirement but aligns with the site programming of comparative sites managed by the proponent

Boundary Street Design

- The proposed site's boundary streets are Place d'Orléans Drive, Centrum Boulevard and Brisebois Crescent
- The new 1.8 metre sidewalks on the frontage of Brisebois Crescent and Centrum Boulevard will improve the pedestrian LOS on the boundary streets
- The City should review the LRT Stage 2 MUP along Place d'Orleans Drive to ensure it best meets the pedestrian LOS targets

Access Intersection Design

- The future total access intersection operations are satisfactory, and no mitigation is recommended
- The proposed full-movement site access is stop-controlled on the minor approach and the drop-off loop outlet is stop-controlled

TDM

- Mode shares used in analysis are representative of the transit context, demographics, and the site's commercial-adjacent context
- Place d'Orléans station will be part of the Confederation Line in Stage 2 LRT
- Additional supportive TDM measures include:
 - Designate an internal program coordinator
 - Posting of pedestrian, cycling, and transit information and maps at primary entrances/exits
 - Unbundle parking from rental costs
 - Provide a multimodal travel option information package to new residents
 - Inclusion of a 1-year Presto card for first time new apartment rental, with a set time frame for this offer (e.g. 6-months) from the initial opening of the site

Transit

- The forecasted transit trips will include 36 two-way trips during the AM peak and 44 two-way trips during the PM peak
- The forecasted trips will represent a ridership increase of no more than two additional trips per bus per route
- No undue transit impacts are expected from driveways or site-generated ridership increases

Network Intersection Design

- The future total intersection operations are similar to the background intersection operations
- No improvements for the study area intersection are required to support the proposed development
- The MMLOS targets for pedestrians, bicycles and transit largely cannot be met due to the nature of arterial roadways at signalized network intersections
- Improvements by the City to address existing pedestrian crossing types, pocket bike lanes, two-stage left-turn boxes could be explored

16 Conclusion

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

Prepared By:



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Transportation Engineering-Intern

Reviewed By:



Andrew Harte, P.Eng.
Senior Transportation Engineer

Appendix A

TIA Screening Form and PM Certification Form

City of Ottawa 2017 TIA Guidelines
Step 1 - Screening Form

Date: 14-Nov-19
Project Number: 2019-75
Project Reference: 211 Centrum

1.1 Description of Proposed Development	
Municipal Address	211 Centrum Blvd
Description of Location	ON 1 (OS) PT LOT 37 PLAN;50R-6837 PARTS 1 & 2
Land Use Classification	Mixed-Use Centre (MC14[1520] S152 & MC[2180])
Development Size	Two 15 storey buildings connected by a 1-4 storey podium
Accesses	One access Centrum Blvd., Two accesses Brisebois
Phase of Development	One phase
Buildout Year	2024
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger	
Land Use Type	Townhomes or apartments
Development Size	399 Units
Trip Generation Trigger	Yes

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

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



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.

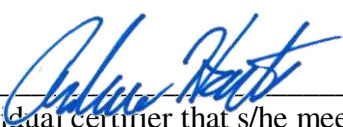
City Of Ottawa
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Dated at Ottawa this 20 day of September, 2018.
(City)

Name: Andrew Harte
(Please Print)

Professional Title: Professional Engineer



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

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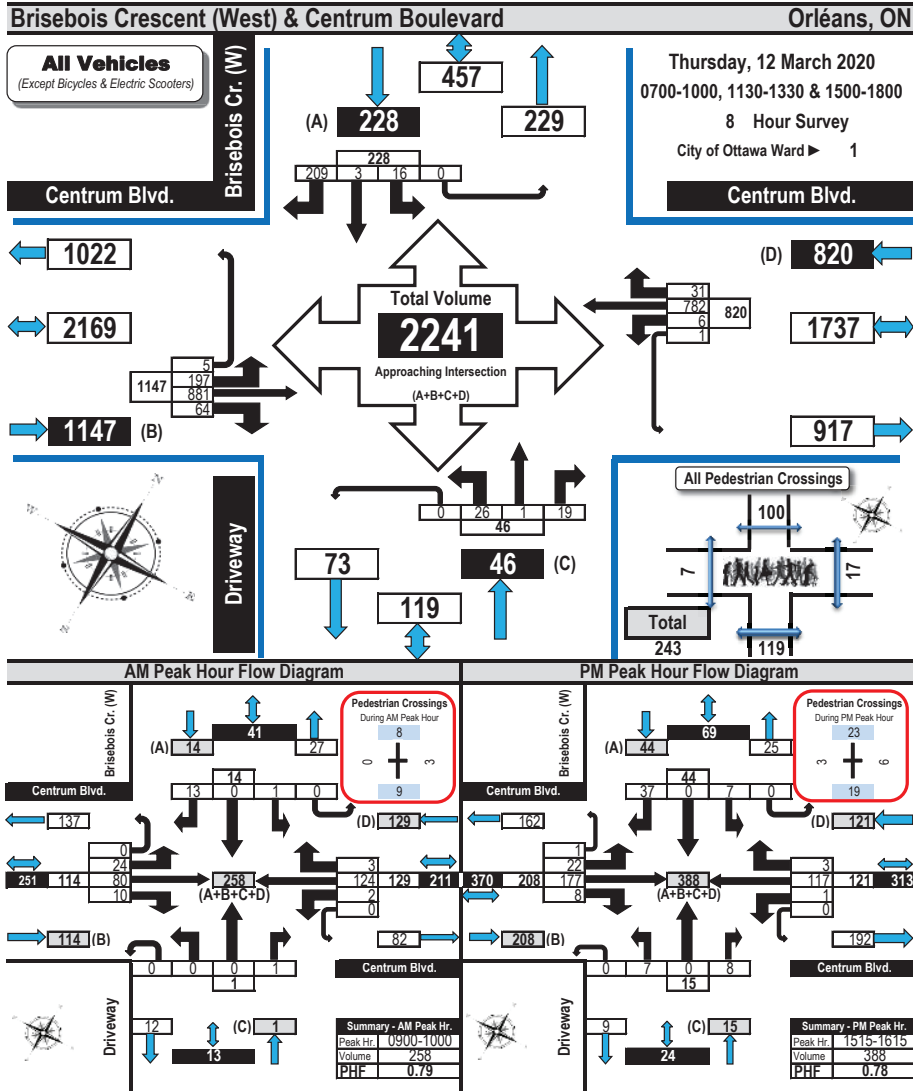
Appendix B

Turning Movement Counts



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



Printed on: 3/19/2020

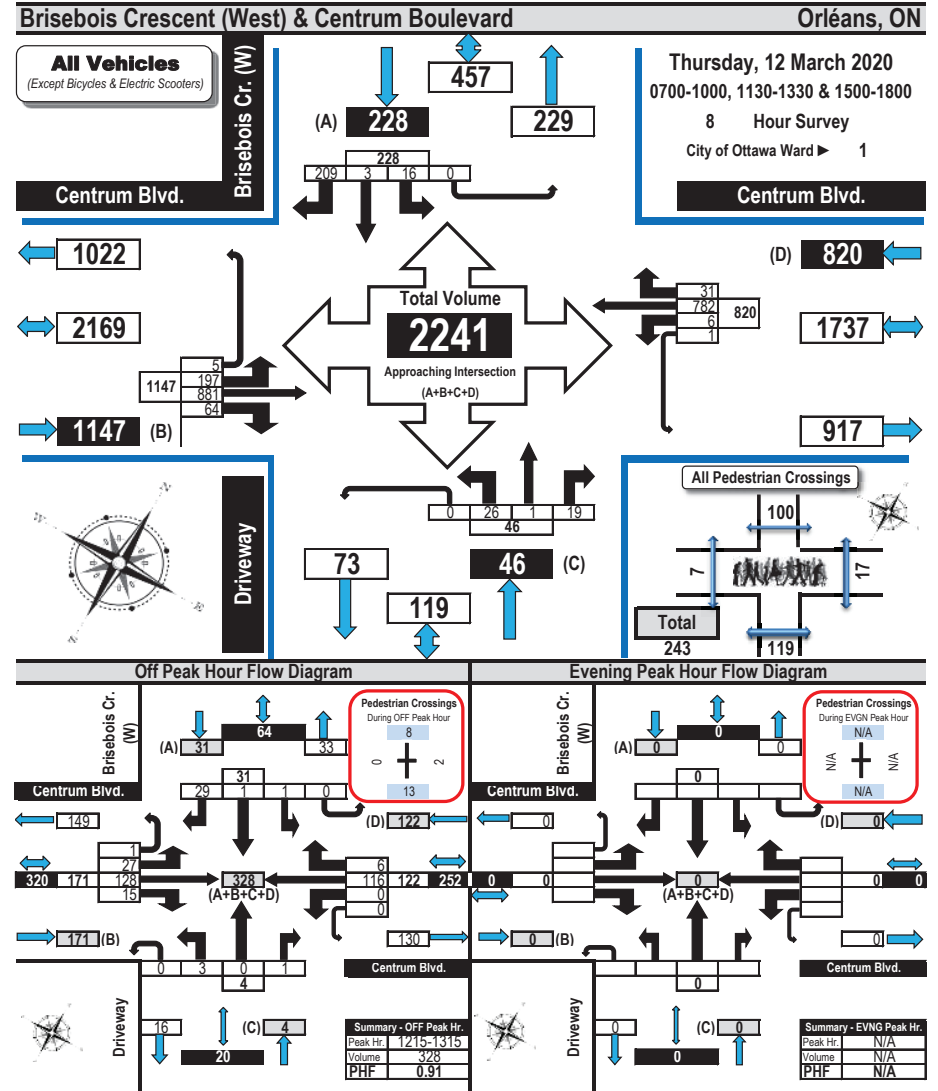
Prepared by: thetrafficsspecialist@gmail.com

Flow Diagrams: AM PM Peak



Turning Movement Count Summary, OFF and EVENING Peak Hour Flow Diagrams

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



Printed on: 3/19/2020

Prepared by: thetrafficsspecialist@gmail.com

Flow Diagrams: OFF Peak

Brisebois Crescent (West) & Centrum Boulevard

Orléans, ON

Survey Date: Thursday, 12 March 2020

Start Time:

0700

AADT Factor: 1.0

Weather AM: Cloudy -2° C

Survey Duration:

8 Hrs.

Survey Hours:

0700-1000, 1130-1330 & 1500-1800

Weather PM: Partly Cloudy +1° C

Surveyor(s): T. Carmody

Time Period	Centrum Blvd.					Centrum Blvd.					Driveway					Brisebois Cr. (W)							
	Eastbound					Westbound					Northbound					Southbound							
	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Tot	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Tot	Grand Total
0700-0800	30	28	0	0	58	0	56	6	0	62	120	0	1	0	0	1	2	0	19	0	21	22	142
0800-0900	29	66	10	1	106	2	95	2	0	99	205	1	0	1	0	2	0	1	23	0	24	26	239
0900-1000	24	80	10	0	114	2	124	3	0	129	243	0	0	1	0	1	1	0	13	0	14	15	258
1000-1230	16	105	11	2	134	0	90	4	0	94	228	8	0	3	0	11	1	0	38	0	39	50	278
1230-1330	31	122	16	0	169	0	123	5	0	128	297	2	0	2	0	4	1	1	23	0	25	29	326
1500-1600	23	155	8	1	187	1	113	1	0	115	302	5	0	5	0	10	3	0	28	0	31	41	343
1600-1700	16	159	2	0	177	0	94	8	0	102	279	9	0	7	0	16	7	1	38	0	46	62	341
1700-1800	28	166	7	1	202	1	87	2	1	91	293	1	0	0	0	1	1	0	27	0	28	29	322
Totals	197	881	64	5	1147	6	782	31	1	820	1967	26	1	19	0	46	16	3	209	0	228	274	2241

**Equivalent 12 & 24-hour Vehicle Volumes Including the Annual Average Daily Traffic (AADT) Factor
Applicable to the Day and Month of the Turning Movement Count**

Expansion factors are applied exclusively to standard weekday 8-hour turning movement counts conducted during the hours of 0700h - 1000h, 1130h - 1330h and 1500h - 1800h

Equivalent 12-hour vehicle volumes. These volumes are calculated by multiplying the 8-hour totals by the 8 $\rightarrow$ 12 expansion factor of 1.39

Equ. 12 Hr	274	1225	89	7	1594	8	1087	43	1	1140	2734	36	1	26	0	64	22	4	291	0	317	381	3115
------------	-----	------	----	---	------	---	------	----	---	------	------	----	---	----	---	----	----	---	-----	---	-----	-----	------

Average daily 12-hour vehicle volumes. These volumes are calculated by multiplying the equivalent 12-hour totals by the AADT factor of: 1.0

AADT 12-hr	274	1225	89	7	1594	8	1087	43	1	1140	2734	36	1	26	0	64	22	4	291	0	317	381	3115
------------	-----	------	----	---	------	---	------	----	---	------	------	----	---	----	---	----	----	---	-----	---	-----	-----	------

24-Hour AADT. These volumes are calculated by multiplying the average daily 12-hour vehicle volumes by the 12 to 24 expansion factor of 1.31

AADT 24 Hr	359	1604	117	9	2089	11	1424	56	2	1493	3582	47	2	35	0	84	29	5	381	0	415	499	4081
------------	-----	------	-----	---	------	----	------	----	---	------	------	----	---	----	---	----	----	---	-----	---	-----	-----	------

AADT and expansion factors provided by the City of Ottawa

AM Peak Hour Factor ➡ 0.79											Highest Hourly Vehicle Volume Between 0700h & 1000h												
AM Peak Hr	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT			
0900-1000	24	80	10	0	114	2	124	3	0	129	243	0	0	1	0	1	1	0	13	0	14	15	258
OFF Peak Hour Factor ➡ 0.91											Highest Hourly Vehicle Volume Between 1130h & 1330h												
OFF Peak Hr	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT			
1215-1315	27	128	15	1	171	0	116	6	0	122	293	3	0	1	0	4	1	1	29	0	31	35	328
PM Peak Hour Factor ➡ 0.78											Highest Hourly Vehicle Volume Between 1500h & 1800h												
PM Peak Hr	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT			
1515-1615	22	177	8	1	208	1	117	3	0	121	329	7	0	8	0	15	7	0	37	0	44	59	388

Comments:

OC Transpo buses and school buses comprise the majority of the heavy vehicle traffic.

Notes:

1. Includes all vehicle types except bicycles, electric bicycles, and electric scooters.
2. When expansion and AADT factors are applied, the results will differ slightly due to rounding.



Turning Movement Count Pedestrian Crossings Summary and Flow Diagram



Brisebois Crescent (West) & Centrum Boulevard

Orléans, ON

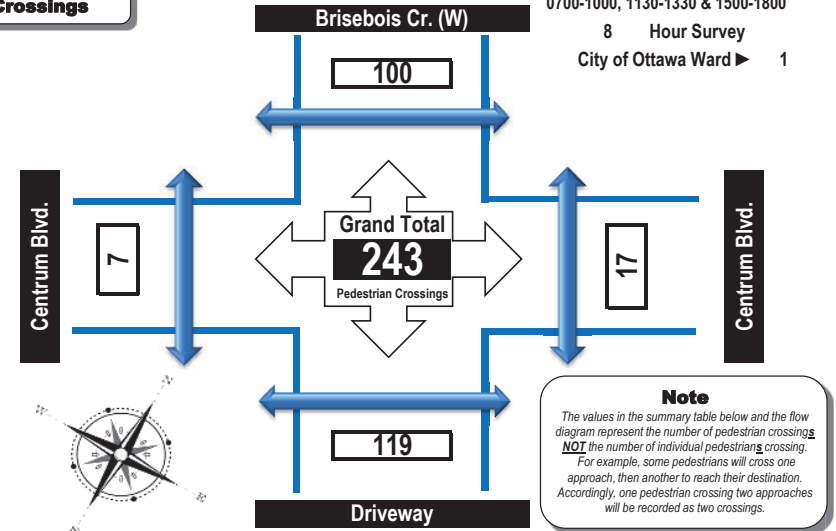
Pedestrian Crossings

Thursday, 12 March 2020

0700-1000, 1130-1330 & 1500-1800

8 Hour Survey

City of Ottawa Ward ► 1



Time Period	West Side Crossing Centrum Blvd.	East Side Crossing Centrum Blvd.	Street Total	South Side Crossing Driveway	North Side Crossing Brisebois Cr. (W)	Street Total	Grand Total
0700-0800	1	2	3	8	3	11	14
0800-0900	0	0	0	11	8	19	19
0900-1000	0	3	3	9	8	17	20
1130-1230	1	0	1	16	13	29	30
1230-1330	1	2	3	16	7	23	26
1500-1600	2	6	8	22	30	52	60
1600-1700	2	1	3	14	18	32	35
1700-1800	0	3	3	23	13	36	39
Totals	7	17	24	119	100	219	243

Comments:

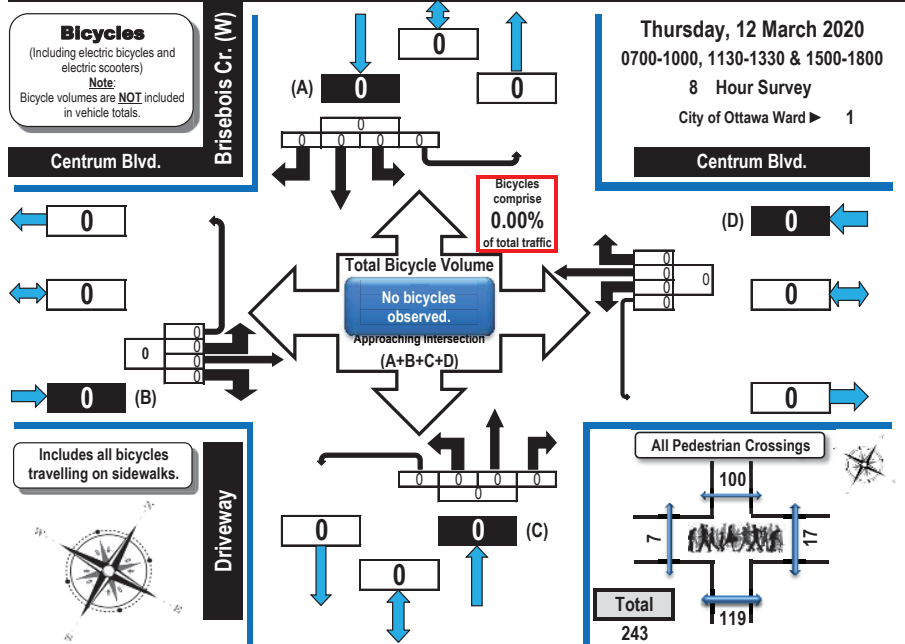
OC Transpo buses and school buses comprise the majority of the heavy vehicle traffic.



Turning Movement Count Bicycle Summary Flow Diagram



Brisebois Crescent (West) & Centrum Boulevard Orléans, ON



Time Period	Centrum Blvd. Eastbound					Centrum Blvd. Westbound					Driveway Northbound					Brisebois Cr. (W) Southbound					S. Tot	G. Tot
	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot		
0700-0800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0800-0900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0900-1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1130-1230	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1230-1330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500-1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700-1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

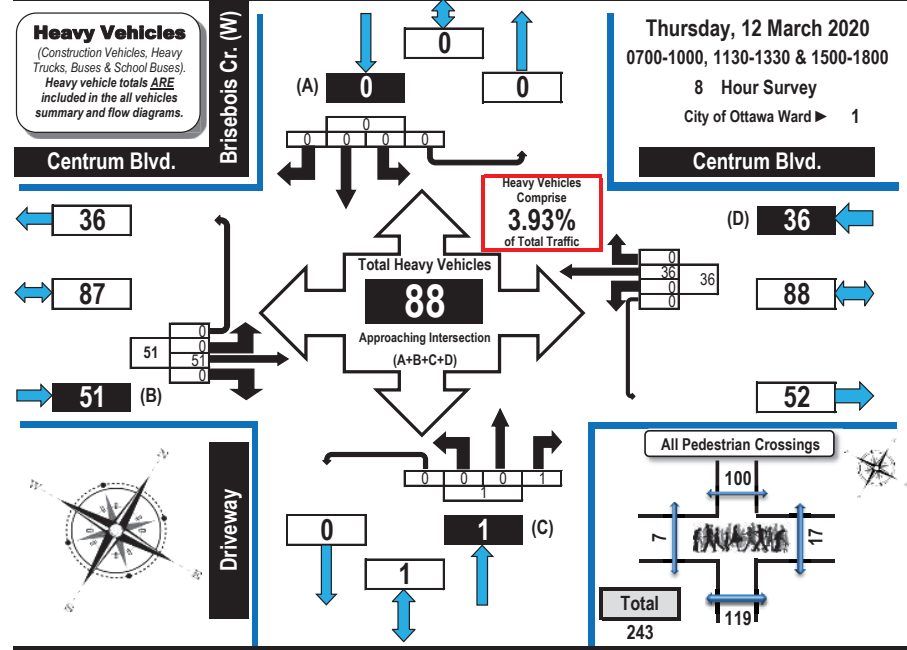
Comments:
OC Transpo buses and school buses comprise the majority of the heavy vehicle traffic.



Turning Movement Count Heavy Vehicle Summary Flow Diagram



Brisebois Crescent (West) & Centrum Boulevard Orléans, ON



Time Period	Centrum Blvd. Eastbound					Centrum Blvd. Westbound					Driveway Northbound					Brisebois Cr. (W) Southbound					S. Tot	G. Tot
	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot		
0700-0800	0	8	0	0	8	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	9
0800-0900	0	12	0	0	12	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	14
0900-1000	0	4	0	0	4	0	4	0	0	4	0	0	1	0	1	0	0	0	0	0	0	9
1130-1230	0	6	0	0	6	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	11
1230-1330	0	4	0	0	4	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	8
1500-1600	0	5	0	0	5	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	11
1600-1700	0	7	0	0	7	0	9	0	0	9	0	0	0	0	0	0	0	0	0	0	0	16
1700-1800	0	5	0	0	5	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	10
Totals	0	51	0	0	51	0	36	0	0	36	0	0	1	0	1	0	0	0	0	0	0	88

Comments:
OC Transpo buses and school buses comprise the majority of the heavy vehicle traffic.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CENTRUM BLVD @ PRESTONE DR

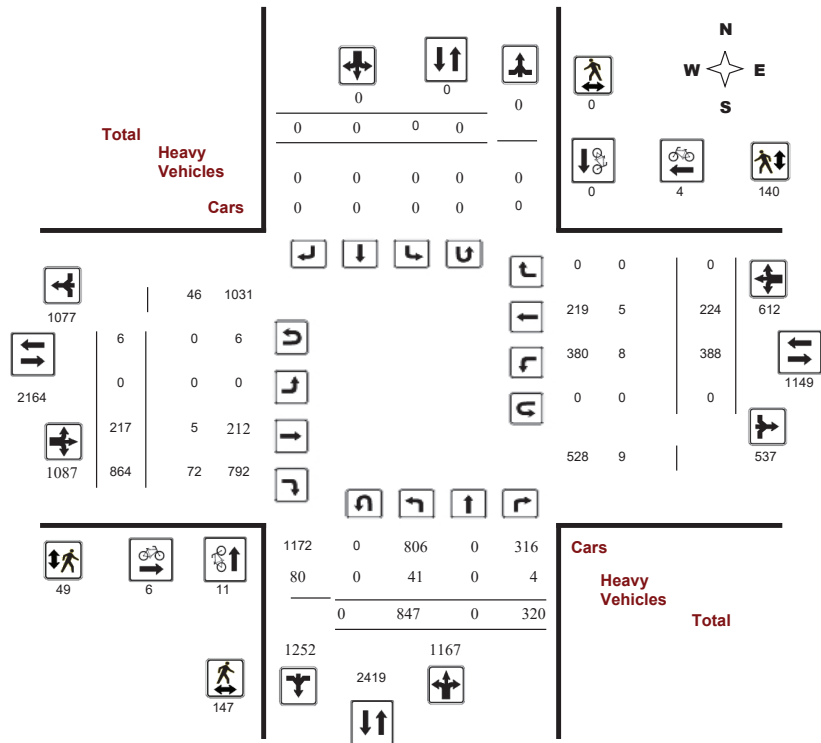
Survey Date: Friday, July 04, 2014

Start Time: 07:00

WO No: 29204

Device: Miovision

Full Study Diagram



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CENTRUM BLVD @ PRESTONE DR

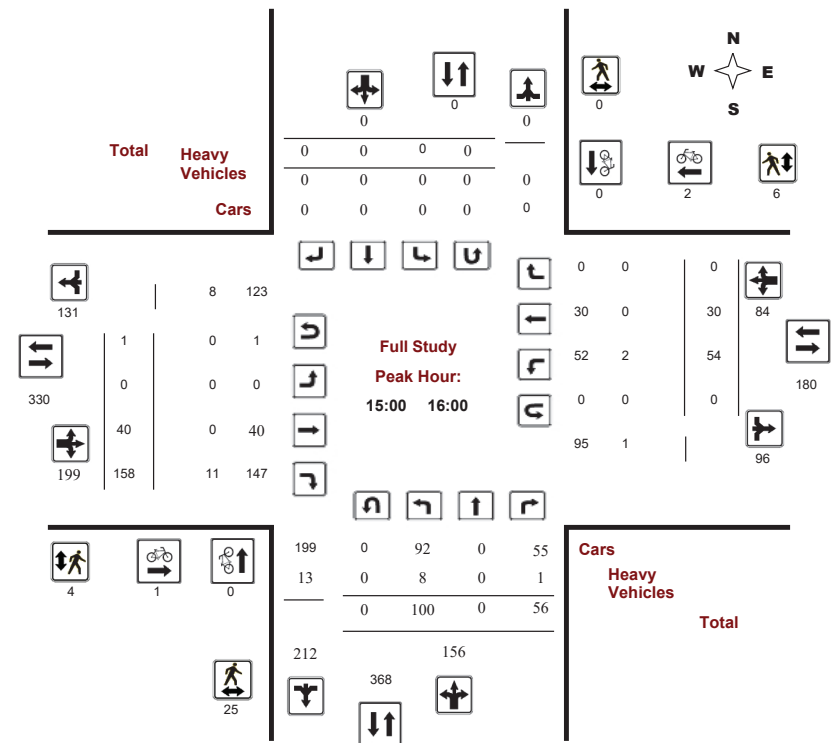
Survey Date: Friday, July 04, 2014

Start Time: 07:00

WO No: 29204

Device: Miovision

Full Study Peak Hour Diagram





Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

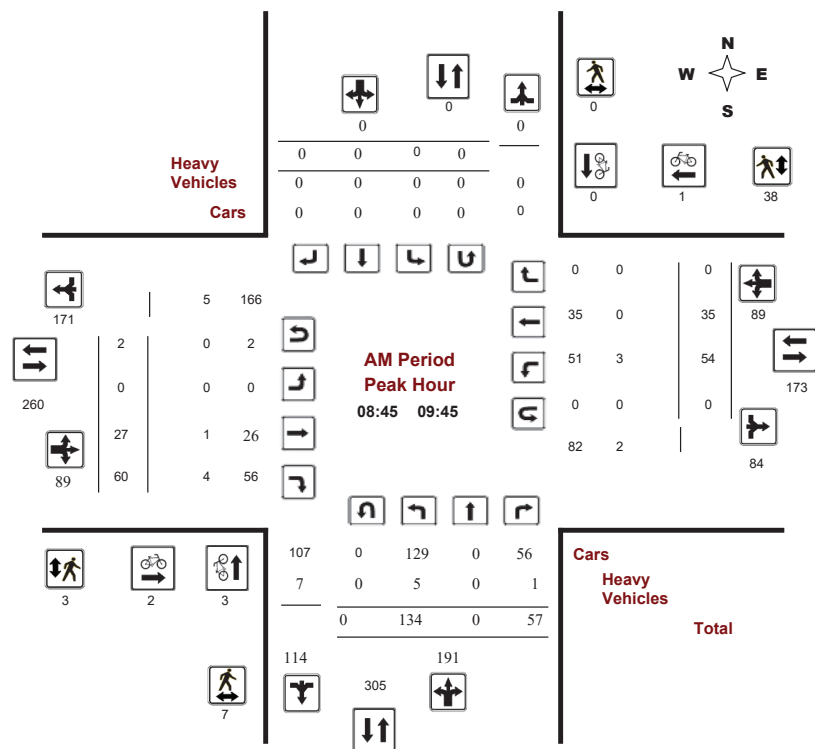
CENTRUM BLVD @ PRESTONE DR

Survey Date: Friday, July 04, 2014

Start Time: 07:00

WO No: 29204

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

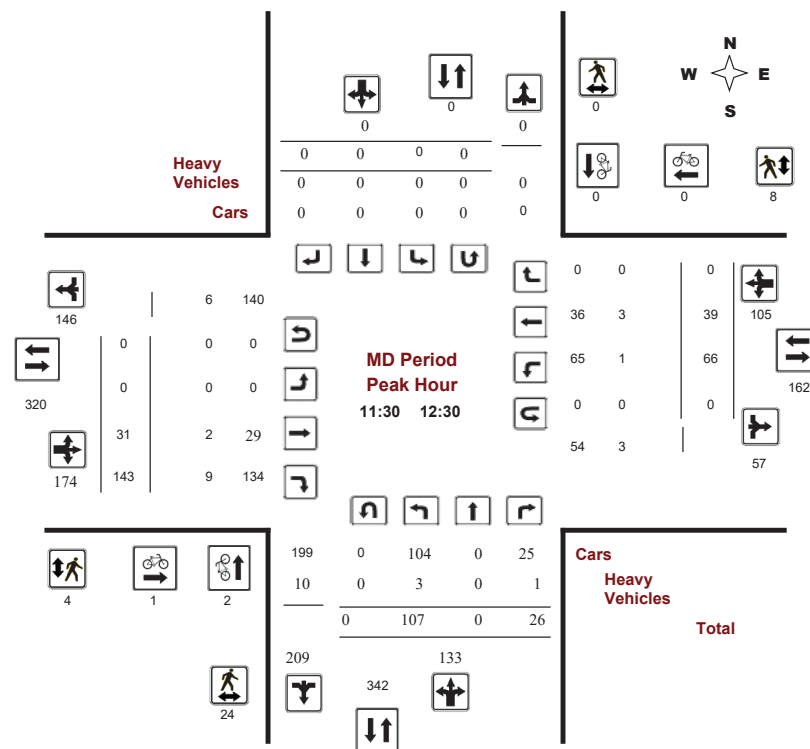
CENTRUM BLVD @ PRESTONE DR

Survey Date: Friday, July 04, 2014

Start Time: 07:00

WO No: 29204

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

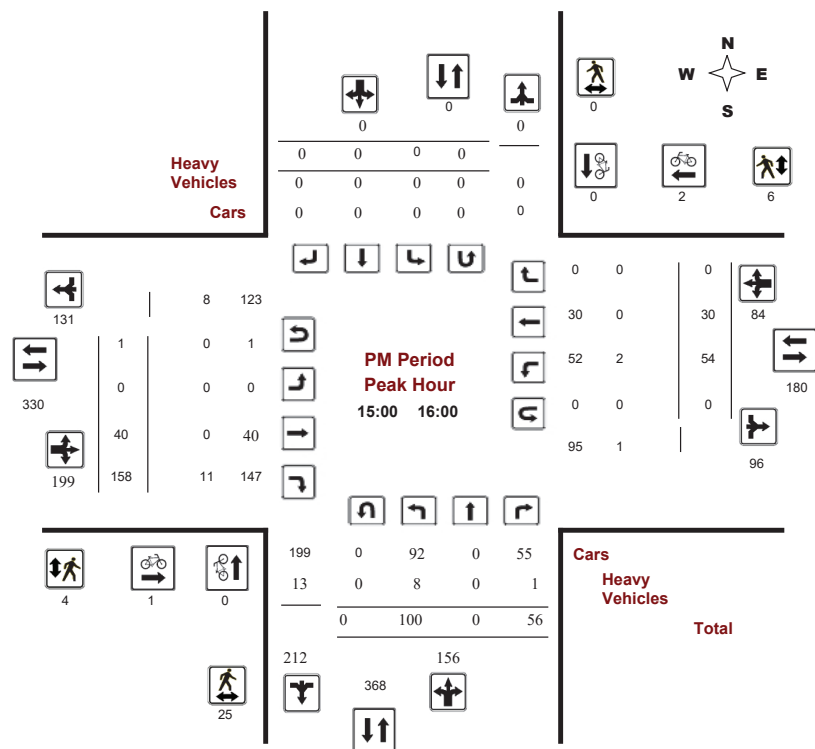
CENTRUM BLVD @ PRESTONE DR

Survey Date: Friday, July 04, 2014

Start Time: 07:00

WO No: 29204

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CENTRUM BLVD @ PRESTONE DR

Survey Date: Friday, July 04, 2014

Start Time: 07:00

WO No: 29204

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Friday, July 04, 2014

Total Observed U-Turns

AADT Factor

Northbound: 0 Southbound: 0
Eastbound: 6 Westbound: 0

1.25

Period	Northbound				Southbound				Eastbound				Westbound				STR TOT	Grand Total
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT		
07:00 08:00	81	0	35	116	0	0	0	0	116	0	17	30	47	33	28	0	61	224
08:00 09:00	127	0	59	186	0	0	0	0	186	0	20	43	63	37	22	0	59	308
09:00 10:00	123	0	44	167	0	0	0	0	167	0	31	75	106	60	31	0	91	364
11:30 12:30	107	0	26	133	0	0	0	0	133	0	31	143	174	66	39	0	105	412
12:30 13:30	107	0	33	140	0	0	0	0	140	0	20	137	157	37	34	0	71	368
15:00 16:00	100	0	56	156	0	0	0	0	156	0	40	158	198	54	30	0	84	438
16:00 17:00	111	0	34	145	0	0	0	0	145	0	30	162	192	61	25	0	86	423
17:00 18:00	91	0	33	124	0	0	0	0	124	0	28	116	144	40	15	0	55	323
Sub Total	847	0	320	1167	0	0	0	0	1167	0	217	864	1081	388	224	0	612	2860
U Turns				0				0	0			6				0	6	6
Total	847	0	320	1167	0	0	0	0	1167	0	217	864	1087	388	224	0	612	2866
EQ 12Hr	1177	0	445	1622	0	0	0	0	1622	0	302	1201	1511	539	311	0	851	3984
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																		1.39
AVG 12Hr	1060	0	400	1460	0	0	0	0	1460	0	271	1081	1360	485	280	0	766	3586
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																		0.9
AVG 24Hr	1388	0	524	1912	0	0	0	0	1912	0	356	1416	1781	636	367	0	1003	4696
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																		1.31
Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.																		



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CENTRUM BLVD @ PRESTONE DR

Survey Date: Friday, July 04, 2014

WO No: 29204

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

		Northbound				Southbound				Eastbound				Westbound						
Time Period		LT	ST	RT	TOT	LT	ST	RT	TOT	STR TOT	LT	ST	RT	TOT	LT	ST	RT	TOT	STR TOT	Grand Total
07:00	07:15	11	0	2	13	0	0	0	0	27	0	4	8	12	6	4	0	10	27	35
07:15	07:30	18	0	10	28	0	0	0	0	42	0	3	7	10	7	10	0	17	42	55
07:30	07:45	33	0	10	43	0	0	0	0	63	0	8	9	17	11	5	0	16	63	76
07:45	08:00	19	0	13	32	0	0	0	0	47	0	2	6	8	9	9	0	18	47	58
08:00	08:15	31	0	9	40	0	0	0	0	61	0	2	15	17	6	5	0	11	61	68
08:15	08:30	29	0	15	44	0	0	0	0	59	0	7	8	15	7	4	0	11	59	70
08:30	08:45	32	0	13	45	0	0	0	0	67	0	5	11	17	11	3	0	14	67	76
08:45	09:00	35	0	22	57	0	0	0	0	79	0	6	9	16	13	10	0	23	79	96
09:00	09:15	23	0	8	31	0	0	0	0	63	0	6	18	25	14	6	0	20	63	76
09:15	09:30	32	0	9	41	0	0	0	0	72	0	5	19	24	12	11	0	23	72	88
09:30	09:45	44	0	18	62	0	0	0	0	91	0	10	14	24	15	8	0	23	91	109
09:45	10:00	24	0	9	33	0	0	0	0	76	0	10	24	34	19	6	0	25	76	92
11:30	11:45	21	0	8	29	0	0	0	0	86	0	9	35	44	22	8	0	30	86	103
11:45	12:00	31	0	5	36	0	0	0	0	82	0	6	36	42	10	8	0	18	82	96
12:00	12:15	30	0	9	39	0	0	0	0	85	0	8	28	36	18	11	0	29	85	104
12:15	12:30	25	0	4	29	0	0	0	0	89	0	8	44	52	16	12	0	28	89	109
12:30	12:45	28	0	8	36	0	0	0	0	72	0	7	27	34	9	8	0	17	72	87
12:45	13:00	29	0	7	36	0	0	0	0	87	0	4	39	43	12	13	0	25	87	104
13:00	13:15	28	0	10	38	0	0	0	0	79	0	3	33	38	8	6	0	14	79	90
13:15	13:30	22	0	8	30	0	0	0	0	76	0	6	38	44	8	7	0	15	76	89
15:00	15:15	33	0	13	46	0	0	0	0	97	0	9	33	43	18	2	0	20	97	109
15:15	15:30	28	0	15	43	0	0	0	0	100	0	11	47	58	10	12	0	22	100	123
15:30	15:45	18	0	11	29	0	0	0	0	75	0	9	34	43	12	9	0	21	75	93
15:45	16:00	21	0	17	38	0	0	0	0	96	0	11	44	55	14	7	0	21	96	114
16:00	16:15	23	0	7	30	0	0	0	0	96	0	5	43	48	23	3	0	26	96	104
16:15	16:30	26	0	8	34	0	0	0	0	83	0	7	39	46	10	8	0	18	83	98
16:30	16:45	25	0	7	32	0	0	0	0	92	0	10	46	56	14	9	0	23	92	111
16:45	17:00	37	0	12	49	0	0	0	0	97	0	8	34	42	14	5	0	19	97	110
17:00	17:15	26	0	12	38	0	0	0	0	86	0	9	34	43	14	4	0	18	86	99
17:15	17:30	20	0	8	28	0	0	0	0	68	0	7	34	41	6	9	0	15	68	84
17:30	17:45	14	0	4	18	0	0	0	0	54	0	5	27	32	9	1	0	10	54	60
17:45	18:00	31	0	9	40	0	0	0	0	72	0	7	21	28	11	1	0	12	72	80
Total:		847	0	320	1167	0	0	0	0	2419	0	217	864	1087	388	224	0	612	2419	2,866

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CENTRUM BLVD @ PRESTONE DR

Survey Date: Friday, July 04, 2014

WO No: 29204

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	2	0	2	0	0	2
07:15	07:30	2	0	2	0	0	2
07:30	07:45	0	0	0	0	0	0
07:45	08:00	0	0	0	0	0	0
08:00	08:15	0	0	0	0	0	0
08:15	08:30	1	0	1	1	1	2
08:30	08:45	0	0	0	0	0	0
08:45	09:00	1	0	1	1	1	2
09:00	09:15	1	0	1	0	1	2
09:15	09:30	0	0	1	0	1	1
09:30	09:45	1	0	1	0	0	1
09:45	10:00	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0
11:45	12:00	0	0	1	0	1	1
12:00	12:15	1	0	1	0	0	1
12:15	12:30	1	0	1	0	0	1
12:30	12:45	1	0	1	0	0	1
12:45	13:00	0	0	0	0	0	0
13:00	13:15	0	0	0	0	0	0
13:15	13:30	0	0	0	0	0	0
15:00	15:15	0	0	0	1	1	1
15:15	15:30	0	0	0	0	0	0
15:30	15:45	0	0	1	1	2	2
15:45	16:00	0	0	0	0	0	0
16:00	16:15	0	0	1	0	1	1
16:15	16:30	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0
16:45	17:00	0	0	1	0	1	1
17:00	17:15	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0
Total		11	0	11	4	10	21



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CENTRUM BLVD @ PRESTONE DR

Survey Date: Friday, July 04, 2014

WO No: 29204

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	3	0	3	0	2	2	5
07:15 07:30	2	0	2	0	4	4	6
07:30 07:45	3	0	3	0	11	11	14
07:45 08:00	1	0	1	2	7	9	10
08:00 08:15	1	0	1	0	2	2	3
08:15 08:30	3	0	3	0	3	3	6
08:30 08:45	1	0	1	5	5	10	11
08:45 09:00	1	0	1	0	9	9	10
09:00 09:15	2	0	2	1	12	13	15
09:15 09:30	3	0	3	1	11	12	15
09:30 09:45	1	0	1	1	6	7	8
09:45 10:00	6	0	6	0	4	4	10
11:30 11:45	13	0	13	1	3	4	17
11:45 12:00	3	0	3	1	0	1	4
12:00 12:15	4	0	4	2	2	4	8
12:15 12:30	4	0	4	0	3	3	7
12:30 12:45	6	0	6	0	3	3	9
12:45 13:00	12	0	12	2	3	5	17
13:00 13:15	8	0	8	1	10	11	19
13:15 13:30	11	0	11	1	0	1	12
15:00 15:15	7	0	7	0	0	0	7
15:15 15:30	12	0	12	0	3	3	15
15:30 15:45	4	0	4	1	2	3	7
15:45 16:00	2	0	2	3	1	4	6
16:00 16:15	7	0	7	5	3	8	15
16:15 16:30	1	0	1	2	2	4	5
16:30 16:45	6	0	6	4	4	8	14
16:45 17:00	7	0	7	2	5	7	14
17:00 17:15	2	0	2	4	3	7	9
17:15 17:30	0	0	0	7	5	12	12
17:30 17:45	9	0	9	0	2	2	11
17:45 18:00	2	0	2	3	10	13	15
Total	147	0	147	49	140	189	336



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CENTRUM BLVD @ PRESTONE DR

Survey Date: Friday, July 04, 2014

WO No: 29204

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

Time Period	Northbound				Southbound				Eastbound				Westbound				Grand Total			
	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT		W TOT	STR TOT	
07:00	07:15	1	0	0	4	0	0	0	0	4	0	1	3	5	0	0	0	1	6	5
07:15	07:30	0	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	1	1
07:30	07:45	2	0	0	4	0	0	0	0	4	0	0	2	4	0	0	0	0	4	4
07:45	08:00	2	0	0	6	0	0	0	0	6	0	0	3	5	1	0	0	1	6	6
08:00	08:15	1	0	0	2	0	0	0	0	2	0	0	1	3	0	1	0	1	4	3
08:15	08:30	2	0	0	5	0	0	0	0	5	0	0	3	5	0	0	0	0	5	5
08:30	08:45	1	0	0	4	0	0	0	0	4	0	0	3	4	0	0	0	0	4	4
08:45	09:00	3	0	0	4	0	0	0	0	4	0	0	1	4	0	0	0	0	4	4
09:00	09:15	0	0	0	2	0	0	0	0	2	0	0	2	2	0	0	0	0	2	2
09:15	09:30	1	0	1	4	0	0	0	0	4	0	1	1	3	1	0	0	3	6	5
09:30	09:45	1	0	0	3	0	0	0	0	3	0	0	0	1	2	0	0	2	3	3
09:45	10:00	0	0	0	3	0	0	0	0	3	0	0	3	3	0	0	0	0	3	3
11:30	11:45	1	0	0	3	0	0	0	0	3	0	0	2	4	0	1	0	1	5	4
11:45	12:00	1	0	0	2	0	0	0	0	2	0	1	1	4	0	1	0	2	6	4
12:00	12:15	1	0	1	5	0	0	0	0	5	0	1	2	5	1	1	0	4	9	7
12:15	12:30	0	0	0	4	0	0	0	0	4	0	0	4	4	0	0	0	0	4	4
12:30	12:45	1	0	0	2	0	0	0	0	2	0	0	1	2	0	0	0	0	2	2
12:45	13:00	1	0	0	2	0	0	0	0	2	0	0	1	2	0	0	0	0	2	2
13:00	13:15	1	0	1	3	0	0	0	0	3	0	0	1	2	0	0	0	1	3	3
13:15	13:30	1	0	0	4	0	0	0	0	4	0	0	3	4	0	0	0	0	4	4
15:00	15:15	1	0	0	4	0	0	0	0	4	0	0	2	3	1	0	0	1	4	4
15:15	15:30	1	0	1	6	0	0	0	0	6	0	0	3	4	1	0	0	2	6	6
15:30	15:45	2	0	0	5	0	0	0	0	5	0	0	3	5	0	0	0	0	5	5
15:45	16:00	4	0	0	7	0	0	0	0	7	0	0	3	7	0	0	0	0	7	7
16:00	16:15	1	0	0	4	0	0	0	0	4	0	0	3	4	0	0	0	0	4	4
16:15	16:30	2	0	0	4	0	0	0	0	4	0	0	2	4	0	0	0	0	4	4
16:30	16:45	1	0	0	3	0	0	0	0	3	0	0	2	3	0	0	0	0	3	3
16:45	17:00	2	0	0	6	0	0	0	0	6	0	0	4	6	0	0	0	0	6	6
17:00	17:15	0	0	0	3	0	0	0	0	3	0	0	3	4	0	1	0	1	5	4
17:15	17:30	2	0	0	5	0	0	0	0	5	0	0	3	5	0	0	0	0	5	5
17:30	17:45	1	0	0	4	0	0	0	0	4	0	0	3	4	0	0	0	0	4	4
17:45	18:00	3	0	0	7	0	0	0	0	7	0	1	3	7	1	0	0	2	9	8
Total: None		41	0	4	125	0	0	0	0	125	0	5	72	123	8	5	0	22	145	135



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CENTRUM BLVD @ PRESTONE DR

Survey Date: Friday, July 04, 2014

WO No: 29204

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	1	0	1
08:45	09:00	0	0	1	0	1
09:00	09:15	0	0	1	0	1
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	2	0	2
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	1	0	1
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		0	0	6	0	6



Transportation Services - Traffic Services

Turning Movement Count - Study Results

OR174 IC102 RAMP15 @ PLACE D'ORLEANS DR

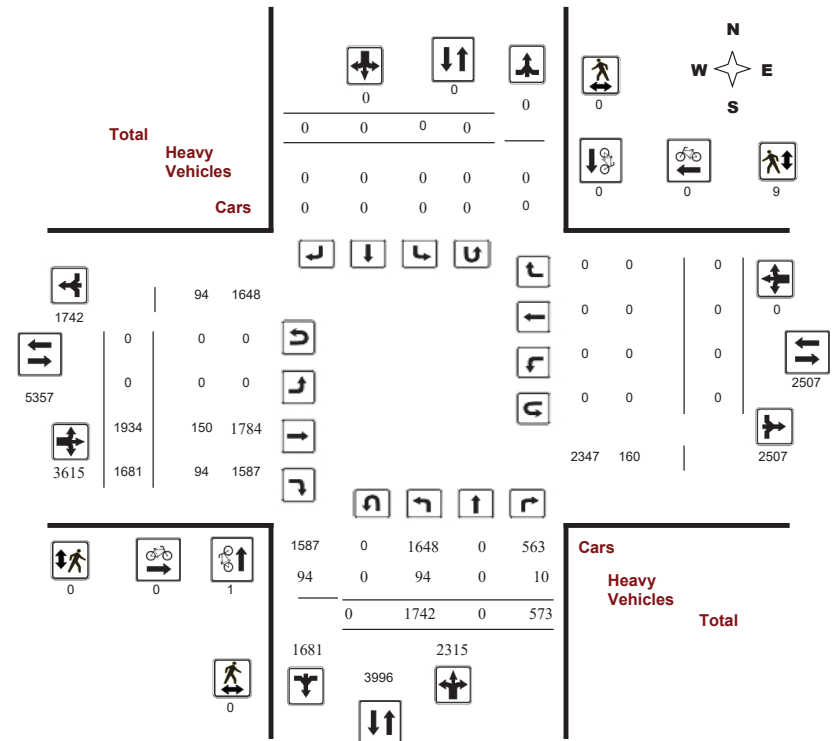
Survey Date: Wednesday, February 21, 2018

WO No: 37542

Start Time: 07:00

Device: Miovision

Full Study Diagram





Transportation Services - Traffic Services

Turning Movement Count - Study Results

OR174 IC102 RAMP15 @ PLACE D'ORLEANS DR

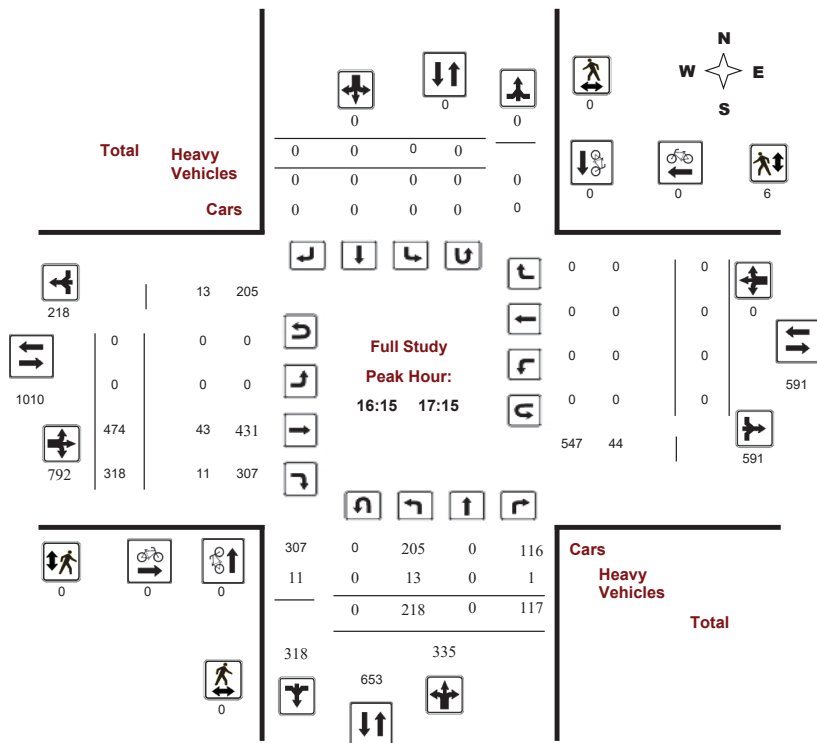
Survey Date: Wednesday, February 21, 2018

WO No: 37542

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

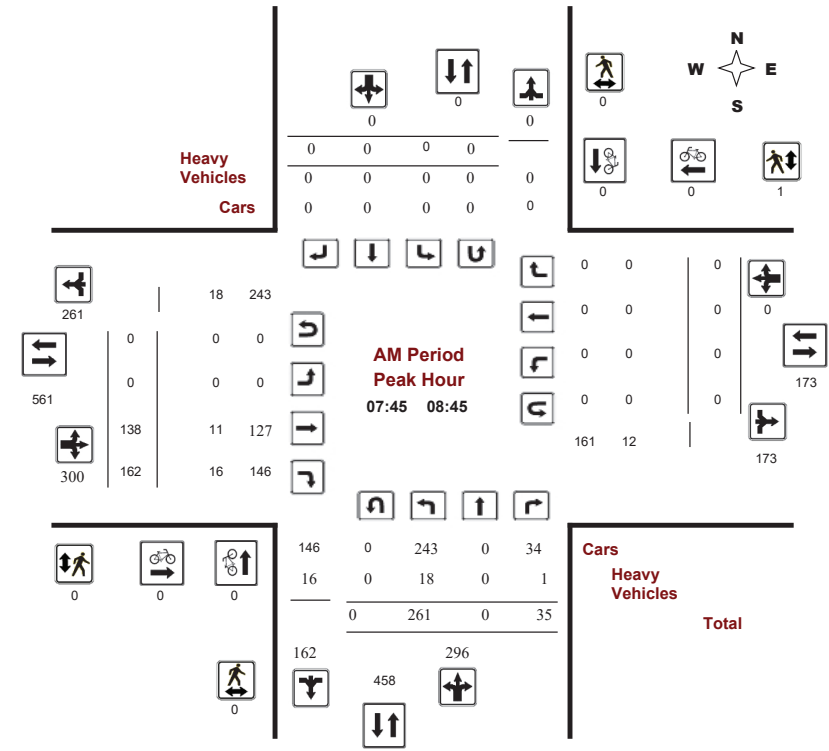
OR174 IC102 RAMP15 @ PLACE D'ORLEANS DR

Survey Date: Wednesday, February 21, 2018

WO No: 37542

Start Time: 07:00

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

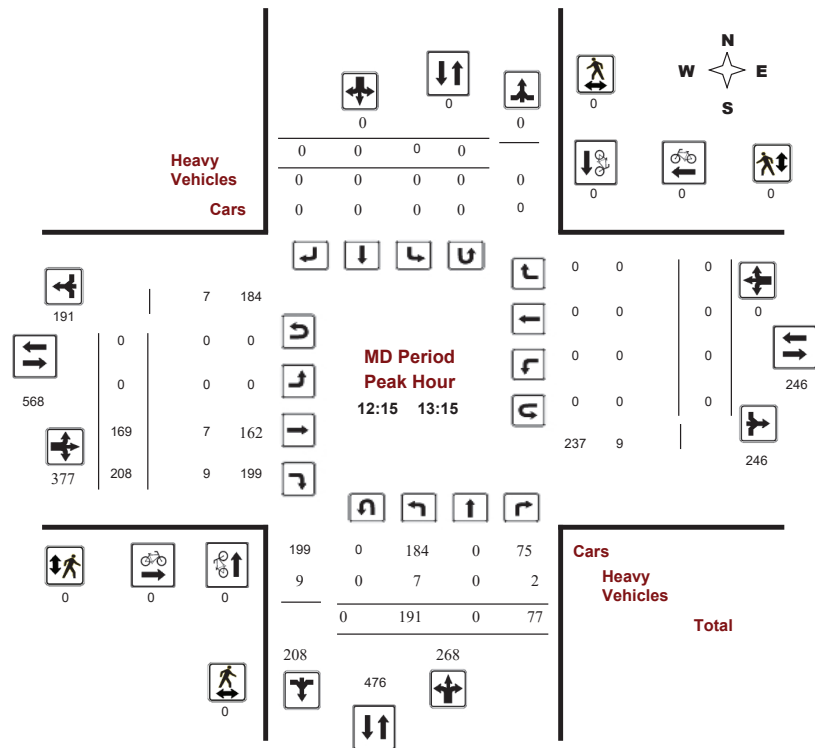
OR174 IC102 RAMP15 @ PLACE D'ORLEANS DR

Survey Date: Wednesday, February 21, 2018

Start Time: 07:00

WO No: 37542

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

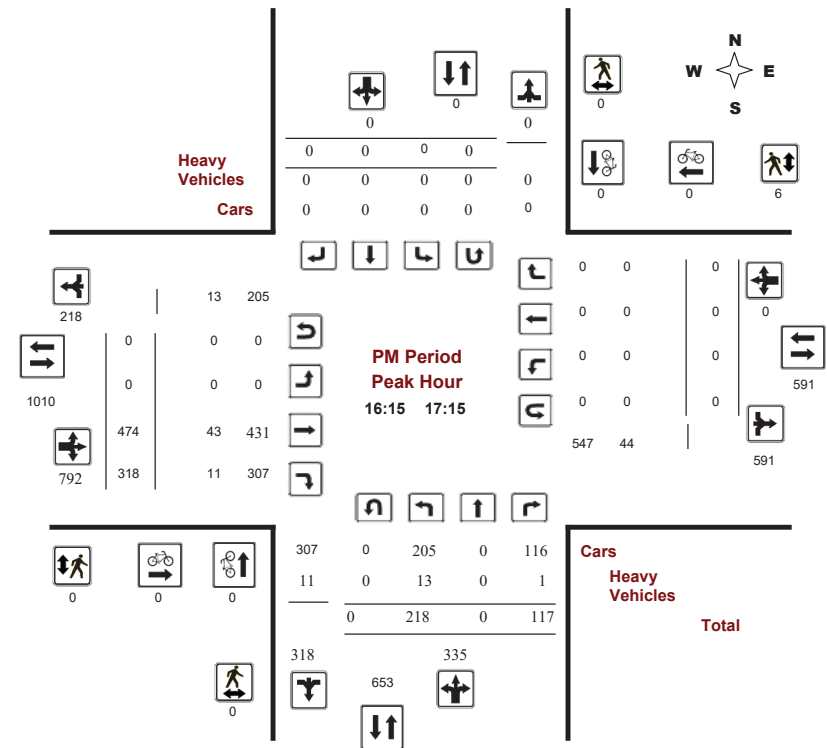
OR174 IC102 RAMP15 @ PLACE D'ORLEANS DR

Survey Date: Wednesday, February 21, 2018

Start Time: 07:00

WO No: 37542

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Study Results

OR174 IC102 RAMP15 @ PLACE D'ORLEANS DR

Survey Date: Wednesday, February 21, 2018

WO No: 37542

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, February 21, 2018

Total Observed U-Turns

AADT Factor

Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 0

1.39

Period	Northbound				Southbound				Eastbound				Westbound				STR TOT	Grand Total
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT		
07:00 08:00	235	0	25	260	0	0	0	0	260	0	127	102	229	0	0	0	229	489
08:00 09:00	246	0	37	283	0	0	0	0	283	0	126	178	304	0	0	0	304	587
09:00 10:00	204	0	46	250	0	0	0	0	250	0	120	173	293	0	0	0	293	543
11:30 12:30	192	0	64	256	0	0	0	0	256	0	157	171	328	0	0	0	328	584
12:30 13:30	182	0	76	258	0	0	0	0	258	0	170	199	369	0	0	0	369	627
15:00 16:00	210	0	102	312	0	0	0	0	312	0	390	267	657	0	0	0	657	969
16:00 17:00	226	0	122	348	0	0	0	0	348	0	472	286	758	0	0	0	758	1106
17:00 18:00	247	0	101	348	0	0	0	0	348	0	372	305	677	0	0	0	677	1025
Sub Total	1742	0	573	2315	0	0	0	0	2315	0	1934	1681	3615	0	0	0	3615	5930
U Turns				0				0	0				0			0	0	0
Total	1742	0	573	2315	0	0	0	0	2315	0	1934	1681	3615	0	0	0	3615	5930
EQ 12Hr	2421	0	796	3218	0	0	0	0	3218	0	2688	2337	5025	0	0	0	5025	8243
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																		
																	1.39	
AVG 12Hr	2421	0	796	3218	0	0	0	0	3218	0	2688	2337	5025	0	0	0	5025	8243
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																		
																	1	
AVG 24Hr	3172	0	1043	4215	0	0	0	0	4215	0	3522	3061	6583	0	0	0	6583	10798
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																		
																	1.31	
Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.																		



Transportation Services - Traffic Services

Turning Movement Count - Study Results

OR174 IC102 RAMP15 @ PLACE D'ORLEANS DR

Survey Date: Wednesday, February 21, 2018

WO No: 37542

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

Time Period	Northbound				Southbound				Eastbound				Westbound				STR TOT	Grand Total
	LT	ST	RT	N TOT	LT	ST	RT	S TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT		
07:00 07:15	54	0	3	57	0	0	0	0	86	0	19	29	48	0	0	0	86	105
07:15 07:30	62	0	5	67	0	0	0	0	91	0	31	24	55	0	0	0	91	122
07:30 07:45	54	0	10	64	0	0	0	0	87	0	40	23	63	0	0	0	87	127
07:45 08:00	65	0	7	72	0	0	0	0	98	0	37	26	63	0	0	0	98	135
08:00 08:15	62	0	10	72	0	0	0	0	122	0	38	50	88	0	0	0	122	160
08:15 08:30	61	0	11	72	0	0	0	0	112	0	27	40	67	0	0	0	112	139
08:30 08:45	73	0	7	80	0	0	0	0	126	0	36	46	82	0	0	0	126	162
08:45 09:00	50	0	9	59	0	0	0	0	101	0	25	42	67	0	0	0	101	126
09:00 09:15	59	0	14	73	0	0	0	0	131	0	28	58	86	0	0	0	131	159
09:15 09:30	48	0	9	57	0	0	0	0	93	0	26	36	62	0	0	0	93	119
09:30 09:45	51	0	9	60	0	0	0	0	95	0	36	35	71	0	0	0	95	131
09:45 10:00	46	0	14	60	0	0	0	0	104	0	30	44	74	0	0	0	104	134
11:30 11:45	59	0	18	77	0	0	0	0	123	0	42	46	88	0	0	0	123	165
11:45 12:00	47	0	12	59	0	0	0	0	107	0	40	48	88	0	0	0	107	147
12:00 12:15	38	0	16	54	0	0	0	0	81	0	35	27	62	0	0	0	81	116
12:15 12:30	48	0	18	66	0	0	0	0	116	0	40	50	90	0	0	0	116	156
12:30 12:45	48	0	15	63	0	0	0	0	119	0	38	56	94	0	0	0	119	157
12:45 13:00	51	0	24	75	0	0	0	0	127	0	43	52	95	0	0	0	127	170
13:00 13:15	44	0	20	64	0	0	0	0	114	0	48	50	98	0	0	0	114	162
13:15 13:30	39	0	17	56	0	0	0	0	97	0	41	41	82	0	0	0	97	138
15:00 15:15	58	0	21	79	0	0	0	0	138	0	69	59	128	0	0	0	138	207
15:15 15:30	51	0	25	76	0	0	0	0	140	0	66	64	130	0	0	0	140	206
15:30 15:45	53	0	26	79	0	0	0	0	155	0	131	76	207	0	0	0	155	286
15:45 16:00	48	0	30	78	0	0	0	0	146	0	124	68	192	0	0	0	146	270
16:00 16:15	63	0	39	102	0	0	0	0	166	0	115	64	179	0	0	0	166	281
16:15 16:30	53	0	24	77	0	0	0	0	161	0	108	84	192	0	0	0	161	269
16:30 16:45	52	0	34	86	0	0	0	0	153	0	116	67	183	0	0	0	153	269
16:45 17:00	58	0	25	83	0	0	0	0	154	0	133	71	204	0	0	0	154	287
17:00 17:15	55	0	34	89	0	0	0	0	185	0	117	96	213	0	0	0	185	302
17:15 17:30	73	0	21	94	0	0	0	0	160	0	99	66	165	0	0	0	160	259
17:30 17:45	64	0	30	94	0	0	0	0	166	0	80	72	152	0	0	0	166	246
17:45 18:00	55	0	16	71	0	0	0	0	142	0	76	71	147	0	0	0	142	218
Total:	1742	0	573	2315	0	0	0	0	3996	0	1934	1681	3615	0	0	0	3996	5,930

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

OR174 IC102 RAMP15 @ PLACE D'ORLEANS DR

Survey Date: Wednesday, February 21, 2018

WO No: 37542

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

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



Transportation Services - Traffic Services

Turning Movement Count - Study Results

OR174 IC102 RAMP15 @ PLACE D'ORLEANS DR

Survey Date: Wednesday, February 21, 2018

WO No: 37542

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	0	0	0	1	1	1
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	0	0	0	1	1	1
08:00 08:15	0	0	0	0	0	0	0
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	0	0	0	0	0	0
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	0	0	0	0	0	0
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	0	0	0	0	0	0	0
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	0	0	0	0	0	0	0
15:00 15:15	0	0	0	0	0	0	0
15:15 15:30	0	0	0	0	0	0	0
15:30 15:45	0	0	0	0	0	0	0
15:45 16:00	0	0	0	0	0	0	0
16:00 16:15	0	0	0	0	0	0	0
16:15 16:30	0	0	0	0	0	0	0
16:30 16:45	0	0	0	0	6	6	6
16:45 17:00	0	0	0	0	0	0	0
17:00 17:15	0	0	0	0	0	0	0
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	1	1	1
Total	0	0	0	0	9	9	9



Transportation Services - Traffic Services

Turning Movement Count - Study Results

OR174 IC102 RAMP15 @ PLACE D'ORLEANS DR

Survey Date: Wednesday, February 21, 2018

WO No: 37542

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

		Northbound			Southbound			Eastbound			Westbound									
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	3	0	0	7	0	0	0	0	7	0	4	4	11	0	0	0	4	15	11
07:15	07:30	2	0	0	5	0	0	0	0	5	0	2	3	7	0	0	0	2	9	7
07:30	07:45	6	0	0	8	0	0	0	0	8	0	4	2	12	0	0	0	4	16	12
07:45	08:00	4	0	0	6	0	0	0	0	6	0	3	2	9	0	0	0	3	12	9
08:00	08:15	5	0	0	10	0	0	0	0	10	0	2	5	12	0	0	0	2	14	12
08:15	08:30	3	0	1	11	0	0	0	0	11	0	2	7	12	0	0	0	3	15	13
08:30	08:45	6	0	0	8	0	0	0	0	8	0	4	2	12	0	0	0	4	16	12
08:45	09:00	2	0	0	6	0	0	0	0	6	0	3	4	9	0	0	0	3	12	9
09:00	09:15	4	0	1	7	0	0	0	0	7	0	4	2	10	0	0	0	5	15	11
09:15	09:30	3	0	0	6	0	0	0	0	6	0	9	3	15	0	0	0	9	24	15
09:30	09:45	2	0	0	5	0	0	0	0	5	0	2	3	7	0	0	0	2	9	7
09:45	10:00	2	0	1	5	0	0	0	0	5	0	2	2	6	0	0	0	3	9	7
11:30	11:45	3	0	0	5	0	0	0	0	5	0	3	2	8	0	0	0	3	11	8
11:45	12:00	2	0	0	6	0	0	0	0	6	0	1	4	7	0	0	0	1	8	7
12:00	12:15	2	0	2	6	0	0	0	0	6	0	1	2	5	0	0	0	3	8	7
12:15	12:30	1	0	0	2	0	0	0	0	2	0	1	1	3	0	0	0	1	4	3
12:30	12:45	2	0	0	6	0	0	0	0	6	0	3	4	9	0	0	0	3	12	9
12:45	13:00	1	0	1	5	0	0	0	0	5	0	2	3	6	0	0	0	3	9	7
13:00	13:15	3	0	1	5	0	0	0	0	5	0	1	1	5	0	0	0	2	7	6
13:15	13:30	2	0	0	4	0	0	0	0	4	0	3	2	7	0	0	0	3	10	7
15:00	15:15	1	0	0	4	0	0	0	0	4	0	4	3	8	0	0	0	4	12	8
15:15	15:30	2	0	1	6	0	0	0	0	6	0	1	3	6	0	0	0	2	8	7
15:30	15:45	4	0	0	7	0	0	0	0	7	0	9	3	16	0	0	0	9	25	16
15:45	16:00	2	0	0	7	0	0	0	0	7	0	14	5	21	0	0	0	14	35	21
16:00	16:15	9	0	1	12	0	0	0	0	12	0	5	2	16	0	0	0	6	22	17
16:15	16:30	4	0	0	6	0	0	0	0	6	0	8	2	14	0	0	0	8	22	14
16:30	16:45	2	0	0	5	0	0	0	0	5	0	15	3	20	0	0	0	15	35	20
16:45	17:00	3	0	1	6	0	0	0	0	6	0	8	2	13	0	0	0	9	22	14
17:00	17:15	4	0	0	8	0	0	0	0	8	0	12	4	20	0	0	0	12	32	20
17:15	17:30	2	0	0	5	0	0	0	0	5	0	7	3	12	0	0	0	7	19	12
17:30	17:45	2	0	0	4	0	0	0	0	4	0	6	2	10	0	0	0	6	16	10
17:45	18:00	1	0	0	5	0	0	0	0	5	0	5	4	10	0	0	0	5	15	10
Total:	None	94	0	10	198	0	0	0	0	198	0	150	94	338	0	0	0	160	498	348



Transportation Services - Traffic Services

Turning Movement Count - Study Results

OR174 IC102 RAMP15 @ PLACE D'ORLEANS DR

Survey Date: Wednesday, February 21, 2018

WO No: 37542

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
13:30	13:45	0	0	0	0	0
13:45	14:00	0	0	0	0	0
14:00	14:15	0	0	0	0	0
14:15	14:30	0	0	0	0	0
14:30	14:45	0	0	0	0	0
14:45	15:00	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		0	0	0	0	0



Transportation Services - Traffic Services

Turning Movement Count - Study Results

PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS

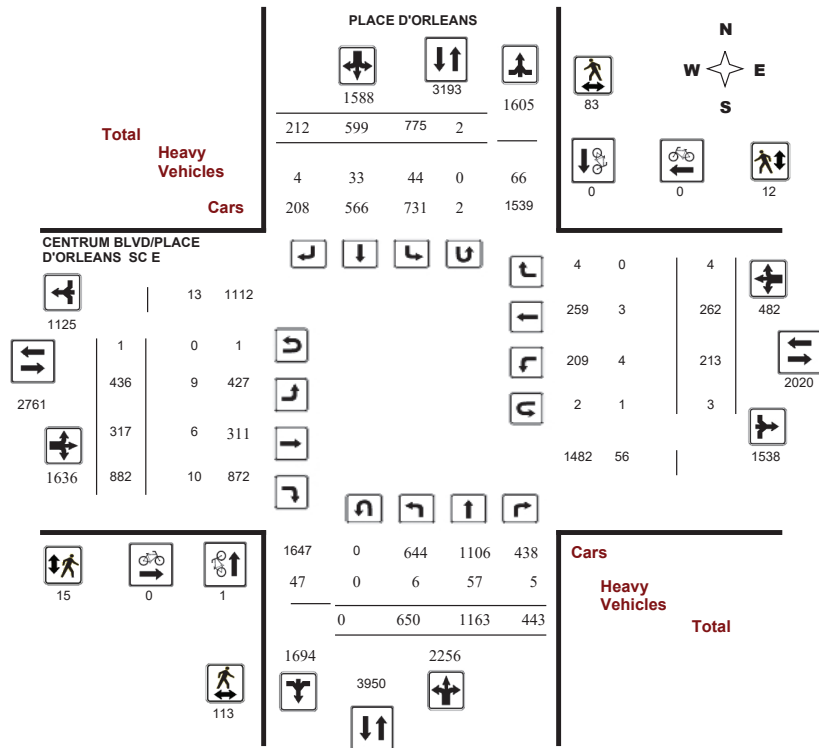
Survey Date: Thursday, January 31, 2019

WO No: 38321

Start Time: 07:00

Device: Miovision

Full Study Diagram



Transportation Services - Traffic Services

Turning Movement Count - Study Results

PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS

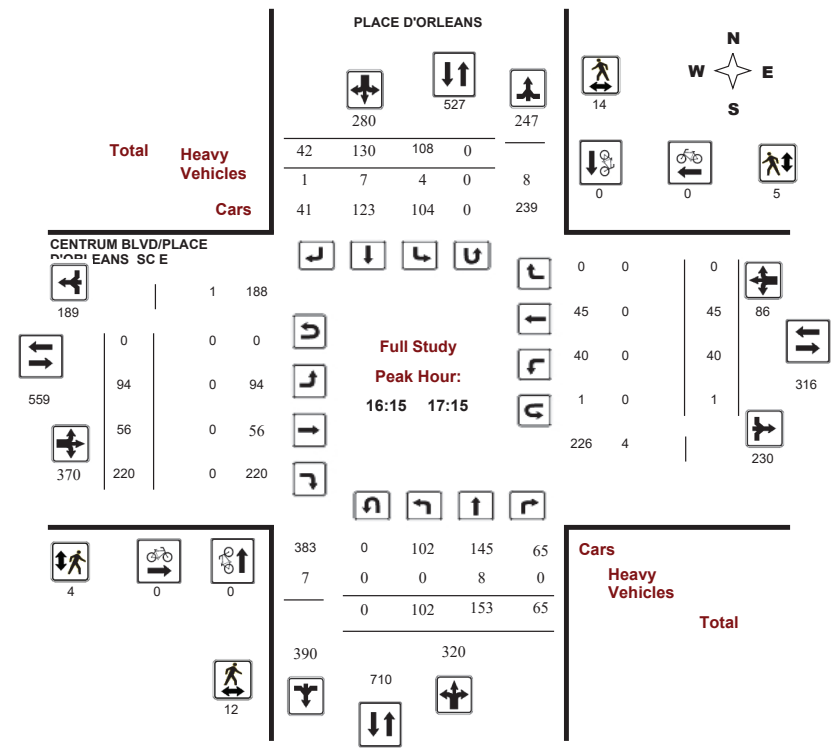
Survey Date: Thursday, January 31, 2019

WO No: 38321

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram





Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

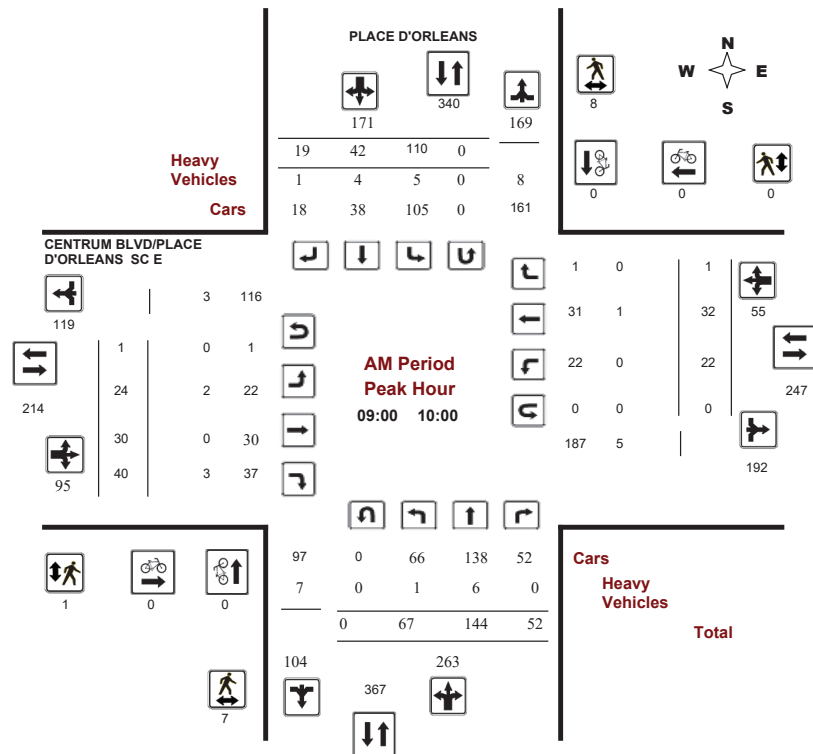
PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS

Survey Date: Thursday, January 31, 2019

Start Time: 07:00

WO No: 38321

Device: Miovision



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

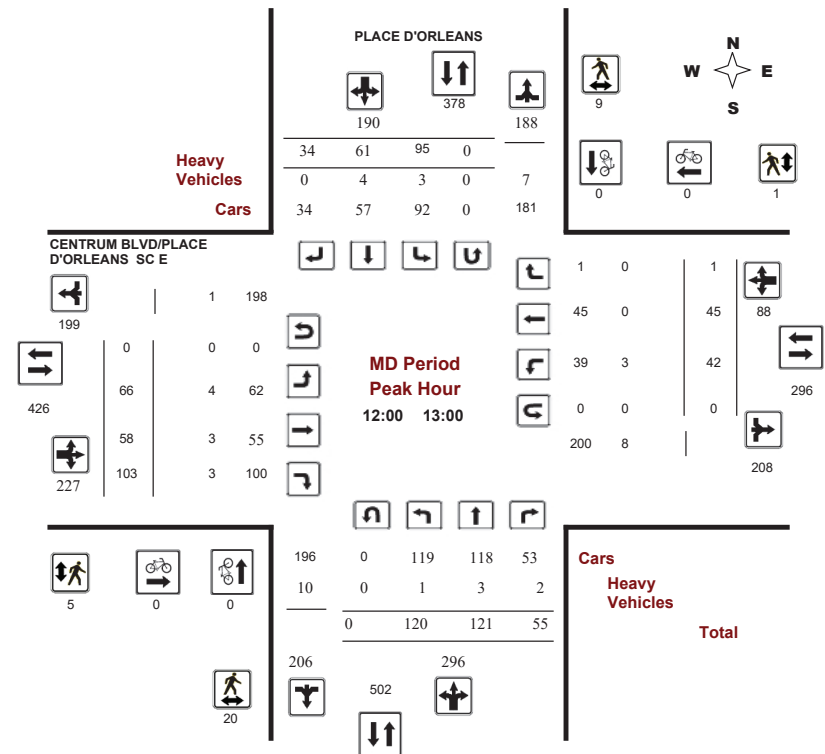
PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS

Survey Date: Thursday, January 31, 2019

Start Time: 07:00

WO No: 38321

Device: Miovision





Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

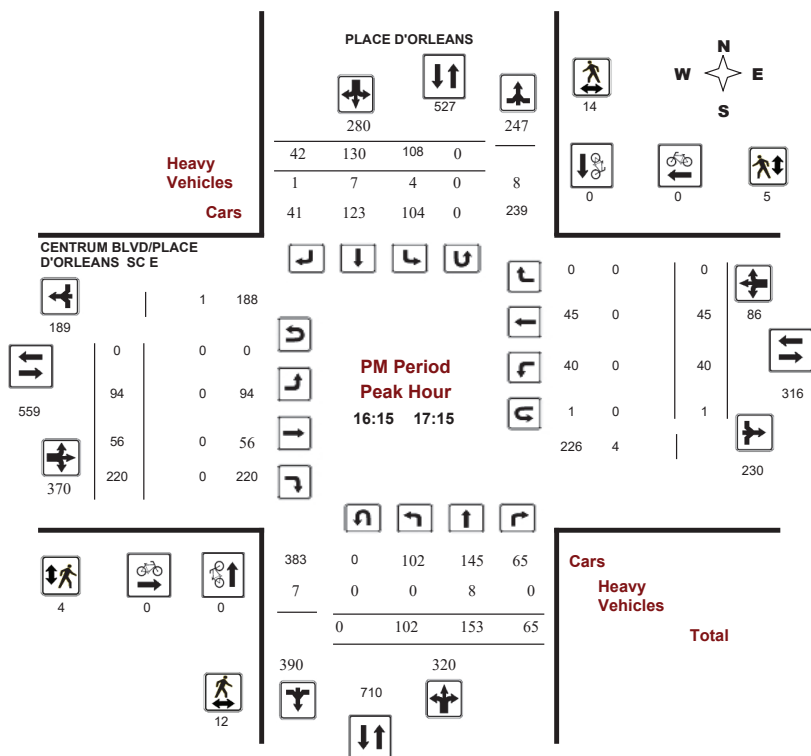
PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS

Survey Date: Thursday, January 31, 2019

Start Time: 07:00

WO No: 38321

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Study Results

PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS

Survey Date: Thursday, January 31, 2019

Start Time: 07:00

WO No: 38321

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Thursday, January 31, 2019

Total Observed U-Turns

AADT Factor

Northbound: 0 Southbound: 2
Eastbound: 1 Westbound: 3

1.39

PLACE D'ORLEANS										CENTRUM BLVD/PLACE D'ORLEANS SC E										
Northbound					Southbound					Eastbound					Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total	
07:00 08:00	38	182	24	244	35	47	7	89	333	4	6	15	25	12	5	0	17	42	375	
08:00 09:00	54	183	55	292	88	47	11	146	438	16	11	23	50	12	19	0	31	81	519	
09:00 10:00	67	144	52	263	110	42	19	171	434	24	30	40	94	22	32	1	55	149	583	
11:30 12:30	117	120	65	302	84	55	31	170	472	55	53	106	214	36	38	0	74	288	760	
12:30 13:30	97	105	48	250	94	60	26	180	430	74	54	103	231	29	48	1	78	309	739	
15:00 16:00	75	129	62	266	130	111	36	277	543	87	61	167	315	34	45	0	79	394	937	
16:00 17:00	108	156	60	324	114	128	46	288	612	81	53	202	336	43	47	1	91	427	1039	
17:00 18:00	94	144	77	315	120	109	36	265	580	95	49	226	370	25	28	1	54	424	1004	
Sub Total	650	1163	443	2256	775	599	212	1586	3842	436	317	882	1635	213	262	4	479	2114	5956	
U Turns				0				2	2				1				3	4	6	
Total	650	1163	443	2256	775	599	212	1588	3844	436	317	882	1636	213	262	4	482	2118	5962	
EQ 12Hr	903	1617	616	3136	1077	833	295	2207	5343	606	441	1226	2274	296	364	6	670	2944	8287	
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														1.39						
AVG 12Hr	903	1617	616	3136	1077	833	295	2207	5343	606	441	1226	2274	296	364	6	670	2944	8287	
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														1						
AVG 24Hr	1184	2118	807	4108	1411	1091	386	2892	7000	794	577	1606	2979	388	477	7	878	3857	10857	
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														1.31						
Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.																				



Transportation Services - Traffic Services

Turning Movement Count - Study Results

PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS

Survey Date: Thursday, January 31, 2019

WO No: 38321

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

PLACE D'ORLEANS													CENTRUM BLVD/PLACE D'ORLEANS SC E												
Northbound				Southbound				Eastbound				Westbound													
Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total						
07:00 07:15	8	45	4	57	7	7	0	16	136	0	0	5	5	4	2	0	6	136	84						
07:15 07:30	11	56	5	72	10	15	3	28	173	0	1	2	3	0	1	0	1	173	104						
07:30 07:45	9	38	4	51	4	11	1	16	126	1	2	5	8	4	1	0	6	126	81						
07:45 08:00	10	43	11	64	14	14	3	31	162	3	3	3	9	4	1	0	5	162	109						
08:00 08:15	14	59	9	82	16	15	4	35	197	3	1	3	7	0	0	0	0	197	124						
08:15 08:30	8	41	11	60	18	15	1	34	164	2	6	10	18	2	8	0	10	164	122						
08:30 08:45	14	40	20	74	31	8	2	41	175	3	3	5	11	4	2	0	6	175	132						
08:45 09:00	18	43	15	76	23	9	4	36	183	8	1	5	14	6	9	0	15	183	141						
09:00 09:15	21	35	12	68	22	11	5	38	168	5	3	6	14	5	2	0	7	168	127						
09:15 09:30	18	38	11	67	32	10	3	45	183	8	4	8	21	6	8	1	15	183	148						
09:30 09:45	16	39	18	73	21	13	5	39	187	5	10	12	27	6	4	0	10	187	149						
09:45 10:00	12	32	11	55	35	8	6	49	169	6	13	14	33	5	18	0	23	169	160						
11:30 11:45	25	28	17	70	21	10	5	36	187	12	9	26	47	5	5	0	11	187	164						
11:45 12:00	28	30	17	75	22	11	12	45	206	12	16	26	54	7	11	0	18	206	192						
12:00 12:15	40	30	12	82	16	19	7	42	227	16	9	28	53	10	15	0	25	227	202						
12:15 12:30	24	32	19	75	25	15	7	47	224	15	19	26	60	14	7	0	21	224	203						
12:30 12:45	28	36	14	78	22	14	12	48	227	16	17	22	55	12	10	1	23	227	204						
12:45 13:00	28	23	10	61	32	13	8	53	202	19	13	27	59	6	13	0	19	202	192						
13:00 13:15	17	23	15	55	18	17	2	37	179	21	11	22	54	4	14	0	18	179	164						
13:15 13:30	24	23	9	56	22	16	4	42	194	18	13	32	63	7	11	0	18	194	179						
15:00 15:15	14	27	13	54	35	24	10	69	238	25	16	35	76	4	13	0	17	238	216						
15:15 15:30	24	51	21	96	38	24	11	73	315	19	12	45	76	7	9	0	16	315	261						
15:30 15:45	16	28	10	54	28	35	8	71	263	23	14	43	80	9	13	0	22	263	227						
15:45 16:00	21	23	18	62	29	28	7	64	255	20	19	44	83	14	10	0	24	255	233						
16:00 16:15	29	31	13	73	33	31	14	78	284	16	13	43	72	11	6	1	18	284	241						
16:15 16:30	26	46	19	91	23	24	14	61	297	19	17	48	84	8	11	0	19	297	255						
16:30 16:45	30	40	15	85	32	34	11	77	319	19	11	48	78	16	14	0	31	319	271						
16:45 17:00	23	39	13	75	26	39	7	72	323	27	12	63	102	8	16	0	24	323	273						
17:00 17:15	23	28	18	69	27	33	10	70	298	29	16	61	106	8	4	0	12	298	257						
17:15 17:30	20	49	22	91	22	25	9	56	303	26	8	54	88	2	7	0	9	303	244						
17:30 17:45	23	36	17	76	26	25	8	59	283	24	12	56	92	7	11	0	18	283	245						
17:45 18:00	28	31	20	79	45	26	9	80	296	16	13	55	84	8	6	1	15	296	258						
Total:	650	1163	443	2256	775	599	212	1588	7143	436	317	882	1636	213	262	4	482	7143	5,962						

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS

Survey Date: Thursday, January 31, 2019

WO No: 38321

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

PLACE D'ORLEANS				CENTRUM BLVD/PLACE D'ORLEANS SC E							
Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total				
07:00 07:15	0	0	0	0	0	0	0				
07:15 07:30	0	0	0	0	0	0	0				
07:30 07:45	0	0	0	0	0	0	0				
07:45 08:00	1	0	1	0	0	0	1				
08:00 08:15	0	0	0	0	0	0	0				
08:15 08:30	0	0	0	0	0	0	0				
08:30 08:45	0	0	0	0	0	0	0				
08:45 09:00	0	0	0	0	0	0	0				
09:00 09:15	0	0	0	0	0	0	0				
09:15 09:30	0	0	0	0	0	0	0				
09:30 09:45	0	0	0	0	0	0	0				
09:45 10:00	0	0	0	0	0	0	0				
11:30 11:45	0	0	0	0	0	0	0				
11:45 12:00	0	0	0	0	0	0	0				
12:00 12:15	0	0	0	0	0	0	0				
12:15 12:30	0	0	0	0	0	0	0				
12:30 12:45	0	0	0	0	0	0	0				
12:45 13:00	0	0	0	0	0	0	0				
13:00 13:15	0	0	0	0	0	0	0				
13:15 13:30	0	0	0	0	0	0	0				
15:00 15:15	0	0	0	0	0	0	0				
15:15 15:30	0	0	0	0	0	0	0				
15:30 15:45	0	0	0	0	0	0	0				
15:45 16:00	0	0	0	0	0	0	0				
16:00 16:15	0	0	0	0	0	0	0				
16:15 16:30	0	0	0	0	0	0	0				
16:30 16:45	0	0	0	0	0	0	0				
16:45 17:00	0	0	0	0	0	0	0				
17:00 17:15	0	0	0	0	0	0	0				
17:15 17:30	0	0	0	0	0	0	0				
17:30 17:45	0	0	0	0	0	0	0				
17:45 18:00	0	0	0	0	0	0	0				
Total	1	0	1	0	0	0	1				



Transportation Services - Traffic Services

Turning Movement Count - Study Results

PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS

Survey Date: Thursday, January 31, 2019

WO No: 38321

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

PLACE D'ORLEANS

CENTRUM BLVD/PLACE D'ORLEANS SC E

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	2	2	0	0	0	2
07:30 07:45	2	1	3	0	0	0	3
07:45 08:00	1	3	4	0	0	0	4
08:00 08:15	2	0	2	0	0	0	2
08:15 08:30	1	2	3	0	0	0	3
08:30 08:45	2	2	4	0	1	1	5
08:45 09:00	2	4	6	0	0	0	6
09:00 09:15	1	2	3	1	0	1	4
09:15 09:30	0	1	1	0	0	0	1
09:30 09:45	2	4	6	0	0	0	6
09:45 10:00	4	1	5	0	0	0	5
11:30 11:45	4	3	7	2	2	4	11
11:45 12:00	4	0	4	0	0	0	4
12:00 12:15	3	3	6	1	0	1	7
12:15 12:30	5	3	8	1	1	2	10
12:30 12:45	7	3	10	0	0	0	10
12:45 13:00	5	0	5	3	0	3	8
13:00 13:15	8	0	8	0	0	0	8
13:15 13:30	4	1	5	0	0	0	5
15:00 15:15	4	4	8	0	1	1	9
15:15 15:30	5	8	13	0	1	1	14
15:30 15:45	5	7	12	0	0	0	12
15:45 16:00	11	6	17	1	0	1	18
16:00 16:15	10	0	10	0	0	0	10
16:15 16:30	5	7	12	0	2	2	14
16:30 16:45	2	3	5	0	3	3	8
16:45 17:00	3	0	3	2	0	2	5
17:00 17:15	2	4	6	2	0	2	8
17:15 17:30	1	6	7	0	1	1	8
17:30 17:45	4	3	7	1	0	1	8
17:45 18:00	4	0	4	1	0	1	5
Total	113	83	196	15	12	27	223



Transportation Services - Traffic Services

Turning Movement Count - Study Results

PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS

Survey Date: Thursday, January 31, 2019

WO No: 38321

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

PLACE D'ORLEANS

CENTRUM BLVD/PLACE D'ORLEANS SC E

Time Period	Northbound				Southbound				Eastbound				Westbound				Grand Total			
	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT		W TOT	STR TOT	
07:00	07:15	0	2	0	2	2	0	0	4	6	0	0	0	0	0	0	0	2	2	4
07:15	07:30	2	5	0	9	2	2	0	9	18	0	0	0	2	0	0	0	2	4	11
07:30	07:45	0	1	0	2	2	1	0	5	7	1	1	0	2	0	0	0	5	7	7
07:45	08:00	0	4	0	5	1	1	0	6	11	0	0	0	0	0	0	0	1	1	6
08:00	08:15	0	3	0	4	2	1	0	6	10	0	0	0	0	0	0	0	2	2	6
08:15	08:30	0	3	0	5	4	1	0	8	13	0	0	1	1	0	0	0	4	5	9
08:30	08:45	0	2	0	2	2	0	0	4	6	0	0	0	0	0	0	0	2	2	4
08:45	09:00	0	4	0	4	2	0	0	6	10	0	0	0	0	0	0	0	2	2	6
09:00	09:15	0	2	0	3	3	0	0	6	9	1	0	1	2	0	0	0	3	5	7
09:15	09:30	0	3	0	5	0	1	1	5	10	0	0	1	2	0	0	0	0	2	6
09:30	09:45	0	0	0	1	1	1	0	2	3	0	0	0	0	0	0	0	1	1	2
09:45	10:00	1	1	0	5	1	2	0	5	10	1	0	1	4	0	1	0	2	6	8
11:30	11:45	1	1	1	4	1	1	0	3	7	0	1	0	2	0	0	0	3	5	6
11:45	12:00	0	1	0	3	0	1	1	4	7	1	0	1	3	0	0	0	0	3	5
12:00	12:15	1	1	0	2	1	0	0	2	4	0	0	0	1	0	0	0	1	2	3
12:15	12:30	0	1	1	7	1	3	0	6	13	1	1	2	4	0	0	0	3	7	10
12:30	12:45	0	1	1	5	1	0	0	4	9	2	1	1	4	2	0	0	5	9	9
12:45	13:00	0	0	0	2	0	1	0	2	4	1	1	0	2	1	0	0	2	4	4
13:00	13:15	0	0	1	1	1	0	0	2	3	1	0	0	1	0	0	0	2	3	3
13:15	13:30	0	1	1	5	1	1	0	3	8	0	0	1	1	1	0	0	3	4	6
15:00	15:15	0	0	0	0	2	0	0	2	2	0	0	0	0	0	0	0	2	2	2
15:15	15:30	0	3	0	5	1	2	1	7	12	0	0	0	1	0	0	0	1	2	7
15:30	15:45	0	2	0	3	2	1	0	5	8	0	1	0	2	0	1	0	4	6	7
15:45	16:00	0	1	0	4	2	2	0	5	9	0	0	1	1	0	0	0	2	3	6
16:00	16:15	0	5	0	5	2	0	0	7	12	0	0	0	0	0	0	0	2	2	7
16:15	16:30	0	3	0	6	0	3	0	6	12	0	0	0	0	0	0	0	0	0	6
16:30	16:45	0	0	0	0	2	0	0	2	2	0	0	0	0	0	0	0	2	2	2
16:45	17:00	0	3	0	6	1	3	1	8	14	0	0	0	1	0	0	0	1	2	8
17:00	17:15	0	2	0	3	1	1	0	4	7	0	0	0	0	0	0	0	1	1	4
17:15	17:30	0	0	0	1	1	1	0	2	3	0	0	0	0	0	0	0	1	1	2
17:30	17:45	1	1	0	3	2	1	0	4	7	0	0	0	2	0	1	0	3	5	6
17:45	18:00	0	1	0	3	0	2	0	3	6	0	0	0	0	0	0	0	0	0	3
Total: None		6	57	5	115	44	33	4	147	262	9	6	10	38	4	3	0	64	102	182



Transportation Services - Traffic Services

Turning Movement Count - Study Results

PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS

Survey Date: Thursday, January 31, 2019

WO No: 38321

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

		PLACE D'ORLEANS		CENTRUM BLVD/PLACE D'ORLEANS		Total
Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	
07:00	07:15	0	2	0	0	2
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	1	1
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	1	0	1
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	1	1
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	1	1
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		0	2	1	3	6



Transportation Services - Traffic Services

Turning Movement Count - Study Results

PRESTONE DR @ ST. JOSEPH BLVD

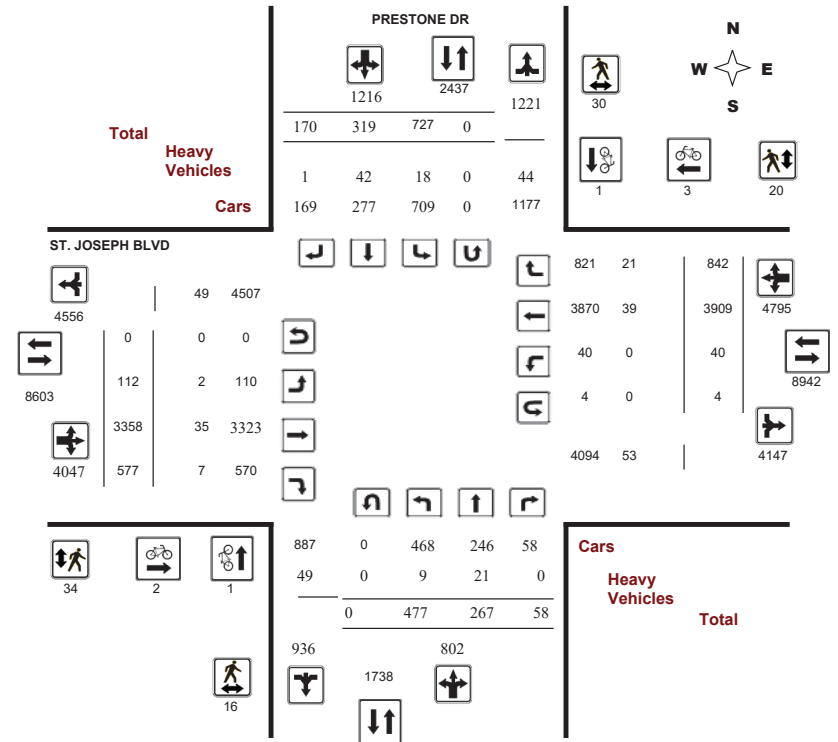
Survey Date: Tuesday, March 20, 2018

WO No: 37614

Start Time: 07:00

Device: Miovision

Full Study Diagram





Transportation Services - Traffic Services

Turning Movement Count - Study Results

PRESTONE DR @ ST. JOSEPH BLVD

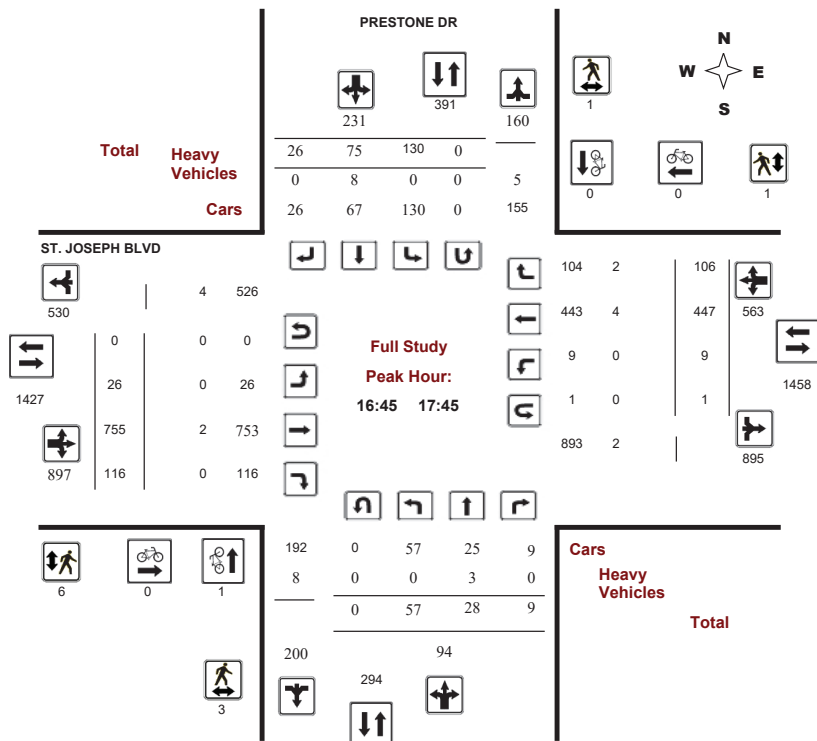
Survey Date: Tuesday, March 20, 2018

Start Time: 07:00

WO No: 37614

Device: Miovision

Full Study Peak Hour Diagram



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

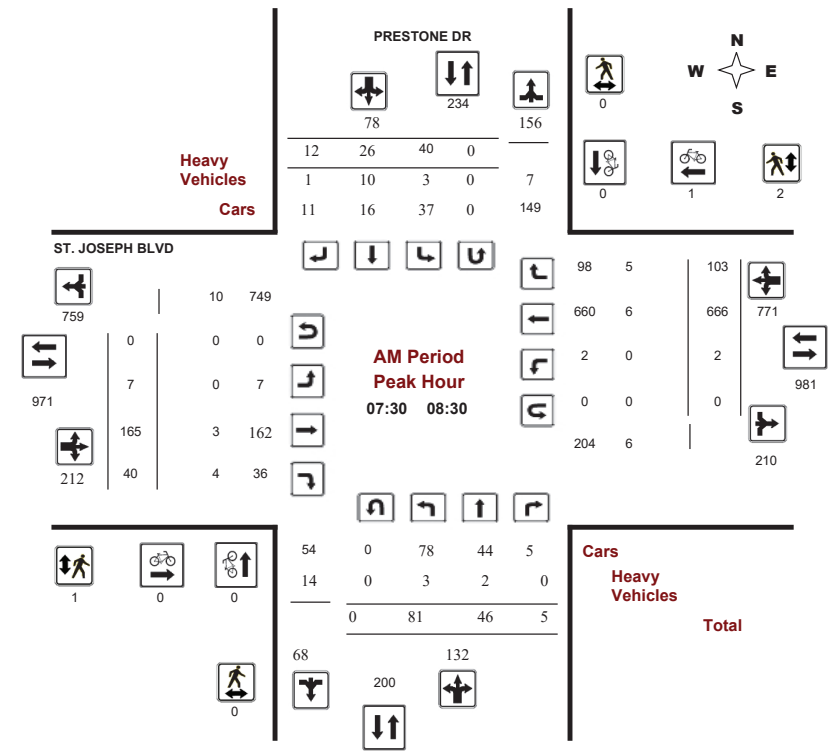
PRESTONE DR @ ST. JOSEPH BLVD

Survey Date: Tuesday, March 20, 2018

Start Time: 07:00

WO No: 37614

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

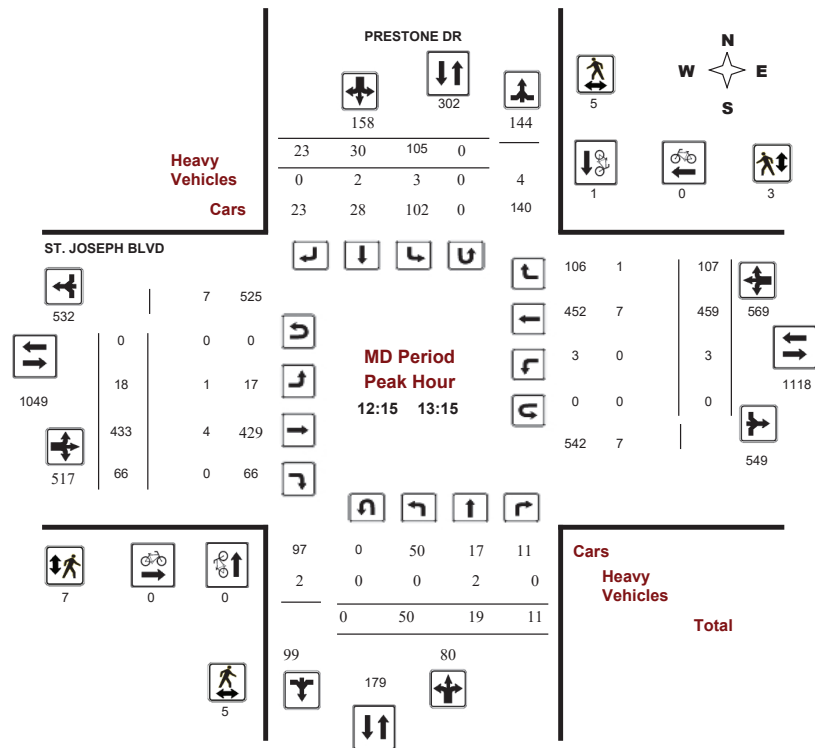
PRESTONE DR @ ST. JOSEPH BLVD

Survey Date: Tuesday, March 20, 2018

Start Time: 07:00

WO No: 37614

Device: Miovision



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

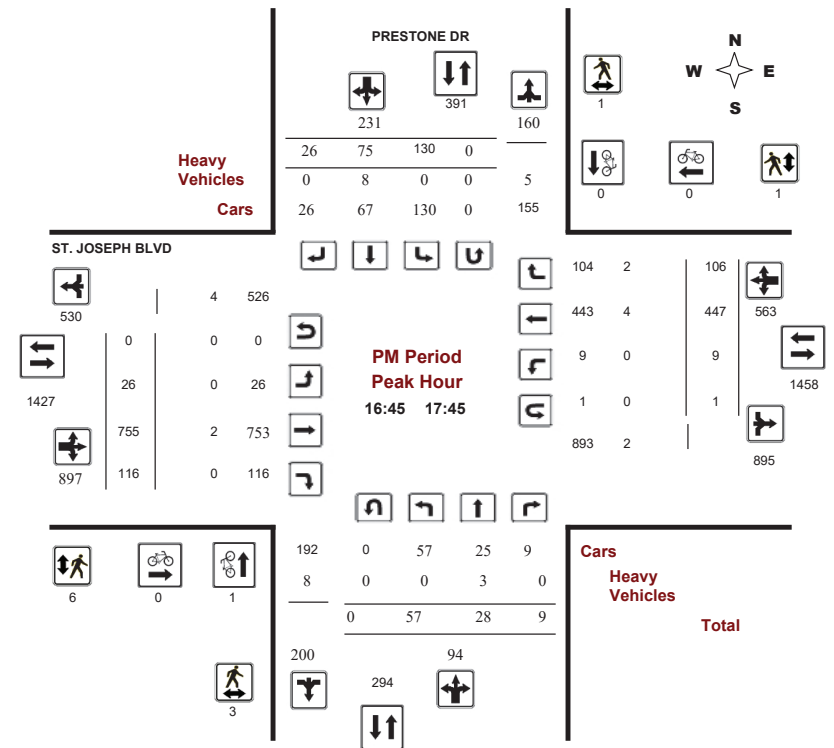
PRESTONE DR @ ST. JOSEPH BLVD

Survey Date: Tuesday, March 20, 2018

Start Time: 07:00

WO No: 37614

Device: Miovision



Turning Movement Count - Study Results

PRESTONE DR @ ST. JOSEPH BLVD

Survey Date: Tuesday, March 20, 2018

WO No: 37614

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, March 20, 2018

Total Observed U-Turns

AADT Factor

Northbound: 0 Southbound: 0

1.39

Eastbound: 0 Westbound: 4

PRESTONE DR										ST. JOSEPH BLVD									
Northbound					Southbound					Eastbound					Westbound				
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00-08:00	101	45	4	150	40	14	16	70	220	6	126	26	158	1	676	83	760	918	1138
08:00-09:00	69	46	5	120	38	32	14	84	204	9	187	33	229	2	573	130	705	934	1138
09:00-10:00	55	36	7	98	50	27	20	97	195	10	232	34	276	3	437	104	544	820	1015
11:30-12:30	55	31	7	93	110	35	28	173	266	2	401	77	480	7	442	104	553	1033	1299
12:30-13:30	55	17	13	85	91	28	25	144	229	22	422	54	498	3	463	107	573	1071	1300
15:00-16:00	42	30	6	78	118	48	22	188	266	23	562	111	696	7	441	92	540	1236	1502
16:00-17:00	44	29	4	77	157	71	24	252	329	16	712	127	855	10	416	111	537	1392	1721
17:00-18:00	56	33	12	101	123	64	21	208	309	24	716	115	855	7	461	111	579	1434	1743
Sub Total	477	267	58	802	727	319	170	1216	2018	112	3358	577	4047	40	3909	842	4791	8838	10856
U Turns				0				0	0				0				4	4	4
Total	477	267	58	802	727	319	170	1216	2018	112	3358	577	4047	40	3909	842	4795	8842	10860
EQ 12Hr	663	371	81	1115	1011	443	236	1690	2805	156	4668	802	5625	56	5434	1170	6665	12290	15095
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														1.39					
AVG 12Hr	663	371	81	1115	1011	443	236	1690	2805	156	4668	802	5625	56	5434	1170	6665	12290	15095
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														1					
AVG 24Hr	869	486	106	1460	1324	581	310	2214	3674	204	6115	1051	7369	73	7118	1533	8731	16100	19774
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														1.31					
Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.																			

Turning Movement Count - Study Results

PRESTONE DR @ ST. JOSEPH BLVD

Survey Date: Tuesday, March 20, 2018

WO No: 37614

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

PRESTONE DR

ST. JOSEPH BLVD

		Northbound					Southbound					Eastbound					Westbound						
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total			
07:00	07:15	29	12	1	42	6	7	5	18	96	1	21	4	26	0	162	12	174	96	260			
07:15	07:30	29	12	1	42	7	1	5	13	93	1	25	5	31	0	158	19	177	93	263			
07:30	07:45	25	10	1	36	16	4	3	23	102	2	28	7	37	1	169	19	189	102	285			
07:45	08:00	18	11	1	30	11	2	3	16	104	2	52	10	64	0	187	33	220	104	330			
08:00	08:15	20	8	0	28	6	8	3	17	101	2	46	13	61	1	167	24	192	101	298			
08:15	08:30	18	17	3	38	7	12	3	22	127	1	39	10	50	0	143	27	170	127	280			
08:30	08:45	19	8	2	29	9	6	5	20	108	2	46	3	51	0	132	40	172	108	272			
08:45	09:00	12	13	0	25	16	6	3	25	120	4	56	7	67	1	131	39	171	120	288			
09:00	09:15	18	12	2	32	13	11	5	29	131	3	62	10	75	2	119	32	154	131	290			
09:15	09:30	10	11	2	23	17	3	5	25	85	3	61	4	68	1	103	15	119	85	235			
09:30	09:45	11	8	0	19	9	8	7	24	102	2	54	10	66	0	111	31	142	102	251			
09:45	10:00	16	5	3	24	11	5	3	19	91	2	55	10	67	0	104	26	130	91	240			
11:30	11:45	14	13	1	28	23	7	6	36	121	0	113	11	124	3	110	23	136	121	324			
11:45	12:00	18	6	2	26	30	11	5	46	147	2	83	27	112	1	117	28	146	147	330			
12:00	12:15	11	5	3	19	23	10	9	42	121	0	90	18	108	3	106	24	133	121	302			
12:15	12:30	12	7	1	20	34	7	8	49	133	0	115	21	136	0	109	29	138	133	343			
12:30	12:45	11	1	4	16	18	8	4	30	110	7	102	14	123	2	122	32	156	110	325			
12:45	13:00	15	6	4	25	27	8	6	41	123	4	110	14	128	1	128	24	153	123	347			
13:00	13:15	12	5	2	19	26	7	5	38	115	7	106	17	130	0	100	22	122	115	309			
13:15	13:30	17	5	3	25	20	5	10	35	112	4	104	9	117	0	113	29	142	112	319			
15:00	15:15	9	9	1	19	30	7	6	43	131	3	139	27	169	1	112	22	135	131	366			
15:15	15:30	10	8	0	18	28	10	8	46	139	8	124	25	157	3	132	21	156	139	377			
15:30	15:45	14	8	3	25	28	13	5	46	155	3	139	30	172	1	113	29	143	155	386			
15:45	16:00	9	5	2	16	32	18	3	53	152	9	160	29	198	2	84	20	107	152	374			
16:00	16:15	11	10	1	22	53	22	6	81	203	3	171	30	204	1	112	34	147	203	454			
16:15	16:30	11	6	3	20	34	12	6	52	149	3	184	36	223	3	96	17	116	149	411			
16:30	16:45	10	9	0	19	39	14	5	58	160	3	164	30	197	3	111	24	139	160	413			
16:45	17:00	12	4	0	16	31	23	7	61	181	7	193	31	231	3	97	36	136	181	444			
17:00	17:15	12	7	3	22	36	18	8	62	175	4	214	37	255	1	135	24	160	175	499			
17:15	17:30	12	9	4	25	36	11	6	53	157	8	181	25	214	3	110	23	137	157	429			
17:30	17:45	21	8	2	31	27	23	5	55	172	7	167	23	197	2	105	23	130	172	413			
17:45	18:00	11	9	3	23	24	12	2	38	159	5	154	30	189	1	111	41	153	159	403			
Total:		477	267	58	802	727	319	170	1216	4175	112	3358	577	4047	40	3909	842	4795	4175	10,860			

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

PRESTONE DR @ ST. JOSEPH BLVD

Survey Date: Tuesday, March 20, 2018

WO No: 37614

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

			PRESTONE DR			ST. JOSEPH BLVD			Grand Total
Time Period			Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00 07:15			0	0	0	0	0	0	0
07:15 07:30			0	0	0	0	0	0	0
07:30 07:45			0	0	0	0	0	0	0
07:45 08:00			0	0	0	0	0	0	0
08:00 08:15			0	0	0	0	1	1	1
08:15 08:30			0	0	0	0	0	0	0
08:30 08:45			0	0	0	0	0	0	0
08:45 09:00			0	0	0	0	0	0	0
09:00 09:15			0	0	0	0	0	0	0
09:15 09:30			0	0	0	0	0	0	0
09:30 09:45			0	0	0	0	0	0	0
09:45 10:00			0	0	0	0	0	0	0
11:30 11:45			0	0	0	0	0	0	0
11:45 12:00			0	0	0	0	0	0	0
12:00 12:15			0	0	0	1	1	2	2
12:15 12:30			0	0	0	0	0	0	0
12:30 12:45			0	0	0	0	0	0	0
12:45 13:00			0	1	1	0	0	0	1
13:00 13:15			0	0	0	0	0	0	0
13:15 13:30			0	0	0	0	1	1	1
15:00 15:15			0	0	0	0	0	0	0
15:15 15:30			0	0	0	0	0	0	0
15:30 15:45			0	0	0	0	0	0	0
15:45 16:00			0	0	0	0	0	0	0
16:00 16:15			0	0	0	1	0	1	1
16:15 16:30			0	0	0	0	0	0	0
16:30 16:45			0	0	0	0	0	0	0
16:45 17:00			0	0	0	0	0	0	0
17:00 17:15			0	0	0	0	0	0	0
17:15 17:30			1	0	1	0	0	0	1
17:30 17:45			0	0	0	0	0	0	0
17:45 18:00			0	0	0	0	0	0	0
Total			1	1	2	2	3	5	7



Transportation Services - Traffic Services

Turning Movement Count - Study Results

PRESTONE DR @ ST. JOSEPH BLVD

Survey Date: Tuesday, March 20, 2018

WO No: 37614

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

			PRESTONE DR			ST. JOSEPH BLVD			Grand Total
Time Period			NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	
07:00 07:15			0	2	2	0	0	0	2
07:15 07:30			0	0	0	0	1	1	1
07:30 07:45			0	0	0	1	0	1	1
07:45 08:00			0	0	0	0	2	2	2
08:00 08:15			0	0	0	0	0	0	0
08:15 08:30			0	0	0	0	0	0	0
08:30 08:45			0	0	0	0	1	1	1
08:45 09:00			0	1	1	0	0	0	1
09:00 09:15			0	2	2	0	0	0	2
09:15 09:30			0	0	0	0	0	0	0
09:30 09:45			0	0	0	0	1	1	1
09:45 10:00			0	0	0	0	0	0	0
11:30 11:45			0	0	0	2	0	2	2
11:45 12:00			2	1	3	2	0	2	5
12:00 12:15			0	1	1	0	1	1	2
12:15 12:30			0	0	0	1	0	1	1
12:30 12:45			4	1	5	3	1	4	9
12:45 13:00			0	2	2	1	2	3	5
13:00 13:15			1	2	3	2	0	2	5
13:15 13:30			0	1	1	0	0	0	1
15:00 15:15			2	2	4	1	1	2	6
15:15 15:30			0	3	3	3	0	3	6
15:30 15:45			1	4	5	2	2	4	9
15:45 16:00			0	2	2	0	1	1	3
16:00 16:15			0	2	2	2	2	4	6
16:15 16:30			0	1	1	2	2	4	5
16:30 16:45			3	0	3	3	1	4	7
16:45 17:00			1	0	1	1	0	1	2
17:00 17:15			0	0	0	0	0	0	0
17:15 17:30			1	1	2	4	1	5	7
17:30 17:45			1	0	1	1	0	1	2
17:45 18:00			0	2	2	3	1	4	6
Total			16	30	46	34	20	54	100

Turning Movement Count - Study Results

PRESTONE DR @ ST. JOSEPH BLVD

Survey Date: Tuesday, March 20, 2018

WO No: 37614

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

PRESTONE DR ST. JOSEPH BLVD

		Northbound				Southbound				Eastbound				Westbound						
Time Period		LT	ST	RT	TOT	LT	ST	RT	TOT	STOT	LT	ST	RT	TOT	LT	ST	RT	TOT	STOT	Grand Total
07:00	07:15	1	0	0	5	0	3	0	3	8	0	1	1	3	0	0	0	1	4	6
07:15	07:30	1	0	0	1	2	0	0	2	3	0	0	0	3	0	2	0	4	7	5
07:30	07:45	0	0	0	3	0	2	0	4	7	0	0	1	5	0	4	2	6	11	9
07:45	08:00	1	0	0	2	1	0	0	1	3	0	1	1	3	0	0	0	2	5	4
08:00	08:15	1	1	0	7	0	4	1	9	16	0	0	1	4	0	1	3	4	8	12
08:15	08:30	1	1	0	7	2	4	0	7	14	0	2	1	5	0	1	0	5	10	12
08:30	08:45	1	0	0	3	0	2	0	3	6	0	3	0	6	0	2	1	6	12	9
08:45	09:00	0	2	0	2	3	0	0	6	8	0	2	0	4	0	2	1	8	12	10
09:00	09:15	0	0	0	2	1	2	0	3	5	0	0	0	1	0	1	0	2	3	4
09:15	09:30	0	1	0	1	1	0	0	2	3	0	1	0	2	0	1	0	3	5	4
09:30	09:45	0	0	0	1	0	1	0	2	3	0	1	0	2	0	1	1	3	5	4
09:45	10:00	0	1	0	1	1	0	0	2	3	0	5	0	7	0	2	0	8	15	9
11:30	11:45	0	0	0	1	0	1	0	1	2	0	3	0	3	0	0	0	3	6	4
11:45	12:00	0	0	0	0	1	0	0	3	3	0	1	0	3	0	2	2	6	9	6
12:00	12:15	0	0	0	1	1	1	0	2	3	0	3	0	7	0	4	0	8	15	9
12:15	12:30	0	1	0	1	0	0	0	1	2	0	3	0	4	0	1	0	4	8	5
12:30	12:45	0	0	0	1	0	1	0	3	4	1	0	0	4	0	3	1	4	8	6
12:45	13:00	0	0	0	0	1	0	0	1	1	0	0	0	1	0	1	0	2	3	2
13:00	13:15	0	1	0	2	2	1	0	4	6	0	1	0	3	0	2	0	5	8	7
13:15	13:30	1	1	0	3	0	1	0	4	7	0	0	0	1	0	0	2	2	3	5
15:00	15:15	1	0	0	3	0	2	0	3	6	1	0	0	2	0	0	0	0	2	4
15:15	15:30	0	3	0	5	2	1	0	8	13	0	1	1	6	0	4	2	9	15	14
15:30	15:45	0	0	0	2	0	2	0	2	4	0	2	0	3	0	1	0	3	6	5
15:45	16:00	0	3	0	5	0	2	0	6	11	0	2	0	2	0	0	1	3	5	8
16:00	16:15	1	1	0	5	0	2	0	4	9	0	0	1	2	0	0	1	1	3	6
16:15	16:30	0	1	0	2	0	1	0	2	4	0	1	0	1	0	0	0	1	2	3
16:30	16:45	0	0	0	1	0	1	0	2	3	0	0	0	0	0	0	1	1	1	2
16:45	17:00	0	1	0	3	0	2	0	4	7	0	1	0	1	0	0	1	2	3	5
17:00	17:15	0	1	0	4	0	3	0	4	8	0	0	0	2	0	2	0	2	4	6
17:15	17:30	0	1	0	1	0	0	0	2	3	0	0	0	1	0	1	1	2	3	3
17:30	17:45	0	0	0	3	0	3	0	3	6	0	1	0	2	0	1	0	2	4	5
17:45	18:00	0	1	0	1	0	0	0	2	3	0	0	0	0	0	0	1	1	1	2
Total:	None	9	21	0	79	18	42	1	105	184	2	35	7	93	0	39	21	113	206	195

Turning Movement Count - Study Results

PRESTONE DR @ ST. JOSEPH BLVD

Survey Date: Tuesday, March 20, 2018

WO No: 37614

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

PRESTONE DR ST. JOSEPH BLVD

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	1	1
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	1	1
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	1	1
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	1	1
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		0	0	0	4	4



Transportation Services - Traffic Services

Turning Movement Count - Study Results

ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR

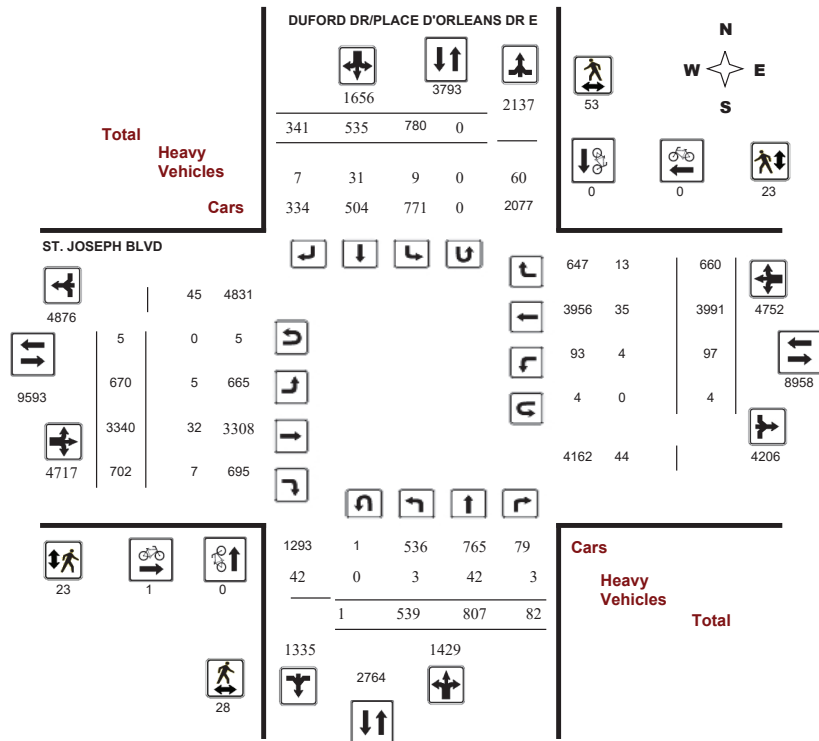
Survey Date: Tuesday, March 20, 2018

WO No: 37611

Start Time: 07:00

Device: Miovision

Full Study Diagram



Transportation Services - Traffic Services

Turning Movement Count - Study Results

ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR

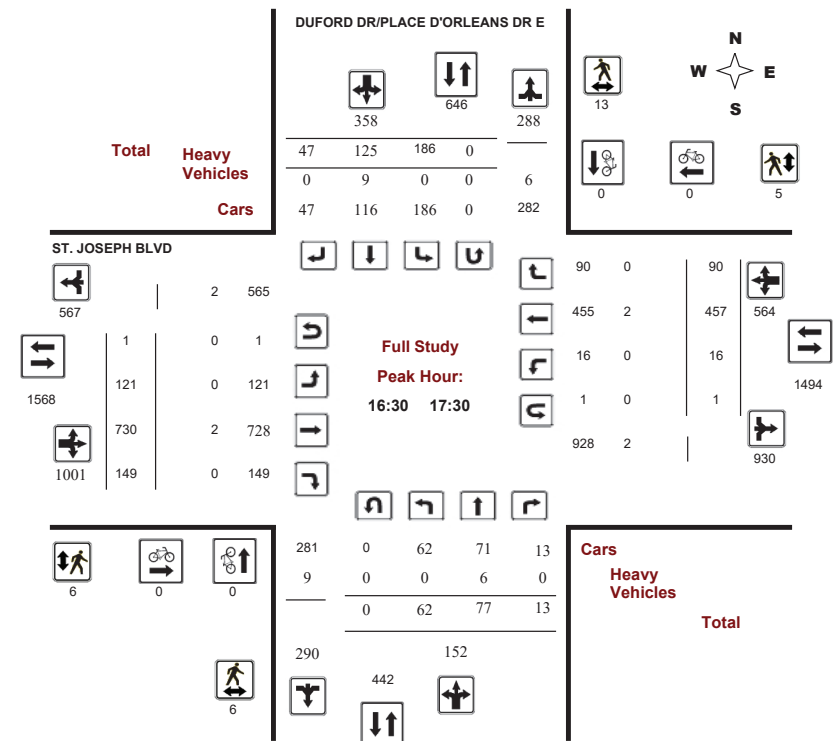
Survey Date: Tuesday, March 20, 2018

WO No: 37611

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram





Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

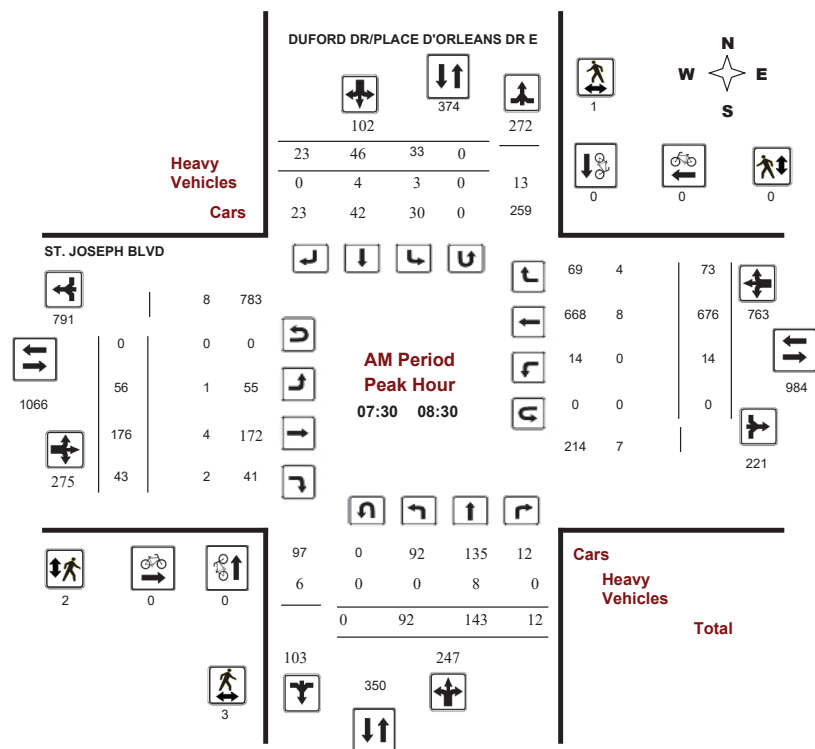
ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR

Survey Date: Tuesday, March 20, 2018

Start Time: 07:00

WO No: 37611

Device: Miovision



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

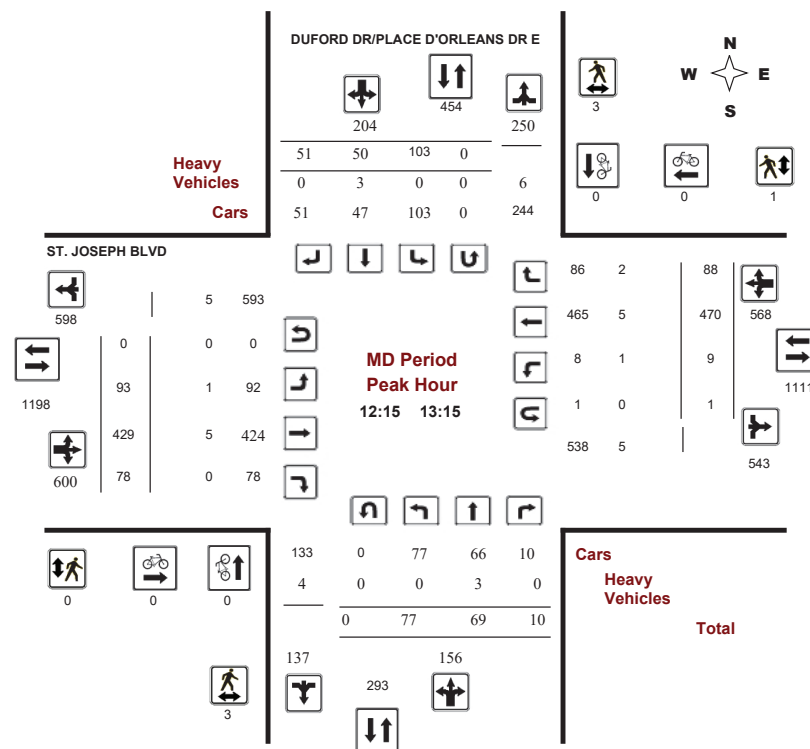
ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR

Survey Date: Tuesday, March 20, 2018

Start Time: 07:00

WO No: 37611

Device: Miovision





Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

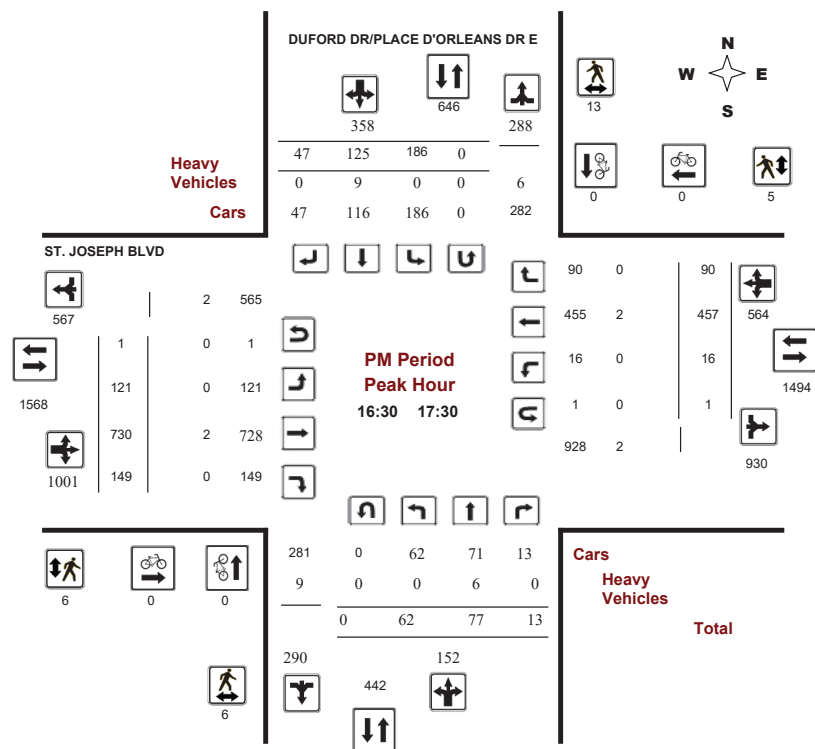
ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR

Survey Date: Tuesday, March 20, 2018

Start Time: 07:00

WO No: 37611

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Study Results

ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR

Survey Date: Tuesday, March 20, 2018

Start Time: 07:00

WO No: 37611

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, March 20, 2018

Total Observed U-Turns

AADT Factor

Northbound: 1 Southbound: 0
Eastbound: 5 Westbound: 4

DUFORD DR/PLACE D'ORLEANS DR E										ST. JOSEPH BLVD										
Northbound					Southbound					Eastbound					Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	STR TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	72	151	7	230	25	30	16	71	301	35	129	37	201	4	768	63	835	1036	1337	
08:00 09:00	106	132	11	249	32	41	25	98	347	65	198	39	302	22	559	74	655	957	1304	
09:00 10:00	57	119	11	187	43	39	35	117	304	73	241	37	351	5	423	84	512	863	1167	
11:30 12:30	46	77	5	128	103	45	68	216	344	91	393	91	575	12	436	88	536	1111	1455	
12:30 13:30	80	65	9	154	93	59	54	206	360	89	424	71	584	8	467	87	562	1146	1506	
15:00 16:00	64	105	16	185	122	96	47	265	450	100	584	148	832	12	446	82	540	1372	1822	
16:00 17:00	57	82	13	152	194	119	60	373	525	102	678	148	928	16	434	83	533	1461	1986	
17:00 18:00	57	76	10	143	168	106	36	310	453	115	693	131	939	18	458	99	575	1514	1967	
Sub Total	539	807	82	1428	780	535	341	1656	3084	670	3340	702	4712	97	3991	660	4748	9460	12544	
U Turns	1				0				1	5				4				9	10	
Total	539	807	82	1429	780	535	341	1656	3085	670	3340	702	4717	97	3991	660	4752	9469	12554	
EQ 12Hr	749	1122	114	1986	1084	744	474	2302	4288	931	4643	976	6557	135	5547	917	6605	13162	17450	
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														1.39						
AVG 12Hr	749	1122	114	1986	1084	744	474	2302	4288	931	4643	976	6557	135	5547	917	6605	13162	17450	
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														1						
AVG 24Hr	981	1469	149	2602	1420	974	621	3015	5617	1220	6082	1278	8589	177	7267	1202	8653	17242	22859	
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														1.31						
Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.																				



Transportation Services - Traffic Services

Turning Movement Count - Study Results

ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR

Survey Date: Tuesday, March 20, 2018

WO No: 37611

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

DUFORD DR/PLACE D'ORLEANS DR E

ST. JOSEPH BLVD

	Northbound					Southbound					Eastbound					Westbound					
Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total		
07:00-07:15	13	43	0	56	6	2	2	10	142	7	20	10	37	0	204	14	218	142	321		
07:15-07:30	20	31	2	53	9	6	4	19	135	7	17	5	29	2	182	12	196	135	297		
07:30-07:45	22	32	1	55	6	5	5	16	149	9	33	11	53	0	182	21	203	149	327		
07:45-08:00	17	45	4	66	4	17	5	26	195	12	59	11	82	2	200	16	218	195	392		
08:00-08:15	22	30	2	54	14	8	4	26	165	13	43	6	62	6	157	22	185	165	327		
08:15-08:30	31	36	5	72	9	16	9	34	215	22	41	15	78	6	137	14	157	215	341		
08:30-08:45	32	39	1	72	6	8	4	18	181	14	43	9	66	5	125	16	146	181	302		
08:45-09:00	21	27	3	51	3	9	8	20	159	16	71	9	96	5	140	22	167	159	334		
09:00-09:15	25	39	5	69	10	13	7	30	195	12	61	11	84	1	114	20	135	195	318		
09:15-09:30	12	24	2	38	13	9	8	30	152	13	62	12	87	1	100	25	127	152	282		
11:45-12:00	10	18	1	29	21	13	14	48	170	20	100	21	142	2	114	19	135	170	354		
09:30-09:45	12	36	3	51	13	8	13	34	174	18	48	7	73	2	103	18	123	174	281		
09:45-10:00	8	20	1	29	7	9	7	23	140	30	70	7	107	1	106	21	128	140	287		
11:30-11:45	10	21	2	33	29	12	14	55	178	18	98	16	132	5	109	18	132	178	352		
12:00-12:15	16	14	0	30	19	11	28	58	205	28	97	30	155	3	99	31	133	205	376		
12:15-12:30	10	24	2	36	34	9	12	55	195	25	98	24	147	2	114	20	136	195	374		
12:30-12:45	24	17	3	44	24	9	13	46	178	16	104	23	143	3	122	20	145	178	378		
12:45-13:00	16	14	4	34	24	21	10	55	194	27	104	14	145	3	119	26	149	194	383		
13:00-13:15	27	14	1	42	21	11	16	48	180	25	123	17	165	1	115	22	138	180	393		
13:15-13:30	13	20	1	34	24	18	15	57	187	21	93	17	133	1	111	19	131	187	355		
15:00-15:15	13	21	3	37	35	22	12	69	227	25	129	27	181	3	110	23	136	227	423		
15:15-15:30	19	32	2	54	29	17	12	58	244	15	120	40	175	3	120	24	147	244	434		
15:30-15:45	12	18	6	36	27	35	12	74	259	31	171	39	241	4	117	22	143	259	494		
15:45-16:00	20	34	5	59	31	22	11	64	265	29	164	42	235	2	99	13	114	265	472		
16:00-16:15	15	17	1	33	51	24	13	88	243	20	169	36	225	5	113	20	139	243	485		
16:15-16:30	12	23	7	42	45	30	15	90	264	15	162	35	213	6	107	23	136	264	481		
16:30-16:45	15	24	2	41	42	24	18	84	277	36	182	41	259	4	109	23	136	277	520		
16:45-17:00	15	18	3	36	56	41	14	111	291	31	165	36	232	1	105	17	124	291	503		
17:00-17:15	17	17	8	42	44	31	8	83	265	30	205	38	274	7	125	17	149	265	548		
17:15-17:30	15	18	0	33	44	29	7	80	255	24	178	34	236	4	118	33	155	255	504		
17:30-17:45	9	27	0	36	46	27	7	80	255	27	155	33	215	5	97	20	122	255	453		
17:45-18:00	16	14	2	32	34	19	14	67	223	34	155	26	215	2	118	29	149	223	463		
Total:	539	807	82	1429	780	535	341	1656	6557	670	3340	702	4717	97	3991	660	4752	6557	12,554		

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR

Survey Date: Tuesday, March 20, 2018

WO No: 37611

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

DUFORD DR/PLACE D'ORLEANS DR E

ST. JOSEPH BLVD

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



Transportation Services - Traffic Services

Turning Movement Count - Study Results

ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR

Survey Date: Tuesday, March 20, 2018

WO No: 37611

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

DUFORD DR/PLACE D'ORLEANS
DR E

ST. JOSEPH BLVD

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	1	1	2	1	0	1	3
07:30 07:45	2	1	3	0	0	0	3
07:45 08:00	0	0	0	1	0	1	1
08:00 08:15	1	0	1	1	0	1	2
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	0	0	0	1	1	1
08:45 09:00	1	1	2	1	1	2	4
09:00 09:15	0	0	0	1	0	1	1
09:15 09:30	0	0	0	0	0	0	0
11:45 12:00	2	4	6	0	0	0	6
09:30 09:45	0	1	1	1	0	1	2
09:45 10:00	1	0	1	0	1	1	2
11:30 11:45	0	0	0	0	0	0	0
12:00 12:15	1	1	2	0	0	0	2
12:15 12:30	1	0	1	0	0	0	1
12:30 12:45	1	1	2	0	0	0	2
12:45 13:00	1	2	3	0	0	0	3
13:00 13:15	0	0	0	0	1	1	1
13:15 13:30	1	2	3	0	1	1	4
15:00 15:15	0	3	3	0	3	3	6
15:15 15:30	0	3	3	2	0	2	5
15:30 15:45	1	5	6	2	3	5	11
15:45 16:00	2	3	5	0	0	0	5
16:00 16:15	2	1	3	0	1	1	4
16:15 16:30	0	3	3	0	1	1	4
16:30 16:45	0	3	3	1	2	3	6
16:45 17:00	4	2	6	3	0	3	9
17:00 17:15	2	3	5	1	3	4	9
17:15 17:30	0	5	5	1	0	1	6
17:30 17:45	1	7	8	1	5	6	14
17:45 18:00	3	1	4	6	0	6	10
Total	28	53	81	23	23	46	127



Transportation Services - Traffic Services

Turning Movement Count - Study Results

ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR

Survey Date: Tuesday, March 20, 2018

WO No: 37611

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

DUFORD DR/PLACE D'ORLEANS
DR E

ST. JOSEPH BLVD

Time Period	Northbound				Southbound				Eastbound				Westbound				Grand Total			
	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT		W TOT	STR TOT	
07:00	07:15	0	2	0	2	1	0	0	4	6	0	1	0	1	0	0	1	3	4	5
07:15	07:30	0	3	0	5	0	2	1	6	11	0	0	0	4	0	3	0	3	7	9
07:30	07:45	0	3	0	4	1	1	0	7	11	0	0	0	2	0	2	2	5	7	9
07:45	08:00	0	1	0	2	0	1	0	3	5	0	2	0	4	0	2	1	5	9	7
08:00	08:15	0	1	0	2	1	1	0	5	7	1	0	0	3	0	2	1	4	7	7
08:15	08:30	0	3	0	6	1	1	0	5	11	0	2	2	6	0	2	0	5	11	11
08:30	08:45	0	2	0	4	0	0	0	3	7	0	3	2	7	0	2	1	6	13	10
08:45	09:00	0	1	0	3	0	0	0	2	5	0	1	0	2	2	1	1	5	7	6
09:00	09:15	0	2	0	2	0	0	0	2	4	0	0	0	0	0	0	0	0	0	2
09:15	09:30	0	1	0	3	0	1	0	3	6	0	1	1	3	0	1	1	3	6	6
11:45	12:00	0	0	0	1	1	1	0	2	3	0	0	0	2	0	2	0	3	5	4
09:30	09:45	0	1	0	1	1	0	0	2	3	0	0	0	1	0	1	0	2	3	3
09:45	10:00	0	0	0	1	0	1	1	2	3	0	5	0	7	0	1	0	6	13	8
11:30	11:45	1	1	0	2	0	0	0	2	4	1	2	0	4	0	0	0	2	6	5
12:00	12:15	0	1	0	1	0	0	1	4	5	1	3	0	9	0	4	1	8	17	11
12:15	12:30	0	1	0	2	0	1	0	2	4	0	3	0	3	0	0	0	3	6	5
12:30	12:45	0	1	0	2	0	0	0	1	3	0	1	0	4	1	3	0	5	9	6
12:45	13:00	0	0	0	1	0	1	0	3	4	1	0	0	2	0	1	1	2	4	4
13:00	13:15	0	1	0	2	0	1	0	3	5	0	1	0	2	0	1	1	3	5	5
13:15	13:30	0	0	0	1	0	1	1	3	4	1	1	0	3	0	0	0	1	4	4
15:00	15:15	0	1	1	3	0	1	0	3	6	0	0	0	0	0	0	1	2	2	4
15:15	15:30	0	1	0	4	0	1	0	2	6	0	2	1	4	1	1	0	4	8	7
15:30	15:45	0	1	0	3	1	1	1	5	8	0	1	1	3	0	0	1	3	6	7
15:45	16:00	1	2	2	7	0	2	0	4	11	0	0	0	2	0	1	0	3	5	8
16:00	16:15	1	1	0	2	1	0	1	3	5	0	0	0	3	0	1	0	2	5	5
16:15	16:30	0	3	0	4	0	1	1	5	9	0	1	0	2	0	0	0	1	3	6
16:30	16:45	0	2	0	5	0	3	0	5	10	0	0	0	0	0	0	0	0	0	5
16:45	17:00	0	2	0	5	0	3	0	5	10	0	1	0	1	0	0	0	1	2	6
17:00	17:15	0	1	0	1	0	0	0	1	2	0	0	0	1	0	1	0	1	2	2
17:15	17:30	0	1	0	4	0	3	0	4	8	0	1	0	2	0	1	0	2	4	6
17:30	17:45	0	1	0	2	1	1	0	3	5	0	0	0	1	0	1	0	2	3	4
17:45	18:00	0	1	0	3	0	2	0	3	6	0	0	0	1	0	1	0	1	2	4
Total:	None	3	42	3	90	9	31	7	107	197	5	32	7	89	4	35	13	96	185	191



Transportation Services - Traffic Services

Turning Movement Count - Study Results

ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR

Survey Date: Tuesday, March 20, 2018

WO No: 37611

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

DUFORD DR/PLACE D'ORLEANS

ST. JOSEPH BLVD

Time Period		DR.E Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	1	1
11:45	12:00	0	0	1	0	1
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	1	1
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	2	0	2
15:00	15:15	0	0	0	0	0
15:15	15:30	1	0	0	0	1
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	1	1
16:15	16:30	0	0	1	0	1
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	1	1
17:00	17:15	0	0	1	0	1
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		1	0	5	4	10

Appendix C

Synchro Intersection Worksheets – Existing Conditions

Lanes, Volumes, Timings
1: Place d'Orléans & Hwy 174

04-20-2020

	→	↗	↖	↘
Lane Group	EBT	EBR	NBL	NBR
Lane Configurations	↑	↑↑	↑↑	↑
Traffic Volume (vph)	138	127	150	20
Future Volume (vph)	138	127	150	20
Lane Group Flow (vph)	153	141	167	22
Turn Type	NA	Perm	Prot	Perm
Protected Phases	4		2	
Permitted Phases		4		2
Detector Phase	4	4	2	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	15.7	15.7	24.8	24.8
Total Split (s)	35.7	35.7	44.8	44.8
Total Split (%)	44.3%	44.3%	55.7%	55.7%
Maximum Green (s)	30.0	30.0	40.0	40.0
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	4.8	4.8
Lead/Lag				
Lead-Lag Optimize?				
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	None	None	Min	Min
Walk Time (s)			15.0	15.0
Flash Dont Walk (s)			5.0	5.0
Pedestrian Calls (#/hr)			1	1
Act Effct Green (s)	10.5	10.5	14.0	14.0
Actuated g/C Ratio	0.30	0.30	0.40	0.40
v/c Ratio	0.30	0.16	0.13	0.04
Control Delay	11.4	3.3	7.1	3.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.4	3.3	7.1	3.5
LOS	B	A	A	A
Approach Delay	7.5		6.6	
Approach LOS	A		A	
Queue Length 50th (m)	5.1	0.0	2.7	0.0
Queue Length 95th (m)	19.4	4.6	6.2	2.2
Internal Link Dist (m)	182.0		201.4	
Turn Bay Length (m)		150.0		50.0
Base Capacity (vph)	1523	2297	3142	1431
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.10	0.06	0.05	0.02
Intersection Summary				
Cycle Length: 80.5				
Actuated Cycle Length: 35.3				
Natural Cycle: 45				
Control Type: Actuated-Uncoordinated				

211 Centrum Boulevard AM Peak Hour Existing

Synchro 10 Light Report
Page 1

Lanes, Volumes, Timings
1: Place d'Orléans & Hwy 174

04-20-2020

Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 7.2	Intersection LOS: A
Intersection Capacity Utilization 25.7%	ICU Level of Service A
Analysis Period (min) 15	
Description: As per signal timing plan provided on Dec. 17, 2019.	

Splits and Phases: 1: Place d'Orléans & Hwy 174



211 Centrum Boulevard AM Peak Hour Existing

Synchro 10 Light Report
Page 2

Lanes, Volumes, Timings

2: Place d'Orléans & Private/Centrum

04-20-2020

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↩	↩	↩	↩	↩	↩	↩	↩	↩
Traffic Volume (vph)	25	18	40	55	80	67	144	66	42
Future Volume (vph)	25	18	40	55	80	67	144	66	42
Lane Group Flow (vph)	28	20	44	61	90	0	268	0	141
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	36.0	36.0	36.0	36.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0	43.0	43.0	43.0	43.0
Total Split (%)	42.7%	42.7%	42.7%	42.7%	42.7%	57.3%	57.3%	57.3%	57.3%
Maximum Green (s)	26.0	26.0	26.0	26.0	26.0	37.0	37.0	37.0	37.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	7	7	7	8	8	0	0	1	1
Act Effct Green (s)	13.1	13.1	13.1	12.3	12.3		54.3		54.3
Actuated g/C Ratio	0.17	0.17	0.17	0.16	0.16		0.72		0.72
v/c Ratio	0.13	0.07	0.15	0.29	0.32		0.13		0.08
Control Delay	24.8	23.2	8.3	28.4	27.9		5.1		5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	24.8	23.2	8.3	28.4	27.9		5.1		5.1
LOS	C	C	A	C	C		A		A
Approach Delay		16.6			28.1		5.1		5.1
Approach LOS		B			C		A		A
Queue Length 50th (m)	3.6	2.5	0.0	8.0	11.7		4.6		2.2
Queue Length 95th (m)	7.8	6.2	6.2	14.0	18.3		15.2		8.6
Internal Link Dist (m)		30.9			117.0		125.7		201.4
Turn Bay Length (m)			20.0	95.0					
Base Capacity (vph)	420	604	533	447	604		1987		1750
Starvation Cap Reductn	0	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0	0		0		0
Reduced v/c Ratio	0.07	0.03	0.08	0.14	0.15		0.13		0.08
Intersection Summary									
Cycle Length: 75									
Actuated Cycle Length: 75									
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green									
Natural Cycle: 70									

211 Centrum Boulevard AM Peak Hour Existing

Synchro 10 Light Report
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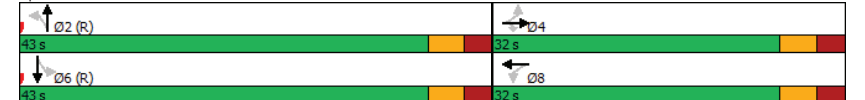
Lanes, Volumes, Timings

2: Place d'Orléans & Private/Centrum

04-20-2020

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.32
Intersection Signal Delay: 12.0
Intersection LOS: B
Intersection Capacity Utilization 60.8%
ICU Level of Service B
Analysis Period (min) 15
Description: As per signal timing plan provided on Dec. 17, 2019.

Splits and Phases: 2: Place d'Orléans & Private/Centrum



211 Centrum Boulevard AM Peak Hour Existing

Synchro 10 Light Report
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HCM 2010 AWSC
3: Prestone & Centrum

04-20-2020

Intersection						
Intersection Delay, s/veh	8.6					
Intersection LOS	A					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Vol, veh/h	27	60	54	35	134	57
Future Vol, veh/h	27	60	54	35	134	57
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	67	60	39	149	63
Number of Lanes	1	0	0	1	1	1
Approach	EB	WB		NB		
Opposing Approach	WB	EB				
Opposing Lanes	1	1		0		
Conflicting Approach Left		NB		EB		
Conflicting Lanes Left	0	2		1		
Conflicting Approach Right	NB			WB		
Conflicting Lanes Right	2	0		1		
HCM Control Delay	7.7	8.4		9.1		
HCM LOS	A	A		A		

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	61%
Vol Thru, %	0%	0%	31%	39%
Vol Right, %	0%	100%	69%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	134	57	87	89
LT Vol	134	0	0	54
Through Vol	0	0	27	35
RT Vol	0	57	60	0
Lane Flow Rate	149	63	97	99
Geometry Grp	7	7	2	2
Degree of Util (X)	0.226	0.075	0.112	0.129
Departure Headway (Hd)	5.476	4.272	4.179	4.701
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	657	839	859	764
Service Time	3.199	1.995	2.195	2.717
HCM Lane V/C Ratio	0.227	0.075	0.113	0.13
HCM Control Delay	9.8	7.3	7.7	8.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.2	0.4	0.4

211 Centrum Boulevard AM Peak Hour Existing

Synchro 10 Light Report
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Lanes, Volumes, Timings
4: Duford/Place d'Orléans & St. Joseph

04-20-2020

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↰	↰↱	↰	↰↱	↰	↰	↰	↰	↰
Traffic Volume (vph)	56	176	14	676	92	143	33	46	23
Future Volume (vph)	56	176	14	676	92	143	33	46	23
Lane Group Flow (vph)	62	244	16	832	102	172	37	51	26
Turn Type	pm+pt	NA	pm+pt	NA	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6	7	4	3	8	
Permitted Phases	2		6						8
Detector Phase	5	2	1	6	7	4	3	8	8
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	10.3	30.3	10.3	30.3	10.8	35.9	10.8	35.9	35.9
Total Split (s)	11.0	37.0	11.0	37.0	21.0	36.0	21.0	36.0	36.0
Total Split (%)	10.5%	35.2%	10.5%	35.2%	20.0%	34.3%	20.0%	34.3%	34.3%
Maximum Green (s)	5.7	30.7	5.7	30.7	15.2	29.1	15.2	29.1	29.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	3.0	2.0	3.0	2.5	3.6	2.5	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.3	5.3	6.3	5.8	6.9	5.8	6.9	6.9
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Walk Time (s)		7.0		7.0		7.0		7.0	7.0
Flash Dont Walk (s)		17.0		17.0		22.0		22.0	22.0
Pedestrian Calls (#/hr)		3		1		0		2	2
Act Effct Green (s)	62.1	58.4	58.9	53.2	12.3	20.0	7.9	13.3	13.3
Actuated g/C Ratio	0.59	0.56	0.56	0.51	0.12	0.19	0.08	0.13	0.13
v/c Ratio	0.19	0.14	0.03	0.50	0.53	0.52	0.30	0.23	0.08
Control Delay	14.3	14.5	14.1	22.5	53.5	41.5	51.5	39.8	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	14.5	14.1	22.5	53.5	41.5	51.5	39.8	0.5
LOS	B	B	B	C	D	D	D	D	A
Approach Delay		14.5		22.4		46.0		34.6	
Approach LOS		B		C		D		C	
Queue Length 50th (m)	4.8	9.3	1.2	59.5	20.1	32.8	7.3	9.7	0.0
Queue Length 95th (m)	15.9	27.6	6.1	#115.6	35.5	43.1	16.9	17.0	0.0
Internal Link Dist (m)		177.7		219.6		140.7		125.7	
Turn Bay Length (m)	70.0		45.0				90.0		
Base Capacity (vph)	330	1790	619	1658	240	496	240	483	513
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.14	0.03	0.50	0.42	0.35	0.15	0.11	0.05

Intersection Summary	
Cycle Length: 105	
Actuated Cycle Length: 105	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 90	

211 Centrum Boulevard AM Peak Hour Existing

Synchro 10 Light Report
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Lanes, Volumes, Timings

4: Duford/Place d'Orléans & St. Joseph

04-20-2020

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 25.9

Intersection LOS: C

Intersection Capacity Utilization 59.5%

ICU Level of Service B

Analysis Period (min) 15

Description: As per signal timing plan provided on Dec. 17, 2019.

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

Queue shown is maximum after two cycles.

Splits and Phases: 4: Duford/Place d'Orléans & St. Joseph

Ø1	Ø2 (R)	Ø3	Ø4
11 s	37 s	21 s	36 s
Ø5	Ø6 (R)	Ø7	Ø8
11 s	37 s	21 s	36 s

Lanes, Volumes, Timings

5: Prestone & St. Joseph

04-20-2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰
Traffic Volume (vph)	8	165	40	2	666	127	81	56	58	38
Future Volume (vph)	8	165	40	2	666	127	81	56	58	38
Lane Group Flow (vph)	9	183	44	2	740	141	90	68	64	61
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	2		6		6		4		8	
Permitted Phases	2	2	2	6	6	6	4	4	8	8
Detector Phase	2	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	23.7	23.7	23.7	23.7	23.7	23.7	29.0	29.0	29.0	29.0
Total Split (s)	51.0	51.0	51.0	51.0	51.0	51.0	29.0	29.0	29.0	29.0
Total Split (%)	63.8%	63.8%	63.8%	63.8%	63.8%	63.8%	36.3%	36.3%	36.3%	36.3%
Maximum Green (s)	45.3	45.3	45.3	45.3	45.3	45.3	23.0	23.0	23.0	23.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.7	6.0	6.0	6.0	6.0
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	2	2	1	1
Act Effct Green (s)	50.2	50.2	50.2	50.2	50.2	50.2	12.7	12.7	12.7	12.7
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.72	0.72	0.18	0.18	0.18	0.18
v/c Ratio	0.02	0.08	0.04	0.00	0.31	0.13	0.40	0.21	0.28	0.19
Control Delay	6.2	5.2	2.4	6.0	6.1	1.7	30.3	23.7	27.5	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.2	5.2	2.4	6.0	6.1	1.7	30.3	23.7	27.5	19.0
LOS	A	A	A	A	A	A	C	C	C	B
Approach Delay	4.7		5.4		27.4		23.4			
Approach LOS	A		A		C		C			
Queue Length 50th (m)	0.3	3.4	0.0	0.1	16.7	0.0	10.4	6.9	7.3	4.7
Queue Length 95th (m)	2.4	10.4	3.9	1.0	41.6	6.8	22.1	16.0	16.6	13.1
Internal Link Dist (m)	166.5		193.8		90.1		86.1			
Turn Bay Length (m)	50.0	120.0		75.0	150.0		90.0			
Base Capacity (vph)	458	2376	1075	795	2376	1089	412	570	409	558
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.08	0.04	0.00	0.31	0.13	0.22	0.12	0.16	0.11

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 70.1

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
5: Prestone & St. Joseph

04-20-2020

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 9.3

Intersection LOS: A

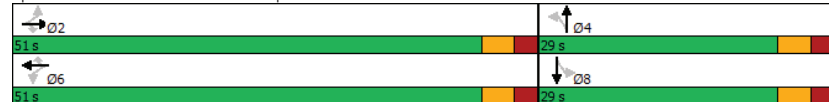
Intersection Capacity Utilization 41.1%

ICU Level of Service A

Analysis Period (min) 15

Description: As per signal timing plan provided on Dec. 17, 2019.

Splits and Phases: 5: Prestone & St. Joseph



HCM 2010 TWSC

14: Orleans Towncentre Access/Brisebois & Centrum

04-20-2020

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	80	10	2	124	3	0	0	1	1	0	13
Future Vol, veh/h	24	80	10	2	124	3	0	0	1	1	0	13
Conflicting Peds, #/hr	8	0	9	9	0	8	0	0	3	3	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	89	11	2	138	3	0	0	1	1	0	14

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	149	0	109	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	4.12	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	2.218	-
Pot Cap-1 Maneuver	1432	-	1481	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1423	-	1471	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	0.1	8.8	9.2
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	938	1423	-	-	1471	-	-	867
HCM Lane V/C Ratio	0.001	0.019	-	-	0.002	-	-	0.018
HCM Control Delay (s)	8.8	7.6	0	-	7.5	0	-	9.2
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.1

Lanes, Volumes, Timings
1: Place d'Orléans & Hwy 174

04-20-2020

	→	↗	↖	↘
Lane Group	EBT	EBR	NBL	NBR
Lane Configurations	↑	↑↑	↑↑	↑
Traffic Volume (vph)	474	270	161	86
Future Volume (vph)	474	270	161	86
Lane Group Flow (vph)	527	300	179	96
Turn Type	NA	Perm	Prot	Perm
Protected Phases	4		2	
Permitted Phases		4		2
Detector Phase	4	4	2	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	15.7	15.7	24.8	24.8
Total Split (s)	45.7	45.7	44.8	44.8
Total Split (%)	50.5%	50.5%	49.5%	49.5%
Maximum Green (s)	40.0	40.0	40.0	40.0
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	4.8	4.8
Lead/Lag				
Lead-Lag Optimize?				
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	None	None	Min	Min
Walk Time (s)			15.0	15.0
Flash Dont Walk (s)			5.0	5.0
Pedestrian Calls (#/hr)			6	6
Act Effct Green (s)	18.1	18.1	11.9	11.9
Actuated g/C Ratio	0.44	0.44	0.29	0.29
v/c Ratio	0.69	0.23	0.19	0.20
Control Delay	14.5	1.7	13.0	5.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	14.5	1.7	13.0	5.1
LOS	B	A	B	A
Approach Delay	9.9		10.3	
Approach LOS	A		B	
Queue Length 50th (m)	23.1	0.0	4.3	0.0
Queue Length 95th (m)	65.6	5.2	13.4	8.2
Internal Link Dist (m)	182.0		201.4	
Turn Bay Length (m)		150.0		50.0
Base Capacity (vph)	1621	2447	2988	1358
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.33	0.12	0.06	0.07
Intersection Summary				
Cycle Length: 90.5				
Actuated Cycle Length: 41				
Natural Cycle: 55				
Control Type: Actuated-Uncoordinated				

211 Centrum Boulevard PM Peak Hour Existing

Synchro 10 Light Report
Page 1

Lanes, Volumes, Timings
1: Place d'Orléans & Hwy 174

04-20-2020

Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 10.0	Intersection LOS: A
Intersection Capacity Utilization 44.9%	ICU Level of Service A
Analysis Period (min) 15	
Description: As per signal timing plan provided on Dec. 17, 2019.	

Splits and Phases: 1: Place d'Orléans & Hwy 174

↖ Ø2	→ Ø4
44.8 s	45.7 s

211 Centrum Boulevard PM Peak Hour Existing

Synchro 10 Light Report
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Lanes, Volumes, Timings

3: Place d'Orléans & Private/Centrum

04-20-2020

	↖	→	↗	↖	←	↖	↑	↗	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↖	↖	↖	↖
Traffic Volume (vph)	94	56	220	71	90	102	153	98	130
Future Volume (vph)	94	56	220	71	90	102	153	98	130
Lane Group Flow (vph)	104	62	244	79	100	0	349	0	300
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	36.0	36.0	36.0	36.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0	53.0	53.0	53.0	53.0
Total Split (%)	37.6%	37.6%	37.6%	37.6%	37.6%	62.4%	62.4%	62.4%	62.4%
Maximum Green (s)	26.0	26.0	26.0	26.0	26.0	47.0	47.0	47.0	47.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	12	12	12	4	4	5	5	14	14
Act Effct Green (s)	14.6	14.6	14.6	14.6	14.6		58.4		58.4
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17		0.69		0.69
v/c Ratio	0.51	0.21	0.54	0.37	0.33		0.21		0.19
Control Delay	39.1	29.4	8.4	34.2	32.1		5.3		5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	39.1	29.4	8.4	34.2	32.1		5.3		5.3
LOS	D	C	A	C	C		A		A
Approach Delay		19.4			33.0		5.3		5.3
Approach LOS		B			C		A		A
Queue Length 50th (m)	16.0	9.0	0.0	11.8	14.8		7.0		6.1
Queue Length 95th (m)	26.1	16.1	15.7	20.5	23.8		18.6		16.4
Internal Link Dist (m)		30.9			117.0		125.7		201.4
Turn Bay Length (m)			20.0	95.0					
Base Capacity (vph)	364	533	612	378	533		1670		1616
Starvation Cap Reductn	0	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0	0		0		0
Reduced v/c Ratio	0.29	0.12	0.40	0.21	0.19		0.21		0.19
Intersection Summary									
Cycle Length: 85									
Actuated Cycle Length: 85									
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green									
Natural Cycle: 70									

211 Centrum Boulevard PM Peak Hour Existing

Synchro 10 Light Report
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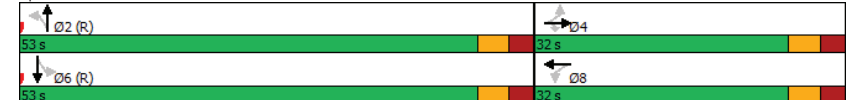
Lanes, Volumes, Timings

3: Place d'Orléans & Private/Centrum

04-20-2020

Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 14.0	Intersection LOS: B
Intersection Capacity Utilization 80.0%	ICU Level of Service D
Analysis Period (min) 15	
Description: As per signal timing plan provided on Dec. 17, 2019.	

Splits and Phases: 3: Place d'Orléans & Private/Centrum



211 Centrum Boulevard PM Peak Hour Existing

Synchro 10 Light Report
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Lanes, Volumes, Timings

6: Duford/Place d'Orléans & St. Joseph

04-20-2020

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↩	↩↩	↩	↩↩	↩	↩	↩	↩	↩
Traffic Volume (vph)	126	730	17	457	62	80	203	137	51
Future Volume (vph)	126	730	17	457	62	80	203	137	51
Lane Group Flow (vph)	140	977	19	611	69	103	226	152	57
Turn Type	pm+pt	NA	pm+pt	NA	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6	7	4	3	8	
Permitted Phases	2		6						8
Detector Phase	5	2	1	6	7	4	3	8	8
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	10.3	30.3	10.3	30.3	10.8	35.9	10.8	35.9	35.9
Total Split (s)	11.0	33.0	11.0	33.0	25.0	36.0	25.0	36.0	36.0
Total Split (%)	10.5%	31.4%	10.5%	31.4%	23.8%	34.3%	23.8%	34.3%	34.3%
Maximum Green (s)	5.7	26.7	5.7	26.7	19.2	29.1	19.2	29.1	29.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	3.0	2.0	3.0	2.5	3.6	2.5	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.3	5.3	6.3	5.8	6.9	5.8	6.9	6.9
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	17.0	17.0	17.0	17.0	22.0	22.0	22.0	22.0	22.0
Pedestrian Calls (#/hr)	6	13	6	13	5	6	6	6	6
Act Effct Green (s)	53.7	49.2	46.5	39.7	9.7	14.7	17.5	24.9	24.9
Actuated g/C Ratio	0.51	0.47	0.44	0.38	0.09	0.14	0.17	0.24	0.24
v/c Ratio	0.40	0.64	0.08	0.50	0.45	0.42	0.82	0.37	0.12
Control Delay	21.2	26.6	17.4	27.7	53.6	41.8	65.2	36.0	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	26.6	17.4	27.7	53.6	41.8	65.2	36.0	0.5
LOS	C	C	B	C	D	D	E	D	A
Approach Delay	25.9		27.4		46.5		46.5		
Approach LOS	C		C		D		D		
Queue Length 50th (m)	13.7	66.1	1.7	47.5	13.6	18.9	44.1	27.5	0.0
Queue Length 95th (m)	#34.8	#164.1	7.2	78.0	26.3	28.7	#77.8	38.6	0.0
Internal Link Dist (m)	149.8		219.6		140.7		125.7		
Turn Bay Length (m)		45.0				90.0			
Base Capacity (vph)	354	1518	233	1228	303	477	303	501	525
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.64	0.08	0.50	0.23	0.22	0.75	0.30	0.11
Intersection Summary									
Cycle Length: 105									
Actuated Cycle Length: 105									
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green									
Natural Cycle: 100									

211 Centrum Boulevard PM Peak Hour Existing

Synchro 10 Light Report
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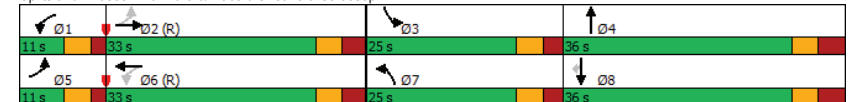
Lanes, Volumes, Timings

6: Duford/Place d'Orléans & St. Joseph

04-20-2020

Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 31.6	Intersection LOS: C
Intersection Capacity Utilization 73.5%	ICU Level of Service D
Analysis Period (min) 15	
Description: As per signal timing plan provided on Dec. 17, 2019.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 6: Duford/Place d'Orléans & St. Joseph



211 Centrum Boulevard PM Peak Hour Existing

Synchro 10 Light Report
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HCM 2010 AWSC
11: Prestone & Centrum

04-20-2020

Intersection						
Intersection Delay, s/veh	8.5					
Intersection LOS	A					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	40	158	54	30	100	56
Future Vol, veh/h	40	158	54	30	100	56
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	44	176	60	33	111	62
Number of Lanes	1	0	0	1	1	1
Approach	EB	WB	NB			
Opposing Approach	WB	EB				
Opposing Lanes	1	1	0			
Conflicting Approach Left		NB	EB			
Conflicting Lanes Left	0	2	1			
Conflicting Approach Right	NB		WB			
Conflicting Lanes Right	2	0	1			
HCM Control Delay	8.3	8.4	8.9			
HCM LOS	A	A	A			

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	64%
Vol Thru, %	0%	0%	20%	36%
Vol Right, %	0%	100%	80%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	100	56	198	84
LT Vol	100	0	0	54
Through Vol	0	0	40	30
RT Vol	0	56	158	0
Lane Flow Rate	111	62	220	93
Geometry Grp	7	7	2	2
Degree of Util (X)	0.176	0.078	0.246	0.123
Departure Headway (Hd)	5.705	4.499	4.019	4.738
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	629	795	895	757
Service Time	3.441	2.234	2.037	2.763
HCM Lane V/C Ratio	0.176	0.078	0.246	0.123
HCM Control Delay	9.7	7.6	8.3	8.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.3	1	0.4

211 Centrum Boulevard PM Peak Hour Existing

Synchro 10 Light Report
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Lanes, Volumes, Timings
12: Prestone & St. Joseph

04-20-2020

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations		 			 			 		
Traffic Volume (vph)	26	755	116	10	450	106	57	28	120	69
Future Volume (vph)	26	755	116	10	450	106	57	28	120	69
Lane Group Flow (vph)	29	839	129	11	500	118	63	41	133	104
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	2				6				8	
Permitted Phases	2		2		6		4		8	
Detector Phase	2		2		6		4		8	
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	28.7	28.7	28.7	28.7	28.7	28.7	24.0	24.0	24.0	24.0
Total Split (s)	51.0	51.0	51.0	51.0	51.0	51.0	29.0	29.0	29.0	29.0
Total Split (%)	63.8%	63.8%	63.8%	63.8%	63.8%	63.8%	36.3%	36.3%	36.3%	36.3%
Maximum Green (s)	45.3	45.3	45.3	45.3	45.3	45.3	23.0	23.0	23.0	23.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.7	6.0	6.0	6.0	6.0
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0	16.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	1	1	1	3	3	3	1	1	6	6
Act Effct Green (s)	48.2	48.2	48.2	48.2	48.2	48.2	13.3	13.3	13.3	13.3
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.66	0.66	0.18	0.18	0.18	0.18
v/c Ratio	0.05	0.38	0.13	0.03	0.23	0.12	0.29	0.13	0.58	0.33
Control Delay	5.9	6.8	1.6	5.9	5.8	1.6	27.8	19.8	36.7	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.9	6.8	1.6	5.9	5.8	1.6	27.8	19.8	36.7	22.1
LOS	A	A	A	A	A	A	C	B	D	C
Approach Delay	6.1				5.0		24.6		30.3	
Approach LOS	A				A		C		C	
Queue Length 50th (m)	1.2	22.6	0.0	0.4	11.8	0.0	7.2	3.4	16.0	9.3
Queue Length 95th (m)	4.6	41.8	5.7	2.5	23.2	5.5	16.8	10.6	31.5	21.2
Internal Link Dist (m)	166.5				193.8		90.1		86.1	
Turn Bay Length (m)	50.0	120.0		75.0	150.0		90.0			
Base Capacity (vph)	538	2183	996	365	2183	1004	377	535	401	541
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.38	0.13	0.03	0.23	0.12	0.17	0.08	0.33	0.19

Intersection Summary										
Cycle Length: 80										
Actuated Cycle Length: 73.2										
Natural Cycle: 55										
Control Type: Semi Act-Uncoord										

211 Centrum Boulevard PM Peak Hour Existing

Synchro 10 Light Report
Page 9

Lanes, Volumes, Timings
12: Prestone & St. Joseph

04-20-2020

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 9.7

Intersection LOS: A

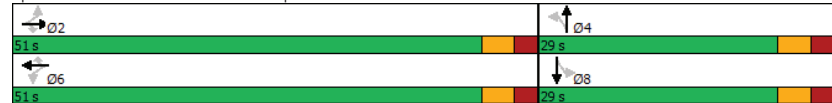
Intersection Capacity Utilization 51.5%

ICU Level of Service A

Analysis Period (min) 15

Description: As per signal timing plan provided on Dec. 17, 2019.

Splits and Phases: 12: Prestone & St. Joseph



HCM 2010 TWSC

14: Orleans Towncentre Access/Brisebois & Centrum

04-20-2020

Intersection

Int Delay, s/veh 1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Vol, veh/h	22	177	8	1	124	3	7	0	8	7	0	37
Future Vol, veh/h	22	177	8	1	124	3	7	0	8	7	0	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	197	9	1	138	3	8	0	9	8	0	41

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	141	0	0	206
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	4.12	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	2.218	-
Pot Cap-1 Maneuver	1442	-	1365	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1442	-	1365	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.1	10.7	9.7
HCM LOS	B		A	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	650	1442	-	-	1365	-	-	822
HCM Lane V/C Ratio	0.026	0.017	-	-	0.001	-	-	0.059
HCM Control Delay (s)	10.7	7.5	0	-	7.6	0	-	9.7
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.2

Appendix D

Collision Data

Record	Location	X	Y	Date	Time	Environment	Road_Surface	Traffic_Control	Collision_Location	Light	Collision_Classification	Impact_type
3307	CENTRUM BLVD @ PRESTONE DR	382259.461	5038366.35	2016-01-13	0.6181	03 - Snow	03 - Loose snow	02 - Stop sign	03 - At intersection	01 - Daylight	02 - Non-fatal injury	07 - SMV other
2473	CENTRUM BLVD @ PRESTONE DR	382259.461	5038363.778	2014-11-15	0.5472	01 - Clear	01 - Dry	02 - Stop sign	03 - At intersection	01 - Daylight	02 - Non-fatal injury	07 - SMV other
3308	CENTRUM BLVD btwn PLACE D'ORLEANS DR & PRESTONE DR	382108.8569	5038281.557	2016-03-10	0.6375	01 - Clear	01 - Dry	10 - No control	04 - At/near private drive	01 - Daylight	03 - P.D. only	04 - Sideswipe
6509	CENTRUM BLVD btwn PLACE D'ORLEANS DR & PRESTONE DR	382240.7551	5038353.355	2014-05-03	0.4472	01 - Clear	01 - Dry	10 - No control	01 - Non intersection	01 - Daylight	03 - P.D. only	04 - Sideswipe
9220	CENTRUM BLVD btwn PLACE D'ORLEANS DR & PRESTONE DR (_3ZA5ZB)	382080.2407	5038262.578	2018-10-10	0.5153	01 - Clear	01 - Dry	10 - No control	01 - Non intersection	01 - Daylight	02 - Non-fatal injury	07 - SMV other
7094	CENTRUM BLVD btwn PRESTONE DR & END	382277.9444	5038374.702	2014-05-08	0.6653	01 - Clear	01 - Dry	10 - No control	04 - At/near private drive	01 - Daylight	03 - P.D. only	02 - Angle
8830	CENTRUM BLVD btwn PRESTONE DR & END	382279.8402	5038378.494	2014-07-07	0.4618	01 - Clear	02 - Wet	10 - No control	04 - At/near private drive	01 - Daylight	03 - P.D. only	99 - Other
11050	OR174 IC102 RAMP15 @ PLACE D'ORLEANS DR	381879.97782	5038346.40000	2017-01-22	19.47	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	07 - Dark	02 - Non-fatal injury	02 - Angle
10544	OR174 IC102 RAMP15 @ PLACE D'ORLEANS DR	381879.62155	5038346.18049	2016-09-03	14.30	01 - Clear	01 - Dry	01 - Traffic signal	02 - Intersection related	01 - Daylight	03 - P.D. only	04 - Sideswipe
10545	OR174 IC102 RAMP15 @ PLACE D'ORLEANS DR	381880.1469	5038346.955	2016-07-13	0.6986	01 - Clear	02 - Wet	01 - Traffic signal	02 - Intersection related	01 - Daylight	03 - P.D. only	04 - Sideswipe
7437	OR174 IC102 RAMP15 @ PLACE D'ORLEANS DR (0009219)	381880.31041	5038346.39934	2018-08-16	21:45	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	07 - Dark	03 - P.D. only	03 - Rear end
10881	PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS	381964.1293	5038137.843	2016-04-06	0.7674	03 - Snow	03 - Loose snow	01 - Traffic signal	02 - Intersection related	01 - Daylight	03 - P.D. only	03 - Rear end
10882	PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS	381964.0545	5038138.587	2016-05-31	0.4875	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	01 - Daylight	03 - P.D. only	07 - SMV other
76	PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS	381962.3593	5038138.685	2015-03-11	0.6597	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	01 - Daylight	02 - Non-fatal injury	07 - SMV other
1368	PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS	381964.0196	5038137.952	2015-06-29	0.4694	02 - Rain	02 - Wet	01 - Traffic signal	03 - At intersection	01 - Daylight	02 - Non-fatal injury	07 - SMV other
2648	PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS	381963.4321	5038137.787	2015-11-27	0.7833	02 - Rain	02 - Wet	01 - Traffic signal	03 - At intersection	07 - Dark	02 - Non-fatal injury	05 - Turning movement
3515	PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS	381964.0049	5038140.338	2015-01-28	0.6493	01 - Clear	01 - Dry	01 - Traffic signal	02 - Intersection related	01 - Daylight	03 - P.D. only	02 - Angle
10430	PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS	381961.9887	5038140.049	2015-09-21	0.8215	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	05 - Dusk	03 - P.D. only	05 - Turning movement
1238	PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS	381966.1621	5038138.584	2014-07-23	0.3646	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	01 - Daylight	02 - Non-fatal injury	05 - Turning movement
14448	PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS	381964.4935	5038137.047	2014-11-28	0.6076	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	01 - Daylight	03 - P.D. only	05 - Turning movement
676	PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS (0004167)	381964.7402	5038137.592	2018-01-15	0.4986	01 - Clear	05 - Packed snow	01 - Traffic signal	02 - Intersection related	01 - Daylight	03 - P.D. only	02 - Angle
3221	PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS (0004167)	381962.7937	5038137.191	2018-03-27	0.5208	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	01 - Daylight	03 - P.D. only	05 - Turning movement
8833	PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS (0004167)	381964.7405	5038137.592	2018-09-28	0.4958	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	01 - Daylight	03 - P.D. only	02 - Angle
11398	PLACE D'ORLEANS DR btwn CENTRUM BLVD & ST. JOSEPH BLVD	381984.3377	5038032.959	2017-01-28	0.775	01 - Clear	02 - Wet	10 - No control	01 - Non intersection	07 - Dark	03 - P.D. only	05 - Turning movement
10886	PLACE D'ORLEANS DR btwn CENTRUM BLVD & ST. JOSEPH BLVD	381983.5446	5038042.636	2016-08-30	0.9132	01 - Clear	01 - Dry	10 - No control	04 - At/near private drive	07 - Dark	02 - Non-fatal injury	05 - Turning movement
2810	PLACE D'ORLEANS DR btwn CENTRUM BLVD & ST. JOSEPH BLVD	381967.6284	5038118.097	2015-12-14	0.3021	02 - Rain	02 - Wet	10 - No control	04 - At/near private drive	03 - Dawn	02 - Non-fatal injury	02 - Angle
5264	PLACE D'ORLEANS DR btwn CENTRUM BLVD & ST. JOSEPH BLVD	381968.2881	5038089.951	2015-02-22	0.5208	01 - Clear	02 - Wet	10 - No control	04 - At/near private drive	01 - Daylight	03 - P.D. only	05 - Turning movement
3173	PLACE D'ORLEANS DR btwn CENTRUM BLVD & ST. JOSEPH BLVD (_3ZA2FM)	381977.1502	5038059.152	2018-03-25	0.966	01 - Clear	01 - Dry	10 - No control	04 - At/near private drive	07 - Dark	03 - P.D. only	02 - Angle
4958	PLACE D'ORLEANS DR btwn CENTRUM BLVD & ST. JOSEPH BLVD (_3ZA2FM)	381991.48	5038014.892	2018-05-29	0.6104	01 - Clear	01 - Dry	10 - No control	04 - At/near private drive	01 - Daylight	03 - P.D. only	02 - Angle
10063	PLACE D'ORLEANS DR btwn CENTRUM BLVD & ST. JOSEPH BLVD (_3ZA2FM)	381981.8389	5038044.978	2018-11-01	0.2993	07 - Fog, mist, sm01	01 - Dry	10 - No control	01 - Non intersection	03 - Dawn	02 - Non-fatal injury	07 - SMV other
13136	PLACE D'ORLEANS DR btwn TO BE DETERMINED & TURN LANE	381896.386	5038299.479	2015-12-11	0.4292	01 - Clear	02 - Wet	10 - No control	01 - Non intersection	01 - Daylight	03 - P.D. only	07 - SMV other
10888	PLACE D'ORLEANS DR btwn TURN LANE & CENTRUM BLVD	381919.2957	5038272.257	2016-08-29	0.5076	01 - Clear	01 - Dry	10 - No control	01 - Non intersection	01 - Daylight	03 - P.D. only	04 - Sideswipe
11483	PRESTONE DR @ ST. JOSEPH BLVD	382326.0789	5038274.923	2017-06-24	0.4583	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	01 - Daylight	02 - Non-fatal injury	05 - Turning movement
11484	PRESTONE DR @ ST. JOSEPH BLVD	382326.0789	5038274.254	2017-04-23	0.5813	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	01 - Daylight	02 - Non-fatal injury	02 - Angle
10981	PRESTONE DR @ ST. JOSEPH BLVD	382325.9664	5038273.363	2016-03-13	0.5917	01 - Clear	02 - Wet	01 - Traffic signal	03 - At intersection	01 - Daylight	03 - P.D. only	02 - Angle
2650	PRESTONE DR @ ST. JOSEPH BLVD	382326.6775	5038272.472	2014-12-30	0.5201	01 - Clear	01 - Dry	01 - Traffic signal	02 - Intersection related	01 - Daylight	02 - Non-fatal injury	03 - Rear end
4473	PRESTONE DR @ ST. JOSEPH BLVD	382325.2705	5038275.481	2014-02-16	0.6813	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	01 - Daylight	03 - P.D. only	02 - Angle
5128	PRESTONE DR @ ST. JOSEPH BLVD	382327.1662	5038272.637	2014-03-04	0.6069	01 - Clear	01 - Dry	01 - Traffic signal	02 - Intersection related	01 - Daylight	03 - P.D. only	03 - Rear end
7008	PRESTONE DR @ ST. JOSEPH BLVD (0003551)	382325.7442	5038273.585	2018-07-31	0.3264	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	01 - Daylight	03 - P.D. only	03 - Rear end
7549	PRESTONE DR @ ST. JOSEPH BLVD (0003551)	382325.7444	5038273.585	2018-08-21	0.6667	02 - Rain	02 - Wet	01 - Traffic signal	03 - At intersection	01 - Daylight	03 - P.D. only	05 - Turning movement
7750	PRESTONE DR @ ST. JOSEPH BLVD (0003551)	382325.7447	5038273.584	2018-08-28	0.7056	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	01 - Daylight	03 - P.D. only	05 - Turning movement
9808	PRESTONE DR @ ST. JOSEPH BLVD (0003551)	382325.7449	5038273.585	2018-10-25	0.8021	01 - Clear	01 - Dry	01 - Traffic signal	02 - Intersection related	07 - Dark	03 - P.D. only	03 - Rear end
9142	PRESTONE DR btwn CENTRUM BLVD & ST. JOSEPH BLVD	382308.4471	5038291.243	2015-01-23	0.8785	01 - Clear	01 - Dry	10 - No control	04 - At/near private drive	07 - Dark	03 - P.D. only	05 - Turning movement
12900	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR	381996.1891	5037994.949	2017-10-02	0.5069	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	01 - Daylight	03 - P.D. only	05 - Turning movement
12901	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR	381994.8993	5037997.798	2017-11-15	0.3472	01 - Clear	01 - Dry	01 - Traffic signal	02 - Intersection related	01 - Daylight	02 - Non-fatal injury	03 - Rear end
12902	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR	381999.2512	5037996.248	2017-03-15	0.3472	03 - Snow	03 - Loose snow	01 - Traffic signal	02 - Intersection related	01 - Daylight	03 - P.D. only	03 - Rear end
12503	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR	381997.36	5037996.399	2016-03-05	0.5986	01 - Clear	01 - Dry	01 - Traffic signal	02 - Intersection related	01 - Daylight	02 - Non-fatal injury	03 - Rear end
12504	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR	381995.9755	5037996.095	2016-09-09	0.4993	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	01 - Daylight	03 - P.D. only	07 - SMV other
12505	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR	381996.5082	5037998.339	2016-10-05	0.3264	01 - Clear	01 - Dry	01 - Traffic signal	02 - Intersection related	01 - Daylight	03 - P.D. only	03 - Rear end
871	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR	381995.7716	5037997.07	2015-01-31	0.6042	01 - Clear	02 - Wet	01 - Traffic signal	03 - At intersection	01 - Daylight	02 - Non-fatal injury	05 - Turning movement
1220	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR	381996.0148	5037995.507	2015-08-24	0.6292	01 - Clear	02 - Wet	01 - Traffic signal	02 - Intersection related	01 - Daylight	02 - Non-fatal injury	03 - Rear end
2208	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR	381997.4562	5037996.228	2015-10-13	0.7333	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	01 - Daylight	02 - Non-fatal injury	02 - Angle
2825	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR	381996.7355	5037997.31	2015-12-25	0.8486	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	07 - Dark	02 - Non-fatal injury	05 - Turning movement
3840	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR	381996.1899	5037998.365	2015-03-09	0.7493	01 - Clear	01 - Dry	01 - Traffic signal	02 - Intersection related	05 - Dusk	03 - P.D. only	99 - Other
481	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR	381996.8359	5037994.871	2014-01-23	0.8028	01 - Clear	02 - Wet	01 - Traffic signal	03 - At intersection	07 - Dark	02 - Non-fatal injury	05 - Turning movement
886	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR	381999.1052	5037995.64	2014-06-07	0.6458	01 - Clear	01 - Dry	01 - Traffic signal	02 - Intersection related	01 - Daylight	02 - Non-fatal injury	03 - Rear end
1550	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR	381996.2616	5037999.432	2014-10-31	0.5139	01 - Clear	01 - Dry	01 - Traffic signal	02 - Intersection related	01 - Daylight	02 - Non-fatal injury	03 - Rear end
4329	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR	381997.2094	5037995.008	2014-02-13	0.3361	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	01 - Daylight	03 - P.D. only	02 - Angle
7318	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR	381995.3137	5037994.692	2014-05-29	0.8646	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	07 - Dark	03 - P.D. only	05 - Turning movement
13263	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR	381995.7062	5037995.678	2014-12-30	0.5167	01 - Clear	01 - Dry	01 - Traffic signal	02 - Intersection related	01 - Daylight	03 - P.D. only	03 - Rear end
252	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	381996.8135	5037996.902	2018-01-06	0.6576	01 - Clear	01 - Dry	01 - Traffic signal	03 - At intersection	01 - Daylight	02 - Non-fatal injury	05 - Turning movement
8714	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	381996.7357	5037996.588	2018-09-25	0.5764	02 - Rain	02 - Wet	01 - Traffic signal	02 - Intersection related	01 - Daylight	03 - P.D. only	02 - Angle
9647	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	381996.7358	5037996.589	2018-10-20	0.6306	01 - Clear	01 - Dry	01 - Traffic signal	02 - Intersection related	01 - Daylight	02 - Non-fatal injury	03 - Rear end
10100	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	381996.7349	5037996.588	2018-11-02	0.2903	02 - Rain	02 - Wet	01 - Traffic signal	03 - At intersection	03 - Dawn	03 - P.D. only	07 - SMV other
13441	ST. JOSEPH BLVD btwn PLACE D'ORLEANS DR & PRESTONE DR	382007.636	5038012.702	2014-09-14	0.6896	01 - Clear	01 - Dry	10 - No control	01 - Non intersection	01 - Daylight	03 - P.D. only	04 - Sideswipe
13860	ST. JOSEPH BLVD btwn PLACE D'ORLEANS DR & PRESTONE DR	382089.1526	5038102.749	2014-09-24	0.6389	01 - Clear	01 - Dry	10 - No control	04 - At/near private drive	01 - Daylight	03 - P.D. only	03 - Rear end
13018	ST. JOSEPH BLVD btwn PRESTONE DR & TENTH LINE RD	382879.5238	5038662.984	2017-10-17	0.5972	01 - Clear	01 - Dry	10 - No control	01 - Non intersection	01 - Daylight	03 - P.D. only	04 - Sideswipe
12624	ST. JOSEPH BLVD btwn PRESTONE DR & TENTH LINE RD	382623.3038	5038533.271	2016-06-11	0.4076	02 - Rain	02 - Wet	10 - No control	01 - Non intersection	01 - Daylight	02 - Non-fatal injury	07 - SMV other
12625	ST. JOSEPH BLVD btwn PRESTONE DR & TENTH LINE RD	382867.0524	5038659.128	2016-02-15	0.3035	01 - Clear	01 - Dry	10 - No control	01 - Non intersection	01 - Daylight	03 - P.D. only	04 - Sideswipe
3693	ST. JOSEPH BLVD btwn PRESTONE DR & TENTH LINE RD	382358.8379	5038304.76	2014-01-14	0.2847	01 - Clear	01 - Dry	10 - No control	01 - Non intersection	07 - Dark	03 - P.D. only	04 - Sideswipe
13324	ST. JOSEPH BLVD btwn PRESTONE DR & TENTH LINE RD	382848.9986	5038649.826	2014-12-06	0.8771	02 - Rain	02 - Wet	10 - No control	01 - Non intersection	07 - Dark	03 - P.D. only	07 - SMV other
287	ST. JOSEPH BLVD btwn PRESTONE DR & TENTH LINE RD (_3ZA11U)	382873.0338	5038660.181	2018-01-06	0.7083	01 - Clear	02 - Wet	10 - No control	01 - Non intersection	05 - Dusk	03 - P.D. only	07 - SMV other
3598	ST. JOSEPH BLVD btwn PRESTONE DR & TENTH LINE RD (_3ZA11U)	382662.8781	5038563.027	2018-04-10	0.7938	01 - Clear	01 - Dry	10 - No control	01 - Non intersection	07 - Dark	03 - P.D. only	04 - Sideswipe
1302												

1982 ST. JOSEPH BLVD btwn ST. JOSEPH BLVD & PLACE D'ORLEANS DR	381844.4463	5037872.733	2014-09-22	0.5139	01 - Clear	01 - Dry	10 - No control	01 - Non intersection	01 - Daylight	02 - Non-fatal injury	07 - SMV other
4979 ST. JOSEPH BLVD btwn ST. JOSEPH BLVD & PLACE D'ORLEANS DR (32A2AV)	381859.2962	5037885.293	2018-05-29	0.7813	01 - Clear	01 - Dry	10 - No control	01 - Non intersection	01 - Daylight	03 - P.D. only	04 - Sideswipe
7102 ST. JOSEPH BLVD btwn ST. JOSEPH BLVD & PLACE D'ORLEANS DR (32A2AV)	381864.0886	5037889.194	2018-08-02	0.6528	02 - Rain	02 - Wet	10 - No control	04 - At/near private drive	01 - Daylight	02 - Non-fatal injury	02 - Angle
11382 ST. JOSEPH BLVD btwn ST. JOSEPH BLVD & PLACE D'ORLEANS DR (32A2AV)	381877.4641	5037900.047	2018-11-30	0.7188	01 - Clear	01 - Dry	10 - No control	04 - At/near private drive	07 - Dark	03 - P.D. only	05 - Turning movement



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2014 **To:** December 31, 2018

Location: CENTRUM BLVD @ PRESTONE DR

Traffic Control: Stop sign

Total Collisions: 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Nov-15, Sat,13:08	Clear	SMV other	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Pedestrian	3
2016-Jan-13, Wed,14:50	Snow	SMV other	Non-fatal injury	Loose snow	West	Going ahead	Unknown	Pedestrian	1

Location: CENTRUM BLVD btwn PLACE D'ORLEANS DR & PRESTONE DR

Traffic Control: No control

Total Collisions: 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-May-03, Sat,10:44	Clear	Sideswipe	P.D. only	Dry	East	Pulling away from shoulder or curb	Passenger van	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Mar-10, Thu,15:18	Clear	Sideswipe	P.D. only	Dry	East	Overtaking	Automobile, station wagon	Other motor vehicle	0
					East	Turning right	Pick-up truck	Other motor vehicle	
2018-Oct-10, Wed,12:22	Clear	SMV other	Non-fatal injury	Dry	East	Slowing or stopping	Automobile, station wagon	Ran off road	0

Location: PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS

Traffic Control: Traffic signal

Total Collisions: 12

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Jul-23, Wed,08:45	Clear	Turning movement	Non-fatal injury	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2014-Nov-28, Fri,14:35	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Jan-28, Wed,15:35	Clear	Angle	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Passenger van	Other motor vehicle	
2015-Mar-11, Wed,15:50	Clear	SMV other	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Pedestrian	1
2015-Jun-29, Mon,11:16	Rain	SMV other	Non-fatal injury	Wet	West	Turning left	Passenger van	Pedestrian	1



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2014 **To:** December 31, 2018

Location: PLACE D'ORLEANS @ CENTRUM BLVD/PLACE D'ORLEANS

Traffic Control: Traffic signal

Total Collisions: 12

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2015-Sep-21, Mon,19:43	Clear	Turning movement	P.D. only	Dry	South	Turning left	Pick-up truck	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Nov-27, Fri,18:48	Rain	Turning movement	Non-fatal injury	Wet	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Pick-up truck	Other motor vehicle	
2016-Apr-06, Wed,18:25	Snow	Rear end	P.D. only	Loose snow	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2016-May-31, Tue,11:42	Clear	SMV other	P.D. only	Dry	West	Turning left	Unknown	Pedestrian	1
2018-Jan-15, Mon,11:58	Clear	Angle	P.D. only	Packed snow	East	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Truck - open	Other motor vehicle	
2018-Mar-27, Tue,12:30	Clear	Turning movement	P.D. only	Dry	East	Turning left	Pick-up truck	Other motor vehicle	0
					West	Turning right	Automobile, station wagon	Other motor vehicle	
2018-Sep-28, Fri,11:54	Clear	Angle	P.D. only	Dry	North	Going ahead	Unknown	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	

Appendix E

TRANS Background Projection Plots

TRANS Regional Model

Version 2.13 - Assigned December 11, 2019

AM Peak Hour Total Traffic Volume 211 Centrum Blvd

2011 Model - Base Scenario

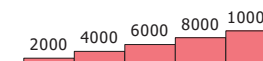
No Modifications from Base Version

User Initials: MM
Plot Prepared: January 09, 2020
EMME Scenario: 21311



Legend

AM Peak Hour Total Traffic Volume



Distance (m)



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

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

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

TRANS Regional Model

Version 2.99 5Assigned December 99, 2493

AM Peak Hour Total Traffic Volume 211 Centrum Blvd

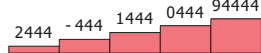
2489 Model 5ABoardable Noad f Uransit I et: orP
I o Modifications Bom Jase Version

y ser Initials(MM
) lot) repaired(kanuarH 43, 2424
TMMT Scenario(29989



Legend

AM) eaP) our Uotal UraBc Volume



Distance ImR

944 244 844 -44 744



Uve UNAI S model is continuousH reHned f maintained, and all information is provided in good fultv. &o: ewer, model outputs are provided "as is", and no : arantH or guarantee is provided as to tve accurat, reliabilityH or reasonableness obtive results. En using tvis data, Hou agree to accept anH and all risks arising Bom anH incorrect, incomplete, or misleading information.

Necipients are required to use caution and professional judgement in using and interpreting model outputs. En particular, caution should be used : ven fousing on a geograpvicalH limited area tveuc as a single road or intersectionR as tve model is primarilH designed to simulate regionalScale phenomena and has been calibrated at a regional level.

As general good practice, it is recommended tvat tve user confm tve net: orP coding : itvin tve area oBinterest, and compare base Hear fbrecasts against traffic count data to assess tve extent to : vicv tve model maH be overS or underestimating tve travel demand.

Appendix F

Synchro Intersection Worksheets – 2024 Background Conditions

Lanes, Volumes, Timings
1: Place d'Orléans & Hwy 174

06-16-2020

	→	↗	↖	↘
Lane Group	EBT	EBR	NBL	NBR
Lane Configurations	↑	↑↑	↑↑	↑
Traffic Volume (vph)	156	144	183	25
Future Volume (vph)	156	144	183	25
Lane Group Flow (vph)	156	144	183	25
Turn Type	NA	Perm	Prot	Perm
Protected Phases	4		2	
Permitted Phases		4		2
Detector Phase	4	4	2	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	15.7	15.7	24.8	24.8
Total Split (s)	35.7	35.7	44.8	44.8
Total Split (%)	44.3%	44.3%	55.7%	55.7%
Maximum Green (s)	30.0	30.0	40.0	40.0
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	4.8	4.8
Lead/Lag				
Lead-Lag Optimize?				
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	None	None	Min	Min
Walk Time (s)			15.0	15.0
Flash Dont Walk (s)			5.0	5.0
Pedestrian Calls (#/hr)			1	1
Act Effct Green (s)	10.4	10.4	13.8	13.8
Actuated g/C Ratio	0.30	0.30	0.39	0.39
v/c Ratio	0.30	0.16	0.14	0.04
Control Delay	11.4	3.3	7.2	3.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.4	3.3	7.2	3.4
LOS	B	A	A	A
Approach Delay	7.5		6.7	
Approach LOS	A		A	
Queue Length 50th (m)	5.3	0.0	3.0	0.0
Queue Length 95th (m)	19.7	4.6	6.8	2.3
Internal Link Dist (m)	182.0		201.4	
Turn Bay Length (m)		150.0		50.0
Base Capacity (vph)	1530	2307	3159	1438
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.10	0.06	0.06	0.02
Intersection Summary				
Cycle Length: 80.5				
Actuated Cycle Length: 35				
Natural Cycle: 45				
Control Type: Actuated-Uncoordinated				

Lanes, Volumes, Timings
1: Place d'Orléans & Hwy 174

06-16-2020

Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 7.2	Intersection LOS: A
Intersection Capacity Utilization 26.0%	ICU Level of Service A
Analysis Period (min) 15	
Description: As per signal timing plan provided on Dec. 17, 2019.	

Splits and Phases: 1: Place d'Orléans & Hwy 174



Lanes, Volumes, Timings

2: Place d'Orléans & Private/Centrum

06-16-2020

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	25	18	40	56	82	67	178	68	48
Future Volume (vph)	25	18	40	56	82	67	178	68	48
Lane Group Flow (vph)	25	18	40	56	83	0	277	0	135
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	36.0	36.0	36.0	36.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0	43.0	43.0	43.0	43.0
Total Split (%)	42.7%	42.7%	42.7%	42.7%	42.7%	57.3%	57.3%	57.3%	57.3%
Maximum Green (s)	26.0	26.0	26.0	26.0	26.0	37.0	37.0	37.0	37.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	7	7	7	8	8	0	0	1	1
Act Effct Green (s)	13.0	13.0	13.0	12.1	12.1		54.4		54.4
Actuated g/C Ratio	0.17	0.17	0.17	0.16	0.16		0.73		0.73
v/c Ratio	0.12	0.06	0.14	0.27	0.29		0.14		0.08
Control Delay	24.6	23.1	7.7	28.0	27.5		5.1		5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	24.6	23.1	7.7	28.0	27.5		5.1		5.1
LOS	C	C	A	C	C		A		A
Approach Delay		16.1			27.7		5.1		5.1
Approach LOS		B			C		A		A
Queue Length 50th (m)	3.2	2.3	0.0	7.3	10.7		4.8		2.1
Queue Length 95th (m)	7.3	5.7	5.5	13.1	17.2		15.7		8.3
Internal Link Dist (m)		30.9			117.0		125.7		201.4
Turn Bay Length (m)			20.0	95.0					
Base Capacity (vph)	422	604	533	448	604		2031		1769
Starvation Cap Reductn	0	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0	0		0		0
Reduced v/c Ratio	0.06	0.03	0.08	0.13	0.14		0.14		0.08

Intersection Summary

Cycle Length: 75

Actuated Cycle Length: 75

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

Natural Cycle: 70

211 Centrum Boulevard AM Peak Hour FB2024

Synchro 10 Light Report
Page 3

Lanes, Volumes, Timings

2: Place d'Orléans & Private/Centrum

06-16-2020

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.29

Intersection Signal Delay: 11.5

Intersection LOS: B

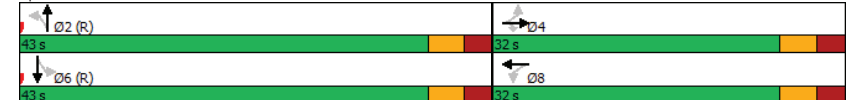
Intersection Capacity Utilization 60.8%

ICU Level of Service B

Analysis Period (min) 15

Description: As per signal timing plan provided on Dec. 17, 2019.

Splits and Phases: 2: Place d'Orléans & Private/Centrum



211 Centrum Boulevard AM Peak Hour FB2024

Synchro 10 Light Report
Page 4

HCM 2010 AWSC
3: Prestone & Centrum

06-16-2020

Intersection						
Intersection Delay, s/veh	8.4					
Intersection LOS	A					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Vol, veh/h	27	62	54	35	137	57
Future Vol, veh/h	27	62	54	35	137	57
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	62	54	35	137	57
Number of Lanes	1	0	0	1	1	1
Approach	EB	WB		NB		
Opposing Approach	WB	EB				
Opposing Lanes	1	1		0		
Conflicting Approach Left		NB		EB		
Conflicting Lanes Left	0	2		1		
Conflicting Approach Right	NB			WB		
Conflicting Lanes Right	2	0		1		
HCM Control Delay	7.6	8.3		8.9		
HCM LOS	A	A		A		

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	61%
Vol Thru, %	0%	0%	30%	39%
Vol Right, %	0%	100%	70%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	137	57	89	89
LT Vol	137	0	0	54
Through Vol	0	0	27	35
RT Vol	0	57	62	0
Lane Flow Rate	137	57	89	89
Geometry Grp	7	7	2	2
Degree of Util (X)	0.208	0.067	0.102	0.115
Departure Headway (Hd)	5.454	4.25	4.116	4.646
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	662	848	872	773
Service Time	3.154	1.95	2.132	2.662
HCM Lane V/C Ratio	0.207	0.067	0.102	0.115
HCM Control Delay	9.6	7.3	7.6	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.2	0.3	0.4

Lanes, Volumes, Timings
4: Duford/Place d'Orléans & St. Joseph

06-16-2020

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↰	↱	↰	↱	↰	↱	↰	↱	↱
Traffic Volume (vph)	78	204	14	765	92	143	37	46	26
Future Volume (vph)	78	204	14	765	92	143	37	46	26
Lane Group Flow (vph)	78	252	14	848	92	155	37	46	26
Turn Type	pm+pt	NA	pm+pt	NA	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6	7	4	3	8	
Permitted Phases	2		6						8
Detector Phase	5	2	1	6	7	4	3	8	8
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	10.3	30.3	10.3	30.3	10.8	35.9	10.8	35.9	35.9
Total Split (s)	11.0	37.0	11.0	37.0	21.0	36.0	21.0	36.0	36.0
Total Split (%)	10.5%	35.2%	10.5%	35.2%	20.0%	34.3%	20.0%	34.3%	34.3%
Maximum Green (s)	5.7	30.7	5.7	30.7	15.2	29.1	15.2	29.1	29.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	3.0	2.0	3.0	2.5	3.6	2.5	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.3	5.3	6.3	5.8	6.9	5.8	6.9	6.9
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Walk Time (s)		7.0		7.0		7.0		7.0	7.0
Flash Dont Walk (s)		17.0		17.0		22.0		22.0	22.0
Pedestrian Calls (#/hr)		3		1		0		2	2
Act Effct Green (s)	62.8	59.0	59.3	53.6	11.0	19.4	7.9	14.0	14.0
Actuated g/C Ratio	0.60	0.56	0.56	0.51	0.10	0.18	0.08	0.13	0.13
v/c Ratio	0.24	0.14	0.02	0.51	0.53	0.48	0.30	0.20	0.08
Control Delay	14.3	14.4	14.0	22.4	54.8	40.9	51.4	39.3	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	14.4	14.0	22.4	54.8	40.9	51.4	39.3	0.5
LOS	B	B	B	C	D	D	D	D	A
Approach Delay		14.4		22.3		46.1		34.1	
Approach LOS		B		C		D		C	
Queue Length 50th (m)	5.9	9.4	1.0	60.0	18.1	29.6	7.3	8.8	0.0
Queue Length 95th (m)	19.2	28.7	5.5	#119.3	32.6	39.3	16.9	15.7	0.0
Internal Link Dist (m)		177.7		219.6		140.7		125.7	
Turn Bay Length (m)	70.0		45.0				90.0		
Base Capacity (vph)	330	1811	619	1671	240	495	240	483	513
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.14	0.02	0.51	0.38	0.31	0.15	0.10	0.05

Intersection Summary

Cycle Length: 105
Actuated Cycle Length: 105
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90

Lanes, Volumes, Timings

4: Duford/Place d'Orléans & St. Joseph

06-16-2020

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 25.3

Intersection LOS: C

Intersection Capacity Utilization 62.8%

ICU Level of Service B

Analysis Period (min) 15

Description: As per signal timing plan provided on Dec. 17, 2019.

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

Queue shown is maximum after two cycles.

Splits and Phases: 4: Duford/Place d'Orléans & St. Joseph

Ø1	Ø2 (R)	Ø3	Ø4
11 s	37 s	21 s	36 s
Ø5	Ø6 (R)	Ø7	Ø8
11 s	37 s	21 s	36 s

Lanes, Volumes, Timings

5: Prestone & St. Joseph

06-16-2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰
Traffic Volume (vph)	8	192	40	2	754	130	81	56	59	38
Future Volume (vph)	8	192	40	2	754	130	81	56	59	38
Lane Group Flow (vph)	8	192	40	2	754	130	81	61	59	55
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2			6			4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	23.7	23.7	23.7	23.7	23.7	23.7	29.0	29.0	29.0	29.0
Total Split (s)	51.0	51.0	51.0	51.0	51.0	51.0	29.0	29.0	29.0	29.0
Total Split (%)	63.8%	63.8%	63.8%	63.8%	63.8%	63.8%	36.3%	36.3%	36.3%	36.3%
Maximum Green (s)	45.3	45.3	45.3	45.3	45.3	45.3	23.0	23.0	23.0	23.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.7	6.0	6.0	6.0	6.0
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	2	2	1	1
Act Effct Green (s)	50.7	50.7	50.7	50.7	50.7	50.7	12.6	12.6	12.6	12.6
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.72	0.72	0.18	0.18	0.18	0.18
v/c Ratio	0.02	0.08	0.04	0.00	0.32	0.12	0.36	0.20	0.26	0.18
Control Delay	6.1	5.1	2.4	6.0	6.0	1.7	29.5	23.7	27.3	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	5.1	2.4	6.0	6.0	1.7	29.5	23.7	27.3	19.0
LOS	A	A	A	A	A	A	C	C	C	B
Approach Delay		4.7			5.4			27.0		23.3
Approach LOS		A			A			C		C
Queue Length 50th (m)	0.3	3.5	0.0	0.1	17.0	0.0	9.3	6.2	6.7	4.2
Queue Length 95th (m)	2.3	10.9	3.7	1.0	42.5	6.5	20.0	14.8	15.6	12.2
Internal Link Dist (m)		166.5			193.8			90.1		86.1
Turn Bay Length (m)	50.0		120.0	75.0		150.0	90.0			
Base Capacity (vph)	453	2387	1079	792	2387	1090	412	568	409	554
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.08	0.04	0.00	0.32	0.12	0.20	0.11	0.14	0.10

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 70.5

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings 5: Prestone & St. Joseph

06-16-2020

Maximum v/c Ratio: 0.36

Intersection Signal Delay: 9.0

Intersection LOS: A

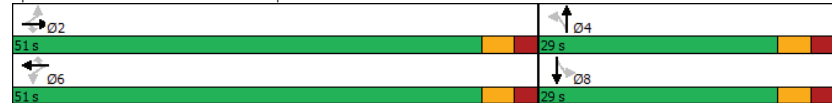
Intersection Capacity Utilization 43.7%

ICU Level of Service A

Analysis Period (min) 15

Description: As per signal timing plan provided on Dec. 17, 2019.

Splits and Phases: 5: Prestone & St. Joseph



HCM 2010 TWSC

6: Orleans Towncentre Access/Brisebois & Centrum

06-16-2020

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Vol, veh/h	24	80	10	2	124	3	0	0	1	1	0	13
Future Vol, veh/h	24	80	10	2	124	3	0	0	1	1	0	13
Conflicting Peds, #/hr	8	0	9	9	0	8	0	0	3	3	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	80	10	2	124	3	0	0	1	1	0	13

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	135	0	0	99
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1449	-	-	1494
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1440	-	-	1484
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	0.1	8.8	9.1
HCM LOS	A		A	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	950	1440	-	-	1484	-	-	885
HCM Lane V/C Ratio	0.001	0.017	-	-	0.001	-	-	0.016
HCM Control Delay (s)	8.8	7.5	0	-	7.4	0	-	9.1
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	14	0	0	12
Future Vol, veh/h	0	0	14	0	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	-	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	14	0	0	12
Major/Minor	Minor2	Major2				
Conflicting Flow All	28	0	0	0		
Stage 1	28	-	-	-		
Stage 2	0	-	-	-		
Critical Hdwy	6.52	6.22	4.12	-		
Critical Hdwy Stg 1	5.52	-	-	-		
Critical Hdwy Stg 2	-	-	-	-		
Follow-up Hdwy	4.018	3.318	2.218	-		
Pot Cap-1 Maneuver	865	-	-	-		
Stage 1	872	-	-	-		
Stage 2	-	-	-	-		
Platoon blocked, %				-		
Mov Cap-1 Maneuver	0	-	-	-		
Mov Cap-2 Maneuver	0	-	-	-		
Stage 1	0	-	-	-		
Stage 2	0	-	-	-		
Approach	EB	WB				
HCM Control Delay, s	0					
HCM LOS	A					
Minor Lane/Major Mvmt	EBLn1	WBL	WBT			
Capacity (veh/h)	-	-	-			
HCM Lane V/C Ratio	-	-	-			
HCM Control Delay (s)	0	-	-			
HCM Lane LOS	A	-	-			
HCM 95th %tile Q(veh)	-	-	-			

	→	↰	↱	↲
Lane Group	EBT	EBR	NBL	NBR
Lane Configurations	↰	↰	↰	↰
Traffic Volume (vph)	536	305	193	103
Future Volume (vph)	536	305	193	103
Lane Group Flow (vph)	536	305	193	103
Turn Type	NA	Perm	Prot	Perm
Protected Phases	4		2	
Permitted Phases		4		2
Detector Phase	4	4	2	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	15.7	15.7	24.8	24.8
Total Split (s)	45.7	45.7	44.8	44.8
Total Split (%)	50.5%	50.5%	49.5%	49.5%
Maximum Green (s)	40.0	40.0	40.0	40.0
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	4.8	4.8
Lead/Lag				
Lead-Lag Optimize?				
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	None	None	Min	Min
Walk Time (s)			15.0	15.0
Flash Dont Walk (s)			5.0	5.0
Pedestrian Calls (#/hr)			6	6
Act Effct Green (s)	18.3	18.3	11.9	11.9
Actuated g/C Ratio	0.44	0.44	0.29	0.29
v/c Ratio	0.69	0.23	0.21	0.21
Control Delay	14.6	1.6	13.3	5.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	14.6	1.6	13.3	5.1
LOS	B	A	B	A
Approach Delay	9.9		10.4	
Approach LOS	A		B	
Queue Length 50th (m)	23.7	0.0	4.7	0.0
Queue Length 95th (m)	67.1	5.2	14.5	8.6
Internal Link Dist (m)	182.0		201.4	
Turn Bay Length (m)		150.0		50.0
Base Capacity (vph)	1616	2441	2979	1354
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.33	0.12	0.06	0.08
Intersection Summary				
Cycle Length: 90.5				
Actuated Cycle Length: 41.3				
Natural Cycle: 55				
Control Type: Actuated-Uncoordinated				

Lanes, Volumes, Timings
1: Place d'Orléans & Hwy 174

06-16-2020

Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 10.0	Intersection LOS: B
Intersection Capacity Utilization 48.4%	ICU Level of Service A
Analysis Period (min) 15	
Description: As per signal timing plan provided on Dec. 17, 2019.	

Splits and Phases: 1: Place d'Orléans & Hwy 174

 Ø2	 Ø4
44.8 s	45.7 s

Lanes, Volumes, Timings
2: Place d'Orléans & Private/Centrum

06-16-2020

									
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	94	51	220	73	92	102	190	100	147
Future Volume (vph)	94	51	220	73	92	102	190	100	147
Lane Group Flow (vph)	94	51	220	73	92	0	352	0	289
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	36.0	36.0	36.0	36.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0	53.0	53.0	53.0	53.0
Total Split (%)	37.6%	37.6%	37.6%	37.6%	37.6%	62.4%	62.4%	62.4%	62.4%
Maximum Green (s)	26.0	26.0	26.0	26.0	26.0	47.0	47.0	47.0	47.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0		6.0
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	12	12	12	4	4	5	5	14	14
Act Effct Green (s)	14.3	14.3	14.3	14.3	14.3		58.7		58.7
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17		0.69		0.69
v/c Ratio	0.47	0.17	0.52	0.35	0.31		0.20		0.17
Control Delay	37.9	29.2	8.5	33.9	32.0		5.3		5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	37.9	29.2	8.5	33.9	32.0		5.3		5.2
LOS	D	C	A	C	C		A		A
Approach Delay		19.0			32.8		5.3		5.2
Approach LOS		B			C		A		A
Queue Length 50th (m)	14.4	7.4	0.0	11.0	13.8		7.0		5.6
Queue Length 95th (m)	23.9	13.9	15.1	19.2	22.3		19.1		16.0
Internal Link Dist (m)		30.9			117.0		125.7		201.4
Turn Bay Length (m)			20.0	95.0					
Base Capacity (vph)	367	533	595	382	533		1731		1653
Starvation Cap Reductn	0	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0	0		0		0
Reduced v/c Ratio	0.26	0.10	0.37	0.19	0.17		0.20		0.17
Intersection Summary									
Cycle Length: 85									
Actuated Cycle Length: 85									
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green									
Natural Cycle: 70									

Lanes, Volumes, Timings

2: Place d'Orléans & Private/Centrum

06-16-2020

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 13.4

Intersection LOS: B

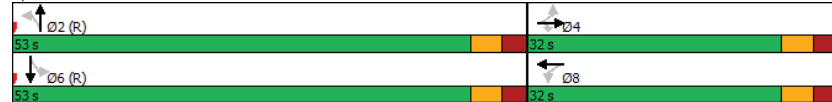
Intersection Capacity Utilization 80.0%

ICU Level of Service D

Analysis Period (min) 15

Description: As per signal timing plan provided on Dec. 17, 2019.

Splits and Phases: 2: Place d'Orléans & Private/Centrum



HCM 2010 AWSC

3: Prestone & Centrum

06-16-2020

Intersection

Intersection Delay, s/veh 8.4

Intersection LOS A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Traffic Vol, veh/h	40	162	54	30	103	56
Future Vol, veh/h	40	162	54	30	103	56
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	162	54	30	103	56
Number of Lanes	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	8.1	8.3	8.8
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	64%
Vol Thru, %	0%	0%	20%	36%
Vol Right, %	0%	100%	80%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	103	56	202	84
LT Vol	103	0	0	54
Through Vol	0	0	40	30
RT Vol	0	56	162	0
Lane Flow Rate	103	56	202	84
Geometry Grp	7	7	2	2
Degree of Util (X)	0.161	0.069	0.223	0.109
Departure Headway (Hd)	5.644	4.438	3.966	4.678
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	637	807	907	768
Service Time	3.372	2.165	1.979	2.698
HCM Lane V/C Ratio	0.162	0.069	0.223	0.109
HCM Control Delay	9.5	7.5	8.1	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.2	0.9	0.4

Lanes, Volumes, Timings

4: Duford/Place d'Orléans & St. Joseph

06-16-2020

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↩	↩↩	↩	↩↩	↩	↩	↩	↩	↩
Traffic Volume (vph)	155	831	17	517	62	77	210	125	53
Future Volume (vph)	155	831	17	517	62	77	210	125	53
Lane Group Flow (vph)	155	985	17	619	62	90	210	125	53
Turn Type	pm+pt	NA	pm+pt	NA	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6	7	4	3	8	
Permitted Phases	2		6						8
Detector Phase	5	2	1	6	7	4	3	8	8
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	10.3	30.3	10.3	30.3	10.8	35.9	10.8	35.9	35.9
Total Split (s)	11.0	33.0	11.0	33.0	25.0	36.0	25.0	36.0	36.0
Total Split (%)	10.5%	31.4%	10.5%	31.4%	23.8%	34.3%	23.8%	34.3%	34.3%
Maximum Green (s)	5.7	26.7	5.7	26.7	19.2	29.1	19.2	29.1	29.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	3.0	2.0	3.0	2.5	3.6	2.5	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.3	5.3	6.3	5.8	6.9	5.8	6.9	6.9
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	17.0	17.0	17.0	17.0	22.0	22.0	22.0	22.0	22.0
Pedestrian Calls (#/hr)	6	13	6	13	5	6	6	6	6
Act Effct Green (s)	58.0	53.5	49.6	42.7	9.3	14.3	17.0	20.9	20.9
Actuated g/C Ratio	0.55	0.51	0.47	0.41	0.09	0.14	0.16	0.20	0.20
v/c Ratio	0.39	0.60	0.07	0.47	0.42	0.38	0.78	0.36	0.13
Control Delay	20.5	24.6	17.1	26.7	53.3	40.0	62.5	37.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	24.6	17.1	26.7	53.3	40.0	62.5	37.0	0.6
LOS	C	C	B	C	D	D	E	D	A
Approach Delay	24.1	26.4	26.4	45.5	45.8				
Approach LOS	C	C	C	D	D				
Queue Length 50th (m)	14.8	64.8	1.5	48.7	12.2	16.1	40.8	22.5	0.0
Queue Length 95th (m)	#41.6	#166.2	6.7	79.3	24.4	25.2	#69.7	32.1	0.0
Internal Link Dist (m)	149.8	219.6	140.7	125.7					
Turn Bay Length (m)	45.0	90.0							
Base Capacity (vph)	396	1652	259	1321	303	477	303	504	527
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.60	0.07	0.47	0.20	0.19	0.69	0.25	0.10
Intersection Summary									
Cycle Length: 105									
Actuated Cycle Length: 105									
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green									
Natural Cycle: 100									

211 Centrum Boulevard PM Peak Hour 2024 Future Background

Synchro 10 Light Report
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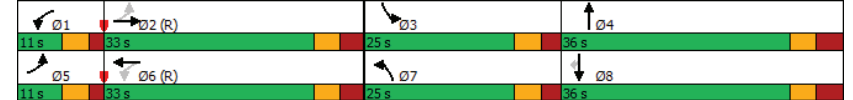
Lanes, Volumes, Timings

4: Duford/Place d'Orléans & St. Joseph

06-16-2020

Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 29.8	Intersection LOS: C
Intersection Capacity Utilization 77.0%	ICU Level of Service D
Analysis Period (min) 15	
Description: As per signal timing plan provided on Dec. 17, 2019.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 4: Duford/Place d'Orléans & St. Joseph



211 Centrum Boulevard PM Peak Hour 2024 Future Background

Synchro 10 Light Report
Page 8

Lanes, Volumes, Timings
5: Prestone & St. Joseph

06-16-2020

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	27	859	116	10	506	109	57	28	123	69
Future Volume (vph)	27	859	116	10	506	109	57	28	123	69
Lane Group Flow (vph)	27	859	116	10	506	109	57	37	123	94
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	2		6		6		4		8	
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	28.7	28.7	28.7	28.7	28.7	28.7	24.0	24.0	24.0	24.0
Total Split (s)	51.0	51.0	51.0	51.0	51.0	51.0	29.0	29.0	29.0	29.0
Total Split (%)	63.8%	63.8%	63.8%	63.8%	63.8%	63.8%	36.3%	36.3%	36.3%	36.3%
Maximum Green (s)	45.3	45.3	45.3	45.3	45.3	45.3	23.0	23.0	23.0	23.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.7	6.0	6.0	6.0	6.0
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0	16.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	1	1	1	3	3	3	1	1	6	6
Act Effct Green (s)	49.8	49.8	49.8	49.8	49.8	49.8	12.7	12.7	12.7	12.7
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.72	0.72	0.18	0.18	0.18	0.18
v/c Ratio	0.05	0.36	0.11	0.03	0.21	0.10	0.26	0.12	0.53	0.29
Control Delay	5.6	6.1	1.6	5.6	5.3	1.6	27.3	19.9	34.5	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.6	6.1	1.6	5.6	5.3	1.6	27.3	19.9	34.5	21.6
LOS	A	A	A	A	A	A	C	B	C	C
Approach Delay	5.6		4.6		24.4		28.9			
Approach LOS	A		A		C		C			
Queue Length 50th (m)	1.0	22.5	0.0	0.4	11.6	0.0	6.5	3.1	14.7	8.0
Queue Length 95th (m)	4.3	41.9	5.3	2.2	22.8	5.2	15.6	9.8	29.3	19.2
Internal Link Dist (m)	166.5		193.8		90.1		86.1			
Turn Bay Length (m)	50.0	120.0		75.0	150.0		90.0			
Base Capacity (vph)	581	2371	1067	396	2371	1078	399	561	423	567
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.36	0.11	0.03	0.21	0.10	0.14	0.07	0.29	0.17

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 69.6
Natural Cycle: 55
Control Type: Semi Act-Uncoord

211 Centrum Boulevard PM Peak Hour 2024 Future Background

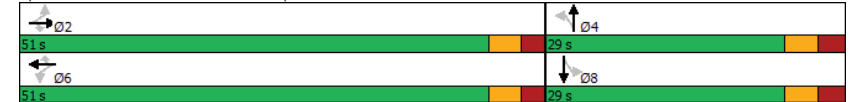
Synchro 10 Light Report
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Lanes, Volumes, Timings
5: Prestone & St. Joseph

06-16-2020

Maximum v/c Ratio: 0.53	Intersection LOS: A
Intersection Signal Delay: 8.8	ICU Level of Service A
Intersection Capacity Utilization 51.5%	
Analysis Period (min) 15	
Description: As per signal timing plan provided on Dec. 17, 2019.	

Splits and Phases: 5: Prestone & St. Joseph



211 Centrum Boulevard PM Peak Hour 2024 Future Background

Synchro 10 Light Report
Page 10

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	22	177	8	1	117	3	7	0	8	7	0	37
Future Vol, veh/h	22	177	8	1	117	3	7	0	8	7	0	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	177	8	1	117	3	7	0	8	7	0	37

Major/Minor	Major1		Major2		Minor1		Minor2			
Conflicting Flow All	120	0	0	185	0	0	364	347	181	350
Stage 1	-	-	-	-	-	225	225	-	121	121
Stage 2	-	-	-	-	-	139	122	-	229	229
Critical Hdwy	4.12	-	-	4.12	-	7.12	6.52	6.22	7.12	6.52
Critical Hdwy Stg 1	-	-	-	-	-	6.12	5.52	-	6.12	5.52
Critical Hdwy Stg 2	-	-	-	-	-	6.12	5.52	-	6.12	5.52
Follow-up Hdwy	2.218	-	-	2.218	-	3.518	4.018	3.318	3.518	4.018
Pot Cap-1 Maneuver	1468	-	-	1390	-	592	576	862	605	574
Stage 1	-	-	-	-	-	778	718	-	883	796
Stage 2	-	-	-	-	-	864	795	-	774	715
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1468	-	-	1390	-	561	566	862	591	564
Mov Cap-2 Maneuver	-	-	-	-	-	561	566	-	591	564
Stage 1	-	-	-	-	-	765	706	-	868	795
Stage 2	-	-	-	-	-	829	794	-	754	703

Approach	EB		WB		NB		SB
HCM Control Delay, s	0.8		0.1		10.3		9.4
HCM LOS					B		A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	689	1468	-	-	1390	-	-	854
HCM Lane V/C Ratio	0.022	0.015	-	-	0.001	-	-	0.052
HCM Control Delay (s)	10.3	7.5	0	-	7.6	0	-	9.4
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.2

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	0	0	44	0	0	9
Future Vol, veh/h	0	0	44	0	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	-	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	44	0	0	9

Major/Minor	Minor2		Major2	
Conflicting Flow All	88	0	0	0
Stage 1	88	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.52	6.22	4.12	-
Critical Hdwy Stg 1	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	802	-	-	-
Stage 1	822	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	0	-	-	-
Mov Cap-2 Maneuver	0	-	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-

Approach	EB		WB
HCM Control Delay, s	0		
HCM LOS	A		

Minor Lane/Major Mvmt	EBLn1	WBL	WBT
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	0	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	-	-	-

Appendix G

Synchro Intersection Worksheets – 2029 Background Conditions

Lanes, Volumes, Timings
1: Place d'Orléans & Hwy 174

06-16-2020

	→	↗	↖	↘
Lane Group	EBT	EBR	NBL	NBR
Lane Configurations	↑	↑↑	↑↑	↑
Traffic Volume (vph)	172	159	200	27
Future Volume (vph)	172	159	200	27
Lane Group Flow (vph)	172	159	200	27
Turn Type	NA	Perm	Prot	Perm
Protected Phases	4		2	
Permitted Phases		4		2
Detector Phase	4	4	2	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	15.7	15.7	24.8	24.8
Total Split (s)	35.7	35.7	44.8	44.8
Total Split (%)	44.3%	44.3%	55.7%	55.7%
Maximum Green (s)	30.0	30.0	40.0	40.0
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	4.8	4.8
Lead/Lag				
Lead-Lag Optimize?				
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	None	None	Min	Min
Walk Time (s)			15.0	15.0
Flash Dont Walk (s)			5.0	5.0
Pedestrian Calls (#/hr)			1	1
Act Effct Green (s)	10.5	10.5	12.9	12.9
Actuated g/C Ratio	0.31	0.31	0.38	0.38
v/c Ratio	0.32	0.17	0.16	0.05
Control Delay	11.5	3.2	7.3	3.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.5	3.2	7.3	3.4
LOS	B	A	A	A
Approach Delay	7.5		6.9	
Approach LOS	A		A	
Queue Length 50th (m)	5.9	0.0	3.3	0.0
Queue Length 95th (m)	21.4	4.8	7.5	2.5
Internal Link Dist (m)	182.0		201.4	
Turn Bay Length (m)		150.0		50.0
Base Capacity (vph)	1562	2353	3179	1448
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.11	0.07	0.06	0.02
Intersection Summary				
Cycle Length: 80.5				
Actuated Cycle Length: 34.1				
Natural Cycle: 45				
Control Type: Actuated-Uncoordinated				

Lanes, Volumes, Timings
1: Place d'Orléans & Hwy 174

06-16-2020

Maximum v/c Ratio: 0.32	
Intersection Signal Delay: 7.3	Intersection LOS: A
Intersection Capacity Utilization 26.9%	ICU Level of Service A
Analysis Period (min) 15	
Description: As per signal timing plan provided on Dec. 17, 2019.	

Splits and Phases: 1: Place d'Orléans & Hwy 174



Lanes, Volumes, Timings

2: Place d'Orléans & Private/Centrum

06-16-2020

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	25	18	40	58	80	67	195	69	52
Future Volume (vph)	25	18	40	58	80	67	195	69	52
Lane Group Flow (vph)	25	18	40	58	81	0	294	0	140
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	36.0	36.0	36.0	36.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0	43.0	43.0	43.0	43.0
Total Split (%)	42.7%	42.7%	42.7%	42.7%	42.7%	57.3%	57.3%	57.3%	57.3%
Maximum Green (s)	26.0	26.0	26.0	26.0	26.0	37.0	37.0	37.0	37.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	7	7	7	8	8	0	0	1	1
Act Effct Green (s)	13.1	13.1	13.1	12.2	12.2		54.3		54.3
Actuated g/C Ratio	0.17	0.17	0.17	0.16	0.16		0.72		0.72
v/c Ratio	0.12	0.06	0.14	0.28	0.29		0.14		0.08
Control Delay	24.6	23.1	7.7	28.2	27.3		5.2		5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	24.6	23.1	7.7	28.2	27.3		5.2		5.1
LOS	C	C	A	C	C		A		A
Approach Delay		16.1			27.6		5.2		5.1
Approach LOS		B			C		A		A
Queue Length 50th (m)	3.2	2.3	0.0	7.6	10.5		5.3		2.2
Queue Length 95th (m)	7.3	5.7	5.5	13.5	17.0		16.7		8.7
Internal Link Dist (m)		30.9			117.0		125.7		201.4
Turn Bay Length (m)			20.0	95.0					
Base Capacity (vph)	423	604	533	448	604		2039		1763
Starvation Cap Reductn	0	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0	0		0		0
Reduced v/c Ratio	0.06	0.03	0.08	0.13	0.13		0.14		0.08
Intersection Summary									
Cycle Length: 75									
Actuated Cycle Length: 75									
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green									
Natural Cycle: 70									

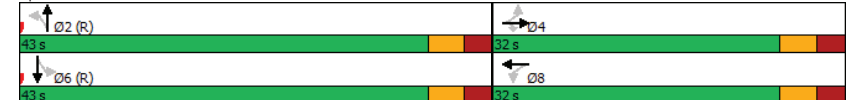
Lanes, Volumes, Timings

2: Place d'Orléans & Private/Centrum

06-16-2020

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.29
Intersection Signal Delay: 11.3
Intersection LOS: B
Intersection Capacity Utilization 61.4%
ICU Level of Service B
Analysis Period (min) 15
Description: As per signal timing plan provided on Dec. 17, 2019.

Splits and Phases: 2: Place d'Orléans & Private/Centrum



HCM 2010 AWSC
3: Prestone & Centrum

06-16-2020

Intersection						
Intersection Delay, s/veh	8.4					
Intersection LOS	A					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Vol, veh/h	27	63	54	35	140	57
Future Vol, veh/h	27	63	54	35	140	57
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	63	54	35	140	57
Number of Lanes	1	0	0	1	1	1
Approach	EB		WB		NB	
Opposing Approach	WB		EB			
Opposing Lanes	1		1		0	
Conflicting Approach Left			NB		EB	
Conflicting Lanes Left	0		2		1	
Conflicting Approach Right	NB				WB	
Conflicting Lanes Right	2		0		1	
HCM Control Delay	7.6		8.3		8.9	
HCM LOS	A		A		A	

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	61%
Vol Thru, %	0%	0%	30%	39%
Vol Right, %	0%	100%	70%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	140	57	90	89
LT Vol	140	0	0	54
Through Vol	0	0	27	35
RT Vol	0	57	63	0
Lane Flow Rate	140	57	90	89
Geometry Grp	7	7	2	2
Degree of Util (X)	0.212	0.067	0.103	0.115
Departure Headway (Hd)	5.456	4.251	4.123	4.656
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	662	848	871	773
Service Time	3.156	1.951	2.137	2.67
HCM Lane V/C Ratio	0.211	0.067	0.103	0.115
HCM Control Delay	9.6	7.3	7.6	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.2	0.3	0.4

Lanes, Volumes, Timings
4: Duford/Place d'Orléans & St. Joseph

06-16-2020

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	85	225	14	844	92	143	41	46	29
Future Volume (vph)	85	225	14	844	92	143	41	46	29
Lane Group Flow (vph)	85	273	14	935	92	155	41	46	29
Turn Type	pm+pt	NA	pm+pt	NA	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6	7	4	3	8	
Permitted Phases	2		6						8
Detector Phase	5	2	1	6	7	4	3	8	8
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	10.3	30.3	10.3	30.3	10.8	35.9	10.8	35.9	35.9
Total Split (s)	11.0	37.0	11.0	37.0	21.0	36.0	21.0	36.0	36.0
Total Split (%)	10.5%	35.2%	10.5%	35.2%	20.0%	34.3%	20.0%	34.3%	34.3%
Maximum Green (s)	5.7	30.7	5.7	30.7	15.2	29.1	15.2	29.1	29.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	3.0	2.0	3.0	2.5	3.6	2.5	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.3	5.3	6.3	5.8	6.9	5.8	6.9	6.9
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Walk Time (s)		7.0		7.0		7.0		7.0	7.0
Flash Dont Walk (s)		17.0		17.0		22.0		22.0	22.0
Pedestrian Calls (#/hr)		3		1		0		2	2
Act Effct Green (s)	62.7	58.8	59.0	53.4	11.0	19.3	8.1	14.1	14.1
Actuated g/C Ratio	0.60	0.56	0.56	0.51	0.10	0.18	0.08	0.13	0.13
v/c Ratio	0.29	0.15	0.02	0.56	0.53	0.48	0.32	0.20	0.09
Control Delay	15.2	14.8	14.1	23.7	54.8	41.0	51.9	39.1	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	14.8	14.1	23.7	54.8	41.0	51.9	39.1	0.6
LOS	B	B	B	C	D	D	D	D	A
Approach Delay	14.9		23.6		46.2		34.0		
Approach LOS	B		C		D		C		
Queue Length 50th (m)	6.5	10.6	1.0	69.6	18.1	29.6	8.1	8.7	0.0
Queue Length 95th (m)	20.6	31.3	5.5	#140.3	32.6	39.5	18.3	15.7	0.0
Internal Link Dist (m)	177.7		219.6		140.7		125.7		
Turn Bay Length (m)	70.0		45.0		90.0				
Base Capacity (vph)	298	1811	606	1663	240	494	240	483	513
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.15	0.02	0.56	0.38	0.31	0.17	0.10	0.06

Intersection Summary	
Cycle Length: 105	
Actuated Cycle Length: 105	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 90	

Lanes, Volumes, Timings

4: Duford/Place d'Orléans & St. Joseph

06-16-2020

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 25.8

Intersection LOS: C

Intersection Capacity Utilization 65.8%

ICU Level of Service C

Analysis Period (min) 15

Description: As per signal timing plan provided on Dec. 17, 2019.

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

Queue shown is maximum after two cycles.

Splits and Phases: 4: Duford/Place d'Orléans & St. Joseph

Ø1	Ø2 (R)	Ø3	Ø4
11 s	37 s	21 s	36 s
Ø5	Ø6 (R)	Ø7	Ø8
11 s	37 s	21 s	36 s

Lanes, Volumes, Timings

5: Prestone & St. Joseph

06-16-2020

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↩	↩↩	↩	↩	↩↩	↩	↩	↩	↩	↩
Traffic Volume (vph)	8	211	40	2	832	133	81	56	61	38
Future Volume (vph)	8	211	40	2	832	133	81	56	61	38
Lane Group Flow (vph)	8	211	40	2	832	133	81	61	61	56
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2			6			4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	23.7	23.7	23.7	23.7	23.7	23.7	29.0	29.0	29.0	29.0
Total Split (s)	51.0	51.0	51.0	51.0	51.0	51.0	29.0	29.0	29.0	29.0
Total Split (%)	63.8%	63.8%	63.8%	63.8%	63.8%	63.8%	36.3%	36.3%	36.3%	36.3%
Maximum Green (s)	45.3	45.3	45.3	45.3	45.3	45.3	23.0	23.0	23.0	23.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.7	6.0	6.0	6.0	6.0
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	2	2	1	1
Act Effct Green (s)	50.7	50.7	50.7	50.7	50.7	50.7	12.6	12.6	12.6	12.6
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.72	0.72	0.18	0.18	0.18	0.18
v/c Ratio	0.02	0.09	0.04	0.00	0.35	0.12	0.36	0.20	0.27	0.18
Control Delay	6.2	5.1	2.4	6.0	6.2	1.7	29.5	23.7	27.5	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.2	5.1	2.4	6.0	6.2	1.7	29.5	23.7	27.5	18.8
LOS	A	A	A	A	A	A	C	C	C	B
Approach Delay		4.7			5.6			27.0		23.3
Approach LOS		A			A			C		C
Queue Length 50th (m)	0.3	3.9	0.0	0.1	19.3	0.0	9.3	6.2	6.9	4.2
Queue Length 95th (m)	2.3	11.8	3.7	1.0	48.0	6.6	20.0	14.8	15.9	12.3
Internal Link Dist (m)		166.5			193.8			90.1		86.1
Turn Bay Length (m)	50.0		120.0	75.0		150.0	90.0			
Base Capacity (vph)	413	2386	1078	778	2386	1091	411	568	409	555
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.09	0.04	0.00	0.35	0.12	0.20	0.11	0.15	0.10

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 70.4

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings 5: Prestone & St. Joseph

06-16-2020

Maximum v/c Ratio: 0.36

Intersection Signal Delay: 8.9

Intersection LOS: A

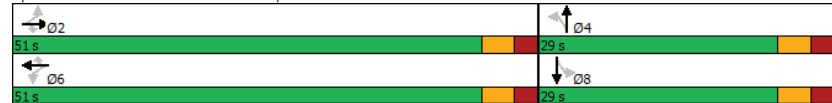
Intersection Capacity Utilization 45.9%

ICU Level of Service A

Analysis Period (min) 15

Description: As per signal timing plan provided on Dec. 17, 2019.

Splits and Phases: 5: Prestone & St. Joseph



HCM 2010 TWSC

6: Orleans Towncentre Access/Brisebois & Centrum

06-16-2020

Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Vol, veh/h	24	84	10	2	130	3	0	0	1	1	0	13
Future Vol, veh/h	24	84	10	2	130	3	0	0	1	1	0	13
Conflicting Peds, #/hr	8	0	9	9	0	8	0	0	3	3	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	84	10	2	130	3	0	0	1	1	0	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	141	0	0	103	0	0	288	291	101	285	295	140
Stage 1	-	-	-	-	-	-	146	146	-	144	144	-
Stage 2	-	-	-	-	-	-	142	145	-	141	151	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1442	-	-	1489	-	-	664	619	954	667	616	908
Stage 1	-	-	-	-	-	-	857	776	-	859	778	-
Stage 2	-	-	-	-	-	-	861	777	-	862	772	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1433	-	-	1479	-	-	641	599	945	651	596	902
Mov Cap-2 Maneuver	-	-	-	-	-	-	641	599	-	651	596	-
Stage 1	-	-	-	-	-	-	836	757	-	838	773	-
Stage 2	-	-	-	-	-	-	848	772	-	844	753	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	1.5		0.1		8.8		9.2	
HCM LOS					A		A	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	945	1433	-	-	1479	-	-	878
HCM Lane V/C Ratio	0.001	0.017	-	-	0.001	-	-	0.016
HCM Control Delay (s)	8.8	7.6	0	-	7.4	0	-	9.2
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	14	0	0	12
Future Vol, veh/h	0	0	14	0	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	-	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	14	0	0	12
Major/Minor	Minor2	Major2				
Conflicting Flow All	28	0	0	0		
Stage 1	28	-	-	-		
Stage 2	0	-	-	-		
Critical Hdwy	6.52	6.22	4.12	-		
Critical Hdwy Stg 1	5.52	-	-	-		
Critical Hdwy Stg 2	-	-	-	-		
Follow-up Hdwy	4.018	3.318	2.218	-		
Pot Cap-1 Maneuver	865	-	-	-		
Stage 1	872	-	-	-		
Stage 2	-	-	-	-		
Platoon blocked, %						
Mov Cap-1 Maneuver	0	-	-	-		
Mov Cap-2 Maneuver	0	-	-	-		
Stage 1	0	-	-	-		
Stage 2	0	-	-	-		
Approach	EB	WB				
HCM Control Delay, s	0					
HCM LOS	A					
Minor Lane/Major Mvmt	EBLn1	WBL	WBT			
Capacity (veh/h)	-	-	-			
HCM Lane V/C Ratio	-	-	-			
HCM Control Delay (s)	0	-	-			
HCM Lane LOS	A	-	-			
HCM 95th %tile Q(veh)	-	-	-			

	→	↰	↱	↲
Lane Group	EBT	EBR	NBL	NBR
Lane Configurations	↰	↰	↰	↰
Traffic Volume (vph)	592	337	212	113
Future Volume (vph)	592	337	212	113
Lane Group Flow (vph)	592	337	212	113
Turn Type	NA	Perm	Prot	Perm
Protected Phases	4		2	
Permitted Phases		4		2
Detector Phase	4	4	2	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	15.7	15.7	24.8	24.8
Total Split (s)	45.7	45.7	44.8	44.8
Total Split (%)	50.5%	50.5%	49.5%	49.5%
Maximum Green (s)	40.0	40.0	40.0	40.0
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	4.8	4.8
Lead/Lag				
Lead-Lag Optimize?				
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	None	None	Min	Min
Walk Time (s)			15.0	15.0
Flash Dont Walk (s)			5.0	5.0
Pedestrian Calls (#/hr)			6	6
Act Effct Green (s)	20.8	20.8	11.9	11.9
Actuated g/C Ratio	0.47	0.47	0.27	0.27
v/c Ratio	0.72	0.24	0.24	0.24
Control Delay	14.8	1.5	14.9	5.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	14.8	1.5	14.9	5.5
LOS	B	A	B	A
Approach Delay	10.0		11.6	
Approach LOS	A		B	
Queue Length 50th (m)	27.6	0.0	5.9	0.0
Queue Length 95th (m)	76.2	5.2	17.2	9.6
Internal Link Dist (m)	182.0		201.4	
Turn Bay Length (m)		150.0		50.0
Base Capacity (vph)	1582	2399	2916	1329
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.37	0.14	0.07	0.09
Intersection Summary				
Cycle Length: 90.5				
Actuated Cycle Length: 43.8				
Natural Cycle: 60				
Control Type: Actuated-Uncoordinated				

Lanes, Volumes, Timings

1: Place d'Orléans & Hwy 174

06-16-2020

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 10.4

Intersection LOS: B

Intersection Capacity Utilization 51.5%

ICU Level of Service A

Analysis Period (min) 15

Description: As per signal timing plan provided on Dec. 17, 2019.

Splits and Phases: 1: Place d'Orléans & Hwy 174

 Ø2	 Ø4
44.8 s	45.7 s

Lanes, Volumes, Timings

2: Place d'Orléans & Private/Centrum

06-16-2020

									
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	94	51	220	74	90	102	208	102	162
Future Volume (vph)	94	51	220	74	90	102	208	102	162
Lane Group Flow (vph)	94	51	220	74	90	0	372	0	306
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	36.0	36.0	36.0	36.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0	53.0	53.0	53.0	53.0
Total Split (%)	37.6%	37.6%	37.6%	37.6%	37.6%	62.4%	62.4%	62.4%	62.4%
Maximum Green (s)	26.0	26.0	26.0	26.0	26.0	47.0	47.0	47.0	47.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0		6.0
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	12	12	12	4	4	5	5	14	14
Act Effct Green (s)	14.3	14.3	14.3	14.3	14.3		58.7		58.7
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17		0.69		0.69
v/c Ratio	0.47	0.17	0.52	0.35	0.31		0.21		0.19
Control Delay	37.9	29.2	8.5	34.0	31.9		5.4		5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	37.9	29.2	8.5	34.0	31.9		5.4		5.3
LOS	D	C	A	C	C		A		A
Approach Delay		19.0			32.9		5.4		5.3
Approach LOS		B			C		A		A
Queue Length 50th (m)	14.4	7.4	0.0	11.1	13.4		7.5		6.1
Queue Length 95th (m)	23.8	13.9	15.1	19.3	21.9		20.3		17.1
Internal Link Dist (m)		30.9			117.0		125.7		201.4
Turn Bay Length (m)			20.0	95.0					
Base Capacity (vph)	368	533	595	382	533		1735		1648
Starvation Cap Reductn	0	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0	0		0		0
Reduced v/c Ratio	0.26	0.10	0.37	0.19	0.17		0.21		0.19

Intersection Summary

Cycle Length: 85

Actuated Cycle Length: 85

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

Natural Cycle: 70

Lanes, Volumes, Timings

2: Place d'Orléans & Private/Centrum

06-16-2020

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 13.2

Intersection LOS: B

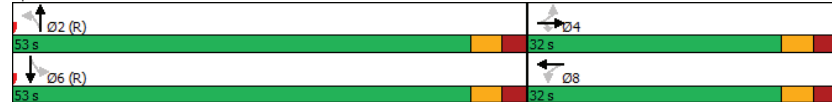
Intersection Capacity Utilization 80.0%

ICU Level of Service D

Analysis Period (min) 15

Description: As per signal timing plan provided on Dec. 17, 2019.

Splits and Phases: 2: Place d'Orléans & Private/Centrum



HCM 2010 AWSC

3: Prestone & Centrum

06-16-2020

Intersection

Intersection Delay, s/veh 8.4

Intersection LOS A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Traffic Vol, veh/h	40	165	54	30	105	56
Future Vol, veh/h	40	165	54	30	105	56
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	165	54	30	105	56
Number of Lanes	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	8.1	8.3	8.8
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	64%
Vol Thru, %	0%	0%	20%	36%
Vol Right, %	0%	100%	80%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	105	56	205	84
LT Vol	105	0	0	54
Through Vol	0	0	40	30
RT Vol	0	56	165	0
Lane Flow Rate	105	56	205	84
Geometry Grp	7	7	2	2
Degree of Util (X)	0.165	0.069	0.226	0.109
Departure Headway (Hd)	5.651	4.445	3.97	4.688
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	635	806	906	766
Service Time	3.377	2.171	1.984	2.708
HCM Lane V/C Ratio	0.165	0.069	0.226	0.11
HCM Control Delay	9.5	7.5	8.1	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.2	0.9	0.4

Lanes, Volumes, Timings

4: Duford/Place d'Orléans & St. Joseph

06-16-2020

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	169	917	17	571	62	77	232	125	59
Future Volume (vph)	169	917	17	571	62	77	232	125	59
Lane Group Flow (vph)	169	1071	17	683	62	90	232	125	59
Turn Type	pm+pt	NA	pm+pt	NA	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6	7	4	3	8	
Permitted Phases	2		6						8
Detector Phase	5	2	1	6	7	4	3	8	8
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	10.3	30.3	10.3	30.3	10.8	35.9	10.8	35.9	35.9
Total Split (s)	11.0	33.0	11.0	33.0	25.0	36.0	25.0	36.0	36.0
Total Split (%)	10.5%	31.4%	10.5%	31.4%	23.8%	34.3%	23.8%	34.3%	34.3%
Maximum Green (s)	5.7	26.7	5.7	26.7	19.2	29.1	19.2	29.1	29.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	3.0	2.0	3.0	2.5	3.6	2.5	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.3	5.3	6.3	5.8	6.9	5.8	6.9	6.9
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	17.0	17.0	17.0	17.0	22.0	22.0	22.0	22.0	22.0
Pedestrian Calls (#/hr)	6	13	6	13	5	6	6	6	6
Act Effct Green (s)	57.3	52.8	45.7	38.9	9.3	14.3	17.7	21.6	21.6
Actuated g/C Ratio	0.55	0.50	0.44	0.37	0.09	0.14	0.17	0.21	0.21
v/c Ratio	0.44	0.66	0.07	0.57	0.42	0.38	0.83	0.35	0.14
Control Delay	22.5	26.2	17.5	30.3	53.3	40.0	66.7	36.3	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.5	26.2	17.5	30.3	53.3	40.0	66.7	36.3	0.7
LOS	C	C	B	C	D	D	E	D	A
Approach Delay	25.7	29.9	45.5	48.2					
Approach LOS	C	C	D	D					
Queue Length 50th (m)	16.5	74.5	1.5	58.1	12.2	16.1	45.4	22.4	0.0
Queue Length 95th (m)	#54.6	#186.7	6.7	#90.4	24.4	25.2	#80.8	32.1	0.0
Internal Link Dist (m)	149.8	219.6	140.7	125.7					
Turn Bay Length (m)	45.0	90.0							
Base Capacity (vph)	388	1631	229	1204	303	477	303	504	527
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.66	0.07	0.57	0.20	0.19	0.77	0.25	0.11
Intersection Summary									
Cycle Length: 105									
Actuated Cycle Length: 105									
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green									
Natural Cycle: 110									

211 Centrum Boulevard PM Peak Hour 2029 Future Background

Synchro 10 Light Report
Page 7

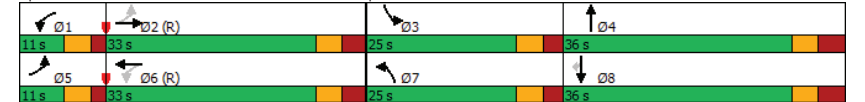
Lanes, Volumes, Timings

4: Duford/Place d'Orléans & St. Joseph

06-16-2020

Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 31.8	Intersection LOS: C
Intersection Capacity Utilization 80.8%	ICU Level of Service D
Analysis Period (min) 15	
Description: As per signal timing plan provided on Dec. 17, 2019.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 4: Duford/Place d'Orléans & St. Joseph



211 Centrum Boulevard PM Peak Hour 2029 Future Background

Synchro 10 Light Report
Page 8

Lanes, Volumes, Timings
5: Prestone & St. Joseph

06-16-2020

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↩	↩↩	↩	↩	↩↩	↩	↩	↩	↩	↩
Traffic Volume (vph)	27	948	116	10	558	111	57	28	126	69
Future Volume (vph)	27	948	116	10	558	111	57	28	126	69
Lane Group Flow (vph)	27	948	116	10	558	111	57	37	126	94
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	2		2		6		4		8	
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	28.7	28.7	28.7	28.7	28.7	28.7	24.0	24.0	24.0	24.0
Total Split (s)	51.0	51.0	51.0	51.0	51.0	51.0	29.0	29.0	29.0	29.0
Total Split (%)	63.8%	63.8%	63.8%	63.8%	63.8%	63.8%	36.3%	36.3%	36.3%	36.3%
Maximum Green (s)	45.3	45.3	45.3	45.3	45.3	45.3	23.0	23.0	23.0	23.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.7	6.0	6.0	6.0	6.0
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0	16.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	1	1	1	3	3	3	1	1	6	6
Act Effct Green (s)	49.8	49.8	49.8	49.8	49.8	49.8	12.8	12.8	12.8	12.8
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.71	0.71	0.18	0.18	0.18	0.18
v/c Ratio	0.05	0.40	0.11	0.03	0.24	0.10	0.26	0.12	0.54	0.29
Control Delay	5.7	6.4	1.6	5.7	5.4	1.6	27.2	19.8	34.8	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.7	6.4	1.6	5.7	5.4	1.6	27.2	19.8	34.8	21.6
LOS	A	A	A	A	A	A	C	B	C	C
Approach Delay	5.9		4.8		24.3		29.2			
Approach LOS	A		A		C		C			
Queue Length 50th (m)	1.1	26.0	0.0	0.4	13.2	0.0	6.5	3.1	15.1	8.0
Queue Length 95th (m)	4.3	47.6	5.3	2.2	25.2	5.2	15.6	9.8	30.0	19.2
Internal Link Dist (m)	166.5		193.8		90.1		86.1			
Turn Bay Length (m)	50.0	120.0		75.0	150.0		90.0			
Base Capacity (vph)	552	2369	1066	353	2369	1077	399	561	422	566
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.40	0.11	0.03	0.24	0.10	0.14	0.07	0.30	0.17

Intersection Summary

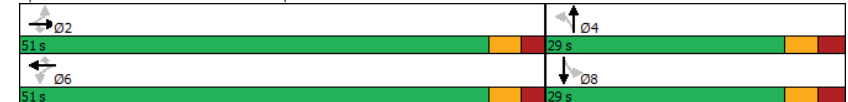
Cycle Length: 80
Actuated Cycle Length: 69.7
Natural Cycle: 55
Control Type: Semi Act-Uncoord

Lanes, Volumes, Timings
5: Prestone & St. Joseph

06-16-2020

Maximum v/c Ratio: 0.54	Intersection LOS: A
Intersection Signal Delay: 8.8	ICU Level of Service A
Intersection Capacity Utilization 51.6%	
Analysis Period (min) 15	
Description: As per signal timing plan provided on Dec. 17, 2019.	

Splits and Phases: 5: Prestone & St. Joseph



Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	22	185	8	1	122	3	7	0	8	7	0	37
Future Vol, veh/h	22	185	8	1	122	3	7	0	8	7	0	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	185	8	1	122	3	7	0	8	7	0	37

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	125	0	0	193
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1462	-	-	1380
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1462	-	-	1380
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.1	10.4	9.5
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	678	1462	-	-	1380	-	-	846
HCM Lane V/C Ratio	0.022	0.015	-	-	0.001	-	-	0.052
HCM Control Delay (s)	10.4	7.5	0	-	7.6	0	-	9.5
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.2

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	0	0	44	0	0	9
Future Vol, veh/h	0	0	44	0	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	-	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	44	0	0	9

Major/Minor	Minor2	Major2
Conflicting Flow All	88	0
Stage 1	88	-
Stage 2	0	-
Critical Hdwy	6.52	6.22
Critical Hdwy Stg 1	5.52	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	4.018	3.318
Pot Cap-1 Maneuver	802	-
Stage 1	822	-
Stage 2	-	-
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	0	-
Mov Cap-2 Maneuver	0	-
Stage 1	0	-
Stage 2	0	-

Approach	EB	WB
HCM Control Delay, s	0	
HCM LOS	A	

Minor Lane/Major Mvmt	EBLn1	WBL	WBT
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	0	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	-	-	-

Appendix H

MMLOS Analysis

Multi-Modal Level of Service - Intersections Form

Consultant
Scenario
Comments

CGH Transportation Inc
Existing and Future Conditions

Project
Date

2019-75	211 Centrum
2020-06-30	

INTERSECTIONS		Place d'Orléans & OR 174				Place d'Orléans & Centrum			
Crossing Side		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes			0 - 2		5	5	6	6
	Median			No Median - 2.4 m		No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns			No left turn / Prohib.		Permissive	Permissive	Permissive	Permissive
	Conflicting Right Turns			Permissive or yield control		Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control
	Right Turns on Red (RTorR) ?			RTOR prohibited		RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?			No		No	No	No	No
	Right Turn Channel			Conventional with Receiving Lane		Conv'tl without Receiving Lane	Conv'tl without Receiving Lane	No Channel	No Channel
	Corner Radius			0-3m		10-15m	10-15m	10-15m	5-10m
	Crosswalk Type			Std transverse markings		Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings
	PETSI Score			100		41	41	20	21
Ped. Exposure to Traffic LoS		-	-	A	-	E	E	F	F
Cycle Length									
Effective Walk Time									
Average Pedestrian Delay									
Pedestrian Delay LoS		-	-	-	-	-	-	-	-
Level of Service		-	-	A	-	E	E	F	F
		A				F			
Approach From		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach			Mixed Traffic		Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Right Turn Lane Configuration			≤ 50 m		≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m
	Right Turning Speed			>25 km/h		≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h
	Cyclist relative to RT motorists	-	E	-	-	D	D	D	D
	Separated or Mixed Traffic	-	Mixed Traffic	-	-	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Left Turn Approach			No lane crossed		One lane crossed	One lane crossed	One lane crossed	One lane crossed
	Operating Speed			> 50 to < 60 km/h		> 50 to < 60 km/h	> 50 to < 60 km/h	≤ 40 km/h	> 40 to ≤ 50 km/h
	Left Turning Cyclist	-	C	-	-	E	E	B	D
Level of Service		-	E	-	-	E	E	D	D
		E				E			
Transit	Average Signal Delay			≤ 20 sec		≤ 10 sec	≤ 10 sec	≤ 40 sec	
	Level of Service	-	C	-	-	B	B	E	-
		C				E			
Truck	Effective Corner Radius			> 15 m		10 - 15 m	10 - 15 m		
	Number of Receiving Lanes on Departure from Intersection			1		≥ 2	≥ 2		
	Level of Service	-	C	-	-	B	B	-	-
		C				B			
Auto	Volume to Capacity Ratio			0.0 - 0.60		0.0 - 0.60			
	Level of Service	A				A			

Place d'Orléans/Duford & St Joseph				Prestone & St. Joseph			
NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
6	6	8	8	5	4	6	6
No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
Protected/ Permissive	Protected/ Permissive	Protected	Protected	Permissive	Permissive	Permissive	Permissive
Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control
RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
No	No	No	No	No	No	No	No
Conventional with Receiving Lane	Conv'tl without Receiving Lane	No Channel	No Channel	Conventional with Receiving Lane	Conv'tl without Receiving Lane	Conv'tl without Receiving Lane	Conv'tl without Receiving Lane
5-10m	0-3m	10-15m	5-10m	0-3m	0-3m	0-3m	0-3m
Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings
22	27	-4	-3	41	60	27	27
F	F	F	F	E	C	F	F
-	-	-	-	-	-	-	-
F	F	F	F	E	C	F	F
F				F			
NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
> 50 m	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m	> 50 m	> 50 m
≤ 25 km/h	≤ 25 km/h	>25 km/h	>25 km/h	>25 km/h	>25 km/h	>25 km/h	>25 km/h
F	D	E	E	E	E	F	F
Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
≥ 2 lanes crossed	One lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	One lane crossed	One lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed
> 50 to < 60 km/h	> 40 to ≤ 50 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h
F	D	F	F	D	D	F	F
F	D	F	F	E	E	F	F
F				F			
> 40 sec	≤ 40 sec	≤ 30 sec		≤ 30 sec	≤ 30 sec	≤ 10 sec	≤ 10 sec
F	E	D	-	D	D	B	B
F				D			
< 10 m		10 - 15 m	> 15 m			> 15 m	> 15 m
≥ 2		≥ 2	1			1	≥ 2
D	-	B	C	-	-	C	A
D				C			
0.61 - 0.70				0.0 - 0.60			
B				A			

Consultant	CGH Transportation Inc	Project	2019-75	211 Centrum
Scenario	Existing and Future Conditions	Date	2021-04-12	
Comments				

SEGMENTS		Street A	Place d'Orléans Present	Place d'Orléans Future	Centrum Present	Centrum Future	Brisebois Present	Brisebois Future
			1	5	2	4	3	4
Pedestrian	Sidewalk Width	F	≥ 2 m	≥ 2 m	1.5 m	1.8 m	no sidewalk	1.8 m
	Boulevard Width		< 0.5	0.5 - 2 m	< 0.5 m	0.5 - 2 m	n/a	< 0.5 m
	Avg Daily Curb Lane Traffic Volume		> 3000	> 3000	≤ 3000	≤ 3000	≤ 3000	≤ 3000
	Operating Speed		> 50 to 60 km/h	> 50 to 60 km/h	> 30 to 50 km/h	> 30 to 50 km/h	> 30 to 50 km/h	> 30 to 50 km/h
	On-Street Parking		no	no	no	no	no	no
	Exposure to Traffic PLoS		E	D	E	B	F	B
	Effective Sidewalk Width		2.0 m	3.0 m	1.5 m	1.5 m	1.2 m	1.5 m
	Pedestrian Volume		250 ped/hr	250 ped/hr	250 ped/hr	250 ped/hr	250 ped/hr	250 ped/hr
Crowding PLoS		B	A	B	B	B	B	
Level of Service		E	D	E	B	F	B	
Bicycle	Type of Cycling Facility	E	Mixed Traffic	Physically Separated	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Number of Travel Lanes		4-5 lanes total		2-3 lanes total	2-3 lanes total	≤ 2 (no centreline)	≤ 2 (no centreline)
	Operating Speed		≥ 50 to 60 km/h		>40 to <50 km/h	>40 to <50 km/h	>40 to <50 km/h	>40 to <50 km/h
	# of Lanes & Operating Speed LoS		E	-	D	D	B	B
	Bike Lane (+ Parking Lane) Width							
	Bike Lane Width LoS		-	-	-	-	-	-
	Bike Lane Blockages							
	Blockage LoS		-	-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge		< 1.8 m refuge	< 1.8 m refuge	< 1.8 m refuge	< 1.8 m refuge
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes		≤ 3 lanes	≤ 3 lanes	≤ 3 lanes	≤ 3 lanes
	Sidestreet Operating Speed		>40 to 50 km/h		>40 to 50 km/h	>40 to 50 km/h	>40 to 50 km/h	>40 to 50 km/h
	Unsignalized Crossing - Lowest LoS		B	A	A	A	A	A
Level of Service		E	A	D	D	B	B	
Transit	Facility Type	D	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic		
	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8		
	Level of Service		D	D	D	D	-	-
Truck	Truck Lane Width	A	≤ 3.5 m	≤ 3.5 m				
	Travel Lanes per Direction		> 1	> 1				
	Level of Service		A	A	-	-	-	-
Auto	Level of Service	Not Applicable						

Appendix I

Synchro Worksheets – 2024 Future Total Conditions

Lanes, Volumes, Timings
1: Place d'Orléans & Hwy 174

2024 Future Total
08-11-2020

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑↑			↑↑	↑
Traffic Volume (vph)	156	153	0	0	200	25
Future Volume (vph)	156	153	0	0	200	25
Satd. Flow (prot)	1745	2611	0	0	3216	1483
Flt Permitted					0.950	
Satd. Flow (perm)	1745	2611	0	0	3216	1464
Satd. Flow (RTOR)		153				25
Lane Group Flow (vph)	156	153	0	0	200	25
Turn Type	NA	Perm			Prot	Perm
Protected Phases	4				2	
Permitted Phases		4				2
Detector Phase	4	4			2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0			10.0	10.0
Minimum Split (s)	15.7	15.7			24.8	24.8
Total Split (s)	35.7	35.7			44.8	44.8
Total Split (%)	44.3%	44.3%			55.7%	55.7%
Yellow Time (s)	3.3	3.3			3.3	3.3
All-Red Time (s)	2.4	2.4			1.5	1.5
Lost Time Adjust (s)	0.0	0.0			0.0	0.0
Total Lost Time (s)	5.7	5.7			4.8	4.8
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None			Min	Min
Act Effct Green (s)	10.4	10.4			13.5	13.5
Actuated g/C Ratio	0.30	0.30			0.39	0.39
v/c Ratio	0.30	0.17			0.16	0.04
Control Delay	11.4	3.3			7.2	3.4
Queue Delay	0.0	0.0			0.0	0.0
Total Delay	11.4	3.3			7.2	3.4
LOS	B	A			A	A
Approach Delay	7.4				6.6	
Approach LOS	A				A	
Queue Length 50th (m)	5.3	0.0			3.3	0.0
Queue Length 95th (m)	19.7	4.8			7.2	2.3
Internal Link Dist (m)	182.0			102.8	201.4	
Turn Bay Length (m)		150.0				50.0
Base Capacity (vph)	1540	2323			3185	1450
Starvation Cap Reductn	0	0			0	0
Spillback Cap Reductn	0	0			0	0
Storage Cap Reductn	0	0			0	0
Reduced v/c Ratio	0.10	0.07			0.06	0.02

Intersection Summary

Cycle Length: 80.5
Actuated Cycle Length: 34.7
Natural Cycle: 45
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.30

Lanes, Volumes, Timings
1: Place d'Orléans & Hwy 174

2024 Future Total
08-11-2020

Intersection Signal Delay: 7.1
Intersection Capacity Utilization 26.0%
Analysis Period (min) 15
Intersection LOS: A
ICU Level of Service A

Splits and Phases: 1: Place d'Orléans & Hwy 174



Lanes, Volumes, Timings

2: Place d'Orléans & Private/Centrum

2024 Future Total

08-11-2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑	↱	↰	↑	↱
Traffic Volume (vph)	25	18	40	64	82	18	67	178	36	77	48	19
Future Volume (vph)	25	18	40	64	82	18	67	178	36	77	48	19
Satd. Flow (prot)	1658	1745	1483	1658	1692	0	0	3214	0	0	3156	0
Flt Permitted	0.692			0.746				0.856			0.735	
Satd. Flow (perm)	1200	1745	1456	1294	1692	0	0	2784	0	0	2382	0
Satd. Flow (RTOR)			44		16			30			19	
Lane Group Flow (vph)	25	18	40	64	100	0	0	281	0	0	144	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0		36.0	36.0		36.0	36.0	
Total Split (s)	32.0	32.0	32.0	32.0	32.0		43.0	43.0		43.0	43.0	
Total Split (%)	42.7%	42.7%	42.7%	42.7%	42.7%		57.3%	57.3%		57.3%	57.3%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	13.1	13.1	13.1	12.2	12.2			54.3			54.3	
Actuated g/C Ratio	0.17	0.17	0.17	0.16	0.16			0.72			0.72	
v/c Ratio	0.12	0.06	0.14	0.30	0.35			0.14			0.08	
Control Delay	24.5	23.0	7.6	28.7	24.6			5.1			5.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	24.5	23.0	7.6	28.7	24.6			5.1			5.2	
LOS	C	C	A	C	C			A			A	
Approach Delay		16.0			26.2			5.1			5.2	
Approach LOS		B			C			A			A	
Queue Length 50th (m)	3.2	2.3	0.0	8.4	11.0			4.9			2.3	
Queue Length 95th (m)	7.3	5.7	5.5	14.6	18.4			15.8			8.9	
Internal Link Dist (m)		30.9			117.0			125.7			201.4	
Turn Bay Length (m)			20.0	95.0								
Base Capacity (vph)	416	604	533	448	597			2022			1728	
Starvation Cap Reductn	0	0	0	0	0			0			0	
Spillback Cap Reductn	0	0	0	0	0			0			0	
Storage Cap Reductn	0	0	0	0	0			0			0	
Reduced v/c Ratio	0.06	0.03	0.08	0.14	0.17			0.14			0.08	

Intersection Summary

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 0 (0%), Referenced to phase 2.NBTL and 6.SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

211 Centrum Boulevard AM Peak Hour

Synchro 11 Report
Page 4

Lanes, Volumes, Timings

2: Place d'Orléans & Private/Centrum

2024 Future Total

08-11-2020

Maximum v/c Ratio: 0.35

Intersection Signal Delay: 11.6

Intersection LOS: B

Intersection Capacity Utilization 61.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 2: Place d'Orléans & Private/Centrum



211 Centrum Boulevard AM Peak Hour

Synchro 11 Report
Page 5

HCM 2010 AWSC
3: Prestone & Centrum

2024 Future Total
08-11-2020

Intersection						
Intersection Delay, s/veh	8.4					
Intersection LOS	A					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	27	68	54	35	140	57
Future Vol, veh/h	27	68	54	35	140	57
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	68	54	35	140	57
Number of Lanes	1	0	0	1	1	1
Approach	EB	WB	NB			
Opposing Approach	WB	EB				
Opposing Lanes	1	1	0			
Conflicting Approach Left		NB	EB			
Conflicting Lanes Left	0	2	1			
Conflicting Approach Right	NB		WB			
Conflicting Lanes Right	2	0	1			
HCM Control Delay	7.6	8.3	8.9			
HCM LOS	A	A	A			

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	61%
Vol Thru, %	0%	0%	28%	39%
Vol Right, %	0%	100%	72%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	140	57	95	89
LT Vol	140	0	0	54
Through Vol	0	0	27	35
RT Vol	0	57	68	0
Lane Flow Rate	140	57	95	89
Geometry Grp	7	7	2	2
Degree of Util (X)	0.213	0.067	0.109	0.115
Departure Headway (Hd)	5.467	4.263	4.114	4.661
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	661	845	873	771
Service Time	3.167	1.963	2.13	2.678
HCM Lane V/C Ratio	0.212	0.067	0.109	0.115
HCM Control Delay	9.6	7.3	7.6	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-ile Q	0.8	0.2	0.4	0.4

Lanes, Volumes, Timings
4: Duford/Place d'Orléans & St. Joseph

2024 Future Total
08-11-2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	82	204	48	14	765	83	92	143	12	37	46	34
Future Volume (vph)	82	204	48	14	765	83	92	143	12	37	46	34
Satd. Flow (prot)	1658	3203	0	1658	3262	0	1658	1724	0	1658	1745	1483
Flt Permitted	0.239			0.596			0.950			0.950		
Satd. Flow (perm)	417	3203	0	1035	3262	0	1654	1724	0	1658	1745	1462
Satd. Flow (RTOR)		27			11			4				150
Lane Group Flow (vph)	82	252	0	14	848	0	92	155	0	37	46	34
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6								8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	10.0		5.0	5.0	5.0
Minimum Split (s)	10.3	30.3		10.3	30.3		10.8	35.9		10.8	35.9	35.9
Total Split (s)	11.0	37.0		11.0	37.0		21.0	36.0		21.0	36.0	36.0
Total Split (%)	10.5%	35.2%		10.5%	35.2%		20.0%	34.3%		20.0%	34.3%	34.3%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.0	3.0		2.0	3.0		2.5	3.6		2.5	3.6	3.6
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.3	6.3		5.3	6.3		5.8	6.9		5.8	6.9	6.9
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	None
Act Effct Green (s)	62.9	59.0		59.2	53.5		11.0	19.4		7.9	14.0	14.0
Actuated g/C Ratio	0.60	0.56		0.56	0.51		0.10	0.18		0.08	0.13	0.13
v/c Ratio	0.25	0.14		0.02	0.51		0.53	0.48		0.30	0.20	0.10
Control Delay	14.5	14.4		14.0	22.5		54.8	40.9		51.4	39.3	0.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	14.5	14.4		14.0	22.5		54.8	40.9		51.4	39.3	0.6
LOS	B	B		B	C		D	D		D	D	A
Approach Delay	14.4			22.4			46.1			31.9		
Approach LOS	B			C			D			C		
Queue Length 50th (m)	6.2	9.4		1.0	60.2		18.1	29.6		7.3	8.8	0.0
Queue Length 95th (m)	19.9	28.7		5.5	#119.3		32.6	39.3		16.9	15.7	0.0
Internal Link Dist (m)		177.7			219.6			140.7			125.7	
Turn Bay Length (m)	70.0			45.0						90.0		
Base Capacity (vph)	330	1811		618	1668		240	495		240	483	513
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.25	0.14		0.02	0.51		0.38	0.31		0.15	0.10	0.07

Intersection Summary	
Cycle Length: 105	
Actuated Cycle Length: 105	
Offset: 0 (0%), Referenced to phase 2EBTL and 6WBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Lanes, Volumes, Timings

4: Duford/Place d'Orléans & St. Joseph

2024 Future Total

08-11-2020

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 25.1

Intersection LOS: C

Intersection Capacity Utilization 63.0%

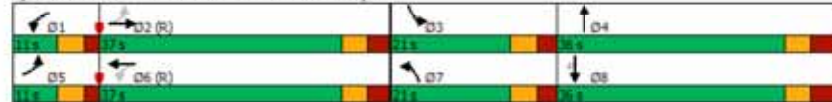
ICU Level of Service B

Analysis Period (min): 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 4: Duford/Place d'Orléans & St. Joseph



Lanes, Volumes, Timings

5: Prestone & St. Joseph

2024 Future Total

08-11-2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Traffic Volume (vph)	8	192	40	2	754	133	81	56	5	65	38	17
Future Volume (vph)	8	192	40	2	754	133	81	56	5	65	38	17
Satd. Flow (prot)	1658	3316	1483	1658	3316	1483	1658	1722	0	1658	1658	0
Flt Permitted	0.361			0.631			0.721			0.717		
Satd. Flow (perm)	630	3316	1483	1101	3316	1465	1257	1722	0	1249	1658	0
Satd. Flow (RTOR)			41			133		5			17	
Lane Group Flow (vph)	8	192	40	2	754	133	81	61	0	65	55	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	NA	NA
Protected Phases		2			6		4			8		8
Permitted Phases	2		2	6		6	4					
Detector Phase	2	2	2	6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	23.7	23.7	23.7	23.7	23.7	23.7	29.0	29.0		29.0	29.0	
Total Split (s)	51.0	51.0	51.0	51.0	51.0	51.0	29.0	29.0		29.0	29.0	
Total Split (%)	63.8%	63.8%	63.8%	63.8%	63.8%	63.8%	36.3%	36.3%		36.3%	36.3%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.7	6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max	Max	None	None		None	None	
Act Effct Green (s)	50.6	50.6	50.6	50.6	50.6	50.6	12.6	12.6		12.6	12.6	
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.72	0.72	0.18	0.18		0.18	0.18	
v/c Ratio	0.02	0.08	0.04	0.00	0.32	0.12	0.36	0.20		0.29	0.18	
Control Delay	6.1	5.1	2.4	6.0	6.0	1.7	29.5	23.7		27.9	19.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	6.1	5.1	2.4	6.0	6.0	1.7	29.5	23.7		27.9	19.0	
LOS	A	A	A	A	A	A	C	C		C	B	
Approach Delay		4.7			5.4			27.0			23.8	
Approach LOS		A			A			C			C	
Queue Length 50th (m)	0.3	3.5	0.0	0.1	17.0	0.0	9.3	6.2		7.4	4.2	
Queue Length 95th (m)	2.3	10.9	3.7	1.0	42.5	6.6	20.0	14.8		16.9	12.2	
Internal Link Dist (m)		166.5			193.8			90.1			86.1	
Turn Bay Length (m)	50.0		120.0	75.0		150.0	90.0					
Base Capacity (vph)	453	2385	1078	792	2385	1091	413	569		410	556	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.02	0.06	0.04	0.00	0.32	0.12	0.20	0.11		0.16	0.10	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 70.3

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.36

Lanes, Volumes, Timings
5: Prestone & St. Joseph

2024 Future Total
08-11-2020

Intersection Signal Delay: 9.1
Intersection Capacity Utilization 43.7%
Analysis Period (min) 15

Intersection LOS: A
ICU Level of Service A

Splits and Phases: 5: Prestone & St. Joseph



HCM 2010 TWSC

6: Orleans Towncentre Access/Brisebois & Centrum

2024 Future Total
08-11-2020

Intersection

Int Delay, s/veh 2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	37	80	10	2	124	6	0	0	1	7	0	37
Future Vol, veh/h	37	80	10	2	124	6	0	0	1	7	0	37
Conflicting Peds, #/hr	8	0	9	9	0	8	0	0	3	3	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	37	80	10	2	124	6	0	0	1	7	0	37

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	138	0	99	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	4.12	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	2.218	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1446	-	1494	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Mov Cap-2 Maneuver	1437	-	1484	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.2	0.1	8.8	9.5
HCM LOS	A	A	A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	950	1437	-	-	1484	-	-	848
HCM Lane V/C Ratio	0.001	0.026	-	-	0.001	-	-	0.052
HCM Control Delay (s)	8.8	7.6	0	-	7.4	0	-	9.5
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.2

Intersection						
Int Delay, s/veh	6.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	0	30	16	0	14	0
Future Vol, veh/h	0	30	16	0	14	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	30	16	0	14	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	46	14	14
Stage 1	14	-	-
Stage 2	32	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	964	1066	1604
Stage 1	1009	-	-
Stage 2	991	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	954	1066	1604
Mov Cap-2 Maneuver	954	-	-
Stage 1	999	-	-
Stage 2	991	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	7.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1604	-	1066	-	-
HCM Lane V/C Ratio	0.01	-	0.028	-	-
HCM Control Delay (s)	7.3	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %ile Q(veh)	0	-	0.1	-	-

	→	↘	↙	↗
Lane Group	EBT	EBR	NBL	NBR
Lane Configurations	↑	↑↑	↑↑	↑
Traffic Volume (vph)	536	323	207	103
Future Volume (vph)	536	323	207	103
Lane Group Flow (vph)	536	323	207	103
Turn Type	NA	Perm	Prot	Perm
Protected Phases	4		2	
Permitted Phases		4		2
Detector Phase	4	4	2	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	15.7	15.7	24.8	24.8
Total Split (s)	45.7	45.7	44.8	44.8
Total Split (%)	50.5%	50.5%	49.5%	49.5%
Maximum Green (s)	40.0	40.0	40.0	40.0
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	4.8	4.8
Lead/Lag				
Lead-Lag Optimize?				
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	None	None	Min	Min
Walk Time (s)			15.0	15.0
Flash Dont Walk (s)			5.0	5.0
Pedestrian Calls (#/hr)			6	6
Act Effct Green (s)	18.3	18.3	11.9	11.9
Actuated g/C Ratio	0.44	0.44	0.29	0.29
v/c Ratio	0.69	0.24	0.22	0.21
Control Delay	14.6	1.6	13.3	5.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	14.6	1.6	13.3	5.1
LOS	D	A	D	A
Approach Delay	9.7		10.6	
Approach LOS	A		B	
Queue Length 50th (m)	23.7	0.0	5.1	0.0
Queue Length 95th (m)	67.1	5.3	15.4	8.6
Internal Link Dist (m)	182.0		201.4	
Turn Bay Length (m)		150.0		50.0
Base Capacity (vph)	1616	2443	2979	1354
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.33	0.13	0.07	0.06

Intersection Summary
Cycle Length: 90.5
Actuated Cycle Length: 41.3
Natural Cycle: 55
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
1: Place d'Orléans & Hwy 174

2024 Future Total
11-17-2020

Maximum v/c Ratio: 0.69	Intersection LOS: A
Intersection Signal Delay: 10.0	ICU Level of Service A
Intersection Capacity Utilization 48.4%	
Analysis Period (min): 15	

Splits and Phases: 1: Place d'Orléans & Hwy 174



Lanes, Volumes, Timings
2: Place d'Orléans & Private/Centrum

2024 Future Total
11-17-2020

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	←	↑	→	←	↑	←	↑	←	↑
Traffic Volume (vph)	94	51	220	80	92	102	190	118	147
Future Volume (vph)	94	51	220	80	92	102	190	118	147
Lane Group Flow (vph)	94	51	220	80	106	0	360	0	307
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	36.0	36.0	36.0	36.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0	53.0	53.0	53.0	53.0
Total Split (%)	37.6%	37.6%	37.6%	37.6%	37.6%	62.4%	62.4%	62.4%	62.4%
Maximum Green (s)	26.0	26.0	26.0	26.0	26.0	47.0	47.0	47.0	47.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	12	12	12	4	4	5	5	14	14
Act Effct Green (s)	14.3	14.3	14.3	14.3	14.3	58.7	58.7	58.7	58.7
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17	0.69	0.69	0.69	0.69
v/c Ratio	0.47	0.17	0.52	0.38	0.36	0.21	0.21	0.19	0.19
Control Delay	38.2	29.2	8.5	34.8	30.3	5.2	5.2	5.4	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.2	29.2	8.5	34.8	30.3	5.2	5.2	5.4	5.4
LOS	D	C	A	C	C	A	A	A	A
Approach Delay		19.0			32.3		5.2		5.4
Approach LOS		B			C		A		A
Queue Length 50th (m)	14.4	7.4	0.0	12.1	14.6	7.0	6.2	6.2	6.2
Queue Length 95th (m)	23.9	13.9	15.1	20.6	23.7	19.2	17.4	17.4	17.4
Internal Link Dist (m)		30.9			117.0		125.7		201.4
Turn Bay Length (m)			20.0	95.0					
Base Capacity (vph)	363	533	595	382	527	1722	1596	1596	1596
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.10	0.37	0.21	0.20	0.21	0.21	0.19	0.19

Intersection Summary

Cycle Length: 85
Actuated Cycle Length: 85
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 70

Lanes, Volumes, Timings

2: Place d'Orléans & Private/Centrum

2024 Future Total

11-17-2020

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 13.5

Intersection LOS: B

Intersection Capacity Utilization 80.0%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 2: Place d'Orléans & Private/Centrum



HCM 2010 AWSC

3: Prestone & Centrum

2024 Future Total

11-17-2020

Intersection

Intersection Delay, s/veh 8.5

Intersection LOS A

Movement

	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	EB	EB	WB	WB	NB	NB
Traffic Vol, veh/h	40	167	54	30	109	56
Future Vol, veh/h	40	167	54	30	109	56
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mynt Flow	40	167	54	30	109	56
Number of Lanes	1	0	0	1	1	1

Approach

	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	8.2	8.3	8.9
HCM LOS	A	A	A

Lane

	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	64%
Vol Thru, %	0%	0%	19%	36%
Vol Right, %	0%	100%	81%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	109	56	207	84
LT Vol	109	0	0	54
Through Vol	0	0	40	30
RT Vol	0	56	167	0
Lane Flow Rate	109	56	207	84
Geometry Grp	7	7	2	2
Degree of Util (X)	0.171	0.069	0.229	0.11
Departure Headway (Hd)	5.655	4.449	3.982	4.703
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	634	805	905	784
Service Time	3.385	2.179	1.995	2.722
HCM Lane V/C Ratio	0.172	0.07	0.229	0.11
HCM Control Delay	9.6	7.5	8.2	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-ile Q	0.6	0.2	0.9	0.4

Lanes, Volumes, Timings

4: Duford/Place d'Orléans & St. Joseph

2024 Future Total

11-17-2020

	↖	→	↗	↖	↗	↖	↗	↖	↗
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	163	831	17	517	62	77	210	125	60
Future Volume (vph)	163	831	17	517	62	77	210	125	60
Lane Group Flow (vph)	163	985	17	619	62	90	210	125	60
Turn Type	pm+pt	NA	pm+pt	NA	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6	7	4	3	8	
Permitted Phases	2		6						8
Detector Phase	5	2	1	6	7	4	3	8	8
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	10.3	30.3	10.3	30.3	10.8	35.9	10.8	35.9	35.9
Total Split (s)	11.0	33.0	11.0	33.0	25.0	36.0	25.0	36.0	36.0
Total Split (%)	10.5%	31.4%	10.5%	31.4%	23.8%	34.3%	23.8%	34.3%	34.3%
Maximum Green (s)	5.7	26.7	5.7	26.7	19.2	29.1	19.2	29.1	29.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	3.0	2.0	3.0	2.5	3.6	2.5	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.3	5.3	6.3	5.8	6.9	5.8	6.9	6.9
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Walk Time (s)		7.0		7.0		7.0		7.0	7.0
Flash Dont Walk (s)		17.0		17.0		22.0		22.0	22.0
Pedestrian Calls (#/hr)		6		13		5		6	6
Act Effct Green (s)	58.0	53.5	48.9	42.1	9.3	14.3	17.0	20.9	20.9
Actuated g/C Ratio	0.55	0.51	0.47	0.40	0.09	0.14	0.16	0.20	0.20
v/c Ratio	0.41	0.60	0.07	0.48	0.42	0.38	0.78	0.36	0.15
Control Delay	21.0	24.6	17.1	27.1	53.3	40.0	62.5	37.0	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.0	24.6	17.1	27.1	53.3	40.0	62.5	37.0	0.8
LOS	C	C	D	C	D	D	C	D	A
Approach Delay		24.1		26.9		45.5		45.0	
Approach LOS		C		C		D		D	
Queue Length 50th (m)	15.7	64.8	1.5	49.3	12.2	16.1	40.8	22.5	0.0
Queue Length 95th (m)	#45.6	#166.2	6.7	79.3	24.4	25.2	#69.7	32.1	0.0
Internal Link Dist (m)		149.8		219.6		140.7		125.7	
Turn Bay Length (m)			45.0				90.0		
Base Capacity (vph)	401	1652	260	1301	303	477	303	504	527
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.60	0.07	0.48	0.20	0.19	0.69	0.25	0.11

Intersection Summary

Cycle Length: 105

Actuated Cycle Length: 105

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

Natural Cycle: 100

211 Centrum Boulevard PM Peak Hour

Synchro 10 Light Report
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Lanes, Volumes, Timings

4: Duford/Place d'Orléans & St. Joseph

2024 Future Total

11-17-2020

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 29.8

Intersection LOS: C

Intersection Capacity Utilization 77.0%

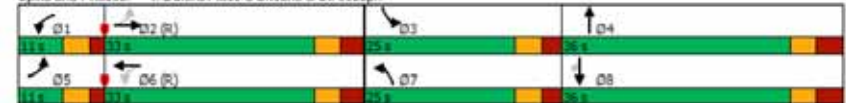
ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 4: Duford/Place d'Orléans & St. Joseph



211 Centrum Boulevard PM Peak Hour

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Lanes, Volumes, Timings
5: Prestone & St. Joseph

2024 Future Total
11-17-2020

	↖	→	↗	↖	→	↗	↖	→	↗	↖	→	↗
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT		
Lane Configurations	↖	↖↗	↗	↖	↖↗	↗	↖	↖↗	↗	↖	↖↗	↗
Traffic Volume (vph)	27	859	116	10	506	115	57	28	128	69		
Future Volume (vph)	27	859	116	10	506	115	57	28	128	69		
Lane Group Flow (vph)	27	859	116	10	506	115	57	37	128	94		
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA		
Protected Phases		2			6			4		8		
Permitted Phases	2		2	6		6	4		8			
Detector Phase	2	2	2	6	6	6	4	4	8	8		
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		
Minimum Split (s)	28.7	28.7	28.7	28.7	28.7	28.7	24.0	24.0	24.0	24.0		
Total Split (s)	51.0	51.0	51.0	51.0	51.0	51.0	29.0	29.0	29.0	29.0		
Total Split (%)	63.8%	63.8%	63.8%	63.8%	63.8%	63.8%	36.3%	36.3%	36.3%	36.3%		
Maximum Green (s)	45.3	45.3	45.3	45.3	45.3	45.3	23.0	23.0	23.0	23.0		
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.7	2.7	2.7	2.7		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.7	6.0	6.0	6.0	6.0		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None		
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0	16.0	11.0	11.0	11.0	11.0		
Pedestrian Calls (#/hr)	1	1	1	3	3	3	1	1	6	6		
Act Effct Green (s)	49.8	49.8	49.8	49.8	49.8	49.8	12.9	12.9	12.9	12.9		
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.71	0.71	0.18	0.18	0.18	0.18		
v/c Ratio	0.05	0.36	0.11	0.03	0.21	0.11	0.26	0.12	0.54	0.29		
Control Delay	5.7	6.2	1.6	5.8	5.3	1.6	27.1	19.8	34.9	21.5		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	5.7	6.2	1.6	5.8	5.3	1.6	27.1	19.8	34.9	21.5		
LOS	A	A	A	A	A	A	C	D	C	C		
Approach Delay		5.7			4.7			24.2		29.2		
Approach LOS		A			A			C		C		
Queue Length 50th (m)	1.1	22.9	0.0	0.4	11.7	0.0	6.5	3.1	15.3	8.0		
Queue Length 95th (m)	4.3	42.3	5.4	2.2	23.0	5.3	15.6	9.8	30.4	19.2		
Internal Link Dist (m)		166.5			193.8			90.1		86.1		
Turn Bay Length (m)	50.0		120.0	75.0		150.0	90.0					
Base Capacity (vph)	580	2366	1065	393	2366	1077	398	560	422	565		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.05	0.36	0.11	0.03	0.21	0.11	0.14	0.07	0.30	0.17		

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 69.8
Natural Cycle: 55
Control Type: Semi Act-Uncoordinated

211 Centrum Boulevard PM Peak Hour

Synchro 10 Light Report
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Lanes, Volumes, Timings
5: Prestone & St. Joseph

2024 Future Total
11-17-2020

Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 8.9	Intersection LOS: A
Intersection Capacity Utilization 51.5%	ICU Level of Service A
Analysis Period (min): 15	

Splits and Phases: 5: Prestone & St. Joseph



211 Centrum Boulevard PM Peak Hour

Synchro 10 Light Report
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Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		+			+			+			+	
Traffic Vol, veh/h	48	177	8	1	117	9	7	0	8	12	0	58
Future Vol, veh/h	48	177	8	1	117	9	7	0	8	12	0	58
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	48	177	8	1	117	9	7	0	8	12	0	58

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	126	0	0	185	0	0	430	405	181	405	405	122
Stage 1	-	-	-	-	-	-	277	277	-	124	124	-
Stage 2	-	-	-	-	-	-	153	128	-	281	281	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1460	-	-	1390	-	-	535	535	862	556	535	929
Stage 1	-	-	-	-	-	-	729	681	-	880	793	-
Stage 2	-	-	-	-	-	-	849	790	-	726	678	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1460	-	-	1390	-	-	487	515	862	535	515	929
Mov Cap-2 Maneuver	-	-	-	-	-	-	487	515	-	535	515	-
Stage 1	-	-	-	-	-	-	702	656	-	847	792	-
Stage 2	-	-	-	-	-	-	795	789	-	693	653	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	0.1	10.8	9.8
HCM LOS	B	A	B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	634	1460	-	-	1390	-	-	825
HCM Lane V/C Ratio	0.024	0.033	-	-	0.001	-	-	0.085
HCM Control Delay (s)	10.8	7.5	0	-	7.6	0	-	9.8
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %ile Q(veh)	0.1	0.1	-	-	0	-	-	0.3

Intersection						
Int Delay, s/veh	7.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			+	+	
Traffic Vol, veh/h	0	26	32	0	0	0
Future Vol, veh/h	0	26	32	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	26	32	0	0	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	65	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	64	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	941	1084	1622	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	959	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	922	1084	1622	-	-	-
Mov Cap-2 Maneuver	922	-	-	-	-	-
Stage 1	1002	-	-	-	-	-
Stage 2	959	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.4	7.3	0
HCM LOS	A	B	A

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1622	-	1084	-	-
HCM Lane V/C Ratio	0.02	-	0.024	-	-
HCM Control Delay (s)	7.3	0	8.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %ile Q(veh)	0.1	-	0.1	-	-

Appendix J

Synchro Worksheets – 2029 Future Total Conditions

Lanes, Volumes, Timings
1: Place d'Orléans & Hwy 174

2029 Future Total
08-11-2020

	→	↘	↙	↗
Lane Group	EBT	EBR	NBL	NBR
Lane Configurations	↑	↑↑	↑↑	↑
Traffic Volume (vph)	172	168	217	27
Future Volume (vph)	172	168	217	27
Lane Group Flow (vph)	172	168	217	27
Turn Type	NA	Perm	Prot	Perm
Protected Phases	4		2	
Permitted Phases		4		2
Detector Phase	4	4	2	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	15.7	15.7	24.8	24.8
Total Split (s)	35.7	35.7	44.8	44.8
Total Split (%)	44.3%	44.3%	55.7%	55.7%
Maximum Green (s)	30.0	30.0	40.0	40.0
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	4.8	4.8
Lead/Lag				
Lead-Lag Optimize?				
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	None	None	Min	Min
Walk Time (s)			15.0	15.0
Flash Dont Walk (s)			5.0	5.0
Pedestrian Calls (#/hr)			1	1
Act Effect Green (s)	10.5	10.5	12.7	12.7
Actuated g/C Ratio	0.31	0.31	0.37	0.37
v/c Ratio	0.32	0.18	0.18	0.05
Control Delay	11.5	3.1	7.4	3.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.5	3.1	7.4	3.4
LOS	D	A	A	A
Approach Delay	7.4		7.0	
Approach LOS	A		A	
Queue Length 50th (m)	5.9	0.0	3.6	0.0
Queue Length 95th (m)	21.4	5.0	8.0	2.5
Internal Link Dist (m)	182.0		201.4	
Turn Bay Length (m)		150.0		50.0
Base Capacity (vph)	1570	2366	3179	1448
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.11	0.07	0.07	0.02
Intersection Summary				
Cycle Length: 80.5				
Actuated Cycle Length: 33.9				
Natural Cycle: 45				
Control Type: Actuated-Uncoordinated				

Lanes, Volumes, Timings
1: Place d'Orléans & Hwy 174

2029 Future Total
08-11-2020

Maximum v/c Ratio: 0.32	Intersection LOS: A
Intersection Signal Delay: 7.2	ICU Level of Service A
Intersection Capacity Utilization 26.9%	
Analysis Period (min): 15	

Splits and Phases: 1: Place d'Orléans & Hwy 174



Lanes, Volumes, Timings

2: Place d'Orléans & Private/Centrum

2029 Future Total

08-11-2020

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↩	↩	↩	↩	↩	↩	↩	↩	↩
Traffic Volume (vph)	25	18	40	66	80	67	195	78	52
Future Volume (vph)	25	18	40	66	80	67	195	78	52
Lane Group Flow (vph)	25	18	40	66	98	0	298	0	149
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	36.0	36.0	36.0	36.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0	43.0	43.0	43.0	43.0
Total Split (%)	42.7%	42.7%	42.7%	42.7%	42.7%	57.3%	57.3%	57.3%	57.3%
Maximum Green (s)	26.0	26.0	26.0	26.0	26.0	37.0	37.0	37.0	37.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	7	7	7	8	8	0	0	1	1
Act Effct Green (s)	13.2	13.2	13.2	12.3	12.3		54.2		54.2
Actuated g/C Ratio	0.18	0.18	0.18	0.16	0.16		0.72		0.72
v/c Ratio	0.12	0.06	0.14	0.31	0.34		0.15		0.09
Control Delay	24.4	22.9	7.6	28.8	24.1		5.2		5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	24.4	22.9	7.6	28.8	24.1		5.2		5.2
LOS	C	C	A	C	C		A		A
Approach Delay		16.0			26.0		5.2		5.2
Approach LOS		B			C		A		A
Queue Length 50th (m)	3.2	2.3	0.0	8.7	10.6		5.3		2.4
Queue Length 95th (m)	7.3	5.7	5.5	15.0	17.9		16.9		9.2
Internal Link Dist (m)		30.9			117.0		125.7		201.4
Turn Bay Length (m)			20.0	95.0					
Base Capacity (vph)	417	604	533	448	596		2029		1722
Starvation Cap Reductn	0	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0	0		0		0
Reduced v/c Ratio	0.06	0.03	0.08	0.15	0.16		0.15		0.09

Intersection Summary

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 0 (0%), Referenced to phase 2-NBTL and 6-SBTL, Start of Green

Natural Cycle: 70

211 Centrum Boulevard AM Peak Hour

Synchro 10 Light Report
Page 4

Lanes, Volumes, Timings

2: Place d'Orléans & Private/Centrum

2029 Future Total

08-11-2020

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.34

Intersection Signal Delay: 11.4

Intersection LOS: B

Intersection Capacity Utilization 61.9%

ICU Level of Service B

Analysis Period (min): 15

Splits and Phases: 2: Place d'Orléans & Private/Centrum



211 Centrum Boulevard AM Peak Hour

Synchro 10 Light Report
Page 5

HCM 2010 AWSC
3: Prestone & Centrum

2029 Future Total
08-11-2020

Intersection						
Intersection Delay, s/veh	8.5					
Intersection LOS	A					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	27	69	54	35	143	57
Future Vol, veh/h	27	69	54	35	143	57
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	69	54	35	143	57
Number of Lanes	1	0	0	1	1	1
Approach	EB	WB	NB			
Opposing Approach	WB	EB				
Opposing Lanes	1	1	0			
Conflicting Approach Left		NB	EB			
Conflicting Lanes Left	0	2	1			
Conflicting Approach Right	NB		WB			
Conflicting Lanes Right	2	0	1			
HCM Control Delay	7.6	8.3	9			
HCM LOS	A	A	A			

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	61%
Vol Thru, %	0%	0%	28%	39%
Vol Right, %	0%	100%	72%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	143	57	96	89
LT Vol	143	0	0	54
Through Vol	0	0	27	35
RT Vol	0	57	69	0
Lane Flow Rate	143	57	96	89
Geometry Grp	7	7	2	2
Degree of Util (X)	0.217	0.068	0.11	0.115
Departure Headway (Hd)	5.469	4.265	4.121	4.671
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	661	845	872	769
Service Time	3.169	1.965	2.137	2.688
HCM Lane V/C Ratio	0.216	0.067	0.11	0.116
HCM Control Delay	9.7	7.3	7.6	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.2	0.4	0.4

Lanes, Volumes, Timings
4: Duford/Place d'Orléans & St. Joseph

2029 Future Total
08-11-2020

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	89	225	14	844	92	143	41	46	37
Future Volume (vph)	89	225	14	844	92	143	41	46	37
Lane Group Flow (vph)	89	273	14	935	92	155	41	46	37
Turn Type	pm+pt	NA	pm+pt	NA	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6	7	4	3	8	
Permitted Phases	2		6						8
Detector Phase	5	2	1	6	7	4	3	8	8
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	10.3	30.3	10.3	30.3	10.8	35.9	10.8	35.9	35.9
Total Split (s)	11.0	37.0	11.0	37.0	21.0	36.0	21.0	36.0	36.0
Total Split (%)	10.5%	35.2%	10.5%	35.2%	20.0%	34.3%	20.0%	34.3%	34.3%
Maximum Green (s)	5.7	30.7	5.7	30.7	15.2	29.1	15.2	29.1	29.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	3.0	2.0	3.0	2.5	3.6	2.5	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.3	5.3	6.3	5.8	6.9	5.8	6.9	6.9
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Walk Time (s)	7.0		7.0		7.0		7.0		7.0
Flash Dont Walk (s)	17.0		17.0		22.0		22.0		22.0
Pedestrian Calls (#/hr)	3		1		0		2		2
Act Effct Green (s)	62.8	58.8	58.9	53.3	11.0	19.3	8.1	14.1	14.1
Actuated g/C Ratio	0.60	0.56	0.56	0.51	0.10	0.18	0.08	0.13	0.13
v/c Ratio	0.30	0.15	0.02	0.56	0.53	0.48	0.32	0.20	0.11
Control Delay	15.5	14.8	14.1	23.8	54.8	41.0	51.9	39.1	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.5	14.8	14.1	23.8	54.8	41.0	51.9	39.1	0.7
LOS	D	D	D	C	D	D	D	D	A
Approach Delay		15.0		23.7		46.2		31.9	
Approach LOS		B		C		D		C	
Queue Length 50th (m)	6.9	10.6	1.0	69.8	18.1	29.6	8.1	8.7	0.0
Queue Length 95th (m)	21.3	31.3	5.5	#140.3	32.6	39.5	18.3	15.7	0.0
Internal Link Dist (m)		177.7		219.6		140.7		125.7	
Turn Bay Length (m)	70.0		45.0			90.0			
Base Capacity (vph)	298	1811	605	1659	240	494	240	483	513
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.15	0.02	0.56	0.38	0.31	0.17	0.10	0.07

Intersection Summary

Cycle Length: 105
Actuated Cycle Length: 105
Offset: 0 (0%), Referenced to phase 2 EBTL and 6 WBTL, Start of Green
Natural Cycle: 90

Lanes, Volumes, Timings
4: Duford/Place d'Orléans & St. Joseph

2029 Future Total
08-11-2020

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 25.7

Intersection LOS: C

Intersection Capacity Utilization 66.0%

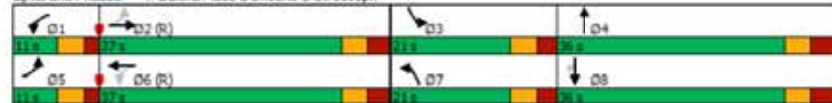
ICU Level of Service C

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 4: Duford/Place d'Orléans & St. Joseph



Lanes, Volumes, Timings
5: Prestone & St. Joseph

2029 Future Total
08-11-2020

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰
Traffic Volume (vph)	8	211	40	2	832	136	81	56	67	38
Future Volume (vph)	8	211	40	2	832	136	81	56	67	38
Lane Group Flow (vph)	8	211	40	2	832	136	81	61	67	56
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2			6			4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	23.7	23.7	23.7	23.7	23.7	23.7	29.0	29.0	29.0	29.0
Total Split (s)	51.0	51.0	51.0	51.0	51.0	51.0	29.0	29.0	29.0	29.0
Total Split (%)	63.8%	63.8%	63.8%	63.8%	63.8%	63.8%	36.3%	36.3%	36.3%	36.3%
Maximum Green (s)	45.3	45.3	45.3	45.3	45.3	45.3	23.0	23.0	23.0	23.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.7	6.0	6.0	6.0	6.0
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	2	2	1	1
Act Effct Green (s)	50.6	50.6	50.6	50.6	50.6	50.6	12.6	12.6	12.6	12.6
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.72	0.72	0.18	0.18	0.18	0.18
v/c Ratio	0.02	0.09	0.04	0.00	0.35	0.12	0.36	0.20	0.30	0.18
Control Delay	6.2	5.1	2.4	6.0	6.2	1.7	29.5	23.7	28.0	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.2	5.1	2.4	6.0	6.2	1.7	29.5	23.7	28.0	18.8
LOS	A	A	A	A	A	A	C	C	C	B
Approach Delay		4.7			5.6			27.0		23.8
Approach LOS		A			A			C		C
Queue Length 50th (m)	0.3	3.9	0.0	0.1	19.3	0.0	9.3	6.2	7.6	4.2
Queue Length 95th (m)	2.3	11.8	3.7	1.0	48.0	6.7	20.0	14.8	17.1	12.3
Internal Link Dist (m)		166.5			193.8			90.1		86.1
Turn Bay Length (m)	50.0		120.0	75.0		150.0	90.0			
Base Capacity (vph)	413	2385	1078	778	2385	1092	412	569	410	555
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.09	0.04	0.00	0.35	0.12	0.20	0.11	0.16	0.10

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 70.3

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
5: Prestone & St. Joseph

2029 Future Total
08-11-2020

Maximum v/c Ratio: 0.36

Intersection Signal Delay: 9.0

Intersection LOS: A

Intersection Capacity Utilization 45.9%

ICU Level of Service A

Analysis Period (min): 15

Splits and Phases: 5: Prestone & St. Joseph



HCM 2010 TWSC

6: Orleans Towncentre Access/Brisebois & Centrum

2029 Future Total
08-11-2020

Intersection

Int Delay, s/veh 2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		+			+			+			+	
Traffic Vol, veh/h	37	84	10	2	130	6	0	0	1	7	0	37
Future Vol, veh/h	37	84	10	2	130	6	0	0	1	7	0	37
Conflicting Peds, #/hr	8	0	9	9	0	8	0	0	3	3	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	37	84	10	2	130	6	0	0	1	7	0	37

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	144	0	103	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	4.12	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	2.218	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1438	-	1489	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Mov Cap-2 Maneuver	1429	-	1479	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.1	0.1	8.8	9.5
HCM LOS	A	A	A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	945	1429	-	-	1479	-	-	841
HCM Lane V/C Ratio	0.001	0.026	-	-	0.001	-	-	0.052
HCM Control Delay (s)	8.8	7.6	0	-	7.4	0	-	9.5
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.2

Intersection						
Int Delay, s/veh	6.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	0	30	16	0	14	0
Future Vol, veh/h	0	30	16	0	14	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	30	16	0	14	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	46	14	14
Stage 1	14	-	-
Stage 2	32	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	964	1066	1604
Stage 1	1009	-	-
Stage 2	991	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	954	1066	1604
Mov Cap-2 Maneuver	954	-	-
Stage 1	999	-	-
Stage 2	991	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	7.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1604	-	1066	-	-
HCM Lane V/C Ratio	0.01	-	0.028	-	-
HCM Control Delay (s)	7.3	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %ile Q(veh)	0	-	0.1	-	-

	EBT	EBR	NBL	NBR
Lane Group	EBT	EBR	NBL	NBR
Lane Configurations	W	W	W	W
Traffic Volume (vph)	592	355	226	113
Future Volume (vph)	592	355	226	113
Lane Group Flow (vph)	592	355	226	113
Turn Type	NA	Perm	Prot	Perm
Protected Phases	4		2	
Permitted Phases		4		2
Detector Phase	4	4	2	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	15.7	15.7	24.8	24.8
Total Split (s)	45.7	45.7	44.8	44.8
Total Split (%)	50.5%	50.5%	49.5%	49.5%
Maximum Green (s)	40.0	40.0	40.0	40.0
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	4.8	4.8
Lead/Lag				
Lead-Lag Optimize?				
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	None	None	Min	Min
Walk Time (s)			15.0	15.0
Flash Dont Walk (s)			5.0	5.0
Pedestrian Calls (#/hr)			6	6
Act Effct Green (s)	20.8	20.8	12.0	12.0
Actuated g/C Ratio	0.47	0.47	0.27	0.27
v/c Ratio	0.72	0.25	0.26	0.24
Control Delay	14.8	1.5	14.9	5.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	14.8	1.5	14.9	5.5
LOS	D	A	B	A
Approach Delay	9.8		11.8	
Approach LOS	A		B	
Queue Length 50th (m)	27.6	0.0	6.3	0.0
Queue Length 95th (m)	76.2	5.3	18.1	9.6
Internal Link Dist (m)	182.0		201.4	
Turn Bay Length (m)		150.0		50.0
Base Capacity (vph)	1578	2396	2909	1326
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.38	0.15	0.08	0.09

Intersection Summary
Cycle Length: 90.5
Actuated Cycle Length: 43.9
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
1: Place d'Orléans & Hwy 174

2029 Future Total
11-17-2020

Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 10.3	Intersection LOS: B
Intersection Capacity Utilization 51.5%	ICU Level of Service A
Analysis Period (min): 15	

Splits and Phases: 1: Place d'Orléans & Hwy 174



Lanes, Volumes, Timings
2: Place d'Orléans & Private/Centrum

2029 Future Total
11-17-2020

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	←	↑	→	←	↑	←	↑	←	↑
Traffic Volume (vph)	94	51	220	81	90	102	208	120	162
Future Volume (vph)	94	51	220	81	90	102	208	120	162
Lane Group Flow (vph)	94	51	220	81	104	0	380	0	324
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	36.0	36.0	36.0	36.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0	53.0	53.0	53.0	53.0
Total Split (%)	37.6%	37.6%	37.6%	37.6%	37.6%	62.4%	62.4%	62.4%	62.4%
Maximum Green (s)	26.0	26.0	26.0	26.0	26.0	47.0	47.0	47.0	47.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	12	12	12	4	4	5	5	14	14
Act Effct Green (s)	14.3	14.3	14.3	14.3	14.3		58.7		58.7
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17		0.69		0.69
v/c Ratio	0.47	0.17	0.52	0.39	0.35		0.22		0.20
Control Delay	38.2	29.2	8.5	35.0	30.1		5.3		5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	38.2	29.2	8.5	35.0	30.1		5.3		5.5
LOS	D	C	A	C	C		A		A
Approach Delay		19.0			32.3		5.3		5.5
Approach LOS		B			C		A		A
Queue Length 50th (m)	14.4	7.4	0.0	12.3	14.2		7.5		6.7
Queue Length 95th (m)	23.9	13.9	15.1	20.8	23.4		20.6		18.4
Internal Link Dist (m)		30.9			117.0		125.7		201.4
Turn Bay Length (m)			20.0	95.0					
Base Capacity (vph)	363	533	595	382	527		1724		1592
Starvation Cap Reductn	0	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0	0		0		0
Reduced v/c Ratio	0.26	0.10	0.37	0.21	0.20		0.22		0.20

Intersection Summary

Cycle Length: 85
Actuated Cycle Length: 85
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 70

Lanes, Volumes, Timings

2: Place d'Orléans & Private/Centrum

2029 Future Total

11-17-2020

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 13.3

Intersection LOS: B

Intersection Capacity Utilization 80.0%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 2: Place d'Orléans & Private/Centrum



HCM 2010 AWSC

3: Prestone & Centrum

2029 Future Total

11-17-2020

Intersection

Intersection Delay, s/veh 8.5

Intersection LOS A

Movement

	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	EB	EB	WB	WB	NB	NB
Traffic Vol, veh/h	40	170	54	30	111	56
Future Vol, veh/h	40	170	54	30	111	56
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mynt Flow	40	170	54	30	111	56
Number of Lanes	1	0	0	1	1	1

Approach

	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	8.2	8.3	8.9
HCM LOS	A	A	A

Lane

	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	64%
Vol Thru, %	0%	0%	19%	36%
Vol Right, %	0%	100%	81%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	111	56	210	84
LT Vol	111	0	0	54
Through Vol	0	0	40	30
RT Vol	0	56	170	0
Lane Flow Rate	111	56	210	84
Geometry Grp	7	7	2	2
Degree of Util (X)	0.175	0.069	0.233	0.11
Departure Headway (Hd)	5.661	4.455	3.986	4.711
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	634	804	903	782
Service Time	3.393	2.186	2.001	2.734
HCM Lane V/C Ratio	0.175	0.07	0.233	0.11
HCM Control Delay	9.6	7.5	8.2	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-ile Q	0.6	0.2	0.9	0.4

Lanes, Volumes, Timings

4: Duford/Place d'Orléans & St. Joseph

2029 Future Total

11-17-2020

	↖	→	↗	↖	↗	↖	↗	↖	↗
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	177	917	17	571	62	77	232	125	66
Future Volume (vph)	177	917	17	571	62	77	232	125	66
Lane Group Flow (vph)	177	1071	17	683	62	90	232	125	66
Turn Type	pm-pt	NA	pm-pt	NA	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6	7	4	3	8	
Permitted Phases	2		6						8
Detector Phase	5	2	1	6	7	4	3	8	8
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	10.3	30.3	10.3	30.3	10.8	35.9	10.8	35.9	35.9
Total Split (s)	11.0	33.0	11.0	33.0	25.0	36.0	25.0	36.0	36.0
Total Split (%)	10.5%	31.4%	10.5%	31.4%	23.8%	34.3%	23.8%	34.3%	34.3%
Maximum Green (s)	5.7	26.7	5.7	26.7	19.2	29.1	19.2	29.1	29.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	3.0	2.0	3.0	2.5	3.6	2.5	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.3	5.3	6.3	5.8	6.9	5.8	6.9	6.9
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Walk Time (s)		7.0		7.0		7.0		7.0	7.0
Flash Dont Walk (s)		17.0		17.0		22.0		22.0	22.0
Pedestrian Calls (#/hr)		6		13		5		6	6
Act Effct Green (s)	57.3	52.8	46.6	39.8	9.3	14.3	17.7	21.6	21.6
Actuated g/C Ratio	0.55	0.50	0.44	0.38	0.09	0.14	0.17	0.21	0.21
v/c Ratio	0.46	0.66	0.07	0.55	0.42	0.38	0.83	0.35	0.16
Control Delay	23.1	26.2	17.5	29.7	53.3	40.0	66.7	36.3	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	26.2	17.5	29.7	53.3	40.0	66.7	36.3	0.8
LOS	C	C	D	C	D	D	C	D	A
Approach Delay		25.7		29.4		45.5		47.4	
Approach LOS		C		C		D		D	
Queue Length 50th (m)	17.4	74.5	1.5	57.9	12.2	16.1	45.4	22.4	0.0
Queue Length 95th (m)	#58.4	#186.7	6.7	#90.4	24.4	25.2	#80.8	32.1	0.0
Internal Link Dist (m)		149.8		219.6		140.7		125.7	
Turn Bay Length (m)			45.0				90.0		
Base Capacity (vph)	381	1631	228	1232	303	477	303	504	527
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.66	0.07	0.55	0.20	0.19	0.77	0.25	0.13

Intersection Summary

Cycle Length: 105

Actuated Cycle Length: 105

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

Natural Cycle: 110

211 Centrum Boulevard PM Peak Hour

Synchro 10 Light Report
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Lanes, Volumes, Timings

4: Duford/Place d'Orléans & St. Joseph

2029 Future Total

11-17-2020

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 31.6

Intersection LOS: C

Intersection Capacity Utilization 80.8%

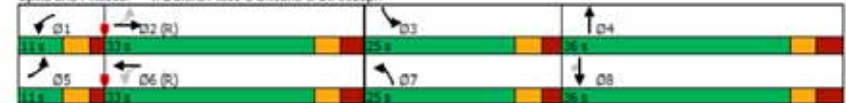
ICU Level of Service D

Analysis Period (min): 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 4: Duford/Place d'Orléans & St. Joseph



211 Centrum Boulevard PM Peak Hour

Synchro 10 Light Report
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Lanes, Volumes, Timings
5: Prestone & St. Joseph

2029 Future Total
11-17-2020

	↖	→	↗	↖	→	↗	↖	→	↗	↖	→	↗
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT		
Lane Configurations	↖	↖↗	↗	↖	↖↗	↗	↖	↖↗	↗	↖	↖↗	↗
Traffic Volume (vph)	27	948	116	10	558	117	57	28	131	69		
Future Volume (vph)	27	948	116	10	558	117	57	28	131	69		
Lane Group Flow (vph)	27	948	116	10	558	117	57	37	131	94		
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA		
Protected Phases		2			6			4		8		
Permitted Phases	2		2	6		6	4		8			
Detector Phase	2	2	2	6	6	6	4	4	8	8		
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		
Minimum Split (s)	28.7	28.7	28.7	28.7	28.7	28.7	24.0	24.0	24.0	24.0		
Total Split (s)	51.0	51.0	51.0	51.0	51.0	51.0	29.0	29.0	29.0	29.0		
Total Split (%)	63.8%	63.8%	63.8%	63.8%	63.8%	63.8%	36.3%	36.3%	36.3%	36.3%		
Maximum Green (s)	45.3	45.3	45.3	45.3	45.3	45.3	23.0	23.0	23.0	23.0		
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.7	2.7	2.7	2.7		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.7	6.0	6.0	6.0	6.0		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None		
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0	16.0	11.0	11.0	11.0	11.0		
Pedestrian Calls (#/hr)	1	1	1	3	3	3	1	1	6	6		
Act Effct Green (s)	48.2	48.2	48.2	48.2	48.2	48.2	13.1	13.1	13.1	13.1		
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.66	0.66	0.18	0.18	0.18	0.18		
v/c Ratio	0.05	0.43	0.12	0.03	0.26	0.12	0.26	0.12	0.57	0.30		
Control Delay	5.8	7.2	1.6	5.9	5.9	1.6	27.3	19.8	36.6	21.2		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	5.8	7.2	1.6	5.9	5.9	1.6	27.3	19.8	36.6	21.2		
LOS	A	A	A	A	A	A	C	D	D	C		
Approach Delay		6.5			5.2			24.3		30.2		
Approach LOS		A			A			C		C		
Queue Length 50th (m)	1.1	26.3	0.0	0.4	13.3	0.0	6.5	3.1	15.7	8.0		
Queue Length 95th (m)	4.4	48.3	5.4	2.3	25.7	5.4	15.6	9.8	31.0	19.2		
Internal Link Dist (m)		166.5			193.8			90.1		86.1		
Turn Bay Length (m)	50.0		120.0	75.0		150.0	90.0					
Base Capacity (vph)	510	2188	993	319	2188	1005	381	536	404	543		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.05	0.43	0.12	0.03	0.26	0.12	0.15	0.07	0.32	0.17		

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 73
Natural Cycle: 55
Control Type: Semi Act-Uncoord

211 Centrum Boulevard PM Peak Hour

Synchro 10 Light Report
Page 9

Lanes, Volumes, Timings
5: Prestone & St. Joseph

2029 Future Total
11-17-2020

Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 9.4	Intersection LOS: A
Intersection Capacity Utilization 51.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Prestone & St. Joseph



211 Centrum Boulevard PM Peak Hour

Synchro 10 Light Report
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Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	48	185	8	1	122	9	7	0	8	12	0	58
Future Vol, veh/h	48	185	8	1	122	9	7	0	8	12	0	58
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	48	185	8	1	122	9	7	0	8	12	0	58

Major/Minor	Major1		Major2		Minor1		Minor2				
Conflicting Flow All	131	0	0	193	0	0	443	418	189	418	127
Stage 1	-	-	-	-	-	-	285	285	-	129	129
Stage 2	-	-	-	-	-	-	158	133	-	289	289
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018
Pot Cap-1 Maneuver	1454	-	-	1380	-	-	525	526	853	545	526
Stage 1	-	-	-	-	-	-	722	676	-	875	789
Stage 2	-	-	-	-	-	-	844	786	-	719	673
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1454	-	-	1380	-	-	478	506	853	524	506
Mov Cap-2 Maneuver	-	-	-	-	-	-	478	506	-	524	506
Stage 1	-	-	-	-	-	-	695	651	-	843	788
Stage 2	-	-	-	-	-	-	790	785	-	686	648

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	0.1	10.9	9.8
HCM LOS	B	A	B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	624	1454	-	-	1380	-	-	816
HCM Lane V/C Ratio	0.024	0.033	-	-	0.001	-	-	0.086
HCM Control Delay (s)	10.9	7.6	0	-	7.6	0	-	9.8
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %ile Q(veh)	0.1	0.1	-	-	0	-	-	0.3

Intersection						
Int Delay, s/veh	7.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	26	32	0	0	0
Future Vol, veh/h	0	26	32	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	26	32	0	0	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	65	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	64	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	941	1084	1622	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	959	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	922	1084	1622	-	-	-
Mov Cap-2 Maneuver	922	-	-	-	-	-
Stage 1	1002	-	-	-	-	-
Stage 2	959	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.4	7.3	0
HCM LOS	A	B	A

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1622	-	1084	-	-
HCM Lane V/C Ratio	0.02	-	0.024	-	-
HCM Control Delay (s)	7.3	0	8.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %ile Q(veh)	0.1	-	0.1	-	-

Appendix K

TDM Checklists

TDM Measures Checklist:

Non-Residential Developments (office, institutional, retail or industrial)

Legend

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

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

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

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

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

TDM Measures Checklist:

Residential Developments (multi-family, condominium or subdivision)

Legend

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

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

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

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

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

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

TDM-supportive design & infrastructure measures: <i>Non-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	☒
BASIC	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☒
BASIC	1.1.3 Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☒
1.2 Facilities for walking & cycling		
REQUIRED	1.2.1 Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations (<i>see Official Plan policy 4.3.3</i>)	☒
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>)	☒

TDM-supportive design & infrastructure measures: Non-residential developments		Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3 Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks (see <i>Official Plan policy 4.3.10</i>)	☒
REQUIRED	1.2.4 Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps (see <i>Official Plan policy 4.3.10</i>)	☒
REQUIRED	1.2.5 Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians (see <i>Official Plan policy 4.3.11</i>)	☐
BASIC	1.2.6 Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☐
BASIC	1.2.7 Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☐
BASIC	1.2.8 Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐
1.3 Amenities for walking & cycling		
BASIC	1.3.1 Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☒
BASIC	1.3.2 Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐

TDM-supportive design & infrastructure measures: Non-residential developments		Check if completed & add descriptions, explanations or plan/drawing references
2. WALKING & CYCLING: END-OF-TRIP FACILITIES		
2.1 Bicycle parking		
REQUIRED	2.1.1 Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible (see <i>Official Plan policy 4.3.6</i>)	☒
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>)	☐
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>)	☒
BASIC	2.1.4 Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	☐
BETTER	2.1.5 Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	☐
2.2 Secure bicycle parking		
REQUIRED	2.2.1 Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers (see <i>Zoning By-law Section 111</i>)	☒
BETTER	2.2.2 Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	☐
2.3 Shower & change facilities		
BASIC	2.3.1 Provide shower and change facilities for the use of active commuters	☐
BETTER	2.3.2 In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	☐
2.4 Bicycle repair station		
BETTER	2.4.1 Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
3. TRANSIT		
3.1 Customer amenities		
BASIC	3.1.1 Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2 Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☒
BETTER	3.1.3 Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐
4. RIDESHARING		
4.1 Pick-up & drop-off facilities		
BASIC	4.1.1 Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐
4.2 Carpool parking		
BASIC	4.2.1 Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	☐
BETTER	4.2.2 At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	☐
5. CARSHARING & BIKESHARING		
5.1 Carshare parking spaces		
BETTER	5.1.1 Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces (<i>see Zoning By-law Section 94</i>)	☐
5.2 Bikeshare station location		
BETTER	5.2.1 Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
6. PARKING		
6.1 Number of parking spaces		
REQUIRED	6.1.1 Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☒
BASIC	6.1.2 Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3 Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly (<i>see Zoning By-law Section 104</i>)	☐
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 (<i>see Zoning By-law Section 111</i>)	☐
6.2 Separate long-term & short-term parking areas		
BETTER	6.2.1 Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	☐
7. OTHER		
7.1 On-site amenities to minimize off-site trips		
BETTER	7.1.1 Provide on-site amenities to minimize mid-day or mid-commute errands	☐

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

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

TDM-supportive design & infrastructure measures: <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	☒
BASIC	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☒
BASIC	1.1.3 Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☒
1.2 Facilities for walking & cycling		
REQUIRED	1.2.1 Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations (see <i>Official Plan policy 4.3.3</i>)	☒
REQUIRED	1.2.2 Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible (see <i>Official Plan policy 4.3.12</i>)	☒

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3 Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks (see <i>Official Plan policy 4.3.10</i>)	☒
REQUIRED	1.2.4 Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps (see <i>Official Plan policy 4.3.10</i>)	☒
REQUIRED	1.2.5 Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians (see <i>Official Plan policy 4.3.11</i>)	☐
BASIC	1.2.6 Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☐
BASIC	1.2.7 Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☐
BASIC	1.2.8 Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐
1.3 Amenities for walking & cycling		
BASIC	1.3.1 Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☒
BASIC	1.3.2 Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐

TDM-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 (<i>see Official Plan policy 4.3.6</i>)	☒
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 (<i>see Zoning By-law Section 111</i>)	☐
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 (<i>see Zoning By-law Section 111</i>)	☒
BASIC	2.1.4 Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	☒
2.2 Secure bicycle parking		
REQUIRED	2.2.1 Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers (<i>see Zoning By-law Section 111</i>)	☒
BETTER	2.2.2 Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☐
2.3 Bicycle repair station		
BETTER	2.3.1 Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐
3. TRANSIT		
3.1 Customer amenities		
BASIC	3.1.1 Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2 Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☒
BETTER	3.1.3 Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐

TDM-supportive design & infrastructure measures: <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	☐
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 (<i>see Zoning By-law Section 94</i>)	☐
5.2 Bikeshare station location		
BETTER	5.2.1 Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐
6. PARKING		
6.1 Number of parking spaces		
REQUIRED	6.1.1 Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☒
BASIC	6.1.2 Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3 Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly (<i>see Zoning By-law Section 104</i>)	☐
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 (<i>see Zoning By-law Section 111</i>)	☐
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)	☐