3030 St-Joseph Boulevard

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Strategy Report

Prepared for:

Theberge Homes
205-2600 Laperriere Avenue
Ottawa ON K1Z 8P5

Prepared by:

6 Plaza Court
Ottawa, ON K2H 7W1

June 2023

PN: 2023-055

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1 Screening

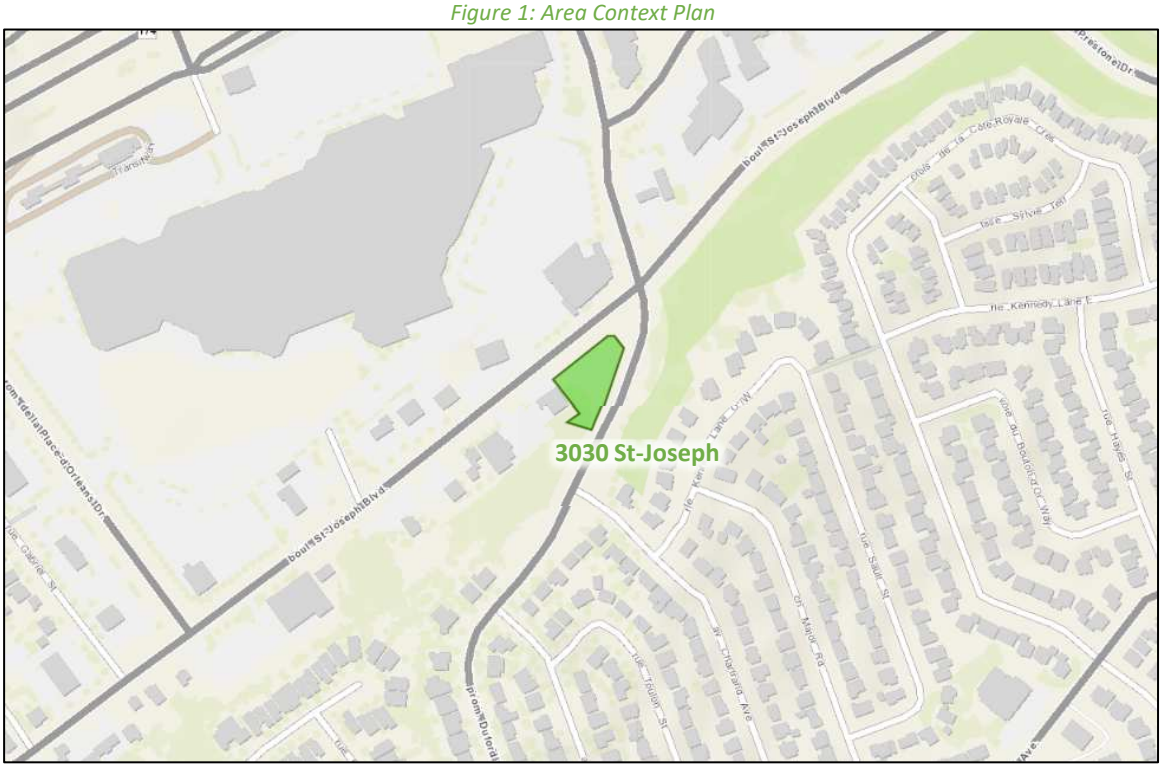
This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for the TIA Study PM. As shown in the Screening Form, a TIA is required including the Design Review component and the Network Impact Component. This study has been prepared to support a zoning by-law amendment and site plan application.

2 Existing and Planned Conditions

2.1 Proposed Development

The development site is located at 3030 St-Joseph Boulevard and is zoned as Arterial Mainstreet Zone (AM3[2705] S438). The development application is for the addition of two stories above the established zoning with a similar building layout as was previously approved for a prior zoning amendment. The development is proposed as an 18-storey mixed-used building comprising 202 units and 2,796 sq. ft commercial space, to be built by 2025. A total of 163 vehicle parking spaces and 210 bicycle parking spaces are proposed. The plan includes a right-in/right-out access on St-Joseph Boulevard. The development is within the Orléans Corridor Secondary Plan Study area. Figure 1 illustrates the study area context. Figure 2 illustrates the proposed concept plan.

Figure 1: Area Context Plan



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: April 25, 2023

Figure 2: Concept Plan

LEGAL DESCRIPTION

TOPOGRAPHICAL PLAN OF SURVEY
PART 1 Plan of
PART OF LOTS 1,2,3 AND 4
REGISTERED PLAN 17
CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

PROJECT DEVELOPER

Starwood Group Inc.
188 Eglinton Avenue East Suite 800
Toronto, Ontario, M4P 2X7
Tel: (416) 482-4822
Fax: (416) 482-8224

URBAN PLANNER

PROJECT INFORMATION

Zoning By-law 2008-250 Consolidation AM3[2705] 8438 — SITE AREA 0.264 ha. — 2,643.97 sq. m. (28,459 sq. ft.)

ZONING	REQUIRED	PROVIDED
BUILDING HEIGHT	16 STOREYS / 52.4m	18 STOREYS / 56.4m
GRADE (GEODETIC ELEVATION - ASL)	72.40m ASL	72.40m ASL
DENSITY - MAXIMUM FLOOR SPACE INDEX	4.25	5.1
FRONT YARD SETBACK - AS PER SCHEDULE 843R	9.0m	9.0m
CORNER YARD SETBACK (Saint Joseph / Duford Avenue)	3.5m / 0.2m	3.5m / 0.3m
INTERIOR SIDE YARD SETBACK	0.2m	0.3m
AMENITY AREA - TOTAL PER UNIT - 6.0m²	1,212m²	1,635m²
AMENITY AREA - 50% COMMUNAL PER UNIT - 3.2m²	606m²	785m²
RESIDENTIAL PARKING (AREA 'Z' - MIN. 0 / MAX. 1.75 PER UNIT)	MIN. 0 / MAX. 354	144
VISITOR PARKING - 0.1 PER UNIT AFTER 12 UNITS	19	19
COMMERCIAL PARKING (AREA 'Z')	NOT REQUIRED	0
BICYCLE PARKING - RESIDENTIAL - 0.5 PER UNIT	101	202
BICYCLE PARKING - COMMERCIAL - 1 PER 250m² GFA	2	8
ABLE & DRIVEWAY MINIMUM / MAXIMUM WIDTH	6.0m / 6.7m	6.0m / 6.7m
ST. JOSEPH BOULEVARD FRONTAGE MINIMUM GROUND FLOOR GLAZING	50%	± 65%

PROJECT STATISTICS

GROSS BUILDING (CITY OF OTTAWA'S DEFINITION)

PARKING LEVELS (3 TYPICAL)		N/A
GROUND FLOOR		259.8 sq. m. (2,796 sq. ft.
1st FLOOR		452.4 sq. m. (4,870) sq. ft.
2nd FLOOR		1,042.5 sq. m. (11,221) sq. ft.
3th & 4th FLOOR	2 x 1,042.5 sq. m. 2 x (11,221) sq. ft.	2,085.0 sq. m. (22,442) sq. ft.
5th to 17th FLOOR	13 x 689.25 sq. m. 13 x (7,419) sq. ft.	8,960.2 sq. m. (96,447) sq. ft.
18th FLOOR		517.9 sq. m. (5,575) sq. ft.
MECHANICAL LEVEL		N/A
TOTAL AREA		13,317.3 sq. m. (143,346) sq. ft.

UNIT STATISTICS

STUDIO UNIT	4
1 BEDROOM UNIT	46
1 BEDROOM + DEN UNIT	39
2 BEDROOM UNIT	110
2 BEDROOM + DEN UNIT	0
3 BEDROOM UNIT	3
TOTAL	202
COMMERCIAL RETAIL	259.8 sq. m. (2,796) sq. ft.

CAR PARKING

REQUIRED by ZONING BY-LAW

RESIDENCE	- AREA 'Z' NONE REQUIRED	0
VISITOR	- 0.1 PER DWELLING UNIT (AFTER 12 UNITS)	19
COMMERCIAL RETAIL	- AREA 'Z' NONE REQUIRED	0
TOTAL		19

PROVIDED

RESIDENCE	- 0.7 PER UNIT	144
VISITOR	- 0.1 PER UNIT	19
TOTAL		163

LOCATION

P3 LEVEL UNDER GROUND PARKING	50
P2 LEVEL UNDER GROUND PARKING	48
P1 LEVEL PARKING	48
GROUND FLOOR PARKING	17
TOTAL	163

BICYCLE PARKING

REQUIRED

RESIDENCE	- 0.5 PER UNIT (202 UNITS)	101
COMMERCIAL RETAIL	- 1.0 PER 250m² OF G.F.A.	2
TOTAL		103

PROVIDED

EXTERIOR	8
INDOOR ON GROUND FLOOR	202
TOTAL	210

LOT COVERAGE

PAVED SURFACE =	39.1 sq. m.	1.5%
BUILDING FOOTPRINT =	1,618.9 sq. m.	61.2%
LANDSCAPE OPEN SPACE =	517.2 sq. m.	35.7%
TOTAL =	2,643.97 sq. m.	100.0%

AMENITY SPACE

AT GRADE COMMUNAL =	250.0 sq. m.
1st FLOOR AMENITY ROOM COMMUNAL =	450.0 sq. m.
1st FLOOR TERRACE COMMUNAL =	85.0 sq. m.
PRIVATE TERRACE =	300.0 sq. m.
PRIVATE BALCONIES =	550.0 sq. m.
TOTAL =	1,635.0 sq. m.
TOTAL COMMUNAL =	785.0 sq. m.
REQUIRED - 6.0M² PER UNIT (202) =	1,212.0 sq. m.
REQUIRED COMMUNAL @ 50% =	606.0 sq. m.

REFUSE REQUIREMENT (202 UNITS)

GARBAGE	- 0.11 PER UNIT	23 YARDS
RECYCLING GRP	- 0.018 PER UNIT	4 YARDS
RECYCLING FIBER	- 0.038 PER UNIT	8 YARDS
COMPOST	- 2400L PER 50 UNITS	4

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT.

ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS.

THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED BY THE ARCHITECT.

DO NOT SCALE DRAWINGS.

NOTATION SYMBOLS:

- (W) INDICATES DRAWING NOTES. LISTED ON EACH SHEET.
- (A) INDICATES ASSEMBLIES TYPE: REFER TO TYPICAL ASSEMBLIES SCHEDULE.
- (W) INDICATES WINDOW TYPE: REFER TO WINDOW ELEVATIONS AND DETAILS ON A900 SERIES.
- (400) INDICATES DOOR TYPE: REFER TO DOOR SCHEDULE AND DETAILS ON A900 SERIES.
- DETAIL NUMBER
- TITLE / SHEET
- DETAIL REFERENCE PAGE
- DETAIL CROSS REFERENCE PAGE

No.	DESCRIPTION	DATE
1	ISSUED FOR OWNER REVIEW	Dec. 22, 22

REVISIONS:

ARCHITECT SEAL: ONTARIO ASSOCIATION OF ARCHITECTS — RODERICK J. LAHEY — LICENCE 4175 — SEAL DATE: STAMP DATE

NORTH ARROWS

OWNER:
St. Joseph Inc.
MASTERCRAFT STARWOOD
Investment Builders Since 1951
THEBERGE HOMES

ARCHITECT:
rla/architecture
roderick lahey architect inc.
56 beech street, ottawa, ontario K1S 3J6
t 613.724.9932 f. 613.724.1209 rlaarchitecture.ca

PROJECT TITLE:
3030 St. JOSEPH BOULIVARD
OTTAWA ONTARIO

SHEET TITLE:
SITE PLAN

DRAWN:	CHECKED:
R.V.	R.V.
SCALE: 1:125	SHEET No. SP-1
PROJECT No. 2222	

PAPER SIZE: ISO_B1_(707.00_x_1000.00_MM) | PLOT DATE: Friday, April 21, 2023 | PLOT SCALE: 1:1 | PEN STYLE: 0-RLA-MASTER-100%.ctb

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2.2 Existing Conditions

2.2.1 Area Road Network

St-Joseph Boulevard: St Joseph Boulevard is a City of Ottawa arterial road with a four-lane urban cross-section. It is an undivided cross-section west of Duford Drive, and it transitions to divided cross-section east of Duford Drive. The posted speed limit is 50km/h west of Prestone Drive, and it transitions to 60km/h east of Prestone Drive. Sidewalks are present on both sides of the road. Within the study area, the Ottawa Official Plan protects a right-of-way of 32.0 metres from the west to Edgar Brault Street, 26.0 metres from Edgar Brault Street to Gabriel Street, 32.0 metres from Gabriel Street to 130 m west of Duford Drive and 37.5 metres to the east. St Joseph Boulevard is a designated truck route.

Place d'Orleans Drive: Place d'Orleans Drive is a City of Ottawa arterial road with a four-lane divided urban cross-section, with the section from OR 174 on-ramp to Duford Drive becoming an undivided roadway. Sidewalks are present on both sides of the road except on the north/east side of the road between Champlain Street and Centrum Boulevard and on the south side between the OR 174 off-ramp and Champlain Street. The posted speed limit is 60 km/h, and the Ottawa Official Plan protects a right-of-way of 37.5 metres within the study area. Place d'Orleans Drive is a designated truck route.

Duford Drive: Duford Drive is a City of Ottawa collector road with a two-lane urban cross-section. Sidewalks are provided on both sides of the road north of Chartrand Avenue and are provided on the east side of the road to the south. The posted speed limit is 40 km/h, and the Ottawa Official Plan protects a right-of-way of 24.0 metres within the study area.

Centrum Boulevard: Centrum Boulevard is a City of Ottawa collector with a two-lane urban cross-section. Sidewalks are provided on both sides of the road, and angle parking is provided on both sides of the road east of Brisebois Crescent (E) within the study area. The posted speed limit is 40 km/h, and the measured right-of-way is 26.0 metres.

Napoleon Way: Napoleon Way is a City of Ottawa local road with a two-lane cross-section. Sidewalks are present on the west side of the road. The unposted speed limit is assumed to be 50 km/h. The existing right-of-way is 30.0 metres.

2.2.2 Existing Intersections

The existing key intersections within 400 metres of the site have been summarized below:

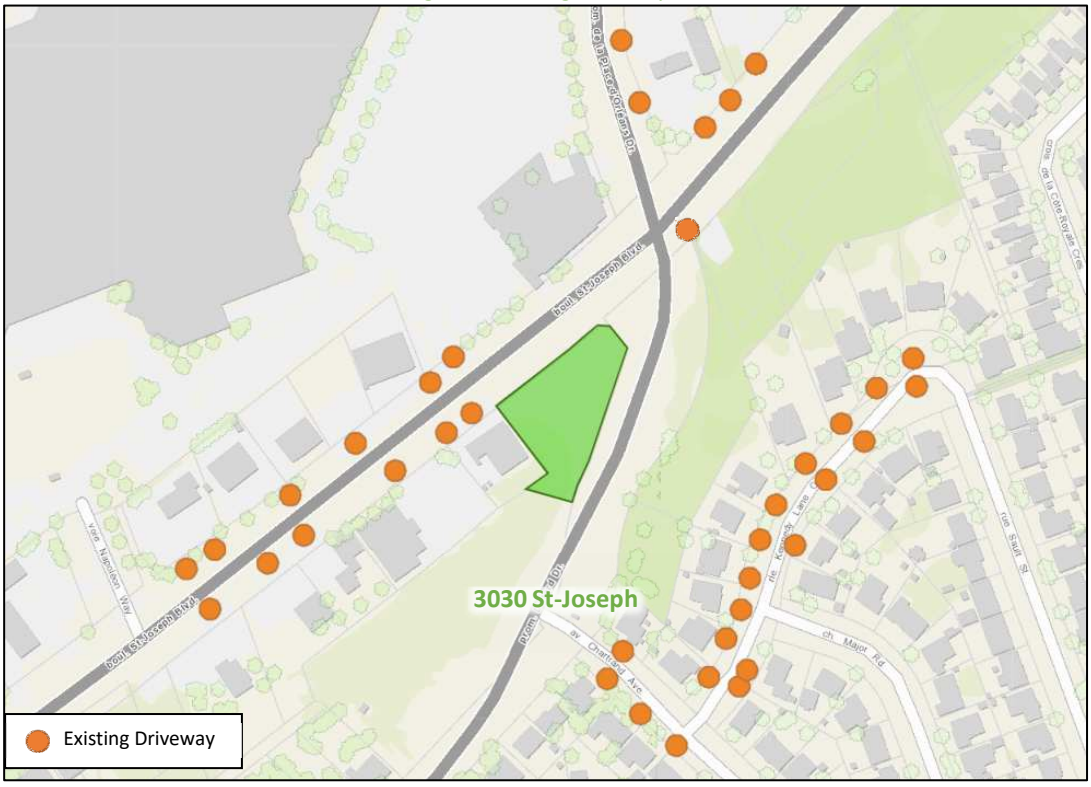
Centrum Boulevard at Place d'Orleans Drive	The intersection of Centrum Boulevard at Place d'Orleans Drive is a signalized intersection. The northbound and southbound approaches each consist of a shared left-turn/through lane and a shared through/right-turn lane. The private eastbound approach consists of a left-turn lane, a through lane, and a channelized right-turn lane, and the westbound approach consists of an auxiliary left-turn lane and a shared through/channelized right-turn lane. No turn restrictions were noted.
St-Joseph Boulevard at Place d'Orleans Drive (W)	The intersection of St-Joseph Boulevard at Place d'Orleans Drive (W) is a signalized intersection. The private northbound approach consists of an auxiliary left-turn lane and a shared through/right-turn lane and the southbound approach consists of a left-turn lane, a through lane, and an auxiliary right-turn lane. The eastbound and westbound approaches each consist of an auxiliary left-turn lane, a through lane,

	and a shared through/right-turn lane. No turn restrictions were noted.
St-Joseph Boulevard at Napoleon Way	The intersection of St-Joseph Boulevard at Napoleon Way is a signalized T-intersection. The southbound approach consists of a shared left-turn/right-turn lane. The eastbound approach consists of an auxiliary left-turn lane and two through lanes, and the westbound approach consists of two through lanes and an auxiliary right-turn lane. No turn restrictions were noted.
St-Joseph Boulevard at Place d'Orleans Drive (E) / Duford Drive	The intersection of St-Joseph Boulevard at Place d'Orleans Drive (E)/ 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 consist of an auxiliary left-turn lane, a through lane, and a shared through/channelized right-turn lane. No turn restrictions were noted.

2.2.3 Existing Driveways

Within 200 metres of the site accesses, driveways to auto shops, a clinic, a restaurant, retail stores, and commercial offices are located on St-Joseph Boulevard west of Place d'Orleans Drive (E). Two driveways on each Place d'Orleans Drive (E) and St-Joseph Boulevard are provided to a gas station with car wash. A driveway to a retail plaza is located on St-Joseph Boulevard east of Place d'Orleans Drive (E). Driveways to single dwelling units are present on Chartrand Avenue and Kennedy Lane West. Figure 3 illustrates the existing driveways.

Figure 3: Existing Driveways



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: April 25, 2023

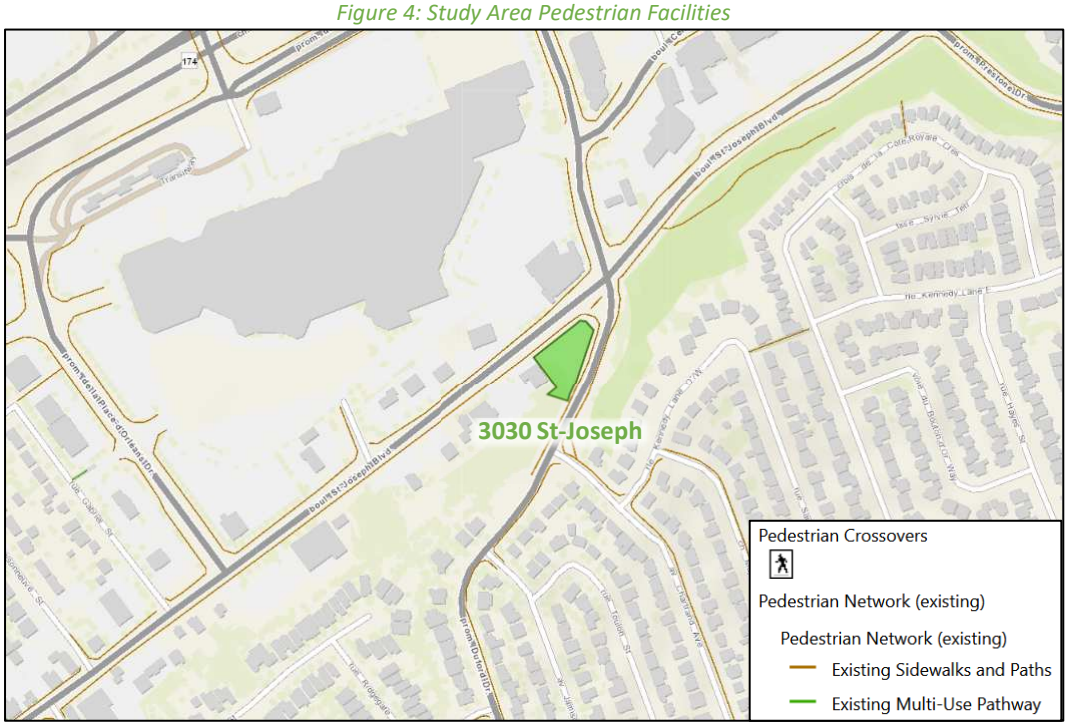
2.2.4 Cycling and Pedestrian Facilities

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

Within the study area, sidewalks are provided on both sides along St Joseph Boulevard, Place d'Orleans Drive, and Centrum Boulevard, and on one side of Napoleon Way. Sidewalks are also provided on the east side of Duford Drive, and on the west side of Duford Drive between St Joseph Boulevard and Chartrand Avenue.

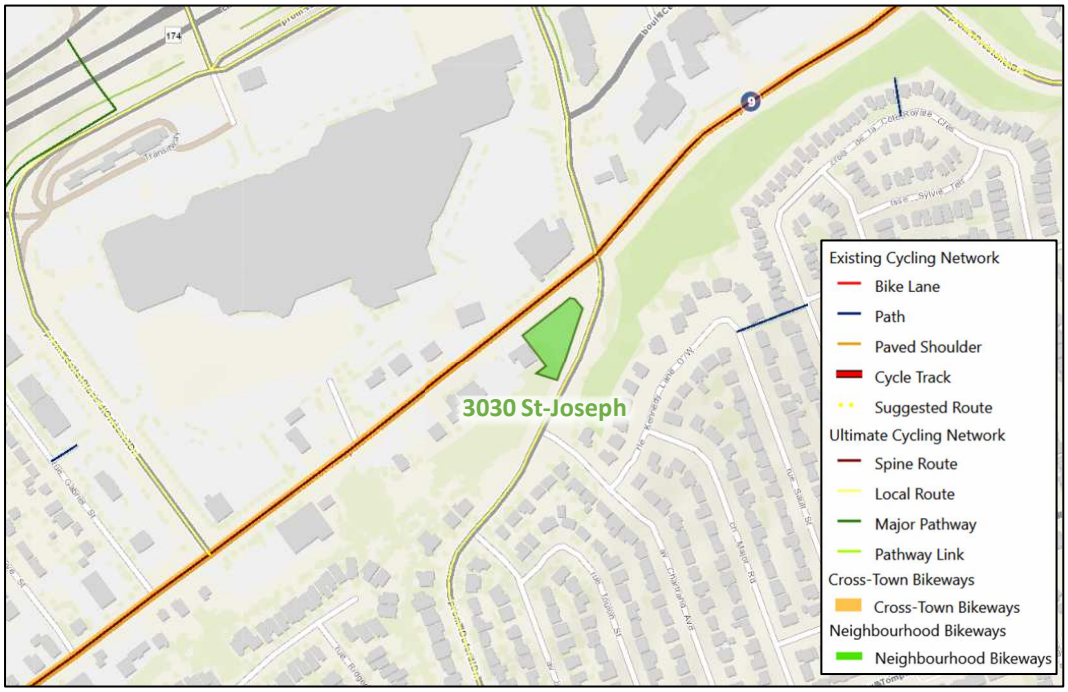
St Joseph Boulevard is a cycling spine route and a cross-town bikeway, and Place d'Orleans Drive and Duford Drive are local routes.

Figure 4: Study Area Pedestrian Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: April 25, 2023

Figure 5: Study Area Cycling Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: April 25, 2023

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

Figure 6: Existing Pedestrian Volumes

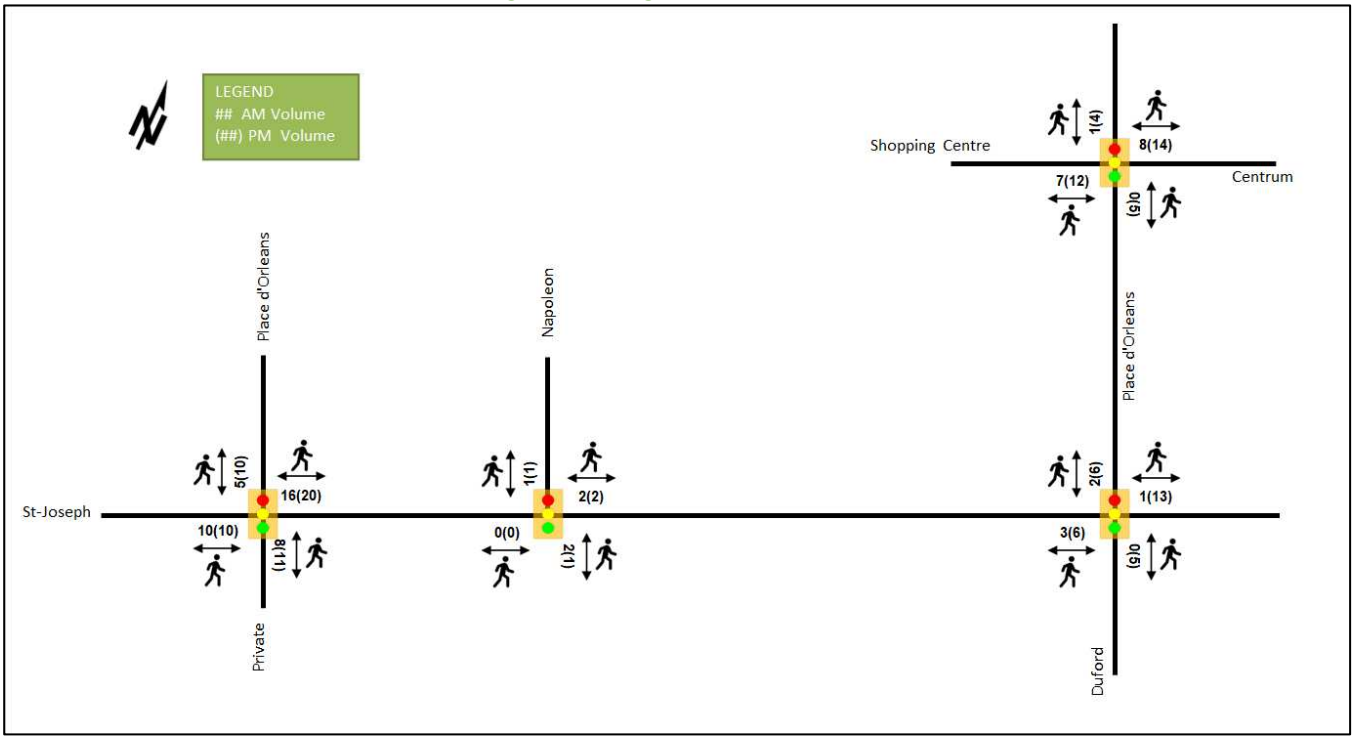
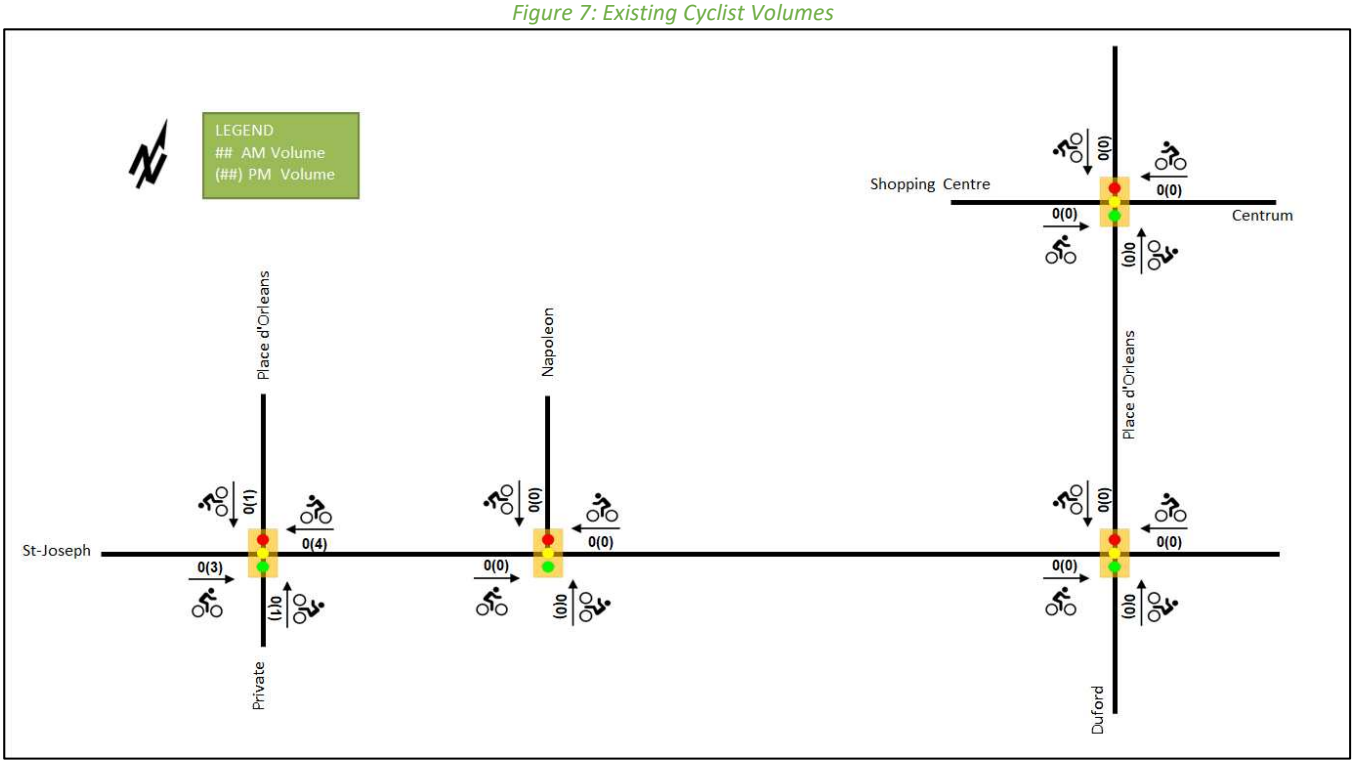


Figure 7: Existing Cyclist Volumes



2.2.5 Existing Transit

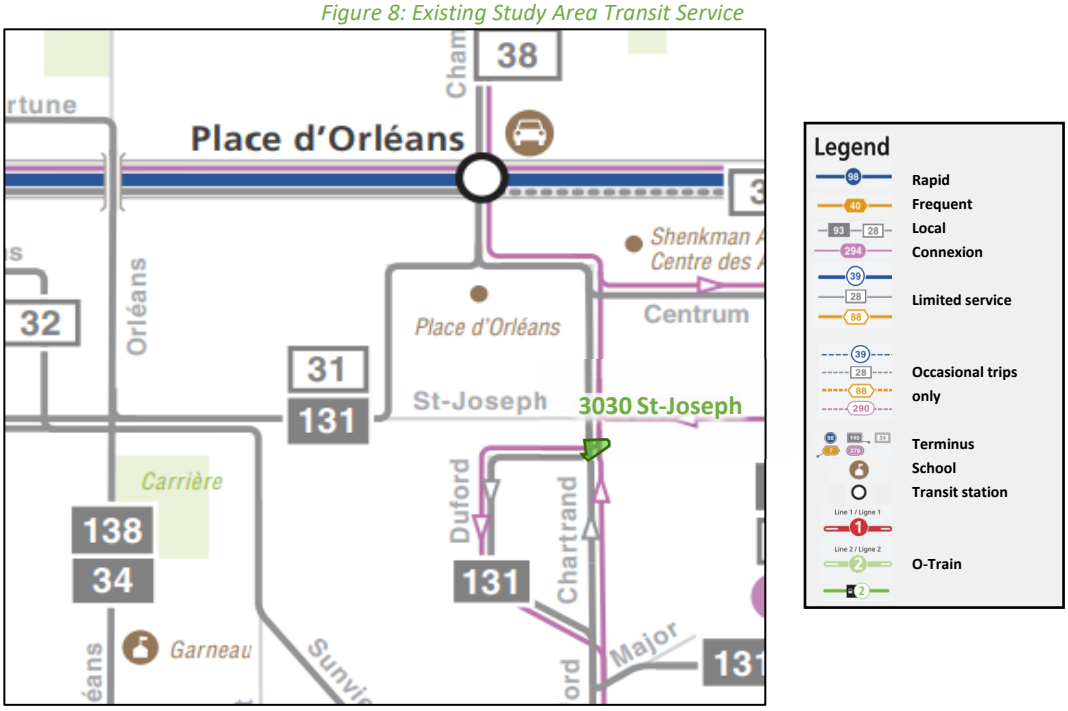
Figure 8 illustrates the transit system map in the study area and Figure 9 illustrates the existing transit stops within 400 metres of the site as well as the existing Bus Rapid Transit (BRT) and the future Light Rail Transit (LRT) within 800 metes of the site. All transit information is from April 22, 2023 and is included for general information purposes and context to the surrounding area.

Within the study area, routes #37, #131, #234, and #632 travel along Place d'Orleans Drive and Duford Drive, routes #33, #35, and #636 travel along Place d'Orleans Drive and Centrum Boulevard. The frequency of these routes within proximity of the proposed site based on April 25, 2023 service levels are:

- Route # 33 – 30-minute service all day
- Route # 35 – 30-minute service all day
- Route # 37 – 30-minute service all day, one-hour service after 6:00 PM, service until 8:00 PM
- Route # 131 – 30-minute service all day
- Route # 234 – 30-minute service in the peak period/direction
- Route # 632 – One bus in the peak period/direction
- Route # 636 – One bus in the peak period/direction

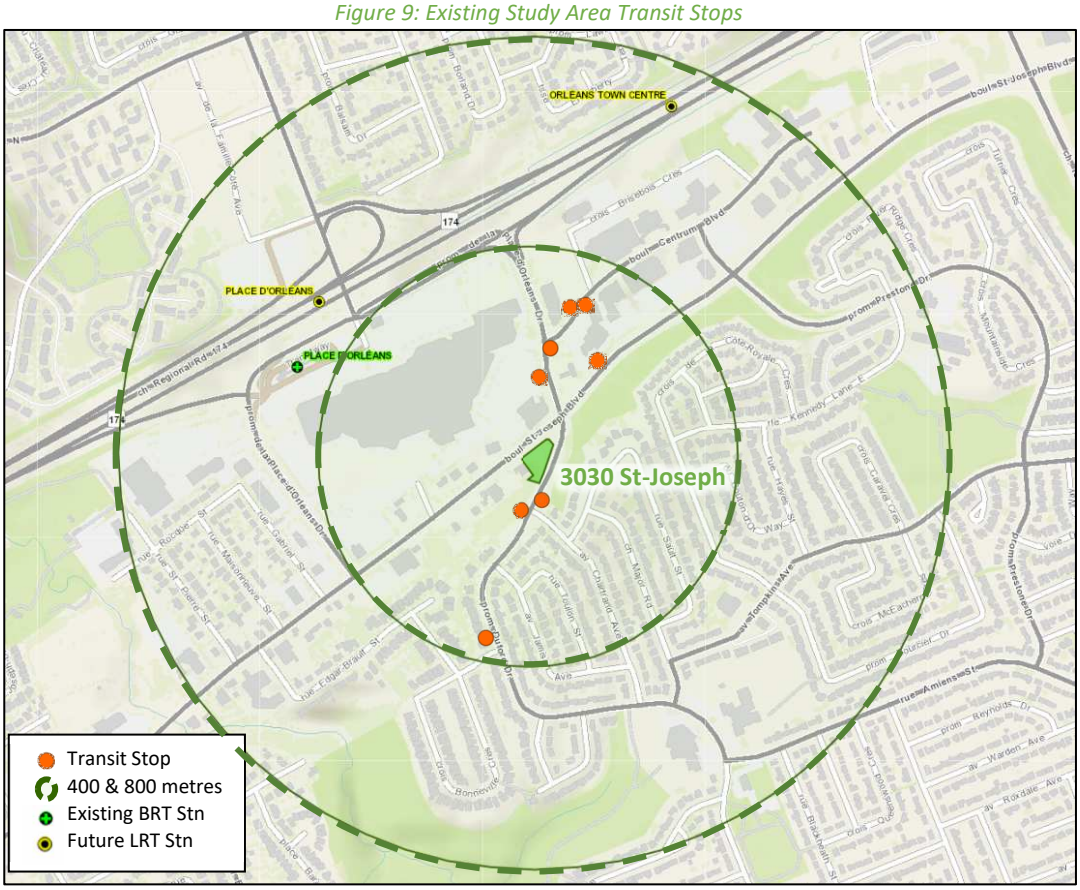
Additionally, Place d'Orleans BRT station, future Place d'Orleans LRT station and future Orleans Town Centre are within 800 metres of the site.

Figure 8: Existing Study Area Transit Service



Source: http://www.octranspo.com/ Accessed: April 25, 2023

Figure 9: Existing Study Area Transit Stops



Source: http://www.octranspo.com/ Accessed: April 25, 2023

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 the City of Ottawa for the existing study area intersections. The volumes were balanced along the St-Joseph Boulevard and Place d'Orleans Drive corridors. Table 1 summarizes the intersection count dates.

Table 1: Intersection Count Date

Intersection	Count Date
Centrum Boulevard at Place d'Orleans Drive (E)	Thursday, January 31, 2019
St-Joseph Boulevard at Place d'Orleans Drive (W)	Thursday, August 29, 2019
St-Joseph Boulevard at Napoleon Way	Tuesday, February 06, 2018
St-Joseph Boulevard at Place d'Orleans Drive / Duford Drive	Tuesday, March 20, 2018

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

Figure 10: Existing Traffic Counts

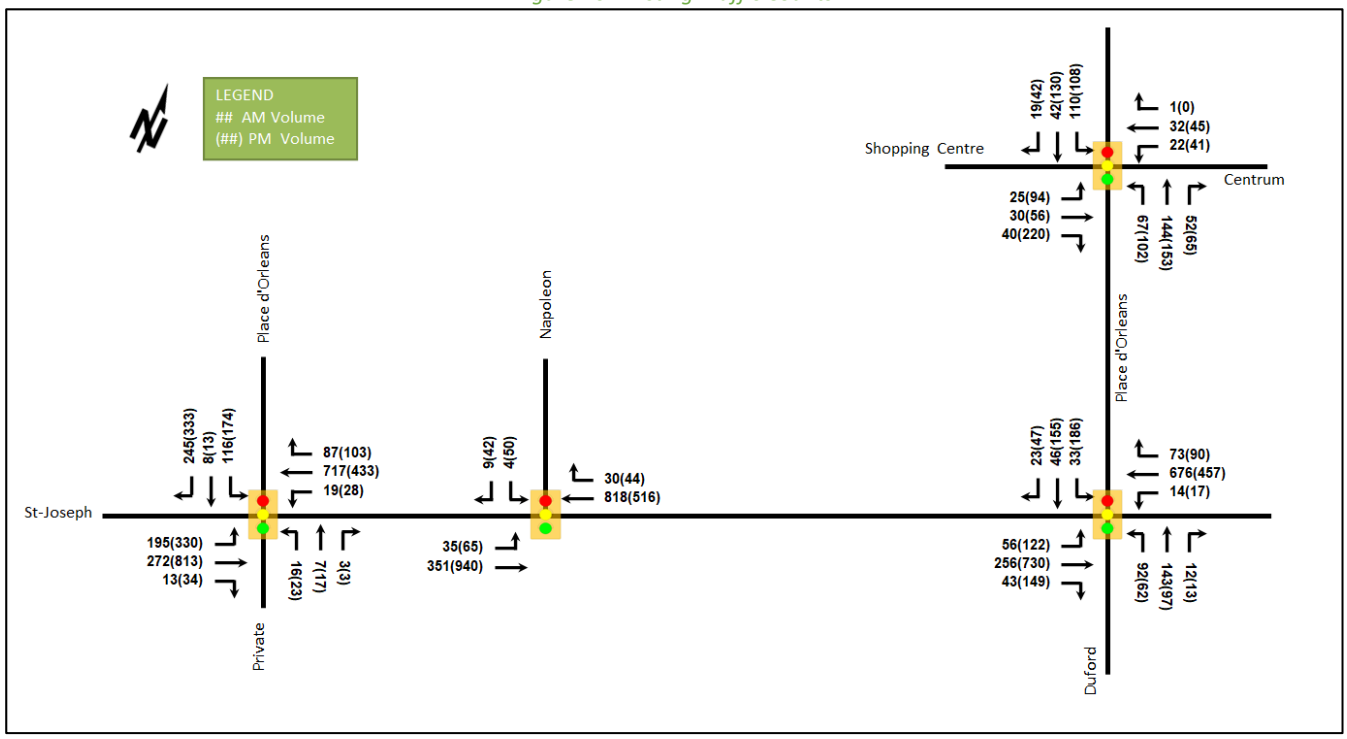


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Centrum Boulevard at Place d'Orleans Drive (E) ***Signalized***	EBL	A	0.13	24.8	7.8	A	0.49	38.4	25.9
	EBT	A	0.11	24.4	8.6	A	0.21	29.7	16.1
	EBR	A	0.15	8.4	6.2	A	0.54	8.5	15.7
	WBL	A	0.11	24.4	7.1	A	0.22	30.4	13.3
	WBT/R	A	0.12	24.1	9.2	A	0.17	28.9	13.8
	NB	A	0.15	4.7	15.3	A	0.21	5.2	18.7
	SB	A	0.12	5.3	11.5	A	0.20	5.4	17.3
	Overall	**A**	**0.15**	**8.8**	-	**A**	**0.26**	**12.2**	-
St-Joseph Boulevard at Place d'Orleans Drive (W) ***Signalized***	EBL	A	0.54	10.5	24.6	B	0.66	18.1	**#87.4**
	EBT/R	A	0.14	5.2	16.1	A	0.43	10.6	81.6
	WBL	A	0.04	8.1	3.3	A	0.14	17.6	5.7
	WBT/R	A	0.52	13.1	76.3	A	0.43	16.2	27.2
	NBL	A	0.08	29.9	7.7	A	0.16	39.4	10.9
	NBT/R	A	0.04	24.9	5.1	A	0.10	33.8	9.1
	SBL	A	0.60	45.7	35.1	C	0.80	57.0	43.8
	SBT	A	0.03	28.5	4.8	A	0.04	24.8	5.7
	SBR	A	0.60	10.9	21.3	B	0.62	7.5	17.8
	Overall	**A**	**0.58**	**13.6**	-	**C**	**0.77**	**16.7**	-
St-Joseph Boulevard at Napoleon Way ***Signalized***	EBL	A	0.08	2.6	3.9	A	0.12	2.8	m4.5
	EBT	A	0.13	1.6	11.5	A	0.39	3.0	23.3
	WBT	A	0.30	3.0	53.8	A	0.25	8.8	45.5
	WBR	A	0.02	2.0	3.5	A	0.05	4.0	6.0
	SBL/R	A	0.06	18.6	4.9	A	0.42	28.7	23.0
	Overall	**A**	**0.32**	**2.7**	-	**A**	**0.43**	**6.3**	-
St-Joseph Boulevard at Place d'Orleans Drive(E) / Duford Drive ***Signalized***	EBL	A	0.38	26.4	15.9	B	0.69	44.5	**#41.0**
	EBT/R	A	0.29	24.9	38.6	E	0.94	53.4	**#164.1**
	WBL	A	0.04	19.2	6.1	A	0.12	23.1	7.3
	WBT/R	D	0.81	40.9	**#115.6**	C	0.73	40.5	77.6
	NBL	A	0.56	55.9	35.5	A	0.45	53.6	26.3
	NBT/R	A	0.25	24.4	43.1	A	0.24	28.8	33.3
	SBL	A	0.30	51.5	16.9	C	0.78	62.1	**#68.0**
	SBT	A	0.09	27.8	17.0	A	0.25	24.9	43.0
	SBR	A	0.05	0.2	0.0	A	0.08	0.2	0.0
	Overall	**A**	**0.55**	**35.2**	-	**C**	**0.71**	**45.6**	-

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 0.90
Delay = average vehicle delay in seconds
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

The existing study area intersections are generally expected to operate well during both peak hours.

During the AM peak hour, the westbound through/right-turn movement at the intersection of St-Joseph Boulevard at Place d'Orleans Drive (E)/ Duford Drive may exhibit extended queues.

During the PM peak hour, the eastbound left-turn movement at the intersection of St-Joseph Boulevard at Place d'Orleans Drive (W) and the eastbound left-turn, eastbound shared through/right-turn, and southbound left-turn movements may exhibit extended queues.

2.2.8 Collision Analysis

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

Table 3: Study Area Collision Summary, 2016-2020

		Number	%
Total Collisions		**41**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	9	22%
	Property Damage Only	32	78%
Initial Impact Type	**Angle**	10	24%
	Rear end	16	39%
	Sideswipe	3	7%
	Turning Movement	7	17%
	SMV Other	5	12%
Road Surface Condition	**Dry**	27	66%
	Wet	8	20%
	Loose Snow	1	2%
	Packed Snow	3	7%
	Ice	2	5%
Pedestrian Involved		1	2%
Cyclists Involved		1	2%

Figure 11: Study Area Collision Records

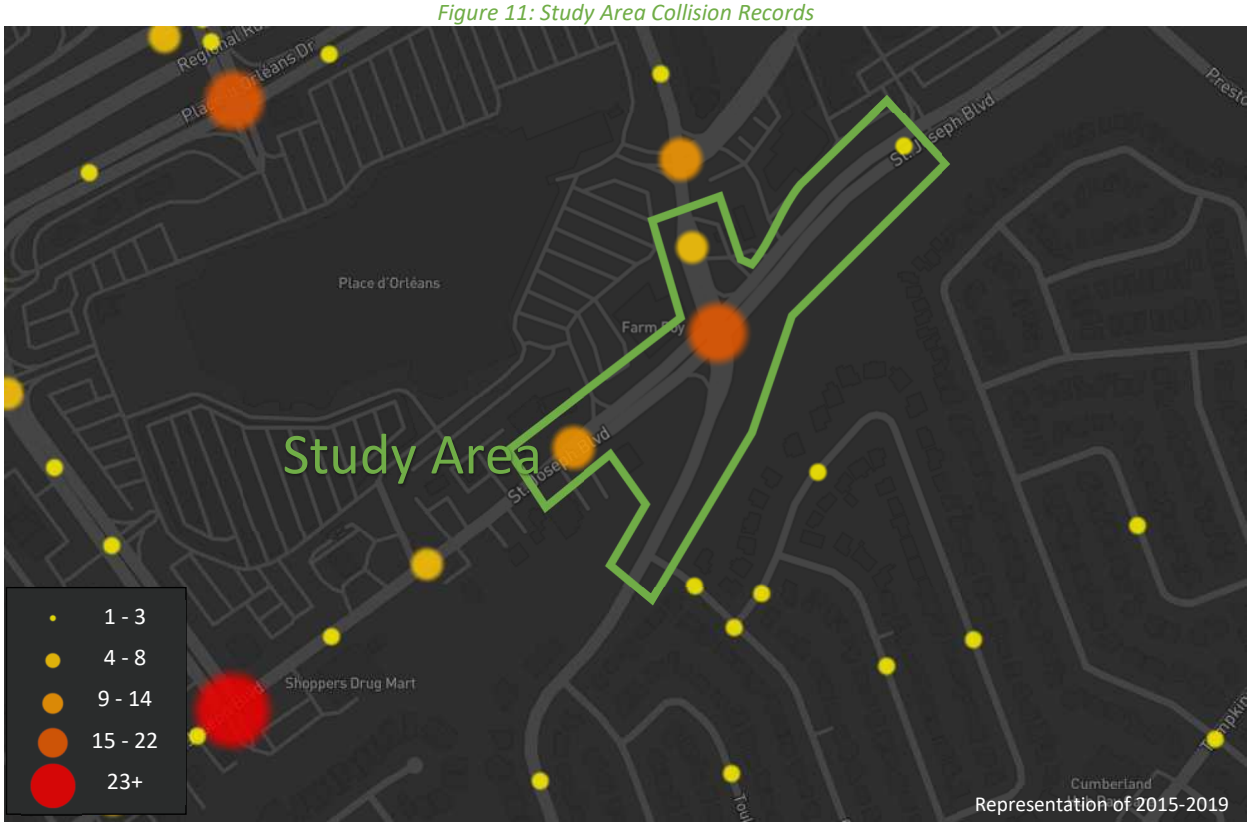


Table 4: Summary of Collision Locations, 2016-2020

Intersections / Segments	Number 41	% 100%
St. Joseph Blvd @ Duford Dr/Place d'Orleans Dr	23	56%
St. Joseph Blvd btwn St. Joseph Blvd & Place d'Orleans Dr	9	22%
Place d'Orleans Dr btwn Centrum Blvd & St. Joseph Blvd	7	17%
St. Joseph Blvd btwn Place d'Orleans Dr & Prestone Dr	2	5%

Within the study area, the intersections of St. Joseph Boulevard at Duford Drive/Place d'Orleans Drive is noted to have experienced higher collisions than other locations. Table 5 summarizes the collision types and conditions for each of the location.

Table 5: St. Joseph Boulevard at Duford Drive/Place d'Orleans Drive Collision Summary

		Number	%
Total Collisions		**23**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	5	22%
	Property Damage Only	18	78%
Initial Impact Type	**Angle**	3	13%
	Rear end	13	57%
	Sideswipe	2	9%
	Turning Movement	2	9%
	SMV Other	3	13%
Road Surface Condition	**Dry**	15	65%
	Wet	4	17%
	Loose Snow	1	4%
	Packed Snow	2	9%
	Ice	1	4%
Pedestrian Involved		1	4%
Cyclists Involved		0	0%

The St. Joseph Boulevard at Duford Drive/Place d'Orleans Drive intersection had a total of 23 collisions during the 2016-2020 time period, with 18 involving property damage only and the remaining five having non-fatal injuries. The collision types are most represented by rear end with 13 collisions, followed by three collisions each for angle and SMV (other), and the remaining collisions split between the sideswipe and turning movement. Rear end collisions are typical of congested conditions, but may be influenced by the intersection skew, the horizontal curve and downslope on Duford Drive, or the sweeping eastbound right-turn. Weather conditions do not affect collisions at this location. No further examination of collisions at this location is required as part of this study.

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

2.3.1.1 City Official Plan (2021)

Within the Official Plan, the ultimate transit network diagram shows an LRT line along OR 174, with a station located at Place d'Orleans connecting to the existing park and ride/station, and a future station north of the site, currently called 'Orleans Town Centre'. This latter station is currently unfunded and will not be considered within this study.

Place d'Orleans station, which is located approximately 700 metres walking distance from the site, is identified as one of the east extension stations in the Stage 2 Light Rail Transit (LRT) project and will be expanded to accommodate LRT. The completion of the east extension is anticipated by the end of 2024.

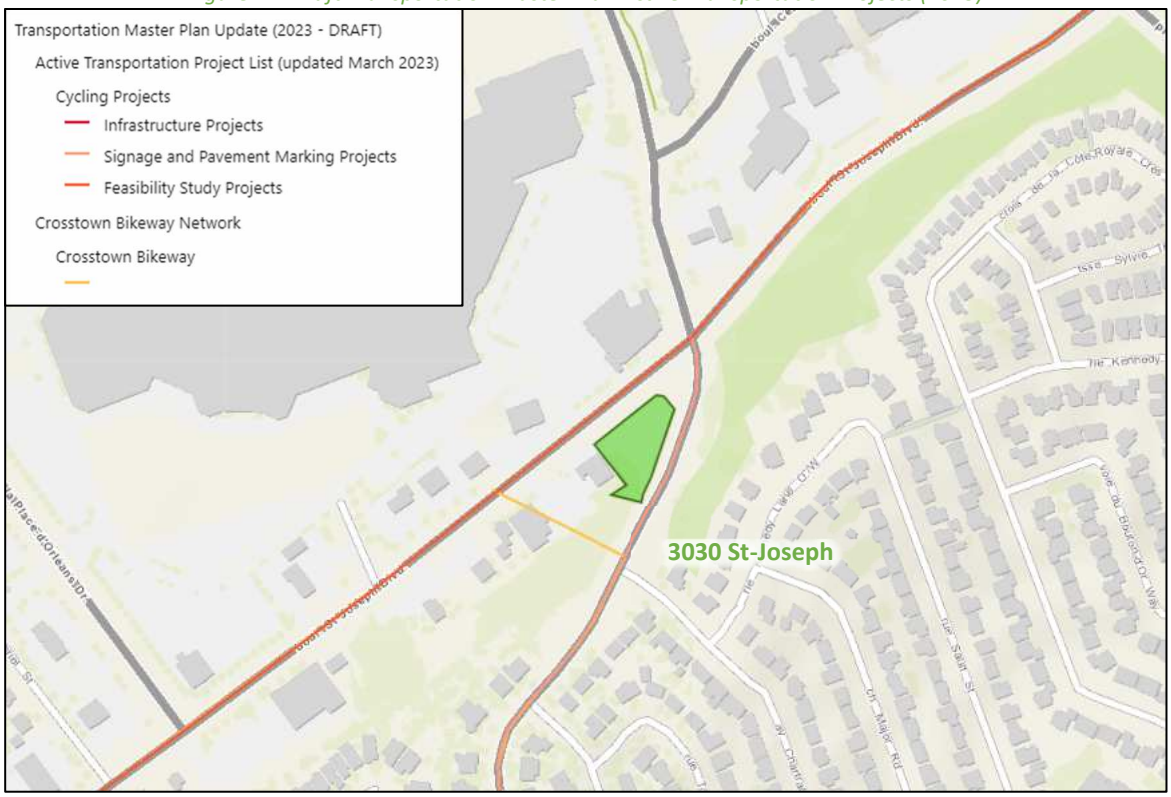
2.3.1.2 Orléans Corridor Secondary Plan

The St. Joseph Boulevard concept plan identified St Joseph Boulevard to be transform from the road right-of-way into a pedestrian-oriented mainstreet in Orléans Corridor Secondary Plan. The potential future changes including a reduction in vehicle travel lanes, separated cycling facilities, wider sidewalks, and improved bus transit facilities. None of the improvement is confirmed, therefore, no changes will be included in this TIA. Plans can be found on the City's website.

2.3.1.3 Draft Transportation Master Plan (2023)

From the draft Transportation Master Plan (2023), St Joseph Boulevard and Duford Drive are cross-town bikeways. The active Transportation project Lists (March 2023) identify a feasibility study of cycling facilities on St-Joseph Boulevard between Forest Valley Drive and Tenth Line Road, as part of the Orléans Corridor Secondary Plan Study. A signage and pavement marking cycling project is identified along Duford Drive. Figure 12 illustrates the active transportation projects from the Draft Transportation Master Plan (2023).

Figure 12: Draft Transportation Master Plan Active Transportation Projects (2023)



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: April 26, 2023

2.3.2 Other Study Area Developments

3277 St Joseph Boulevard

The proposed development application includes a site plan for the construction of two apartment buildings with a total of 273 dwellings. The development is forecast to be built out in 2024 and generate 58 new AM and 60 new PM two-way peak-hour auto trips. (Novatech, 2023)

3459 & 3479 St Joseph Boulevard

The proposed development application includes a zoning by-law amendment to permit the construction of 328 apartment units. The development was initially forecast to be built out in 2022 and to generate 141 new AM and 179 new PM two-way peak-hour auto trips. The new build-out horizon is assumed to be 2024. (Novatech, 2022)

360 Kennedy Lane East
The proposed development application includes a zoning by-law amendment and site plan to construct 81 residential dwelling units. No TIA is expected to be warranted for this development.

211 Centrum Boulevard
The proposed development application includes a site plan for the construction of a 17-storey retirement home comprising 394 retirement dwelling units. The development is forecast to be built out in 2024 to generate 46 new AM and 57 new PM two-way peak-hour auto trips. (CGH, 2021)

265 Centrum Boulevard
The proposed development application includes a zoning bylaw amendment and site plan for the construction of 363 residential units, 8,970 sq. ft retail space, and 31,570 sq. ft office space. The development is forecast to be built out in 2028 and to generate 210 new AM and 248 new PM two-way peak-hour auto trips. (CGH, 2023)

3 Study Area and Time Periods

3.1 Study Area

The study area will include the intersections of:

- St-Joseph Boulevard at
  - Place d'Orleans Drive (W)
  - Napoleon Way
  - Place d'Orleans Drive (E)/ Duford Drive
- Centrum Boulevard at
  - Place d'Orleans Drive (E)

The boundary road will be St-Joseph Boulevard and Duford Drive. TRANS screenline SL-45 is located to the west of the Place d'Orleans Mall and will not be assessed as part of this study.

City Staff have requested rationalization for the study area for the site to exclude the intersections of St Jospeh Boulevard at Preston Drive,Place d'Orleans Boulevard at OR-174 off-ramp and Place d'Orleans Boulevard at Champlain Street. The TOD nature of the site will produce minimal auto trips to the area road network and, particularly at these intersections, only contribute to the mainline or primary movements at the intersections with dedicated facilities to accommodate the primary routing of area drivers. It is anticipated that the trips will be less than 10 additional vehicles at any of these intersections and would not be describable from general background growth. Therefore, these intersections have been excluded from the following study.

3.2 Time Periods

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

3.3 Horizon Years

The anticipated build-out year is 2025. As a result, the full build-out plus five years horizon year is 2030.

4 Exemption Review

Table 6 summarizes the exemptions for this TIA.

Table 6: 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
	4.1.3 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

4.1 TIA Stepped Process

The proposed development application is further to the approved 3030 St-Joseph Boulevard zoning by-law amendment with the additional of two stories above which was approved and for which a Transportation Brief was prepared in 2017. No operational constraints are noted at the area intersections within that study, and the subject TIA will expand on that work, primarily through the Step 4 content. Due to the above factors, the Steps 3 and 4 is combined into a single submission.

5 Development-Generated Travel Demand

5.1 Mode Shares

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

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

Travel Mode	Multi-Unit (High-Rise)		Commercial Generator	
	AM	PM	AM	PM
Auto Driver	54%	60%	77%	72%
Auto Passenger	7%	13%	14%	20%
Transit	29%	21%	3%	2%
Cycling	0%	0%	0%	1%
Walking	10%	6%	6%	5%
Total	**100%**	**100%**	**100%**	**100%**

It is noted that the future Place d'Orleans LRT station will be approximately 700 metres walking distance from the site, and completion is anticipated by the end of 2024. A 15% shift to transit mode from the auto mode for residential land use and a 10% percent shift to transit mode from the auto mode for commercial land use are proposed. The modified mode share targets are summarized in Table 8.

Table 8: Proposed Development Mode Shares

Travel Mode	Multi-Unit (High-Rise)		Commercial Generator	
	AM	PM	AM	PM
Auto Driver	39%	45%	67%	62%
Auto Passenger	7%	13%	14%	20%
Transit	44%	36%	13%	12%
Cycling	0%	0%	0%	1%
Walking	10%	6%	6%	5%
Total	**100%**	**100%**	**100%**	**100%**

5.2 Trip Generation

This TIA has been prepared using the vehicle and person trip rates for the residential dwellings using the TRANS Trip Generation Manual (2020) and the vehicle trip rates and derived person trip rates for commercial component from the ITE Trip Generation Manual 11th Edition (2021) using the City-prescribed conversion factor of 1.28. Table 9 summarizes the person trip rates for the proposed residential land uses for each peak period and the person trip rates for the non-residential land uses by peak hour.

Table 9: Trip Generation Person Trip Rates

Land Use	Land Use Code	Peak	Peak Period		Peak Hour	
			Vehicle Trip Rate	Person Trip Rates	Vehicle Trip Rate	Person Trip Rates
Multi-Unit (High-Rise)	221 & 222 (TRANS)	AM	-	0.80	-	-
		PM	-	0.90	-	
Strip Retail Plaza (<40k)	822 (ITE)	AM	-	-	2.36	3.02
		PM	-	-	6.59	8.44

Using the above person trip rates, the total person trip generation has been estimated. Table 10 summarizes the total person trip generation for the residential land uses and for the non-residential land uses.

Table 10: Total Person Trip Generation

Land Use	Units	AM Peak Period			PM Peak Period		
		In	Out	Total	In	Out	Total
Multi-Unit (High-Rise)	202	50	112	162	106	76	182
Land Use	**GFA**	**AM Peak Hour**			**PM Peak Hour**		
		In	**Out**	**Total**	**In**	**Out**	**Total**
Strip Retail Plaza (<40k)	2,796 sq.ft	5	3	8	12	12	24

Internal capture rates from the ITE Trip Generation Handbook 3rd Edition have been assigned to the development's retail component for mixed-use developments. The rates summarized in Table 11 represent the percentage of trips to/from the retail use based on the residential component.

Table 11: Internal Capture Rates

Land Use	AM		PM	
	In	Out	In	Out
Residential to/from Shopping Centre	17%	14%	10%	26%

Pass-by reductions applied to the retail trip generation at a rate of 25% have been assumed. Using the above mode share targets for a LRT area, the internal capture and pass-by rates, and the person trip rates, the person trips by mode have been projected. Trip generation by peak hour has been forecasted using the prescribed peak period conversion factors presented in the TRANS Trip Generation Manual (2020) for the residential component. Table 12 summarizes the residential trip generation and the non-residential trip generation by mode and peak hour.

Table 12: Trip Generation by Mode

Travel Mode		AM Peak Hour				PM Peak Hour			
		Mode Share	In	Out	Total	Mode Share	In	Out	Total
Multi-Unit (High-Rise)	Auto Driver	**39%**	10	21	31	**45%**	21	15	36
	Auto Passenger	**7%**	2	4	6	**13%**	6	4	10
	Transit	**44%**	12	27	39	**36%**	18	13	31
	Cycling	**0%**	0	0	0	**0%**	0	0	0
	Walking	**10%**	3	6	9	**6%**	3	3	6
	Total	**100%**	**27**	**58**	**85**	**100%**	**48**	**35**	**83**
Shopping Centre	Auto Driver	**67%**	2	1	3	**62%**	4	3	7
	Auto Passenger	**14%**	1	0	1	**20%**	2	2	4
	Transit	**13%**	1	0	1	**12%**	1	1	3
	Cycling	**0%**	0	0	0	**1%**	0	0	0
	Walking	**6%**	0	0	0	**5%**	1	1	2
	Internal Capture	*varies*	*-1*	*0*	*-1*	*varies*	*-1*	*-2*	*-3*
	Pass-by	*25%*	*-1*	*-1*	*-2*	*25%*	*-3*	*-3*	*-6*
	Total	**100%**	**4**	**1**	**5**	**100%**	**8**	**7**	**15**
Total	Auto Driver	-	12	22	34	-	25	18	43
	Auto Passenger	-	3	4	7	-	8	6	14
	Transit	-	13	27	40	-	19	14	33
	Cycling	-	0	0	0	-	0	0	0
	Walking	-	3	6	9	-	4	4	8
	Internal Capture	*varies*	*-1*	*0*	*-1*	*varies*	*-1*	*-2*	*-3*
	Pass-by	*25%*	*-1*	*-1*	*-2*	*25%*	*-3*	*-3*	*-6*
	Total	**100%**	**31**	**59**	**90**	**100%**	**56**	**42**	**98**

As shown above, a total of 34 AM and 43 PM new peak hour two-way vehicle trips are projected as a result of the proposed development.

5.3 Trip Distribution

To understand the travel patterns of the subject development, the OD Survey has been reviewed to determine the travel, and these patterns were applied based on the build-out of Orleans. Table 13 below summarizes the distributions.

Table 13: OD Survey Distribution – Orleans

To/From	% of Trips
North	5%
South	30%
East	25%
West	40%
Total	**100%**

5.4 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the study area road network. Table 14 summarizes the proportional assignment to the study area roadways, Figure 13 illustrates the new site generated volumes and Figure 14 illustrates the pass-by volumes.

Table 14: Trip Assignment

To/From	Inbound Via	Outbound Via
North	5% Place d'Orleans Drive W (N)	5% Place d'Orleans Drive E (W)
South	30% St-Joseph Boulevard (W)	20% Duford Drive (S) 10% St-Joseph Boulevard (E)
East	25% Place d'Orleans Drive W (N)	25% St-Joseph Boulevard (E)
West	40% St-Joseph Boulevard (W)	40% Place d'Orleans Drive E (N)/Highway 417
Total	**100%**	**100%**

Figure 13: New Site Generation Auto Volumes

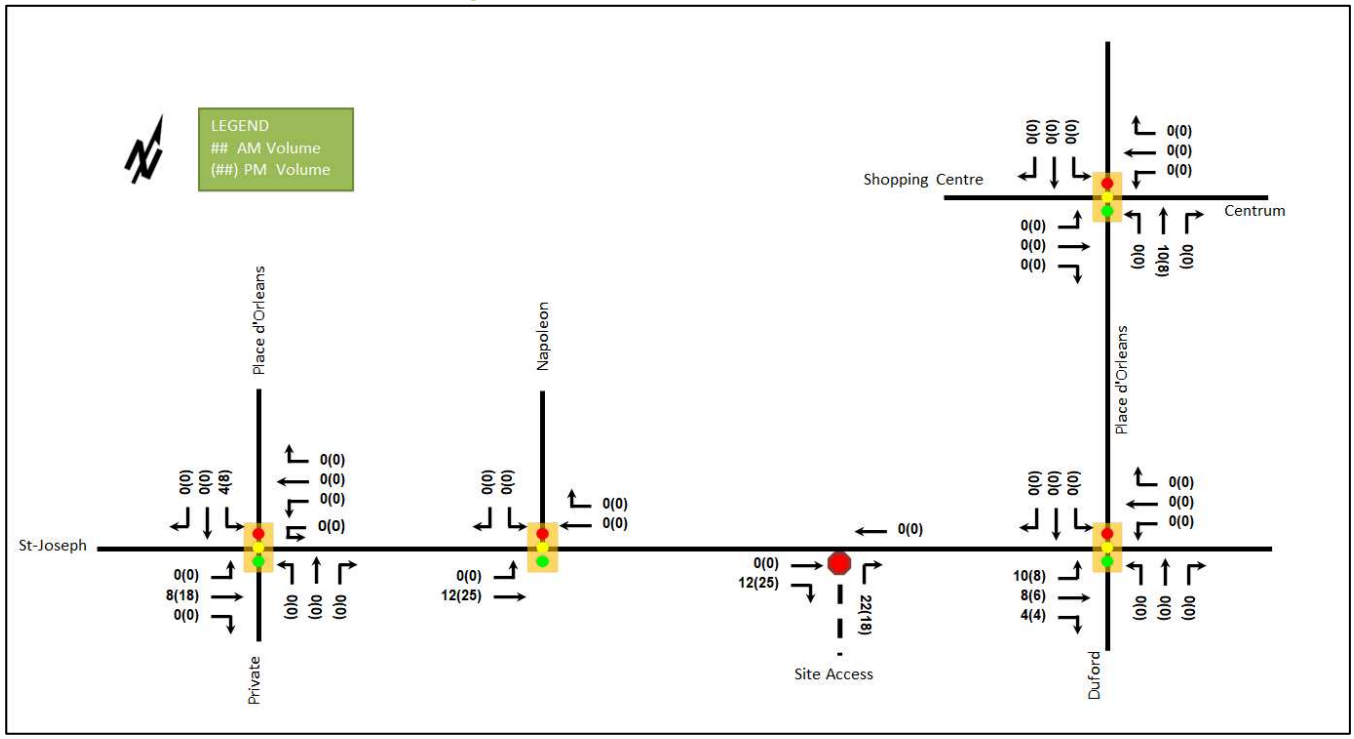
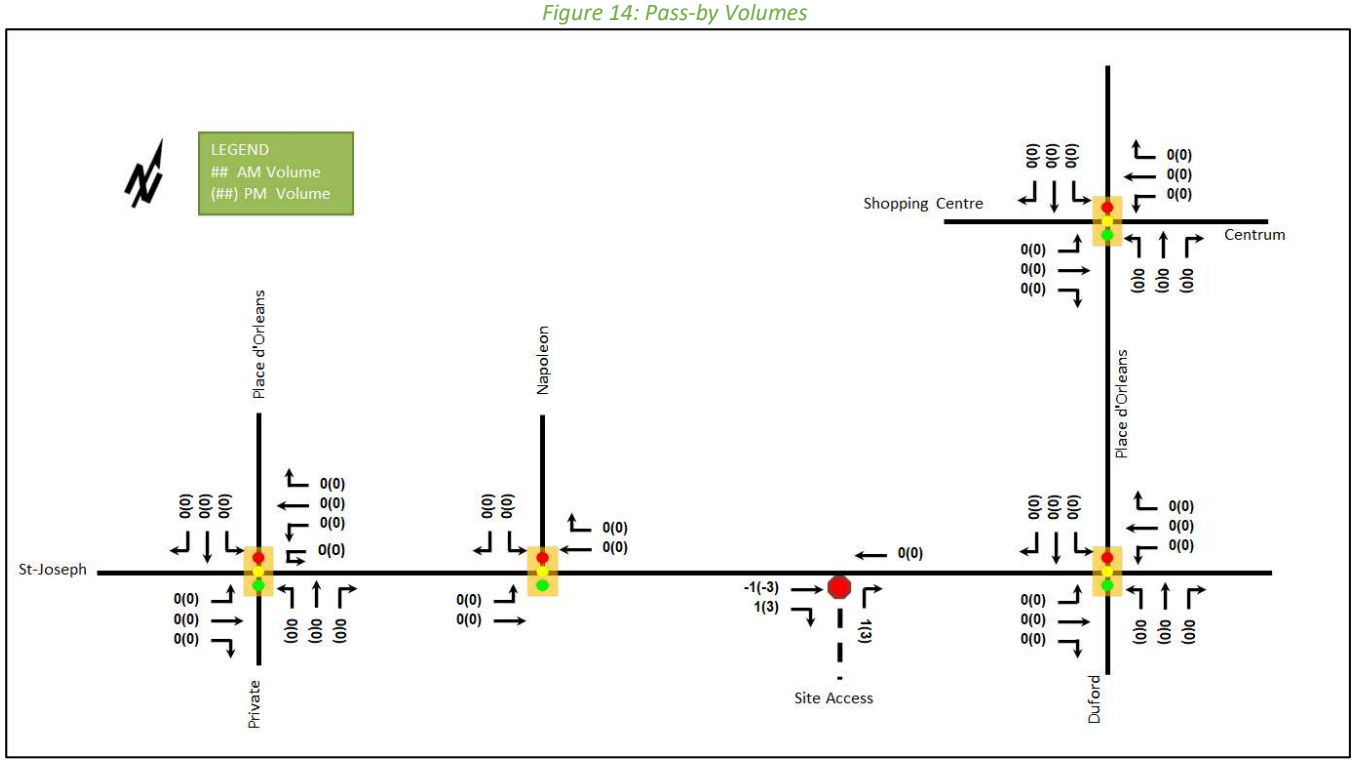


Figure 14: Pass-by Volumes



6 Background Network Travel Demands

6.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3 and have been incorporated into the road network analysis.

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. The background TRANS model growth rates are summarized in Table 15 and the TRANS model plots are provided in Appendix E.

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

Street	TRANS Rate		2011 to Existing		Existing to 2031	
	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound
Centrum	0.21%	0.34%	19.56%	-15.47%	-10.91%	12.50%
St Joseph	0.65%	1.42%	-4.71%	-0.51%	9.27%	4.39%
	Northbound	**Southbound**	**Northbound**	**Southbound**	**Northbound**	**Southbound**
Place d'Orleans (E)	3.71%	-0.24%	6.18%	37.80%	2.09%	-19.57%
Duford	0.41%	-3.05%	27.67%	29.53%	-14.44%	-20.07%
Place d'Orleans (W)	0.19%	-0.59%	10.93%	21.06%	-6.38%	-12.83%

In general, the growth rates in the study area derived from the two TRANS model horizons are projected to be positive on the eastbound, westbound, and northbound of the roads. A comparison of the TRANS volumes and the existing volumes illustrates a situation that development has not progressed linearly. Table 16 summarizes the recommended growth rates to be considered within the study area.

Table 16: Recommended Area Growth Rates

Street	AM Peak Hour		PM Peak Hour	
	Eastbound	Westbound	Eastbound	Westbound
Centrum	0.25%	0.25%	0.25%	0.25%
St Joseph	0.75%	1.50%	1.50%	0.75%
	Northbound	**Southbound**	**Northbound**	**Southbound**
Place d'Orleans (E)	2.00%	-	-	2.00%
Duford	-	-	-	-
Place d'Orleans (W)	0.25%	-	-	0.25%

6.3 Other Developments

The background developments explicitly considered in the background conditions (Section 6.2) include:

- 3277 St Joseph Boulevard
- 3459 & 3479 St Joseph Boulevard
- 211 Centrum Boulevard
- 265 Centrum Boulevard

Figure 15 andFigure 16 illustrate the 2025 and 2030 background development volumes, respectively. The background development volumes within the study area have been provided in Appendix F.

Figure 15: 2025 Background Development Volumes

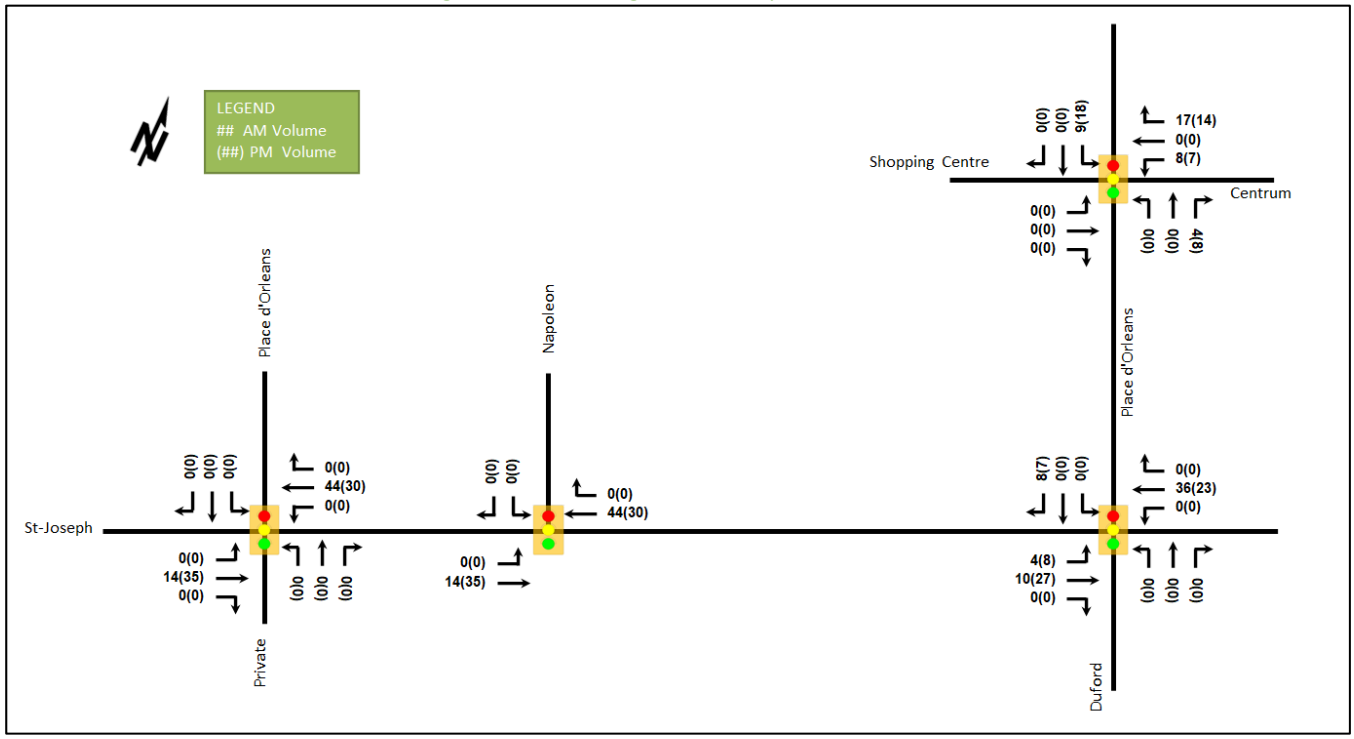
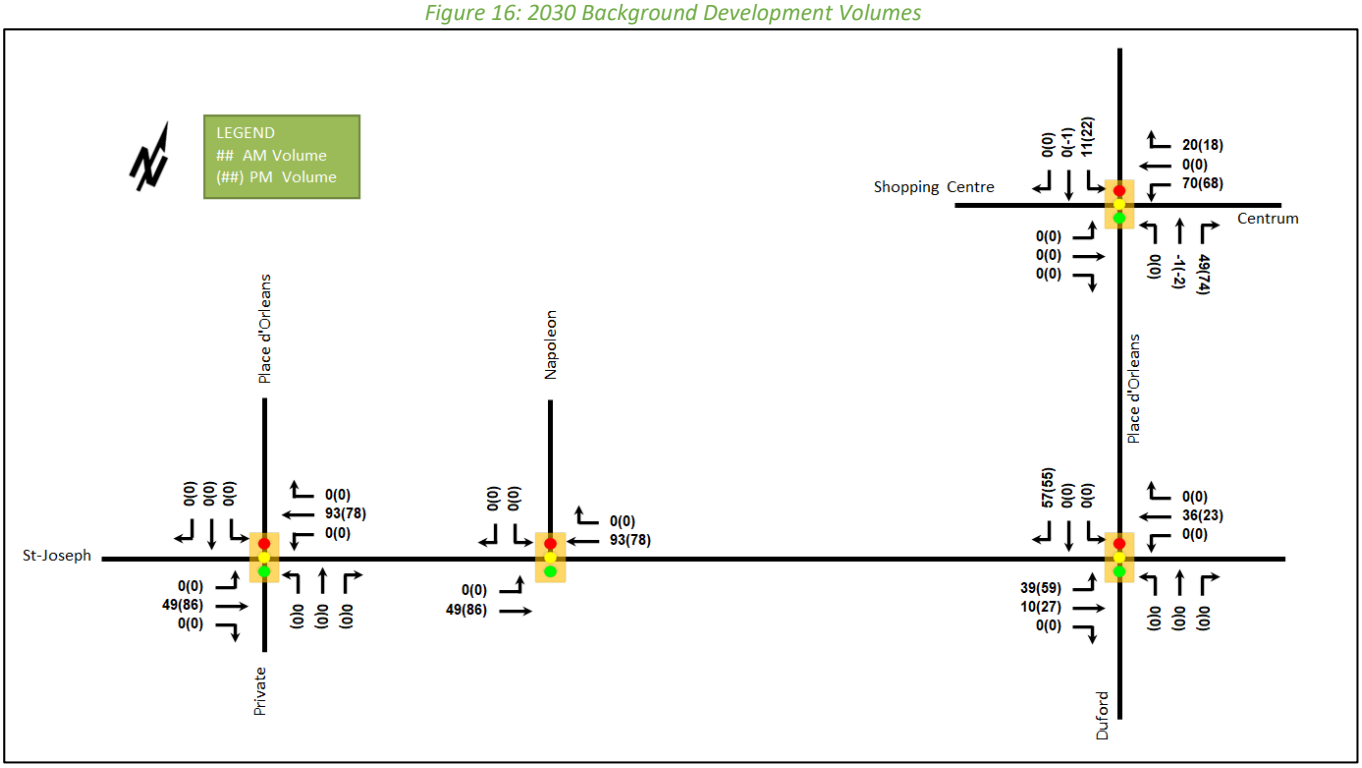


Figure 16: 2030 Background Development Volumes



7 Demand Rationalization

7.1 2025 Future Background Operations

Figure 17 illustrates the 2025 background volumes and Table 17 summarizes the 2025 background intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection. The synchro worksheets for the 2025 future background horizon are provided in Appendix G.

Figure 17: 2025 Future Background Volumes

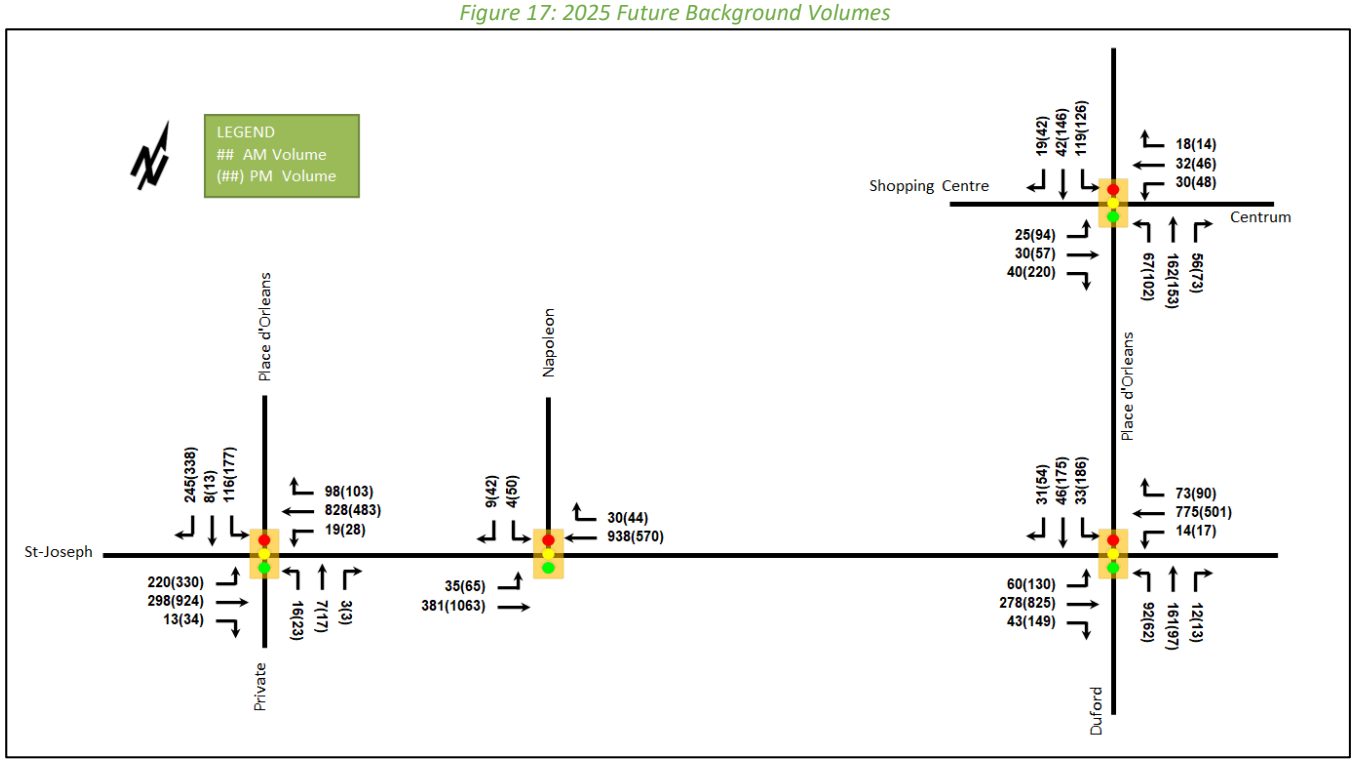


Table 17: 2025 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Centrum Boulevard at Place d'Orleans Drive (E) ***Signalized***	EBL	A	0.12	24.6	7.3	A	0.46	37.5	23.7
	EBT	A	0.10	24.1	8.1	A	0.20	29.7	15.2
	EBR	A	0.14	7.7	5.5	A	0.52	8.6	15.1
	WBL	A	0.14	25.0	8.3	A	0.23	31.0	13.8
	WBT/R	A	0.17	18.2	9.9	A	0.21	24.2	14.1
	NB	A	0.13	4.3	14.8	A	0.19	4.8	16.6
	SB	A	0.10	4.8	11.1	A	0.20	5.4	17.8
	Overall	**A**	**0.15**	**8.4**	-	**A**	**0.24**	**11.9**	-
St-Joseph Boulevard at Place d'Orleans Drive (W) ***Signalized***	EBL	A	0.55	10.8	24.9	B	0.61	16.1	**#65.0**
	EBT/R	A	0.13	5.1	15.8	A	0.44	10.7	83.4
	WBL	A	0.04	7.5	2.9	A	0.12	16.7	5.2
	WBT/R	A	0.53	12.9	79.6	A	0.39	14.6	26.4
	NBL	A	0.08	30.1	7.1	A	0.14	38.9	10.1
	NBT/R	A	0.04	24.8	4.8	A	0.09	33.3	8.7
	SBL	A	0.56	44.3	31.9	C	0.73	50.5	40.2
	SBT	A	0.03	28.8	4.4	A	0.03	24.8	5.4
	SBR	A	0.56	9.4	17.5	A	0.59	7.3	17.1
	Overall	**A**	**0.58**	**13.1**	-	**C**	**0.71**	**15.3**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
St-Joseph Boulevard at Napoleon Way ***Signalized***	EBL	A	0.07	2.7	3.6	A	0.11	2.7	m3.9
	EBT	A	0.12	1.6	11.5	A	0.40	2.9	21.7
	WBT	A	0.31	3.0	56.1	A	0.25	8.6	45.0
	WBR	A	0.02	2.1	3.4	A	0.04	4.0	5.6
	SBL/R	A	0.06	19.4	4.8	A	0.38	26.7	20.2
	Overall	**A**	**0.33**	**2.7**	**-**	**A**	**0.43**	**5.9**	**-**
St-Joseph Boulevard at Place d'Orleans Drive (E) / Duford Drive ***Signalized***	EBL	A	0.37	26.1	15.7	B	0.64	40.5	**#37.0**
	EBT/R	A	0.28	24.8	37.5	E	0.94	52.9	**#163.8**
	WBL	A	0.04	19.1	5.5	A	0.11	22.8	6.7
	WBT/R	D	0.82	41.8	**#119.3**	C	0.71	39.9	75.4
	NBL	A	0.53	54.8	32.6	A	0.42	53.3	24.4
	NBT/R	A	0.25	24.2	43.1	A	0.21	28.0	30.5
	SBL	A	0.28	51.1	15.6	C	0.74	59.3	58.0
	SBT	A	0.08	27.3	15.7	A	0.26	24.6	43.3
	SBR	A	0.05	0.2	0.0	A	0.08	0.2	0.0
	Overall	**A**	**0.55**	**35.5**	**-**	**B**	**0.69**	**44.6**	**-**

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

During both AM and PM peak hours, the study area intersections operate similar to the existing condition. No capacity issues are noted.

7.2 2030 Future Background Operations

Figure 18 illustrates the 2030 background volumes and Table 18 summarizes the 2030 background intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection. The synchro worksheets for the 2030 future background horizon are provided in Appendix H.

Figure 18: 2030 Future Background Volumes

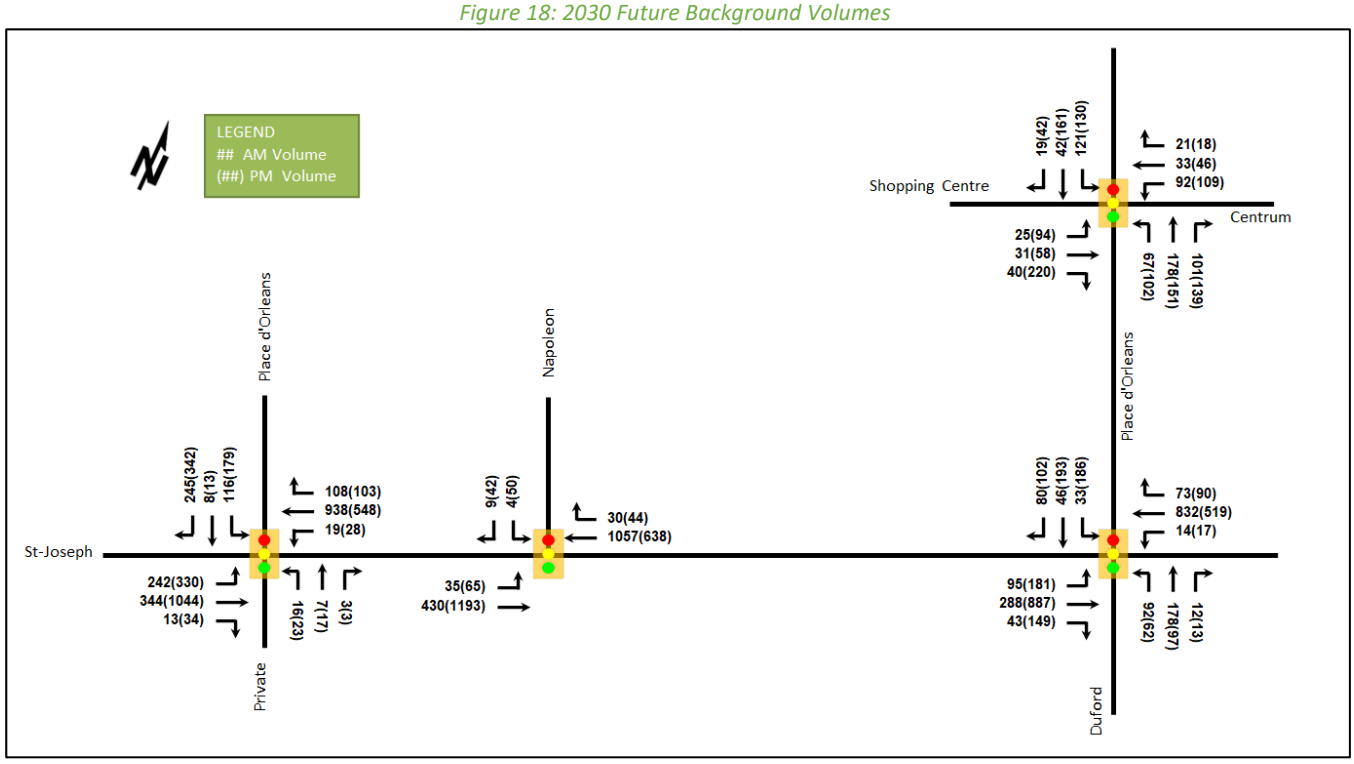


Table 18: 2030 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Centrum Boulevard at Place d'Orleans Drive (E) ***Signalized***	EBL	A	0.11	23.6	7.3	A	0.44	36.4	23.7
	EBT	A	0.10	23.3	8.3	A	0.19	29.2	15.5
	EBR	A	0.13	7.4	5.5	A	0.51	8.3	15.1
	WBL	A	0.39	30.3	19.6	A	0.51	38.9	27.0
	WBT/R	A	0.17	17.0	10.2	A	0.21	22.8	14.4
	NB	A	0.17	4.5	16.2	A	0.23	4.2	16.8
	SB	A	0.12	5.6	11.2	A	0.22	5.7	19.2
	Overall	**A**	**0.22**	**10.2**	-	**A**	**0.27**	**12.8**	-
St-Joseph Boulevard at Place d'Orleans Drive (W) ***Signalized***	EBL	B	0.65	16.1	**#37.9**	B	0.64	17.4	**#71.7**
	EBT/R	A	0.15	5.2	18.2	A	0.49	11.5	98.5
	WBL	A	0.04	7.9	m2.3	A	0.14	17.1	5.1
	WBT/R	B	0.62	15.3	94.0	A	0.45	15.5	29.0
	NBL	A	0.08	30.1	7.1	A	0.14	38.9	10.1
	NBT/R	A	0.04	24.8	4.8	A	0.09	33.3	8.7
	SBL	A	0.56	44.3	31.9	C	0.74	51.2	40.8
	SBT	A	0.03	28.8	4.4	A	0.03	24.8	5.4
	SBR	A	0.58	11.3	20.5	A	0.59	7.3	17.3
	Overall	**B**	**0.66**	**14.9**	-	**C**	**0.73**	**15.9**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
St-Joseph Boulevard at Place d'Orleans Drive (E) / Duford Drive ***Signalized***	EBL	A	0.58	36.2	**#24.5**	E	0.91	75.1	**#65.4**
	EBT/R	A	0.28	25.1	38.6	E	1.00	65.1	**#178.5**
	WBL	A	0.04	19.1	5.5	A	0.11	22.8	6.7
	WBT/R	D	0.88	45.8	**#133.2**	C	0.73	40.7	78.1
	NBL	A	0.53	54.8	32.6	A	0.42	53.3	24.4
	NBT/R	A	0.28	24.7	47.3	A	0.21	28.0	30.5
	SBL	A	0.28	51.1	15.6	C	0.74	59.3	58.0
	SBT	A	0.08	27.3	15.7	A	0.28	24.9	47.5
	SBR	A	0.13	0.5	0.0	A	0.15	1.8	4.0
	Overall	**A**	**0.60**	**37.0**	-	**C**	**0.74**	**51.5**	-

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

During both AM and PM peak hours, the study area intersections operate similar to the existing condition. No capacity issues are noted.

7.3 2025 Future Total Operations

Figure 19 illustrates the 2025 total volumes and Table 19 summarizes the 2025 total intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection The synchro worksheets for the 2025 total horizon are provided in Appendix I.

Figure 19: 2025 Future Total Volumes

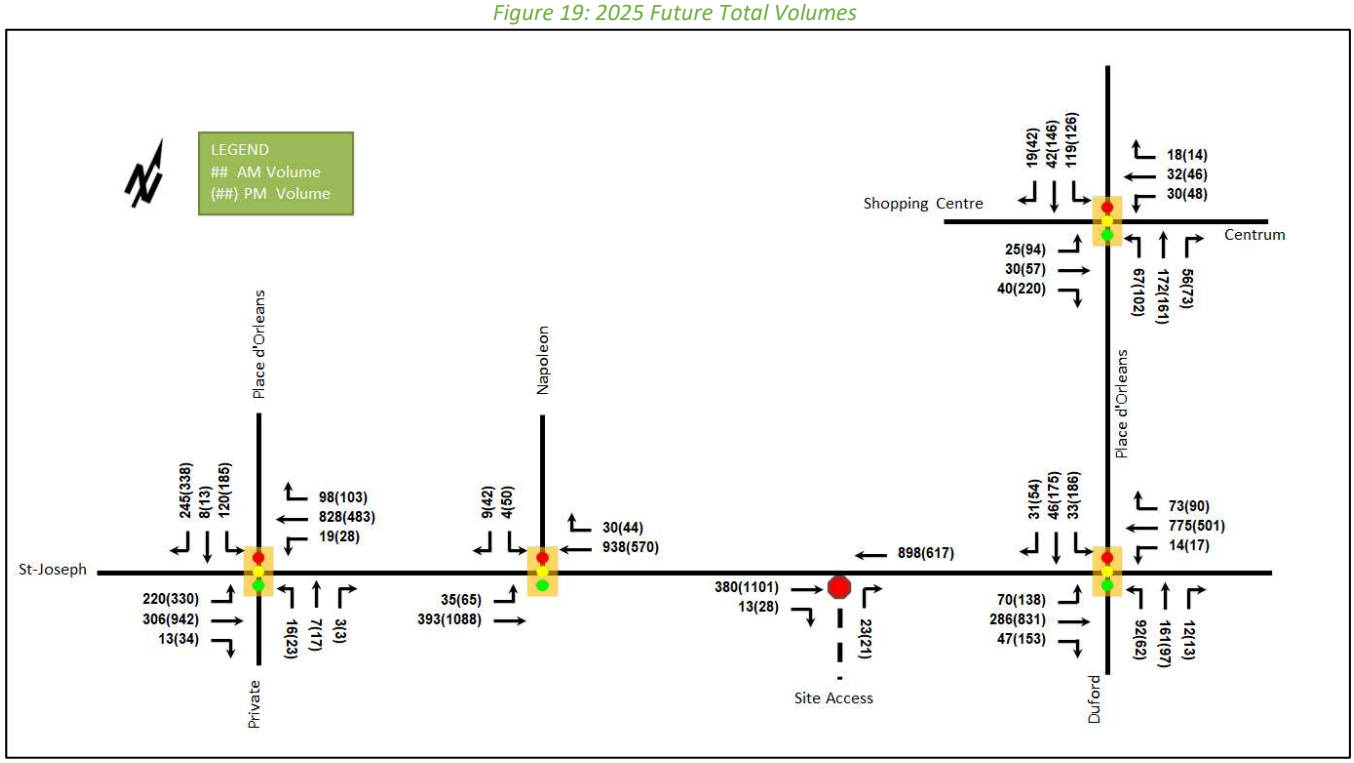


Table 19: 2025 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Centrum Boulevard at Place d'Orleans Drive (E) ***Signalized***	EBL	A	0.12	24.6	7.3	A	0.46	37.5	23.7
	EBT	A	0.10	24.1	8.1	A	0.20	29.7	15.2
	EBR	A	0.14	7.7	5.5	A	0.52	8.6	15.1
	WBL	A	0.14	25.0	8.3	A	0.23	31.0	13.8
	WBT/R	A	0.17	18.2	9.9	A	0.21	24.2	14.1
	NB	A	0.14	4.3	15.5	A	0.20	4.8	17.1
	SB	A	0.10	4.8	11.1	A	0.20	5.4	17.8
	Overall	**A**	**0.15**	**8.4**	-	**A**	**0.24**	**11.8**	-
St-Joseph Boulevard at Place d'Orleans Drive (W) ***Signalized***	EBL	A	0.55	10.8	24.9	B	0.61	16.1	**#65.0**
	EBT/R	A	0.14	5.1	16.3	A	0.45	10.8	85.7
	WBL	A	0.04	7.6	2.9	A	0.12	16.8	5.2
	WBT/R	A	0.53	13.0	79.6	A	0.39	14.6	26.4
	NBL	A	0.08	29.9	7.1	A	0.14	38.9	10.1
	NBT/R	A	0.04	24.7	4.8	A	0.09	33.3	8.7
	SBL	A	0.57	44.8	33.0	C	0.76	53.4	42.0
	SBT	A	0.03	28.6	4.4	A	0.03	24.8	5.4
	SBR	A	0.56	9.3	17.5	A	0.59	7.3	17.1
	Overall	**A**	**0.58**	**13.2**	-	**C**	**0.72**	**15.7**	-
St-Joseph Boulevard at Napoleon Way ***Signalized***	EBL	A	0.07	2.7	3.6	A	0.11	2.6	m4.0
	EBT	A	0.13	1.6	11.8	A	0.41	2.9	22.6
	WBT	A	0.31	3.0	56.1	A	0.25	8.6	45.0
	WBR	A	0.02	2.1	3.4	A	0.04	4.0	5.6
	SBL/R	A	0.06	19.4	4.8	A	0.38	26.7	20.2
	Overall	**A**	**0.33**	**2.7**	-	**A**	**0.44**	**5.9**	-
St-Joseph Boulevard at Place d'Orleans Drive (E) / Duford Drive ***Signalized***	EBL	A	0.43	27.9	17.6	B	0.68	43.4	**#41.1**
	EBT/R	A	0.29	24.9	38.7	E	0.95	54.5	**#165.9**
	WBL	A	0.04	19.1	5.5	A	0.11	22.8	6.7
	WBT/R	D	0.82	41.8	**#119.3**	C	0.71	39.9	75.4
	NBL	A	0.53	54.8	32.6	A	0.42	53.3	24.4
	NBT/R	A	0.25	24.2	43.1	A	0.21	28.0	30.5
	SBL	A	0.28	51.1	15.6	C	0.74	59.3	58.0
	SBT	A	0.08	27.3	15.7	A	0.26	24.6	43.3
	SBR	A	0.05	0.2	0.0	A	0.08	0.2	0.0
	Overall	**A**	**0.56**	**35.5**	-	**B**	**0.70**	**45.4**	-
St-Joseph Boulevard at Site Access ***Unsignalized***	EBT/R	-	-	-	-	-	-	-	-
	WB	-	-	-	-	-	-	-	-
	NBR	A	0.03	9.6	0.8	B	0.05	13.1	0.8
	Overall	**A**	**-**	**0.2**	-	**A**	**-**	**0.2**	-

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

During both AM and PM peak hours, the study area intersections operate similar to the 2025 future background condition. No capacity issues are noted.

7.4 2030 Future Total Operations

Figure 20 illustrates the 2030 total volumes and Table 20 summarizes the 2030 total intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM

2000 v/c calculations for the overall intersection. The synchro worksheets for the 2030 future total horizon are provided in Appendix J.

Figure 20: 2030 Future Total Volumes

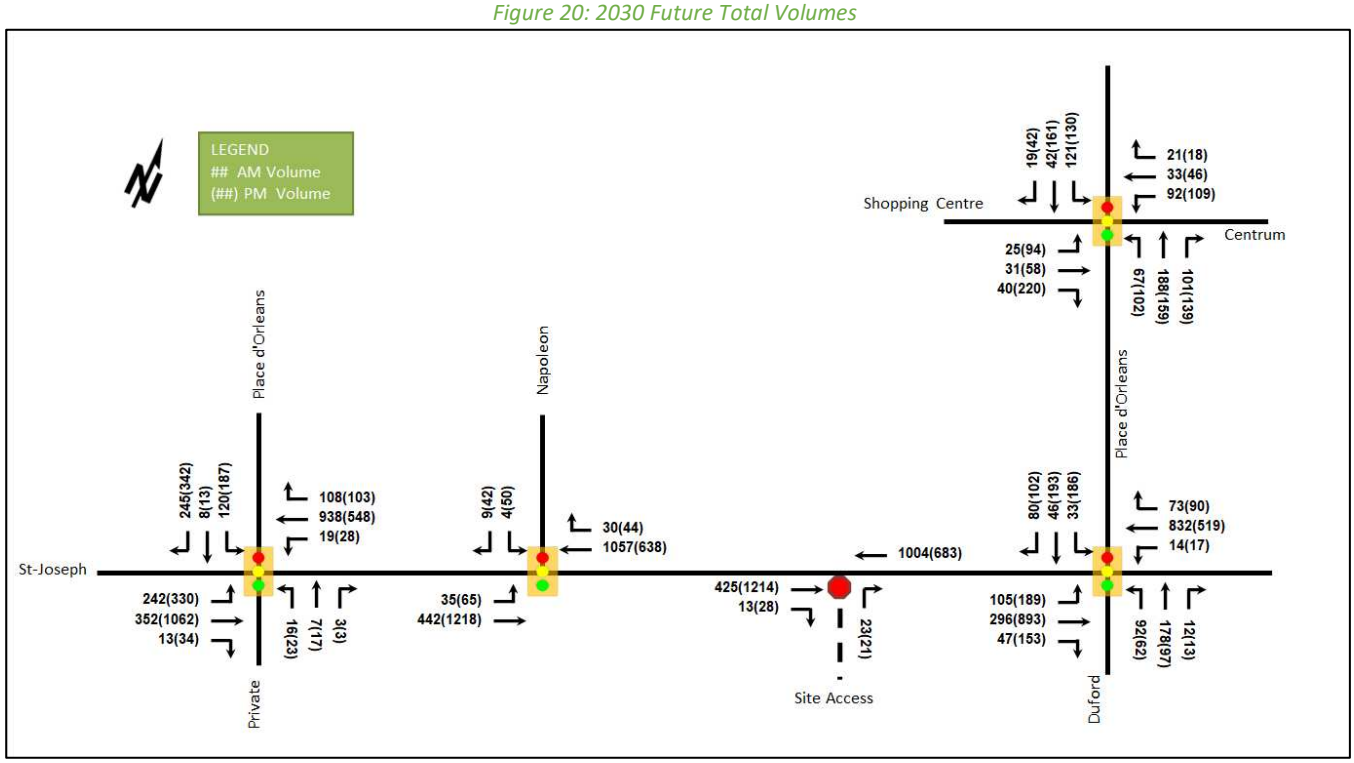


Table 20: 2030 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Centrum Boulevard at Place d'Orleans Drive (E) ***Signalized***	EBL	A	0.11	23.6	7.3	A	0.44	36.4	23.7
	EBT	A	0.10	23.3	8.3	A	0.19	29.2	15.5
	EBR	A	0.13	7.4	5.5	A	0.51	8.3	15.1
	WBL	A	0.39	30.3	19.6	A	0.51	38.9	27.0
	WBT/R	A	0.17	17.0	10.2	A	0.21	22.8	14.4
	NB	A	0.18	4.5	16.7	A	0.24	4.3	17.3
	SB	A	0.12	5.6	11.2	A	0.22	5.7	19.2
	Overall	**A**	**0.23**	**10.2**	-	**A**	**0.27**	**12.7**	-
St-Joseph Boulevard at Place d'Orleans Drive (W) ***Signalized***	EBL	B	0.65	16.2	**#37.9**	B	0.64	17.4	**#71.7**
	EBT/R	A	0.16	5.2	18.6	A	0.50	11.6	100.8
	WBL	A	0.04	8.1	m2.3	A	0.14	17.2	5.1
	WBT/R	B	0.62	15.4	94.0	A	0.45	15.5	29.0
	NBL	A	0.08	29.9	7.1	A	0.14	38.9	10.1
	NBT/R	A	0.04	24.7	4.8	A	0.09	33.3	8.7
	SBL	A	0.57	44.8	33.0	C	0.77	54.3	42.5
	SBT	A	0.03	28.6	4.4	A	0.03	24.8	5.4
	SBR	A	0.58	11.2	20.5	A	0.59	7.3	17.3
	Overall	**B**	**0.66**	**15.1**	-	**C**	**0.74**	**16.2**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
St-Joseph Boulevard at Napoleon Way ***Signalized***	EBL	A	0.08	2.9	3.8	A	0.11	2.5	m3.5
	EBT	A	0.14	1.7	13.6	A	0.46	2.8	23.0
	WBT	A	0.35	3.2	66.1	A	0.28	8.9	51.0
	WBR	A	0.02	2.3	3.6	A	0.04	4.4	6.0
	SBL/R	A	0.06	19.4	4.8	A	0.38	26.7	20.2
	Overall	**A**	**0.37**	**2.9**	**-**	**A**	**0.49**	**5.8**	**-**
St-Joseph Boulevard at Place d'Orleans Drive (E) / Duford Drive ***Signalized***	EBL	B	0.64	40.8	**#30.3**	E	0.95	**83.9**	**#69.4**
	EBT/R	A	0.30	25.1	40.0	**F**	**1.01**	**67.0**	**#180.8**
	WBL	A	0.04	19.1	5.5	A	0.11	22.8	6.7
	WBT/R	E	0.94	54.2	**#133.2**	C	0.73	40.7	78.1
	NBL	A	0.53	54.8	32.6	A	0.42	53.3	24.4
	NBT/R	A	0.28	24.7	47.3	A	0.21	28.0	30.5
	SBL	A	0.28	51.1	15.6	C	0.74	59.3	58.0
	SBT	A	0.08	27.3	15.7	A	0.28	24.9	47.5
	SBR	A	0.13	0.5	0.0	A	0.15	1.8	4.0
	Overall	**B**	**0.61**	**41.5**	**-**	**C**	**0.75**	**53.1**	**-**
St-Joseph Boulevard at Site Access ***Unsignalized***	EBT/R	-	-	-	-	-	-	-	-
	WB	-	-	-	-	-	-	-	-
	NBR	A	0.03	9.7	0.8	B	0.05	13.8	1.5
	Overall	**A**	**-**	**0.2**	**-**	**A**	**-**	**0.1**	**-**

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

During both AM and PM peak hours, the study area intersections operate similar to the 2030 future background condition except for the eastbound movement at St-Joseph Boulevard at Place d'Orleans Drive / Duford Drive intersection during the PM peak hour.

At St-Joseph Boulevard at Place d'Orleans Drive / Duford Drive intersection during the PM peak hour, the eastbound left-turn movement may be subject to high delays and extended queues and the eastbound shared through/right-turn movement will be over theoretical capacity with high delays and extended queues.

During the PM peak hour, it is noted that the eastbound shared through/right-turn movement at St-Joseph Boulevard at Place d'Orleans Drive / Duford Drive intersection will reach the capacity at the 2030 future background condition. The site is expected to generate 1.5% of the trips (18 out of 1,235) on the eastbound movement during the PM peak, and it is considered to have negligible impact on the intersection. A reduction of five vehicles on the eastbound through movement or shifting one second of split from the northbound and southbound left-turn phases to the eastbound and westbound shared through/right-turn phases would reduce the v/c of all movements at this intersection to 1.00 or below at this horizon.

7.5 Demand Rationalization Conclusions

7.5.1 Network Rationalization

During the 2030 background conditions for the eastbound shared through/right-turn movement at the intersection of at St-Joseph Boulevard at Place d'Orleans Drive / Duford Drive are expected to reach capacity during the PM peak hour. The forecasted traffic does not include any network reductions for the opening of LRT. While the extent of these reductions are unknown at this time, it is likely to be more than the 1% reduction required to make the 2030 background or total horizons operate under capacity.

7.5.2 Development Rationalization

Being 700 metres walking distance from the future Place d'Orleans LRT station, the proposed mode shares for the development are expected to be achieved and TDM measures will be provided to support these targets. The site trip generation was found to have minor impact on the network, and no capacity issues were noted at the future total horizons that could not be mitigated through signal timing adjustment. No rationalization for site traffic or mode share selection is required.

8 Development Design

8.1 Design for Sustainable Modes

The proposed development includes a mixed-used building with a right in/right out access on St-Joseph Boulevard. A total of eight exterior bicycle parking and 202 indoor bicycle parking spaces are proposed. Hard surface connections are provided from the building entrances to St-Joseph Boulevard and Duford Drive. Local bus stops are located within 200 metre-walking distance from the site entrances at Centrum Boulevard at Place d'Orleans Drive (E) and Duford Drive and Chartrand Avenue. Place d'Orléans station is approximately 700 metre-walking distance from the site.

The infrastructure TDM checklist is provided in Appendix K.

8.2 Circulation and Access

The proposed development proposes a right in/right out access on St-Joseph Boulevard. The site access will connect to the ground-level parking and via the ramp to the underground parking levels. Emergency service is expected to access the site at the frontage of St-Joseph Boulevard and Duford Drive.

9 Parking

9.1 Parking Supply

The site provides a total of 163 vehicle parking spaces including 17 ground floor parking and 146 underground parking spaces. A total of 210 bicycle parking spaces are provided including eight exterior parking and 202 indoor parking spaces.

From the zoning by-law, the maximum vehicle parking provision for the site is 354 parking spaces, and the minimum visitor parking provision for the site is 19 visitor parking spaces. The minimum bicycle parking provision is 101 spaces for the residence and two for the commercial retail. Therefore, the maximum residential parking, minimum visitor parking, and minimum bicycle parking requirements are satisfied.

10 Boundary Street Design

Table 21 summarizes the MMLOS analysis for the boundary streets of Place d'Orleans Drive (E) and Duford Drive. The boundary street analysis is based on the policy area of "within 600 metres of a rapid transit station" and the land use of "Mixed-Use Centre". The existing and future targets for St-Joseph Boulevard will be the same and are considered in one row. From the draft Transportation Master Plan (2023), Duford Drive will be a cross-town bikeway, and the bicycle target will be changed in the future. The MMLOS worksheets have been provided in Appendix L.

Table 21: Boundary Street MMLOS Analysis

Segment	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target
St-Joseph Boulevard	**E**	A	**E**	A	N/A	N/A	A	D
Duford Drive (Existing)	**B**	A	**D**	B	N/A	N/A	N/A	N/A
Duford Drive (Future)	**B**	A	**D**	A	N/A	N/A	N/A	N/A

The pedestrian LOS will not be met along the segment of St-Joseph Boulevard and Duford Drive. To meet the theoretical pedestrian LOS target on St-Joseph Boulevard, the boulevards would need to be at least 0.5 metres and the operating speed would need to be lower than 30 km/h. To meet the theoretical pedestrian LOS target on Duford Drive, the boulevards would need to be at least 0.5 metres or the operating speed would need to be lower than 30 km/h.

The bicycle LOS will not be met along the segment of St-Joseph Boulevard and Duford Drive. To meet the theoretical bicycle LOS targets, physically separated facilities would need along the boundary streets.

No further improvements are required to meet the PLOS and BLOS targets, although the City may look at reducing the speed limit to help improve the PLOS and BLOS results.

11 Access Intersections Design

11.1 Location and Design of Access

The development proposes right-in/right-out access on St-Joseph Boulevard. The access connects to the parking, and it is 6.0 metres wide. The throat length for the access is 8.5 metres, and it does not meet the suggested minimum 25 metres from Table 8.9.3 of the TAC Geometric Design Guidelines. It is noted that the access in right-in/right-out and the total vehicle trips during peak hours would be 34 AM and 43 PM two-way vehicle trips. Therefore, the throat length is not anticipated to be an issue.

The access is approximately 60 metres from the St-Joseph Boulevard at Place d'Orleans Drive / Duford Drive intersection and it meets the minimum requirement of 55 metres.

11.2 Intersection Control

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

11.3 Access Intersection Design

11.3.1 Future Access Intersection Operations

The operations are noted in Section 7.4 and no mitigation is required for the development.

11.3.2 Access Intersection MMLOS

The site access is unsignalized and does not require MMLOS review.

11.3.3 Recommended Design Elements

The proposed access will be constructed to comply with the City standard SC7.1.

12 Transportation Demand Management

12.1 Context for TDM

The subject site has been assumed to rely predominantly on auto driver and transit mode shares due to the conversion of the Place d'Orleans LRT station. The convenience of the transit station should provide the opportunity to reach the forecast transit mode share.

12.2 Need and Opportunity

The subject site has been assumed to rely predominantly on auto and transit travel, and those assumptions have been carried through the analysis.

12.3 TDM Program

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

- Display local area maps with walking/cycling access routes and key destinations at major entrances
- Display relevant transit schedules and route maps at entrances
- Provide a multimodal travel option information package to new/relocating employees, students, and new residents
- Inclusion of a 1-year Presto card for the initial purchase of condo purchase and/or inaugural rental of apartment
- Unbundle parking costs from lease rates at multi-tenant sites, purchase or rental costs

13 Transit

13.1 Route Capacity

In Section 5.1 the trip generation by mode was estimated, including an estimate of the number of transit trips that will be generated by the proposed development. Table 22 summarizes the transit trip generation.

Table 22: Trip Generation by Transit Mode

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Transit	Varies	13	27	40	19	14	33

The proposed development is anticipated to generate an additional 40 AM and 33 PM peak hour two-way transit trips. From the trip distribution found in section 5.3, these values can be further broken down. Table 23 summarizes forecasted site-generated transit ridership trips by direction and the equivalent bus loads.

Table 23: Forecasted Site-Generated Transit Ridership

Direction	AM Peak Hour		PM Peak Hour		Service Type	Approximate Equivalent Peak Hour/Direction Bus Loads
	In	Out	In	Out		
North	1	1	0	0	Bus	Negligible
South	4	8	6	4	Bus	Negligible
East	3	7	5	4	Bus, LRT	Negligible
West	5	11	8	6	Bus, LRT	One-Fifth of a standard bus

13.2 Transit Priority

Examining the study area intersection delays, negligible impacts are noted on the transit movements at the study area intersections. No specific transit priority measures were considered as part of this development.

14 Network Intersection Design

14.1 Network Intersection Control

No change to the existing signalized control is recommended for the network intersections.

14.2 Network Intersection Design

14.2.1 2025 & 2030 Future Total Network Intersection Operations

The operations are noted in Section 7.4 and a reduction of five vehicles on the eastbound through movement or signal timing adjustment would address the capacity issues. No further rationalization is required.

14.2.2 Network Intersection MMLOS

Table 24 summarizes the MMLOS analysis for the network intersections. The intersection analysis is based on the policy area of "within 600 metres of a rapid transit station" and the land use of "Mixed-Use Centre". The existing and future conditions for the network intersections will be the same and are considered in one row. The MMLOS worksheets have been provided in Appendix L.

Table 24: 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
Centrum Boulevard at Place d'Orleans Drive (E)	F	A	F	B	N/A	N/A	N/A	N/A	A	D
St-Joseph Boulevard at Place d'Orleans Drive (W)	F	A	F	A	N/A	N/A	B	D	C	D
St-Joseph Boulevard at Napoleon Way	F	A	F	A	N/A	N/A	N/A	N/A	A	D
St-Joseph Boulevard at Place d'Orleans Drive / Duford Drive	F	A	F	A	N/A	N/A	B	D	C	D

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

Pedestrian delay LOS is not considered in the PLOS calculation as it is not a suitable metric for the assessment of pedestrian LOS as formulated. This exclusion is consistent with City direction since 2015, and no alternative methodology has been provided for its assessment.

The bicycle LOS targets will not be met at the study area intersections, and two-stage left turns or left-turn boxes would be required to meet LOS targets on all approaches.

The City of Ottawa will be responsible for exploring options to address the area PLOS and BLOS deficiencies, given they are arterial road intersections and may require greater network improvements beyond the localized intersection upgrades.

14.2.3 Recommended Design Elements

No study area intersection design elements are proposed as part of this study.

15 Summary of Improvements Indicated and Modifications Options

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

Proposed Site and Screening

- The proposed site includes an 18-storey mixed-used building comprising 202 units and 2,796 sq. ft commercial space
- A right-in/right-out access will be provided on St-Joseph Boulevard
- The development is proposed to be completed as a single phase by 2025
- The trip generation, location, and safety triggers were met for the TIA Screening

Existing Conditions

- St Joseph Boulevard and Place d'Orleans Drive are arterial roads, and Duford Drive and Centrum Boulevard are collector roads in the study area
- Sidewalks are provided on both sides along St Joseph Boulevard, Place d'Orleans Drive, and Centrum Boulevard, on one side of Napoleon Way, on the east side of Duford Drive, and on the west side of Duford Drive between St Joseph Boulevard and Chartrand Avenue
- The intersections of Place d'Orleans Drive West at St. Joseph Boulevard and St. Joseph Boulevard at Duford Drive/Place d'Orleans Drive are noted to have experienced higher collisions than other locations within the study area
- At Place d'Orleans Drive West at St. Joseph Boulevard intersection, the collision types are most represented by turning movement and may be impacted by the bus stops on the west and north departures, and six of eight of these collisions occurred near the PM peak period
- At St. Joseph Boulevard at Duford Drive/Place d'Orleans Drive intersection, the collision types are most represented by rear end and are typical of congested conditions, but may be influenced by the intersection skew, the horizontal curve and downslope on Duford Drive, or the sweeping eastbound right-turn
- No further examination of collisions at this location is required as part of this study
- The existing study area intersections are generally expected to operate well during both peak hours

Development Generated Travel Demand

- Being 700 metres walking distance from the future Place d'Orleans LRT station, a 15% shift to transit mode from the auto mode for residential land use and a 10% percent shift to transit mode from the auto mode for commercial land use are proposed for the proposed development
- A total of 34 AM and 43 PM new peak hour two-way vehicle trips are projected as a result of the proposed development
- Of the forecasted trips, 5 % are anticipated to travel north, 30% to the south, 25% to the east, and 40 % to the west

Background Conditions

- A comparison of the TRANS volumes and the existing volumes illustrates a situation that development has not progressed linearly
- The background developments were explicitly included in the background conditions, along background growth along St Joseph Boulevard, Place d'Orleans Drive, and Centrum Boulevard along the mainline volumes

- The study area intersections at the future background conditions will operate similar to the existing conditions
- The eastbound shared through/right-turn movement at St-Joseph Boulevard at Place d'Orleans Drive / Duford Drive intersection during the PM peak hour will reach the capacity at the 2030 future background condition
- The forecasted traffic does not include any network reductions for the opening of LRT, which is likely to be more than the 1% reduction required to make the 2030 background or total horizons operate under capacity

Development Design

- The proposed development proposes a right in/right out access on St-Joseph Boulevard
- A total of eight exterior bicycle parking and 202 indoor bicycle parking spaces are proposed
- Hard surface connections are provided from the building entrances to St-Joseph Boulevard and Duford Drive
- Local bus stops are located within 200 metre-walking distance from the site entrances at Centrum Boulevard at Place d'Orleans Drive (E) and Duford Drive and Chartrand Avenue
- Place d'Orléans station is approximately 700 metre-walking distance from the site
- Emergency service is expected to access the site at the frontage of St-Joseph Boulevard and Duford Drive

Parking

- The site provides a total of 163 vehicle parking spaces including 17 ground floor parking and 146 underground parking spaces
- A total of 210 bicycle parking spaces are provided including eight exterior parking and 202 indoor parking spaces
- The maximum residential parking, minimum visitor parking, and minimum bicycle parking requirements are satisfied

Boundary Street Design

- The pedestrian LOS will not be met along the segment of St-Joseph Boulevard and Duford Drive
- At least 0.5 metres boulevards and lower than 30 km/h operating speed would need to meet the theoretical pedestrian LOS target on St-Joseph Boulevard
- At least 0.5 metres boulevards or lower than 30 km/h operating speed would need to meet the theoretical pedestrian LOS target on St-Joseph Boulevard
- The bicycle LOS will not be met along the segment of St-Joseph Boulevard and Duford Drive and physically separated facilities would need along the boundary streets
- No further improvements are required to meet the PLOS and BLOS targets, although the City may look at reducing the speed limit to help improve the PLOS and BLOS results

Access Intersections Design

- The access connects to the parking, and it is 6.0 metres wide. The throat length for the access is 8.5 metres, and it does not meet the suggested minimum 25 metres from Table 8.9.3 of the TAC Geometric Design Guidelines
- It is noted that the access in right-in/right-out and the total vehicle trips during peak hours would be 34 AM and 43 PM two-way vehicle trips, thus, the throat length is not anticipated to be an issue

- The access is approximately 60 metres from the St-Joseph Boulevard at Place d'Orleans Drive / Duford Drive intersection and it meets the minimum requirement of 55 metres
- The access will operation well and no mitigation is required for the development
- The proposed access will be constructed to comply with the City standard SC7.1

TDM

- Supportive TDM measures to be included within the proposed development should include:
    - Display local area maps with walking/cycling access routes and key destinations at major entrances
    - Display relevant transit schedules and route maps at entrances
    - Provide a multimodal travel option information package to new/relocating employees, students, and new residents
    - Offer at least one year of free monthly transit passes on residence purchase/move-in
    - Unbundle parking costs from lease rates at multi-tenant sites, purchase or rental costs

Transit

- The forecasted transit trips will include 40 two-way trips during the AM peak and 33 two-way trips during the PM peak
- Peak hour increases in transit ridership resulting from the site equate to one-fifth of a standard bus load westerly of the site and negligible impact on other directions
- Negligible impacts are noted on the transit movements at the study area intersections
- No specific transit priority measures were considered as part of this development

Network Intersection Design

- Generally, the network intersections will operate similar to the future background condition except for the St-Joseph Boulevard at Place d'Orleans Drive / Duford Drive intersection during the PM peak hour
- At the St-Joseph Boulevard at Place d'Orleans Drive / Duford Drive intersection during the PM peak hour, the eastbound left-turn movement may be subject to high delays and extended queues and the eastbound shared through/right-turn movement will be over theoretical capacity with high delays and extended queues
- The site-generated trips are considered to have negligible impact on the intersection
- Further optimized signal timings or a reduction of five vehicles can address the constraint and reduce the v/c of all movements to be 1.00 or below at St-Joseph Boulevard at Place d'Orleans Drive / Duford Drive intersection
- Being 700 metres walking distance from the future Place d'Orleans LRT station, the proposed mode shares for the development are expected to be achieved and TDM measures will be provided to support these targets, and no rationalization for site traffic or mode share selection is required
- The pedestrian LOS targets will not be met at the study area intersections, and maximum of two-lane widths crossing distance on all pedestrian crossings would need
- Pedestrian delay LOS is not considered in the PLOS calculation as it is not a suitable metric for the assessment of pedestrian LOS as formulated
- The bicycle LOS targets will not be met at the study area intersections, and two-stage left turns or left-turn boxes would be required to meet LOS targets on all approaches.

- The City of Ottawa will be responsible for exploring options to address the area PLOS and BLOS deficiencies, given they are arterial road intersections and may require greater network improvements beyond the localized intersection upgrades

16 Conclusion

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

Prepared By:

Yu-Chu Chen, EIT
Transportation Engineering-Intern

Reviewed By:

Andrew Harte, P.Eng.
Senior Transportation Engineer

Appendix A

TIA Screening Form and PM Certification Form

CGH TRANSPORTATION

6 Plaza Court
Ottawa, ON K2H 7W1

City of Ottawa 2017 TIA Guidelines
Step 1 - Screening Form

Date: 26-Apr-23
Project Number: 2023-055
Project Reference: 3030 St-Joseph

1.1 Description of Proposed Development	
Municipal Address	3030 St-Joseph Boulevard
Description of Location	Southwest corner of the intersection of St-Joseph Blvd at Place d'Orleans Dr/Duford Dr
Land Use Classification	Arterial Mainstreet Zone (AM3[2705] S438)
Development Size	18-storey mixed-used building including 202 units and 2,796 sq. ft commercial space
Accesses	Right in/right out access on St-Joseph Boulevard
Phase of Development	Single
Buildout Year	2025
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger		
Land Use Type	Townhomes or apartments	
Development Size	202	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?	Yes	St-Joseph spine route
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?	No	
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?	No
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?	Yes
Is the proposed driveway within auxiliary lanes of an intersection?	Yes
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 licensed[1] or registered[2] 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
Infrastructure Services and Community Sustainability
Planning and Growth Management
110 Laurier Avenue West, 4th fl.
Ottawa, ON K1P 1J1
Tel. : 613-580-2424
Fax: 613-560-6006

Ville d'Ottawa
Services d 'infrastructure et Viabilité des collectivités
Urbanisme et Gestion de la croissance
110, avenue Laurier Ouest
Ottawa (Ontario) K1P 1J1
Tél. : 613-580-2424
Télécopieur: 613-560-6006

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

Office Contact Information (Please Print)
Address: 6 Plaza Court
City / Postal Code: Ottawa / K2H 7W1
Telephone / Extension: (613) 697-3797
E-Mail Address: Andrew.Harte@CGHTransportation.com

Appendix B

Turning Movement Counts

Transportation Services - Traffic Services

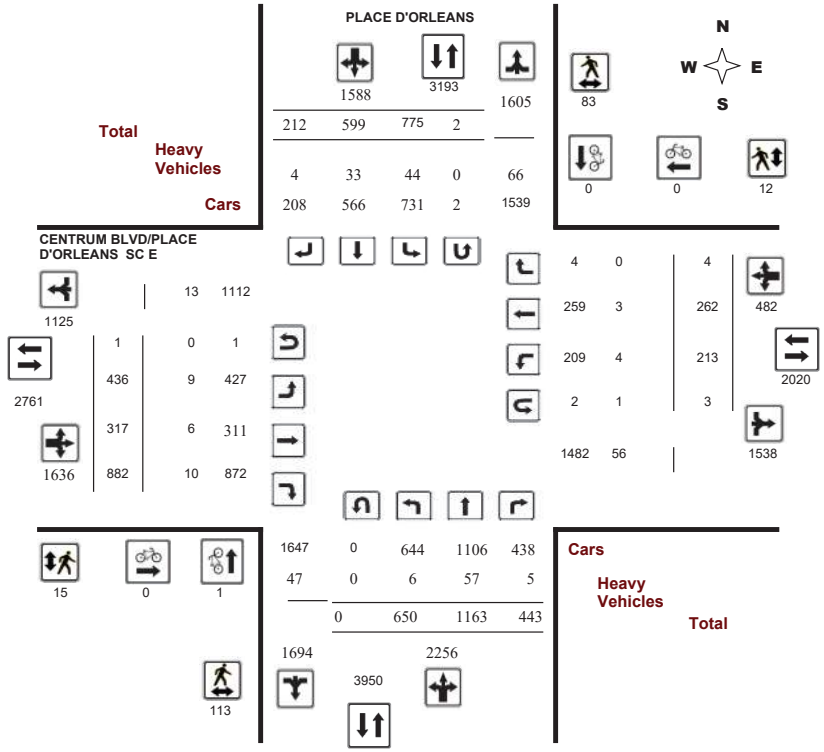
Turning Movement Count - Study Results

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

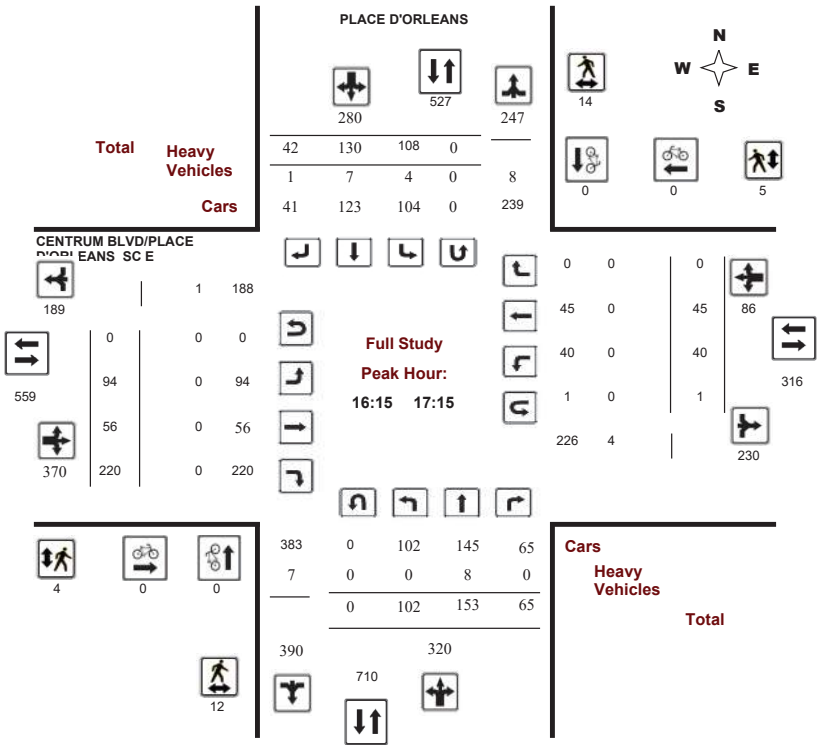
Turning Movement Count - Study Results

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



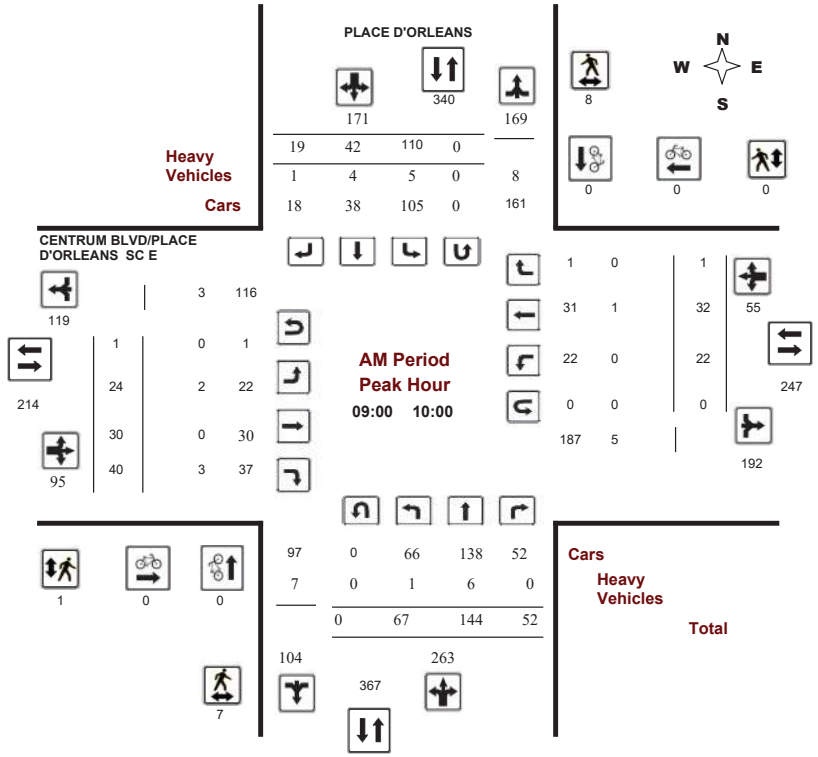
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

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

Survey Date: Thursday, January 31, 2019 **WO No:** 38321

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



Comments

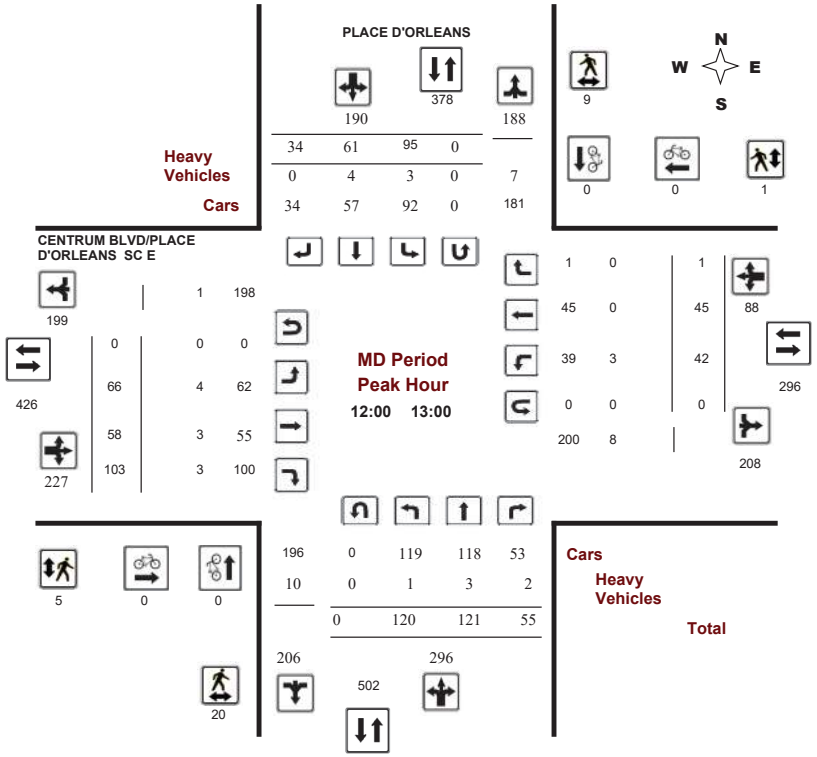
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

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

Survey Date: Thursday, January 31, 2019 **WO No:** 38321

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



Comments

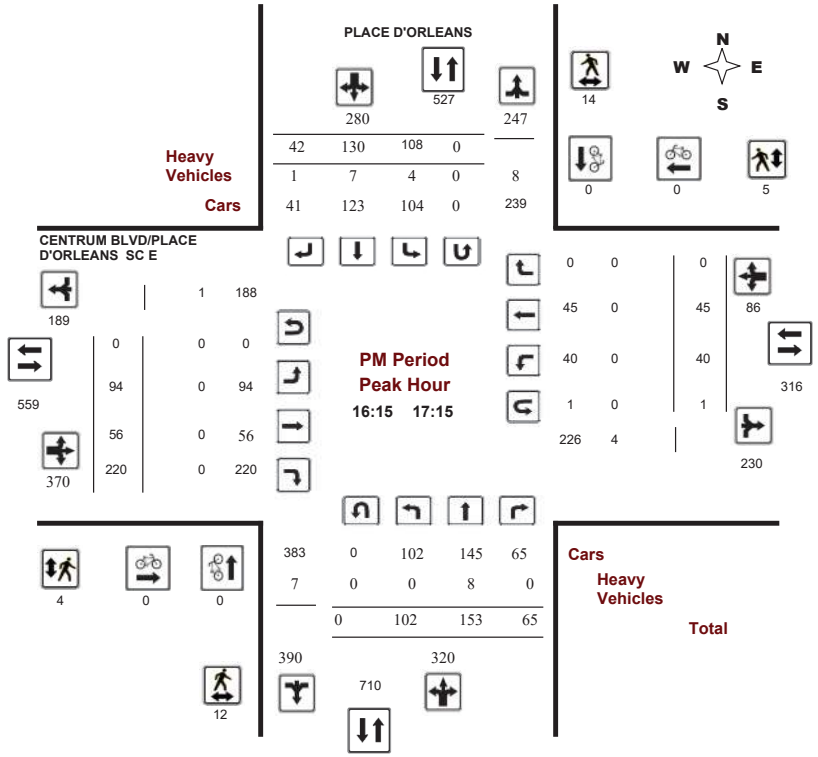
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

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

Survey Date: Thursday, January 31, 2019 **WO No:** 38321

Start Time: 07:00 **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 **WO No:** 38321

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

Full Study Summary (8 HR Standard)

Survey Date: Thursday, January 31, 2019

Total Observed U-Turns

Northbound: 0 Southbound: 2

Eastbound: 1 Westbound: 3

AADT Factor 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

Time Period	PLACE D'ORLEANS NB Approach (E or W Crossing)	PLACE D'ORLEANS SB Approach (E or W Crossing)	PLACE D'ORLEANS Total	CENTRUM BLVD/PLACE D'ORLEANS SC E EB Approach (N or S Crossing)	CENTRUM BLVD/PLACE D'ORLEANS SC E WB Approach (N or S Crossing)	CENTRUM BLVD/PLACE D'ORLEANS SC E 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

Time Period		PLACE D'ORLEANS Northbound LT	Northbound ST	Northbound RT	Northbound N TOT	Southbound LT	Southbound ST	Southbound RT	Southbound S TOT	Southbound STR TOT	CENTRUM BLVD/PLACE D'ORLEANS SC E Eastbound LT	Eastbound ST	Eastbound RT	Eastbound E TOT	Westbound LT	Westbound ST	Westbound RT	Westbound W TOT	Westbound STR TOT	Grand Total
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

Time Period		PLACE D'ORLEANS Northbound U-Turn Total	PLACE D'ORLEANS Southbound U-Turn Total	CENTRUM BLVD/PLACE D'ORLEANS SC E Eastbound U-Turn Total	CENTRUM BLVD/PLACE D'ORLEANS SC E Westbound U-Turn Total	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

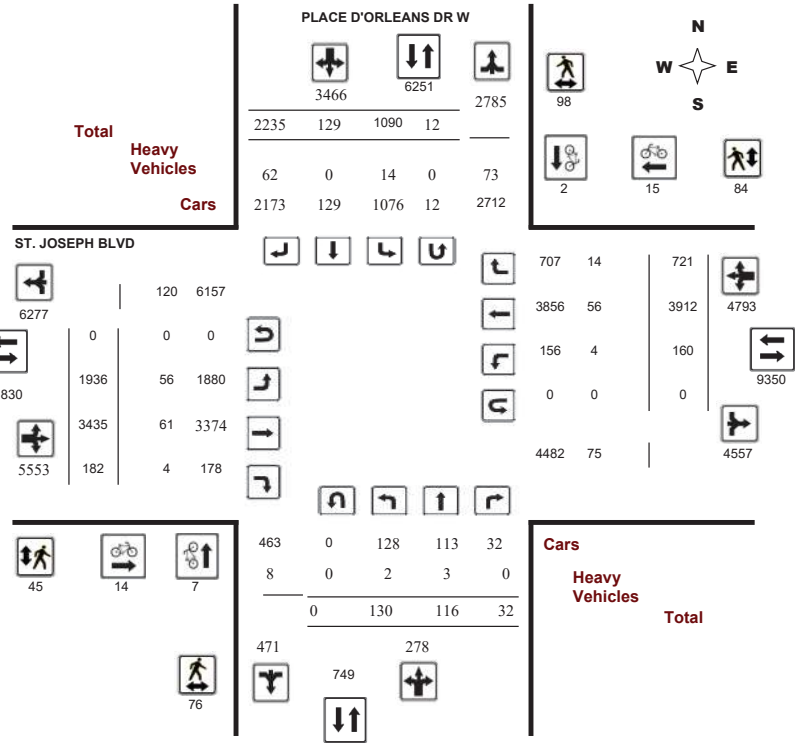
Turning Movement Count - Study Results

PLACE D'ORLEANS DR W @ ST. JOSEPH BLVD

Survey Date: Thursday, August 29, 2019 **WO No:** 38722

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

Full Study Diagram



Transportation Services - Traffic Services

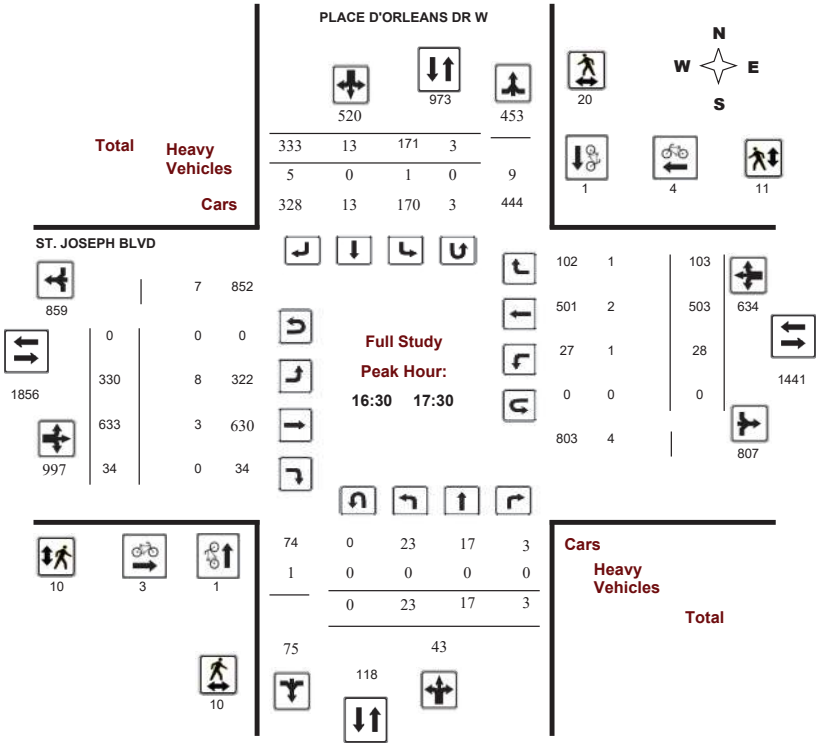
Turning Movement Count - Study Results

PLACE D'ORLEANS DR W @ ST. JOSEPH BLVD

Survey Date: Thursday, August 29, 2019 **WO No:** 38722

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

Full Study Peak Hour Diagram



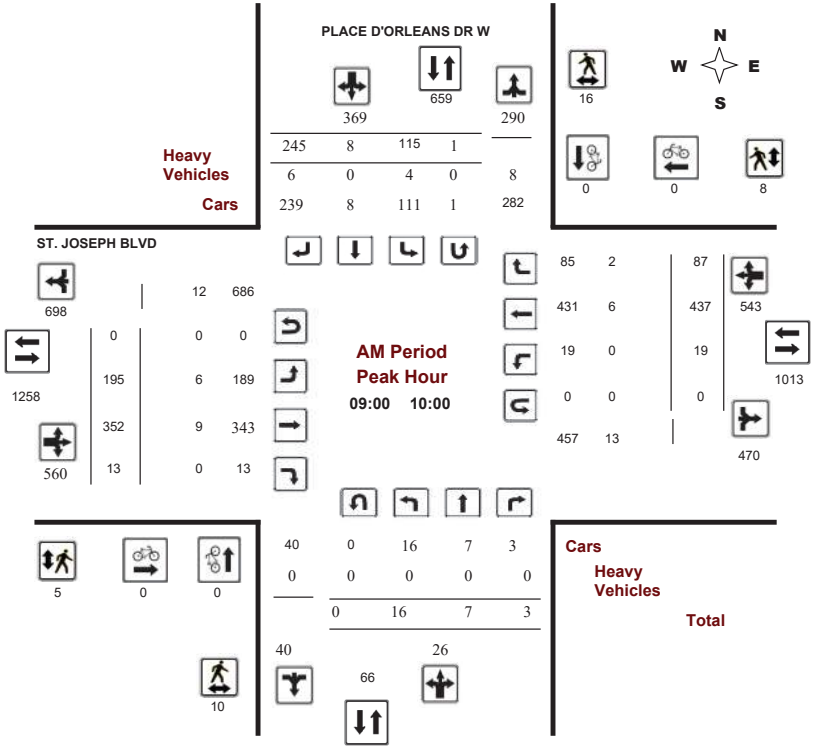
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

PLACE D'ORLEANS DR W @ ST. JOSEPH BLVD

Survey Date: Thursday, August 29, 2019 **WO No:** 38722

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



Comments

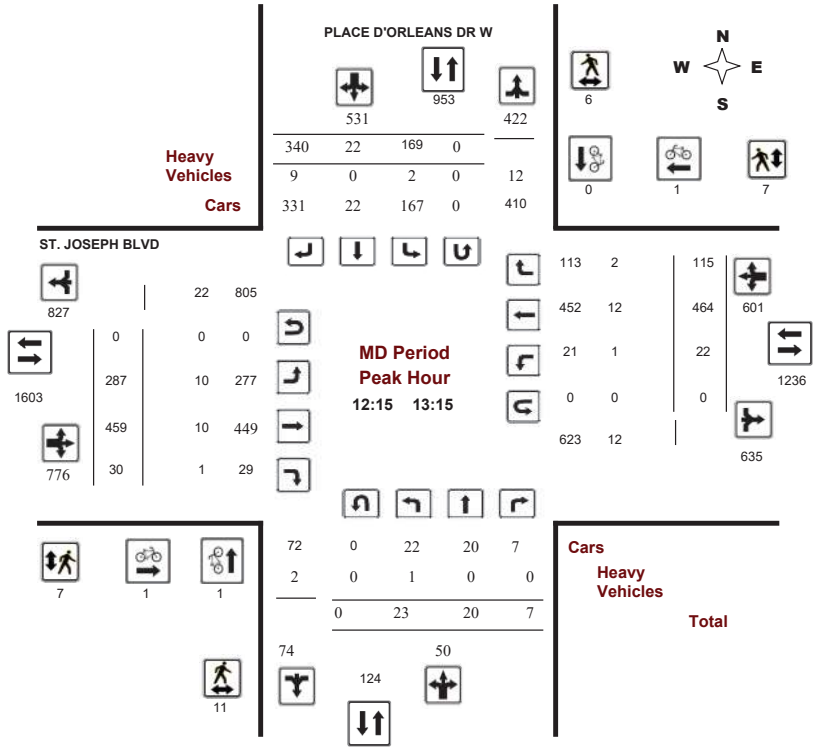
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

PLACE D'ORLEANS DR W @ ST. JOSEPH BLVD

Survey Date: Thursday, August 29, 2019 **WO No:** 38722

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



Comments

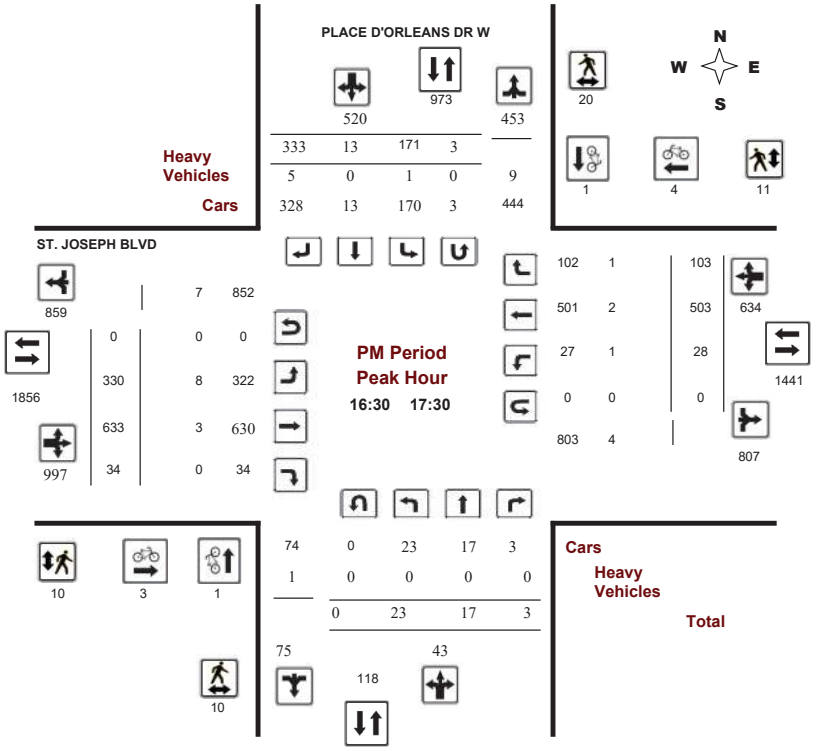
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

PLACE D'ORLEANS DR W @ ST. JOSEPH BLVD

Survey Date: Thursday, August 29, 2019 **WO No:** 38722

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



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

PLACE D'ORLEANS DR W @ ST. JOSEPH BLVD

Survey Date: Thursday, August 29, 2019 **WO No:** 38722

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

Full Study Summary (8 HR Standard)

Survey Date: Thursday, August 29, 2019

Total Observed U-Turns

Northbound: 0 Southbound: 12

Eastbound: 0 Westbound: 0

AADT Factor .90

	PLACE D'ORLEANS DR W								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	1	0	0	**1**	56	4	181	**241**	**242**	116	192	1	**309**	4	613	44	**661**	**970**	**1212**
08:00 09:00	5	2	2	**9**	85	11	216	**312**	**321**	157	262	8	**427**	7	524	63	**594**	**1021**	**1342**
09:00 10:00	16	7	3	**26**	115	8	245	**368**	**394**	195	352	13	**560**	19	437	87	**543**	**1103**	**1497**
11:30 12:30	20	27	1	**48**	157	24	313	**494**	**542**	256	419	29	**704**	30	467	114	**611**	**1315**	**1857**
12:30 13:30	28	13	8	**49**	161	21	328	**510**	**559**	293	444	32	**769**	24	467	117	**608**	**1377**	**1936**
15:00 16:00	18	23	7	**48**	154	26	279	**459**	**507**	296	590	24	**910**	19	449	100	**568**	**1478**	**1985**
16:00 17:00	28	25	7	**60**	174	19	349	**542**	**602**	325	589	48	**962**	30	460	102	**592**	**1554**	**2156**
17:00 18:00	14	19	4	**37**	188	16	324	**528**	**565**	298	587	27	**912**	27	495	94	**616**	**1528**	**2093**
Sub Total	130	116	32	**278**	1090	129	2235	**3454**	**3732**	1936	3435	182	**5553**	160	3912	721	**4793**	**10346**	**14078**
U Turns	0			**0**	12			**12**	**12**	**0**			**0**	0			**0**	**0**	**12**
Total	130	116	32	**278**	1102	129	2235	**3466**	**3744**	1936	3435	182	**5553**	160	3912	721	**4793**	**10346**	**14090**
EQ 12Hr	181	161	44	**386**	1532	179	3107	**4818**	**5204**	2691	4775	253	**7719**	222	5438	1002	**6662**	**14381**	**19585**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	163	145	40	**348**	1379	161	2796	**4336**	**4684**	2422	4298	228	**6948**	200	4894	902	**5996**	**12944**	**17628**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
AVG 24Hr	214	190	52	**456**	1806	211	3663	**5680**	**6136**	3173	5630	299	**9102**	262	6411	1182	**7855**	**16957**	**23093**
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 DR W @ ST. JOSEPH BLVD

Survey Date: Thursday, August 29, 2019 **WO No:** 38722

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

Full Study 15 Minute Increments

		PLACE D'ORLEANS DR W									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	0	0	0	0	14	0	32	46	**46**	31	32	1	64	0	120	10	130	**194**	**240**
07:15	07:30	0	0	0	0	17	1	46	64	**64**	30	34	0	64	0	162	9	171	**235**	**299**
07:30	07:45	1	0	0	1	10	0	44	54	**55**	26	53	0	79	2	148	8	158	**237**	**292**
07:45	08:00	0	0	0	0	16	3	59	78	**78**	29	73	0	102	2	183	17	202	**304**	**382**
08:00	08:15	1	0	2	3	12	2	46	60	**63**	28	54	1	83	2	119	13	134	**217**	**280**
08:15	08:30	0	1	0	1	15	3	45	63	**64**	35	70	1	106	1	150	15	166	**272**	**336**
08:30	08:45	2	1	0	3	29	2	51	82	**85**	38	61	1	100	2	135	9	146	**246**	**331**
08:45	09:00	2	0	0	2	29	4	74	107	**109**	56	77	5	138	2	120	26	148	**286**	**395**
09:00	09:15	4	3	0	7	32	0	60	92	**99**	40	96	1	137	3	116	21	140	**277**	**376**
09:15	09:30	5	0	0	5	29	2	73	104	**109**	43	67	3	113	7	113	11	131	**244**	**353**
09:30	09:45	3	2	2	7	27	2	54	83	**90**	59	96	2	157	5	95	25	125	**282**	**372**
09:45	10:00	4	2	1	7	28	4	58	90	**97**	53	93	7	153	4	113	30	147	**300**	**397**
11:30	11:45	3	5	0	8	33	9	75	117	**125**	67	115	8	190	11	101	30	142	**332**	**457**
11:45	12:00	7	6	0	13	47	7	67	121	**134**	62	104	9	175	7	113	28	148	**323**	**457**
12:00	12:15	8	7	1	16	39	2	88	129	**145**	61	95	7	163	9	132	28	169	**332**	**477**
12:15	12:30	2	9	0	11	39	6	83	128	**139**	66	105	5	176	3	121	28	152	**328**	**467**
12:30	12:45	7	1	2	10	45	5	86	136	**146**	59	118	10	187	0	124	30	154	**341**	**487**
12:45	13:00	6	4	2	12	42	5	80	127	**139**	91	117	5	213	12	112	33	157	**370**	**509**
13:00	13:15	8	6	3	17	43	6	91	140	**157**	71	119	10	200	7	107	24	138	**338**	**495**
13:15	13:30	7	2	1	10	32	5	71	108	**118**	72	90	7	169	5	124	30	159	**328**	**446**
15:00	15:15	4	6	2	12	50	2	84	136	**148**	70	109	6	185	6	125	29	160	**345**	**493**
15:15	15:30	2	2	3	7	44	8	63	115	**122**	82	143	8	233	4	106	21	131	**364**	**486**
15:30	15:45	4	11	1	16	26	13	55	94	**110**	65	169	2	236	6	113	28	147	**383**	**493**
15:45	16:00	8	4	1	13	35	3	77	115	**128**	79	169	8	256	3	105	22	130	**386**	**514**
16:00	16:15	6	4	4	14	39	9	93	141	**155**	67	150	13	230	11	112	28	151	**381**	**536**
16:15	16:30	8	15	1	24	49	6	83	138	**162**	99	130	18	247	6	113	23	142	**389**	**551**
16:30	16:45	8	6	1	15	47	2	78	127	**142**	85	151	12	248	5	120	23	148	**396**	**538**
16:45	17:00	6	0	1	7	41	2	95	138	**145**	74	158	5	237	8	115	28	151	**388**	**533**
17:00	17:15	3	5	1	9	42	3	87	132	**141**	85	144	9	238	6	135	30	171	**409**	**550**
17:15	17:30	6	6	0	12	44	6	73	123	**135**	86	180	8	274	9	133	22	164	**438**	**573**
17:30	17:45	3	4	2	9	54	4	76	134	**143**	70	147	5	222	6	113	18	137	**359**	**502**
17:45	18:00	2	4	1	7	53	3	88	144	**151**	57	116	5	178	6	114	24	144	**322**	**473**
Total:		130	116	32	278	1102	129	2235	3466	**3744**	1936	3435	182	5553	160	3912	721	4793	**3744**	**14,090**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

PLACE D'ORLEANS DR W @ ST. JOSEPH BLVD

Survey Date: Thursday, August 29, 2019 **WO No:** 38722

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

Full Study Cyclist Volume

Time Period		PLACE D'ORLEANS DR W			ST. JOSEPH BLVD			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	1	0	**1**	4	0	**4**	**5**
07:15	07:30	0	0	**0**	0	0	**0**	**0**
07:30	07:45	0	0	**0**	0	2	**2**	**2**
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	1	0	**1**	1	0	**1**	**2**
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	1	0	**1**	1	2	**3**	**4**
11:45	12:00	0	0	**0**	0	1	**1**	**1**
12:00	12:15	0	0	**0**	1	0	**1**	**1**
12:15	12:30	1	0	**1**	0	0	**0**	**1**
12:30	12:45	0	0	**0**	0	0	**0**	**0**
12:45	13:00	0	0	**0**	1	0	**1**	**1**
13:00	13:15	0	0	**0**	0	1	**1**	**1**
13:15	13:30	0	0	**0**	0	0	**0**	**0**
15:00	15:15	0	0	**0**	1	1	**2**	**2**
15:15	15:30	0	0	**0**	0	3	**3**	**3**
15:30	15:45	2	0	**2**	2	0	**2**	**4**
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	1	**1**	**1**
16:30	16:45	0	0	**0**	0	3	**3**	**3**
16:45	17:00	0	0	**0**	1	0	**1**	**1**
17:00	17:15	1	1	**2**	2	1	**3**	**5**
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	1	**1**	0	0	**0**	**1**
Total		7	2	**9**	14	15	**29**	**38**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

PLACE D'ORLEANS DR W @ ST. JOSEPH BLVD

Survey Date: Thursday, August 29, 2019 **WO No:** 38722

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

Full Study Pedestrian Volume

Time Period		PLACE D'ORLEANS DR W			ST. JOSEPH BLVD			
		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	1	**4**	0	1	**1**	**5**
07:15	07:30	1	1	**2**	0	2	**2**	**4**
07:30	07:45	1	4	**5**	0	2	**2**	**7**
07:45	08:00	1	2	**3**	0	0	**0**	**3**
08:00	08:15	3	1	**4**	0	3	**3**	**7**
08:15	08:30	0	0	**0**	0	0	**0**	**0**
08:30	08:45	0	3	**3**	0	2	**2**	**5**
08:45	09:00	2	2	**4**	2	2	**4**	**8**
09:00	09:15	4	3	**7**	0	4	**4**	**11**
09:15	09:30	2	1	**3**	2	1	**3**	**6**
09:30	09:45	1	9	**10**	2	1	**3**	**13**
09:45	10:00	3	3	**6**	1	2	**3**	**9**
11:30	11:45	5	5	**10**	1	3	**4**	**14**
11:45	12:00	0	5	**5**	0	3	**3**	**8**
12:00	12:15	3	2	**5**	3	5	**8**	**13**
12:15	12:30	3	1	**4**	1	3	**4**	**8**
12:30	12:45	2	3	**5**	2	3	**5**	**10**
12:45	13:00	4	1	**5**	2	1	**3**	**8**
13:00	13:15	2	1	**3**	2	0	**2**	**5**
13:15	13:30	2	3	**5**	2	6	**8**	**13**
15:00	15:15	9	8	**17**	1	9	**10**	**27**
15:15	15:30	5	6	**11**	0	6	**6**	**17**
15:30	15:45	2	1	**3**	4	1	**5**	**8**
15:45	16:00	1	3	**4**	4	1	**5**	**9**
16:00	16:15	4	1	**5**	3	1	**4**	**9**
16:15	16:30	1	4	**5**	3	4	**7**	**12**
16:30	16:45	2	4	**6**	1	3	**4**	**10**
16:45	17:00	4	4	**8**	4	3	**7**	**15**
17:00	17:15	1	6	**7**	3	2	**5**	**12**
17:15	17:30	3	6	**9**	2	3	**5**	**14**
17:30	17:45	0	2	**2**	0	3	**3**	**5**
17:45	18:00	2	2	**4**	0	4	**4**	**8**
Total	.....	76	98	**174**	45	84	**129**	**303**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

PLACE D'ORLEANS DR W @ ST. JOSEPH BLVD

Survey Date: Thursday, August 29, 2019 **WO No:** 38722

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

Full Study Heavy Vehicles

PLACE D'ORLEANS DR W **ST. JOSEPH BLVD**

Time Period		Northbound				Southbound					Eastbound				Westbound					
		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	0	0	0	**0**	1	0	3	**4**	**4**	1	3	0	**4**	0	1	0	**1**	**5**	**9**
07:15	07:30	0	0	0	**0**	1	0	4	**5**	**5**	0	1	0	**1**	0	2	1	**3**	**4**	**9**
07:30	07:45	0	0	0	**0**	0	0	3	**3**	**3**	3	2	0	**5**	0	1	0	**1**	**6**	**9**
07:45	08:00	0	0	0	**0**	1	0	2	**3**	**3**	2	3	0	**5**	0	0	1	**1**	**6**	**9**
08:00	08:15	0	0	0	**0**	1	0	4	**5**	**5**	0	4	0	**4**	0	4	0	**4**	**8**	**13**
08:15	08:30	0	0	0	**0**	1	0	0	**1**	**1**	2	1	0	**3**	0	3	0	**3**	**6**	**7**
08:30	08:45	1	0	0	**1**	1	0	3	**4**	**5**	1	3	0	**4**	1	7	0	**8**	**12**	**17**
08:45	09:00	0	0	0	**0**	1	0	2	**3**	**3**	4	0	0	**4**	0	3	0	**3**	**7**	**10**
09:00	09:15	0	0	0	**0**	2	0	3	**5**	**5**	2	5	0	**7**	0	0	0	**0**	**7**	**12**
09:15	09:30	0	0	0	**0**	1	0	1	**2**	**2**	1	1	0	**2**	0	1	2	**3**	**5**	**7**
09:30	09:45	0	0	0	**0**	0	0	2	**2**	**2**	2	2	0	**4**	0	4	0	**4**	**8**	**10**
09:45	10:00	0	0	0	**0**	1	0	0	**1**	**1**	1	1	0	**2**	0	1	0	**1**	**3**	**4**
11:30	11:45	0	1	0	**1**	0	0	3	**3**	**4**	2	5	2	**9**	1	1	0	**2**	**11**	**15**
11:45	12:00	0	1	0	**1**	0	0	1	**1**	**2**	2	4	0	**6**	0	2	0	**2**	**8**	**10**
12:00	12:15	0	0	0	**0**	0	0	2	**2**	**2**	2	1	0	**3**	0	4	3	**7**	**10**	**12**
12:15	12:30	0	0	0	**0**	1	0	1	**2**	**2**	2	3	0	**5**	0	3	0	**3**	**8**	**10**
12:30	12:45	0	0	0	**0**	0	0	3	**3**	**3**	4	3	0	**7**	0	6	0	**6**	**13**	**16**
12:45	13:00	0	0	0	**0**	0	0	0	**0**	**0**	2	1	0	**3**	1	1	1	**3**	**6**	**6**
13:00	13:15	1	0	0	**1**	1	0	5	**6**	**7**	2	3	1	**6**	0	2	1	**3**	**9**	**16**
13:15	13:30	0	0	0	**0**	0	0	2	**2**	**2**	0	2	0	**2**	0	2	0	**2**	**4**	**6**
15:00	15:15	0	0	0	**0**	0	0	3	**3**	**3**	2	1	0	**3**	0	3	2	**5**	**8**	**11**
15:15	15:30	0	0	0	**0**	0	0	2	**2**	**2**	3	1	0	**4**	0	1	0	**1**	**5**	**7**
15:30	15:45	0	0	0	**0**	0	0	1	**1**	**1**	2	1	0	**3**	0	0	0	**0**	**3**	**4**
15:45	16:00	0	1	0	**1**	0	0	1	**1**	**2**	2	3	1	**6**	0	1	0	**1**	**7**	**9**
16:00	16:15	0	0	0	**0**	0	0	3	**3**	**3**	1	0	0	**1**	0	1	1	**2**	**3**	**6**
16:15	16:30	0	0	0	**0**	0	0	1	**1**	**1**	1	3	0	**4**	0	0	1	**1**	**5**	**6**
16:30	16:45	0	0	0	**0**	1	0	0	**1**	**1**	1	0	0	**1**	0	0	1	**1**	**2**	**3**
16:45	17:00	0	0	0	**0**	0	0	3	**3**	**3**	3	2	0	**5**	0	0	0	**0**	**5**	**8**
17:00	17:15	0	0	0	**0**	0	0	1	**1**	**1**	0	0	0	**0**	1	1	0	**2**	**2**	**3**
17:15	17:30	0	0	0	**0**	0	0	1	**1**	**1**	4	1	0	**5**	0	1	0	**1**	**6**	**7**
17:30	17:45	0	0	0	**0**	0	0	2	**2**	**2**	1	0	0	**1**	0	0	0	**0**	**1**	**3**
17:45	18:00	0	0	0	**0**	0	0	0	**0**	**0**	1	1	0	**2**	0	0	0	**0**	**2**	**2**
Total:	None	2	3	0	**5**	14	0	62	**76**	**81**	56	61	4	**121**	4	56	14	**74**	**195**	**276**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

PLACE D'ORLEANS DR W @ ST. JOSEPH BLVD

Survey Date: Thursday, August 29, 2019 **WO No:** 38722

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

Full Study 15 Minute U-Turn Total

PLACE D'ORLEANS DR W **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	1	0	0	**1**
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	1	0	0	**1**
11:30	11:45	0	0	0	0	**0**
11:45	12:00	0	1	0	0	**1**
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	1	0	0	**1**
15:00	15:15	0	0	0	0	**0**
15:15	15:30	0	1	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	0	**0**
16:15	16:30	0	2	0	0	**2**
16:30	16:45	0	0	0	0	**0**
16:45	17:00	0	0	0	0	**0**
17:00	17:15	0	1	0	0	**1**
17:15	17:30	0	2	0	0	**2**
17:30	17:45	0	0	0	0	**0**
17:45	18:00	0	2	0	0	**2**
Total		0	12	0	0	**12**

Transportation Services - Traffic Services

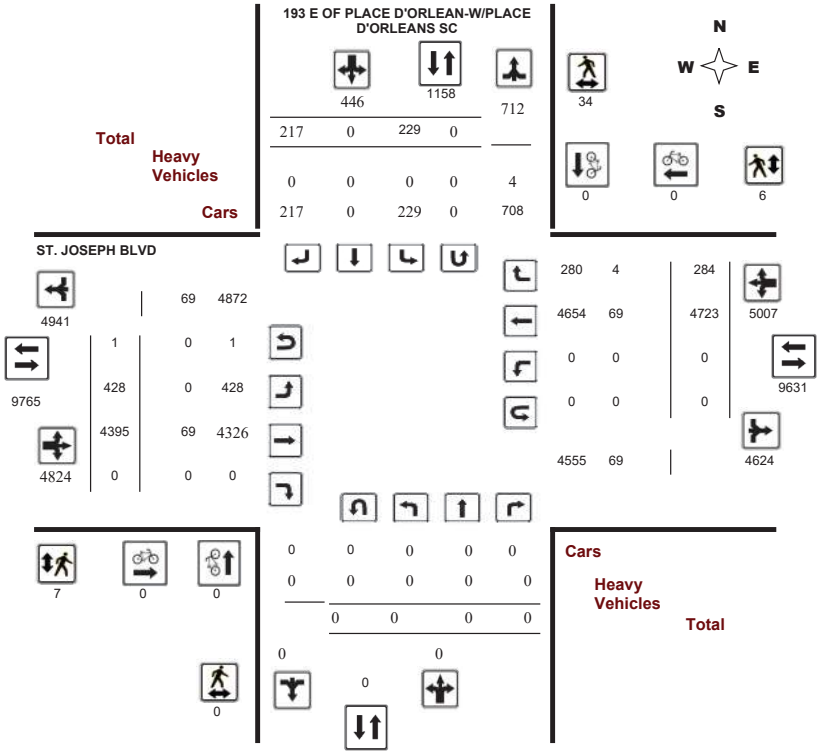
Turning Movement Count - Study Results

ST. JOSEPH BLVD @ 193 E OF PLACE D'ORLEAN-W/PL

Survey Date: Tuesday, February 06, 2018 **WO No:** 37493

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

Full Study Diagram



Transportation Services - Traffic Services

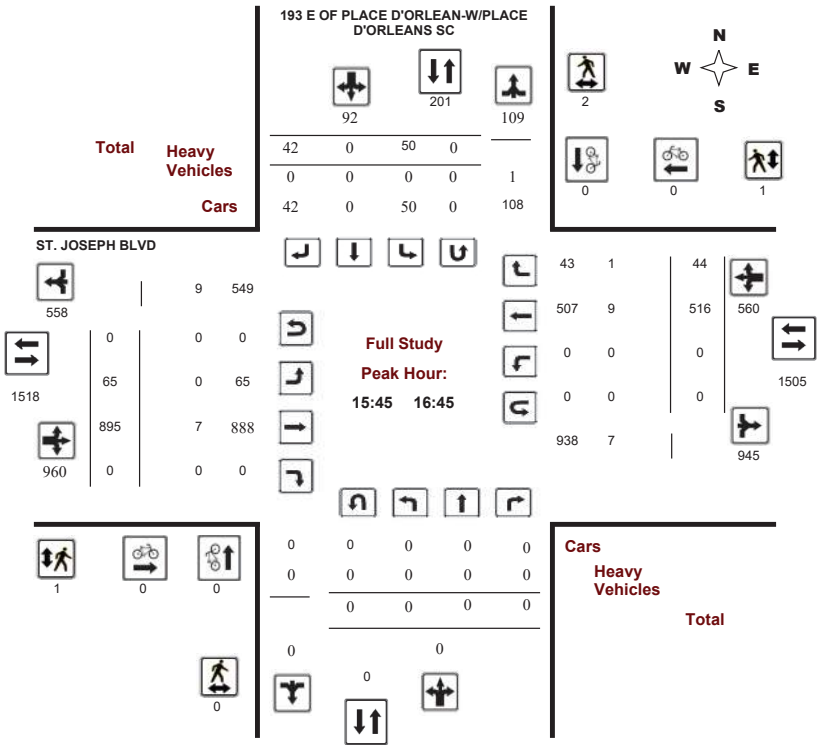
Turning Movement Count - Study Results

ST. JOSEPH BLVD @ 193 E OF PLACE D'ORLEAN-W/PL

Survey Date: Tuesday, February 06, 2018 **WO No:** 37493

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

Full Study Peak Hour Diagram



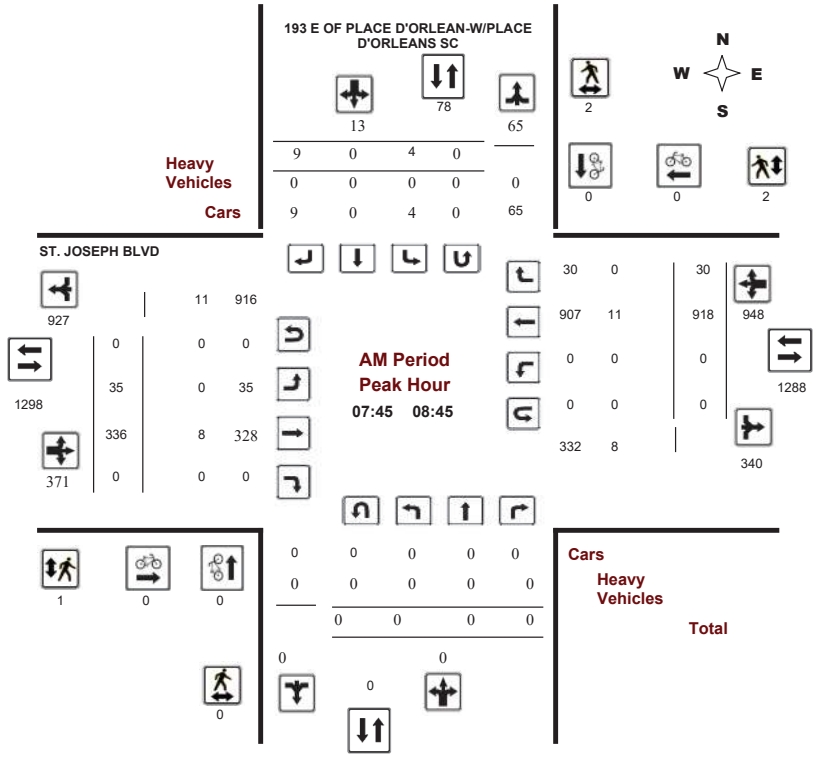
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ST. JOSEPH BLVD @ 193 E OF PLACE D'ORLEAN-W/PL

Survey Date: Tuesday, February 06, 2018 **WO No:** 37493

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



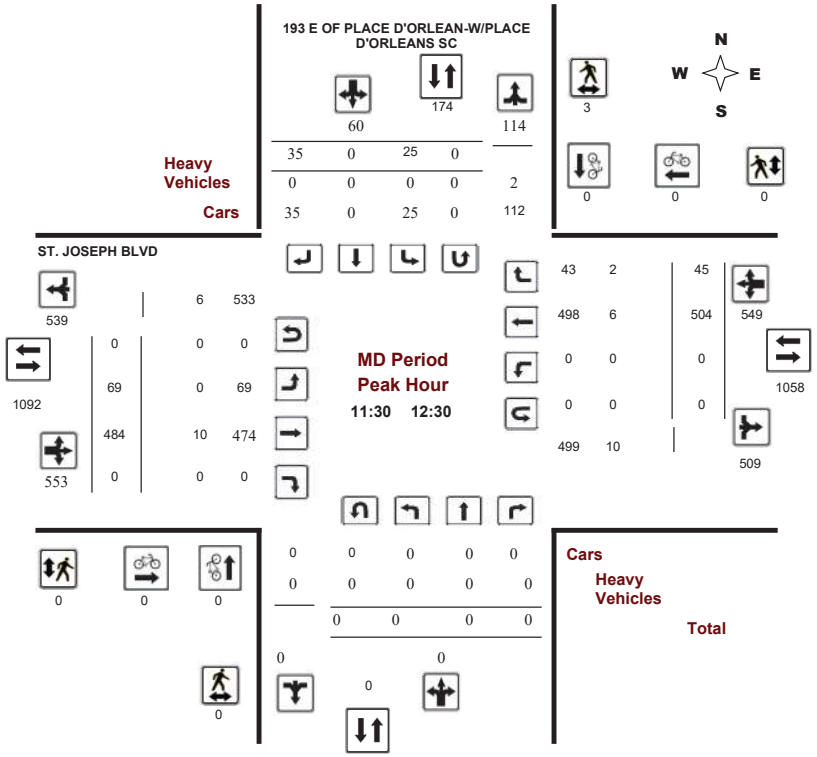
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ST. JOSEPH BLVD @ 193 E OF PLACE D'ORLEAN-W/PL

Survey Date: Tuesday, February 06, 2018 **WO No:** 37493

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



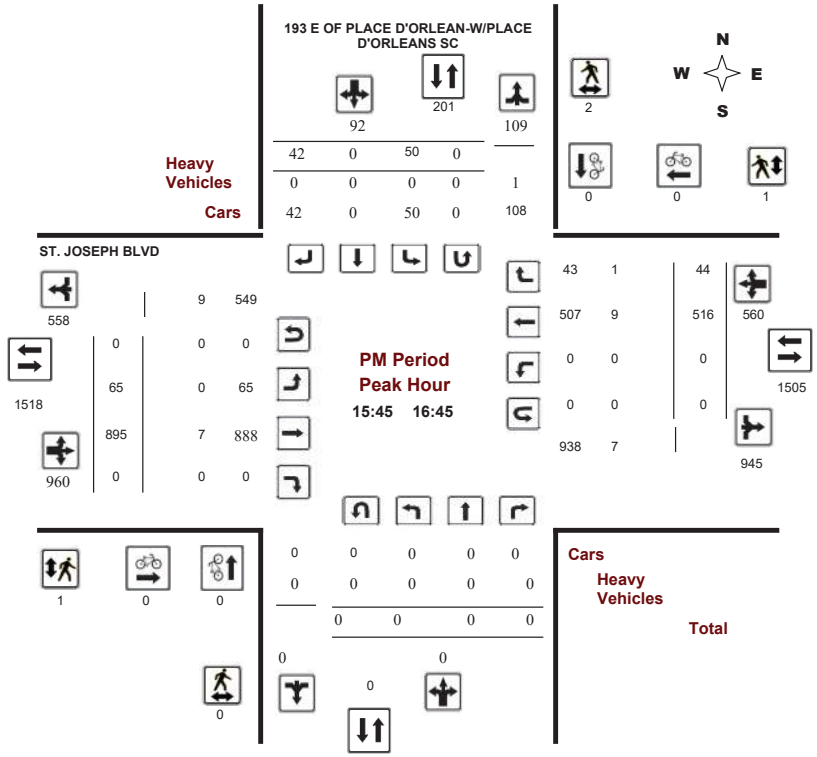
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ST. JOSEPH BLVD @ 193 E OF PLACE D'ORLEAN-W/PL

Survey Date: Tuesday, February 06, 2018 **WO No:** 37493

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



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ST. JOSEPH BLVD @ 193 E OF PLACE D'ORLEAN-W/PL

Survey Date: Tuesday, February 06, 2018 **WO No:** 37493

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

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, February 06, 2018

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 1 Westbound: 0

AADT Factor 1.00

	193 E OF PLACE D'ORLEAN-W/PLACE D'ORLEANS SC								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	0	0	0	**0**	0	0	2	**2**	**2**	20	210	0	**230**	0	836	28	**864**	**1094**	**1096**
08:00 09:00	0	0	0	**0**	4	0	12	**16**	**16**	42	367	0	**409**	0	843	30	**873**	**1282**	**1298**
09:00 10:00	0	0	0	**0**	4	0	15	**19**	**19**	53	419	0	**472**	0	547	33	**580**	**1052**	**1071**
11:30 12:30	0	0	0	**0**	25	0	35	**60**	**60**	69	484	0	**553**	0	504	45	**549**	**1102**	**1162**
12:30 13:30	0	0	0	**0**	34	0	42	**76**	**76**	63	462	0	**525**	0	463	33	**496**	**1021**	**1097**
15:00 16:00	0	0	0	**0**	44	0	32	**76**	**76**	58	785	0	**843**	0	521	39	**560**	**1403**	**1479**
16:00 17:00	0	0	0	**0**	65	0	42	**107**	**107**	64	847	0	**911**	0	499	40	**539**	**1450**	**1557**
17:00 18:00	0	0	0	**0**	53	0	37	**90**	**90**	59	821	0	**880**	0	510	36	**546**	**1426**	**1516**
Sub Total	0	0	0	**0**	229	0	217	**446**	**446**	428	4395	0	**4823**	0	4723	284	**5007**	**9830**	**10276**
U Turns	0			**0**	0			**0**	**0**	**1**			**1**	0			**0**	**1**	**1**
Total	0	0	0	**0**	229	0	217	**446**	**446**	429	4395	0	**4824**	0	4723	284	**5007**	**9831**	**10277**
EQ 12Hr	0	0	0	**0**	318	0	302	**620**	**620**	596	6109	0	**6705**	0	6565	395	**6960**	**13665**	**14285**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	0	0	0	**0**	318	0	302	**620**	**620**	596	6109	0	**6705**	0	6565	395	**6960**	**13665**	**14285**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**1.00**					
AVG 24Hr	0	0	0	**0**	417	0	396	**813**	**813**	781	8003	0	**8784**	0	8600	517	**9117**	**17901**	**18714**
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 @ 193 E OF PLACE D'ORLEAN-W/PL

Survey Date: Tuesday, February 06, 2018 **WO No:** 37493

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

Full Study 15 Minute Increments

		193 E OF PLACE D'ORLEAN-W/PLACE D'ORLEANS SC									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	0	0	0	0	0	0	0	0	**0**	4	37	0	41	0	167	7	174	**215**	**215**
07:15	07:30	0	0	0	0	0	0	0	0	**0**	5	51	0	56	0	195	7	202	**258**	**258**
07:30	07:45	0	0	0	0	0	0	1	1	**1**	6	44	0	50	0	233	9	242	**292**	**293**
07:45	08:00	0	0	0	0	0	0	1	1	**1**	5	78	0	83	0	241	5	246	**329**	**330**
08:00	08:15	0	0	0	0	3	0	1	4	**4**	8	81	0	89	0	243	6	249	**338**	**342**
08:15	08:30	0	0	0	0	1	0	2	3	**3**	11	90	0	101	0	192	13	205	**306**	**309**
08:30	08:45	0	0	0	0	0	0	5	5	**5**	11	87	0	98	0	242	6	248	**346**	**351**
08:45	09:00	0	0	0	0	0	0	4	4	**4**	12	109	0	121	0	166	5	171	**292**	**296**
09:00	09:15	0	0	0	0	2	0	6	8	**8**	13	87	0	100	0	172	8	180	**280**	**288**
09:15	09:30	0	0	0	0	1	0	4	5	**5**	16	121	0	137	0	131	6	137	**274**	**279**
09:30	09:45	0	0	0	0	0	0	3	3	**3**	9	119	0	128	0	130	8	138	**266**	**269**
09:45	10:00	0	0	0	0	1	0	2	3	**3**	16	92	0	108	0	114	11	125	**233**	**236**
11:30	11:45	0	0	0	0	5	0	12	17	**17**	16	127	0	143	0	132	9	141	**284**	**301**
11:45	12:00	0	0	0	0	4	0	9	13	**13**	8	109	0	117	0	109	14	123	**240**	**253**
12:00	12:15	0	0	0	0	6	0	3	9	**9**	18	118	0	136	0	131	10	141	**277**	**286**
12:15	12:30	0	0	0	0	10	0	11	21	**21**	27	130	0	157	0	132	12	144	**301**	**322**
12:30	12:45	0	0	0	0	6	0	5	11	**11**	11	112	0	123	0	128	9	137	**260**	**271**
12:45	13:00	0	0	0	0	5	0	6	11	**11**	14	117	0	131	0	108	6	114	**245**	**256**
13:00	13:15	0	0	0	0	15	0	15	30	**30**	16	119	0	135	0	116	10	126	**261**	**291**
13:15	13:30	0	0	0	0	8	0	16	24	**24**	22	114	0	136	0	111	8	119	**255**	**279**
15:00	15:15	0	0	0	0	15	0	9	24	**24**	13	168	0	181	0	147	9	156	**337**	**361**
15:15	15:30	0	0	0	0	10	0	7	17	**17**	16	187	0	203	0	125	15	140	**343**	**360**
15:30	15:45	0	0	0	0	11	0	9	20	**20**	18	206	0	224	0	126	3	129	**353**	**373**
15:45	16:00	0	0	0	0	8	0	7	15	**15**	11	224	0	235	0	123	12	135	**370**	**385**
16:00	16:15	0	0	0	0	6	0	12	18	**18**	19	232	0	251	0	136	10	146	**397**	**415**
16:15	16:30	0	0	0	0	13	0	10	23	**23**	19	237	0	256	0	132	8	140	**396**	**419**
16:30	16:45	0	0	0	0	23	0	13	36	**36**	16	202	0	218	0	125	14	139	**357**	**393**
16:45	17:00	0	0	0	0	23	0	7	30	**30**	10	176	0	186	0	106	8	114	**300**	**330**
17:00	17:15	0	0	0	0	16	0	11	27	**27**	17	235	0	252	0	140	8	148	**400**	**427**
17:15	17:30	0	0	0	0	13	0	11	24	**24**	18	204	0	222	0	105	11	116	**338**	**362**
17:30	17:45	0	0	0	0	7	0	9	16	**16**	9	205	0	214	0	123	7	130	**344**	**360**
17:45	18:00	0	0	0	0	17	0	6	23	**23**	15	177	0	192	0	142	10	152	**344**	**367**
Total:		0	0	0	0	229	0	217	446	**446**	429	4395	0	4824	0	4723	284	5007	**446**	**10,277**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ST. JOSEPH BLVD @ 193 E OF PLACE D'ORLEAN-W/PL

Survey Date: Tuesday, February 06, 2018 **WO No:** 37493

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

Full Study Cyclist Volume

		193 E OF PLACE D'ORLEAN-W/PLACE D'ORLEANS SC			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**
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		0	0	**0**	0	0	**0**	**0**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ST. JOSEPH BLVD @ 193 E OF PLACE D'ORLEAN-W/PL

Survey Date: Tuesday, February 06, 2018 **WO No:** 37493

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

Full Study Pedestrian Volume

	193 E OF PLACE D'ORLEAN-W/PLACE D'ORLEANS SC			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	1	**1**	0	0	**0**	**1**
07:15 07:30	0	0	**0**	0	0	**0**	**0**
07:30 07:45	0	1	**1**	0	0	**0**	**1**
07:45 08:00	0	1	**1**	1	2	**3**	**4**
08:00 08:15	0	0	**0**	0	0	**0**	**0**
08:15 08:30	0	1	**1**	0	0	**0**	**1**
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	1	**1**	0	1	**1**	**2**
09:30 09:45	0	1	**1**	1	0	**1**	**2**
09:45 10:00	0	1	**1**	0	0	**0**	**1**
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	2	**2**	0	0	**0**	**2**
12:15 12:30	0	1	**1**	0	0	**0**	**1**
12:30 12:45	0	2	**2**	0	0	**0**	**2**
12:45 13:00	0	3	**3**	0	0	**0**	**3**
13:00 13:15	0	3	**3**	0	0	**0**	**3**
13:15 13:30	0	3	**3**	0	0	**0**	**3**
15:00 15:15	0	0	**0**	0	0	**0**	**0**
15:15 15:30	0	2	**2**	2	0	**2**	**4**
15:30 15:45	0	3	**3**	0	0	**0**	**3**
15:45 16:00	0	0	**0**	0	0	**0**	**0**
16:00 16:15	0	1	**1**	1	0	**1**	**2**
16:15 16:30	0	0	**0**	0	1	**1**	**1**
16:30 16:45	0	1	**1**	0	0	**0**	**1**
16:45 17:00	0	0	**0**	0	0	**0**	**0**
17:00 17:15	0	0	**0**	0	1	**1**	**1**
17:15 17:30	0	3	**3**	2	0	**2**	**5**
17:30 17:45	0	2	**2**	0	0	**0**	**2**
17:45 18:00	0	1	**1**	0	1	**1**	**2**
Total	0	34	**34**	7	6	**13**	**47**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ST. JOSEPH BLVD @ 193 E OF PLACE D'ORLEAN-W/PL

Survey Date: Tuesday, February 06, 2018 **WO No:** 37493

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

Full Study Heavy Vehicles

		193 E OF PLACE D'ORLEAN-W/PLACE D'ORLEANS SC									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	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	0	0	**0**	**2**	**2**
07:15	07:30	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	0	0	**0**	**1**	**1**
07:30	07:45	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	2	0	**2**	**3**	**3**
07:45	08:00	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	3	0	**3**	**5**	**5**
08:00	08:15	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	3	0	**3**	**6**	**6**
08:15	08:30	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	3	0	**3**	**3**	**3**
08:30	08:45	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	2	0	**2**	**5**	**5**
08:45	09:00	0	0	0	**0**	0	0	0	**0**	**0**	0	5	0	**5**	0	6	0	**6**	**11**	**11**
09:00	09:15	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	3	0	**3**	**3**	**3**
09:15	09:30	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	2	0	**2**	**5**	**5**
09:30	09:45	0	0	0	**0**	0	0	0	**0**	**0**	0	7	0	**7**	0	2	0	**2**	**9**	**9**
09:45	10:00	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	2	0	**2**	**4**	**4**
11:30	11:45	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	2	0	**2**	**5**	**5**
11:45	12:00	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	2	1	**3**	**6**	**6**
12:00	12:15	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	2	1	**3**	**5**	**5**
12:15	12:30	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	0	0	**0**	**2**	**2**
12:30	12:45	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	3	0	**3**	**4**	**4**
12:45	13:00	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	0	1	**1**	**3**	**3**
13:00	13:15	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	1	0	**1**	**2**	**2**
13:15	13:30	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	1	0	**1**	**1**	**1**
15:00	15:15	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	4	0	**4**	**7**	**7**
15:15	15:30	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**4**	0	5	0	**5**	**9**	**9**
15:30	15:45	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**4**	0	2	0	**2**	**6**	**6**
15:45	16:00	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	2	0	**2**	**4**	**4**
16:00	16:15	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	4	1	**5**	**7**	**7**
16:15	16:30	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	2	0	**2**	**4**	**4**
16:30	16:45	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	1	0	**1**	**2**	**2**
16:45	17:00	0	0	0	**0**	0	0	0	**0**	**0**	0	5	0	**5**	0	2	0	**2**	**7**	**7**
17:00	17:15	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	2	0	**2**	**4**	**4**
17:15	17:30	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	2	0	**2**	**3**	**3**
17:30	17:45	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	3	0	**3**	**3**	**3**
17:45	18:00	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	1	0	**1**	**1**	**1**
Total:	None	0	0	0	**0**	0	0	0	**0**	**0**	0	69	0	**69**	0	69	4	**73**	**142**	**142**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ST. JOSEPH BLVD @ 193 E OF PLACE D'ORLEAN-W/PL

Survey Date: Tuesday, February 06, 2018 **WO No:** 37493

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

Full Study 15 Minute U-Turn Total

Time Period		193 E OF PLACE D'ORLEAN-W/PLACE D'ORLEANS SC Northbound U-Turn Total	193 E OF PLACE D'ORLEAN-W/PLACE D'ORLEANS SC Southbound U-Turn Total	ST. JOSEPH BLVD Eastbound U-Turn Total	ST. JOSEPH BLVD 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	1	0	**1**
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	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	1	0	**1**

Transportation Services - Traffic Services

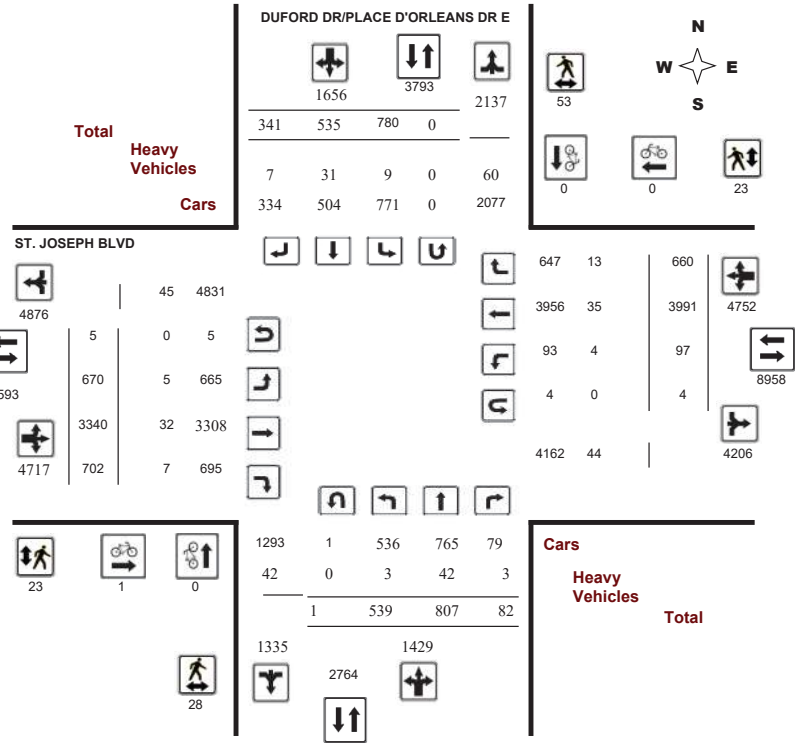
Turning Movement Count - Study Results

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 Diagram



Transportation Services - Traffic Services

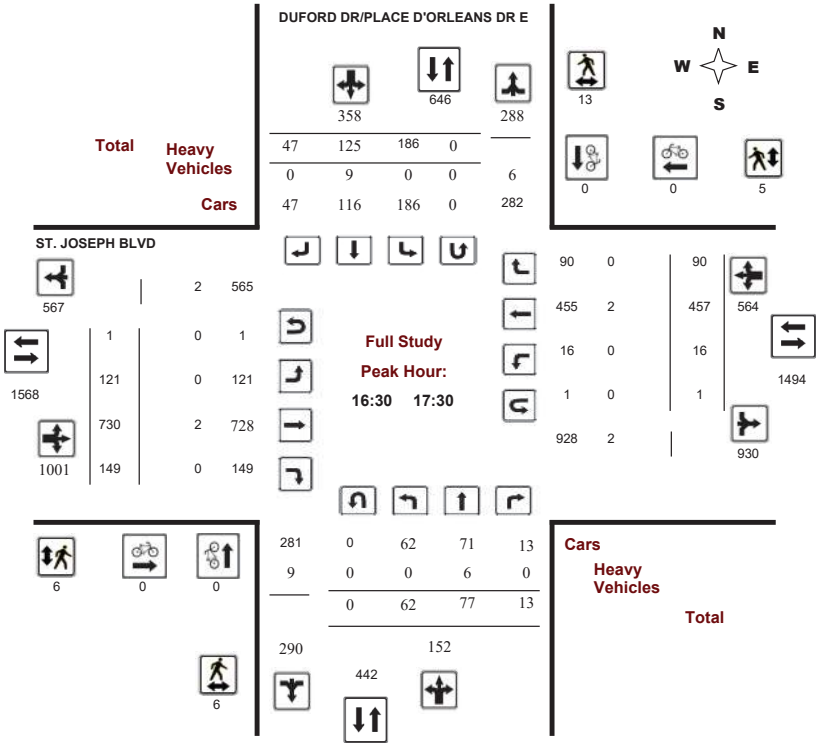
Turning Movement Count - Study Results

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



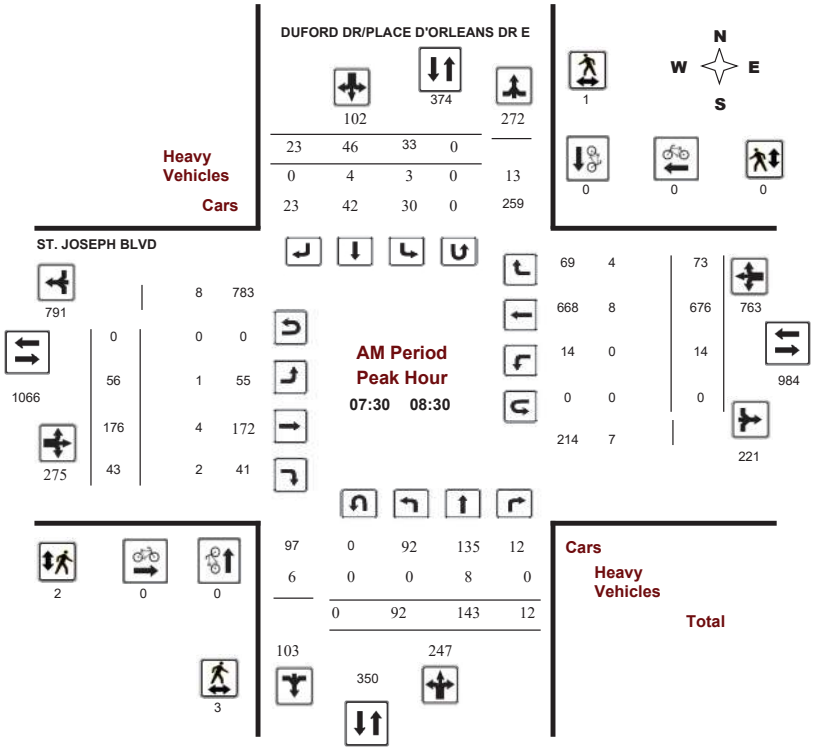
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

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

Survey Date: Tuesday, March 20, 2018 **WO No:** 37611

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



Comments

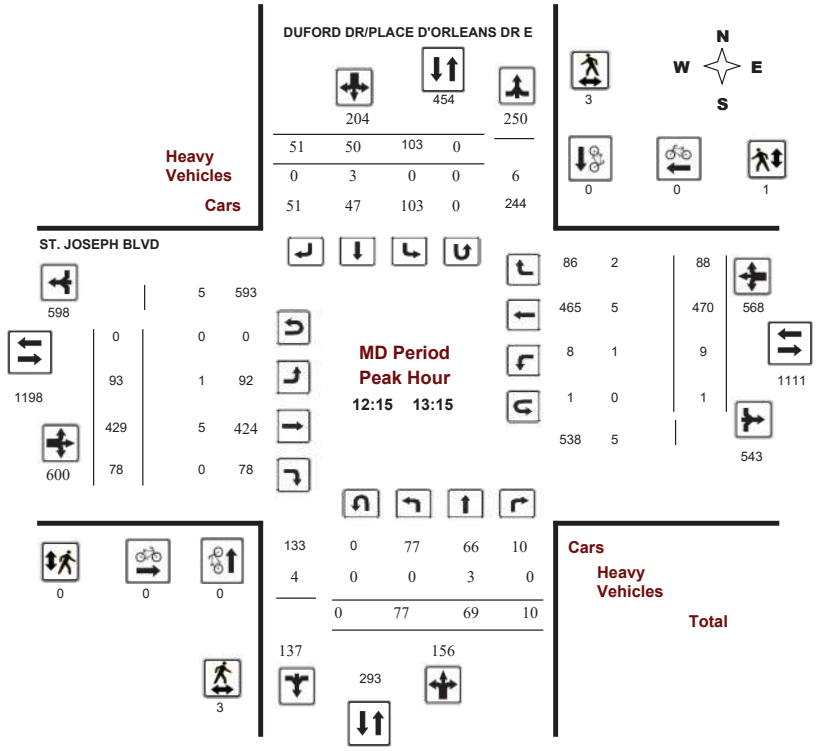
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

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

Survey Date: Tuesday, March 20, 2018 **WO No:** 37611

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



Comments

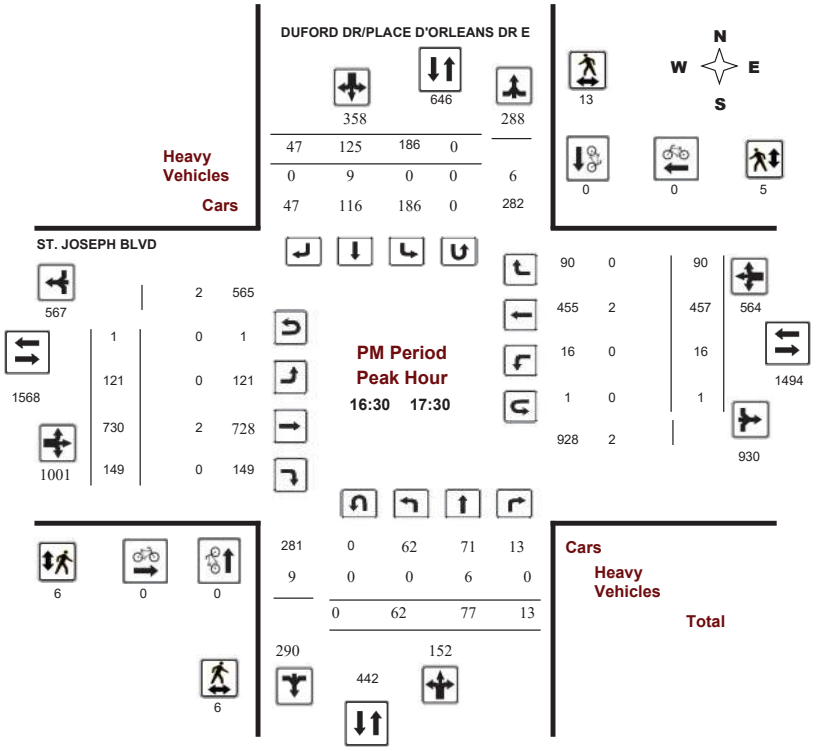
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

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

Survey Date: Tuesday, March 20, 2018 **WO No:** 37611

Start Time: 07:00 **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 **WO No:** 37611

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

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, March 20, 2018

Total Observed U-Turns

Northbound: 1 Southbound: 0

Eastbound: 5 Westbound: 4

AADT Factor 1.39

	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	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

Time Period		DUFORD DR/PLACE D'ORLEANS DR E			ST. JOSEPH BLVD			
		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

Time Period		DUFORD DR/PLACE D'ORLEANS DR E			ST. JOSEPH BLVD			
		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

Time Period		DUFORD DR/PLACE D'ORLEANS DR E									ST. JOSEPH BLVD									
		Northbound				Southbound					Eastbound				Westbound					
		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	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

Time Period		DUFORD DR/PLACE D'ORLEANS DR E		ST. JOSEPH BLVD		
		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

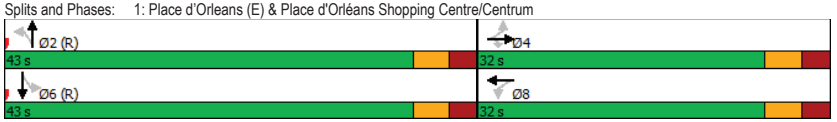
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	30	40	22	32	1	67	144	52	110	42	19
Future Volume (vph)	25	30	40	22	32	1	67	144	52	110	42	19
Satd. Flow (prot)	1658	1745	1483	1658	1737	0	0	3174	0	0	3151	0
Flt Permitted	0.733			0.736				0.836			0.676	
Satd. Flow (perm)	1270	1745	1456	1277	1737	0	0	2688	0	0	2198	0
Satd. Flow (RTOR)			44		1			57			21	
Lane Group Flow (vph)	28	33	44	24	37	0	0	292	0	0	190	0
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	10.0	10.0		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	
Total Lost Time (s)	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)	13.0	13.0	13.0	13.0	13.0			54.4			54.4	
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17			0.73			0.73	
v/c Ratio	0.13	0.11	0.15	0.11	0.12			0.15			0.12	
Control Delay	24.8	24.4	8.4	24.4	24.1			4.7			5.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	24.8	24.4	8.4	24.4	24.1			4.7			5.3	
LOS	C	C	A	C	C			A			A	
Approach Delay		17.8			24.2			4.7			5.3	
Approach LOS		B			C			A			A	
Queue Length 50th (m)	3.6	4.2	0.0	3.1	4.6			4.5			3.2	
Queue Length 95th (m)	7.8	8.6	6.2	7.1	9.2			15.3			11.5	
Internal Link Dist (m)		23.8			91.9			122.1			170.6	
Turn Bay Length (m)	52.0		20.0									
Base Capacity (vph)	440	604	533	442	602			1965			1600	
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	0.05	0.08	0.05	0.06			0.15			0.12	

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

Maximum v/c Ratio: 0.15

Intersection Signal Delay: 8.8	Intersection LOS: A
Intersection Capacity Utilization 59.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Place d'Orleans (E) & Place d'Orléans Shopping Centre/Centrum



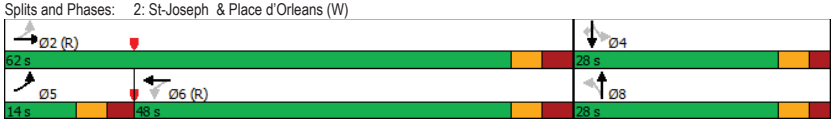
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	272	13	19	717	87	16	7	3	116	8	245
Future Volume (vph)	195	272	13	19	717	87	16	7	3	116	8	245
Satd. Flow (prot)	1658	3288	0	1658	3254	0	1658	1664	0	1658	1745	1483
Flt Permitted	0.233			0.560			0.752			0.750		
Satd. Flow (perm)	405	3288	0	968	3254	0	1304	1664	0	1296	1745	1457
Satd. Flow (RTOR)		10			19			3				257
Lane Group Flow (vph)	217	316	0	21	894	0	18	11	0	129	9	272
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	11.2	38.8		38.8	38.8		27.7	27.7		27.7	27.7	27.7
Total Split (s)	14.0	62.0		48.0	48.0		28.0	28.0		28.0	28.0	28.0
Total Split (%)	15.6%	68.9%		53.3%	53.3%		31.1%	31.1%		31.1%	31.1%	31.1%
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)	2.9	3.5		3.5	3.5		2.4	2.4		2.4	2.4	2.4
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)	6.2	6.8		6.8	6.8		5.7	5.7		5.7	5.7	5.7
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	63.2	62.6		47.7	47.7		14.9	14.9		14.9	14.9	14.9
Actuated g/C Ratio	0.70	0.70		0.53	0.53		0.17	0.17		0.17	0.17	0.17
v/c Ratio	0.54	0.14		0.04	0.52		0.08	0.04		0.60	0.03	0.60
Control Delay	10.5	5.2		8.1	13.1		29.9	24.9		45.7	28.5	10.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	10.5	5.2		8.1	13.1		29.9	24.9		45.7	28.5	10.9
LOS	B	A		A	B		C	C		D	C	B
Approach Delay		7.4			13.0			28.0			22.2	
Approach LOS		A			B			C			C	
Queue Length 50th (m)	10.6	7.7		1.7	48.7		2.7	1.2		21.1	1.3	2.2
Queue Length 95th (m)	24.6	16.1		3.3	76.3		7.7	5.1		35.1	4.8	21.3
Internal Link Dist (m)		46.9			172.0			20.4			94.2	
Turn Bay Length (m)	60.0			50.0								70.0
Base Capacity (vph)	408	2289		512	1732		323	414		321	432	554
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	0.53	0.14		0.04	0.52		0.06	0.03		0.40	0.02	0.49

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 50 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 13.6	Intersection LOS: B
Intersection Capacity Utilization 67.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: St-Joseph & Place d'Orleans (W)



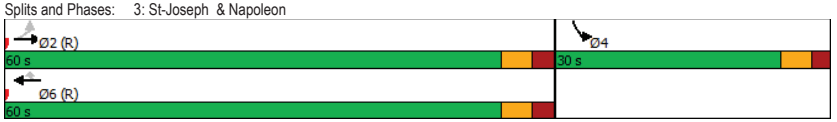
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	35	351	818	30	4	9
Future Volume (vph)	35	351	818	30	4	9
Satd. Flow (prot)	1658	3316	3316	1483	1541	0
Flt Permitted	0.314				0.986	
Satd. Flow (perm)	547	3316	3316	1448	1540	0
Satd. Flow (RTOR)				30	10	
Lane Group Flow (vph)	39	390	909	33	14	0
Turn Type	Perm	NA	NA	Perm	Prot	
Protected Phases		2	6		4	
Permitted Phases	2			6		
Detector Phase	2	2	6	6	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	23.9	23.9	27.9	27.9	29.5	
Total Split (s)	60.0	60.0	60.0	60.0	30.0	
Total Split (%)	66.7%	66.7%	66.7%	66.7%	33.3%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.6	2.6	2.6	2.6	2.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9	5.9	5.9	5.9	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	
Act Effct Green (s)	82.9	82.9	82.9	82.9	12.8	
Actuated g/C Ratio	0.92	0.92	0.92	0.92	0.14	
v/c Ratio	0.08	0.13	0.30	0.02	0.06	
Control Delay	2.6	1.6	3.0	2.0	18.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.6	1.6	3.0	2.0	18.6	
LOS	A	A	A	A	B	
Approach Delay		1.7	2.9		18.6	
Approach LOS		A	A		B	
Queue Length 50th (m)	0.0	0.0	0.0	0.0	0.6	
Queue Length 95th (m)	3.9	11.5	53.8	3.5	4.9	
Internal Link Dist (m)		172.0	281.0		52.2	
Turn Bay Length (m)	80.0			25.0		
Base Capacity (vph)	504	3055	3055	1336	426	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.08	0.13	0.30	0.02	0.03	

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 24 (27%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.30

Intersection Signal Delay: 2.7	Intersection LOS: A
Intersection Capacity Utilization 48.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: St-Joseph & Napoleon

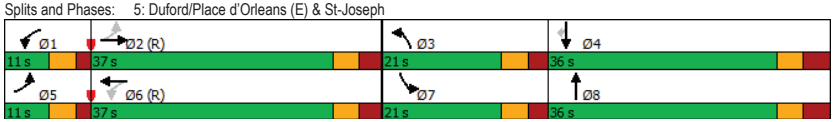


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	256	43	14	676	73	92	143	12	33	46	23
Future Volume (vph)	56	256	43	14	676	73	92	143	12	33	46	23
Satd. Flow (prot)	1658	3230	0	1658	3262	0	1658	1726	0	1658	1745	1483
Flt Permitted	0.126			0.551			0.950			0.950		
Satd. Flow (perm)	220	3230	0	958	3262	0	1654	1726	0	1658	1745	1462
Satd. Flow (RTOR)		18			11			4				150
Lane Group Flow (vph)	62	332	0	16	832	0	102	172	0	37	51	26
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6								4
Detector Phase	5	2		1	6		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	10.0		5.0	10.0	10.0
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	Max		None	Max	Max
Act Effct Green (s)	40.6	37.3		38.4	32.9		11.5	41.2		7.9	32.8	32.8
Actuated g/C Ratio	0.39	0.36		0.37	0.31		0.11	0.39		0.08	0.31	0.31
v/c Ratio	0.38	0.29		0.04	0.81		0.56	0.25		0.30	0.09	0.05
Control Delay	26.4	24.9		19.2	40.9		55.9	24.4		51.5	27.8	0.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	26.4	24.9		19.2	40.9		55.9	24.4		51.5	27.8	0.2
LOS	C	C		B	D		E	C		D	C	A
Approach Delay		25.1			40.5			36.1			29.2	
Approach LOS		C			D			D			C	
Queue Length 50th (m)	7.7	22.1		1.9	83.6		20.1	24.5		7.3	7.4	0.0
Queue Length 95th (m)	15.9	38.6		6.1	#115.6		35.5	43.1		16.9	17.0	0.0
Internal Link Dist (m)		281.0			131.7			117.2			122.1	
Turn Bay Length (m)	70.0			50.0			17.0			50.0		
Base Capacity (vph)	163	1159		389	1029		240	679		240	545	560
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	0.38	0.29		0.04	0.81		0.42	0.25		0.15	0.09	0.05

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 105
Offset: 47 (45%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81
Intersection Signal Delay: 35.2 — Intersection LOS: D
Intersection Capacity Utilization 70.7% — 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: 5: Duford/Place d'Orleans (E) & St-Joseph

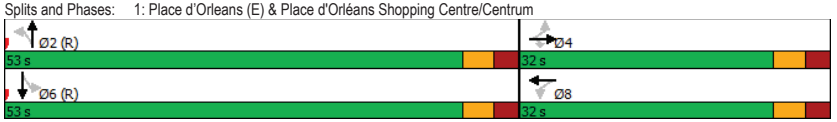


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	56	220	41	45	0	102	153	65	108	130	42
Future Volume (vph)	94	56	220	41	45	0	102	153	65	108	130	42
Satd. Flow (prot)	1658	1745	1483	1658	1745	0	0	3147	0	0	3166	0
Flt Permitted	0.724			0.717				0.751			0.711	
Satd. Flow (perm)	1247	1745	1448	1237	1745	0	0	2399	0	0	2291	0
Satd. Flow (RTOR)			244					59			38	
Lane Group Flow (vph)	104	62	244	46	50	0	0	355	0	0	311	0
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	10.0	10.0		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%	
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?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	14.4	14.4	14.4	14.4	14.4			58.6			58.6	
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17			0.69			0.69	
v/c Ratio	0.49	0.21	0.54	0.22	0.17			0.21			0.20	
Control Delay	38.4	29.7	8.5	30.4	28.9			5.2			5.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	38.4	29.7	8.5	30.4	28.9			5.2			5.4	
LOS	D	C	A	C	C			A			A	
Approach Delay		19.3			29.6			5.2			5.4	
Approach LOS		B			C			A			A	
Queue Length 50th (m)	16.0	9.0	0.0	6.7	7.3			6.9			6.3	
Queue Length 95th (m)	25.9	16.1	15.7	13.3	13.8			18.7			17.3	
Internal Link Dist (m)		23.8			91.9			122.1			170.6	
Turn Bay Length (m)	52.0		20.0									
Base Capacity (vph)	381	533	612	378	533			1671			1590	
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	0.27	0.12	0.40	0.12	0.09			0.21			0.20	

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
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.54
Intersection Signal Delay: 12.2 — Intersection LOS: B
Intersection Capacity Utilization 80.0% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: Place d'Orleans (E) & Place d'Orléans Shopping Centre/Centrum

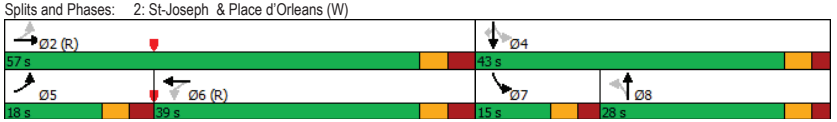


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	330	813	34	28	433	103	23	17	3	174	13	333
Future Volume (vph)	330	813	34	28	433	103	23	17	3	174	13	333
Satd. Flow (prot)	1658	3291	0	1658	3199	0	1658	1704	0	1658	1745	1483
Flt Permitted	0.318			0.304			0.748			0.433		
Satd. Flow (perm)	551	3291	0	528	3199	0	1288	1704	0	746	1745	1445
Satd. Flow (RTOR)		6			30			3				370
Lane Group Flow (vph)	367	941	0	31	595	0	26	22	0	193	14	370
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases	5	2			6			8		7	4	
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.2	38.8		38.8	38.8		27.7	27.7		11.0	27.7	27.7
Total Split (s)	18.0	57.0		39.0	39.0		28.0	28.0		15.0	43.0	43.0
Total Split (%)	18.0%	57.0%		39.0%	39.0%		28.0%	28.0%		15.0%	43.0%	43.0%
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)	2.9	3.5		3.5	3.5		2.4	2.4		2.7	2.4	2.4
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)	6.2	6.8		6.8	6.8		5.7	5.7		6.0	5.7	5.7
Lead/Lag	Lead			Lag	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes		
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	66.7	66.1		42.8	42.8		12.4	12.4		21.1	21.4	21.4
Actuated g/C Ratio	0.67	0.66		0.43	0.43		0.12	0.12		0.21	0.21	0.21
v/c Ratio	0.66	0.43		0.14	0.43		0.16	0.10		0.80	0.04	0.62
Control Delay	18.1	10.6		17.6	16.2		39.4	33.8		57.0	24.8	7.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	18.1	10.6		17.6	16.2		39.4	33.8		57.0	24.8	7.5
LOS	B	B		B	B		D	C		E	C	A
Approach Delay		12.7			16.3			36.8			24.5	
Approach LOS		B			B			D			C	
Queue Length 50th (m)	30.7	45.7		2.2	45.8		4.7	3.4		32.0	2.1	0.0
Queue Length 95th (m)	#87.4	81.6		5.7	27.2		10.9	9.1		43.8	5.7	17.8
Internal Link Dist (m)		46.9			172.0			20.4			94.2	
Turn Bay Length (m)	60.0			50.0								70.0
Base Capacity (vph)	556	2177		226	1387		287	382		241	650	770
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	0.66	0.43		0.14	0.43		0.09	0.06		0.80	0.02	0.48

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 61 (61%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80
Intersection Signal Delay: 16.7 Intersection LOS: B
Intersection Capacity Utilization 78.8% 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: 2: St-Joseph & Place d'Orleans (W)



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	940	516	44	50	42
Future Volume (vph)	65	940	516	44	50	42
Satd. Flow (prot)	1658	3316	3316	1483	1585	0
Flt Permitted	0.395				0.974	
Satd. Flow (perm)	688	3316	3316	1447	1584	0
Satd. Flow (RTOR)				44	42	
Lane Group Flow (vph)	72	1044	573	49	103	0
Turn Type	pm+pt	NA	NA	Perm	Prot	
Protected Phases	5	2	6		4	
Permitted Phases	2			6		
Detector Phase	5	2	6	6	4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	10.9	23.9	27.9	27.9	29.5	
Total Split (s)	18.0	67.0	49.0	49.0	33.0	
Total Split (%)	18.0%	67.0%	49.0%	49.0%	33.0%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.6	2.6	2.6	2.6	2.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9	5.9	5.9	5.9	5.5	
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	
Act Effct Green (s)	78.6	79.8	69.5	69.5	13.1	
Actuated g/C Ratio	0.79	0.80	0.70	0.70	0.13	
v/c Ratio	0.12	0.39	0.25	0.05	0.42	
Control Delay	2.8	3.0	8.8	4.0	28.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.8	3.0	8.8	4.0	28.7	
LOS	A	A	A	A	C	
Approach Delay		3.0	8.4		28.7	
Approach LOS		A	A		C	
Queue Length 50th (m)	2.3	18.8	21.3	0.3	11.3	
Queue Length 95th (m)	m4.5	23.3	45.5	6.0	23.0	
Internal Link Dist (m)		172.0	281.0		52.2	
Turn Bay Length (m)	80.0			25.0		
Base Capacity (vph)	658	2646	2304	1019	466	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.11	0.39	0.25	0.05	0.22	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 66 (66%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 6.3	Intersection LOS: A
Intersection Capacity Utilization 45.6%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 3: St-Joseph & Napoleon

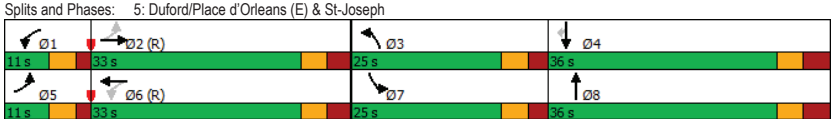
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	730	149	17	457	90	62	97	13	186	155	47
Future Volume (vph)	122	730	149	17	457	90	62	97	13	186	155	47
Satd. Flow (prot)	1658	3215	0	1658	3218	0	1658	1712	0	1658	1745	1483
Flt Permitted	0.214			0.156			0.950			0.950		
Satd. Flow (perm)	371	3215	0	272	3218	0	1649	1712	0	1650	1745	1456
Satd. Flow (RTOR)		22			21			6				150
Lane Group Flow (vph)	136	977	0	19	608	0	69	122	0	207	172	52
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6								4
Detector Phase	5	2		1	6		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	10.0		5.0	10.0	10.0
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%
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	Max		None	Max	Max
Act Effct Green (s)	36.6	33.3		33.4	26.7		9.7	31.4		16.9	40.9	40.9
Actuated g/C Ratio	0.35	0.32		0.32	0.25		0.09	0.30		0.16	0.39	0.39
v/c Ratio	0.69	0.94		0.12	0.73		0.45	0.24		0.78	0.25	0.08
Control Delay	44.5	53.4		23.1	40.5		53.6	28.8		62.1	24.9	0.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	44.5	53.4		23.1	40.5		53.6	28.8		62.1	24.9	0.2
LOS	D	D		C	D		D	C		E	C	A
Approach Delay		52.3			40.0			37.8			39.8	
Approach LOS		D			D			D			D	
Queue Length 50th (m)	18.9	93.2		2.5	58.0		13.6	18.2		40.3	24.4	0.0
Queue Length 95th (m)	#41.0	#164.1		7.3	77.6		26.3	33.3		#68.0	43.0	0.0
Internal Link Dist (m)		281.0			131.7			117.2			122.1	
Turn Bay Length (m)	70.0			50.0			17.0			50.0		
Base Capacity (vph)	198	1034		161	833		303	516		303	680	659
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	0.69	0.94		0.12	0.73		0.23	0.24		0.68	0.25	0.08

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
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94
Intersection Signal Delay: 45.6 — Intersection LOS: D
Intersection Capacity Utilization 85.9% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Duford/Place d'Orleans (E) & St-Joseph



Appendix D

Collision Data

CGH TRANSPORTATION

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Traffic Control Condition	Classification Of Accident	Initial Impact Type	Road Surface Condition	# Vehicles	# Motorcycles	# Bicycles	# Pedestrians
8/30/2016	2016	21:55	PLACE D'ORLEANS DR btwn CENTRUM BLVD & ST. JOSEPH BLVD (__3ZA2FM)	01 - Clear	07 - Dark	10 - No control	0	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	1	0	0
1/28/2017	2017	18:36	PLACE D'ORLEANS DR btwn CENTRUM BLVD & ST. JOSEPH BLVD (__3ZA2FM)	01 - Clear	07 - Dark	10 - No control	0	03 - P.D. only	05 - Turning movement	02 - Wet	2	0	0	0
11/1/2018	2018	7:11	PLACE D'ORLEANS DR btwn CENTRUM BLVD & ST. JOSEPH BLVD (__3ZA2FM)	07 - Fog, mist, smoke, dust	03 - Dawn	10 - No control	0	02 - Non-fatal injury	07 - SMV other	01 - Dry	1	0	0	0
3/25/2018	2018	23:11	PLACE D'ORLEANS DR btwn CENTRUM BLVD & ST. JOSEPH BLVD (__3ZA2FM)	01 - Clear	07 - Dark	10 - No control	0	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
5/29/2018	2018	14:39	PLACE D'ORLEANS DR btwn CENTRUM BLVD & ST. JOSEPH BLVD (__3ZA2FM)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
10/23/2019	2019	16:36	PLACE D'ORLEANS DR btwn CENTRUM BLVD & ST. JOSEPH BLVD (__3ZA2FM)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
4/22/2020	2020	10:10	PLACE D'ORLEANS DR btwn CENTRUM BLVD & ST. JOSEPH BLVD (__3ZA2FM)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
10/5/2016	2016	7:50	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
3/5/2016	2016	14:22	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	03 - Rear end	01 - Dry	2	0	0	0
9/9/2016	2016	11:59	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	07 - SMV other	01 - Dry	1	0	0	0
10/2/2017	2017	12:10	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	05 - Turning movement	01 - Dry	3	0	0	0
11/15/2017	2017	8:20	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	03 - Rear end	01 - Dry	2	0	0	0
3/15/2017	2017	8:20	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	03 - Snow	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	03 - Loose snow	2	0	0	0
11/2/2018	2018	6:58	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	02 - Rain	03 - Dawn	01 - Traffic signal	01 - Functioning	03 - P.D. only	07 - SMV other	02 - Wet	1	0	0	1
10/20/2018	2018	15:08	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	03 - Rear end	01 - Dry	2	0	0	0
1/6/2018	2018	15:47	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	0	0	0
9/25/2018	2018	13:50	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	02 - Rain	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	02 - Wet	2	0	0	0
8/28/2019	2019	20:07	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	01 - Clear	05 - Dusk	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
10/18/2019	2019	17:07	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
1/23/2019	2019	10:09	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	03 - Snow	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	05 - Packed snow	2	0	0	0
12/13/2019	2019	21:00	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
4/9/2019	2019	7:31	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	03 - Snow	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	07 - SMV other	06 - Ice	1	0	0	0
4/14/2019	2019	21:07	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	02 - Rain	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	02 - Wet	2	0	0	0
8/10/2019	2019	17:40	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
1/6/2020	2020	13:52	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	03 - Snow	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	05 - Packed snow	2	0	0	0
2/21/2020	2020	16:50	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
3/16/2020	2020	15:18	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
5/24/2020	2020	16:33	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	03 - Rear end	01 - Dry	2	0	0	0
8/19/2020	2020	16:57	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
11/19/2020	2020	13:09	ST. JOSEPH BLVD @ DUFORD DR/PLACE D'ORLEANS DR (0003629)	02 - Rain	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	02 - Wet	2	0	0	0
5/31/2019	2019	16:41	ST. JOSEPH BLVD btwn PLACE D'ORLEANS DR & PRESTONE DR (__3ZA3YQ)	01 - Clear	01 - Daylight	10 - No control	0	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	0	0	0
5/18/2019	2019	7:07	ST. JOSEPH BLVD btwn PLACE D'ORLEANS DR & PRESTONE DR (__3ZA3YQ)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	07 - SMV other	01 - Dry	1	0	0	0
12/19/2016	2016	16:40	ST. JOSEPH BLVD btwn ST. JOSEPH BLVD & PLACE D'ORLEANS DR (__3ZA2AV)	01 - Clear	05 - Dusk	10 - No control	0	03 - P.D. only	02 - Angle	05 - Packed snow	2	0	0	0
3/16/2016	2016	15:04	ST. JOSEPH BLVD btwn ST. JOSEPH BLVD & PLACE D'ORLEANS DR (__3ZA2AV)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
12/21/2017	2017	16:55	ST. JOSEPH BLVD btwn ST. JOSEPH BLVD & PLACE D'ORLEANS DR (__3ZA2AV)	01 - Clear	05 - Dusk	10 - No control	0	03 - P.D. only	05 - Turning movement	02 - Wet	2	0	0	0
11/30/2018	2018	17:15	ST. JOSEPH BLVD btwn ST. JOSEPH BLVD & PLACE D'ORLEANS DR (__3ZA2AV)	01 - Clear	07 - Dark	10 - No control	0	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
5/29/2018	2018	18:45	ST. JOSEPH BLVD btwn ST. JOSEPH BLVD & PLACE D'ORLEANS DR (__3ZA2AV)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
8/2/2018	2018	15:40	ST. JOSEPH BLVD btwn ST. JOSEPH BLVD & PLACE D'ORLEANS DR (__3ZA2AV)	02 - Rain	01 - Daylight	10 - No control	0	02 - Non-fatal injury	02 - Angle	02 - Wet	2	0	1	0
12/16/2019	2019	18:33	ST. JOSEPH BLVD btwn ST. JOSEPH BLVD & PLACE D'ORLEANS DR (__3ZA2AV)	01 - Clear	07 - Dark	10 - No control	0	03 - P.D. only	02 - Angle	02 - Wet	2	0	0	0
1/2/2019	2019	16:50	ST. JOSEPH BLVD btwn ST. JOSEPH BLVD & PLACE D'ORLEANS DR (__3ZA2AV)	01 - Clear	05 - Dusk	10 - No control	0	03 - P.D. only	03 - Rear end	06 - Ice	2	0	0	0
3/1/2020	2020	11:50	ST. JOSEPH BLVD btwn ST. JOSEPH BLVD & PLACE D'ORLEANS DR (__3ZA2AV)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0

Appendix E

TRANS model plots

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

265 Centrum Boulevard

2011 Model - Basecase

N/A

User Initials: TIMW
Plot Prepared: January, 2023
EMME Scenario: 21713

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

N

Distance (m)

200 400 600 800 1000

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

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

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

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

265 Centrum Boulevard

2031 Model - Basecase

N/A

User Initials: TIMW
Plot Prepared: January, 2023
EMME Scenario: 21715

TRANS

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

N

Distance (m)

200 400 600 800 1000

Appendix F

Background Development Volumes

CGH TRANSPORTATION

Figure 8: Site-Generated Traffic Volumes

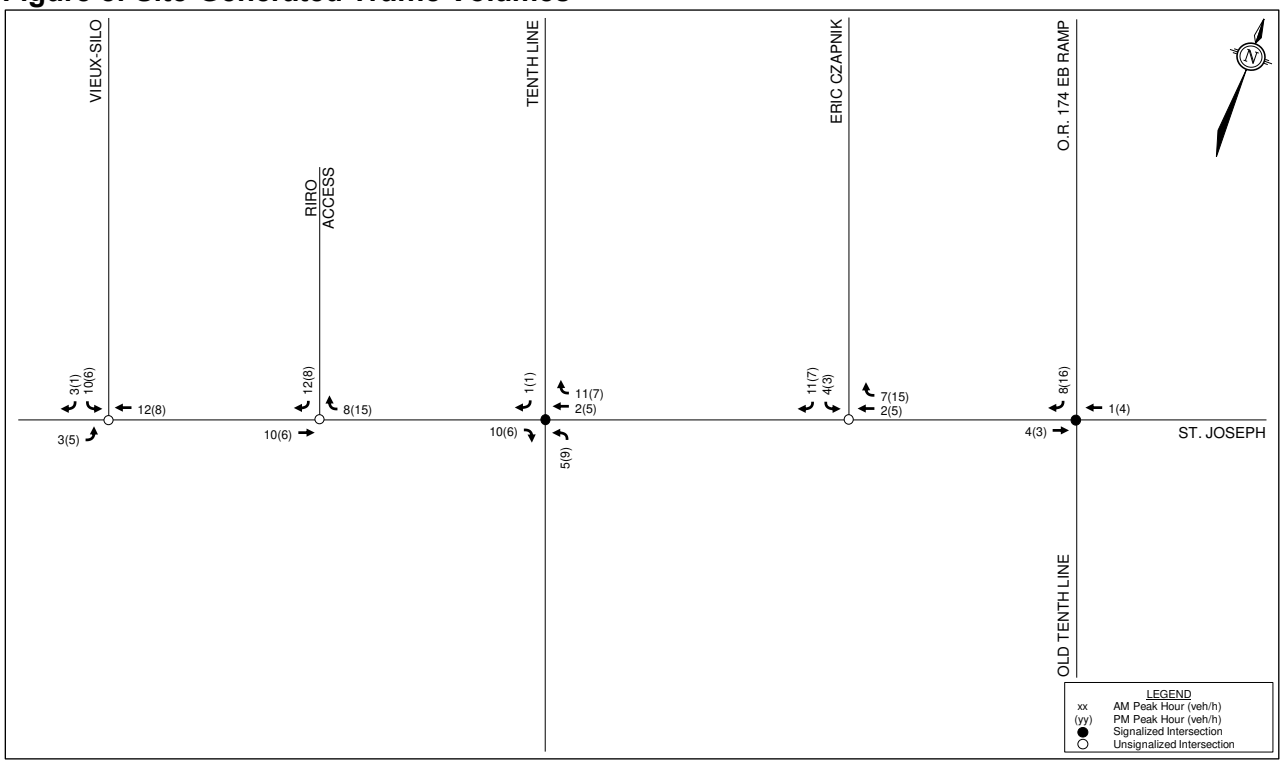
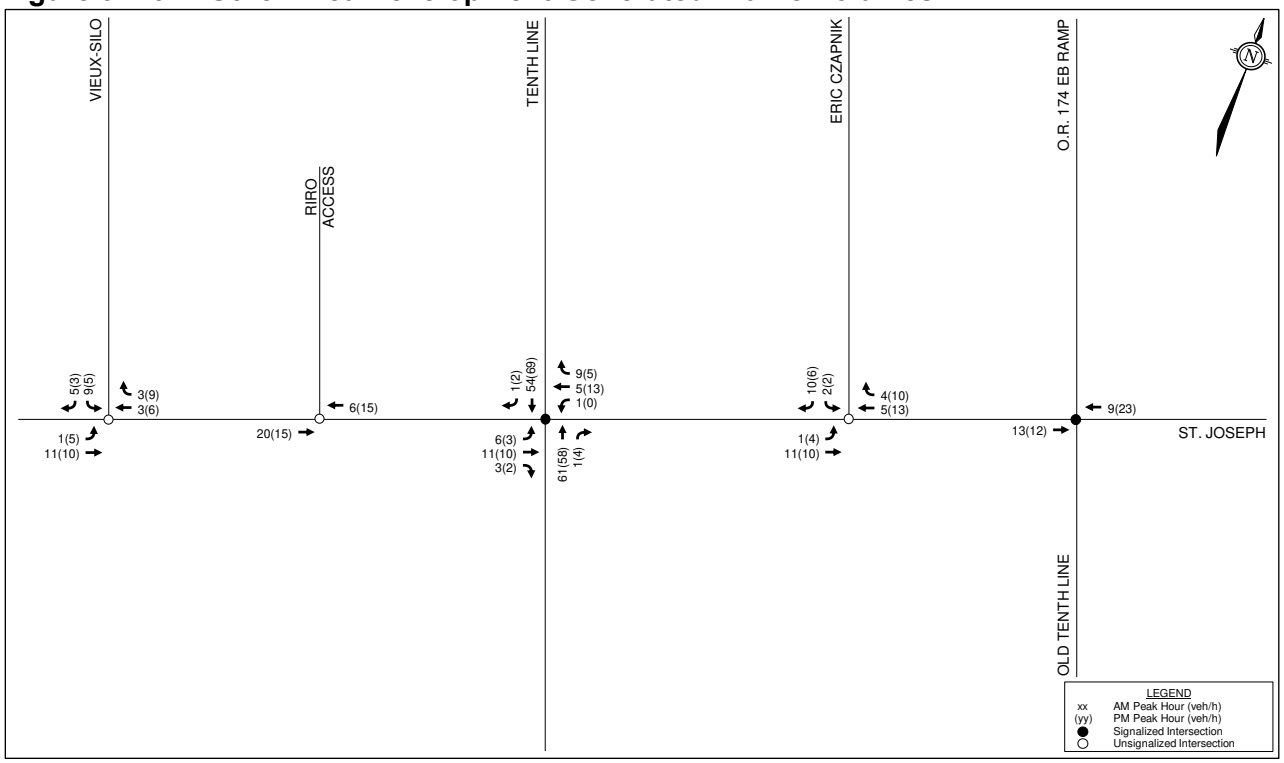


Figure 9: 2024 Other Area Development-Generated Traffic Volumes



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

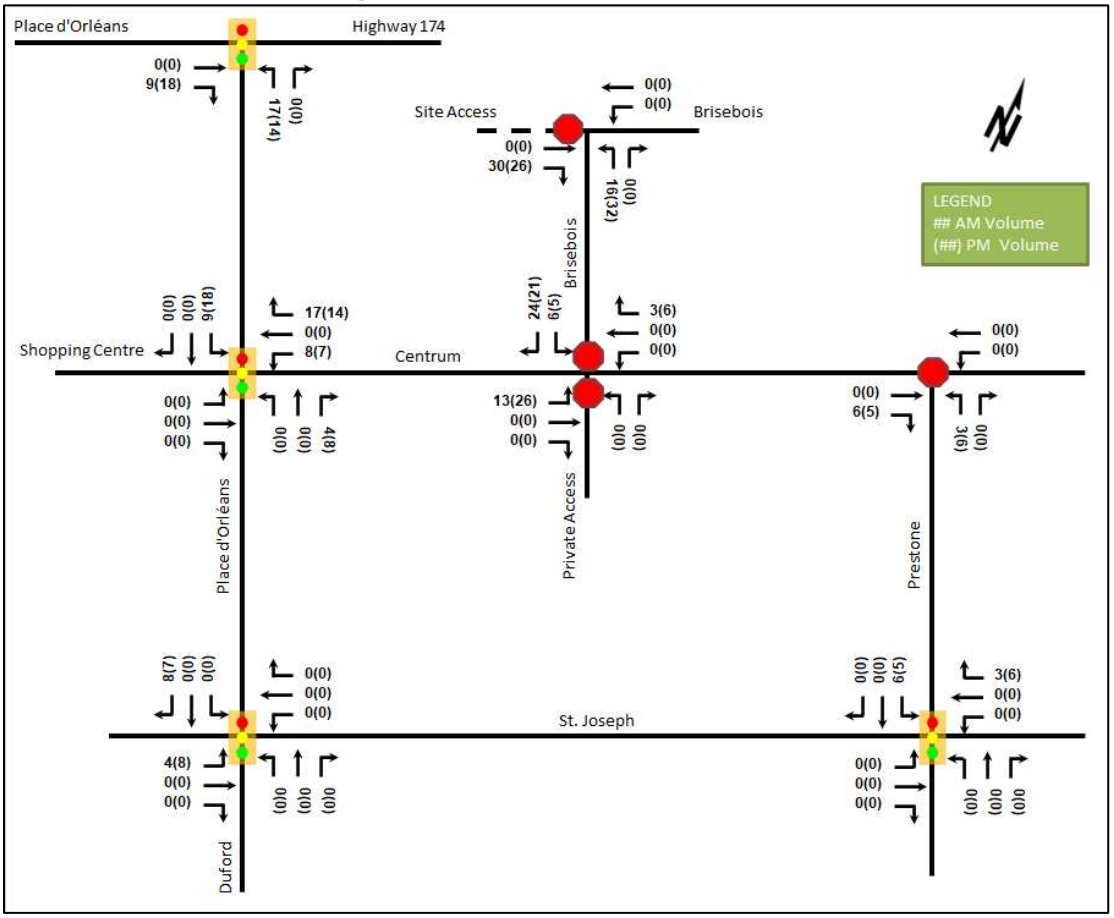


Figure 12: New Site Generation Auto Volumes

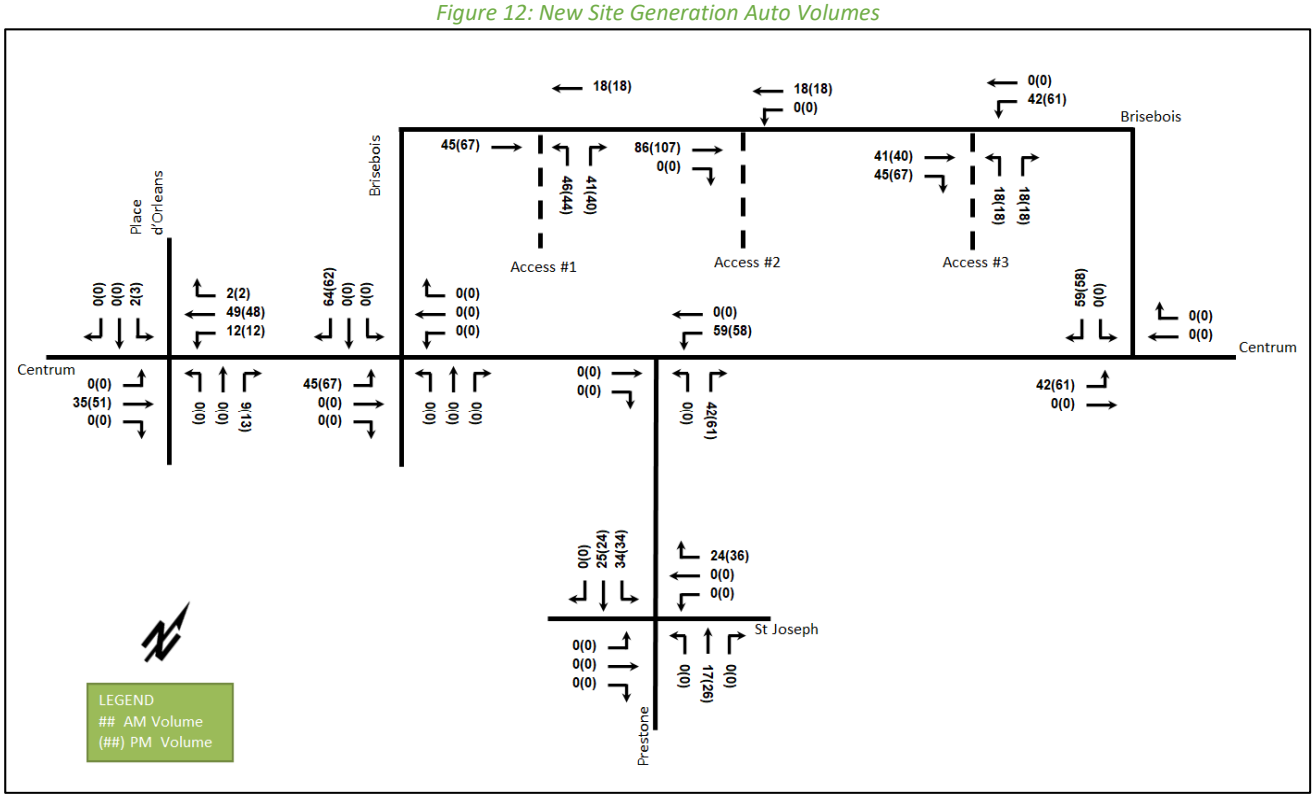


Figure 13: Pass-by Auto Volumes

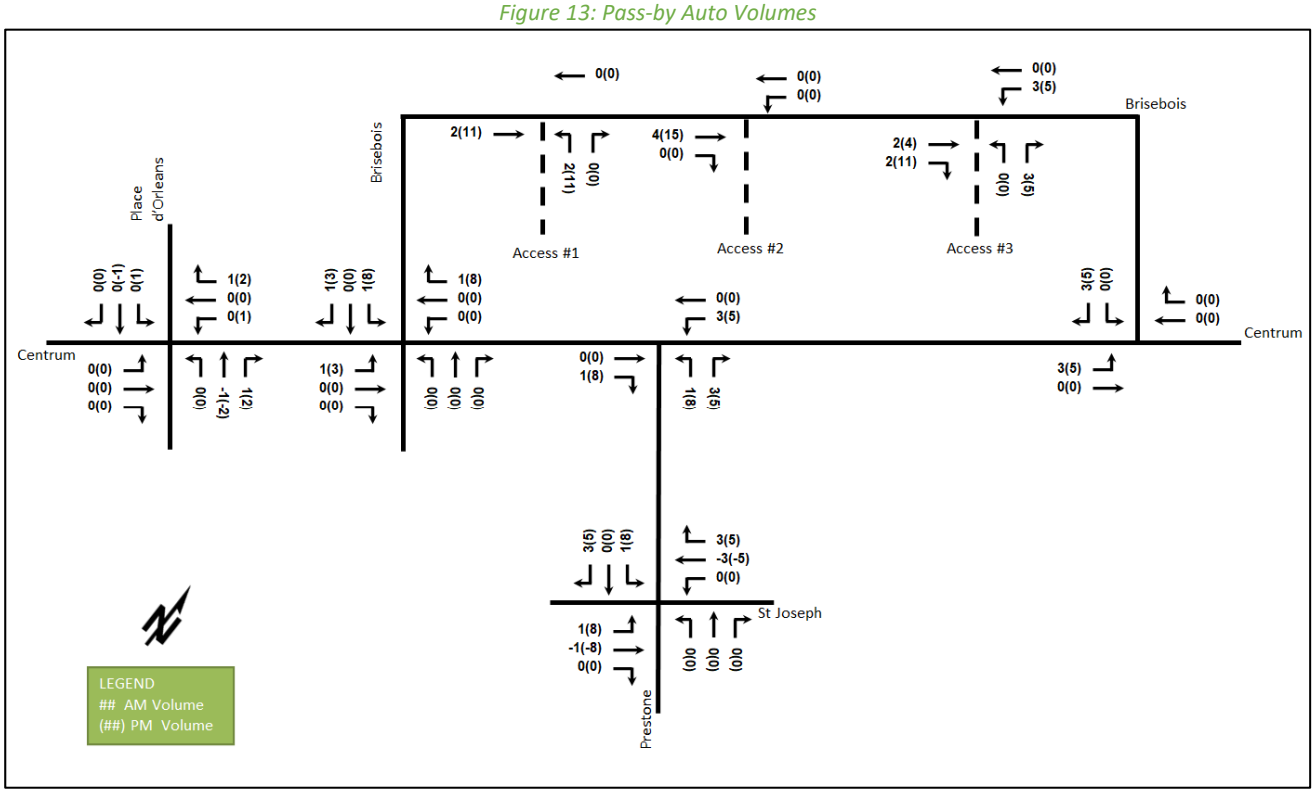
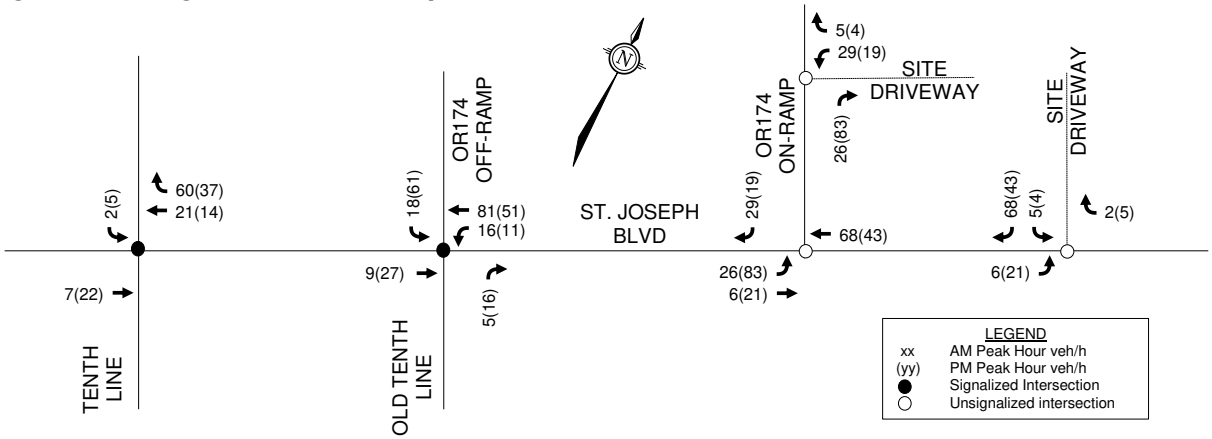


Figure 5: Assignment of Site Trips



Appendix G

Synchro Intersection Worksheets – 2025 Future Background Conditions

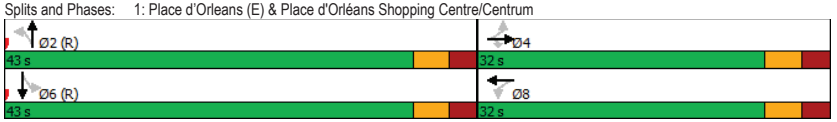
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	30	40	30	32	18	67	162	56	119	42	19
Future Volume (vph)	25	30	40	30	32	18	67	162	56	119	42	19
Satd. Flow (prot)	1658	1745	1483	1658	1640	0	0	3181	0	0	3151	0
Flt Permitted	0.724			0.738				0.849			0.678	
Satd. Flow (perm)	1255	1745	1456	1280	1640	0	0	2733	0	0	2207	0
Satd. Flow (RTOR)			44		18			56			19	
Lane Group Flow (vph)	25	30	40	30	50	0	0	285	0	0	180	0
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	10.0	10.0		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	
Total Lost Time (s)	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)	13.0	13.0	13.0	13.0	13.0			58.8			58.8	
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17			0.78			0.78	
v/c Ratio	0.12	0.10	0.14	0.14	0.17			0.13			0.10	
Control Delay	24.6	24.1	7.7	25.0	18.2			4.3			4.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	24.6	24.1	7.7	25.0	18.2			4.3			4.8	
LOS	C	C	A	C	B			A			A	
Approach Delay		17.3			20.8			4.3			4.8	
Approach LOS		B			C			A			A	
Queue Length 50th (m)	3.2	3.8	0.0	3.8	4.1			4.4			3.1	
Queue Length 95th (m)	7.3	8.1	5.5	8.3	9.9			14.8			11.1	
Internal Link Dist (m)		23.8			91.9			122.1			170.6	
Turn Bay Length (m)	52.0		20.0									
Base Capacity (vph)	435	604	533	443	580			2154			1734	
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	0.05	0.08	0.07	0.09			0.13			0.10	

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

Maximum v/c Ratio: 0.17

Intersection Signal Delay: 8.4	Intersection LOS: A
Intersection Capacity Utilization 60.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Place d'Orleans (E) & Place d'Orléans Shopping Centre/Centrum



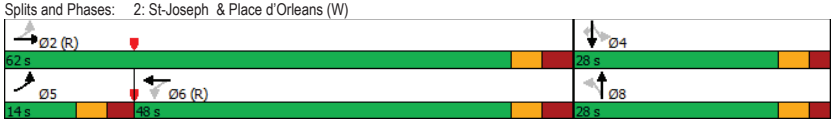
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	298	13	19	828	98	16	7	3	116	8	245
Future Volume (vph)	220	298	13	19	828	98	16	7	3	116	8	245
Satd. Flow (prot)	1658	3291	0	1658	3254	0	1658	1656	0	1658	1745	1483
Flt Permitted	0.223			0.563			0.752			0.751		
Satd. Flow (perm)	388	3291	0	974	3254	0	1304	1656	0	1298	1745	1457
Satd. Flow (RTOR)		9			19			3				245
Lane Group Flow (vph)	220	311	0	19	926	0	16	10	0	116	8	245
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	11.2	38.8		38.8	38.8		27.7	27.7		27.7	27.7	27.7
Total Split (s)	14.0	62.0		48.0	48.0		28.0	28.0		28.0	28.0	28.0
Total Split (%)	15.6%	68.9%		53.3%	53.3%		31.1%	31.1%		31.1%	31.1%	31.1%
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)	2.9	3.5		3.5	3.5		2.4	2.4		2.4	2.4	2.4
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)	6.2	6.8		6.8	6.8		5.7	5.7		5.7	5.7	5.7
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	63.7	63.1		48.1	48.1		14.4	14.4		14.4	14.4	14.4
Actuated g/C Ratio	0.71	0.70		0.53	0.53		0.16	0.16		0.16	0.16	0.16
v/c Ratio	0.55	0.13		0.04	0.53		0.08	0.04		0.56	0.03	0.56
Control Delay	10.8	5.1		7.5	12.9		30.1	24.8		44.3	28.8	9.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	10.8	5.1		7.5	12.9		30.1	24.8		44.3	28.8	9.4
LOS	B	A		A	B		C	C		D	C	A
Approach Delay		7.4			12.8			28.0			20.8	
Approach LOS		A			B			C			C	
Queue Length 50th (m)	10.3	7.3		1.5	50.0		2.4	1.1		19.0	1.2	0.0
Queue Length 95th (m)	24.9	15.8		2.9	79.6		7.1	4.8		31.9	4.4	17.5
Internal Link Dist (m)		46.9			172.0			20.4			94.2	
Turn Bay Length (m)	60.0			50.0								70.0
Base Capacity (vph)	401	2309		519	1746		323	412		321	432	545
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	0.55	0.13		0.04	0.53		0.05	0.02		0.36	0.02	0.45

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 50 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 13.1	Intersection LOS: B
Intersection Capacity Utilization 70.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: St-Joseph & Place d'Orleans (W)



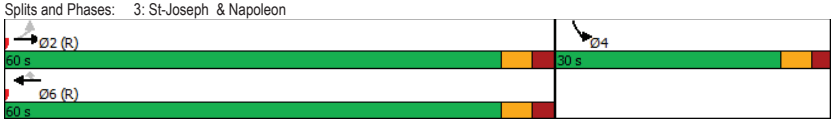
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	35	381	938	30	4	9
Future Volume (vph)	35	381	938	30	4	9
Satd. Flow (prot)	1658	3316	3316	1483	1545	0
Flt Permitted	0.304				0.985	
Satd. Flow (perm)	530	3316	3316	1448	1544	0
Satd. Flow (RTOR)				26	9	
Lane Group Flow (vph)	35	381	938	30	13	0
Turn Type	Perm	NA	NA	Perm	Prot	
Protected Phases		2	6		4	
Permitted Phases	2			6		
Detector Phase	2	2	6	6	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	23.9	23.9	27.9	27.9	29.5	
Total Split (s)	60.0	60.0	60.0	60.0	30.0	
Total Split (%)	66.7%	66.7%	66.7%	66.7%	33.3%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.6	2.6	2.6	2.6	2.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9	5.9	5.9	5.9	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	
Act Effct Green (s)	82.9	82.9	82.9	82.9	12.8	
Actuated g/C Ratio	0.92	0.92	0.92	0.92	0.14	
v/c Ratio	0.07	0.12	0.31	0.02	0.06	
Control Delay	2.7	1.6	3.0	2.1	19.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.7	1.6	3.0	2.1	19.4	
LOS	A	A	A	A	B	
Approach Delay		1.7	3.0		19.4	
Approach LOS		A	A		B	
Queue Length 50th (m)	0.0	0.0	0.0	0.0	0.6	
Queue Length 95th (m)	3.6	11.5	56.1	3.4	4.8	
Internal Link Dist (m)		172.0	281.0		52.2	
Turn Bay Length (m)	80.0			25.0		
Base Capacity (vph)	488	3055	3055	1336	427	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.07	0.12	0.31	0.02	0.03	

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 24 (27%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.31

Intersection Signal Delay: 2.7	Intersection LOS: A
Intersection Capacity Utilization 48.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: St-Joseph & Napoleon



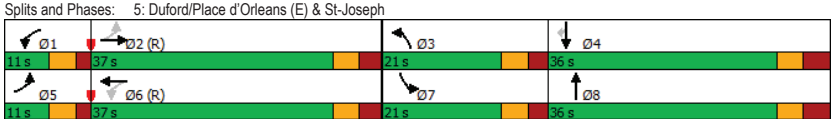
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	278	43	14	775	73	92	161	12	33	46	31
Future Volume (vph)	60	278	43	14	775	73	92	161	12	33	46	31
Satd. Flow (prot)	1658	3238	0	1658	3269	0	1658	1728	0	1658	1745	1483
Flt Permitted	0.126			0.557			0.950			0.950		
Satd. Flow (perm)	220	3238	0	968	3269	0	1654	1728	0	1658	1745	1462
Satd. Flow (RTOR)		17			9			4				150
Lane Group Flow (vph)	60	321	0	14	848	0	92	173	0	33	46	31
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6								4
Detector Phase	5	2		1	6		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	10.0		5.0	10.0	10.0
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	Max		None	Max	Max
Act Effct Green (s)	40.6	37.3		38.4	32.9		11.0	41.4		7.6	35.8	35.8
Actuated g/C Ratio	0.39	0.36		0.37	0.31		0.10	0.39		0.07	0.34	0.34
v/c Ratio	0.37	0.28		0.04	0.82		0.53	0.25		0.28	0.08	0.05
Control Delay	26.1	24.8		19.1	41.8		54.8	24.2		51.1	27.3	0.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	26.1	24.8		19.1	41.8		54.8	24.2		51.1	27.3	0.2
LOS	C	C		B	D		D	C		D	C	A
Approach Delay		25.0			41.4			34.9			26.8	
Approach LOS		C			D			C			C	
Queue Length 50th (m)	7.4	21.3		1.7	85.8		18.1	24.6		6.5	6.6	0.0
Queue Length 95th (m)	15.7	37.5		5.5	#119.3		32.6	43.1		15.6	15.7	0.0
Internal Link Dist (m)		281.0			131.7			117.2			122.1	
Turn Bay Length (m)	70.0			50.0			17.0			50.0		
Base Capacity (vph)	163	1161		392	1030		240	683		240	594	596
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	0.37	0.28		0.04	0.82		0.38	0.25		0.14	0.08	0.05

Intersection Summary

Cycle Length: 105
Actuated Cycle Length: 105
Offset: 47 (45%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82
Intersection Signal Delay: 35.5 — Intersection LOS: D
Intersection Capacity Utilization 73.6% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Duford/Place d'Orleans (E) & St-Joseph



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	57	220	48	46	14	102	153	73	126	146	42
Future Volume (vph)	94	57	220	48	46	14	102	153	73	126	146	42
Satd. Flow (prot)	1658	1745	1483	1658	1674	0	0	3139	0	0	3174	0
Flt Permitted	0.718			0.720				0.759			0.712	
Satd. Flow (perm)	1237	1745	1448	1242	1674	0	0	2416	0	0	2301	0
Satd. Flow (RTOR)			220		14			69			32	
Lane Group Flow (vph)	94	57	220	48	60	0	0	328	0	0	314	0
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	10.0	10.0		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%	
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?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	14.2	14.2	14.2	14.2	14.2			58.8			58.8	
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17			0.69			0.69	
v/c Ratio	0.46	0.20	0.52	0.23	0.21			0.19			0.20	
Control Delay	37.5	29.7	8.6	31.0	24.2			4.8			5.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	37.5	29.7	8.6	31.0	24.2			4.8			5.4	
LOS	D	C	A	C	C			A			A	
Approach Delay		19.2			27.3			4.8			5.4	
Approach LOS		B			C			A			A	
Queue Length 50th (m)	14.4	8.4	0.0	7.1	6.7			5.7			6.3	
Queue Length 95th (m)	23.7	15.2	15.1	13.8	14.1			16.6			17.8	
Internal Link Dist (m)		23.8			91.9			122.1			170.6	
Turn Bay Length (m)	52.0		20.0									
Base Capacity (vph)	378	533	595	379	521			1693			1602	
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	0.25	0.11	0.37	0.13	0.12			0.19			0.20	

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
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 11.9	Intersection LOS: B
Intersection Capacity Utilization 80.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Place d'Orleans (E) & Place d'Orléans Shopping Centre/Centrum

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	330	924	34	28	483	103	23	17	3	177	13	338
Future Volume (vph)	330	924	34	28	483	103	23	17	3	177	13	338
Satd. Flow (prot)	1658	3295	0	1658	3211	0	1658	1698	0	1658	1745	1483
Flt Permitted	0.336			0.299			0.749			0.434		
Satd. Flow (perm)	583	3295	0	520	3211	0	1290	1698	0	748	1745	1445
Satd. Flow (RTOR)		5			27			3				338
Lane Group Flow (vph)	330	958	0	28	586	0	23	20	0	177	13	338
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases	5	2			6			8		7	4	
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.2	38.8		38.8	38.8		27.7	27.7		11.0	27.7	27.7
Total Split (s)	18.0	57.0		39.0	39.0		28.0	28.0		15.0	43.0	43.0
Total Split (%)	18.0%	57.0%		39.0%	39.0%		28.0%	28.0%		15.0%	43.0%	43.0%
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)	2.9	3.5		3.5	3.5		2.4	2.4		2.7	2.4	2.4
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)	6.2	6.8		6.8	6.8		5.7	5.7		6.0	5.7	5.7
Lead/Lag	Lead			Lag	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes		
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	66.7	66.1		46.0	46.0		12.4	12.4		21.1	21.4	21.4
Actuated g/C Ratio	0.67	0.66		0.46	0.46		0.12	0.12		0.21	0.21	0.21
v/c Ratio	0.61	0.44		0.12	0.39		0.14	0.09		0.73	0.03	0.59
Control Delay	16.1	10.7		16.7	14.6		38.9	33.3		50.5	24.8	7.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	16.1	10.7		16.7	14.6		38.9	33.3		50.5	24.8	7.3
LOS	B	B		B	B		D	C		D	C	A
Approach Delay		12.1			14.7			36.3			22.2	
Approach LOS		B			B			D			C	
Queue Length 50th (m)	26.9	47.0		2.0	20.3		4.2	3.1		29.0	1.9	0.0
Queue Length 95th (m)	#65.0	83.4		5.2	26.4		10.1	8.7		40.2	5.4	17.1
Internal Link Dist (m)		46.9			172.0			20.4			94.2	
Turn Bay Length (m)	60.0			50.0								70.0
Base Capacity (vph)	541	2179		239	1491		287	380		242	650	750
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	0.61	0.44		0.12	0.39		0.08	0.05		0.73	0.02	0.45

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 61 (61%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73
Intersection Signal Delay: 15.3 Intersection LOS: B
Intersection Capacity Utilization 78.9% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: St-Joseph & Place d'Orleans (W)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	1063	570	44	50	42
Future Volume (vph)	65	1063	570	44	50	42
Satd. Flow (prot)	1658	3316	3316	1483	1585	0
Flt Permitted	0.397				0.974	
Satd. Flow (perm)	692	3316	3316	1447	1584	0
Satd. Flow (RTOR)				40	42	
Lane Group Flow (vph)	65	1063	570	44	92	0
Turn Type	pm+pt	NA	NA	Perm	Prot	
Protected Phases	5	2	6		4	
Permitted Phases	2			6		
Detector Phase	5	2	6	6	4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	10.9	23.9	27.9	27.9	29.5	
Total Split (s)	18.0	67.0	49.0	49.0	33.0	
Total Split (%)	18.0%	67.0%	49.0%	49.0%	33.0%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.6	2.6	2.6	2.6	2.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9	5.9	5.9	5.9	5.5	
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	
Act Effct Green (s)	78.8	80.0	69.8	69.8	12.9	
Actuated g/C Ratio	0.79	0.80	0.70	0.70	0.13	
v/c Ratio	0.11	0.40	0.25	0.04	0.38	
Control Delay	2.7	2.9	8.6	4.0	26.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.7	2.9	8.6	4.0	26.7	
LOS	A	A	A	A	C	
Approach Delay		2.8	8.3		26.7	
Approach LOS		A	A		C	
Queue Length 50th (m)	1.9	17.4	21.1	0.3	9.2	
Queue Length 95th (m)	m3.9	21.7	45.0	5.6	20.2	
Internal Link Dist (m)		172.0	281.0		52.2	
Turn Bay Length (m)	80.0			25.0		
Base Capacity (vph)	662	2652	2313	1021	466	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.10	0.40	0.25	0.04	0.20	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 66 (66%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 5.9	Intersection LOS: A
Intersection Capacity Utilization 49.2%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 3: St-Joseph & Napoleon

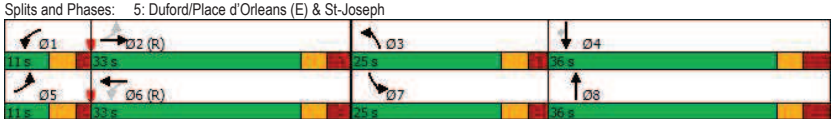
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	825	149	17	501	90	62	97	13	186	175	54
Future Volume (vph)	130	825	149	17	501	90	62	97	13	186	175	54
Satd. Flow (prot)	1658	3223	0	1658	3225	0	1658	1710	0	1658	1745	1483
Flt Permitted	0.225			0.157			0.950			0.950		
Satd. Flow (perm)	390	3223	0	274	3225	0	1649	1710	0	1650	1745	1456
Satd. Flow (RTOR)		19			19			6				150
Lane Group Flow (vph)	130	974	0	17	591	0	62	110	0	186	175	54
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6								4
Detector Phase	5	2		1	6		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	10.0		5.0	10.0	10.0
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%
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	Max		None	Max	Max
Act Effct Green (s)	36.6	33.3		33.3	26.7		9.3	32.2		16.1	41.3	41.3
Actuated g/C Ratio	0.35	0.32		0.32	0.25		0.09	0.31		0.15	0.39	0.39
v/c Ratio	0.64	0.94		0.11	0.71		0.42	0.21		0.74	0.26	0.08
Control Delay	40.5	52.9		22.8	39.9		53.3	28.0		59.3	24.6	0.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	40.5	52.9		22.8	39.9		53.3	28.0		59.3	24.6	0.2
LOS	D	D		C	D		D	C		E	C	A
Approach Delay		51.5			39.4			37.1			37.0	
Approach LOS		D			D			D			D	
Queue Length 50th (m)	18.0	93.0		2.2	56.1		12.2	15.8		36.3	24.6	0.0
Queue Length 95th (m)	#37.0	#163.8		6.7	75.4		24.4	30.5		58.0	43.3	0.0
Internal Link Dist (m)		281.0			131.7			117.2			122.1	
Turn Bay Length (m)	70.0			50.0			17.0			50.0		
Base Capacity (vph)	204	1035		162	834		303	529		303	686	663
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	0.64	0.94		0.10	0.71		0.20	0.21		0.61	0.26	0.08

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
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94
Intersection Signal Delay: 44.6 — Intersection LOS: D
Intersection Capacity Utilization 88.6% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Duford/Place d'Orleans (E) & St-Joseph



Appendix H

Synchro Intersection Worksheets – 2030 Future Background Conditions

CGH TRANSPORTATION

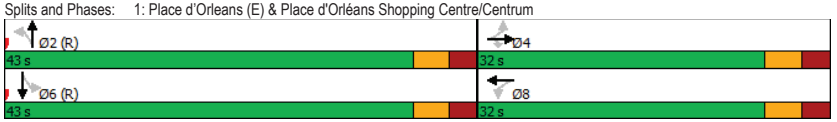
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	31	40	92	33	21	67	178	101	121	42	19
Future Volume (vph)	25	31	40	92	33	21	67	178	101	121	42	19
Satd. Flow (prot)	1658	1745	1483	1658	1632	0	0	3138	0	0	3151	0
Flt Permitted	0.722			0.737				0.862			0.656	
Satd. Flow (perm)	1252	1745	1456	1278	1632	0	0	2732	0	0	2136	0
Satd. Flow (RTOR)			44		21			101			19	
Lane Group Flow (vph)	25	31	40	92	54	0	0	346	0	0	182	0
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	10.0	10.0		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	
Total Lost Time (s)	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)	13.7	13.7	13.7	13.7	13.7			53.7			53.7	
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.18			0.72			0.72	
v/c Ratio	0.11	0.10	0.13	0.39	0.17			0.17			0.12	
Control Delay	23.6	23.3	7.4	30.3	17.0			4.5			5.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	23.6	23.3	7.4	30.3	17.0			4.5			5.6	
LOS	C	C	A	C	B			A			A	
Approach Delay		16.8			25.4			4.5			5.6	
Approach LOS		B			C			A			A	
Queue Length 50th (m)	3.1	3.9	0.0	12.2	4.2			5.0			3.2	
Queue Length 95th (m)	7.3	8.3	5.5	19.6	10.2			16.2			11.2	
Internal Link Dist (m)		23.8			91.9			122.1			170.6	
Turn Bay Length (m)	52.0		20.0									
Base Capacity (vph)	434	604	533	443	579			1985			1534	
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	0.05	0.08	0.21	0.09			0.17			0.12	

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

Maximum v/c Ratio: 0.39

Intersection Signal Delay: 10.2	Intersection LOS: B
Intersection Capacity Utilization 64.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Place d'Orleans (E) & Place d'Orléans Shopping Centre/Centrum



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	242	344	13	19	938	108	16	7	3	116	8	245
Future Volume (vph)	242	344	13	19	938	108	16	7	3	116	8	245
Satd. Flow (prot)	1658	3295	0	1658	3257	0	1658	1656	0	1658	1745	1483
Flt Permitted	0.176			0.538			0.752			0.751		
Satd. Flow (perm)	306	3295	0	931	3257	0	1304	1656	0	1298	1745	1457
Satd. Flow (RTOR)		8			18			3				228
Lane Group Flow (vph)	242	357	0	19	1046	0	16	10	0	116	8	245
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	11.2	38.8		38.8	38.8		27.7	27.7		27.7	27.7	27.7
Total Split (s)	14.0	62.0		48.0	48.0		28.0	28.0		28.0	28.0	28.0
Total Split (%)	15.6%	68.9%		53.3%	53.3%		31.1%	31.1%		31.1%	31.1%	31.1%
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)	2.9	3.5		3.5	3.5		2.4	2.4		2.4	2.4	2.4
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)	6.2	6.8		6.8	6.8		5.7	5.7		5.7	5.7	5.7
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	63.7	63.1		46.3	46.3		14.4	14.4		14.4	14.4	14.4
Actuated g/C Ratio	0.71	0.70		0.51	0.51		0.16	0.16		0.16	0.16	0.16
v/c Ratio	0.65	0.15		0.04	0.62		0.08	0.04		0.56	0.03	0.58
Control Delay	16.1	5.2		7.9	15.3		30.1	24.8		44.3	28.8	11.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	16.1	5.2		7.9	15.3		30.1	24.8		44.3	28.8	11.3
LOS	B	A		A	B		C	C		D	C	B
Approach Delay		9.6			15.1			28.0			22.1	
Approach LOS		A			B			C			C	
Queue Length 50th (m)	11.5	8.5		1.6	63.3		2.4	1.1		19.0	1.2	2.6
Queue Length 95th (m)	#37.9	18.2		m2.3	94.0		7.1	4.8		31.9	4.4	20.5
Internal Link Dist (m)		46.9			172.0			20.4			94.2	
Turn Bay Length (m)	60.0			50.0								70.0
Base Capacity (vph)	375	2312		479	1685		323	412		321	432	532
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	0.65	0.15		0.04	0.62		0.05	0.02		0.36	0.02	0.46

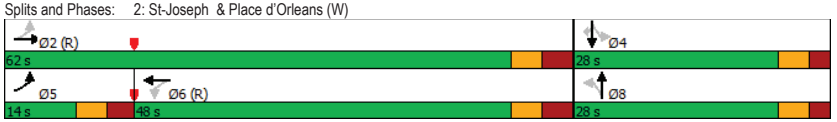
Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 50 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 14.9	Intersection LOS: B
Intersection Capacity Utilization 75.1%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 2: St-Joseph & Place d'Orleans (W)



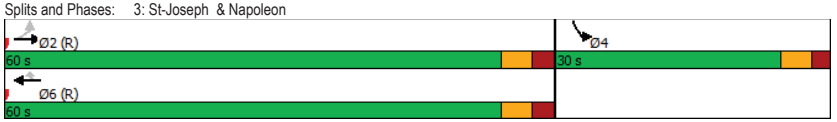
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	35	430	1057	30	4	9
Future Volume (vph)	35	430	1057	30	4	9
Satd. Flow (prot)	1658	3316	3316	1483	1545	0
Flt Permitted	0.266				0.985	
Satd. Flow (perm)	464	3316	3316	1448	1544	0
Satd. Flow (RTOR)				23	9	
Lane Group Flow (vph)	35	430	1057	30	13	0
Turn Type	Perm	NA	NA	Perm	Prot	
Protected Phases		2	6		4	
Permitted Phases	2			6		
Detector Phase	2	2	6	6	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	23.9	23.9	27.9	27.9	29.5	
Total Split (s)	60.0	60.0	60.0	60.0	30.0	
Total Split (%)	66.7%	66.7%	66.7%	66.7%	33.3%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.6	2.6	2.6	2.6	2.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9	5.9	5.9	5.9	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	
Act Effct Green (s)	82.9	82.9	82.9	82.9	12.8	
Actuated g/C Ratio	0.92	0.92	0.92	0.92	0.14	
v/c Ratio	0.08	0.14	0.35	0.02	0.06	
Control Delay	2.9	1.7	3.2	2.3	19.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.9	1.7	3.2	2.3	19.4	
LOS	A	A	A	A	B	
Approach Delay		1.8	3.2		19.4	
Approach LOS		A	A		B	
Queue Length 50th (m)	0.0	0.0	0.0	0.0	0.6	
Queue Length 95th (m)	3.8	13.3	66.1	3.6	4.8	
Internal Link Dist (m)		172.0	281.0		52.2	
Turn Bay Length (m)	80.0			25.0		
Base Capacity (vph)	427	3055	3055	1336	427	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.08	0.14	0.35	0.02	0.03	

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 24 (27%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.35

Intersection Signal Delay: 2.9	Intersection LOS: A
Intersection Capacity Utilization 49.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: St-Joseph & Napoleon



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	288	43	14	832	73	92	178	12	33	46	80
Future Volume (vph)	95	288	43	14	832	73	92	178	12	33	46	80
Satd. Flow (prot)	1658	3242	0	1658	3272	0	1658	1729	0	1658	1745	1483
Flt Permitted	0.126			0.552			0.950			0.950		
Satd. Flow (perm)	220	3242	0	959	3272	0	1654	1729	0	1658	1745	1462
Satd. Flow (RTOR)		16			9			3				150
Lane Group Flow (vph)	95	331	0	14	905	0	92	190	0	33	46	80
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6								4
Detector Phase	5	2		1	6		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	10.0		5.0	10.0	10.0
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	Max		None	Max	Max
Act Effct Green (s)	40.6	37.3		38.4	32.9		11.0	41.4		7.6	35.8	35.8
Actuated g/C Ratio	0.39	0.36		0.37	0.31		0.10	0.39		0.07	0.34	0.34
v/c Ratio	0.58	0.28		0.04	0.88		0.53	0.28		0.28	0.08	0.13
Control Delay	36.2	25.1		19.1	45.8		54.8	24.7		51.1	27.3	0.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	36.2	25.1		19.1	45.8		54.8	24.7		51.1	27.3	0.5
LOS	D	C		B	D		D	C		D	C	A
Approach Delay		27.5			45.4			34.5			18.7	
Approach LOS		C			D			C			B	
Queue Length 50th (m)	12.0	22.2		1.7	93.9		18.1	27.6		6.5	6.6	0.0
Queue Length 95th (m)	#24.5	38.6		5.5	#133.2		32.6	47.3		15.6	15.7	0.0
Internal Link Dist (m)		281.0			131.7			117.2			122.1	
Turn Bay Length (m)	70.0			50.0			17.0			50.0		
Base Capacity (vph)	163	1162		389	1031		240	683		240	594	596
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	0.58	0.28		0.04	0.88		0.38	0.28		0.14	0.08	0.13

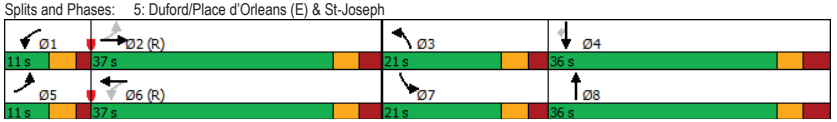
Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 105
Offset: 47 (45%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 37.0	Intersection LOS: D
Intersection Capacity Utilization 76.7%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 5: Duford/Place d'Orleans (E) & St-Joseph



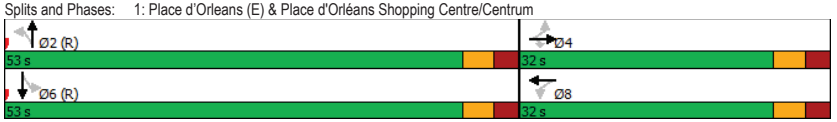
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	58	220	109	46	18	102	151	139	130	161	42
Future Volume (vph)	94	58	220	109	46	18	102	151	139	130	161	42
Satd. Flow (prot)	1658	1745	1483	1658	1660	0	0	3070	0	0	3181	0
Flt Permitted	0.715			0.719				0.773			0.693	
Satd. Flow (perm)	1231	1745	1448	1241	1660	0	0	2402	0	0	2243	0
Satd. Flow (RTOR)			220		18			139			30	
Lane Group Flow (vph)	94	58	220	109	64	0	0	392	0	0	333	0
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	10.0	10.0		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%	
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?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	14.7	14.7	14.7	14.7	14.7			58.3			58.3	
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17			0.69			0.69	
v/c Ratio	0.44	0.19	0.51	0.51	0.21			0.23			0.22	
Control Delay	36.4	29.2	8.3	38.9	22.8			4.2			5.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	36.4	29.2	8.3	38.9	22.8			4.2			5.7	
LOS	D	C	A	D	C			A			A	
Approach Delay		18.7			32.9			4.2			5.7	
Approach LOS		B			C			A			A	
Queue Length 50th (m)	14.2	8.4	0.0	16.7	6.6			5.9			7.3	
Queue Length 95th (m)	23.7	15.5	15.1	27.0	14.4			16.8			19.2	
Internal Link Dist (m)		23.8			91.9			122.1			170.6	
Turn Bay Length (m)	52.0		20.0									
Base Capacity (vph)	376	533	595	379	520			1692			1548	
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	0.25	0.11	0.37	0.29	0.12			0.23			0.22	

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
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 12.8	Intersection LOS: B
Intersection Capacity Utilization 80.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Place d'Orleans (E) & Place d'Orléans Shopping Centre/Centrum



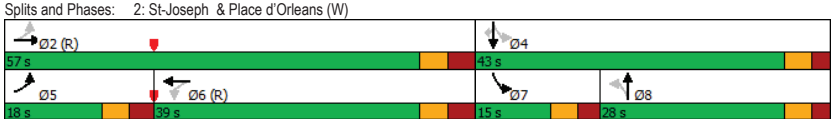
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	330	1044	34	28	548	103	23	17	3	179	13	342
Future Volume (vph)	330	1044	34	28	548	103	23	17	3	179	13	342
Satd. Flow (prot)	1658	3295	0	1658	3219	0	1658	1698	0	1658	1745	1483
Flt Permitted	0.298			0.265			0.749			0.434		
Satd. Flow (perm)	517	3295	0	461	3219	0	1290	1698	0	748	1745	1445
Satd. Flow (RTOR)		5			23			3				342
Lane Group Flow (vph)	330	1078	0	28	651	0	23	20	0	179	13	342
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases	5	2			6			8		7	4	
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.2	38.8		38.8	38.8		27.7	27.7		11.0	27.7	27.7
Total Split (s)	18.0	57.0		39.0	39.0		28.0	28.0		15.0	43.0	43.0
Total Split (%)	18.0%	57.0%		39.0%	39.0%		28.0%	28.0%		15.0%	43.0%	43.0%
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)	2.9	3.5		3.5	3.5		2.4	2.4		2.7	2.4	2.4
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)	6.2	6.8		6.8	6.8		5.7	5.7		6.0	5.7	5.7
Lead/Lag	Lead			Lag	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes		
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	66.7	66.1		45.0	45.0		12.4	12.4		21.1	21.4	21.4
Actuated g/C Ratio	0.67	0.66		0.45	0.45		0.12	0.12		0.21	0.21	0.21
v/c Ratio	0.64	0.49		0.14	0.45		0.14	0.09		0.74	0.03	0.59
Control Delay	17.4	11.5		17.1	15.5		38.9	33.3		51.2	24.8	7.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	17.4	11.5		17.1	15.5		38.9	33.3		51.2	24.8	7.3
LOS	B	B		B	B		D	C		D	C	A
Approach Delay		12.9			15.6			36.3			22.4	
Approach LOS		B			B			D			C	
Queue Length 50th (m)	26.9	55.7		2.0	22.6		4.2	3.1		29.4	1.9	0.0
Queue Length 95th (m)	#71.7	98.5		5.1	29.0		10.1	8.7		40.8	5.4	17.3
Internal Link Dist (m)		46.9			172.0			20.4			94.2	
Turn Bay Length (m)	60.0			50.0								70.0
Base Capacity (vph)	514	2179		207	1461		287	380		242	650	753
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	0.64	0.49		0.14	0.45		0.08	0.05		0.74	0.02	0.45

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 61 (61%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74
Intersection Signal Delay: 15.9 Intersection LOS: B
Intersection Capacity Utilization 79.0% 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: 2: St-Joseph & Place d'Orleans (W)



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	1193	638	44	50	42
Future Volume (vph)	65	1193	638	44	50	42
Satd. Flow (prot)	1658	3316	3316	1483	1585	0
Flt Permitted	0.366				0.974	
Satd. Flow (perm)	638	3316	3316	1447	1584	0
Satd. Flow (RTOR)				36	42	
Lane Group Flow (vph)	65	1193	638	44	92	0
Turn Type	pm+pt	NA	NA	Perm	Prot	
Protected Phases	5	2	6		4	
Permitted Phases	2			6		
Detector Phase	5	2	6	6	4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	10.9	23.9	27.9	27.9	29.5	
Total Split (s)	18.0	67.0	49.0	49.0	33.0	
Total Split (%)	18.0%	67.0%	49.0%	49.0%	33.0%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.6	2.6	2.6	2.6	2.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9	5.9	5.9	5.9	5.5	
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	
Act Effct Green (s)	78.8	80.0	69.8	69.8	12.9	
Actuated g/C Ratio	0.79	0.80	0.70	0.70	0.13	
v/c Ratio	0.11	0.45	0.28	0.04	0.38	
Control Delay	2.5	2.8	8.9	4.4	26.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.5	2.8	8.9	4.4	26.7	
LOS	A	A	A	A	C	
Approach Delay		2.8	8.6		26.7	
Approach LOS		A	A		C	
Queue Length 50th (m)	1.8	18.0	24.2	0.5	9.2	
Queue Length 95th (m)	m3.5	22.2	51.0	6.0	20.2	
Internal Link Dist (m)		172.0	281.0		52.2	
Turn Bay Length (m)	80.0			25.0		
Base Capacity (vph)	625	2652	2313	1020	466	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.10	0.45	0.28	0.04	0.20	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 66 (66%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 5.8	Intersection LOS: A
Intersection Capacity Utilization 53.0%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 3: St-Joseph & Napoleon

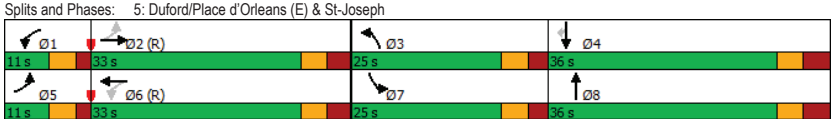
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	181	887	149	17	519	90	62	97	13	186	193	102
Future Volume (vph)	181	887	149	17	519	90	62	97	13	186	193	102
Satd. Flow (prot)	1658	3227	0	1658	3229	0	1658	1710	0	1658	1745	1483
Flt Permitted	0.213			0.157			0.950			0.950		
Satd. Flow (perm)	370	3227	0	274	3229	0	1650	1710	0	1650	1745	1456
Satd. Flow (RTOR)		17			18			6				150
Lane Group Flow (vph)	181	1036	0	17	609	0	62	110	0	186	193	102
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6								4
Detector Phase	5	2		1	6		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	10.0		5.0	10.0	10.0
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%
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	Max		None	Max	Max
Act Effct Green (s)	36.6	33.3		33.3	26.7		9.3	32.2		16.1	41.3	41.3
Actuated g/C Ratio	0.35	0.32		0.32	0.25		0.09	0.31		0.15	0.39	0.39
v/c Ratio	0.91	1.00		0.11	0.73		0.42	0.21		0.74	0.28	0.15
Control Delay	75.1	65.1		22.8	40.7		53.3	28.0		59.3	24.9	1.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	75.1	65.1		22.8	40.7		53.3	28.0		59.3	24.9	1.8
LOS	E	E		C	D		D	C		E	C	A
Approach Delay		66.6			40.2			37.1			33.3	
Approach LOS		E			D			D			C	
Queue Length 50th (m)	25.9	102.0		2.2	58.3		12.2	15.8		36.3	27.5	0.0
Queue Length 95th (m)	#65.4	#178.5		6.7	78.1		24.4	30.5		58.0	47.5	4.0
Internal Link Dist (m)		281.0			131.7			117.2			122.1	
Turn Bay Length (m)	70.0			50.0			17.0			50.0		
Base Capacity (vph)	198	1035		162	834		303	529		303	686	663
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	0.91	1.00		0.10	0.73		0.20	0.21		0.61	0.28	0.15

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
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00
Intersection Signal Delay: 51.5 — Intersection LOS: D
Intersection Capacity Utilization 90.4% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Duford/Place d'Orleans (E) & St-Joseph



Appendix I

Synchro Intersection Worksheets – 2025 Future Total Conditions

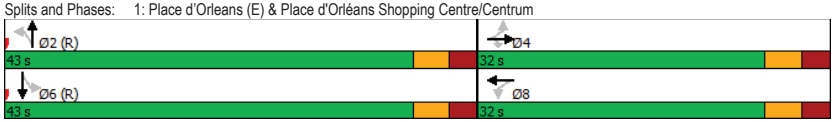
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	30	40	30	32	18	67	172	56	119	42	19
Future Volume (vph)	25	30	40	30	32	18	67	172	56	119	42	19
Satd. Flow (prot)	1658	1745	1483	1658	1640	0	0	3187	0	0	3151	0
Flt Permitted	0.724			0.738				0.852			0.675	
Satd. Flow (perm)	1255	1745	1456	1280	1640	0	0	2745	0	0	2197	0
Satd. Flow (RTOR)			44		18			54			19	
Lane Group Flow (vph)	25	30	40	30	50	0	0	295	0	0	180	0
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	10.0	10.0		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	
Total Lost Time (s)	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)	13.0	13.0	13.0	13.0	13.0			58.8			58.8	
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17			0.78			0.78	
v/c Ratio	0.12	0.10	0.14	0.14	0.17			0.14			0.10	
Control Delay	24.6	24.1	7.7	25.0	18.2			4.3			4.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	24.6	24.1	7.7	25.0	18.2			4.3			4.8	
LOS	C	C	A	C	B			A			A	
Approach Delay		17.3			20.8			4.3			4.8	
Approach LOS		B			C			A			A	
Queue Length 50th (m)	3.2	3.8	0.0	3.8	4.1			4.6			3.1	
Queue Length 95th (m)	7.3	8.1	5.5	8.3	9.9			15.5			11.1	
Internal Link Dist (m)		23.8			91.9			122.1			170.6	
Turn Bay Length (m)	52.0		20.0									
Base Capacity (vph)	435	604	533	443	580			2163			1726	
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	0.05	0.08	0.07	0.09			0.14			0.10	

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

Maximum v/c Ratio: 0.17

Intersection Signal Delay: 8.4	Intersection LOS: A
Intersection Capacity Utilization 60.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Place d'Orleans (E) & Place d'Orléans Shopping Centre/Centrum



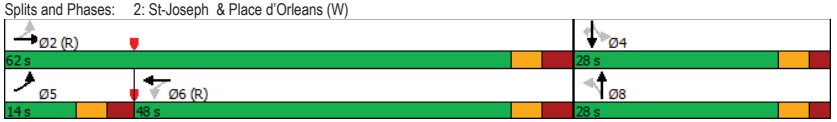
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	306	13	19	828	98	16	7	3	120	8	245
Future Volume (vph)	220	306	13	19	828	98	16	7	3	120	8	245
Satd. Flow (prot)	1658	3291	0	1658	3254	0	1658	1656	0	1658	1745	1483
Flt Permitted	0.223			0.558			0.752			0.751		
Satd. Flow (perm)	388	3291	0	965	3254	0	1304	1656	0	1298	1745	1457
Satd. Flow (RTOR)		9			19			3				245
Lane Group Flow (vph)	220	319	0	19	926	0	16	10	0	120	8	245
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	11.2	38.8		38.8	38.8		27.7	27.7		27.7	27.7	27.7
Total Split (s)	14.0	62.0		48.0	48.0		28.0	28.0		28.0	28.0	28.0
Total Split (%)	15.6%	68.9%		53.3%	53.3%		31.1%	31.1%		31.1%	31.1%	31.1%
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)	2.9	3.5		3.5	3.5		2.4	2.4		2.4	2.4	2.4
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)	6.2	6.8		6.8	6.8		5.7	5.7		5.7	5.7	5.7
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	63.6	63.0		47.9	47.9		14.5	14.5		14.5	14.5	14.5
Actuated g/C Ratio	0.71	0.70		0.53	0.53		0.16	0.16		0.16	0.16	0.16
v/c Ratio	0.55	0.14		0.04	0.53		0.08	0.04		0.57	0.03	0.56
Control Delay	10.8	5.1		7.6	13.0		29.9	24.7		44.8	28.6	9.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	10.8	5.1		7.6	13.0		29.9	24.7		44.8	28.6	9.3
LOS	B	A		A	B		C	C		D	C	A
Approach Delay		7.5			12.9			27.9			21.1	
Approach LOS		A			B			C			C	
Queue Length 50th (m)	10.5	7.6		1.5	50.5		2.4	1.0		19.7	1.2	0.0
Queue Length 95th (m)	24.9	16.3		2.9	79.6		7.1	4.8		33.0	4.4	17.5
Internal Link Dist (m)		46.9			172.0			20.4			94.2	
Turn Bay Length (m)	60.0			50.0								70.0
Base Capacity (vph)	401	2304		513	1740		323	412		321	432	545
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	0.55	0.14		0.04	0.53		0.05	0.02		0.37	0.02	0.45

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 50 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 13.2	Intersection LOS: B
Intersection Capacity Utilization 70.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: St-Joseph & Place d'Orleans (W)



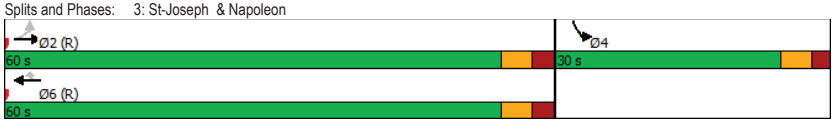
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	35	393	938	30	4	9
Future Volume (vph)	35	393	938	30	4	9
Satd. Flow (prot)	1658	3316	3316	1483	1545	0
Flt Permitted	0.304				0.985	
Satd. Flow (perm)	530	3316	3316	1448	1544	0
Satd. Flow (RTOR)				26	9	
Lane Group Flow (vph)	35	393	938	30	13	0
Turn Type	Perm	NA	NA	Perm	Prot	
Protected Phases		2	6		4	
Permitted Phases	2			6		
Detector Phase	2	2	6	6	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	23.9	23.9	27.9	27.9	29.5	
Total Split (s)	60.0	60.0	60.0	60.0	30.0	
Total Split (%)	66.7%	66.7%	66.7%	66.7%	33.3%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.6	2.6	2.6	2.6	2.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9	5.9	5.9	5.9	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	
Act Effct Green (s)	82.9	82.9	82.9	82.9	12.8	
Actuated g/C Ratio	0.92	0.92	0.92	0.92	0.14	
v/c Ratio	0.07	0.13	0.31	0.02	0.06	
Control Delay	2.7	1.6	3.0	2.1	19.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.7	1.6	3.0	2.1	19.4	
LOS	A	A	A	A	B	
Approach Delay		1.7	3.0		19.4	
Approach LOS		A	A		B	
Queue Length 50th (m)	0.0	0.0	0.0	0.0	0.6	
Queue Length 95th (m)	3.6	11.8	56.1	3.4	4.8	
Internal Link Dist (m)		172.0	202.1		52.2	
Turn Bay Length (m)	80.0			25.0		
Base Capacity (vph)	488	3055	3055	1336	427	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.07	0.13	0.31	0.02	0.03	

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 24 (27%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.31

Intersection Signal Delay: 2.7	Intersection LOS: A
Intersection Capacity Utilization 48.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: St-Joseph & Napoleon



Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	380	13	0	898	0	23
Future Vol, veh/h	380	13	0	898	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	380	13	0	898	0	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	197
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	811
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	811
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	811	-	-	-
HCM Lane V/C Ratio	0.028	-	-	-
HCM Control Delay (s)	9.6	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	286	47	14	775	73	92	161	12	33	46	31
Future Volume (vph)	70	286	47	14	775	73	92	161	12	33	46	31
Satd. Flow (prot)	1658	3234	0	1658	3269	0	1658	1728	0	1658	1745	1483
Flt Permitted	0.126			0.551			0.950			0.950		
Satd. Flow (perm)	220	3234	0	958	3269	0	1654	1728	0	1658	1745	1462
Satd. Flow (RTOR)		18			9			4				150
Lane Group Flow (vph)	70	333	0	14	848	0	92	173	0	33	46	31
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6								4
Detector Phase	5	2		1	6		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	10.0		5.0	10.0	10.0
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	Max		None	Max	Max
Act Effct Green (s)	40.6	37.3		38.4	32.9		11.0	41.4		7.6	35.8	35.8
Actuated g/C Ratio	0.39	0.36		0.37	0.31		0.10	0.39		0.07	0.34	0.34
v/c Ratio	0.43	0.29		0.04	0.82		0.53	0.25		0.28	0.08	0.05
Control Delay	27.9	24.9		19.1	41.8		54.8	24.2		51.1	27.3	0.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	27.9	24.9		19.1	41.8		54.8	24.2		51.1	27.3	0.2
LOS	C	C		B	D		D	C		D	C	A
Approach Delay		25.4			41.4			34.9			26.8	
Approach LOS		C			D			C			C	
Queue Length 50th (m)	8.7	22.2		1.7	85.8		18.1	24.6		6.5	6.6	0.0
Queue Length 95th (m)	17.6	38.7		5.5	#119.3		32.6	43.1		15.6	15.7	0.0
Internal Link Dist (m)		55.0			131.7			117.2			122.1	
Turn Bay Length (m)	70.0			50.0			17.0			50.0		
Base Capacity (vph)	163	1160		389	1030		240	683		240	594	596
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	0.43	0.29		0.04	0.82		0.38	0.25		0.14	0.08	0.05

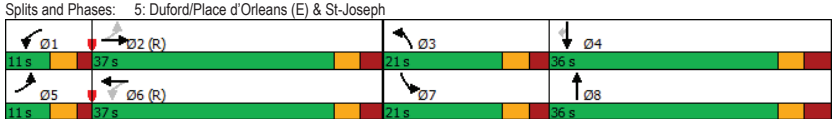
Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 105
Offset: 47 (45%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 35.5	Intersection LOS: D
Intersection Capacity Utilization 73.6%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 5: Duford/Place d'Orleans (E) & St-Joseph



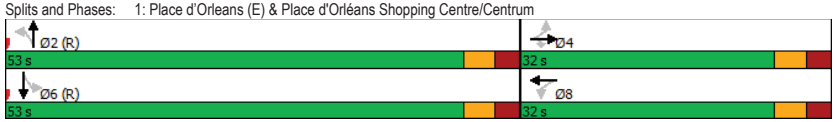
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	57	220	48	46	14	102	161	73	126	146	42
Future Volume (vph)	94	57	220	48	46	14	102	161	73	126	146	42
Satd. Flow (prot)	1658	1745	1483	1658	1674	0	0	3140	0	0	3174	0
Flt Permitted	0.718			0.720				0.761			0.709	
Satd. Flow (perm)	1237	1745	1448	1242	1674	0	0	2423	0	0	2292	0
Satd. Flow (RTOR)			220		14			66			32	
Lane Group Flow (vph)	94	57	220	48	60	0	0	336	0	0	314	0
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	10.0	10.0		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%	
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?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	14.2	14.2	14.2	14.2	14.2			58.8			58.8	
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17			0.69			0.69	
v/c Ratio	0.46	0.20	0.52	0.23	0.21			0.20			0.20	
Control Delay	37.5	29.7	8.6	31.0	24.2			4.8			5.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	37.5	29.7	8.6	31.0	24.2			4.8			5.4	
LOS	D	C	A	C	C			A			A	
Approach Delay		19.2			27.3			4.8			5.4	
Approach LOS		B			C			A			A	
Queue Length 50th (m)	14.4	8.4	0.0	7.1	6.7			6.0			6.3	
Queue Length 95th (m)	23.7	15.2	15.1	13.8	14.1			17.1			17.8	
Internal Link Dist (m)		23.8			91.9			122.1			170.6	
Turn Bay Length (m)	52.0		20.0									
Base Capacity (vph)	378	533	595	379	521			1697			1596	
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	0.25	0.11	0.37	0.13	0.12			0.20			0.20	

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
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 11.8	Intersection LOS: B
Intersection Capacity Utilization 80.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Place d'Orleans (E) & Place d'Orléans Shopping Centre/Centrum



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	330	942	34	28	483	103	23	17	3	185	13	338
Future Volume (vph)	330	942	34	28	483	103	23	17	3	185	13	338
Satd. Flow (prot)	1658	3295	0	1658	3211	0	1658	1698	0	1658	1745	1483
Flt Permitted	0.336			0.294			0.749			0.434		
Satd. Flow (perm)	583	3295	0	511	3211	0	1290	1698	0	748	1745	1445
Satd. Flow (RTOR)		5			27			3				338
Lane Group Flow (vph)	330	976	0	28	586	0	23	20	0	185	13	338
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases	5	2			6			8		7	4	
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.2	38.8		38.8	38.8		27.7	27.7		11.0	27.7	27.7
Total Split (s)	18.0	57.0		39.0	39.0		28.0	28.0		15.0	43.0	43.0
Total Split (%)	18.0%	57.0%		39.0%	39.0%		28.0%	28.0%		15.0%	43.0%	43.0%
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)	2.9	3.5		3.5	3.5		2.4	2.4		2.7	2.4	2.4
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)	6.2	6.8		6.8	6.8		5.7	5.7		6.0	5.7	5.7
Lead/Lag	Lead			Lag	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes		
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	66.7	66.1		46.0	46.0		12.4	12.4		21.1	21.4	21.4
Actuated g/C Ratio	0.67	0.66		0.46	0.46		0.12	0.12		0.21	0.21	0.21
v/c Ratio	0.61	0.45		0.12	0.39		0.14	0.09		0.76	0.03	0.59
Control Delay	16.1	10.8		16.8	14.6		38.9	33.3		53.4	24.8	7.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	16.1	10.8		16.8	14.6		38.9	33.3		53.4	24.8	7.3
LOS	B	B		B	B		D	C		D	C	A
Approach Delay		12.2			14.7			36.3			23.6	
Approach LOS		B			B			D			C	
Queue Length 50th (m)	26.9	48.3		2.0	20.3		4.2	3.1		30.5	1.9	0.0
Queue Length 95th (m)	#65.0	85.7		5.2	26.4		10.1	8.7		42.0	5.4	17.1
Internal Link Dist (m)		46.9			172.0			20.4			94.2	
Turn Bay Length (m)	60.0			50.0								70.0
Base Capacity (vph)	541	2179		234	1491		287	380		242	650	750
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	0.61	0.45		0.12	0.39		0.08	0.05		0.76	0.02	0.45

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 61 (61%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 15.7	Intersection LOS: B
Intersection Capacity Utilization 79.3%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 2: St-Joseph & Place d'Orleans (W)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	1088	570	44	50	42
Future Volume (vph)	65	1088	570	44	50	42
Satd. Flow (prot)	1658	3316	3316	1483	1585	0
Flt Permitted	0.397				0.974	
Satd. Flow (perm)	692	3316	3316	1447	1584	0
Satd. Flow (RTOR)				40	42	
Lane Group Flow (vph)	65	1088	570	44	92	0
Turn Type	pm+pt	NA	NA	Perm	Prot	
Protected Phases	5	2	6		4	
Permitted Phases	2			6		
Detector Phase	5	2	6	6	4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	10.9	23.9	27.9	27.9	29.5	
Total Split (s)	18.0	67.0	49.0	49.0	33.0	
Total Split (%)	18.0%	67.0%	49.0%	49.0%	33.0%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.6	2.6	2.6	2.6	2.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9	5.9	5.9	5.9	5.5	
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	
Act Effct Green (s)	78.8	80.0	69.8	69.8	12.9	
Actuated g/C Ratio	0.79	0.80	0.70	0.70	0.13	
v/c Ratio	0.11	0.41	0.25	0.04	0.38	
Control Delay	2.6	2.9	8.6	4.0	26.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.6	2.9	8.6	4.0	26.7	
LOS	A	A	A	A	C	
Approach Delay		2.9	8.3		26.7	
Approach LOS		A	A		C	
Queue Length 50th (m)	1.9	18.3	21.1	0.3	9.2	
Queue Length 95th (m)	m4.0	22.6	45.0	5.6	20.2	
Internal Link Dist (m)		172.0	199.2		52.2	
Turn Bay Length (m)	80.0			25.0		
Base Capacity (vph)	662	2652	2313	1021	466	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.10	0.41	0.25	0.04	0.20	

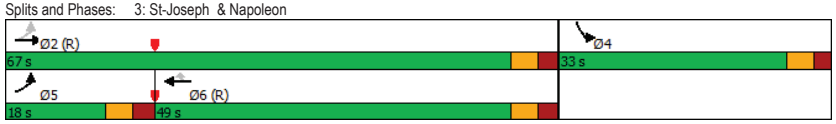
Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 66 (66%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.41

Intersection Signal Delay: 5.9	Intersection LOS: A
Intersection Capacity Utilization 50.0%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 3: St-Joseph & Napoleon



Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1101	28	0	617	0	21
Future Vol, veh/h	1101	28	0	617	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1101	28	0	617	0	21

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	565
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	468
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	468
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	468	-	-	-
HCM Lane V/C Ratio	0.045	-	-	-
HCM Control Delay (s)	13.1	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	831	153	17	501	90	62	97	13	186	175	54
Future Volume (vph)	138	831	153	17	501	90	62	97	13	186	175	54
Satd. Flow (prot)	1658	3223	0	1658	3225	0	1658	1710	0	1658	1745	1483
Flt Permitted	0.225			0.157			0.950			0.950		
Satd. Flow (perm)	390	3223	0	274	3225	0	1649	1710	0	1650	1745	1456
Satd. Flow (RTOR)		19			19			6				150
Lane Group Flow (vph)	138	984	0	17	591	0	62	110	0	186	175	54
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6								4
Detector Phase	5	2		1	6		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	10.0		5.0	10.0	10.0
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%
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	Max		None	Max	Max
Act Effct Green (s)	36.6	33.3		33.3	26.7		9.3	32.2		16.1	41.3	41.3
Actuated g/C Ratio	0.35	0.32		0.32	0.25		0.09	0.31		0.15	0.39	0.39
v/c Ratio	0.68	0.95		0.11	0.71		0.42	0.21		0.74	0.26	0.08
Control Delay	43.4	54.5		22.8	39.9		53.3	28.0		59.3	24.6	0.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	43.4	54.5		22.8	39.9		53.3	28.0		59.3	24.6	0.2
LOS	D	D		C	D		D	C		E	C	A
Approach Delay		53.1			39.4			37.1			37.0	
Approach LOS		D			D			D			D	
Queue Length 50th (m)	19.2	94.5		2.2	56.1		12.2	15.8		36.3	24.6	0.0
Queue Length 95th (m)	#41.1	#165.9		6.7	75.4		24.4	30.5		58.0	43.3	0.0
Internal Link Dist (m)		57.8			131.7			117.2			122.1	
Turn Bay Length (m)	70.0			50.0			17.0			50.0		
Base Capacity (vph)	204	1035		162	834		303	529		303	686	663
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	0.68	0.95		0.10	0.71		0.20	0.21		0.61	0.26	0.08

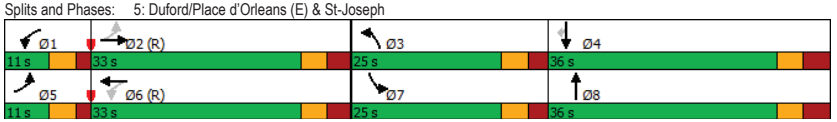
Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 105
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 45.4	Intersection LOS: D
Intersection Capacity Utilization 89.0%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 5: Duford/Place d'Orleans (E) & St-Joseph



Appendix J

Synchro Intersection Worksheets – 2030 Future Total Conditions

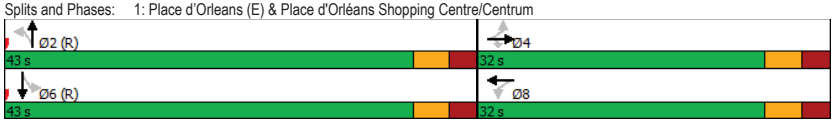
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	31	40	92	33	21	67	188	101	121	42	19
Future Volume (vph)	25	31	40	92	33	21	67	188	101	121	42	19
Satd. Flow (prot)	1658	1745	1483	1658	1632	0	0	3145	0	0	3151	0
Flt Permitted	0.722			0.737				0.864			0.653	
Satd. Flow (perm)	1252	1745	1456	1278	1632	0	0	2741	0	0	2126	0
Satd. Flow (RTOR)			44		21			101			19	
Lane Group Flow (vph)	25	31	40	92	54	0	0	356	0	0	182	0
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	10.0	10.0		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	
Total Lost Time (s)	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)	13.7	13.7	13.7	13.7	13.7			53.7			53.7	
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.18			0.72			0.72	
v/c Ratio	0.11	0.10	0.13	0.39	0.17			0.18			0.12	
Control Delay	23.6	23.3	7.4	30.3	17.0			4.5			5.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	23.6	23.3	7.4	30.3	17.0			4.5			5.6	
LOS	C	C	A	C	B			A			A	
Approach Delay		16.8			25.4			4.5			5.6	
Approach LOS		B			C			A			A	
Queue Length 50th (m)	3.1	3.9	0.0	12.2	4.2			5.2			3.3	
Queue Length 95th (m)	7.3	8.3	5.5	19.6	10.2			16.7			11.2	
Internal Link Dist (m)		23.8			91.9			122.1			170.6	
Turn Bay Length (m)	52.0		20.0									
Base Capacity (vph)	434	604	533	443	579			1991			1527	
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	0.05	0.08	0.21	0.09			0.18			0.12	

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

Maximum v/c Ratio: 0.39

Intersection Signal Delay: 10.2	Intersection LOS: B
Intersection Capacity Utilization 65.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Place d'Orleans (E) & Place d'Orléans Shopping Centre/Centrum



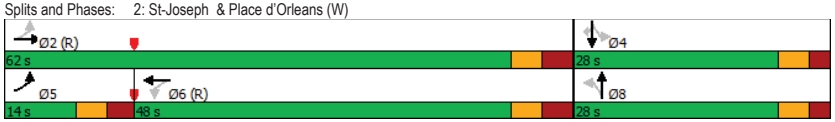
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	242	352	13	19	938	108	16	7	3	120	8	245
Future Volume (vph)	242	352	13	19	938	108	16	7	3	120	8	245
Satd. Flow (prot)	1658	3295	0	1658	3257	0	1658	1656	0	1658	1745	1483
Flt Permitted	0.176			0.534			0.752			0.751		
Satd. Flow (perm)	306	3295	0	924	3257	0	1304	1656	0	1298	1745	1457
Satd. Flow (RTOR)		8			18			3				228
Lane Group Flow (vph)	242	365	0	19	1046	0	16	10	0	120	8	245
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	11.2	38.8		38.8	38.8		27.7	27.7		27.7	27.7	27.7
Total Split (s)	14.0	62.0		48.0	48.0		28.0	28.0		28.0	28.0	28.0
Total Split (%)	15.6%	68.9%		53.3%	53.3%		31.1%	31.1%		31.1%	31.1%	31.1%
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)	2.9	3.5		3.5	3.5		2.4	2.4		2.4	2.4	2.4
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)	6.2	6.8		6.8	6.8		5.7	5.7		5.7	5.7	5.7
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	63.6	63.0		46.2	46.2		14.5	14.5		14.5	14.5	14.5
Actuated g/C Ratio	0.71	0.70		0.51	0.51		0.16	0.16		0.16	0.16	0.16
v/c Ratio	0.65	0.16		0.04	0.62		0.08	0.04		0.57	0.03	0.58
Control Delay	16.2	5.2		8.1	15.4		29.9	24.7		44.8	28.6	11.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	16.2	5.2		8.1	15.4		29.9	24.7		44.8	28.6	11.2
LOS	B	A		A	B		C	C		D	C	B
Approach Delay		9.6			15.3			27.9			22.4	
Approach LOS		A			B			C			C	
Queue Length 50th (m)	11.7	8.9		1.6	64.0		2.4	1.0		19.7	1.2	2.6
Queue Length 95th (m)	#37.9	18.6		m2.3	94.0		7.1	4.8		33.0	4.4	20.5
Internal Link Dist (m)		46.9			172.0			20.4			94.2	
Turn Bay Length (m)	60.0			50.0								70.0
Base Capacity (vph)	375	2307		473	1678		323	412		321	432	532
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	0.65	0.16		0.04	0.62		0.05	0.02		0.37	0.02	0.46

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 50 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65
Intersection Signal Delay: 15.1 Intersection LOS: B
Intersection Capacity Utilization 75.3% ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: St-Joseph & Place d'Orleans (W)



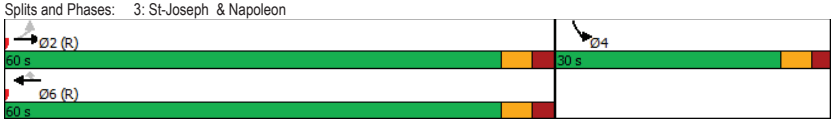
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	35	442	1057	30	4	9
Future Volume (vph)	35	442	1057	30	4	9
Satd. Flow (prot)	1658	3316	3316	1483	1545	0
Flt Permitted	0.266				0.985	
Satd. Flow (perm)	464	3316	3316	1448	1544	0
Satd. Flow (RTOR)				23	9	
Lane Group Flow (vph)	35	442	1057	30	13	0
Turn Type	Perm	NA	NA	Perm	Prot	
Protected Phases		2	6		4	
Permitted Phases	2			6		
Detector Phase	2	2	6	6	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	23.9	23.9	27.9	27.9	29.5	
Total Split (s)	60.0	60.0	60.0	60.0	30.0	
Total Split (%)	66.7%	66.7%	66.7%	66.7%	33.3%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.6	2.6	2.6	2.6	2.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9	5.9	5.9	5.9	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	
Act Effct Green (s)	82.9	82.9	82.9	82.9	12.8	
Actuated g/C Ratio	0.92	0.92	0.92	0.92	0.14	
v/c Ratio	0.08	0.14	0.35	0.02	0.06	
Control Delay	2.9	1.7	3.2	2.3	19.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.9	1.7	3.2	2.3	19.4	
LOS	A	A	A	A	B	
Approach Delay		1.8	3.2		19.4	
Approach LOS		A	A		B	
Queue Length 50th (m)	0.0	0.0	0.0	0.0	0.6	
Queue Length 95th (m)	3.8	13.6	66.1	3.6	4.8	
Internal Link Dist (m)		172.0	202.1		52.2	
Turn Bay Length (m)	80.0			25.0		
Base Capacity (vph)	427	3055	3055	1336	427	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.08	0.14	0.35	0.02	0.03	

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 24 (27%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.35

Intersection Signal Delay: 2.9	Intersection LOS: A
Intersection Capacity Utilization 49.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: St-Joseph & Napoleon



Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	425	13	0	1004	0	23
Future Vol, veh/h	425	13	0	1004	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	425	13	0	1004	0	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	219
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	785
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	785
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	785	-	-	-
HCM Lane V/C Ratio	0.029	-	-	-
HCM Control Delay (s)	9.7	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	296	47	14	832	73	92	178	12	33	46	80
Future Volume (vph)	105	296	47	14	832	73	92	178	12	33	46	80
Satd. Flow (prot)	1658	3234	0	1658	3272	0	1658	1729	0	1658	1745	1483
Flt Permitted	0.126			0.546			0.950			0.950		
Satd. Flow (perm)	220	3234	0	949	3272	0	1654	1729	0	1658	1745	1462
Satd. Flow (RTOR)		17			9			3				150
Lane Group Flow (vph)	105	343	0	14	905	0	92	190	0	33	46	80
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6								4
Detector Phase	5	2		1	6		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	10.0		5.0	10.0	10.0
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	Max		None	Max	Max
Act Effct Green (s)	40.6	37.3		37.3	30.7		11.0	41.4		7.6	35.8	35.8
Actuated g/C Ratio	0.39	0.36		0.36	0.29		0.10	0.39		0.07	0.34	0.34
v/c Ratio	0.64	0.30		0.04	0.94		0.53	0.28		0.28	0.08	0.13
Control Delay	40.8	25.1		19.1	54.2		54.8	24.7		51.1	27.3	0.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	40.8	25.1		19.1	54.2		54.8	24.7		51.1	27.3	0.5
LOS	D	C		B	D		D	C		D	C	A
Approach Delay		28.8			53.7			34.5			18.7	
Approach LOS		C			D			C			B	
Queue Length 50th (m)	13.3	23.1		1.7	93.9		18.1	27.6		6.5	6.6	0.0
Queue Length 95th (m)	#30.3	40.0		5.5	#133.2		32.6	47.3		15.6	15.7	0.0
Internal Link Dist (m)		55.0			131.7			117.2			122.1	
Turn Bay Length (m)	70.0			50.0			17.0			50.0		
Base Capacity (vph)	163	1159		376	963		240	683		240	594	596
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	0.64	0.30		0.04	0.94		0.38	0.28		0.14	0.08	0.13

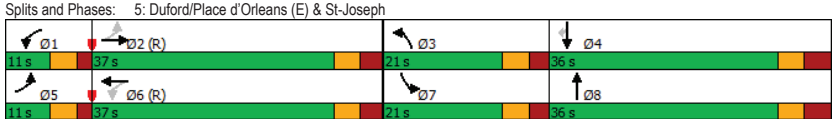
Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 105
Offset: 47 (45%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 41.5	Intersection LOS: D
Intersection Capacity Utilization 77.2%	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: 5: Duford/Place d'Orleans (E) & St-Joseph



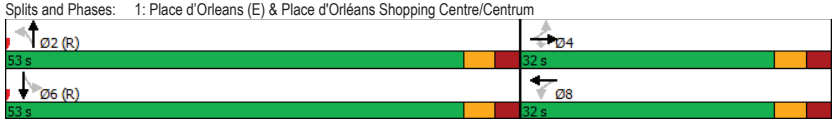
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	58	220	109	46	18	102	159	139	130	161	42
Future Volume (vph)	94	58	220	109	46	18	102	159	139	130	161	42
Satd. Flow (prot)	1658	1745	1483	1658	1660	0	0	3073	0	0	3181	0
Flt Permitted	0.715			0.719				0.775			0.690	
Satd. Flow (perm)	1231	1745	1448	1241	1660	0	0	2411	0	0	2234	0
Satd. Flow (RTOR)			220		18			139			30	
Lane Group Flow (vph)	94	58	220	109	64	0	0	400	0	0	333	0
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	10.0	10.0		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%	
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?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	14.7	14.7	14.7	14.7	14.7			58.3			58.3	
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17			0.69			0.69	
v/c Ratio	0.44	0.19	0.51	0.51	0.21			0.24			0.22	
Control Delay	36.4	29.2	8.3	38.9	22.8			4.3			5.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	36.4	29.2	8.3	38.9	22.8			4.3			5.7	
LOS	D	C	A	D	C			A			A	
Approach Delay		18.7			32.9			4.3			5.7	
Approach LOS		B			C			A			A	
Queue Length 50th (m)	14.2	8.4	0.0	16.7	6.6			6.1			7.3	
Queue Length 95th (m)	23.7	15.5	15.1	27.0	14.4			17.3			19.2	
Internal Link Dist (m)		23.8			91.9			122.1			170.6	
Turn Bay Length (m)	52.0		20.0									
Base Capacity (vph)	376	533	595	379	520			1698			1542	
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	0.25	0.11	0.37	0.29	0.12			0.24			0.22	

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
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 12.7	Intersection LOS: B
Intersection Capacity Utilization 80.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Place d'Orleans (E) & Place d'Orléans Shopping Centre/Centrum



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	330	1062	34	28	548	103	23	17	3	187	13	342
Future Volume (vph)	330	1062	34	28	548	103	23	17	3	187	13	342
Satd. Flow (prot)	1658	3295	0	1658	3219	0	1658	1698	0	1658	1745	1483
Flt Permitted	0.298			0.260			0.749			0.434		
Satd. Flow (perm)	517	3295	0	452	3219	0	1290	1698	0	748	1745	1445
Satd. Flow (RTOR)		5			23			3				342
Lane Group Flow (vph)	330	1096	0	28	651	0	23	20	0	187	13	342
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases	5	2			6			8		7	4	
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.2	38.8		38.8	38.8		27.7	27.7		11.0	27.7	27.7
Total Split (s)	18.0	57.0		39.0	39.0		28.0	28.0		15.0	43.0	43.0
Total Split (%)	18.0%	57.0%		39.0%	39.0%		28.0%	28.0%		15.0%	43.0%	43.0%
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)	2.9	3.5		3.5	3.5		2.4	2.4		2.7	2.4	2.4
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)	6.2	6.8		6.8	6.8		5.7	5.7		6.0	5.7	5.7
Lead/Lag	Lead			Lag	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes		
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	66.7	66.1		45.0	45.0		12.4	12.4		21.1	21.4	21.4
Actuated g/C Ratio	0.67	0.66		0.45	0.45		0.12	0.12		0.21	0.21	0.21
v/c Ratio	0.64	0.50		0.14	0.45		0.14	0.09		0.77	0.03	0.59
Control Delay	17.4	11.6		17.2	15.5		38.9	33.3		54.3	24.8	7.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	17.4	11.6		17.2	15.5		38.9	33.3		54.3	24.8	7.3
LOS	B	B		B	B		D	C		D	C	A
Approach Delay		12.9			15.6			36.3			23.9	
Approach LOS		B			B			D			C	
Queue Length 50th (m)	26.9	57.2		2.0	22.6		4.2	3.1		30.9	1.9	0.0
Queue Length 95th (m)	#71.7	100.8		5.1	29.0		10.1	8.7		42.5	5.4	17.3
Internal Link Dist (m)		46.9			172.0			20.4			94.2	
Turn Bay Length (m)	60.0			50.0								70.0
Base Capacity (vph)	514	2179		203	1461		287	380		242	650	753
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	0.64	0.50		0.14	0.45		0.08	0.05		0.77	0.02	0.45

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 61 (61%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 16.2	Intersection LOS: B
Intersection Capacity Utilization 79.4%	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: 2: St-Joseph & Place d'Orleans (W)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	1218	638	44	50	42
Future Volume (vph)	65	1218	638	44	50	42
Satd. Flow (prot)	1658	3316	3316	1483	1585	0
Flt Permitted	0.366				0.974	
Satd. Flow (perm)	638	3316	3316	1447	1584	0
Satd. Flow (RTOR)				36	42	
Lane Group Flow (vph)	65	1218	638	44	92	0
Turn Type	pm+pt	NA	NA	Perm	Prot	
Protected Phases	5	2	6		4	
Permitted Phases	2			6		
Detector Phase	5	2	6	6	4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	10.9	23.9	27.9	27.9	29.5	
Total Split (s)	18.0	67.0	49.0	49.0	33.0	
Total Split (%)	18.0%	67.0%	49.0%	49.0%	33.0%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.6	2.6	2.6	2.6	2.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9	5.9	5.9	5.9	5.5	
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	
Act Effct Green (s)	78.8	80.0	69.8	69.8	12.9	
Actuated g/C Ratio	0.79	0.80	0.70	0.70	0.13	
v/c Ratio	0.11	0.46	0.28	0.04	0.38	
Control Delay	2.5	2.8	8.9	4.4	26.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.5	2.8	8.9	4.4	26.7	
LOS	A	A	A	A	C	
Approach Delay		2.8	8.6		26.7	
Approach LOS		A	A		C	
Queue Length 50th (m)	1.8	18.8	24.2	0.5	9.2	
Queue Length 95th (m)	m3.5	23.0	51.0	6.0	20.2	
Internal Link Dist (m)		172.0	199.2		52.2	
Turn Bay Length (m)	80.0			25.0		
Base Capacity (vph)	625	2652	2313	1020	466	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.10	0.46	0.28	0.04	0.20	

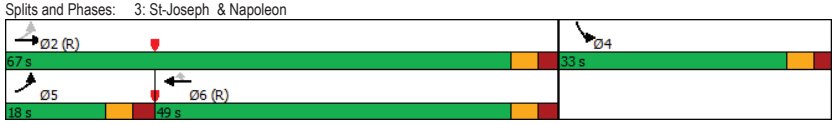
Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 66 (66%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.46

Intersection Signal Delay: 5.8	Intersection LOS: A
Intersection Capacity Utilization 53.8%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 3: St-Joseph & Napoleon



Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1214	28	0	683	0	21
Future Vol, veh/h	1214	28	0	683	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1214	28	0	683	0	21

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	621
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	430
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	430
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	430	-	-	-
HCM Lane V/C Ratio	0.049	-	-	-
HCM Control Delay (s)	13.8	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

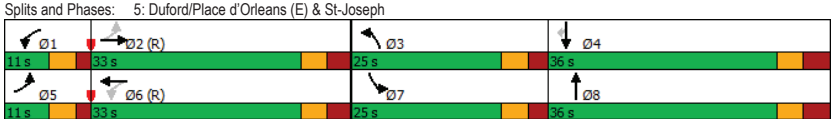
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	189	893	153	17	519	90	62	97	13	186	193	102
Future Volume (vph)	189	893	153	17	519	90	62	97	13	186	193	102
Satd. Flow (prot)	1658	3227	0	1658	3229	0	1658	1710	0	1658	1745	1483
Flt Permitted	0.213			0.157			0.950			0.950		
Satd. Flow (perm)	370	3227	0	274	3229	0	1650	1710	0	1650	1745	1456
Satd. Flow (RTOR)		18			18			6				150
Lane Group Flow (vph)	189	1046	0	17	609	0	62	110	0	186	193	102
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6								4
Detector Phase	5	2		1	6		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	10.0		5.0	10.0	10.0
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%
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	Max		None	Max	Max
Act Effct Green (s)	36.6	33.3		33.3	26.7		9.3	32.2		16.1	41.3	41.3
Actuated g/C Ratio	0.35	0.32		0.32	0.25		0.09	0.31		0.15	0.39	0.39
v/c Ratio	0.95	1.01		0.11	0.73		0.42	0.21		0.74	0.28	0.15
Control Delay	83.9	67.0		22.8	40.7		53.3	28.0		59.3	24.9	1.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	83.9	67.0		22.8	40.7		53.3	28.0		59.3	24.9	1.8
LOS	F	E		C	D		D	C		E	C	A
Approach Delay		69.6			40.2			37.1			33.3	
Approach LOS		E			D			D			C	
Queue Length 50th (m)	27.2	103.5		2.2	58.3		12.2	15.8		36.3	27.5	0.0
Queue Length 95th (m)	#69.4	#180.8		6.7	78.1		24.4	30.5		58.0	47.5	4.0
Internal Link Dist (m)		57.8			131.7			117.2			122.1	
Turn Bay Length (m)	70.0			50.0			17.0			50.0		
Base Capacity (vph)	198	1036		162	834		303	529		303	686	663
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	0.95	1.01		0.10	0.73		0.20	0.21		0.61	0.28	0.15

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
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.01
Intersection Signal Delay: 53.1 — Intersection LOS: D
Intersection Capacity Utilization 90.8% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Duford/Place d'Orleans (E) & St-Joseph



Appendix K

TDM Checklist

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	
		Commuter travel	
BETTER	★	2.2.1 Offer on-site cycling courses for commuters, or subsidize off-site courses	☐
		2.3 Valet bike parking	
		Visitor travel	
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	
		Commuter travel	
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	☐
		Visitor travel	
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	
		Commuter travel	
BETTER		3.3.1 Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	☐
		Visitor travel	
BETTER		3.3.2 Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	☐
		3.4 Private transit service	
		Commuter travel	
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)	☐
		Visitor travel	
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: *Non-residential developments*	Check if proposed & add descriptions
		4.	**RIDESHARING**	
		4.1	**Ridematching service**	
			Commuter travel	
BASIC	★	4.1.1	Provide a dedicated ridematching portal at OttawaRideMatch.com	☐
		4.2	**Carpool parking price incentives**	
			Commuter travel	
BETTER		4.2.1	Provide discounts on parking costs for registered carpools	☐
		4.3	**Vanpool service**	
			Commuter travel	
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	☐
			Commuter travel	
BETTER		5.1.2	Provide employees with bikeshare memberships for local business travel	☐
		5.2	**Carshare vehicles & memberships**	
			Commuter travel	
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**	
			Commuter travel	
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	☐
			Visitor travel	
BETTER		6.1.3	Charge for short-term parking (hourly)	☐

TDM Measures Checklist **City of Ottawa**
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			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		7.	**TDM MARKETING & COMMUNICATIONS**	
		7.1	**Multimodal travel information**	
			Commuter travel	
BASIC	★	7.1.1	Provide a multimodal travel option information package to new/relocating employees and students	☑
			Visitor travel	
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**	
			Commuter travel	
BETTER	★	7.2.1	Offer personalized trip planning to new/relocating employees	☐
		7.3	**Promotions**	
			Commuter travel	
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**	
			Commuter travel	
BETTER	★	8.1.1	Provide emergency ride home service to non-driving commuters	☐
		8.2	**Alternative work arrangements**	
			Commuter travel	
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**	
			Commuter travel	
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**	
			Commuter travel	
BETTER		8.4.1	Offer employees a taxable, mode-neutral commuting allowance	☐
		8.5	**On-site amenities**	
			Commuter travel	
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 *(multi-family, condominium)*	☐
	2.2	**Bicycle skills training**	
BETTER	2.2.1	Offer on-site cycling courses for residents, or subsidize off-site courses	☐

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: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☑
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 Official Plan policy 4.3.3)*	☑
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☑

		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 Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☐
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 Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☐
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of 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 Zoning By-law Section 111)*	☑
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: *Non-residential developments*	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 *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	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 *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	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: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☐
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 Official Plan policy 4.3.3)*	☑
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☑

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☐
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: *Residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☑
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☐
	2.3	**Bicycle repair station**	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐

	TDM-supportive design & infrastructure measures: *Residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑
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 *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	☐

Appendix L

MMLOS Analysis

CGH TRANSPORTATION

Multi-Modal Level of Service - Intersections Form

Consultant	**CGH Transportation Inc.**	**Project**	**2023-055**
Scenario	**Existing/Future**	**Date**	**6/1/2023**
Comments			

	INTERSECTIONS	Centrum Boulevard at Place d'Orleans Drive (E				St-Joseph Boulevard at Place d'Orleans Drive (W)				St-Joseph Boulevard at Napoleon Way				St-Joseph Boulevard at Place d'Orleans Drive / Duford Drive			
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	8	7	7	8	9	6	9	8	9		5	5	9	10+	10+	10+
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m		No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive	Protected/ Permissive	Permissive	Protected/ Permissive	Permissive	Protected/ Permissive		Permissive	No left turn / Prohib.	Protected/ Permissive	Protected/ Permissive	Protected	Protected
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control		No right turn	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed		RTOR prohibited	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?	No	No	No	No	No	No	No	No	No		No	No	No	No	No	No
	Right Turn Channel	Conv'tl without Receiving Lane	Conv'tl without Receiving Lane	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel		No Right Turn	No Channel	No Channel	No Channel	No Channel	Conv'tl without Receiving Lane
	Corner Radius	5-10m	5-10m	10-15m	15-25m	5-10m	5-10m	5-10m	5-10m	10-15m		No Right Turn	10-15m	5-10m	15-25m	5-10m	10-15m
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Textured/coloured pavement	Textured/coloured pavement	Textured/coloured pavement	Textured/coloured pavement	Std transverse markings		Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings
	PETSI Score	-7	9	4	-14	-25	24	-25	-8	-29		55	45	-28	-47	-36	-33
	Ped. Exposure to Traffic LoS	F	F	F	F	F	F	F	F	F	-	D	D	F	F	F	F
	Cycle Length	75	75	85	85	90	100	100	100	90		100	90	105	105	105	105
	Effective Walk Time	19	19	11	11	7	7	7	25	8		28	54	7	7	10	10
	Average Pedestrian Delay	21	21	32	32	38	43	43	28	37		26	7	46	46	43	43
	Pedestrian Delay LoS	C	C	D	D	D	E	E	C	D	-	C	A	E	E	E	E
	Level of Service	F	F	F	F	F	F	F	F	F	-	D	D	F	F	F	F
		F				F				F				F			
	Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic		Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Right Turn Lane Configuration				≤ 50 m	> 50 m						≤ 50 m		> 50 m			
	Right Turning Speed				≤ 25 km/h	≤ 25 km/h						≤ 25 km/h		≤ 25 km/h			
	Cyclist relative to RT motorists	#N/A	#N/A	#N/A	D	F	#N/A	#N/A	#N/A	#N/A	-	D	#N/A	F	#N/A	#N/A	#N/A
	Separated or Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	-	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Left Turn Approach	One lane crossed	One lane crossed	One lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	One lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed		≥ 2 lanes crossed		≥ 2 lanes crossed	One lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed
	Operating Speed	≥ 60 km/h	≥ 60 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	≥ 60 km/h	≥ 60 km/h	≤ 40 km/h		> 50 to < 60 km/h		≥ 60 km/h	> 40 to ≤ 50 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h
	Left Turning Cyclist	F	F	D	E	F	E	F	F	B	-	F	-	F	D	F	F
	Level of Service	F	F	D	E	F	E	F	F	B	-	F	#N/A	F	D	F	F
		F				F				F				F			
Transit	Average Signal Delay																
	Level of Service	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		-				-				-				-			
Truck	Effective Corner Radius					10 - 15 m		10 - 15 m						10 - 15 m		10 - 15 m	
	Number of Receiving Lanes on Departure from Intersection					≥ 2		≥ 2						≥ 2		≥ 2	
	Level of Service	-	-	-	-	B	-	B	-	-	-	-	-	B	-	B	-
		-				B				-				B			
Auto	Volume to Capacity Ratio	0.0 - 0.60				0.71 - 0.80				0.0 - 0.60				0.71 - 0.80			
	Level of Service	A				C				A				C			

Multi-Modal Level of Service - Segments Form

Consultant	**CGH Transportation Inc.**	**Project**	**2023-055**
Scenario	**Existing/Future**	**Date**	**6/1/2023**
Comments			

SEGMENTS			Section St-Joseph Boulevard	Section Duford Drive	Section 3
Pedestrian	Sidewalk Width Boulevard Width		≥ 2 m < 0.5	≥ 2 m < 0.5	
	Avg Daily Curb Lane Traffic Volume		> 3000	≤ 3000	
	Operating Speed On-Street Parking		> 50 to 60 km/h no	> 30 to 50 km/h no	
	Exposure to Traffic PLoS	**-**	**E**	**B**	**-**
	Effective Sidewalk Width				
	Pedestrian Volume				
	Crowding PLoS		**-**	**-**	**-**
	Level of Service		**-**	**-**	**-**
Bicycle	Type of Cycling Facility		Mixed Traffic	Mixed Traffic	
	Number of Travel Lanes		4-5 lanes total	2-3 lanes total	
	Operating Speed		≥ 50 to 60 km/h	>40 to <50 km/h	
	# of Lanes & Operating Speed LoS		**E**	**D**	**-**
	Bike Lane (+ Parking Lane) Width				
	Bike Lane Width LoS	**E**	**-**	**-**	**-**
	Bike Lane Blockages				
	Blockage LoS		**-**	**-**	**-**
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge	< 1.8 m refuge	
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes	≤ 3 lanes	
	Sidestreet Operating Speed		>50 to 60 km/h	>40 to 50 km/h	
	Unsignalized Crossing - Lowest LoS		**C**	**A**	**-**
	Level of Service		**E**	**D**	**-**
Transit	Facility Type				
	Friction or Ratio Transit:Posted Speed	**-**			
	Level of Service		**-**	**-**	**-**
Truck	Truck Lane Width		> 3.7 m		
	Travel Lanes per Direction		> 1		
	Level of Service	**A**	**A**	**-**	**-**