



September 7, 2017
File: 163601146

Attention: Simon Nehme
Conroy Business Park Inc.
1890 Broadmoor Ave
Ottawa, Ontario
K1H 5B4

Dear Mr. Nehme,

Reference: 2500 St Laurent Blvd Transportation Brief

1.0 INTRODUCTION

Conroy Business Park Inc. is seeking site plan approval for a proposed office development located at 2500 St Laurent Boulevard in the Alta Vista area of the City of Ottawa. Stantec Consulting Ltd. was retained to undertake a Transportation Brief to determine the potential transportation implications of the proposed office development.

This Transportation Brief includes:

- A description of the proposed office development;
- A review of the site plan to confirm site access location;
- An overview of the existing surrounding transportation environment, including an operational assessment of the study area intersections under 2017 existing conditions;
- The volume of site traffic the proposed office development is anticipated to generate during the AM and PM roadway peak hours;
- An operational assessment of the study area intersections under 2021 total future conditions (site build-out); and
- An operational assessment of the study area intersections under 2026 ultimate future conditions (5-years beyond build-out).



Reference: 2500 St Laurent Blvd Transportation Brief

Through discussions with City of Ottawa staff, the following intersections were identified as part of the study area:

1. Walkley Road at Don Reid Drive / Ryder Street;
2. Walkley Road at Conroy Road;
3. Conroy Road at St Laurent Blvd; and
4. St Laurent Blvd at the proposed site access (north) and existing site access (south).

2.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

The subject site is located in the Alta Vista District of the City of Ottawa at the northwest quadrant of the St Laurent Blvd. / Conroy Road intersection.

The proposed development consists of 6,329.86 m^2 of office space within two, two-story buildings. It is proposed to include a total of 18 office units, 169 parking spaces, 2 loading areas, and 20 bicycle parking spaces.

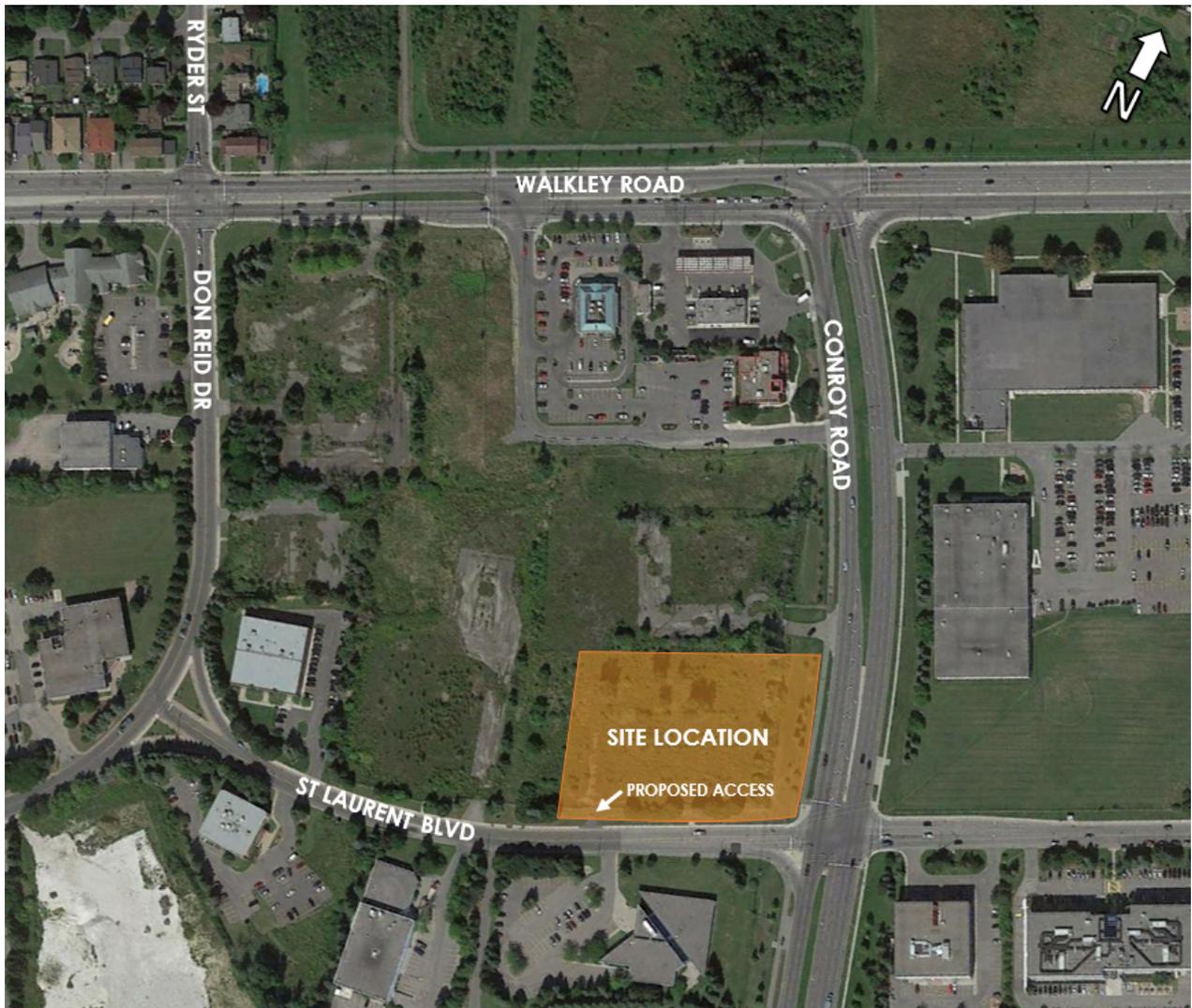
Figure 1 illustrates the location of the site at 2500 St Laurent Blvd.

Attachment 1 illustrates the site plan.



Reference: 2500 St Laurent Blvd Transportation Brief

Figure 1 - Site Location





Reference: 2500 St Laurent Blvd Transportation Brief

3.0 EXISTING TRANSPORTATION ENVIRONMENT

3.1 ROADS AND TRAFFIC CONTROLS

The major roadways in the study area are as follows:

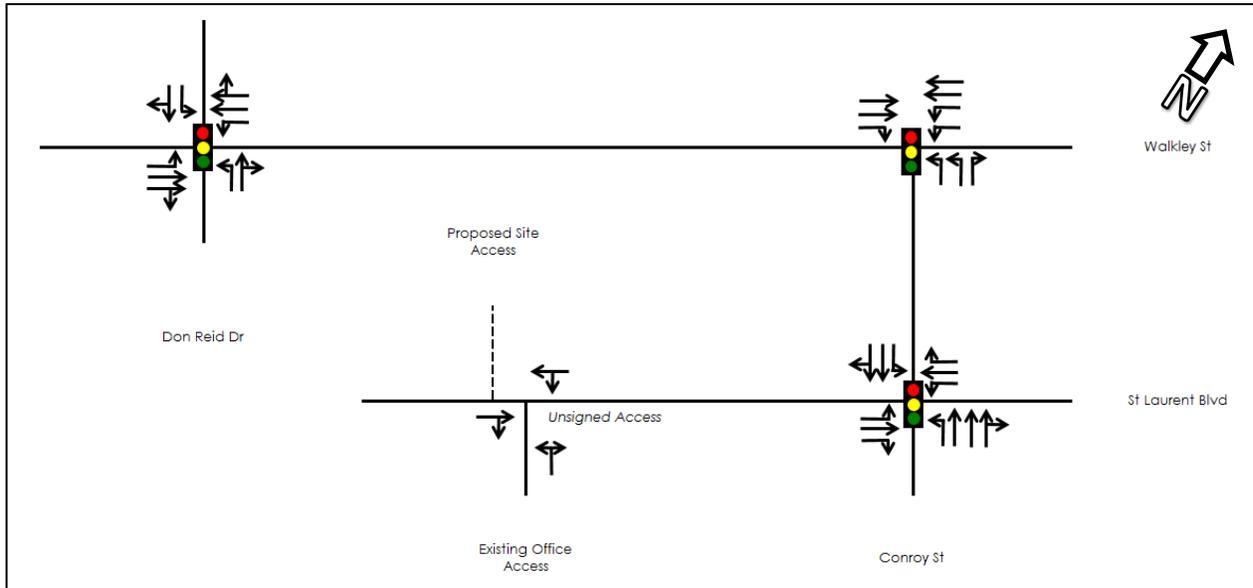
Conroy Road	Conroy Road is a four-lane urban arterial with a posted speed limit of 60 km/h. Sidewalks are provided along both sides of the road. The intersection with St Laurent Boulevard is signalized with dedicated left turn lanes along Conroy Street.
St Laurent Boulevard	St Laurent Boulevard is a two-lane local road with a posted speed limit of 50 km/h. A sidewalk is provided along the north side of the road. On-street parking is prohibited along both sides.
Walkley Road	Walkley Road is a four-lane urban arterial with a default speed limit of 50 km/h. Sidewalks are provided along both sides of the road. The intersection with Conroy Road is signalized with dedicated left turn lanes and channelized right turn lanes.
Don Reid Drive	Don Reid Drive is a two-lane local road with a default speed limit of 50 km/h. A sidewalk is provided along the east side of the street and parking is prohibited along both sides of the road.

Figure 2 illustrates the existing intersection control and lane geometry for the study area intersections.



Reference: 2500 St Laurent Blvd Transportation Brief

Figure 2 - 2017 Existing Intersection Control and Lane Geometry



3.2 TRANSIT SERVICE

Transit service is currently provided within close proximity of the subject site by OC Transpo Routes 112, 114, and 291.

Route 112 is a Local route providing service between Elmvale and Billings Bridge. Route 112 operates on Walkley Road with stops within 450 meters of the subject site.

Route 114 is a Local route providing service between St Laurent Station and Greenboro Station. Route 114 operates on Conroy Road and St Laurent Boulevard with stops within 150 meters of the subject site.

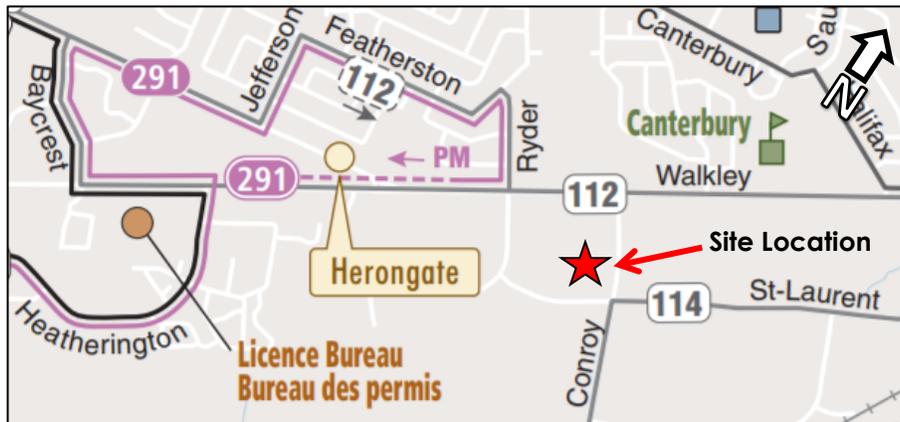
Route 291 is a Connexion route providing service between Herongate Mall and Hurdman Station during peak hours only with stops within 650 meters of the subject site.

Figure 3 illustrates the transit service near the subject site.



Reference: 2500 St Laurent Blvd Transportation Brief

Figure 3 - Study Area Transit Routes



Source: City of Ottawa's OC Transpo System Map (accessed August 31st, 2017)

3.3 CYCLING AND WALKING FACILITIES

Nearby pedestrian and cycling facilities provide access to the subject study location.

Conroy Road has a sidewalk on the east side of the road and a segregated +3.0 meter multi-use pathway on the west side. Conroy Road also forms part of the City's crosstown bikeway network and has on-street bike lanes on both sides road between Walkley Road and Hunt Club Road.

Additional cycling connectivity is provided from the existing multi-use pathway link between Walkley Road and Kilborne Avenue, with connections to other multi-use pathway links towards Smyth Road.

St Laurent Blvd. has a sidewalk along the north side of the road between Don Reid Drive and Walkley Road.

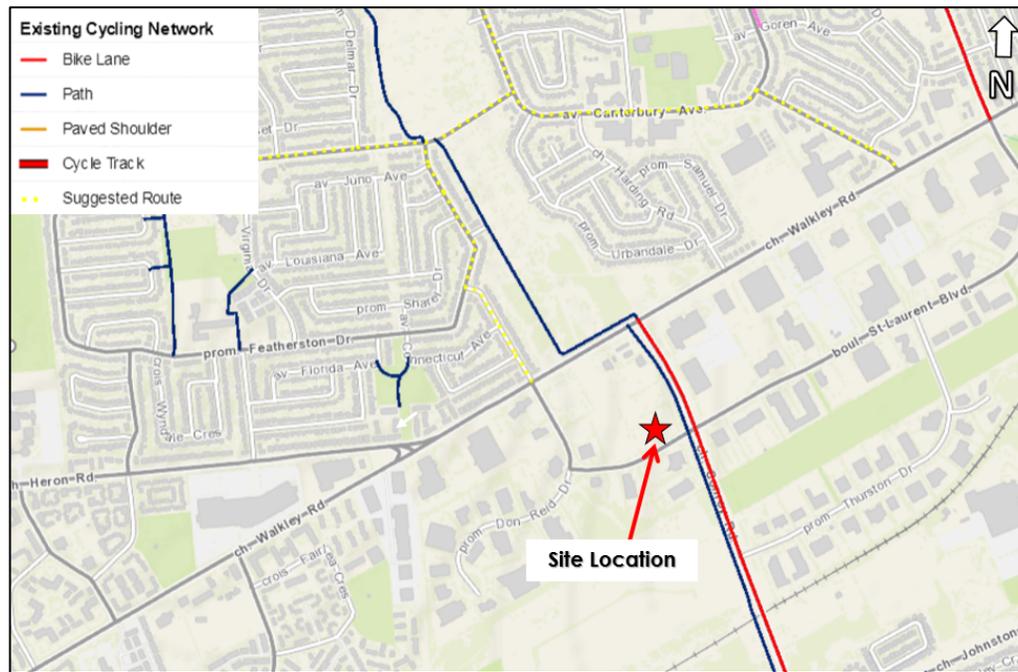
Don Reid Road has a sidewalk along the east side of the road between Walkley Road and St Laurent Blvd.

Figure 4 illustrates the existing cycling facilities within the study area.



Reference: 2500 St Laurent Blvd Transportation Brief

Figure 4 - Existing Cycling Network



Source: City of Ottawa's GeoOttawa Mapping (accessed August 22nd, 2017)

3.4 INTERSECTION OPERATIONS

An assessment was undertaken to determine the operational characteristics under 2017 existing conditions. The study area intersections include Conroy Road at St Laurent Blvd, Conroy Road at Walkley Road, Don Reid Drive/ Ryder Street at Walkley Road, and St Laurent Blvd at the existing south access in the vicinity of the proposed development.

Intersection level of service analysis was undertaken using the Synchro 9.0™ software package. Traffic counts and signal timings were obtained from the City of Ottawa and were used in the assessment of 2017 existing conditions. In addition, trip generation from the existing single-story office building (approximately 16 ksf) on the south access were estimated using industry standard trip generation rates. Additional information on this is provided in **Section 4.2**.

Figure 5 and **Figure 6** illustrate the 2017 existing traffic volumes at the study area intersections.

Table 1 provides a summary of 2017 existing intersection operations.

Appendix A contains the traffic counts and signal timing plans provided by the City of Ottawa and **Appendix B** contains the detailed intersection performance worksheets.



Reference: 2500 St Laurent Blvd Transportation Brief

Figure 5 - 2017 Existing AM Peak Traffic Volumes

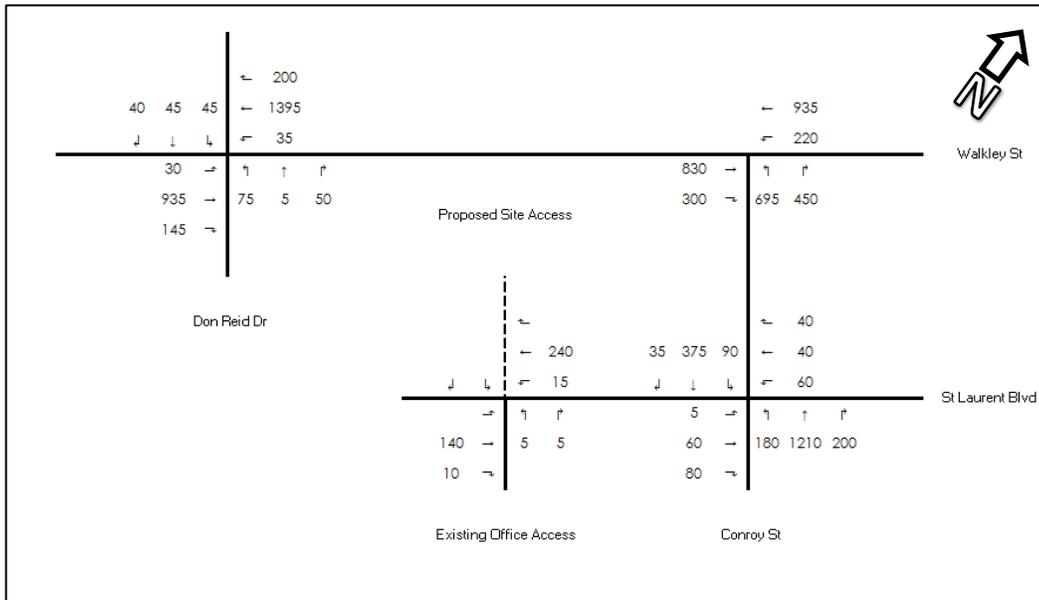
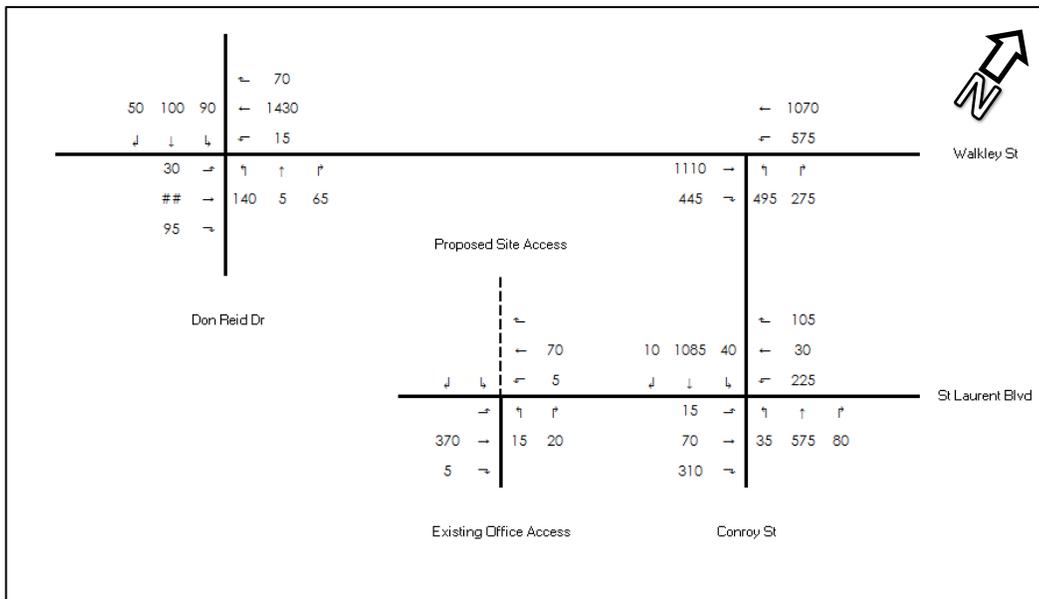


Figure 6 - 2017 Existing PM Peak Traffic Volumes





Reference: 2500 St Laurent Blvd Transportation Brief

Table 1 - 2017 Existing Intersection Operations

SIGNALIZED INTERSECTION	APPROACH/MOVEMENT	2017 EXISTING CONDITIONS				
		LOS	V/C ²	Delay (s)	Q ³ (m)	
Don Reid Dr at Walkley Rd (Signalized)	EB	Left	A (A)	0.27 (0.27)	9.2 (11.6)	11.9 (10.7)
		Through / Right	A (B)	0.48 (0.70)	5.7 (11.6)	92.7 (160.4)
	WB	Left	A (A)	0.14 (0.14)	4.7 (7.6)	m6.3 (m2.7)
		Through / Right	C (C)	0.71 (0.71)	10.6 (14.4)	#199.4 (172.6)
	NB	Left	A (D)	0.51 (0.82)	42.9 (65.5)	24.2 (51.4)
		Through / Right	A (A)	0.07 (0.16)	38.1 (37.4)	9.9 (18.2)
	SB	Left	A (A)	0.30 (0.42)	40.2 (40.3)	16.0 (31.8)
		Through / Right	A (A)	0.31 (0.46)	40.1 (40.5)	20.9 (43.5)
	Overall Intersection		B (C)	0.68 (0.73)	11.3 (17.5)	-
	Conroy Rd at Walkley Rd (Signalized)	EB	Through	B (D)	0.65 (0.88)	26.1 (34.4)
Right			A (A)	0.22 (0.36)	41.4 (46.1)	34.4 (48.7)
WB		Left	A (E)	0.60 (0.93)	43.8 (61.9)	34.6 (#106.9)
		Through	A (A)	0.51 (0.52)	12.3 (9.5)	74.1 (78.4)
NB		Left	D (D)	0.86 (0.81)	40.6 (48.9)	56.5 (76.0)
		Right	B (A)	0.62 (0.20)	38.4 (36.5)	54.6 (22.1)
Overall Intersection		C (D)	0.72 (0.87)	29.3 (34.9)	-	
St Laurent Blvd and Conroy Rd (Signalized)	EB	Left	A (A)	0.03 (0.06)	32.9 (28.4)	3.3 (6.1)
		Through	A (A)	0.20 (0.18)	34.4 (29.3)	17.4 (17.0)
		Right	A (C)	0.06 (0.73)	33.2 (41.6)	9.3 (55.7)
	WB	Left	A (A)	0.31 (0.60)	35.7 (24.6)	18.2 (36.2)
		Through	A (A)	0.15 (0.05)	33.9 (18.0)	12.6 (6.8)
		Right	A (A)	0.06 (0.14)	33.2 (18.7)	7.8 (11.2)
	NB	Left	A (A)	0.33 (0.37)	8.2 (26.0)	42.1 (#21.8)
		Through / Right	A (A)	0.47 (0.31)	8.2 (16.0)	90.0 (48.3)
	SB	Left	A (A)	0.57 (0.13)	25.2 (15.2)	#46.2 (13.5)
		Through / Right	A (C)	0.20 (0.75)	9.4 (24.0)	51.2 (#175.0)
	Overall Intersection		A (C)	0.51 (0.74)	12.1 (23.9)	-
St Laurent Blvd and Existing Access (Stop-Controlled)	EB	Through / Right	A (A)	0.09 (0.25)	0.0 (0.0)	0.0 (0.0)
	WB	Left / Through	A (A)	0.01 (0.01)	0.6 (0.6)	0.3 (0.1)
	NB	Left / Right	B (B)	0.02 (0.07)	10.3 (11.6)	0.4 (1.6)
	Overall Intersection		B (B)	-	0.6 (0.9)	-
Note:						
1. Table Format: AM (PM)						
2. Volume to capacity ratio						
3. 95th Percentile Queue (m)						
4. # - 95th percentile volume exceeds capacity, queue may be longer						
5. m - volume for 95th percentile queue is metered by upstream signal						



Reference: 2500 St Laurent Blvd Transportation Brief

As outlined in **Table 1**, all study area intersections currently operate acceptably under 2017 existing conditions during both the AM and PM peak hours.

4.0 FUTURE TRANSPORTATION ENVIRONMENT

4.1 CYCLING AND WALKING FACILITIES

The City of Ottawa's Cycling Plan Ultimate Cycling Network identifies Walkley Road as a spine route as part of the crosstown bikeway network. The City's Ultimate Cycling Network also designates St Laurent Blvd. to be a "local route". No other cycling or walking facilities are planned in the vicinity of the site.

4.2 SITE TRAFFIC GENERATION

4.2.1 Land Use and Trip Generation Rates

The Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition, was used to estimate the volume of traffic expected to be generated by the proposed development during the AM and PM peak hours. Land use code 710 – General Office Building was thought to be the most representative of the proposed land use.

Table 2 summarizes the trip rates obtained from the ITE Trip Generation Manual and the ensuing sections describe the methodology used to convert these trips to person trips across all modes.

Table 2 - ITE Trip Generation Rates

ITE TRIP GENERATION RATES							
Land Use Code	1000 Sq. Ft Gross Floor Area	AM Peak Hour			PM Peak Hour		
		Inbound	Outbound	Rate	Inbound	Outbound	Total
710 - General Office Building	39	88%	12%	2.31	17%	83%	3.13

4.2.2 Conversion of ITE Rates to Person Trips

The notion of quantifying the volume of "person" trips expected to be generated by a given development is becoming a commonly accepted practice. It is aimed at quantifying the expected demands across the primary modes of transportation.

In order to convert ITE rates to person trips, the rates obtained from the ITE Trip Generation Manual were adjusted to account for the transit modal share and auto occupancy thought to be inherent within the ITE rates. An assumed transit share of 10% was thought to be inherent within the ITE rates and an auto occupancy rate of 1.15 persons per vehicle was also assumed to be inherent within the ITE rates.



Reference: 2500 St Laurent Blvd Transportation Brief

The proposed development is anticipated to generate 113 and 152 person trips during the AM and PM peak hours, respectively.

Table 3 outlines the conversion from auto trips to person trips.

Table 3 - Conversion from Auto Trips to Person Trips

ITE LAND USE			MORNING PEAK HOUR			AFTERNOON PEAK HOUR		
			IN	OUT	TOTAL	IN	OUT	TOTAL
710 - General Office Building	Trip Gen		79	11	90	21	101	122
	Transit Share	10%	8	1	9	2	10	12
	Auto Occupancy	1.15	12	2	14	3	15	18
	Total Person Trips		99	14	113	26	126	152

4.2.3 Modal Shares

To reflect local travel characteristics, the person trips were assigned to the four primary modal shares (i.e. auto, passenger, transit, and active moves) according to the TRANS Committee's 2011 Origin-Destination (O-D) Survey for the Alta Vista District.

Table 4 summarizes the expected person trips by modal share.

Table 4 - Site Trips by Modal Share

ITE LAND USE			MORNING PEAK HOUR			AFTERNOON PEAK HOUR		
			IN	OUT	TOTAL	IN	OUT	TOTAL
710 - General Office Building	Auto	65%	65	9	72	17	82	99
	Passenger	15%	15	2	17	3	19	22
	Transit	17%	17	2	19	4	21	25
	Active Modes	3%	3	0	3	1	4	5

The proposed development is anticipated to generate an additional 72 and 99 auto trips (two-way) during the AM and PM peak hours, respectively.



Reference: 2500 St Laurent Blvd Transportation Brief

4.2.4 Trip Distribution and Assignment

Based on the location of the study area and the results of the TRANS Committee 2011 O-D Survey, the following cardinal trip distribution assumptions were adopted:

- 20% of site generated trips were assumed to come from or go to the south;
- 15% were assumed to come from or go to the west;
- 15% were assumed to come from or go to the east;
- 20% were assumed to come from or go to the north; and
- 30% were assumed to remain within the Alta Vista district.

The following trip assignments were assumed:

- 40% of inbound/outbound trips would utilize the Walkley/Don Reid intersection; and
- 60% of inbound/outbound trips would utilize the St Laurent Blvd at Conroy Road intersection.

Figure 7 and **Figure 8** illustrate the auto trips the proposed development is anticipated to generate during the AM and PM peak hours, respectively.



Reference: 2500 St Laurent Blvd Transportation Brief

Figure 7 - Auto Trips Generated at the Site during AM Peak Period

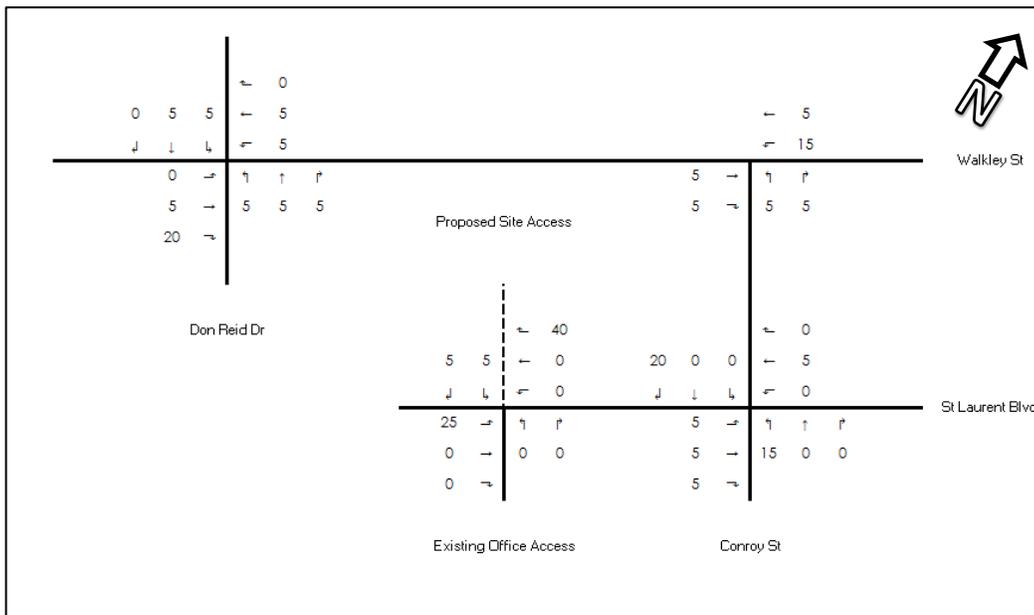
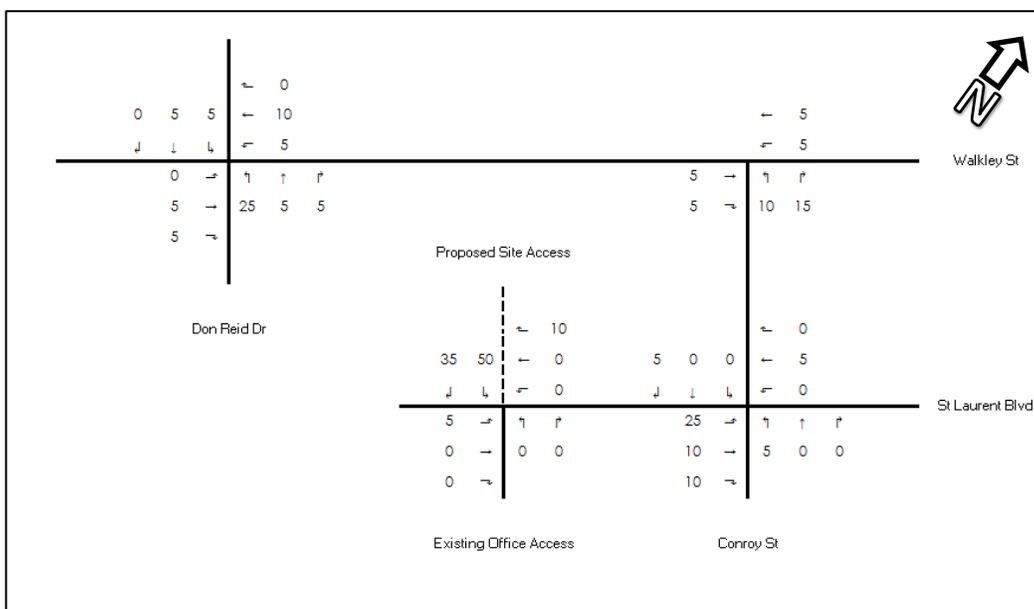


Figure 8 - Auto Trips generated at the Site during PM Peak Period





Reference: 2500 St Laurent Blvd Transportation Brief

4.3 SITE ACCESS CONSIDERATIONS

The proposed site access location was assessed from a functional and traffic operations perspective.

The proposed development includes a single access point located on the north side of St Laurent Blvd. This proposed access point is offset by approximately 8.5 meters (centerline to centerline) to the west of the existing access connection / office development on the south side of St Laurent Blvd.

Preferably, opposing local access points are aligned in order to avoid interlocking left turn movement conflicts and to simplify intersection operations. In the context of the proposed development at 2500 St Laurent Blvd, a number of factors were considered including the local built-environment, general traffic volumes on St Laurent Blvd, anticipated site generated activity, and proximity to signalized intersections.

The proposed access arrangement with centerline offsets is consistent with other similar low-rise office buildings within business park developments. Similar access arrangements can be found within the Ottawa Business Park near the proposed development, as well as other similar business parks including Colonnade Business Park in Nepean.

Figure 9 provides an overview of the access arrangements with centerline offsets within the Colonnade Business Park.

Figure 9 - Existing Local Access Arrangements (Colonnade Road)



The built-environment near the subject site as well as the relatively low traffic volumes from existing and proposed land uses on St Laurent Blvd indicate that the proposed location of the site access can function adequately without any adverse impacts.

In addition, the placement of the proposed access location for 2500 St Laurent Blvd allows for a greater offset from the intersection of St Laurent Blvd and Conroy, particularly from the eastbound left turn lane taper.



Reference: 2500 St Laurent Blvd Transportation Brief

5.0 FUTURE TRANSPORTATION ASSESSMENT

5.1 2021 FUTURE BACKGROUND CONDITIONS

An assessment of the study area intersections was undertaken to determine the operational characteristics under 2021 future background conditions. The operational analysis was facilitated using the Synchro 9.0™ software package.

Traffic counts were obtained from the City of Ottawa and were used in the assessment of 2021 future background conditions. As the traffic counts were conducted in 2017, study area volumes under the 2021 time horizon were developed applying an annual growth rate of 2% to base volumes.

Figure 10 and **Figure 11** illustrate the 2021 future background traffic volumes at the study area intersections.

Table 5 provides a summary of 2021 future background intersection operations.

As illustrated in **Table 5**, all study area intersections are anticipated to operate acceptably under 2021 future background conditions.



Reference: 2500 St Laurent Blvd Transportation Brief

Figure 10 - 2021 Future Background AM Peak Traffic Volumes

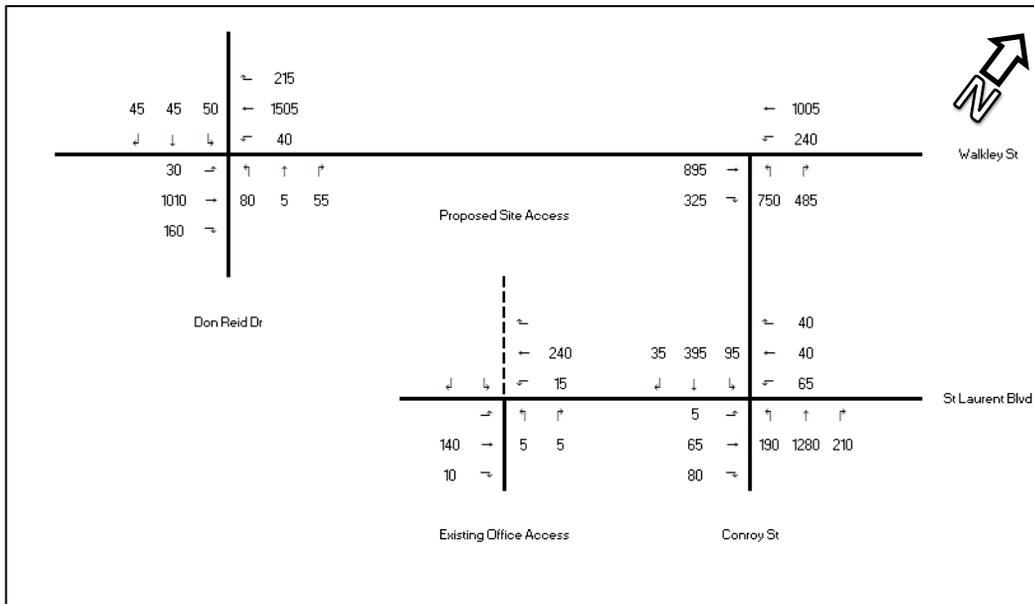
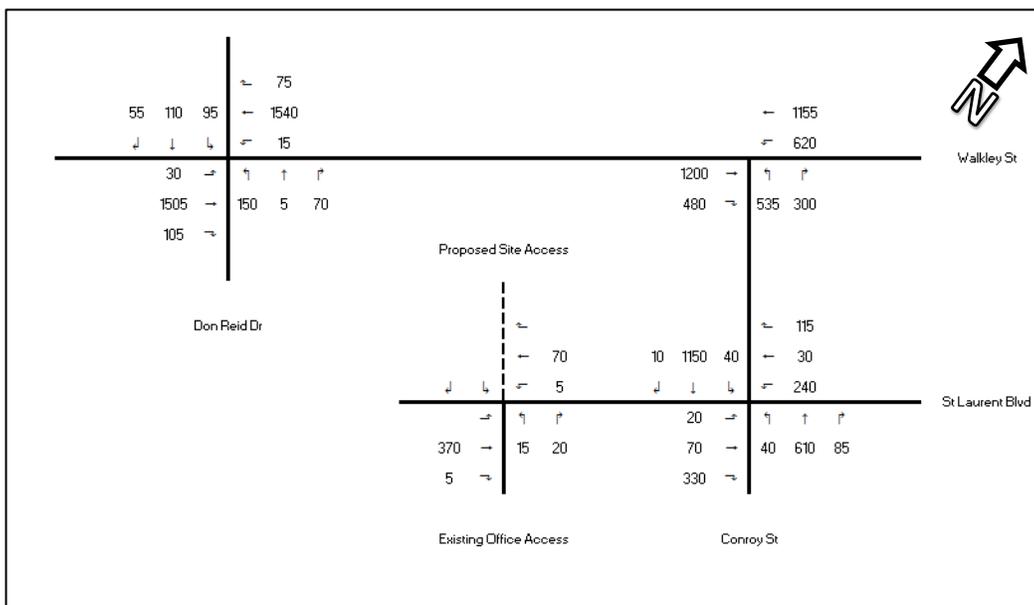


Figure 11 - 2021 Future Background PM Peak Traffic Volumes





Reference: 2500 St Laurent Blvd Transportation Brief

Table 5 - 2021 Future Background Intersection Operations

SIGNALIZED INTERSECTION	APPROACH/MOVEMENT	2021 FUTURE BACKGROUND CONDITIONS				
		LOS	V/C ²	Delay (s)	Q ³ (m)	
Don Reid Dr at Walkley Rd (Signalized)	EB	Left	A (A)	0.22 (0.22)	7.5 (9.5)	9.9 (9.1)
		Through / Right	A (B)	0.47 (0.68)	5.5 (10.9)	89.3 (151.7)
	WB	Left	A (A)	0.14 (0.11)	3.7 (4.7)	m4.5 (m1.5)
		Through / Right	B (B)	0.69 (0.68)	5.8 (6.5)	135.3 (82.0)
	NB	Left	A (C)	0.49 (0.80)	42.7 (64.2)	23.3 (49.2)
		Through / Right	A (A)	0.06 (0.15)	38.2 (37.7)	9.5 (16.6)
	SB	Left	A (A)	0.30 (0.40)	40.3 (40.5)	16.0 (30.4)
		Through / Right	A (A)	0.28 (0.47)	39.9 (41.0)	19.6 (43.1)
Overall Intersection		B (C)	0.66 (0.71)	8.7 (13.7)	-	
Conroy Rd at Walkley Rd (Signalized)	EB	Through	B (D)	0.65 (0.85)	22.8 (27.0)	53.4 (#166.5)
		Right	A (A)	0.21 (0.35)	12.4 (21.0)	9.9 (14.8)
	WB	Left	B (D)	0.62 (0.89)	45.0 (55.0)	35.5 (#94.0)
		Through	A (A)	0.51 (0.50)	13.2 (8.9)	81.1 (73.8)
	NB	Left	C (D)	0.78 (0.81)	26.7 (49.7)	22.5 (74.4)
		Right	B (A)	0.62 (0.20)	18.2 (37.0)	17.8 (22.1)
	Overall Intersection		B (D)	0.69 (0.85)	20.9 (29.0)	-
St Laurent Blvd and Conroy St (Signalized)	EB	Left	A (A)	0.02 (0.07)	33.0 (28.6)	3.0 (6.8)
		Through	A (A)	0.20 (0.18)	34.4 (29.5)	17.1 (16.7)
		Right	A (C)	0.05 (0.71)	33.2 (40.5)	9.0 (53.5)
	WB	Left	A (A)	0.31 (0.56)	35.7 (26.3)	17.9 (39.5)
		Through	A (A)	0.13 (0.05)	33.9 (20.5)	11.8 (7.0)
		Right	A (A)	0.04 (0.09)	33.1 (20.8)	7.0 (8.3)
	NB	Left	A (A)	0.31 (0.28)	7.9 (18.1)	40.6 (16.5)
		Through / Right	A (A)	0.46 (0.28)	8.0 (13.5)	86.3 (43.4)
	SB	Left	A (A)	0.54 (0.12)	14.8 (12.8)	m#41.5 (12.8)
		Through / Right	A (B)	0.19 (0.67)	2.5 (19.3)	13.9 (#152.7)
Overall Intersection		A (B)	0.49 (0.69)	10.4 (21.3)	-	
St Laurent Blvd and Existing Access (Stop-Controlled)	EB	Through / Right	A (A)	0.09 (0.24)	0.0 (0.0)	0.0 (0.0)
	WB	Left / Through	A (A)	0.01 (0.0)	0.5 (0.5)	0.2 (0.1)
	NB	Left / Through / Right	B (B)	0.01 (0.06)	10.2 (11.4)	0.3 (1.4)
	Overall Intersection		B (B)	-	0.6 (0.9)	-
Note: 1. Table Format: AM (PM) 2. Volume to capacity ratio 3. 95th Percentile Queue (m) 4. # - 95th percentile volume exceeds capacity, queue may be longer 5. m - volume for 95th percentile queue is metered by upstream signal						



Reference: 2500 St Laurent Blvd Transportation Brief

5.2 2021 TOTAL FUTURE CONDITIONS

An assessment of the study area intersections was undertaken to determine the operational characteristics under 2021 total future conditions. Intersection level of service analysis was undertaken using the Synchro 9.0™ software package.

The 2021 total future traffic volumes were derived by adding site generated trips to 2021 future background traffic volumes.

Figure 12 and **Figure 13** illustrate the 2021 total future traffic volumes at the study area intersections for the AM and PM peak hours, respectively.

Table 6 provides a summary of 2021 total future intersection operations.

The study area intersections are anticipated to operate acceptably under 2021 total future conditions. No transportation improvements are required to accommodate the anticipated site trips generated by the proposed office development.



Reference: 2500 St Laurent Blvd Transportation Brief

Figure 12 - 2021 Total AM Peak Traffic Volumes

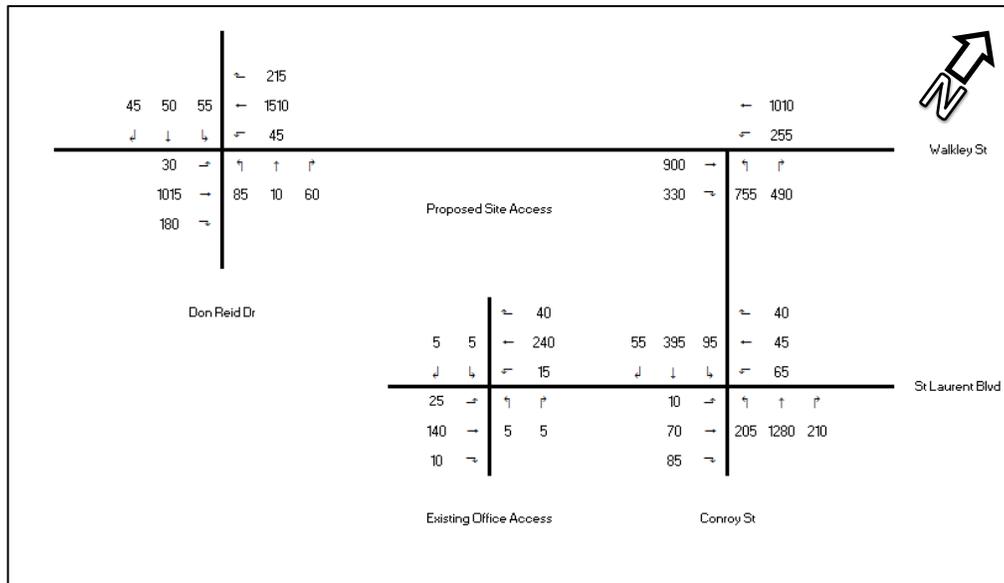
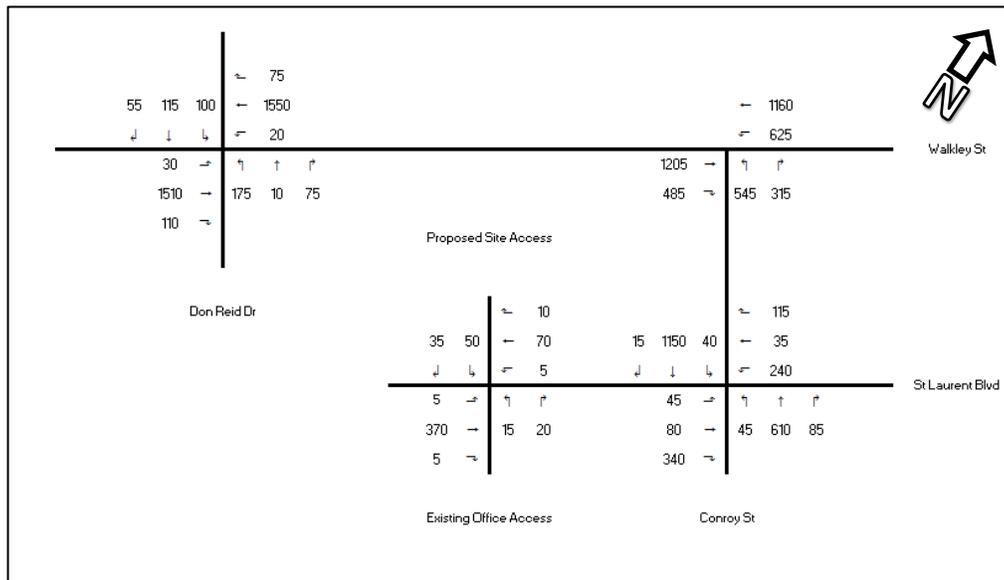


Figure 13 - 2021 Total PM Peak Traffic Volumes





Reference: 2500 St Laurent Blvd Transportation Brief

Table 6 - 2021 Total Future Intersection Operations

SIGNALIZED INTERSECTION	APPROACH/MOVEMENT	2021 TOTAL FUTURE CONDITIONS				
		LOS	V/C ²	Delay (s)	Q ³ (m)	
Don Reid Dr at Walkley Rd (Signalized)	EB	Left	A (A)	0.22 (0.24)	7.7 (11.1)	10.0 (9.5)
		Through / Right	A (B)	0.48 (0.70)	5.7 (12.3)	92.0 (153.6)
	WB	Left	A (A)	0.16 (0.16)	4.1 (6.0)	m5.3 (m2.1)
		Through / Right	B (B)	0.69 (0.70)	6.1 (7.3)	155.4 (98.2)
	NB	Left	A (D)	0.52 (0.85)	43.1 (68.5)	24.5 (57.5)
		Through / Right	A (A)	0.09 (0.17)	38.2 (36.3)	11.1 (19.3)
	SB	Left	A (A)	0.33 (0.39)	40.4 (38.3)	17.1 (31.9)
		Through / Right	A (A)	0.30 (0.44)	39.9 (39.2)	20.6 (44.7)
	Overall Intersection		B (C)	0.67 (0.74)	9.1 (15.1)	-
	Conroy Rd at Walkley Rd (Signalized)	EB	Through	B (D)	0.66 (0.85)	22.9 (26.7)
Right			A (A)	0.22 (0.35)	12.3 (21.4)	9.5 (17.0)
WB		Left	B (D)	0.66 (0.90)	46.2 (56.5)	37.5 (#96.5)
		Through	A (A)	0.51 (0.50)	13.3 (9.1)	81.7 (74.2)
NB		Left	C (D)	0.79 (0.82)	26.5 (49.7)	19.9 (75.8)
		Right	B (A)	0.63 (0.21)	16.8 (36.8)	9.2 (22.6)
Overall Intersection		B (D)	0.70 (0.86)	20.9 (29.3)	-	
St Laurent Blvd and Conroy St (Signalized)	EB	Left	A (A)	0.04 (0.15)	33.1 (28.9)	4.6 (12.2)
		Through	A (A)	0.21 (0.20)	34.5 (29.3)	18.1 (18.6)
		Right	A (C)	0.06 (0.73)	33.3 (40.8)	9.3 (56.0)
	WB	Left	A (A)	0.31 (0.56)	35.7 (26.0)	17.9 (39.5)
		Through	A (A)	0.15 (0.06)	34.0 (20.3)	12.9 (7.9)
		Right	A (A)	0.04 (0.09)	33.1 (20.5)	7.0 (8.3)
	NB	Left	A (A)	0.34 (0.33)	8.3 (20.2)	45.0 (#20.7)
		Through / Right	A (A)	0.46 (0.28)	8.0 (13.8)	86.3 (43.4)
	SB	Left	A(A)	0.54 (0.12)	14.9 (13.1)	m#40.1 (12.8)
		Through / Right	A (B)	0.20 (0.68)	2.3 (19.9)	12.3 (#153.9)
	Overall Intersection		A (B)	0.49 (0.70)	10.5 (21.8)	-
St Laurent Blvd and Proposed/ Existing Access (Stop-Controlled)	EB	Left / Through / Right	A (A)	0.02 (0.0)	1.2 (0.1)	0.5 (0.1)
	WB	Left / Through / Right	A (A)	0.01 (0.0)	0.5 (0.5)	0.2 (0.1)
	NB	Left / Through / Right	B (B)	0.03 (0.08)	11.8 (12.5)	0.6 (1.8)
	SB	Left / Through / Right	B (B)	0.03 (0.16)	11.9 (12.6)	0.7 (4.3)
	Overall Intersection		B (B)	-	1.4 (2.7)	-
Note: 1. Table Format: AM (PM) 2. Volume to capacity ratio 3. 95th Percentile Queue (m) 4. # - 95th percentile volume exceeds capacity, queue may be longer 5. m - volume for 95th percentile queue is metered by upstream signal						



Reference: 2500 St Laurent Blvd Transportation Brief

5.2 2026 ULTIMATE CONDITIONS

An assessment of the study area intersections was undertaken to determine the operational characteristics under 2026 ultimate conditions. Intersection level of service analysis was undertaken using the Synchro 9.0™ software package.

As the traffic counts were conducted in 2017, study area traffic volumes were adjusted to reflect 2026 growth by applying an annual rate of growth of 1% between the 2021 and 2026 time horizons. The annual growth rate applied between the 2021 and 2026 time horizons considers significant improvements in transit and active modes infrastructure. This includes completion of both Phase 1 and Phase 2 of Light Rail Transit (LRT) construction and the adoption of expanded cycling infrastructure in the vicinity of the study area.

The 2026 ultimate traffic volumes were derived by adding site generated trips to 2026 future background traffic volumes.

Figure 14 and **Figure 15** illustrates the 2026 ultimate traffic volumes at the study area intersections under AM and PM peak hours, respectively.

Table 7 provides a summary of 2026 ultimate intersection operations.

The study area intersections are anticipated to operate acceptably under 2026 ultimate future conditions.



Reference: 2500 St Laurent Blvd Transportation Brief

Figure 14 - 2026 Ultimate AM Peak Traffic Volumes

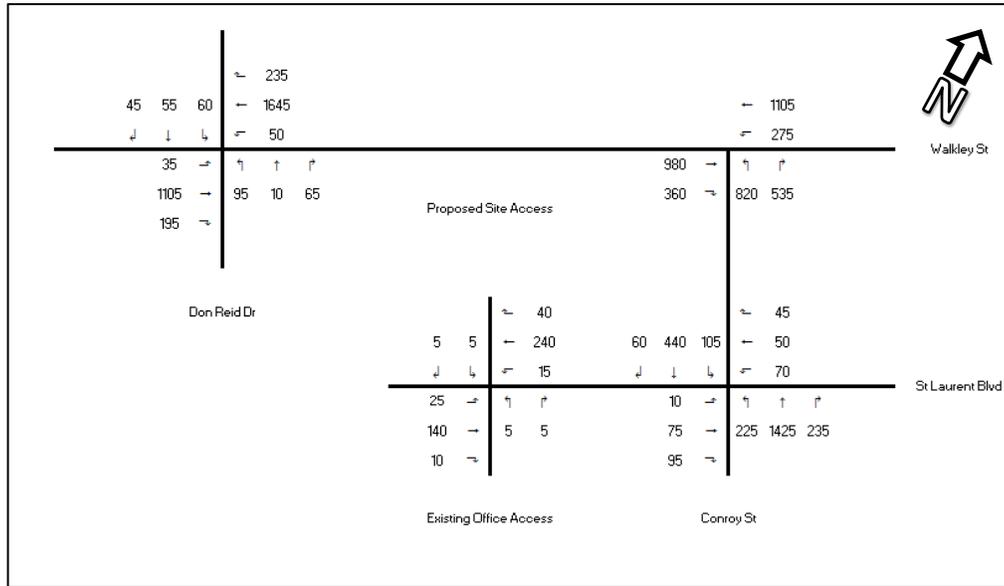
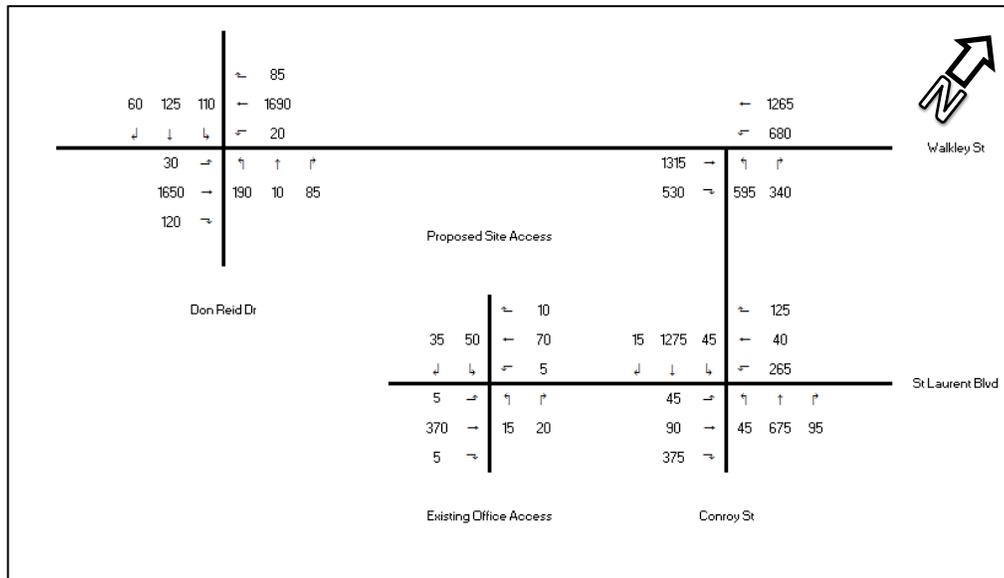


Figure 15 - 2026 Ultimate PM Peak Traffic Volumes





Reference: 2500 St Laurent Blvd Transportation Brief

Table 7 - 2026 Ultimate Intersection Operations

SIGNALIZED INTERSECTION	APPROACH/MOVEMENT		2026 ULTIMATE CONDITIONS				
			LOS	V/C ²	Delay (s)	Q ³ (m)	
Don Reid Dr at Walkley Rd (Signalized)	EB	Left	A (A)	0.25 (0.30)	9.0 (14.6)	11.2 (10.9)	
		Through / Right	A (C)	0.50 (0.75)	5.8 (14.0)	99.4 (169.0)	
	WB	Left	A (A)	0.17 (0.19)	3.1 (7.3)	m4.4 (m2.1)	
		Through / Right	C (C)	0.72 (0.75)	4.9 (8.2)	#40.3 (113.8)	
	NB	Left	A (D)	0.49 (0.88)	42.7 (73.9)	23.3 (#66.7)	
		Through / Right	A (A)	0.08 (0.19)	38.4 (35.7)	10.8 (21.7)	
	SB	Left	A (A)	0.36 (0.39)	40.9 (38.0)	18.3 (33.2)	
		Through / Right	A (A)	0.33 (0.45)	40.4 (38.4)	21.6 (47.0)	
	Overall Intersection			B (C)	0.69 (0.78)	8.4 (16.5)	-
	Conroy Rd at Walkley Rd (Signalized)	EB	Through	C (E)	0.70 (0.91)	23.2 (30.3)	63.2 (#178.8)
Right			A (A)	0.23 (0.39)	12.5 (21.4)	3.7 (23.0)	
WB		Left	B (E)	0.70 (0.92)	47.9 (59.5)	38.7 (#103.9)	
		Through	A (A)	0.54 (0.53)	14.0 (9.6)	85.1 (80.1)	
NB		Left	D (D)	0.81 (0.84)	37.9 (51.1)	91.3 (79.6)	
		Right	C (A)	0.69 (0.22)	35.6 (36.6)	80.1 (23.2)	
Overall Intersection			C (D)	0.74 (0.90)	26.0 (31.0)	-	
St Laurent Blvd and Conroy St (Signalized)	EB	Left	A (A)	0.04 (0.14)	30.6 (28.1)	4.3 (12.2)	
		Through	A (A)	0.22 (0.20)	32.0 (28.5)	17.6 (19.4)	
		Right	A (C)	0.06 (0.74)	30.8 (40.9)	8.9 (59.7)	
	WB	Left	A (A)	0.31 (0.57)	33.2 (25.6)	17.6 (41.2)	
		Through	A (A)	0.14 (0.06)	31.4 (19.6)	12.0 (7.9)	
		Right	A (A)	0.04 (0.12)	30.6 (20.1)	6.4 (10.2)	
	NB	Left	A (A)	0.38 (0.39)	9.2 (24.9)	49.2 (#23.4)	
		Through / Right	A (A)	0.49 (0.30)	8.7 (14.5)	93.4 (45.9)	
	SB	Left	B (A)	0.65 (0.13)	29.4 (13.8)	#48.6 (12.9)	
		Through / Right	A (C)	0.21 (0.73)	6.6 (21.8)	36.0 (#166.9)	
	Overall Intersection			A (C)	0.57 (0.74)	12.0 (22.8)	-
St Laurent Blvd and Proposed/ Existing Access (Stop-Controlled)	EB	Left / Through / Right	A (A)	0.02 (0.0)	1.2 (0.1)	0.5 (0.1)	
	WB	Left / Through / Right	A (A)	0.01 (0.0)	0.5 (0.5)	0.2 (0.1)	
	NB	Left / Through / Right	B (B)	0.03 (0.08)	11.9 (12.7)	0.7 (1.9)	
	SB	Left / Through / Right	B (B)	0.03 (0.16)	12.1 (12.9)	0.7 (4.4)	
	Overall Intersection			B (B)	-	1.4 (2.7)	-
Note: 1. Table Format: AM (PM) 2. Volume to capacity ratio 3. 95th Percentile Queue (m) 4. # - 95th percentile volume exceeds capacity, queue may be longer 5. m - volume for 95th percentile queue is metered by upstream signal							



September 7, 2017
Conroy Business Park Inc.
Page 24 of 24

Reference: 2500 St Laurent Blvd Transportation Brief

6.0 CONCLUSIONS

This transportation brief has found the following:

- There are no foreseeable transportation issues related to the site access location or general site circulation.
- The study area intersections currently operate acceptably under 2017 existing conditions.
- The proposed office development is expected to generate approximately 72 vehicle trips during the AM peak hour and 99 vehicle trips during the PM peak hour.
- With the addition of the anticipated site traffic generated by the proposed development, the study area intersections are expected to operate acceptably under 2021 total future conditions.
- The study area intersections are expected to operate acceptably under 2026 ultimate conditions.

Based on the transportation evaluation and the negligible impacts that have been identified in this Transportation Brief, the proposed office development at 2500 St Laurent Blvd is not anticipated to have a significant impact on the transportation network and should be permitted to proceed.

Regards,

Stantec Consulting Ltd.

Hassan Madhoun, M.Eng, P.Eng
Associate, Transportation

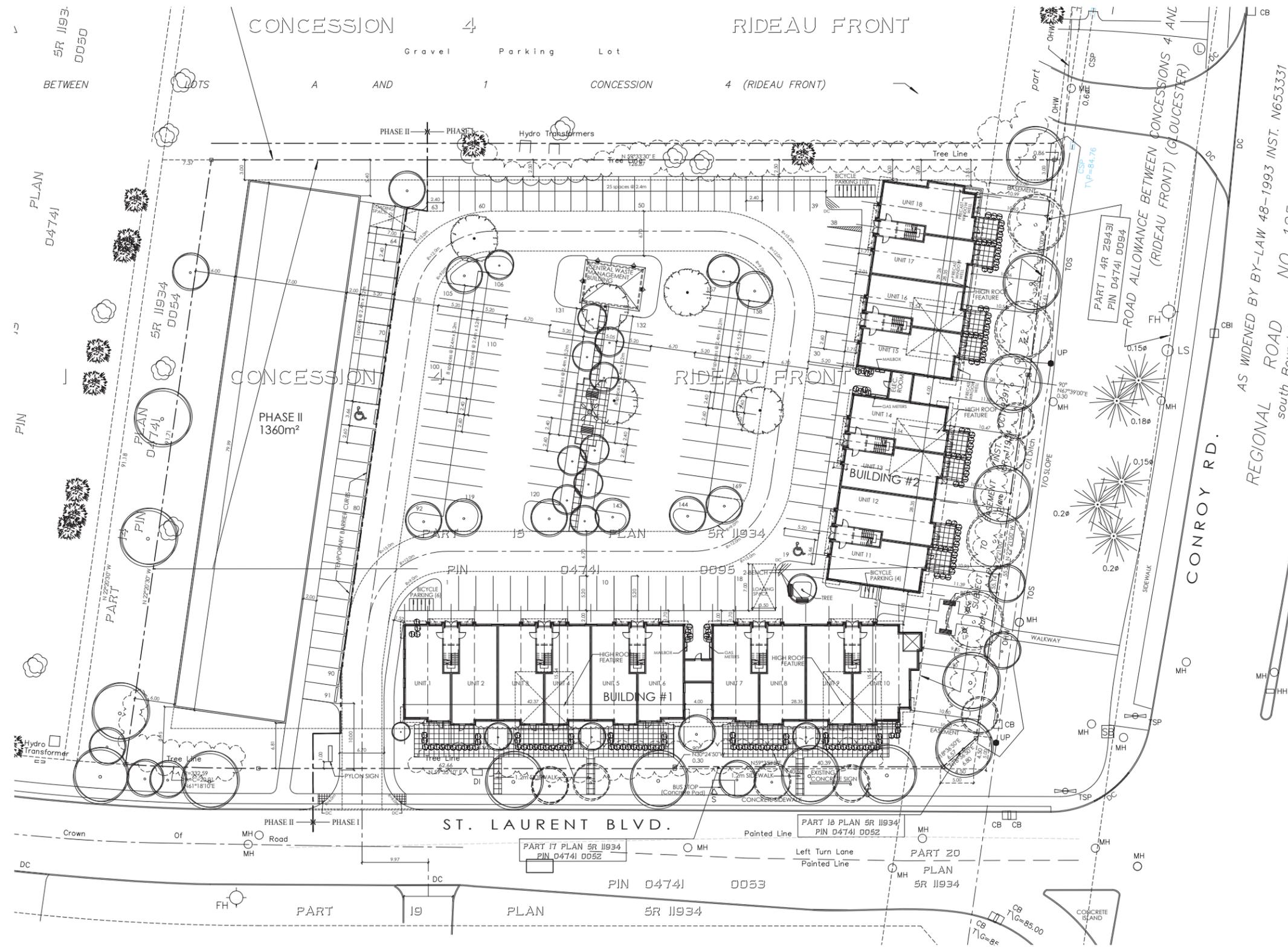


Haitham AlRajie, M.ASc, EIT
Transportation Engineering Intern

Attachments: Attachment 1 – Proposed Site Plan
Appendix A – Traffic Counts and Signal Timing Plan
Appendix B – Intersection Performance Worksheets

ATTACHMENT 1

PROPOSED SITE PLAN



KEY PLAN: N.T.S.



ZONING INFORMATION

ZONING - IP [2103]	PROVIDED
MIN. LOT AREA - 750 m ²	11,619.99 m ²
MIN. LOT WIDTH - 0 m	92.16 m
MAX. LOT COVERAGE - 55%	27%
MIN. FRONT YARD DEPTH - 6.0 m	9.41 m
CORNER SIDE YARD WIDTH - 6.0 m	7.0 m
MIN. INTERIOR SIDE YARD	3.0 m
- ABUTTING RESIDENTIAL - 6.0m	
- ALL OTHER CASES - 3.0m	
MIN. REAR YARD DEPTH - 6.0 m	6.0m
MAX. BUILDING HEIGHT	7.72 m
- WITHIN 20m RESIDENTIAL - 11.0m	
- ALL OTHER CASES - 22.0m	
MIN. LANDSCAPE ABUTTING	
- RESIDENTIAL - 3.0m	
- STREET - 3.0m	
- OTHER - 0.0m	
[2103] - CONVENIENCE STORE PROHIBITED	

BUILDING #1 UNITS 1 - 10 (G.F.A.)

GROUND FLOOR-	999.97m ²
SECOND FLOOR-	1,024.39m ²
TOTAL FLOOR AREA	2,024.36m ²

BUILDING #2 UNITS 11 - 18 (G.F.A.)

GROUND FLOOR-	783.01m ²
SECOND FLOOR-	802.49m ²
TOTAL FLOOR AREA	1,585.50m ²

PARKING REQUIRED PHASE I (2.4 SPACES/100m² OFFICE)

3,609.86m²/ 100m² = 36.10 x 2.4 = 86.64 SPACES

PARKING REQUIRED PHASE II (2.4SPACES/100m² OFFICE)

2720m²/ 100m² = 27.2 x 2.4 = 65.28 SPACES

PARKING REQUIRED PHASE I & II

6,329.86 m²/ 100m² = 63.30 x 2.4 = 151.92 SPACES

PARKING PROVIDED

SPACES @ 2.6m x 5.2m = 85 SPACES (50.3%)

SPACES @ 2.4m x 5.2m = 84 SPACES (49.7%)

TOTAL PARKING PROVIDED = 169 SPACES

LOADING SPACES REQUIRED = OFFICE (5,000-9,999 m² G.F.A.) = 2 SPACES

LOADING SPACES PROVIDED = 2 SPACES

BICYCLE PARKING REQUIRED - 1/250m² G.F.A.

PHASE I = 4,004.07m²/ 250m² = 16.01 = 16 SPACES

PHASE I BICYCLE PARKING PROVIDED = 20 SPACES

SITE INFORMATION DERIVED FROM

SURVEYOR'S REAL PROPERTY REPORT

PART 1 PLAN OF PART OF LOT 1

CONCESSION 4 (RIDEAU FRONT)

GEOGRAPHIC TOWNSHIP OF GLOUCESTER

CITY OF OTTAWA

PREPARED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD.

SITE PLAN TO BE READ IN CONJUNCTION WITH

- LANDSCAPE PLAN PREPARED BY JAMES B. LENNOX AND ASSOCIATES INC.

- SITE SERVICING & GRADING PLANS PREPARED BY EXP



GENERAL NOTES:

- 1- THE CONTRACTOR IS RESPONSIBLE FOR CHECKING AND VERIFYING ALL DIMENSIONS. ANY DISCREPANCY MUST BE REPORTED TO M. DAVID BLAKELY ARCHITECT INC.
- 2- ALL WORK AND MATERIALS TO BE IN COMPLIANCE WITH ALL CODES, REGULATIONS, & BY-LAWS
- 3- ADDITIONAL DRAWINGS MAY BE ISSUED FOR
- 4- CLARIFICATION TO ASSIST THE PROPER EXECUTION OF WORK. SUCH DRAWINGS WILL HAVE THE SAME MEANING AND INTENT AS IF THEY WERE INCLUDED WITH THE PLANS IN CONTRACT DOCUMENTS
- 5- DO NOT SCALE DRAWINGS.

- 6- THIS DRAWING SHALL NOT BE USED OR COPIED WITHOUT THE AUTHORIZATION OF THE ARCHITECT
- 7- THIS DRAWING SHALL NOT BE USED FOR PERMIT OR CONSTRUCTION UNLESS THE DRAWING BEARS THE ARCHITECT'S SEAL AND SIGNATURE
- 8- THIS REPRODUCTION SHALL NOT BE ALTERED.



No.	DATE	DESCRIPTION	INT.	No.	DATE	DESCRIPTION	INT.
11.				22.			
10.				21.			
9.				20.			
8.	04/07/17	REMOVE BASEMENT LEVEL (UNITS 15-18)	JB	19.			
7.	14/05/17	LOADING SPACES ADDED	JB	18.			
6.	06/04/17	WINDOW WELLS ADDED UNITS 15 THRU 18	JB	17.			
5.	03/05/17	REVISED SIGHT TRIANGLE DIMENSIONS	JB	16.			
4.	25/04/17	REVISED PER PRE-CONSULTATION MEETING	JB	15.			
3.	31/03/17	FOR REVIEW	JB	14.			
2.	29/03/17	REVISED PER SURVEY	JB	13.			
1.	08/09/16	FOR REVIEW	JB	12.			



- A - DETAIL NUMBER
- B - SHEET NUMBER (DETAIL REQUIRED)
- C - SHEET NUMBER (DETAIL LOCATION)

PROJECT: CONROY BUSINESS PARK 2500 ST. LAURENT BLVD. OTTAWA, ONTARIO		DRAWING TITLE: SITE PLAN	
CLIENT: CONROY BUSINESS PARK Inc		DATE: MAR., 2017	SHEET NO.: SP-1
		SCALE: 1: 300	
		DRAWN BY: JB	CHECKED: MDB

**M. David Blakely
Architect Inc.**
2200 Prince of Wales Dr. - Suite 101
Ottawa, Ontario K2E 6Z9
Phone (613) 226-8811 Fax (613) 226-7942

APPENDIX A

TRAFFIC COUNTS & SIGNAL TIMING PLANS



Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

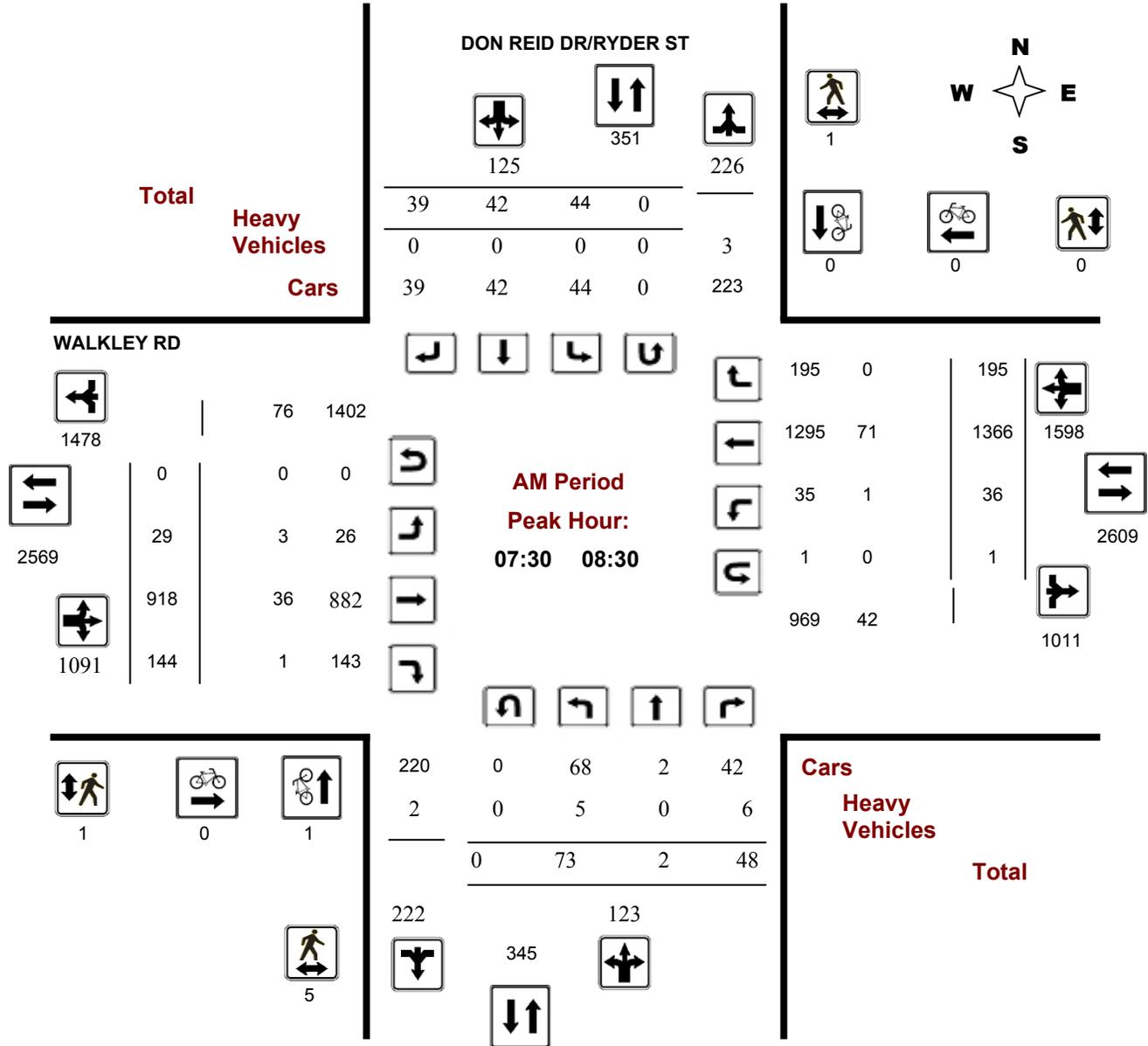
WALKLEY RD @ DON REID DR/Ryder ST

Survey Date: Tuesday, November 29, 2016

Start Time: 07:00

WO No: 36554

Device: Miovision



Turning Movement Count - Full Study Peak Hour Diagram

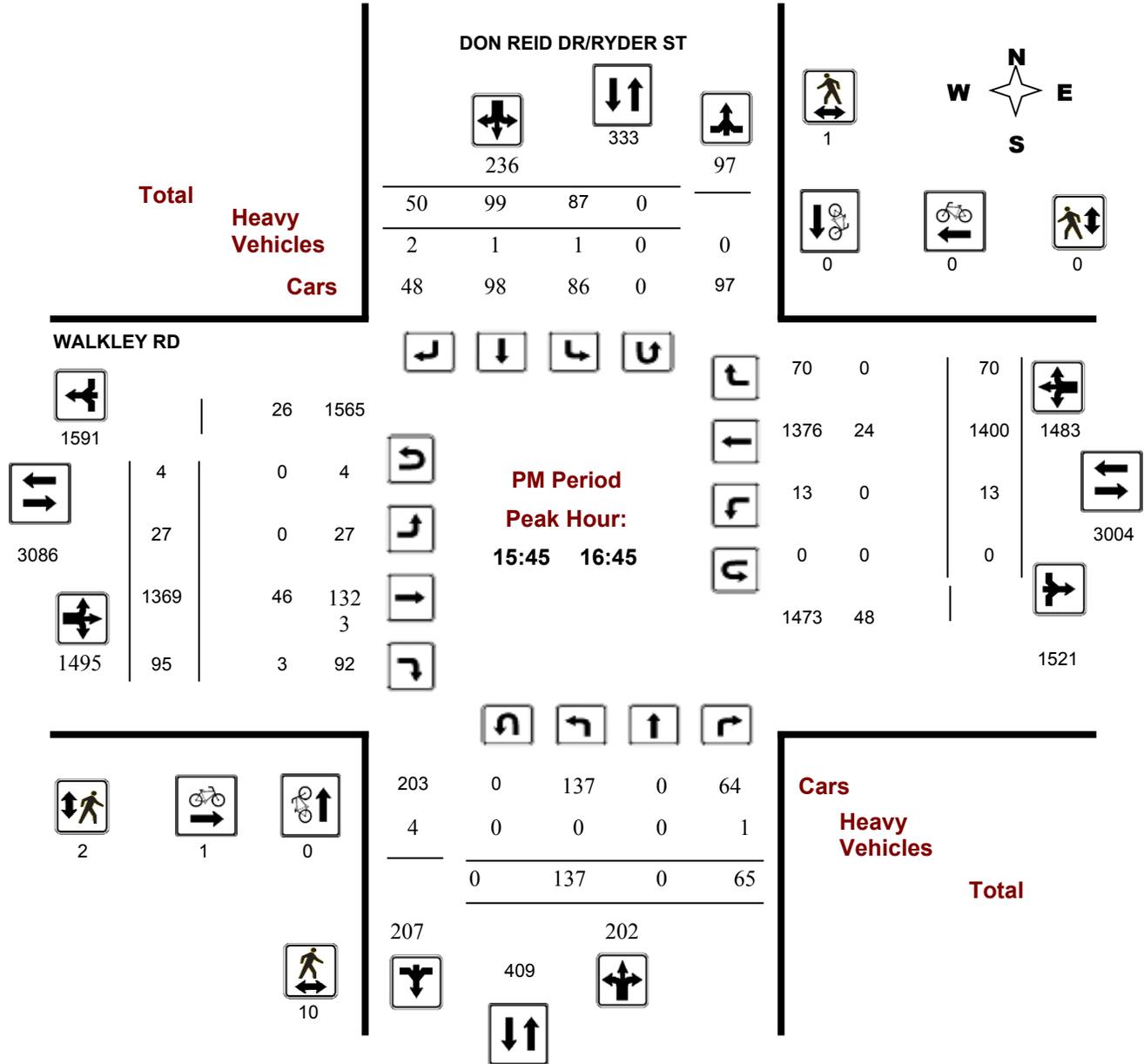
WALKLEY RD @ DON REID DR/Ryder ST

Survey Date: Tuesday, November 29, 2016

Start Time: 07:00

WO No: 36554

Device: Miovision





Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

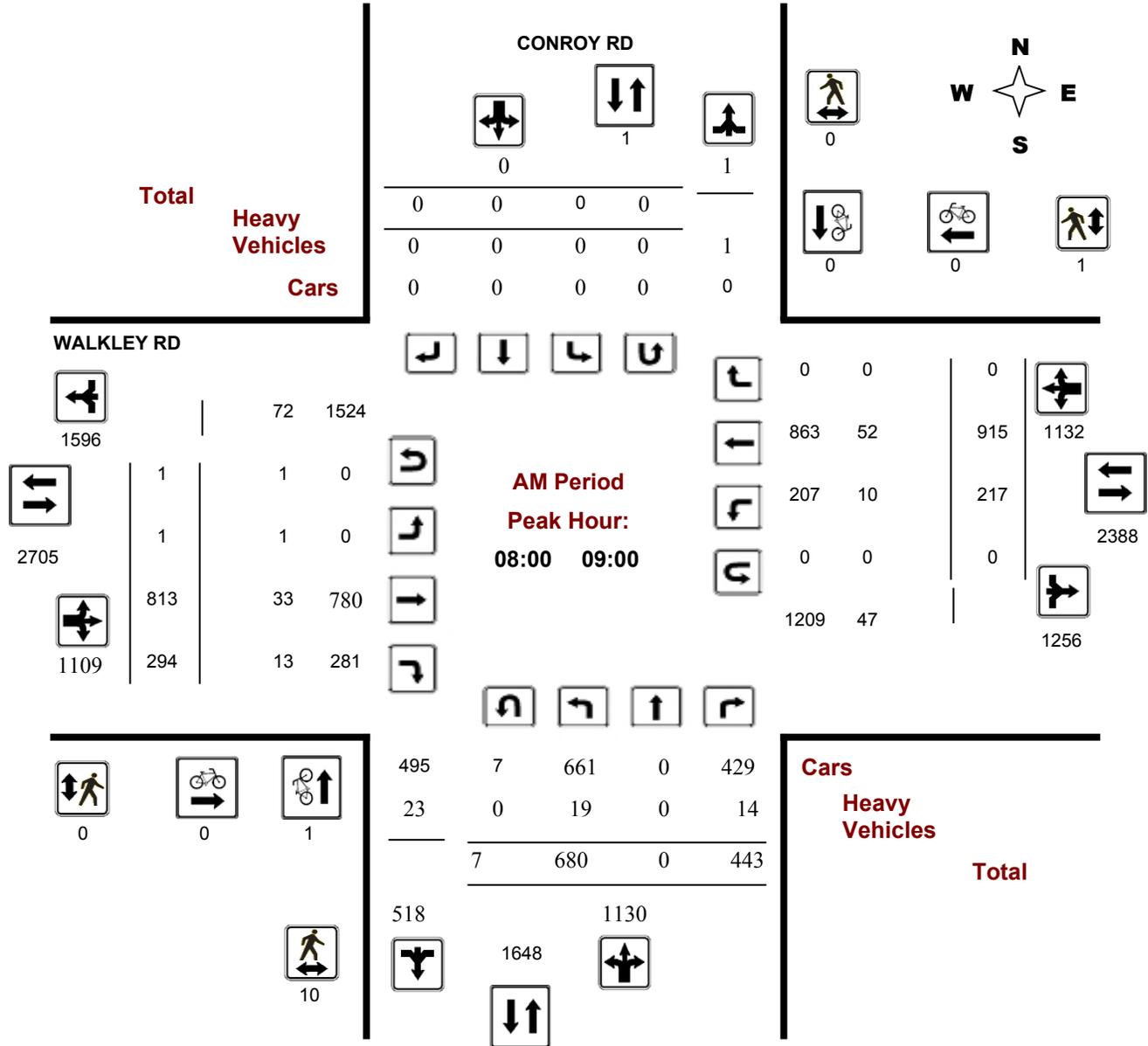
CONROY RD @ WALKLEY RD

Survey Date: Thursday, February 04, 2016

Start Time: 07:00

WO No: 35703

Device: Miovision



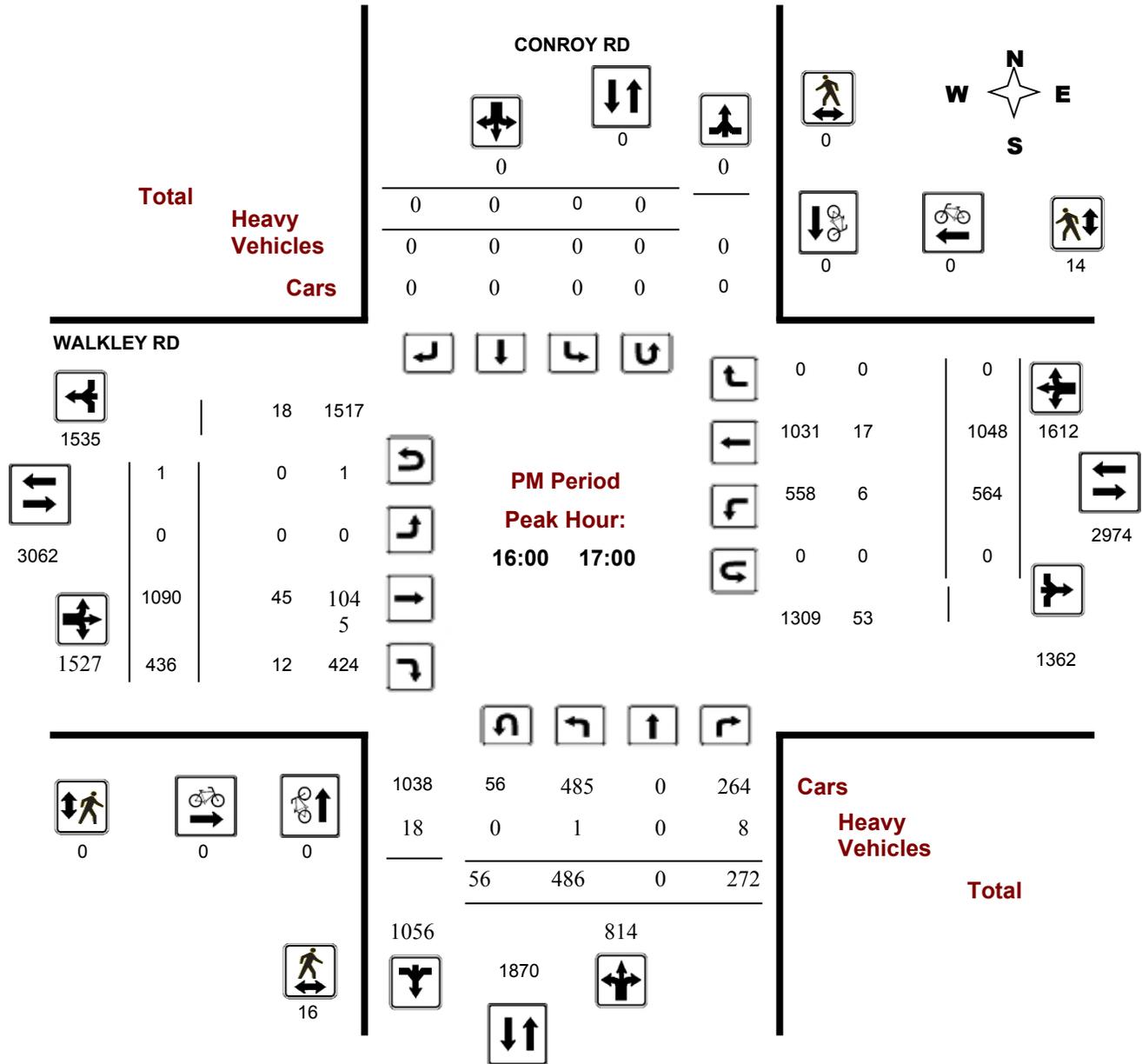
Comments

Survey Date: Thursday, February 04, 2016

Start Time: 07:00

WO No: 35703

Device: Miovision



Turning Movement Count - Peak Hour Diagram

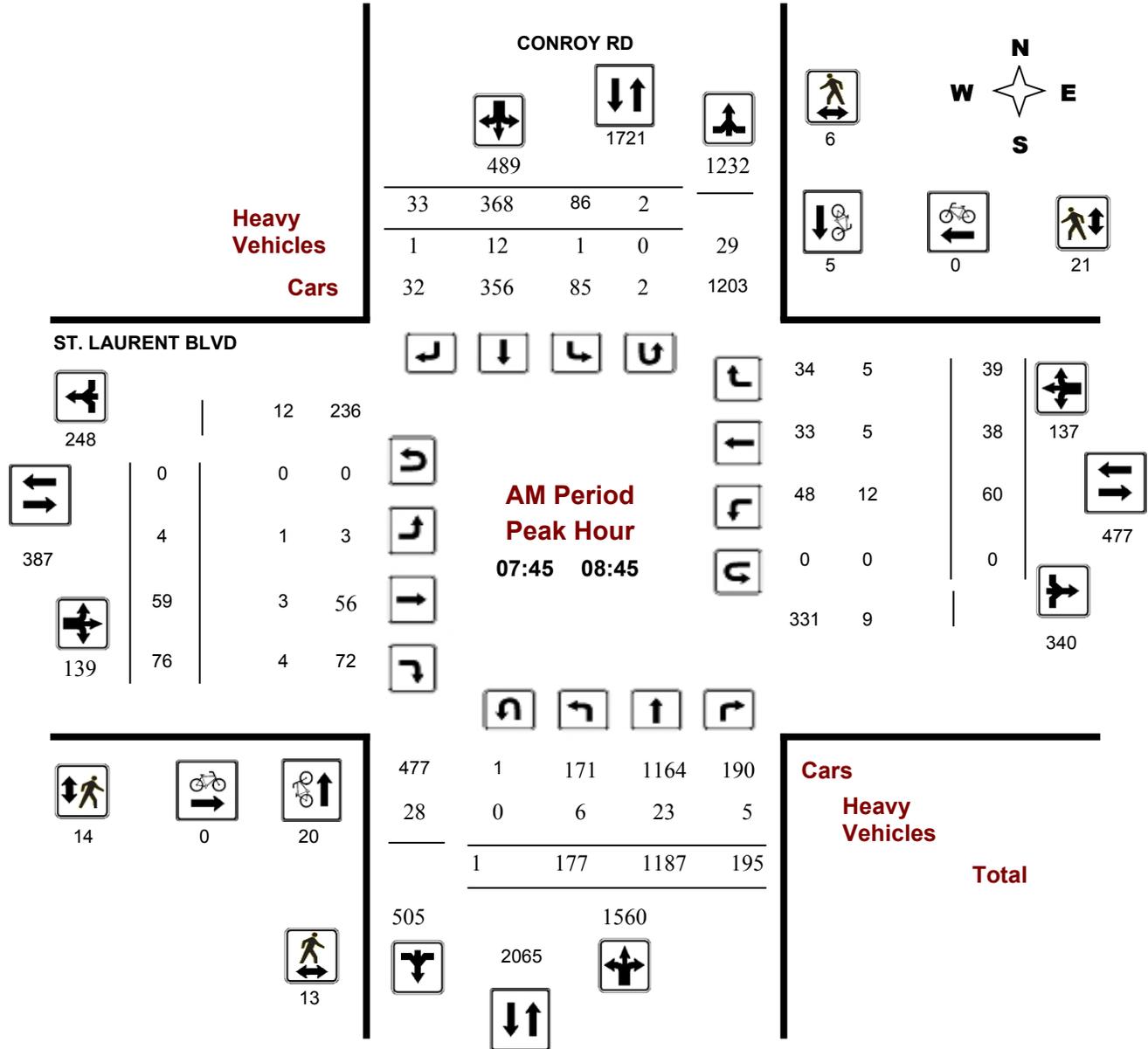
CONROY RD @ ST. LAURENT BLVD

Survey Date: Thursday, June 01, 2017

Start Time: 07:00

WO No: 37032

Device: Miovision



Turning Movement Count - Peak Hour Diagram

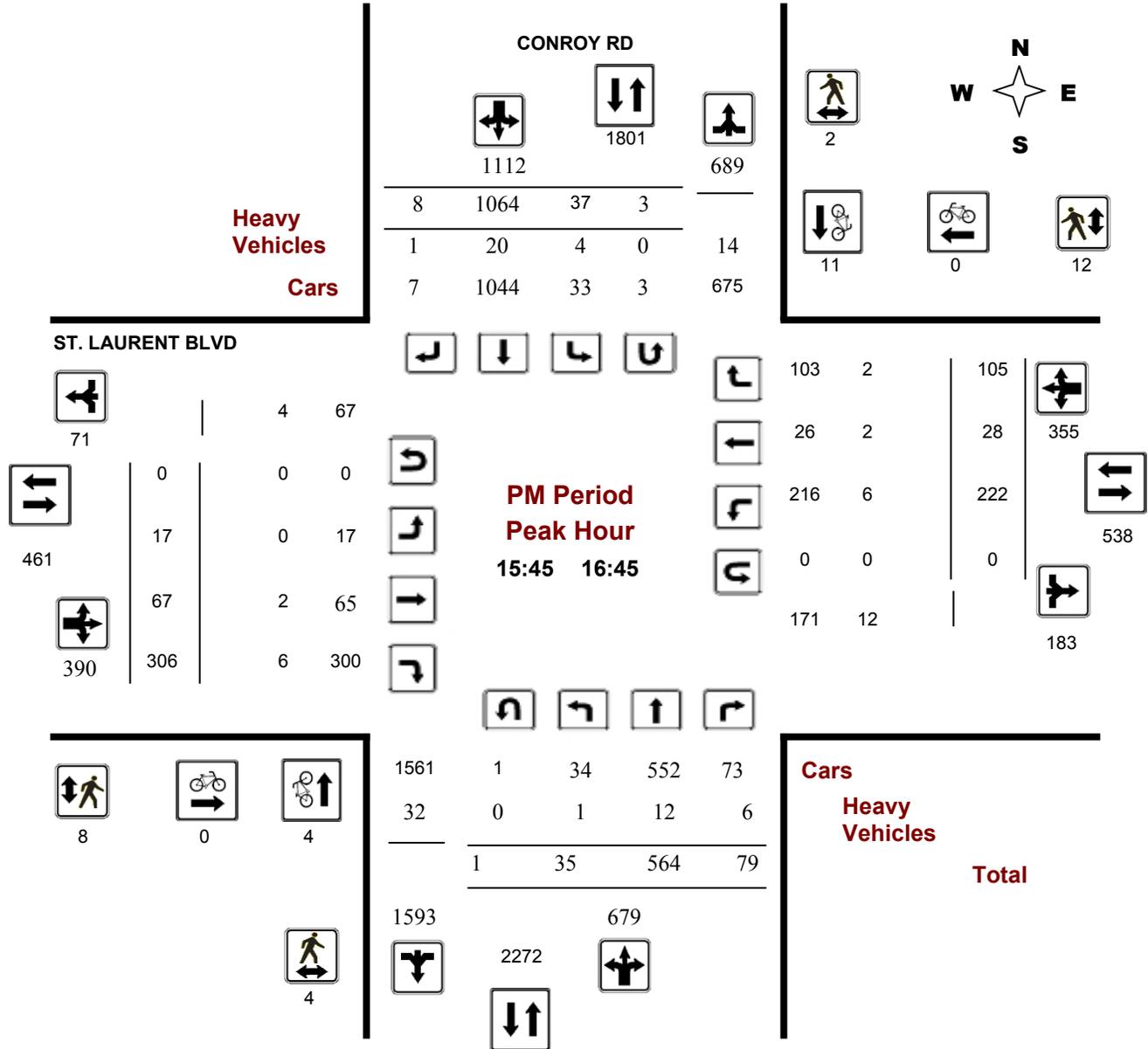
CONROY RD @ ST. LAURENT BLVD

Survey Date: Thursday, June 01, 2017

Start Time: 07:00

WO No: 37032

Device: Miovision



Comments

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Operations Unit

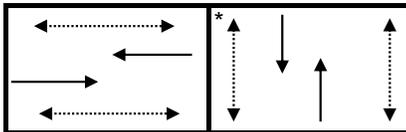
Intersection:	<i>Main:</i> Walkley	<i>Side:</i> Don Reid/Ryder
Controller:	MS 3200	TSD: 5424
Author:	Matthew Anderson	Date: 17-Aug-17

Existing Timing Plans†

	Plan					Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Weekend 5	Walk	DW	A+R
Cycle	100	100	110	80	100			
Offset	94	20	20	20	38			
EB Thru	64	64	74	44	64	15	15	3.3 + 2.6
WB Thru	64	64	74	44	64	15	15	3.3 + 2.6
NB Thru	36	36	36	36	36	10	20	3.3 + 2.9
SB Thru	36	36	36	36	36	10	20	3.3 + 2.9

Phasing Sequence‡

Plan: All



Schedule

Weekday		Saturday		Sunday	
Time	Plan	Time	Plan	Time	Plan
0:15	4	0:15	4	0:15	4
6:30	1	6:30	2	6:30	2
9:30	2	11:00	5	21:00	4
15:00	3	19:30	2		
18:30	2	22:00	4		
21:30	4				

Notes

†: Time for each direction includes amber and all red intervals

‡: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

←.....→ Pedestrian signal

Cost is \$56.50 (\$50 + HST)

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Operations Unit

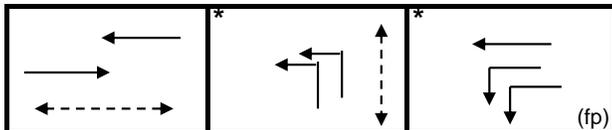
Intersection: *Main:* Walkley *Side:* Conroy
Controller: MS 3200 **TSD:** 5399
Author: Matthew Anderson **Date:** 17-Aug-17

Existing Timing Plans†

	Plan						Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Weekend 5	AM Rush 10	Walk	DW	A+R
Cycle	100	100	110	80	100	120			
Offset	90	47	20	X	18	43			
EB Thru	44	45	51	36	45	55	10	20	3.3+2.7
WB Thru	65	69	79	49	69	80	10	20	3.3+2.7
NB Left	35	31	31	31	31	40	7	17	3.7+2.7
WBLT (fp)	21	24	28	13	24	25	-	-	3.3+2.9

Phasing Sequence‡

Plan: All



Schedule

Weekday		Saturday		Sunday	
Time	Plan	Time	Plan	Time	Plan
0:15	4	0:15	4	0:15	4
6:30	1	6:30	2	6:30	2
7:00	10	11:00	5	21:00	4
9:30	2	19:30	2		
15:00	3	22:00	4		
18:30	2				
21:30	4				

Notes

†: Time for each direction includes amber and all red intervals
 ‡: Start of first phase should be used as reference point for offset
 Asterisk (*) Indicates actuated phase
 (fp): Fully Protected Left Turn

◄.....► Pedestrian signal

Cost is \$56.50 (\$50 + HST)

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Operations Unit

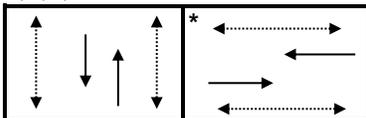
Intersection:	Main: St. Laurent	Side: Conroy
Controller:	MS-3200	TSD: 5612
Author:	Jon Pach	Date: 04-Aug-2017

Existing Timing Plans[†]

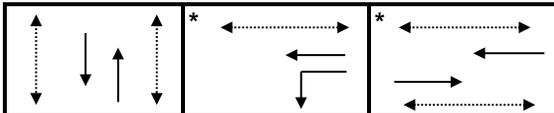
	Plan					Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Weekend 5	Walk	DW	A+R
Cycle	100	90	95	90	90			
Offset	23	50	2	X	0			
NB Thru	56	46	36	46	46	7	17	3.7 + 2.6
SB Thru	56	46	36	46	46	7	17	3.7 + 2.6
WB Left	-	-	15	-	-	-	-	3.3 + 2.4
EB Thru	44	44	44	44	44	7	30	3.3 + 3.6
WB Thru	44	44	59	44	44	7	30	3.3 + 3.6

Phasing Sequence[‡]

Plan: 1, 2, 4, and 5



Plan: 3



Schedule

Weekday		Saturday		Sunday	
Time	Plan	Time	Plan	Time	Plan
0:15	4	0:15	4	0:15	4
6:30	1	6:30	2	6:30	2
9:30	2	11:00	5	21:00	4
15:00	3	19:30	2		
18:30	2	22:00	4		
21:30	4				

Notes

- †: Time for each direction includes amber and all red intervals
- ‡: Start of first phase should be used as reference point for offset
- Asterisk (*) Indicates actuated phase
- (fp): Fully Protected Left Turn
- ◀.....▶ Pedestrian signal

Cost is \$56.50 (\$50 + HST)

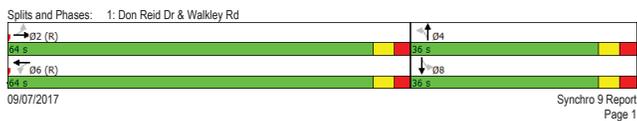
APPENDIX B

**INTERSECTION PERFORMANCE
WORKSHEETS**

Lanes, Volumes, Timings
 1: Don Reid Dr & Walkley Rd
 2500 St Laurent Blvd
 Existing AM Peak Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	30	935	145	35	1395	200	75	5	50	45	45	40
Future Volume (vph)	30	935	145	35	1395	200	75	5	50	45	45	40
Satd. Flow (prot)	1695	3322	0	1695	3326	0	1695	1543	0	1695	1659	0
Flt Permitted	0.094			0.210	0.696		0.717					
Satd. Flow (perm)	168	3322	0	375	3326	0	1242	1543	0	1279	1659	0
Satd. Flow (RTOR)		29			27			56			30	
Lane Group Flow (vph)	33	1200	0	39	1772	0	83	62	0	50	94	0
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA
Protected Phases	2		6		4		8		8		8	
Total Split (s)	64.0	64.0	64.0	64.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
Total Lost Time (s)	5.9	5.9	5.9	5.9	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Act Effct Green (s)	77.1	77.1	77.1	77.1	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Actuated g/C Ratio	0.77	0.77	0.77	0.77	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
v/c Ratio	0.26	0.47	0.13	0.69	0.44	0.22	0.26	0.34				
Control Delay	14.2	7.1	8.3	13.5	43.5	11.9	37.6	27.5				
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	7.1	8.3	13.5	43.5	11.9	37.6	27.5				
LOS	B	A	A	B	D	B	D	C				
Approach Delay	7.3			13.4			30.0			31.0		
Approach LOS	A			B			C			C		
Queue Length 50th (m)	1.6	36.4		2.2	84.0		15.4	1.0		9.0	11.5	
Queue Length 95th (m)	11.9	92.7		m6.3	#199.4		24.2	9.9		16.0	20.9	
Internal Link Dist (m)	135.9		146.4		128.0		152.6		149.9		105.7	
Turn Bay Length (m)	40.0		55.0		35.0		30.0		75.0		200.0	
Base Capacity (vph)	129	2567		289	2569		370	499		381	515	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.47	0.13	0.69	0.22	0.12	0.13	0.18				

Intersection Summary
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 94 (94%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 12.6
 Intersection LOS: B
 Intersection Capacity Utilization 68.6%
 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.
 m Volume for 95th percentile queue is metered by upstream signal.



Lanes, Volumes, Timings
 2: Conroy Rd & Walkley Rd
 2500 St Laurent Blvd
 Existing AM Peak Conditions

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (vph)	830	300	220	935	695	450
Future Volume (vph)	830	300	220	935	695	450
Satd. Flow (prot)	3390	1517	3288	3390	3288	1517
Flt Permitted			0.950			
Satd. Flow (perm)	3390	1517	3288	3390	3288	1517
Satd. Flow (RTOR)			333			336
Lane Group Flow (vph)	922	333	244	1039	772	500
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1		4	
Permitted Phases	2		2		4	
Total Split (s)	44.0	44.0	21.0	65.0	35.0	35.0
Total Lost Time (s)	6.0	6.0	6.2	6.0	6.4	6.4
Act Effct Green (s)	41.7	41.7	12.4	60.3	27.3	27.3
Actuated g/C Ratio	0.42	0.42	0.12	0.60	0.27	0.27
v/c Ratio	0.65	0.40	0.60	0.51	0.86	0.76
Control Delay	27.3	6.8	47.6	12.7	42.6	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	6.8	47.6	12.7	42.6	19.6
LOS	C	A	D	B	D	B
Approach Delay	21.8		19.4		33.6	
Approach LOS	C		B		C	
Queue Length 50th (m)	55.4	0.0	23.2	58.3	71.9	34.0
Queue Length 95th (m)	98.4	34.4	34.6	74.1	56.5	54.6
Internal Link Dist (m)	149.9		284.3		105.7	
Turn Bay Length (m)	75.0		200.0		141.3	
Base Capacity (vph)	1413	826	486	2043	940	673
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.40	0.50	0.51	0.82	0.74

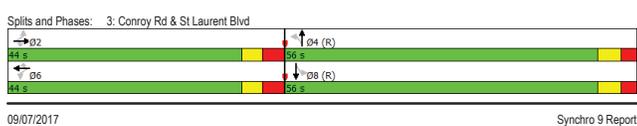
Intersection Summary
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 90 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 24.9
 Intersection LOS: C
 Intersection Capacity Utilization 67.3%
 ICU Level of Service C
 Analysis Period (min) 15



Lanes, Volumes, Timings
 3: Conroy Rd & St Laurent Blvd
 2500 St Laurent Blvd
 Existing AM Peak Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	5	60	75	60	40	40	175	1185	195	85	370	35
Future Volume (vph)	5	60	75	60	40	40	175	1185	195	85	370	35
Satd. Flow (prot)	1631	1717	1459	1491	1569	1334	1695	4769	0	1695	3346	0
Flt Permitted	0.728			0.713	0.492		0.137					
Satd. Flow (perm)	1250	1717	1459	1119	1569	1334	878	4769	0	244	3346	0
Satd. Flow (RTOR)				83		36		45			14	
Lane Group Flow (vph)	6	67	83	67	44	44	194	1534	0	94	450	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	NA	Perm	NA	NA
Protected Phases	2		6		6		4		8		8	
Total Split (s)	44.0	44.0	44.0	44.0	44.0	44.0	56.0	56.0	56.0	56.0	56.0	56.0
Total Lost Time (s)	6.9	6.9	6.9	6.9	6.9	6.9	6.3	6.3	6.3	6.3	6.3	6.3
Act Effct Green (s)	21.1	21.1	21.1	21.1	21.1	21.1	70.4	70.4	70.4	70.4	70.4	70.4
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21	0.21	0.70	0.70	0.70	0.70	0.70	0.70
v/c Ratio	0.02	0.19	0.22	0.29	0.13	0.14	0.31	0.46		0.55	0.19	
Control Delay	23.0	29.0	6.3	31.7	27.6	10.3	12.8	10.7		39.3	13.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	29.0	6.3	31.7	27.6	10.3	12.8	10.7		39.3	13.3	
LOS	C	C	A	C	C	B	B	B	D	B	B	B
Approach Delay	16.7			24.5			11.0			17.8		
Approach LOS	B			C			B			B		
Queue Length 50th (m)	1.1	12.2	0.0	12.4	7.9	1.4	9.7	31.1		11.9	26.8	
Queue Length 95th (m)	3.3	17.4	9.3	18.2	12.6	7.8	42.1	90.0		#46.2	51.2	
Internal Link Dist (m)	94.6		187.3		142.2		95.1		100.0		171	
Turn Bay Length (m)	50.0		45.0		70.0		60.0		90.0		100.0	
Base Capacity (vph)	463	637	593	415	582	517	618	3369		171	2359	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.11	0.14	0.16	0.08	0.09	0.31	0.46		0.55	0.19	

Intersection Summary
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 23 (23%), Referenced to phase 4:NBLT and 8:SBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.55
 Intersection Signal Delay: 13.5
 Intersection LOS: B
 Intersection Capacity Utilization 63.5%
 ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



HCM Unsignalized Intersection Capacity Analysis
 4: Existing Office Access & St Laurent Blvd
 2500 St Laurent Blvd
 Existing AM Peak Conditions

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	135	10	15	235	5	5
Future Volume (Veh/h)	135	10	15	235	5	5
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	150	11	17	261	6	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)	119					
pX, platoon unblocked	0.98					
vC, conflicting volume			161		450	
vC1, stage 1 conf vol					161	
vC2, stage 2 conf vol					424	
vCu, unblocked vol			161		424	
tC, single (s)			4.1		6.4	
tC, 2 stage (s)						
tF (s)			2.2		3.5	
p0 queue free %			99		99	
cM capacity (veh/h)			1400		565	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	161	278	12			
Volume Left	0	17	6			
Volume Right	11	0	6			
cSH	1700	1400	692			
Volume to Capacity	0.09	0.01	0.02			
Queue Length 95th (m)	0.0	0.3	0.4			
Control Delay (s)	0.0	0.6	10.3			
Lane LOS	A			B		
Approach Delay (s)	0.0		0.6		10.3	
Approach LOS	B		B		B	
Intersection Summary						
Average Delay	0.6					
Intersection Capacity Utilization	35.4%		ICU Level of Service		A	
Analysis Period (min)	15					

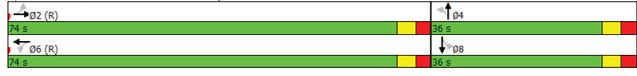
Lanes, Volumes, Timings
1: Don Reid Dr & Walkley Rd

2500 St Laurent Blvd
Existing PM Peak Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	30	1395	95	15	1430	70	140	5	65	90	100	50
Future Volume (vph)	30	1395	95	15	1430	70	140	5	65	90	100	50
Satd. Flow (prot)	1695	3356	0	1695	3366	0	1695	1538	0	1695	1695	0
Flt Permitted	0.098			0.099			0.561			0.706		
Satd. Flow (perm)	175	3356	0	177	3366	0	1001	1538	0	1260	1695	0
Satd. Flow (RTOR)	12			8			37			23		
Lane Group Flow (vph)	33	1656	0	17	1667	0	156	78	0	100	167	0
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA
Protected Phases	2		2		6		4		4		8	
Permitted Phases	2		6		4		8		8		4	
Total Split (s)	74.0	74.0		74.0	74.0		36.0	36.0		36.0	36.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9		6.2	6.2		6.2	6.2	
Act Effct Green (s)	76.9	76.9		76.9	76.9		21.0	21.0		21.0	21.0	
Actuated g/C Ratio	0.70	0.70		0.70	0.70		0.19	0.19		0.19	0.19	
v/c Ratio	0.27	0.70		0.14	0.71		0.82	0.24		0.42	0.49	
Control Delay	15.5	13.0		10.8	16.3		72.6	21.6		42.6	37.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.5	13.0		10.8	16.3		72.6	21.6		42.6	37.5	
LOS	B	B		B	B		E	C		D	D	
Approach Delay	13.1			16.3			55.6			39.4		
Approach LOS	B			B			E			D		
Queue Length 50th (m)	2.3	98.1		1.3	146.6		32.4	7.4		19.0	27.6	
Queue Length 95th (m)	10.7	160.4		m2.7	172.6		51.4	18.2		31.8	43.5	
Internal Link Dist (m)	135.9			146.4			128.0			152.6		
Turn Bay Length (m)	40.0			55.0			35.0			30.0		
Base Capacity (vph)	122	2351		123	2356		271	443		341	475	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.27	0.70		0.14	0.71		0.58	0.18		0.29	0.35	

Intersection Summary
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 20 (18%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 18.9
 Intersection LOS: B
 Intersection Capacity Utilization 76.4%
 ICU Level of Service D
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Don Reid Dr & Walkley Rd



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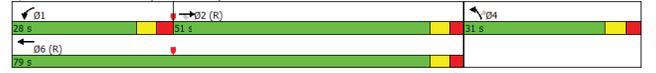
Lanes, Volumes, Timings
2: Conroy Rd & Walkley Rd

2500 St Laurent Blvd
Existing PM Peak Conditions

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (vph)	1110	445	575	1070	495	275
Future Volume (vph)	1110	445	575	1070	495	275
Satd. Flow (prot)	3390	1517	3288	3390	3288	1517
Flt Permitted			0.950			
Satd. Flow (perm)	3390	1517	3288	3390	3288	1517
Satd. Flow (RTOR)	458			458		
Lane Group Flow (vph)	1233	494	639	1189	550	306
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1		6	
Permitted Phases	2		1		4	
Total Split (s)	51.0	51.0	28.0	79.0	31.0	31.0
Total Lost Time (s)	6.0	6.0	6.2	6.0	6.4	6.4
Act Effct Green (s)	45.8	45.8	23.0	74.9	22.7	22.7
Actuated g/C Ratio	0.42	0.42	0.21	0.68	0.21	0.21
v/c Ratio	0.88	0.55	0.93	0.51	0.81	0.55
Control Delay	35.1	8.1	64.7	9.9	51.8	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.1	8.1	64.7	9.9	51.8	8.2
LOS	D	A	E	A	D	A
Approach Delay	27.4		29.0		36.2	
Approach LOS	C		C		D	
Queue Length 50th (m)	77.8	0.0	70.6	62.3	57.3	0.0
Queue Length 95th (m)	#143.1	48.7	#106.9	78.4	76.0	22.1
Internal Link Dist (m)	149.9		284.3		105.7	
Turn Bay Length (m)	75.0		200.0			
Base Capacity (vph)	1409	898	686	2309	735	576
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.55	0.93	0.51	0.75	0.53

Intersection Summary
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 20 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 29.8
 Intersection LOS: C
 Intersection Capacity Utilization 80.1%
 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.

Splits and Phases: 2: Conroy Rd & Walkley Rd



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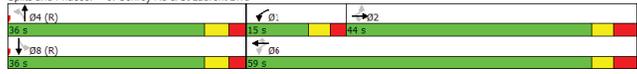
Lanes, Volumes, Timings
3: Conroy Rd & St Laurent Blvd

2500 St Laurent Blvd
Existing PM Peak Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	15	65	305	220	30	105	35	565	80	35	1065	10
Future Volume (vph)	15	65	305	220	30	105	35	565	80	35	1065	10
Satd. Flow (prot)	1631	1717	1459	1491	1569	1334	1695	4779	0	1695	3387	0
Flt Permitted	0.736			0.565			0.126			0.348		
Satd. Flow (perm)	1264	1717	1459	886	1569	1334	225	4779	0	621	3387	0
Satd. Flow (RTOR)	117			75			28			1		
Lane Group Flow (vph)	17	72	339	244	33	117	39	717	0	39	1194	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	NA	Perm	NA	NA
Protected Phases	2		2		6		4		4		8	
Permitted Phases	2		6		4		8		8		4	
Total Split (s)	44.0	44.0	44.0	15.0	59.0	59.0	36.0	36.0		36.0	36.0	
Total Lost Time (s)	6.9	6.9	6.9	5.7	6.9	6.9	6.3	6.3		6.3	6.3	
Act Effct Green (s)	22.2	22.2	22.2	38.4	37.2	37.2	44.6	44.6		44.6	44.6	
Actuated g/C Ratio	0.23	0.23	0.23	0.40	0.39	0.39	0.47	0.47		0.47	0.47	
v/c Ratio	0.06	0.18	0.79	0.59	0.05	0.21	0.37	0.32		0.13	0.75	
Control Delay	23.3	26.4	34.0	24.7	14.5	6.9	36.2	17.4		20.7	27.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	23.3	26.4	34.0	24.7	14.5	6.9	36.2	17.4		20.7	27.1	
LOS	C	C	C	C	B	A	D	B		C	C	
Approach Delay	32.3			18.6			18.3			26.9		
Approach LOS	C			B			B			C		
Queue Length 50th (m)	2.5	10.8	39.6	31.9	3.8	4.9	4.3	26.9		3.8	88.5	
Queue Length 95th (m)	6.1	17.0	55.7	36.2	6.8	11.2	#21.8	48.3		13.5	#175.0	
Internal Link Dist (m)	94.6			187.3			142.2			95.1		
Turn Bay Length (m)	50.0			45.0			70.0			100.0		
Base Capacity (vph)	493	670	641	417	860	765	105	2257		291	1590	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.03	0.11	0.53	0.59	0.04	0.15	0.37	0.32		0.13	0.75	

Intersection Summary
 Cycle Length: 95
 Actuated Cycle Length: 95
 Offset: 2 (2%), Referenced to phase 4:NBL and 8:SBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 24.2
 Intersection LOS: C
 Intersection Capacity Utilization 80.0%
 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: 3: Conroy Rd & St Laurent Blvd



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Synchro 9 Report
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HCM Unsignalized Intersection Capacity Analysis
4: Existing Office Access & St Laurent Blvd

2500 St Laurent Blvd
Existing PM Peak Conditions

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	370	5	5	70	15	20
Future Volume (Veh/h)	370	5	5	70	15	20
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	411	6	6	78	17	22
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median storage (veh)	None		None			
Upstream signal (m)	119					
pX, platoon unblocked						
vC, conflicting volume			417		504 414	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			417		504 414	
tC, single (s)			4.1		6.4 6.2	
tC, 2 stage (s)						
tF (s)			2.2		3.5 3.3	
p0 queue free %			99		97 97	
cM capacity (veh/h)			1126		525 638	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	417	84	39			
Volume Left	0	6	17			
Volume Right	6	0	22			
cSH	1700	1126	583			
Volume to Capacity	0.25	0.01	0.07			
Queue Length 95th (m)	0.0	0.1	1.6			
Control Delay (s)	0.0	0.6	11.6			
Lane LOS	A			B		
Approach Delay (s)	0.0		0.6		11.6	
Approach LOS	B		B		B	
Intersection Summary						
Average Delay	0.9					
Intersection Capacity Utilization	30.9%		ICU Level of Service		A</	

Lanes, Volumes, Timings
1: Don Reid Dr & Walkley Rd
2500 St Laurent Blvd
2021 FBG AM Peak Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	30	1010	160	40	1505	215	80	5	55	50	45	45
Future Volume (vph)	30	1010	160	40	1505	215	80	5	55	50	45	45
Satd. Flow (prot)	1695	3319	0	1695	3326	0	1695	1538	0	1695	1650	0
Flt Permitted	0.102			0.219			0.699			0.718		
Satd. Flow (perm)	182	3319	0	391	3326	0	1247	1538	0	1281	1650	0
Satd. Flow (RTOR)		30			27			55			33	
Lane Group Flow (vph)	30	1170	0	40	1720	0	80	60	0	50	90	0
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA
Protected Phases	2	2		6			4			8		
Total Split (s)	64.0	64.0		64.0			36.0			36.0		
Total Lost Time (s)	5.9	5.9		5.9			6.2			6.2		
Act Effct Green (s)	77.2	77.2		77.2			15.1			15.1		
Actuated g/C Ratio	0.77	0.77		0.77			0.15			0.15		
v/c Ratio	0.21	0.46		0.13			0.43			0.26		
Control Delay	12.1	6.9		6.4			43.2			11.7		
Queue Delay	0.0	0.0		0.0			0.0			0.0		
Total Delay	12.1	6.9		6.4			43.2			11.7		
LOS	B	A		A			D			B		
Approach Delay	7.0			7.4			29.7			30.2		
Approach LOS	A			A			C			C		
Queue Length 50th (m)	1.4	34.7		0.9			14.9			9.0		
Queue Length 95th (m)	9.9	89.3		m4.5			23.3			16.0		
Internal Link Dist (m)		135.9					146.4			128.0		
Turn Bay Length (m)	40.0			55.0			35.0			30.0		
Base Capacity (vph)	140	2569		301			2573			496		
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	0.21	0.46		0.13			0.67			0.22		

Intersection Summary
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 67 (67%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.67
 Intersection Signal Delay: 9.2
 Intersection Capacity Utilization 72.6%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.
 Intersection LOS: A
 ICU Level of Service C



Lanes, Volumes, Timings
2: Conroy Rd & Walkley Rd
2500 St Laurent Blvd
2021 FBG AM Peak Conditions

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	895	325	240	1005	750	485
Future Volume (vph)	895	325	240	1005	750	485
Satd. Flow (prot)	3390	1517	3288	3390	3288	1517
Flt Permitted			0.950			0.950
Satd. Flow (perm)	3390	1517	3288	3390	3288	1517
Satd. Flow (RTOR)			325			298
Lane Group Flow (vph)	895	325	240	1005	750	485
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases	2		2		4	
Total Split (s)	42.0	42.0	18.0	60.0	40.0	40.0
Total Lost Time (s)	6.0	6.0	6.2	6.0	6.4	6.4
Act Effct Green (s)	40.5	40.5	11.8	58.5	29.1	29.1
Actuated g/C Ratio	0.40	0.40	0.12	0.58	0.29	0.29
v/c Ratio	0.65	0.40	0.62	0.51	0.79	0.74
Control Delay	23.7	3.0	49.6	14.0	28.5	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	3.0	49.6	14.0	28.5	12.9
LOS	C	A	D	B	C	B
Approach Delay	18.2			20.9	22.4	
Approach LOS	B			C	C	
Queue Length 50th (m)	74.5	0.0	23.1	57.0	68.2	38.6
Queue Length 95th (m)	53.4	9.9	35.5	81.1	22.5	17.8
Internal Link Dist (m)	149.9			284.3	105.7	
Turn Bay Length (m)		75.0	200.0			
Base Capacity (vph)	1374	808	387	1984	1104	707
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.40	0.62	0.51	0.68	0.69

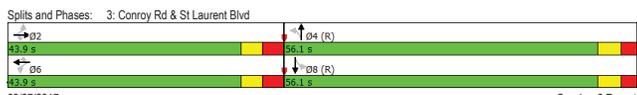
Intersection Summary
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 83 (83%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 20.5
 Intersection Capacity Utilization 71.4%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C



Lanes, Volumes, Timings
3: Conroy Rd & St Laurent Blvd
2500 St Laurent Blvd
2021 FBG AM Peak Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	5	65	80	65	40	40	190	1280	210	95	395	35
Future Volume (vph)	5	65	80	65	40	40	190	1280	210	95	395	35
Satd. Flow (prot)	1631	1717	1459	1491	1569	1334	1695	4769	0	1695	3350	0
Flt Permitted	0.731			0.715			0.502			0.145		
Satd. Flow (perm)	1255	1717	1459	1122	1569	1334	896	4769	0	259	3350	0
Satd. Flow (RTOR)				80			36			45		13
Lane Group Flow (vph)	5	65	80	65	40	40	190	1490	0	95	430	0
Turn Type	Perm	NA	Perm	Perm	NA	NA	Perm	Perm	NA	Perm	NA	NA
Protected Phases	2	2		6			4			8		
Total Split (s)	43.9	43.9	43.9	43.9	43.9	43.9	56.1			56.1		
Total Lost Time (s)	6.9	6.9	6.9	6.9	6.9	6.9	6.3			6.3		
Act Effct Green (s)	21.0	21.0	21.0	21.0	21.0	21.0	70.4			70.4		
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21	0.21	0.70			0.70		
v/c Ratio	0.02	0.18	0.22	0.28	0.12	0.13	0.30			0.44		
Control Delay	22.8	28.9	6.4	31.5	27.3	9.2	12.5			10.5		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0		
Total Delay	22.8	28.9	6.4	31.5	27.3	9.2	12.5			10.5		
LOS	C	C	A	C	C	A	B			B		
Approach Delay	16.7			24.2			10.8			6.9		
Approach LOS	B			C			B			A		
Queue Length 50th (m)	0.9	11.8	0.0	12.1	7.2	0.7	9.3			6.1		
Queue Length 95th (m)	3.0	17.1	9.0	17.9	11.8	7.0	40.6			m#41.5		
Internal Link Dist (m)		94.6			187.3		142.2			95.1		
Turn Bay Length (m)	50.0		45.0	70.0			60.0			100.0		
Base Capacity (vph)	464	635	590	415	580	516	631			371		2362
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	0.01	0.10	0.14	0.16	0.07	0.08	0.30			0.44		

Intersection Summary
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 24 (24%), Referenced to phase 4:NBLT and 8:SBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 11.1
 Intersection Capacity Utilization 66.1%
 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.
 Intersection LOS: B
 ICU Level of Service C



HCM Unsignalized Intersection Capacity Analysis
4: Existing Office Access & St Laurent Blvd
2500 St Laurent Blvd
2021 FBG AM Peak Conditions

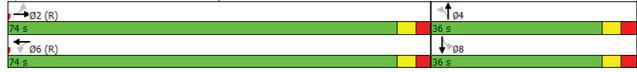
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	145	10	15	250	5	5
Future Volume (Veh/h)	145	10	15	250	5	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	145	10	15	250	5	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)				119		
pX, platoon unblocked					0.98	
vC, conflicting volume				155	430	150
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				155	404	150
tC, single (s)				4.1	6.4	6.2
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				99	99	99
cM capacity (veh/h)				1407	582	896
Direction_Lane #	EB 1	WB 1	NB 1			
Volume Total	155	265	10			
Volume Left	0	15	5			
Volume Right	10	0	5			
cSH	1700	1407	706			
Volume to Capacity	0.09	0.01	0.01			
Queue Length 95th (m)	0.0	0.2	0.3			
Control Delay (s)	0.0	0.5	10.2			
Lane LOS	A	B				
Approach Delay (s)	0.0	0.5	10.2			
Approach LOS	B					
Intersection Summary						
Average Delay		0.6				
Intersection Capacity Utilization		36.8%</				

Lanes, Volumes, Timings
1: Don Reid Dr & Walkley Rd
2500 St Laurent Blvd
2021 FBG PM Peak Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔	↔		↔	↔		↔	↔		↔
Traffic Volume (vph)	30	1505	105	15	1540	75	150	5	70	95	110	55
Future Volume (vph)	30	1505	105	15	1540	75	150	5	70	95	110	55
Satd. Flow (prot)	1695	3356	0	1695	3366	0	1695	1535	0	1695	1695	0
Flt Permitted	0.108			0.109			0.562			0.708		
Satd. Flow (perm)	193	3356	0	194	3366	0	1003	1535	0	1263	1695	0
Satd. Flow (RTOR)	12			8			41			22		
Lane Group Flow (vph)	30	1610	0	15	1615	0	150	75	0	95	165	0
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA
Protected Phases	2		2		6		4		4		8	
Permitted Phases	2		6		4		8		4		8	
Total Split (s)	74.0	74.0		74.0	74.0		36.0	36.0		36.0	36.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9		6.2	6.2		6.2	6.2	
Act Effct Green (s)	77.4	77.4		77.4	77.4		20.5	20.5		20.5	20.5	
Actuated g/C Ratio	0.70	0.70		0.70	0.70		0.19	0.19		0.19	0.19	
v/c Ratio	0.22	0.68		0.11	0.68		0.81	0.24		0.40	0.50	
Control Delay	12.9	12.3		6.5	7.3		71.5	19.7		42.5	38.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	12.9	12.3		6.5	7.3		71.5	19.7		42.5	38.2	
LOS	B	B		A	A		E	B		D	D	
Approach Delay	12.3			7.3			54.2			39.8		
Approach LOS	B			A			D			D		
Queue Length 50th (m)	2.0	90.3		0.6	47.5		31.1	6.1		18.1	27.7	
Queue Length 95th (m)	9.1	151.7		m1.5	82.0		49.2	16.6		30.4	43.1	
Internal Link Dist (m)	135.9			146.4			128.0			152.6		
Turn Bay Length (m)	40.0			55.0			35.0			30.0		
Base Capacity (vph)	135	2365		136	2371		271	445		342	475	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.22	0.68		0.11	0.68		0.55	0.17		0.28	0.35	

Intersection Summary
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 71 (65%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 14.5
 Intersection LOS: B
 Intersection Capacity Utilization 81.1%
 ICU Level of Service D
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Don Reid Dr & Walkley Rd



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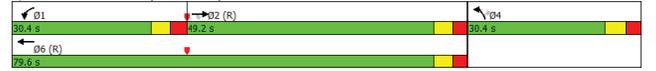
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Lanes, Volumes, Timings
2: Conroy Rd & Walkley Rd
2500 St Laurent Blvd
2021 FBG PM Peak Conditions

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (vph)	1200	480	620	1155	535	300
Future Volume (vph)	1200	480	620	1155	535	300
Satd. Flow (prot)	3390	1517	3288	3390	3288	1517
Flt Permitted	0.950		0.950		0.950	
Satd. Flow (perm)	3390	1517	3288	3390	3288	1517
Satd. Flow (RTOR)	445		445		300	
Lane Group Flow (vph)	1200	480	620	1155	535	300
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1		6	
Permitted Phases	2		1		6	
Total Split (s)	49.2	49.2	30.4	79.6	30.4	30.4
Total Lost Time (s)	6.0	6.0	6.2	6.0	6.4	6.4
Act Effct Green (s)	46.0	46.0	23.4	75.6	22.0	22.0
Actuated g/C Ratio	0.42	0.42	0.21	0.69	0.20	0.20
v/c Ratio	0.85	0.54	0.89	0.50	0.82	0.55
Control Delay	28.3	4.8	57.6	9.3	52.7	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.3	4.8	57.6	9.3	52.7	8.4
LOS	C	A	E	A	D	A
Approach Delay	21.6		26.2		36.8	
Approach LOS	C		C		D	
Queue Length 50th (m)	127.8	29.5	66.0	58.5	55.8	0.0
Queue Length 95th (m)	#166.5	14.8	#94.0	73.8	74.4	22.1
Internal Link Dist (m)	149.9		284.3		105.7	
Turn Bay Length (m)	75.0		200.0			
Base Capacity (vph)	1417	893	725	2331	717	565
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.54	0.86	0.50	0.75	0.53

Intersection Summary
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 26.4
 Intersection LOS: C
 Intersection Capacity Utilization 85.3%
 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: 2: Conroy Rd & Walkley Rd



09/07/2017

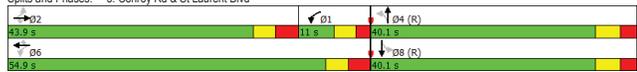
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Lanes, Volumes, Timings
3: Conroy Rd & St Laurent Blvd
2500 St Laurent Blvd
2021 FBG PM Peak Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔	↔		↔	↔		↔	↔		↔
Traffic Volume (vph)	20	70	330	240	30	115	40	610	85	40	1150	10
Future Volume (vph)	20	70	330	240	30	115	40	610	85	40	1150	10
Satd. Flow (prot)	1631	1717	1459	1491	1569	1334	1695	4783	0	1695	3387	0
Flt Permitted	0.738			0.711			0.156			0.366		
Satd. Flow (perm)	1267	1717	1459	1116	1569	1334	278	4783	0	653	3387	0
Satd. Flow (RTOR)	117			113			29			1		
Lane Group Flow (vph)	20	70	330	240	30	115	40	695	0	40	1160	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	NA	Perm	NA	NA
Protected Phases	2		2		6		4		4		8	
Permitted Phases	2		6		4		8		4		8	
Total Split (s)	43.9	43.9	43.9	11.0	54.9	54.9	40.1	40.1		40.1	40.1	
Total Lost Time (s)	6.9	6.9	6.9	5.7	6.9	6.9	6.3	6.3		6.3	6.3	
Act Effct Green (s)	22.0	22.0	22.0	34.4	33.2	33.2	48.6	48.6		48.6	48.6	
Actuated g/C Ratio	0.23	0.23	0.23	0.36	0.35	0.35	0.51	0.51		0.51	0.51	
v/c Ratio	0.07	0.18	0.77	0.56	0.05	0.21	0.28	0.28		0.12	0.67	
Control Delay	23.8	26.4	32.7	28.4	16.7	4.1	25.5	14.7		17.7	22.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	23.8	26.4	32.7	28.4	16.7	4.1	25.5	14.7		17.7	22.2	
LOS	C	C	C	C	B	A	C	B		B	C	
Approach Delay	31.2			20.2			15.3			22.1		
Approach LOS	C			C			B			C		
Queue Length 50th (m)	2.9	10.5	37.8	33.8	3.7	0.2	3.9	23.4		3.5	76.5	
Queue Length 95th (m)	6.8	16.7	53.5	39.5	7.0	8.3	16.5	43.4		12.8	#152.7	
Internal Link Dist (m)	94.6			187.3			142.2			95.1		
Turn Bay Length (m)	50.0			45.0			70.0			100.0		
Base Capacity (vph)	493	668	639	425	792	729	142	2462		334	1733	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.04	0.10	0.52	0.56	0.04	0.16	0.28	0.28		0.12	0.67	

Intersection Summary
 Cycle Length: 95
 Actuated Cycle Length: 95
 Offset: 0 (0%), Referenced to phase 4:NBL and 8:SBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 21.4
 Intersection LOS: C
 Intersection Capacity Utilization 85.2%
 ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Conroy Rd & St Laurent Blvd



09/07/2017

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HCM Unsignalized Intersection Capacity Analysis
4: Existing Office Access & St Laurent Blvd
2500 St Laurent Blvd
2021 FBG PM Peak Conditions

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	400	5	5	75	15	20
Future Volume (Veh/h)	400	5	5	75	15	20
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	400		5		75	
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)	119					
pX, platoon unblocked						
vC, conflicting volume			405		488	
vC1, stage 1 conf vol			405		488	
vC2, stage 2 conf vol			405		488	
vCu, unblocked vol			405		488	
tC, single (s)			4.1		6.4	
tC, 2 stage (s)						
tF (s)			2.2		3.5	
p0 queue free %			100		97	
cM capacity (veh/h)			1138		537	
Direction_Lane #	EB 1	WB 1	NB 1			
Volume Total	405	80	35			
Volume Left	0	5	15			
Volume Right	5	0	20			
cSH	1700	1138	595			
Volume to Capacity	0.24	0.00	0.06			
Queue Length 95th (m)	0.0	0.1	1.4			
Control Delay (s)	0.0	0.5	11.4			
Lane LOS	A		B			
Approach Delay (s)	0.0		0.5		11.4	
Approach LOS	B		B			
Intersection Summary						
Average Delay	0.9					
Intersection Capacity Utilization	32.5%		ICU Level of Service		A	
Analysis Period (min)						

Lanes, Volumes, Timings
1: Don Reid Dr & Walkley Rd

2500 St Laurent Blvd
2021 Total AM Peak Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	30	1015	180	45	1510	215	85	10	60	55	50	45
Future Volume (vph)	30	1015	180	45	1510	215	85	10	60	55	50	45
Satd. Flow (prot)	1695	3312	0	1695	3326	0	1695	1554	0	1695	1658	0
Flt Permitted	0.101			0.211			0.695			0.711		
Satd. Flow (perm)	180	3312	0	376	3326	0	1240	1554	0	1269	1658	0
Satd. Flow (RTOR)		34			27			60			33	
Lane Group Flow (vph)	30	1195	0	45	1725	0	85	70	0	55	95	0
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA
Protected Phases	2	2		6		6	4		4		8	
Total Split (s)	64.0	64.0		64.0		64.0	36.0		36.0		36.0	
Total Lost Time (s)	5.9	5.9		5.9		5.9	6.2		6.2		6.2	
Act Effct Green (s)	77.0	77.0		77.0		77.0	15.3		15.3		15.3	
Actuated g/C Ratio	0.77	0.77		0.77		0.77	0.15		0.15		0.15	
v/c Ratio	0.22	0.47		0.16		0.67	0.45		0.24		0.28	
Control Delay	12.3	7.1		7.0		7.8	43.8		12.4		38.3	
Queue Delay	0.0	0.0		0.0		0.0	0.0		0.0		0.0	
Total Delay	12.3	7.1		7.0		7.8	43.8		12.4		38.3	
LOS	B	A		A		A	D		B		D	
Approach Delay	7.2			7.8			29.7				30.8	
Approach LOS	A			A			C				C	
Queue Length 50th (m)	1.4	36.7		1.1		27.7	15.8		1.8		9.9	
Queue Length 95th (m)	10.0	92.0		m#5.3		155.4	24.5		11.1		17.1	
Internal Link Dist (m)		135.9				146.4			128.0			152.6
Turn Bay Length (m)	40.0			55.0			35.0				30.0	
Base Capacity (vph)	138	2558		289		2567	369		505		378	517
Starvation Cap Reductn	0	0		0		0	0		0		0	0
Spillback Cap Reductn	0	0		0		0	0		0		0	0
Storage Cap Reductn	0	0		0		0	0		0		0	0
Reduced v/c Ratio	0.22	0.47		0.16		0.67	0.23		0.14		0.15	0.18

Intersection Summary
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 69 (69%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.67
 Intersection Signal Delay: 9.7
 Intersection Capacity Utilization 73.0%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.
 ICU Level of Service D



Lanes, Volumes, Timings
2: Conroy Rd & Walkley Rd

2500 St Laurent Blvd
2021 Total AM Peak Conditions

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	900	330	255	1010	755	490
Future Volume (vph)	900	330	255	1010	755	490
Satd. Flow (prot)	3390	1517	3288	3390	3288	1517
Flt Permitted			0.950			
Satd. Flow (perm)	3390	1517	3288	3390	3288	1517
Satd. Flow (RTOR)			330			298
Lane Group Flow (vph)	900	330	255	1010	755	490
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6		4
Permitted Phases	2		2			4
Total Split (s)	42.0	42.0	18.0	60.0	40.0	40.0
Total Lost Time (s)	6.0	6.0	6.2	6.0	6.4	6.4
Act Effct Green (s)	40.4	40.4	11.8	58.4	29.2	29.2
Actuated g/C Ratio	0.40	0.40	0.12	0.58	0.29	0.29
v/c Ratio	0.66	0.41	0.66	0.51	0.79	0.75
Control Delay	23.9	3.0	51.1	14.1	28.3	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	3.0	51.1	14.1	28.3	12.6
LOS	C	A	D	B	C	B
Approach Delay	18.3			21.5		22.1
Approach LOS	B			C		C
Queue Length 50th (m)	75.5	0.0	24.7	57.7	68.6	41.0
Queue Length 95th (m)	55.1	9.5	37.5	81.7	19.9	9.2
Internal Link Dist (m)	149.9			284.3		105.7
Turn Bay Length (m)		75.0	200.0			
Base Capacity (vph)	1370	809	387	1980	1104	707
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.41	0.66	0.51	0.68	0.69

Intersection Summary
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 86 (86%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 20.7
 Intersection Capacity Utilization 72.2%
 Analysis Period (min) 15
 ICU Level of Service C



Lanes, Volumes, Timings
3: Conroy Rd & St Laurent Blvd

2500 St Laurent Blvd
2021 Total AM Peak Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	10	70	85	65	45	40	205	1280	210	95	395	55
Future Volume (vph)	10	70	85	65	45	40	205	1280	210	95	395	55
Satd. Flow (prot)	1631	1717	1459	1491	1569	1334	1695	4769	0	1695	3329	0
Flt Permitted	0.728			0.711			0.492			0.145		
Satd. Flow (perm)	1250	1717	1459	1116	1569	1334	878	4769	0	259	3329	0
Satd. Flow (RTOR)				85			36			45		22
Lane Group Flow (vph)	10	70	85	65	45	40	205	1490	0	95	450	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	NA	Perm	NA	NA
Protected Phases	2	2		6		6	4		4		8	
Total Split (s)	43.9	43.9		43.9		43.9	56.1		56.1		56.1	
Total Lost Time (s)	6.9	6.9		6.9		6.9	6.3		6.3		6.3	
Act Effct Green (s)	21.0	21.0		21.0		21.0	70.4		70.4		70.4	
Actuated g/C Ratio	0.21	0.21		0.21		0.21	0.70		0.70		0.70	
v/c Ratio	0.04	0.19		0.23		0.28	0.14		0.33		0.44	
Control Delay	23.6	29.3		6.3		31.6	27.7		13.1		10.5	
Queue Delay	0.0	0.0		0.0		0.0	0.0		0.0		0.0	
Total Delay	23.6	29.3		6.3		31.6	27.7		13.1		10.5	
LOS	C	C		A		C	C		B		C	
Approach Delay	17.1			24.4			10.9				6.6	
Approach LOS	B			C			B				A	
Queue Length 50th (m)	1.8	12.8		0.0		12.1	8.1		0.7		10.4	
Queue Length 95th (m)	4.6	18.1		9.3		17.9	12.9		7.0		45.0	
Internal Link Dist (m)		94.6				187.3			142.2			95.1
Turn Bay Length (m)	50.0			45.0		70.0	60.0		90.0		100.0	
Base Capacity (vph)	462	635		593		412	580		618		3370	
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	0.02	0.11		0.14		0.16	0.08		0.08		0.33	

Intersection Summary
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 24 (24%), Referenced to phase 4:NBLT and 8:SBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 11.1
 Intersection Capacity Utilization 66.1%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 m Volume for 95th percentile queue is metered by upstream signal.
 ICU Level of Service C



HCM Unsignalized Intersection Capacity Analysis
4: Existing Office Access/Proposed Office Access & St Laurent Blvd

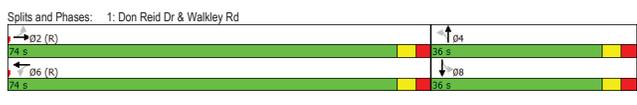
2500 St Laurent Blvd
2021 Total AM Peak Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	25	145	10	15	250	40	5	5	5	5	5	5
Future Volume (Veh/h)	25	145	10	15	250	40	5	5	5	5	5	5
Sign Control	Free			Free			Stop		Stop		Stop	
Grade	0%			0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	145	10	15	250	40	5	5	5	5	5	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median storage (veh)												
Median storage (veh)												
Upstream signal (m)					119							
pX, platoon unblocked	0.97						0.97	0.97		0.97	0.97	0.97
vC, conflicting vol	290						508	520		150	508	505
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	255						155			478	491	150
tC, single (s)	4.1						4.1			7.1	6.5	

Lanes, Volumes, Timings
1: Don Reid Dr & Walkley Rd
2500 St Laurent Blvd
2021 Total PM Peak Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	[Diagram showing lane configurations with arrows]											
Traffic Volume (vph)	30	1510	110	20	1550	75	175	10	75	100	115	55
Future Volume (vph)	30	1510	110	20	1550	75	175	10	75	100	115	55
Satd. Flow (prot)	1695	3356	0	1695	3366	0	1695	1549	0	1695	1697	0
Flt Permitted	0.101			0.102			0.565			0.702		
Satd. Flow (perm)	180	3356	0	182	3366	0	1008	1549	0	1253	1697	0
Satd. Flow (RTOR)		13			8			41			21	
Lane Group Flow (vph)	30	1620	0	20	1625	0	175	85	0	100	170	0
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA
Protected Phases	2	2		6	6		4	4		8	8	
Permitted Phases	2			6			4			8		
Total Split (s)	74.0	74.0		74.0	74.0		36.0	36.0		36.0	36.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9		6.2	6.2		6.2	6.2	
Act Effct Green (s)	75.4	75.4		75.4	75.4		22.5	22.5		22.5	22.5	
Actuated g/C Ratio	0.69	0.69		0.69	0.69		0.20	0.20		0.20	0.20	
v/c Ratio	0.24	0.70		0.16	0.70		0.85	0.24		0.39	0.47	
Control Delay	14.8	13.7		7.9	8.1		74.5	20.6		40.6	36.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	14.8	13.7		7.9	8.1		74.5	20.6		40.6	36.4	
LOS	B	B		A	A		E	C		D	D	
Approach Delay	13.7			8.1			56.9			38.0		
Approach LOS	B			A			E			D		
Queue Length 50th (m)	2.2	101.1		0.9	50.4		36.2	7.7		18.6	27.9	
Queue Length 95th (m)	9.5	153.6		m2.1	98.2		57.5	19.3		31.9	44.7	
Internal Link Dist (m)		135.9			146.4			128.0			152.6	
Turn Bay Length (m)	40.0			55.0			35.0			30.0		
Base Capacity (vph)	123	2304		124	2309		273	449		339	475	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.24	0.70		0.16	0.70		0.64	0.19		0.29	0.36	

Intersection Summary
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 67 (61%), Referenced to phase 2:EBTL and 6:WBL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 15.9
 Intersection LOS: B
 Intersection Capacity Utilization 83.2%
 ICU Level of Service E
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.



Lanes, Volumes, Timings
2: Conroy Rd & Walkley Rd
2500 St Laurent Blvd
2021 Total PM Peak Conditions

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	[Diagram showing lane configurations with arrows]					
Traffic Volume (vph)	1205	485	625	1160	545	315
Future Volume (vph)	1205	485	625	1160	545	315
Satd. Flow (prot)	3390	1517	3288	3390	3288	1517
Flt Permitted			0.950			
Satd. Flow (perm)	3390	1517	3288	3390	3288	1517
Satd. Flow (RTOR)		451				315
Lane Group Flow (vph)	1205	485	625	1160	545	315
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Total Split (s)	49.6	49.6	30.0	79.6	30.4	30.4
Total Lost Time (s)	6.0	6.0	6.2	6.0	6.4	6.4
Act Effct Green (s)	45.8	45.8	23.3	75.3	22.3	22.3
Actuated g/C Ratio	0.42	0.42	0.21	0.68	0.20	0.20
v/c Ratio	0.85	0.54	0.90	0.50	0.82	0.56
Control Delay	27.9	4.7	59.2	9.5	52.6	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.9	4.7	59.2	9.5	52.6	8.4
LOS	C	A	E	A	D	A
Approach Delay	21.2			26.9	36.4	
Approach LOS	C			C	D	
Queue Length 50th (m)	128.5	25.6	67.3	59.6	56.8	0.0
Queue Length 95th (m)	#167.6	17.0	#96.5	74.2	75.8	22.6
Internal Link Dist (m)	149.9			284.3	105.7	
Turn Bay Length (m)		75.0	200.0			
Base Capacity (vph)	1410	894	714	2320	717	577
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.54	0.88	0.50	0.76	0.55

Intersection Summary
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 108 (98%), Referenced to phase 2:EBT and 6:WBL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 26.6
 Intersection LOS: C
 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.



Lanes, Volumes, Timings
3: Conroy Rd & St Laurent Blvd
2500 St Laurent Blvd
2021 Total PM Peak Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	[Diagram showing lane configurations with arrows]											
Traffic Volume (vph)	45	80	340	240	35	115	45	610	85	40	1150	15
Future Volume (vph)	45	80	340	240	35	115	45	610	85	40	1150	15
Satd. Flow (prot)	1631	1717	1459	1491	1569	1334	1695	4783	0	1695	3383	0
Flt Permitted	0.734			0.705			0.152			0.365		
Satd. Flow (perm)	1260	1717	1459	1106	1569	1334	271	4783	0	651	3383	0
Satd. Flow (RTOR)			117			113		29			1	
Lane Group Flow (vph)	45	80	340	240	35	115	45	695	0	40	1165	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	NA	Perm	NA	NA
Protected Phases	2	2		1	6	6	4	4		8	8	
Permitted Phases	2			6			4			8		
Total Split (s)	43.9	43.9	43.9	11.0	54.9	54.9	40.1	40.1		40.1	40.1	
Total Lost Time (s)	6.9	6.9	6.9	5.7	6.9	6.9	6.3	6.3		6.3	6.3	
Act Effct Green (s)	22.5	22.5	22.5	34.9	33.7	33.7	48.1	48.1		48.1	48.1	
Actuated g/C Ratio	0.24	0.24	0.24	0.37	0.35	0.35	0.51	0.51		0.51	0.51	
v/c Ratio	0.15	0.20	0.78	0.56	0.06	0.21	0.33	0.29		0.12	0.68	
Control Delay	25.6	26.6	33.3	27.9	16.7	4.0	28.2	15.0		18.0	22.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	25.6	26.6	33.3	27.9	16.7	4.0	28.2	15.0		18.0	22.8	
LOS	C	C	C	C	B	A	C	B		B	C	
Approach Delay	31.4			19.9			15.8			22.6		
Approach LOS	C			B			B			C		
Queue Length 50th (m)	6.7	12.0	39.6	33.4	4.3	0.2	4.5	23.8		3.6	78.5	
Queue Length 95th (m)	12.2	18.6	56.0	39.5	7.9	8.3	#20.7	43.4		12.8	#153.9	
Internal Link Dist (m)		94.6			187.3			142.2			95.1	
Turn Bay Length (m)	50.0		45.0	70.0		60.0	90.0			100.0		
Base Capacity (vph)	490	668	639	428	792	729	137	2436		329	1713	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.09	0.12	0.53	0.56	0.04	0.16	0.33	0.29		0.12	0.68	

Intersection Summary
 Cycle Length: 95
 Actuated Cycle Length: 95
 Offset: 0 (0%), Referenced to phase 4:NBL and 8:SBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 21.9
 Intersection LOS: C
 Intersection Capacity Utilization 86.1%
 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.



HCM Unsignalized Intersection Capacity Analysis
4: Existing Office Access/Proposed Office Access & St Laurent Blvd
2500 St Laurent Blvd
2021 Total PM Peak Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	[Diagram showing lane configurations with arrows]												
Traffic Volume (veh/h)	5	400	5	5	75	10	15	5	20	50	5	35	
Future Volume (veh/h)	5	400	5	5	75	10	15	5	20	50	5	35	
Sign Control	Free			Free			Stop			Stop			
Grade	0%												
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly flow rate (vph)	5	400	5	5	75	10	15	5	20	50	5	35	
Pedestrians													
Lane Width (m)													
Walking Speed (m/s)													
Percent Blockage													
Right turn flare (veh)													
Median storage (veh)	None			None									
Upstream signal (m)	119												
pX, platoon unblocked													
vC, conflicting volume	85			405				540	508	402	525	505	80
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vC3, unblocked vol	85			405				540	508	402	525	505	80
tC, single (s)	4.1			4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)													
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100				97	99	97	89	99	96
cM capacity (veh/h)	1512			1138				430	464	648	443	466	980
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	410	90	40	90									
Volume Left	5	5	15	50									
Volume Right	5	10	20	35									

Lanes, Volumes, Timings
1: Don Reid Dr & Walkley Rd
2500 St Laurent Blvd
2026 Ultimate AM Peak Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	[Diagram showing lane configurations with arrows]											
Traffic Volume (vph)	30	1065	190	45	1585	225	80	10	55	60	50	45
Future Volume (vph)	30	1065	190	45	1585	225	80	10	55	60	50	45
Satd. Flow (prot)	1695	3312	0	1695	3326	0	1695	1558	0	1695	1658	0
Flt Permitted	0.088			0.196			0.695			0.715		
Satd. Flow (perm)	157	3312	0	350	3326	0	1240	1558	0	1276	1658	0
Satd. Flow (RTOR)		35			27			55			27	
Lane Group Flow (vph)	30	1255	0	45	1810	0	80	65	0	60	95	0
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA
Protected Phases	2		6		4		4		8		8	
Total Split (s)	64.0	64.0	64.0	64.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
Total Lost Time (s)	5.9	5.9	5.9	5.9	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Act Effct Green (s)	77.2	77.2	77.2	77.2	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1
Actuated g/C Ratio	0.77	0.77	0.77	0.77	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
v/c Ratio	0.25	0.49	0.17	0.70	0.43	0.23	0.31	0.35				
Control Delay	14.3	7.3	5.0	6.7	43.3	12.9	39.3	28.8				
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Total Delay	14.3	7.3	5.0	6.7	43.3	12.9	39.3	28.8				
LOS	B	A	A	A	D	B	D	C				
Approach Delay	7.4		6.6		29.7		32.9					
Approach LOS	A		A		C		C					
Queue Length 50th (m)	1.4	38.7	1.1	28.9	14.9	1.8	10.9	12.3				
Queue Length 95th (m)	11.2	99.4	m4.4	#40.3	23.3	10.8	18.3	21.6				
Internal Link Dist (m)	135.9		320.2		128.0		152.6					
Turn Bay Length (m)	40.0		55.0		35.0		30.0					
Base Capacity (vph)	121	2564	270	2573	369	502	380	513				
Starvation Cap Reductn	0	0	0	0	0	0	0	0				
Spillback Cap Reductn	0	0	0	0	0	0	0	0				
Storage Cap Reductn	0	0	0	0	0	0	0	0				
Reduced v/c Ratio	0.25	0.49	0.17	0.70	0.22	0.13	0.16	0.19				

Intersection Summary
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 89 (89%), Referenced to phase 2:EBTL and 6:WBL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 9.1
 Intersection Capacity Utilization 75.2%
 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.

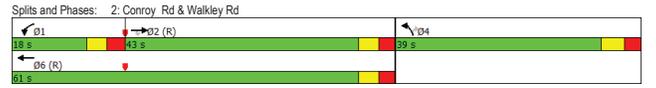


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Lanes, Volumes, Timings
2: Conroy Rd & Walkley Rd
2500 St Laurent Blvd
2026 Ultimate AM Peak Conditions

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	[Diagram showing lane configurations with arrows]					
Traffic Volume (vph)	945	345	265	1060	795	515
Future Volume (vph)	945	345	265	1060	795	515
Satd. Flow (prot)	3390	1517	3288	3390	3288	1517
Flt Permitted			0.950			0.950
Satd. Flow (perm)	3390	1517	3288	3390	3288	1517
Satd. Flow (RTOR)			345			290
Lane Group Flow (vph)	945	345	265	1060	795	515
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1		4	
Total Split (s)	43.0	43.0	18.0	61.0	39.0	39.0
Total Lost Time (s)	6.0	6.0	6.2	6.0	6.4	6.4
Act Effct Green (s)	40.1	40.1	11.6	57.9	29.7	29.7
Actuated g/C Ratio	0.40	0.40	0.12	0.58	0.30	0.30
v/c Ratio	0.70	0.42	0.70	0.54	0.82	0.79
Control Delay	24.2	3.0	52.7	14.7	39.9	22.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.2	3.0	52.7	14.7	39.9	22.8
LOS	C	A	D	B	D	C
Approach Delay	18.5		22.3		33.2	
Approach LOS	B		C		C	
Queue Length 50th (m)	84.7	11.0	25.4	64.6	71.5	39.5
Queue Length 95th (m)	63.2	3.7	38.7	85.1	91.3	80.1
Internal Link Dist (m)	320.2		284.3		104.5	
Turn Bay Length (m)	75.0		200.0			
Base Capacity (vph)	1359	814	396	1963	1071	690
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.42	0.67	0.54	0.74	0.75

Intersection Summary
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 12 (12%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 24.7
 Intersection Capacity Utilization 75.0%
 Analysis Period (min) 15



09/07/2017 Synchro 9 Report Page 2

Lanes, Volumes, Timings
3: Conroy Rd & St Laurent Blvd
2500 St Laurent Blvd
2026 Ultimate AM Peak Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	[Diagram showing lane configurations with arrows]											
Traffic Volume (vph)	10	75	90	70	45	40	215	1345	220	100	415	55
Future Volume (vph)	10	75	90	70	45	40	215	1345	220	100	415	55
Satd. Flow (prot)	1631	1717	1459	1491	1569	1334	1695	4769	0	1695	3329	0
Flt Permitted	0.728			0.708			0.483			0.130		
Satd. Flow (perm)	1250	1717	1459	1111	1569	1334	862	4769	0	232	3329	0
Satd. Flow (RTOR)			90				38			45		21
Lane Group Flow (vph)	10	75	90	70	45	40	215	1565	0	100	470	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	NA	Perm	NA	NA
Protected Phases	2		6		6		4		8		8	
Total Split (s)	43.9	43.9	43.9	43.9	43.9	43.9	51.1	51.1	51.1	51.1	51.1	51.1
Total Lost Time (s)	6.9	6.9	6.9	6.9	6.9	6.9	6.3	6.3	6.3	6.3	6.3	6.3
Act Effct Green (s)	21.1	21.1	21.1	21.1	21.1	21.1	65.4	65.4	65.4	65.4	65.4	65.4
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.22	0.69	0.69	0.69	0.69	0.69	0.69
v/c Ratio	0.04	0.20	0.23	0.28	0.13	0.12	0.36	0.47		0.63	0.20	
Control Delay	21.3	27.0	5.7	29.3	25.2	7.6	14.4	11.5		41.0	9.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	21.3	27.0	5.7	29.3	25.2	7.6	14.4	11.5		41.0	9.2	
LOS	C	C	A	C	C	A	B	B		D	A	
Approach Delay	15.7		22.5		11.8		14.8					
Approach LOS	B		C		B		B					
Queue Length 50th (m)	1.7	12.9	0.0	12.3	7.6	0.3	11.2	32.1		6.9	10.6	
Queue Length 95th (m)	4.3	17.6	8.9	17.6	12.0	6.4	49.2	93.4		#48.6	36.0	
Internal Link Dist (m)	94.6		187.3		142.2		189.6					
Turn Bay Length (m)	50.0		45.0		70.0		60.0		90.0		100.0	
Base Capacity (vph)	486	668	623	432	611	542	593	3296		159	2297	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.02	0.11	0.14	0.16	0.07	0.07	0.36	0.47		0.63	0.20	

Intersection Summary
 Cycle Length: 95
 Actuated Cycle Length: 95
 Offset: 0 (0%), Referenced to phase 4:NBL and 8:SBL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 13.3
 Intersection Capacity Utilization 67.9%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



09/07/2017 Synchro 9 Report Page 3

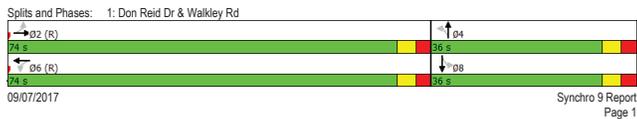
HCM Unsignalized Intersection Capacity Analysis
4: Existing Office Access/Proposed Office Access & St Laurent Blvd
2500 St Laurent Blvd
2026 Ultimate AM Peak Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	[Diagram showing lane configurations with arrows]											
Traffic Volume (veh/h)	25	150	10	15	265	40	5	5	5	5	5	5
Future Volume (Veh/h)	25	150	10	15	265	40	5	5	5	5	5	5
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	150	10	15	265	40	5	5	5	5	5	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median storage (veh)	None			None								
Upstream signal (m)				119								
pX, platoon unblocked	0.97						0.97			0.97		
vC, conflicting vol	305			160			528			540		
vC1, stage 1 conf vol							528			525		
vC2, stage 2 conf vol							528			525		
vCu, unblocked vol	263			160			494			507		
tC, single (s)	4.1			4.1			7.1			6.5		
tC, 2 stage (s)							7.1			6.5		
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	98			99			99			99		
cM capacity (veh/h)	1257			1401			452			439		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	185	320	15	15								
Volume Left	25	15	5	5								
Volume Right	10	40	5	5								
cSH	1257	1401	534	522								
Volume to Capacity	0.02	0.01	0.03	0.03								
Queue Length 95th (m)	0.5	0.2	0.7	0.7								
Control Delay (s)	1.2	0.5										

Lanes, Volumes, Timings
1: Don Reid Dr & Walkley Rd
2500 St Laurent Blvd
2021 Ultimate PM Peak Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	[Diagram showing lane configurations with arrows]											
Traffic Volume (vph)	30	1585	115	20	1625	80	185	10	80	105	120	60
Future Volume (vph)	30	1585	115	20	1625	80	185	10	80	105	120	60
Satd. Flow (prot)	1695	3356	0	1695	3366	0	1695	1547	0	1695	1695	0
Flt Permitted	0.085			0.085			0.551			0.699		
Satd. Flow (perm)	152	3356	0	152	3366	0	983	1547	0	1247	1695	0
Satd. Flow (RTOR)		13			8			34			22	
Lane Group Flow (vph)	30	1700	0	20	1705	0	185	90	0	105	180	0
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA
Protected Phases	[Diagram showing protected phases]											
Permitted Phases	2			6			4			8		
Total Split (s)	74.0	74.0		74.0	74.0		36.0	36.0		36.0	36.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9		6.2	6.2		6.2	6.2	
Act Effct Green (s)	74.3	74.3		74.3	74.3		23.6	23.6		23.6	23.6	
Actuated g/C Ratio	0.68	0.68		0.68	0.68		0.21	0.21		0.21	0.21	
v/c Ratio	0.29	0.75		0.20	0.75		0.88	0.25		0.39	0.47	
Control Delay	18.7	15.5		9.4	9.0		77.9	23.1		39.8	35.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	18.7	15.5		9.4	9.0		77.9	23.1		39.8	35.9	
LOS	B	B		A	A		E	C		D	D	
Approach Delay	[Diagram showing approach delays]											
Approach LOS	[Diagram showing approach LOS]											
Queue Length 50th (m)	2.4	116.8		1.0	55.6		38.2	9.7		19.2	29.3	
Queue Length 95th (m)	10.9	169.0		m2.1	113.8		#66.7	21.7		33.2	47.0	
Internal Link Dist (m)	[Diagram showing internal link distances]											
Turn Bay Length (m)	40.0			55.0			35.0			30.0		
Base Capacity (vph)	102	2269		102	2274		266	443		337	475	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.29	0.75		0.20	0.75		0.70	0.20		0.31	0.38	

Intersection Summary
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 67 (61%), Referenced to phase 2:EBTL and 6:WBLT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 17.3
 Intersection LOS: B
 Intersection Capacity Utilization: 86.7%
 ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.



Lanes, Volumes, Timings
2: Conroy Rd & Walkley Rd
2500 St Laurent Blvd
2021 Ultimate PM Peak Conditions

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	[Diagram showing lane configurations with arrows]					
Traffic Volume (vph)	1265	510	655	1220	570	330
Future Volume (vph)	1265	510	655	1220	570	330
Satd. Flow (prot)	3390	1517	3288	3390	3288	1517
Flt Permitted			0.950			
Satd. Flow (perm)	3390	1517	3288	3390	3288	1517
Satd. Flow (RTOR)			451			
Lane Group Flow (vph)	1265	510	655	1220	570	330
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	[Diagram showing protected phases]					
Permitted Phases	2		1		6	
Total Split (s)	49.6	49.6	30.0	79.6	30.4	30.4
Total Lost Time (s)	6.0	6.0	6.2	6.0	6.4	6.4
Act Effct Green (s)	45.0	45.0	23.8	74.9	22.7	22.7
Actuated g/C Ratio	0.41	0.41	0.22	0.68	0.21	0.21
v/c Ratio	0.91	0.58	0.92	0.53	0.84	0.57
Control Delay	31.5	5.3	62.2	10.0	54.1	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.5	5.3	62.2	10.0	54.1	8.4
LOS	C	A	E	A	D	A
Approach Delay	[Diagram showing approach delays]					
Approach LOS	[Diagram showing approach LOS]					
Queue Length 50th (m)	138.3	27.9	71.3	64.3	60.1	0.0
Queue Length 95th (m)	#178.8	23.0	#103.9	80.1	79.6	23.2
Internal Link Dist (m)	[Diagram showing internal link distances]					
Turn Bay Length (m)	[Diagram showing turn bay lengths]					
Base Capacity (vph)	1385	886	718	2309	717	588
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.58	0.91	0.53	0.79	0.56

Intersection Summary
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 28.4
 Intersection LOS: C
 Intersection Capacity Utilization: 89.3%
 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.



Lanes, Volumes, Timings
3: Conroy Rd & St Laurent Blvd
2500 St Laurent Blvd
2021 Ultimate PM Peak Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	[Diagram showing lane configurations with arrows]											
Traffic Volume (vph)	45	85	355	250	35	120	45	640	90	40	1210	15
Future Volume (vph)	45	85	355	250	35	120	45	640	90	40	1210	15
Satd. Flow (prot)	1631	1717	1459	1491	1569	1334	1695	4783	0	1695	3383	0
Flt Permitted	0.734			0.702			0.130			0.347		
Satd. Flow (perm)	1260	1717	1459	1101	1569	1334	232	4783	0	619	3383	0
Satd. Flow (RTOR)				117			100	30			1	
Lane Group Flow (vph)	45	85	355	250	35	120	45	730	0	40	1225	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	NA	Perm	NA	NA
Protected Phases	[Diagram showing protected phases]											
Permitted Phases	2		2		6		6	4		8		
Total Split (s)	43.9	43.9	43.9	11.1	55.0	55.0	40.0	40.0		40.0	40.0	
Total Lost Time (s)	6.9	6.9	6.9	5.7	6.9	6.9	6.3	6.3		6.3	6.3	
Act Effct Green (s)	23.5	23.5	23.5	35.9	34.7	34.7	47.1	47.1		47.1	47.1	
Actuated g/C Ratio	0.25	0.25	0.25	0.38	0.37	0.37	0.50	0.50		0.50	0.50	
v/c Ratio	0.14	0.20	0.79	0.57	0.06	0.22	0.39	0.31		0.13	0.73	
Control Delay	24.8	26.1	33.9	27.6	16.2	5.4	34.3	15.7		18.6	24.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	24.8	26.1	33.9	27.6	16.2	5.4	34.3	15.7		18.6	24.7	
LOS	C	C	C	C	B	A	C	B		B	C	
Approach Delay	[Diagram showing approach delays]											
Approach LOS	[Diagram showing approach LOS]											
Queue Length 50th (m)	6.5	12.4	41.7	33.8	4.1	2.3	4.9	26.4		3.8	88.8	
Queue Length 95th (m)	12.2	19.4	59.7	41.2	7.9	10.2	#23.4	45.9		12.9	#166.9	
Internal Link Dist (m)	[Diagram showing internal link distances]											
Turn Bay Length (m)	50.0		45.0	70.0			60.0	90.0		100.0		
Base Capacity (vph)	490	668	639	438	794	724	115	2386		306	1677	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.09	0.13	0.56	0.57	0.04	0.17	0.39	0.31		0.13	0.73	

Intersection Summary
 Cycle Length: 95
 Actuated Cycle Length: 95
 Offset: 0 (0%), Referenced to phase 4:NBLT and 8:SBLT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 23.0
 Intersection LOS: C
 Intersection Capacity Utilization: 89.4%
 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.



HCM Unsignalized Intersection Capacity Analysis
4: Existing Office Access/Proposed Office Access & St Laurent Blvd
2500 St Laurent Blvd
2021 Ultimate PM Peak Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	[Diagram showing lane configurations with arrows]											
Traffic Volume (veh/h)	5	420	5	5	80	10	15	5	20	50	5	35
Future Volume (veh/h)	5	420	5	5	80	10	15	5	20	50	5	35
Sign Control	Free Free Stop Stop											
Grade	0% 0% 0% 0%											
Peak Hour Factor	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00											
Hourly flow rate (vph)	5 420 5 5 80 10 15 5 20 50 5 35											
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None None											
Median storage (veh)												
Upstream signal (m)	119											
pX, platoon unblocked												
vC, conflicting volume	90 425 565 532 422 550 530 85											
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	90 425 565 532 422 550 530 85											
tC, single (s)	4.1 4.1 7.1 6.5 6.2 7.1 6.5 6.2											
tC, 2 stage (s)												
tF (s)	2.2 2.2 3.5 4.0 3.3 3.5 4.0 3.3											
p0 queue free %	100 100 96 99 97 88 99 96											
cM capacity (veh/h)	1505 1118 414 450 631 425 451 974											
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	430	95	40	90								
Volume Left	5	5	15	50								
Volume Right	5	10	20	35								
cSH	1505	1118	506	547								
Volume to Capacity	0.00	0.00	0.08	0.16								
Queue Length 95th (m)	0.1	0.1	1.9	4.4								
Control Delay (s)	0.1	0.5	12.7	12.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.5	12.7	12.9								
Approach LOS	B				B							
Intersection Summary												
Average Delay	2.7											
Intersection Capacity Utilization	40.5% ICU Level of Service A											
Analysis Period (min)	15											

