January 26, 2016
File: 160401218

Attention: Lisa Della Rosa
Cardel Developments Ltd.
Suite 100, 301 Moodie Drive
Ottawa, Ontario
K2H 9C4

Dear Ms. Della Rosa,

Reference: 3368 Carling Avenue Transportation Brief

1.0 INTRODUCTION

Cardel Developments Ltd. (Cardel) is seeking site plan approval for a proposed residential development located at 3368 Carling Avenue in the Crystal Beach Community of the City of Ottawa. Stantec Consulting Ltd. was retained to undertake a Transportation Brief to determine the potential transportation implications of the proposed residential development.

This Transportation Brief will include:

- A description of the proposed residential development;
- A review of the site plan to confirm site access location(s), parking requirements, and general site circulation;
- An overview of the existing surrounding transportation environment, including an operational assessment of the Carling Avenue at Bedale Drive intersection under 2016 existing conditions;
- The volume of site traffic the proposed residential development is anticipated to generate during the AM and PM roadway peaks;
- An operational assessment of the Carling Avenue at Bedale Drive intersection under 2017 future conditions (i.e. at site occupancy); and
- The potential transportation implications of the proposed development.

Reference: 3368 Carling Avenue Transportation Brief

2.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

The subject site is located in the Crystal Beach Community of the City of Ottawa at the southeast quadrant of the Carling Avenue / Bedale Drive intersection. The site is currently a paved lot with an abandoned commercial building on it. The proposed residential development will consist of a three storey apartment building with 15 residential units and 18 underground parking spaces.

Figure 1 illustrates the location of the site at 3368 Carling Avenue.

Figure 1 Site Location

3.0 SITE PLAN REVIEW

Attachment 1 illustrates the proposed site plan.

The site plan was reviewed to confirm site access location, parking requirements, and general site circulation. The proposed residential development will contain one access to / from Bedale Drive that will lead to an underground parking garage. The entrance to the garage is proposed to be 4.0m wide.

According to the City of Ottawa Zoning By-law Sections 101 and 102, the minimum number of required parking stalls for the proposed residential building is 1.2 residential parking stalls and 0.2 visitor parking

stalls per residential unit. As there are 15 proposed residential units the total number of required parking stalls would be 21 (18 residential parking stalls plus 3 visitor stalls). Cardel proposes to provide a total of 18 parking stalls, or 3 less than required under the current Zoning By-Law. Of the 18 proposed parking spaces 15 would be allocated to residential units (1 per residential unit) with the remaining 3 spaces allocated to visitors. Cardel will be seeking a minor variance to allow for the reduced parking requirement.

4.0 EXISTING TRANSPORTATION ENVIRONMENT

4.1 ROADS AND TRAFFIC CONTROLS

The major roadways in the study area are as follows:

Carling Avenue	Carling Avenue 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 Carling Avenue is signalized with dedicated left turn lanes along Carling Avenue.
Bedale Drive	Bedale 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 the west side.

4.2 TRANSIT SERVICE

Transit service is currently provided within close proximity of the subject sites by route 152. Route 152 is a regular route that runs between Crystal Beach and Lincoln Fields Station.

Figure 2 illustrates the local transit routes.

Figure 2 Study Area Transit Routes

Source: City of Ottawa's OC Transpo System Map (accessed January 5th, 2016)

4.3 CYCLING AND WALKING FACILITIES

Carling Avenue has a sidewalk along the southern side and an asphalt path along the northern side. Bedale Drive has a sidewalk along the eastern side.

The City of Ottawa's 'GeoOttawa' mapping depicts the existing cycling facilities within the study area. The asphalt path along the northern side of Carling Avenue is designated as a cycling path.

Figure 3 illustrates the existing cycling facilities within the study area.

Figure 3 Existing Cycling Network

Source: City of Ottawa's GeoOttawa Mapping (accessed January 5th, 2016)

4.4 INTERSECTION OPERATIONS

An assessment of the Carling Avenue at Bedale Drive intersection was undertaken to determine the operational characteristics under 2016 existing conditions. The operational analysis was facilitated by Synchro 9.0™ software package. Traffic counts and signal timings were obtained from the City of Ottawa and were used in the assessment of 2016 existing conditions. As the traffic counts were conducted in 2013, the through volumes along Carling Avenue were adjusted to 2016 conditions using an annual rate of growth of 2%.

Table 1 provides a summary of 2016 existing intersection operations.

The intersection of Carling Avenue at Bedale Drive currently operates acceptably under 2016 existing conditions.

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: 3368 Carling Avenue Transportation Brief

Table 1 2016 Existing Intersection Operations

Signalized Intersection	Approach/Movement		2015 Existing Conditions		
			LOS	V/C[2]	Q[3] (m)
Carling Avenue and Bedale Drive	EB	Left	A (A)	0.14 (0.58)	7.6 (#23.1)
		Through	C (B)	0.77 (0.61)	78.0 (62.2)
		Right	A (A)	0.01 (0.01)	0.6 (1.4)
	WB	Left	A (A)	0.10 (0.21)	3.6 (8.7)
		Through / Right	A (D)	0.47 (0.87)	41.3 (#105.4)
	NB	Left / Through / Right	A (A)	0.06 (0.03)	8.3 (5.8)
	SB	Left / Through / Right	A (A)	0.02 (0.03)	4.7 (5.6)
	Overall Intersection		***A (A)***	***0.42 (0.49)***	-

Note: yellow highlight denotes v/c of 1.00 or greater

1. *Table Format: AM (PM)*
2. *v/c – represents the anticipated volume divided by the predicted capacity*
3. *95th Percentile Queue (m)*
4. *# - 95th percentile volume exceeds capacity, queue may be longer*

5.0 SITE TRAFFIC GENERATION

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 220 - Apartment was thought to be the most representative of the proposed land use.

Table 2 summarizes the estimated vehicular trips expected to be generated during the morning and afternoon peak hours. It is projected that proposed site will generate approximately 8 vehicle trips during the AM peak hour and 9 vehicle trips during the PM peak hour.

The trips generated by the proposed development are considered to be negligible, and therefore, the proposed development is expected to have a negligible impact on traffic conditions in the vicinity of the site.

Table 2 Site Traffic Generation

ITE Trip Generation Rates							
Land Use Code	Units	AM Peak Hour			PM Peak Hour		
		Inbound	Outbound	Total	Inbound	Outbound	Total
220 – Apartment	15	20%	80%	0.51	65%	35%	0.62
Projected Auto Trips							
220 - Apartment	15	2	6	8	6	3	9

As per the City of Ottawa's *Transportation Impact Assessment Guidelines 2006*, the number of trips this proposed residential development is anticipated to generate does not meet the triggers for requiring a formal transportation impact assessment.

6.0 FUTURE TRANSPORTATION ENVIRONMENT

6.1 CYCLING AND WALKING FACILITIES

According to the City's GeoOttawa mapping, the City's Ultimate Cycling Network designates the pathway along the north side of Carling Avenue to be a "major pathway" and Bedale Drive to be a "local route". No other cycling or walking facilities are planned in the vicinity of the site.

6.2 INTERSECTION OPERATIONS

An assessment of the Carling Avenue at Bedale Drive intersection was undertaken to determine the operational characteristics under 2017 future conditions. The operational analysis was facilitated by Synchro 9.0™ software package. Traffic counts were obtained from the City of Ottawa and were used in the assessment of 2017 future conditions. As the traffic counts were conducted in 2013, the through volumes along Carling Avenue were adjusted to 2017 using an annual rate of growth of 2%.

Table 3 provides a summary of 2017 future intersection operations.

The signal timing plans were optimized which accounts for the slight improvement in intersection operations as compared to 2016 existing conditions. The intersection of Carling Avenue at Bedale Drive is anticipated to operate acceptably under 2017 future conditions. No transportation improvements are required to accommodate the anticipated site trips generated by the proposed residential development.

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: 3368 Carling Avenue Transportation Brief

Table 3 2017 Future Intersection Operations

Signalized Intersection	Approach/Movement		2015 Existing Conditions		
			LOS	V/C[2]	Q[3] (m)
Carling Avenue and Bedale Drive	EB	Left	A (B)	0.14 (0.65)	7.8 (#27.1)
		Through	C (A)	0.75 (0.55)	84.4 (62.6)
		Right	A (A)	0.01 (0.02)	1.4 (2.1)
	WB	Left	A (A)	0.10 (0.20)	3.6 (8.7)
		Through / Right	A (C)	0.47 (0.79)	45.3 (103.6)
	NB	Left / Through / Right	A (A)	0.07 (0.04)	11.1 (8.3)
	SB	Left / Through / Right	A (A)	0.02 (0.04)	5.8 (7.5)
	Overall Intersection		***A (A)***	***0.43 (0.48)***	-

Note: yellow highlight denotes v/c of 1.00 or greater
1. *Table Format: AM (PM)*
2. *v/c – represents the anticipated volume divided by the predicted capacity*
3. *95th Percentile Queue (m)*

7.0 CONCLUSIONS

This transportation brief has found the following:

- The proposed site will be undergoing site plan approval in order to permit the proposed residential development.
- There are no foreseeable transportation issues related to the site access location or general site circulation.
- The intersection of Carling Avenue at Bedale Drive currently operates acceptably under 2016 existing conditions.
- The proposed residential development is expected to generate approximately 8 vehicle trips during the AM peak hour and 9 vehicle trips during the PM peak hour.
- Based on the trip generation estimates, the City of Ottawa's guidelines do not require the preparation of a formal transportation impact assessment.
- With the addition of the anticipated site traffic generated by the proposed development the intersection of Carling Avenue at Bedale Drive is expected to operate acceptably under 2017 future conditions.

Reference: 3368 Carling Avenue Transportation Brief

- The trips generated by the proposed development are considered to be negligible, and therefore, the proposed residential development is expected to have a negligible impact on traffic conditions in the vicinity of the site.

Based on the transportation evaluation and the negligible impacts that have been identified in this Transportation Brief, the proposed residential development at 3368 Carling Avenue is not anticipated to have a significant impact on the transportation network and should be permitted to proceed.

Regards,

Stantec Consulting Ltd.

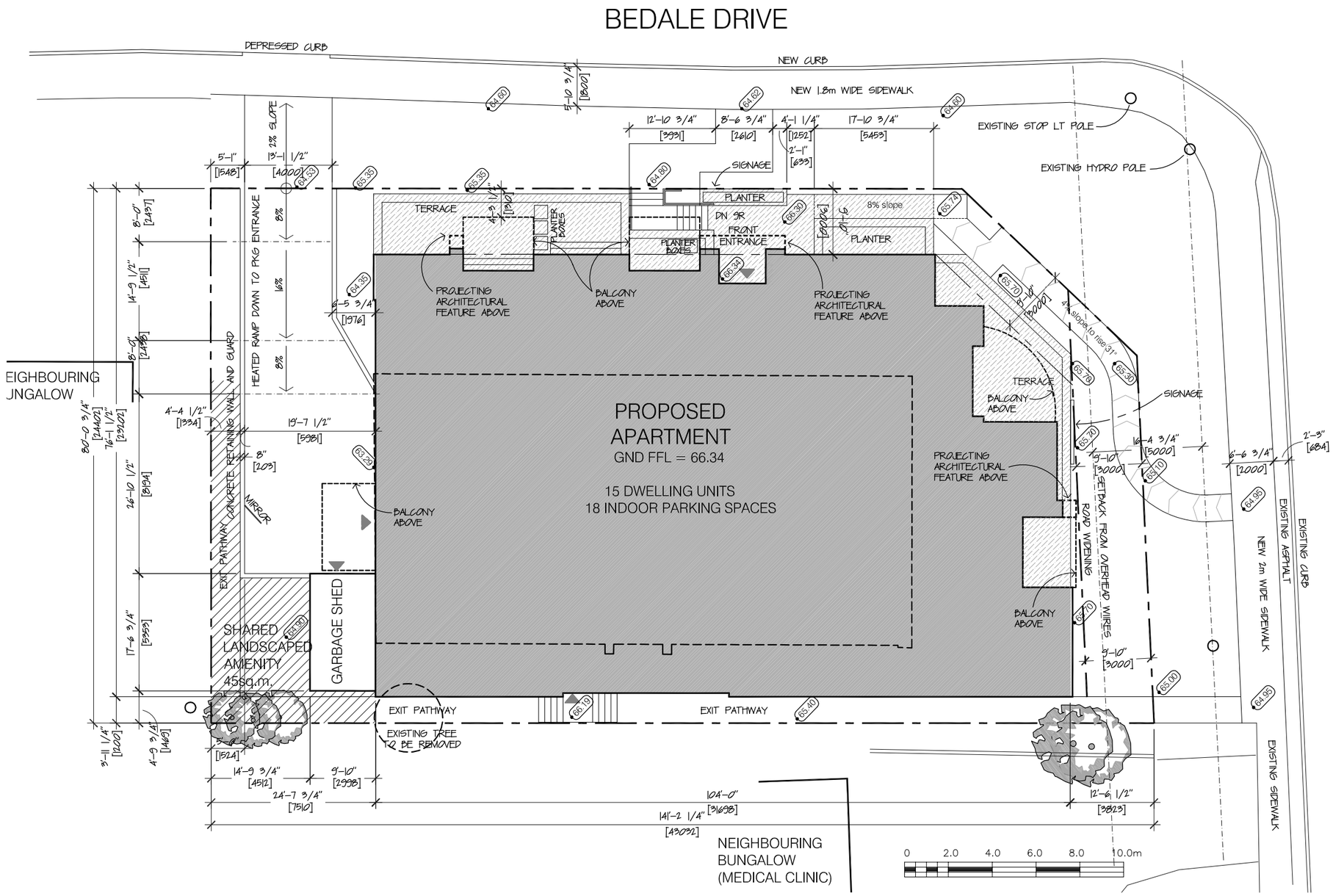
Robert Vastag, MCIP, RPP
Senior Transportation Planner

Lauren O'Grady B.A.Sc.
Transportation Engineering Intern

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

Reference: 3368 Carling Avenue Transportation Brief

Attachment 1 – Proposed Site Plan



LOT AREA = 1006.7sq.m.

ZONING:

LC(2127) ZONING DESIGNATION
12.5m HEIGHT LIMIT, 10.6m BUILDING HEIGHT PROPOSED
EXISTING AVG GRADE = 65.37
7.5m MINIMUM REAR YARD SETBACK, 7.5m PROVIDED
1.2m MIN. SIDE YARD REQUIRED, 1.2m PROVIDED
3m MIN. CORNER SIDE YARD SETBACK, 3m PROVIDED
3m MIN. FRONT YD SETBK, 3m PROVIDED (ROAD WIDENING)
3sq.m./ DU SHARED AMENITY SPACE REQ'D AND PROVIDED
IN REAR YARD

PARKING REQUIREMENTS:

1.2 RESIDENT SPACES REQUIRED PER D.U. - 1 PER D.U. PROVIDED
0.2 VISITOR SPACES REQUIRED PER D.U. - PROVIDED
18 PARKING SPACES PROVIDED IN BASEMENT LEVEL
1 ACCESSIBLE PARKING SPACE REQUIRED AND PROVIDED

PROPOSED BUILDING:

3 STORY APARTMENT BUILDING
1 LEVEL OF UNDERGROUND PARKING (18 SPACES)
15 UNITS
15 STORAGE LOCKERS WITH BIKE STORAGE
TERRACES AND BALCONIES FOR PRIVATE AMENITY SPACE

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Carling Lowrise
3368 Carling Avenue, Ottawa
Jan. 18, 2016 • SCALE: 1:200

SITE PLAN

Reference: 3368 Carling Avenue Transportation Brief

Appendix A – Traffic Counts and Signal Timing Plan

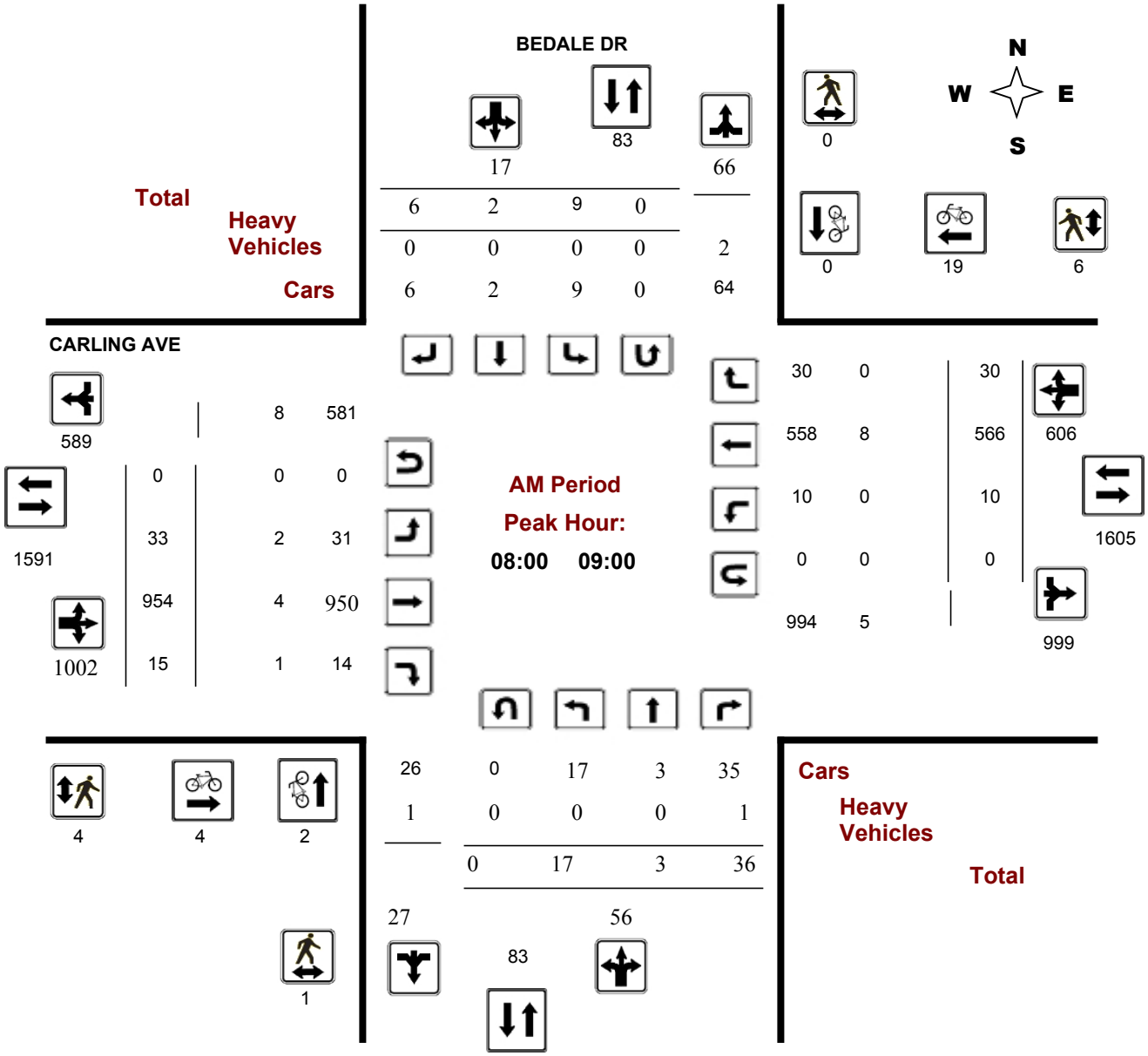
Public Works - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

CARLING AVE @ BEDALE DR

Survey Date: Thursday, August 15, 2013 **WO No:** 31476

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



Comments

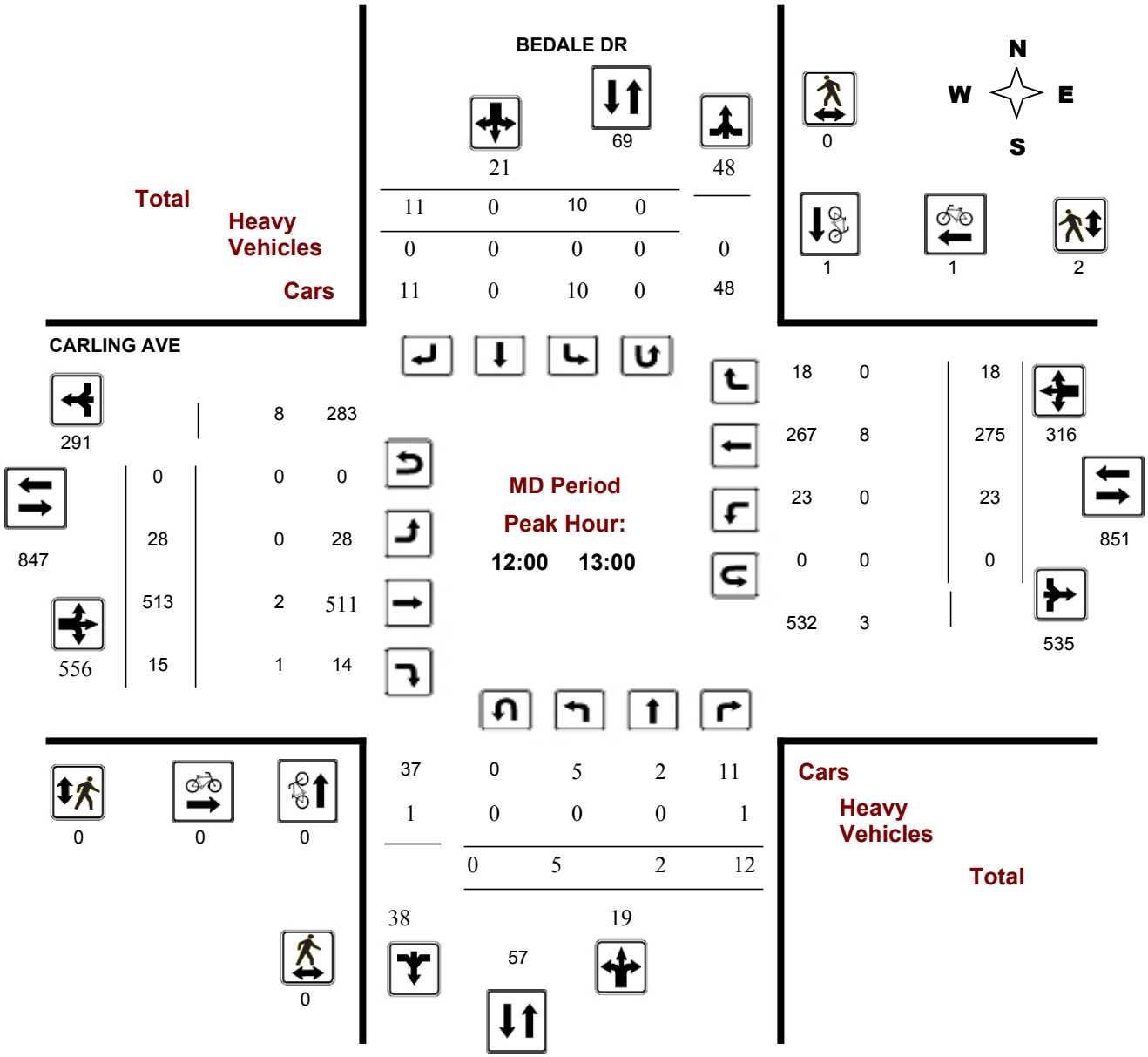
Public Works - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

CARLING AVE @ BEDALE DR

Survey Date: Thursday, August 15, 2013 **WO No:** 31476

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



Comments

Public Works - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

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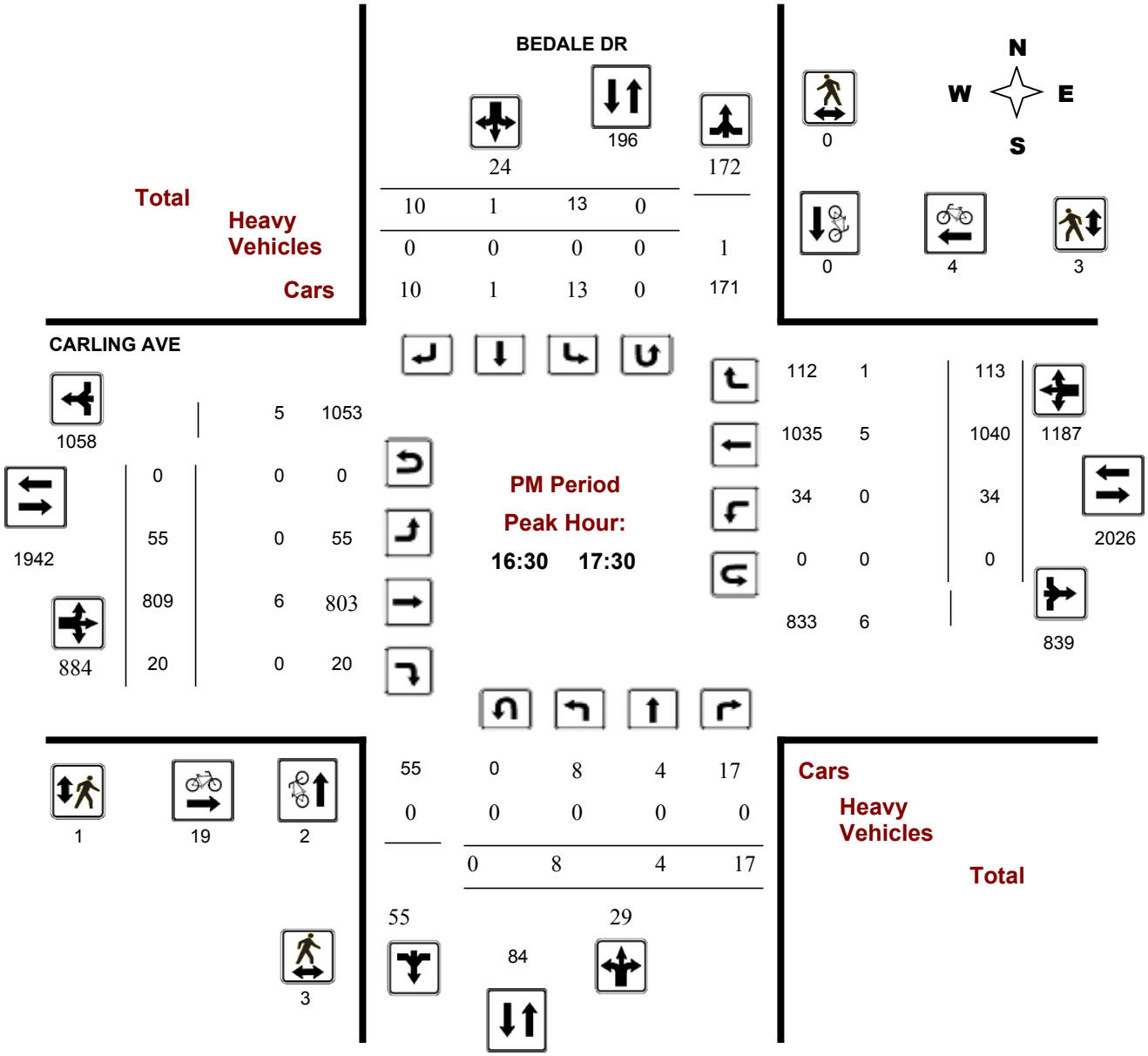


Comments

Traffic Signal Timing

City of Ottawa, Public Works Department

Traffic Operations Unit

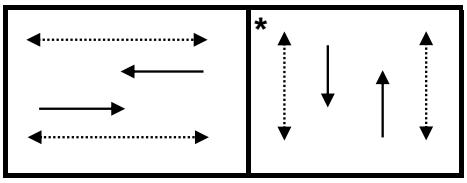
Intersection:	**Main:**	Carling	**Side:**	Bedale	
Controller:	**MS-3200**			**TSD:**	6070
Author:	Basel Ansari			**Date:**	07-Jan-2016

Existing Timing Plans†

	Plan						**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	**Weekend** 5	**Night** 9	***Walk***	***DW***	***A+R***
Cycle	70	60	70	60	60	FREE			
Offset	0	0	0	0	0	0			
EB Thru	38	28	38	28	28	Min=55.6	7	13	3.7+1.9
WB Thru	38	28	38	28	28	Min=55.6	7	13	3.7+1.9
NB Thru	32	32	32	32	32	Max=41.1	9	16	3.3+2.8
SB Thru	32	32	32	32	32	Max=41.1	9	16	3.3+2.8

Phasing Sequence‡

Plan: **All**



Schedule

Weekday

Time	Plan
0:15	9
6:30	1
9:30	2
15:00	3
18:00	2
22:00	4
22:30	9

Weekend

Time	Plan
8:00	2
9:00	5
17:00	2
22:00	4
22:30	9

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)

Reference: 3368 Carling Avenue Transportation Brief

Appendix B – Intersection Performance Worksheets

Reference: 3368 Carling Avenue Transportation Brief

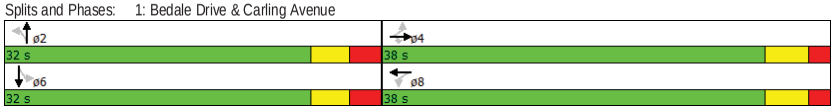
Appendix B1 – 2016 Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	1011	15	10	589	30	17	3	35	9	2	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.993			0.913			0.950	
Flt Protected	0.950			0.950				0.985			0.974	
Satd. Flow (prot)	1695	3390	1517	1695	3366	0	0	1605	0	0	1651	0
Flt Permitted	0.343			0.145				0.936			0.904	
Satd. Flow (perm)	612	3390	1517	259	3366	0	0	1525	0	0	1532	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48		10			38			7	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		97.5			106.7			85.7			71.9	
Travel Time (s)		5.9			6.4			6.2			5.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	1099	16	11	640	33	18	3	38	10	2	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	36	1099	16	11	673	0	0	59	0	0	19	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0		31.1	31.1		31.1	31.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	38.0	38.0	38.0	38.0	38.0		32.0	32.0		32.0	32.0	
Total Split (%)	54.3%	54.3%	54.3%	54.3%	54.3%		45.7%	45.7%		45.7%	45.7%	
Maximum Green (s)	32.4	32.4	32.4	32.4	32.4		25.9	25.9		25.9	25.9	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.9	1.9	1.9	1.9	1.9		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.6			6.1			6.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		9.0	9.0		9.0	9.0	
Flash Dont Walk (s)	13.0	13.0	13.0	13.0	13.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)	27.6	27.6	27.6	27.6	27.6			26.1			26.1	
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.42			0.40			0.40	
v/c Ratio	0.14	0.77	0.02	0.10	0.47			0.09			0.03	
Control Delay	12.6	20.2	0.6	13.4	14.4			8.0			11.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	12.6	20.2	0.6	13.4	14.4			8.0			11.4	
LOS	B	C	A	B	B			A			B	
Approach Delay		19.7			14.4			8.0			11.4	
Approach LOS		B			B			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 65.4			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 17.3		Intersection LOS: B	
Intersection Capacity Utilization 43.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Bedale Drive & Carling Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	36	1099	16	11	673	59	19
v/c Ratio	0.14	0.77	0.02	0.10	0.47	0.09	0.03
Control Delay	12.6	20.2	0.6	13.4	14.4	8.0	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	20.2	0.6	13.4	14.4	8.0	11.4
Queue Length 50th (m)	2.6	57.2	0.0	0.8	29.0	1.6	0.9
Queue Length 95th (m)	7.6	78.0	0.6	3.6	41.3	8.3	4.7
Internal Link Dist (m)		73.5			82.7	61.7	47.9
Turn Bay Length (m)							
Base Capacity (vph)	305	1690	780	128	1683	631	615
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	0.12	0.65	0.02	0.09	0.40	0.09	0.03

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	1011	15	10	589	30	17	3	35	9	2	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.6	5.6	5.6	5.6	5.6			6.1			6.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00			1.00	
Frt	1.00	1.00	0.85	1.00	0.99			0.91			0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1695	3390	1517	1695	3365			1605			1652	
Flt Permitted	0.34	1.00	1.00	0.15	1.00			0.94			0.90	
Satd. Flow (perm)	612	3390	1517	260	3365			1526			1533	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	1099	16	11	640	33	18	3	38	10	2	7
RTOR Reduction (vph)	0	0	9	0	6	0	0	23	0	0	4	0
Lane Group Flow (vph)	36	1099	7	11	667	0	0	36	0	0	15	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	27.5	27.5	27.5	27.5	27.5			26.1			26.1	
Effective Green, g (s)	27.5	27.5	27.5	27.5	27.5			26.1			26.1	
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.42			0.40			0.40	
Clearance Time (s)	5.6	5.6	5.6	5.6	5.6			6.1			6.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	257	1427	638	109	1417			609			612	
v/s Ratio Prot		c0.32			0.20							
v/s Ratio Perm	0.06		0.00	0.04				c0.02			0.01	
v/c Ratio	0.14	0.77	0.01	0.10	0.47			0.06			0.02	
Uniform Delay, d1	11.6	16.2	11.0	11.4	13.6			12.1			11.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.3	2.6	0.0	0.4	0.2			0.2			0.1	
Delay (s)	11.9	18.8	11.0	11.8	13.9			12.2			12.0	
Level of Service	B	B	B	B	B			B			B	
Approach Delay (s)		18.5			13.9			12.2			12.0	
Approach LOS		B			B			B			B	

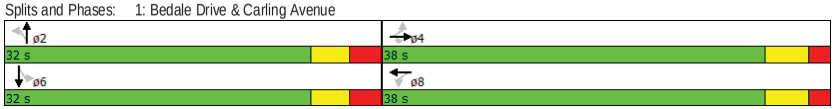
Intersection Summary					
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.42				
Actuated Cycle Length (s)	65.3	Sum of lost time (s)		11.7	
Intersection Capacity Utilization	43.4%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	858	20	34	1102	113	8	4	17	13	1	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.986			0.922			0.943	
Flt Protected	0.950			0.950				0.986			0.974	
Satd. Flow (prot)	1695	3390	1517	1695	3343	0	0	1622	0	0	1639	0
Flt Permitted	0.129			0.222				0.948			0.899	
Satd. Flow (perm)	230	3390	1517	396	3343	0	0	1560	0	0	1513	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48		21			18			11	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		122.6			134.1			83.2			74.0	
Travel Time (s)		7.4			8.0			6.0			5.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	933	22	37	1198	123	9	4	18	14	1	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	933	22	37	1321	0	0	31	0	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	26.0	26.0	26.0	33.0	33.0		31.1	31.1		31.1	31.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	38.0	38.0	38.0	38.0	38.0		32.0	32.0		32.0	32.0	
Total Split (%)	54.3%	54.3%	54.3%	54.3%	54.3%		45.7%	45.7%		45.7%	45.7%	
Maximum Green (s)	32.4	32.4	32.4	32.4	32.4		25.9	25.9		25.9	25.9	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.9	1.9	1.9	1.9	1.9		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.6			6.1			6.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		9.0	9.0		9.0	9.0	
Flash Dont Walk (s)	13.0	13.0	13.0	13.0	13.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)	31.0	31.0	31.0	31.0	31.0			25.9			25.9	
Actuated g/C Ratio	0.45	0.45	0.45	0.45	0.45			0.38			0.38	
v/c Ratio	0.58	0.61	0.03	0.21	0.87			0.05			0.04	
Control Delay	41.3	16.2	1.4	14.9	24.4			9.2			10.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	41.3	16.2	1.4	14.9	24.4			9.2			10.7	
LOS	D	B	A	B	C			A			B	
Approach Delay		17.4			24.2			9.2			10.7	
Approach LOS		B			C			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 68.6			
Natural Cycle: 65			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 21.0		Intersection LOS: C	
Intersection Capacity Utilization 58.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Bedale Drive & Carling Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	60	933	22	37	1321	31	26
v/c Ratio	0.58	0.61	0.03	0.21	0.87	0.05	0.04
Control Delay	41.3	16.2	1.4	14.9	24.4	9.2	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	16.2	1.4	14.9	24.4	9.2	10.7
Queue Length 50th (m)	5.4	45.2	0.0	2.7	75.2	1.1	1.2
Queue Length 95th (m)	#23.1	62.2	1.4	8.7	#105.4	5.8	5.6
Internal Link Dist (m)		98.6			110.1	59.2	50.0
Turn Bay Length (m)							
Base Capacity (vph)	108	1603	742	187	1591	600	578
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	0.56	0.58	0.03	0.20	0.83	0.05	0.04

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	858	20	34	1102	113	8	4	17	13	1	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.6	5.6	5.6	5.6	5.6			6.1			6.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00			1.00	
Frt	1.00	1.00	0.85	1.00	0.99			0.92			0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1695	3390	1517	1695	3343			1621			1638	
Flt Permitted	0.13	1.00	1.00	0.22	1.00			0.95			0.90	
Satd. Flow (perm)	230	3390	1517	397	3343			1559			1512	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	933	22	37	1198	123	9	4	18	14	1	11
RTOR Reduction (vph)	0	0	12	0	12	0	0	11	0	0	7	0
Lane Group Flow (vph)	60	933	10	37	1309	0	0	20	0	0	19	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	31.0	31.0	31.0	31.0	31.0			25.9			25.9	
Effective Green, g (s)	31.0	31.0	31.0	31.0	31.0			25.9			25.9	
Actuated g/C Ratio	0.45	0.45	0.45	0.45	0.45			0.38			0.38	
Clearance Time (s)	5.6	5.6	5.6	5.6	5.6			6.1			6.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	103	1531	685	179	1510			588			570	
v/s Ratio Prot		0.28			c0.39							
v/s Ratio Perm	0.26		0.01	0.09				c0.01			0.01	
v/c Ratio	0.58	0.61	0.01	0.21	0.87			0.03			0.03	
Uniform Delay, d1	14.0	14.2	10.4	11.4	16.9			13.5			13.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2	8.1	0.7	0.0	0.6	5.5			0.1			0.1	
Delay (s)	22.1	14.9	10.4	11.9	22.5			13.6			13.6	
Level of Service	C	B	B	B	C			B			B	
Approach Delay (s)		15.2			22.2			13.6			13.6	
Approach LOS		B			C			B			B	

Intersection Summary

HCM 2000 Control Delay	19.1	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.49				
Actuated Cycle Length (s)	68.6	Sum of lost time (s)		11.7	
Intersection Capacity Utilization	58.7%	ICU Level of Service		B	
Analysis Period (min)	15				

c Critical Lane Group

Reference: 3368 Carling Avenue Transportation Brief

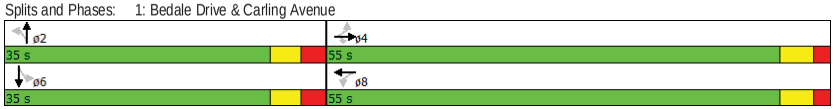
Appendix B2 – 2017 Future Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	1030	17	10	611	30	19	3	40	9	2	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.993			0.913			0.950	
Flt Protected	0.950			0.950				0.985			0.974	
Satd. Flow (prot)	1695	3390	1517	1695	3366	0	0	1605	0	0	1651	0
Flt Permitted	0.328			0.142				0.932			0.904	
Satd. Flow (perm)	585	3390	1517	253	3366	0	0	1518	0	0	1532	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			38		9			43			7	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		97.5			106.7			85.7			71.9	
Travel Time (s)		5.9			6.4			6.2			5.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	1120	18	11	664	33	21	3	43	10	2	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	36	1120	18	11	697	0	0	67	0	0	19	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8						1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0		31.1	31.1		31.1	31.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	55.0	55.0	55.0	55.0	55.0		35.0	35.0		35.0	35.0	
Total Split (%)	61.1%	61.1%	61.1%	61.1%	61.1%		38.9%	38.9%		38.9%	38.9%	
Maximum Green (s)	49.4	49.4	49.4	49.4	49.4		28.9	28.9		28.9	28.9	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.9	1.9	1.9	1.9	1.9		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.6			6.1			6.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		9.0	9.0		9.0	9.0	
Flash Dont Walk (s)	13.0	13.0	13.0	13.0	13.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)	32.2	32.2	32.2	32.2	32.2			29.2			29.2	
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.44			0.40			0.40	
v/c Ratio	0.14	0.75	0.03	0.10	0.47			0.11			0.03	
Control Delay	12.8	20.3	1.4	13.3	14.9			9.4			13.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	12.8	20.3	1.4	13.3	14.9			9.4			13.9	
LOS	B	C	A	B	B			A			B	
Approach Delay		19.8			14.9			9.4			13.9	
Approach LOS		B			B			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 73.3			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 17.6		Intersection LOS: B	
Intersection Capacity Utilization 44.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Bedale Drive & Carling Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	36	1120	18	11	697	67	19
v/c Ratio	0.14	0.75	0.03	0.10	0.47	0.11	0.03
Control Delay	12.8	20.3	1.4	13.3	14.9	9.4	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	20.3	1.4	13.3	14.9	9.4	13.9
Queue Length 50th (m)	2.8	64.4	0.0	0.9	33.3	1.9	1.0
Queue Length 95th (m)	7.8	84.0	1.4	3.6	45.3	11.1	5.8
Internal Link Dist (m)		73.5			82.7	61.7	47.9
Turn Bay Length (m)							
Base Capacity (vph)	398	2310	1046	172	2297	631	615
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	0.09	0.48	0.02	0.06	0.30	0.11	0.03

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	1030	17	10	611	30	19	3	40	9	2	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.6	5.6	5.6	5.6	5.6			6.1			6.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00			1.00	
Frt	1.00	1.00	0.85	1.00	0.99			0.91			0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1695	3390	1517	1695	3366			1605			1652	
Flt Permitted	0.33	1.00	1.00	0.14	1.00			0.93			0.90	
Satd. Flow (perm)	586	3390	1517	253	3366			1519			1532	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	1120	18	11	664	33	21	3	43	10	2	7
RTOR Reduction (vph)	0	0	10	0	5	0	0	26	0	0	4	0
Lane Group Flow (vph)	36	1120	8	11	692	0	0	41	0	0	15	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	32.3	32.3	32.3	32.3	32.3			29.2			29.2	
Effective Green, g (s)	32.3	32.3	32.3	32.3	32.3			29.2			29.2	
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.44			0.40			0.40	
Clearance Time (s)	5.6	5.6	5.6	5.6	5.6			6.1			6.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	258	1495	669	111	1485			605			611	
v/s Ratio Prot		c0.33			0.21							
v/s Ratio Perm	0.06		0.01	0.04				c0.03			0.01	
v/c Ratio	0.14	0.75	0.01	0.10	0.47			0.07			0.02	
Uniform Delay, d1	12.2	17.1	11.5	11.9	14.4			13.6			13.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	2.1	0.0	0.4	0.2			0.2			0.1	
Delay (s)	12.4	19.2	11.5	12.3	14.6			13.8			13.4	
Level of Service	B	B	B	B	B			B			B	
Approach Delay (s)		18.8			14.6			13.8			13.4	
Approach LOS		B			B			B			B	

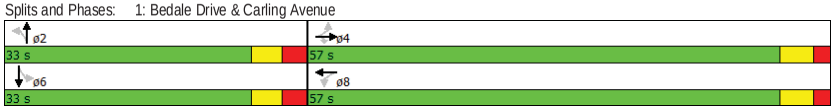
Intersection Summary					
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.43				
Actuated Cycle Length (s)	73.2	Sum of lost time (s)		11.7	
Intersection Capacity Utilization	44.0%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	874	22	38	1123	113	9	4	19	13	1	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.986			0.919			0.943	
Flt Protected	0.950			0.950				0.986			0.974	
Satd. Flow (prot)	1695	3390	1517	1695	3343	0	0	1617	0	0	1639	0
Flt Permitted	0.103			0.231				0.946			0.895	
Satd. Flow (perm)	184	3390	1517	412	3343	0	0	1551	0	0	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			38		20			21			11	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		122.6			134.1			83.2			74.0	
Travel Time (s)		7.4			8.0			6.0			5.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	950	24	41	1221	123	10	4	21	14	1	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	950	24	41	1344	0	0	35	0	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0		31.1	31.1		31.1	31.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	57.0	57.0	57.0	57.0	57.0		33.0	33.0		33.0	33.0	
Total Split (%)	63.3%	63.3%	63.3%	63.3%	63.3%		36.7%	36.7%		36.7%	36.7%	
Maximum Green (s)	51.4	51.4	51.4	51.4	51.4		26.9	26.9		26.9	26.9	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.9	1.9	1.9	1.9	1.9		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.6			6.1			6.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		9.0	9.0		9.0	9.0	
Flash Dont Walk (s)	13.0	13.0	13.0	13.0	13.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)	39.9	39.9	39.9	39.9	39.9			27.2			27.2	
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.51			0.34			0.34	
v/c Ratio	0.65	0.55	0.03	0.20	0.79			0.06			0.05	
Control Delay	48.9	14.4	1.9	12.6	19.4			13.0			15.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	48.9	14.4	1.9	12.6	19.4			13.0			15.6	
LOS	D	B	A	B	B			B			B	
Approach Delay		16.1			19.2			13.0			15.6	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 78.9			
Natural Cycle: 65			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 17.8		Intersection LOS: B	
Intersection Capacity Utilization 59.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Bedale Drive & Carling Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	60	950	24	41	1344	35	26
v/c Ratio	0.65	0.55	0.03	0.20	0.79	0.06	0.05
Control Delay	48.9	14.4	1.9	12.6	19.4	13.0	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.9	14.4	1.9	12.6	19.4	13.0	15.6
Queue Length 50th (m)	6.1	47.8	0.0	3.2	80.0	1.4	1.5
Queue Length 95th (m)	#27.1	62.6	2.1	8.7	103.6	8.3	7.5
Internal Link Dist (m)		98.6			110.1	59.2	50.0
Turn Bay Length (m)							
Base Capacity (vph)	121	2233	1012	271	2209	548	526
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	0.50	0.43	0.02	0.15	0.61	0.06	0.05

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	874	22	38	1123	113	9	4	19	13	1	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.6	5.6	5.6	5.6	5.6			6.1			6.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00			1.00	
Frt	1.00	1.00	0.85	1.00	0.99			0.92			0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1695	3390	1517	1695	3344			1617			1638	
Flt Permitted	0.10	1.00	1.00	0.23	1.00			0.95			0.90	
Satd. Flow (perm)	184	3390	1517	411	3344			1552			1506	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	950	24	41	1221	123	10	4	21	14	1	11
RTOR Reduction (vph)	0	0	12	0	10	0	0	14	0	0	7	0
Lane Group Flow (vph)	60	950	12	41	1334	0	0	21	0	0	19	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	39.9	39.9	39.9	39.9	39.9			27.2			27.2	
Effective Green, g (s)	39.9	39.9	39.9	39.9	39.9			27.2			27.2	
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.51			0.35			0.35	
Clearance Time (s)	5.6	5.6	5.6	5.6	5.6			6.1			6.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	93	1716	768	208	1693			535			519	
v/s Ratio Prot		0.28			c0.40							
v/s Ratio Perm	0.33		0.01	0.10				c0.01			0.01	
v/c Ratio	0.65	0.55	0.02	0.20	0.79			0.04			0.04	
Uniform Delay, d1	14.3	13.3	9.7	10.7	16.0			17.1			17.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2	14.3	0.4	0.0	0.5	2.5			0.1			0.1	
Delay (s)	28.6	13.7	9.7	11.1	18.5			17.3			17.2	
Level of Service	C	B	A	B	B			B			B	
Approach Delay (s)		14.5			18.3			17.3			17.2	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	16.7	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.48				
Actuated Cycle Length (s)	78.8	Sum of lost time (s)		11.7	
Intersection Capacity Utilization	59.3%	ICU Level of Service		B	
Analysis Period (min)	15				

c Critical Lane Group