
To:	Chris Collins	From:	Wilson Yip Ahmed Abdelnaby
	Cardel Homes		Stantec Consulting Ltd.
File:	160401218	Date:	September 17, 2020

Reference: 3368 Carling Avenue Transportation Brief Update

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 Update to determine the potential transportation implications of the proposed residential development.

This memorandum is intended to supplement the Transportation Brief dated August 25th, 2016, hereby referred to as the *2016 Transportation Brief* and includes:

- Reviewing and documenting the changes between the previous *2016 Transportation Brief* proposed site plan and the most recently updated site plan, dated July 2020; and
- Summarizing the anticipated transportation impacts due to the site plan revision.

SITE PLAN REVIEW

Stantec received an updated site plan from Cardel, illustrated in **Attachment 1**. The updated site plan was reviewed to identify changes between the original *2016 Transportation Brief's* site plan and the 2020 revised site plan. The 2016 Site Plan and the *2016 Transportation Brief* can be found in in **Attachments 2** and **3**, respectively. The updated site plan contains the following transportation-related changes:

- Reduction in parking spaces from a total of 18 spaces to a total of 16 spaces

As per the City of Ottawa Zoning By-law, Sections 101 and 102, the total required parking spaces is 21, of which 18 spaces are required for the residential units and 3 spaces for visitors. Following the 2016 Transportation Brief, Cardel requested a minor variance to allow for providing 18 spaces instead of 21 spaces. The original minor variance was approved by the City of Ottawa. Currently, due to minimum landscaping requirements and restrictions, Cardel is proposing to provide a total of 16 parking spaces and is seeking a new minor variance. Due to the small size of the development (a total of 15 apartment units), it is anticipated that the number of visitors would be relatively low and that those visiting the residential units using personal vehicles could use the Dick Bell Park parking lot..

SITE TRAFFIC GENERATION REVIEW

Since there is no change in the number of residential units proposed in the update site plan, no additional traffic impacts are anticipated as compared to the *2016 Transportation Brief*.

ASSESSMENT AND CONCLUSION

The updated site plan for this development proposes changes to the total number of provided parking spaces to include 16 spaces, a reduction of 2 spaces from the approved minor variance and 5 spaces from the City of Ottawa By-law requirements. As the development is not a major trip generator (a total of 15 proposed apartment units), it is anticipated that the number of visitors would be relatively low and that those visiting the residential

September 17, 2020

Chris Collins

Page 2 of 2

Reference: 3368 Carling Avenue Transportation Brief Update

units using personal vehicles could use the Dick Bell Park parking lot. Therefore, Cardel is seeking a revised minor variance to support the development.

Based on the conducted review, the proposed residential development at 3368 Carling Avenue is not anticipated to have a significant impact on the transportation network and the findings of the 2016 Transportation Brief remain valid.

For additional clarifications or concerns, please contact the undersigned.

Stantec Consulting Ltd.

Wilson Yip MEng
Transportation Planner

Phone: 416-507-3479
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Ahmed Abdelnaby P.Eng., M.Sc., RSP1.
Project Engineer

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Attachment: Attachment 1 – Proposed Updated Site Plan
Attachment 2 – Previous Site Plan (August 2016)
Attachment 3 – Previous 2016 Transportation Brief

Attachment 1 – Proposed Updated Site Plan

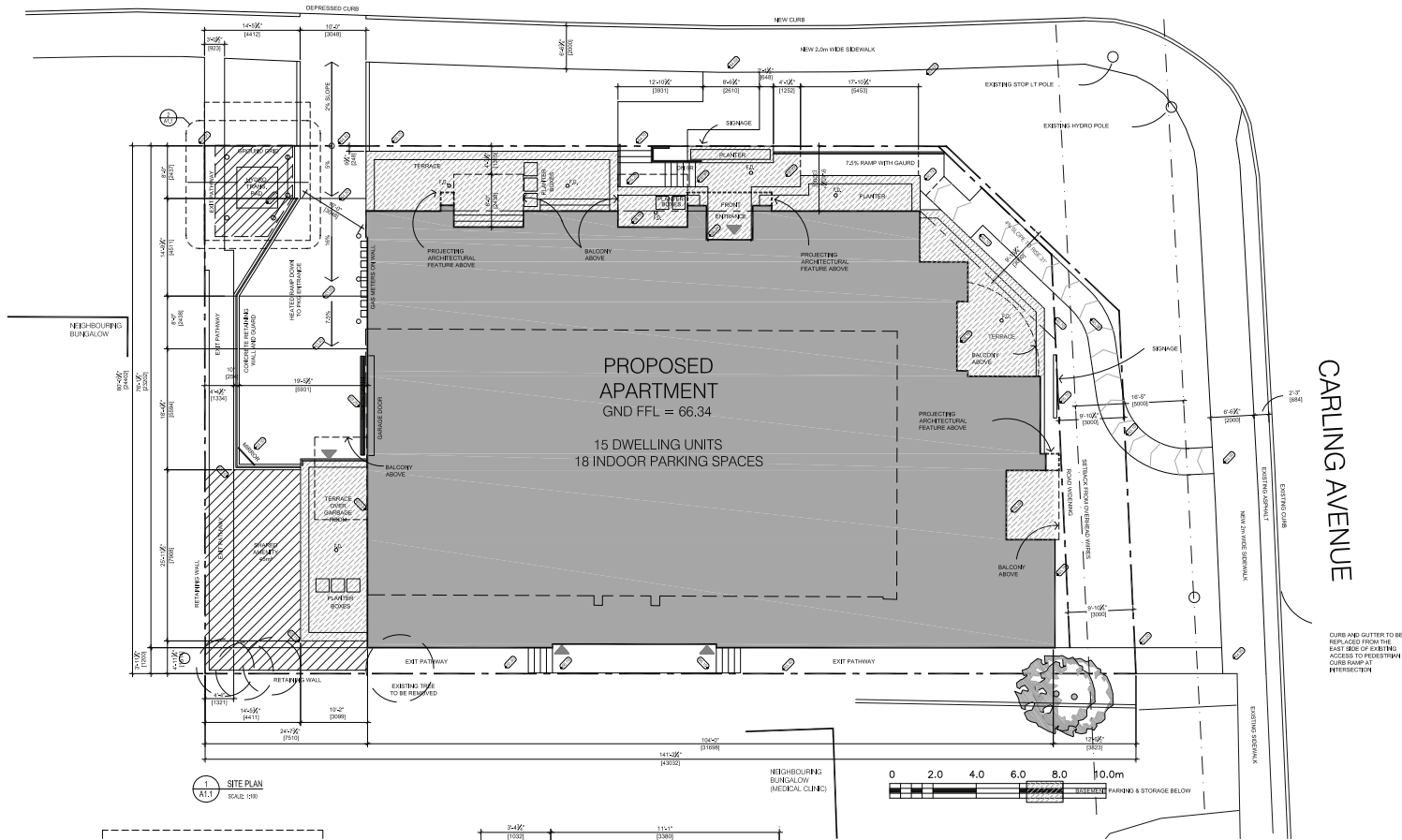
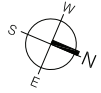
Attachment 2 – Previous Site Plan (August 2016)

BEDALE DRIVE

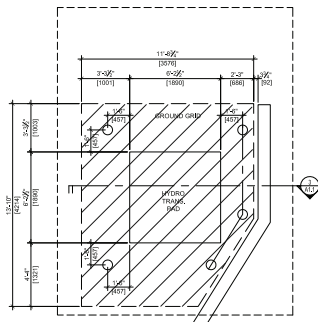
PROPOSED APARTMENT
GND FFL = 66.34

15 DWELLING UNITS
18 INDOOR PARKING SPACES

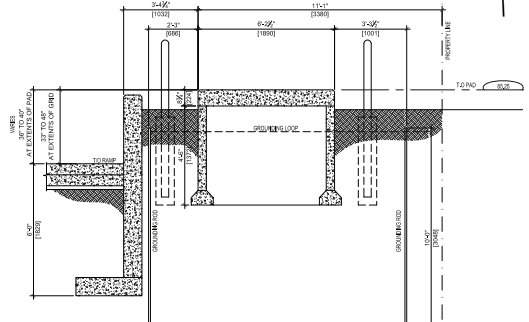
CARLING AVENUE



1 SITE PLAN
SCALE: 1/8" = 1'-0"



2 TRANSFORMER PAD ENLARGED PLAN
SCALE: 1/4" = 1'-0"



3 SECTION AT RAMP AND TRANSFORMER
SCALE: 1/8" = 1'-0"

LOT AREA = 1006.7 sqm
BUILDING FOOTPRINT = 604 sqm (60% OF LOT AREA)
WHD+ SORT LANDSCAPING = 292 sqm (29% OF LOT AREA)
PARKWAY = 110 sqm (11% OF LOT AREA)

ZONING:
O2 (27) ZONING PERMITION
12.5m HEIGHT, 12m MIN. OVERHEIGHT PROPOSED
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
2m MIN. FRONT YARD SETBACK, 3m PROVIDED
3sqm/PU SHEEP AMENITY SPACE REQ'D AND PROVIDED IN REAR YARD

PAVING REQUIREMENTS:
1/2 RESIDENT SPACES REQUIRED PER P.U.
0/2 VISITOR SPACES REQUIRED PER P.U.
A TOTAL OF 20 SPACES REQUIRED AND PROVIDED
1 ACCESSIBLE PARKING SPACE REQUIRED AND PROVIDED

EXISTING BUILDING:
SINGLE STOREY COMMERCIAL BUILDING TO BE DEMOLISHED

PROPOSED BUILDING:
3-STOREY APARTMENT BUILDING
1 LEVEL OF UNDERGROUND PARKING (20 SPACES)
14 UNITS
14 STORAGE LOCKERS WITH ONE STORAGE BALCONIES FOR EACH UNIT'S PRIVATE AMENITY



It is the responsibility of the approved contractor to check & verify all dimensions on site and report all errors for corrections to the architect. All contractors must comply with all permit codes & systems, & use proprietary products as directed by the manufacturer. Do not scale drawings. This drawing may not be used for construction unless stated as such. Copyright reserved.

CARDEL - CARLING LOWRISE
3368 CARLING AVE, OTTAWA ON K2H 5A8

SITE PLAN	
Drawn by: RJH	Scale: 1:100
Checked by: 1515	Date: Nov. 2015
A1.1	

RJH
Rosaline J. Hill
Architect & Development Consultant

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3.	2016-028	SITE PLAN COORDINATION
2.	2016-564	PROGRESS PRINT / COORDINATION
1.	2016-564	PROGRESS PRINT / COORDINATION
NO. 17-11-01 REVISION		

Attachment 3 – Previous 2016 Transportation Brief



August 25, 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 Update

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 update supersedes the original dated January 26th, 2016.

This Transportation Brief includes:

- 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 updated 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. As outlined in the City of Ottawa's Zoning By-Law Section 107(1)(aa)(i), the maximum width of a driveway is 3.6m leading to developments less than 20 parking spaces. As the proposed width of the driveway is 3.0m, it complies with this By-Law.



Reference: 3368 Carling Avenue Transportation Brief

AutoTurn templates were used and it was found that the access configuration and driveway ramp will be able to accommodate a large passenger car. However, due to the width of the driveway ramp, only one car will be able to use the ramp at a time (i.e., you cannot have one car entering and one car exiting at the same time). A mirror is proposed at the bottom of the ramp to provide sightlines for cars entering / exiting the site which will help mitigate potential conflicts.

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

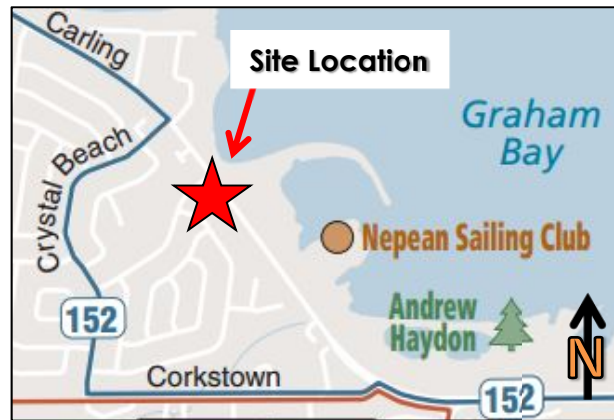
Transit service is currently provided within close proximity of the subject sites by route 152. Route 152 is a regular route that runs between Crystal Beach and Lincoln Fields Station.

Figure 2 illustrates the local transit routes.



Reference: 3368 Carling Avenue Transportation Brief

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)



Reference: 3368 Carling Avenue Transportation Brief

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.

Table 1 2016 Existing Intersection Operations

Signalized Intersection	Approach/Movement		2016 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: 1. Table Format: AM (PM) 2. v/c – represents the anticipated volume divided by the predicted capacity 3. 95 th Percentile Queue (m) 4. # - 95 th 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.



Reference: 3368 Carling Avenue Transportation Brief

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



Reference: 3368 Carling Avenue Transportation Brief

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.

Table 3 2017 Future Intersection Operations

Signalized Intersection	Approach/Movement		2017 Future 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:
 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 access configuration and driveway ramp will be able to accommodate a large passenger car, however, only one car will be able to use the ramp at a time (i.e., it cannot accommodate two cars entering and existing at the same time).
- The intersection of Carling Avenue at Bedale Drive currently operates acceptably under 2016 existing conditions.



August 25, 2016
Lisa Della Rosa
Page 8 of 13

Reference: 3368 Carling Avenue Transportation Brief

- 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.
- 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, 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



August 25, 2016
Lisa Della Rosa
Page 9 of 13

Reference: 3368 Carling Avenue Transportation Brief

Attachment 1 – Proposed Site Plan



August 25, 2016
Lisa Della Rosa
Page 10 of 13

Reference: 3368 Carling Avenue Transportation Brief

Appendix A – Traffic Counts and Signal Timing Plan



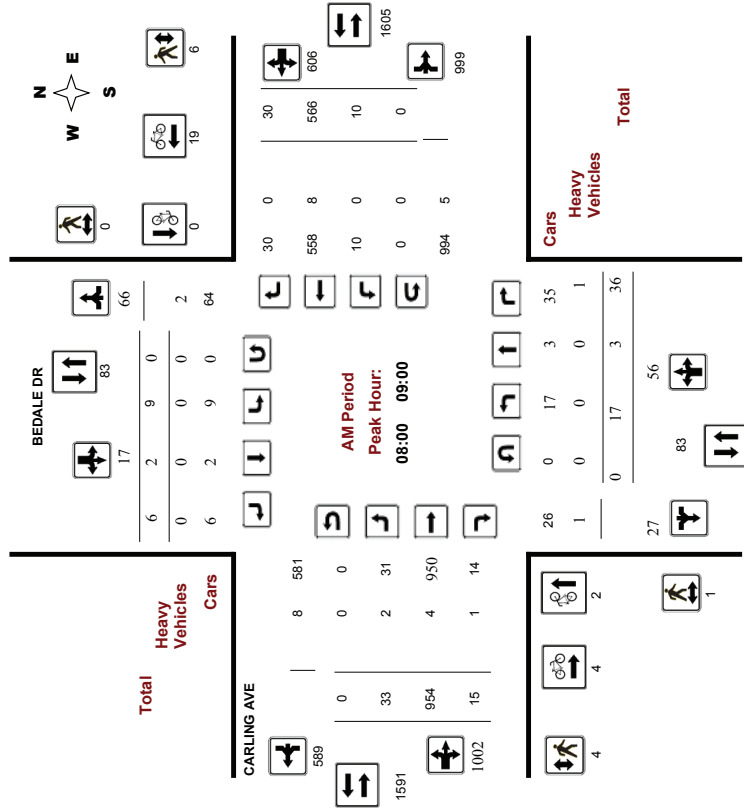
Public Works - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

CARLING AVE @ BEDALE DR

Survey Date: Thursday, August 15, 2013
Start Time: 07:00

WO No: 31476
Device:



Comments



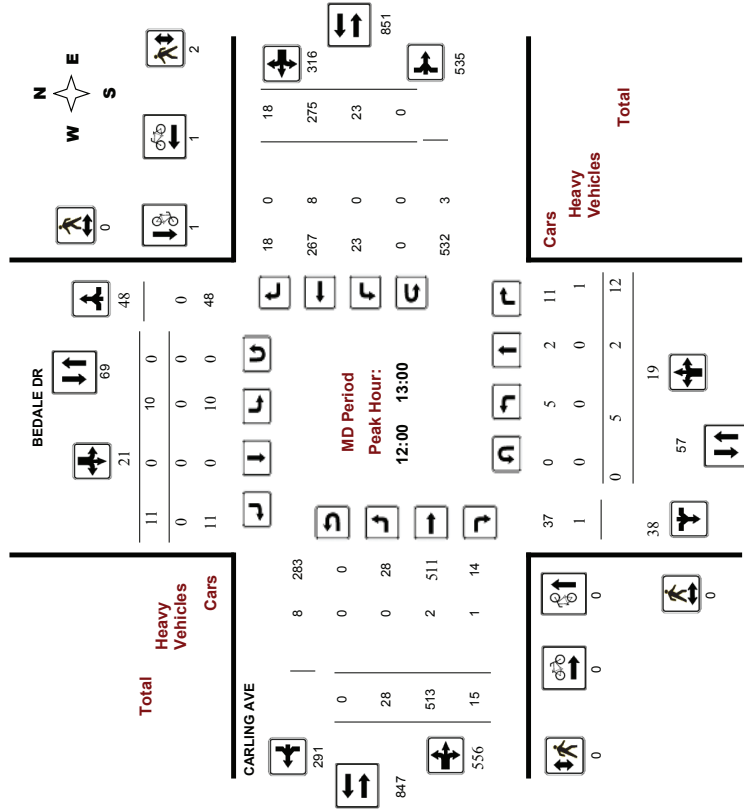
Public Works - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

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Device:



Comments



August 25, 2016
Lisa Della Rosa
Page 11 of 13

Reference: 3368 Carling Avenue Transportation Brief

Appendix B – Intersection Performance Worksheets



August 25, 2016
Lisa Della Rosa
Page 12 of 13

Reference: 3368 Carling Avenue Transportation Brief

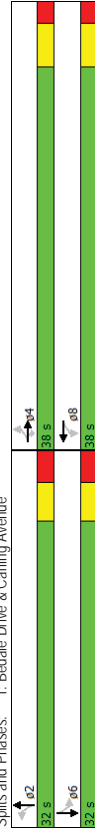
Appendix B1 – 2016 Existing Conditions

Lanes, Volumes, Timings
1: Bedale Drive & Carling Avenue

Lanes, Volumes, Timings
1: Bedale Drive & Carling Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	33	1011	15	10	589	30	17	3	35	9	2	6
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	0.850	0.950	0.993	0.985	0.974	0.961	0.936	0.904	0.904	0.904	0.904	0.904
Flt Protected	0.950	3390	1517	1695	3366	0	0	1605	0	0	1651	0
Satd. Flow (prot)	0.343	0.145	0.145	0.145	0.145	0.145	0.145	0.145	0.145	0.145	0.145	0.145
Flt Permitted	612	3390	1517	259	3366	0	0	1525	0	0	1532	0
Satd. Flow (perm)	Yes	48	10	38	7	50	50	50	50	50	50	50
Right Turn on Red	60	97.5	106.7	85.7	71.9	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Said. Flow (RTOR)	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Link Speed (k/h)	36	1099	16	11	640	33	18	3	38	10	2	7
Link Distance (m)	36	1099	16	11	640	33	18	3	38	10	2	7
Travel Time (s)	No	No	No	No	No	No	No	No	No	No	No	No
Peak Hour Factor	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right
Adj. Flow (vph)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Shared Lane Traffic (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Group Flow (vph)	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Enter Blocked Intersection	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Lane Alignment	24	14	24	14	24	14	24	14	24	14	24	14
Median Width(m)	1	2	1	2	1	2	1	2	1	2	1	2
Crosswalk Width(m)	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Two way Left Turn Lane	6.1	30.5	6.1	30.5	6.1	30.5	6.1	30.5	6.1	30.5	6.1	30.5
Headway Factor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turning Speed (k/h)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Number of Detectors	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Template	6.1	1.8	6.1	1.8	6.1	1.8	6.1	1.8	6.1	1.8	6.1	1.8
Leading Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	6.1	1.8	6.1	1.8	6.1	1.8	6.1	1.8	6.1	1.8	6.1	1.8
Detector 1 Size(m)	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 1 Type	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Extend(s)	0.0	0.0	0.0	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	0.0	0.0	0.0
Detector 1 Delay (s)	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
Detector 2 Position(m)	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Detector 2 Size(m)	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 2 Type	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Extend(s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4	4	4	8	8	2	2	2	6	6	6	6
Permitted Phases	4	4	4	8	8	2	2	2	6	6	6	6
Switch Phase	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Initial (s)	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
Minimum Split (s)	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1

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



Queues 3368 Carling Avenue
1: Bedale Drive & Carling Avenue

	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group	36	1099	16	11	673	59	19
Lane Group Flow (vph)	0.14	0.77	0.02	0.10	0.47	0.09	0.03
v/c Ratio	12.6	20.2	0.6	13.4	14.4	8.0	11.4
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	12.6	20.2	0.6	13.4	14.4	8.0	11.4
Total Delay	2.6	57.2	0.0	0.8	29.0	1.6	0.9
Queue Length 50th (m)	7.6	78.0	0.6	3.6	41.3	8.3	4.7
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							

HCM Signalized Intersection Capacity Analysis 3368 Carling Avenue
1: Bedale Drive & Carling Avenue

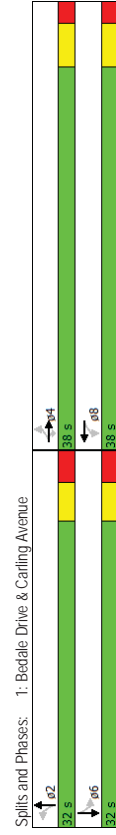
	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations	33	1011	15	10	589	30	17	3	35	9
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	5.6	5.6	5.6	5.6	5.6	5.6	5.6	6.1	6.1	6.1
Total Lost time (s)	1.00	0.95	1.00	1.00	0.95	1.00	0.91	1.00	0.95	0.95
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	0.99	0.91	1.00	0.98	0.97
Flt Protected	1695	3390	1517	1695	3365	1605	1605	1652	1652	1652
Satd. Flow (prot)	0.34	1.00	1.00	0.15	1.00	0.94	0.94	0.90	0.90	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
Adj. Flow (vph)	36	1099	16	11	640	33	18	3	38	10
RTOR Reduction (vph)	0	0	9	0	6	0	0	23	0	4
Lane Group Flow (vph)	36	1099	7	11	667	0	0	36	0	15
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm
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
w/s Ratio Prot	c0.32			0.20						
w/s Ratio Perm	0.06	0.00	0.04	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										

Lanes, Volumes, Timings
1: Bedale Drive & Carling Avenue

Lanes, Volumes, Timings
1: Bedale Drive & Carling Avenue

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	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ft	0.950	0.850	0.950	0.986	0.986	0.986	0.986	0.986	0.986	0.986	0.986	0.986
Fill Protected	1695	3390	1517	1695	3343	0	0	1622	0	0	1639	0
Satd. Flow (perm)	0.129	0.222	0.222	0.222	0.222	0.222	0.222	0.222	0.222	0.222	0.222	0.222
Right Turn on Red	230	3390	1517	396	3343	0	0	1560	0	0	1513	0
Satd. Flow (RTOR)	48	21	18	18	18	18	18	18	18	18	18	18
Link Speed (k/h)	60	60	60	60	60	60	60	60	60	60	60	60
Link Distance (m)	122.6	134.1	83.2	83.2	83.2	83.2	83.2	83.2	83.2	83.2	83.2	83.2
Travel Time (s)	7.4	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
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 (%)	60	933	22	37	1321	0	0	31	0	0	0	26
Lane Group Flow (vph)	No	No	No	No	No	No	No	No	No	No	No	No
Enter Blocked Intersection	Left	Left	Right	Left	Right	Left	Right	Left	Right	Left	Left	Right
Median Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Link Offset (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width (m)	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Two way Left Turn Lane	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Headway Factor	24	14	24	14	24	14	24	14	24	14	24	14
Turning Speed (k/h)	1	2	1	1	2	1	2	1	2	1	2	1
Number of Detectors	Left	Thru	Right	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left
Detector Template	6.1	30.5	6.1	6.1	30.5	6.1	30.5	6.1	30.5	6.1	30.5	6.1
Leading Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position (m)	6.1	1.8	6.1	6.1	1.8	6.1	1.8	6.1	1.8	6.1	1.8	6.1
Detector 1 Size (m)	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 1 Type	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Extend (s)	0.0	0.0	0.0	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	0.0	0.0	0.0
Detector 1 Delay (s)	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
Detector 2 Position (m)	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Detector 2 Size (m)	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 2 Type	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Extend (s)	Permitted	Permitted	Permitted	Permitted	Permitted	Permitted	Permitted	Permitted	Permitted	Permitted	Permitted	Permitted
Turn Type	4	4	8	8	8	2	2	2	2	6	6	6
Protected Phases	4	4	8	8	8	2	2	2	2	6	6	6
Permitted Phases	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Switch Phase	26.0	26.0	26.0	33.0	33.0	31.1	31.1	31.1	31.1	31.1	31.1	31.1
Minimum Split (s)												

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	38.0	32.0	32.0	32.0	32.0	32.0	32.0
Total Split (%)	54.3%	54.3%	54.3%	54.3%	54.3%	54.3%	45.7%	45.7%	45.7%	45.7%	45.7%	45.7%
Maximum Green (s)	32.4	32.4	32.4	32.4	32.4	32.4	25.9	25.9	25.9	25.9	25.9	25.9
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	1.9	1.9	1.9	1.9	1.9	1.9	2.8	2.8	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	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.6	5.6	6.1	6.1	6.1	6.1	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	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	9.0	9.0	9.0	9.0	9.0	9.0
Flash Dont Walk (s)	13.0	13.0	13.0	13.0	13.0	13.0	16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	31.0	31.0	31.0	31.0	31.0	31.0	25.9	25.9	25.9	25.9	25.9	25.9
Actuated G/C Ratio	0.45	0.45	0.45	0.45	0.45	0.45	0.38	0.38	0.38	0.38	0.38	0.38
v/c Ratio	0.58	0.61	0.03	0.21	0.87	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Control Delay	41.3	16.2	1.4	14.9	24.4	9.2	9.2	9.2	9.2	9.2	9.2	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	16.2	1.4	14.9	24.4	9.2	9.2	9.2	9.2	9.2	9.2	9.2
LOS	D	B	A	B	C	A	A	A	A	B	B	B
Approach Delay	17.4						24.2	24.2	24.2	9.2	9.2	10.7
Approach LOS	B						C	C	C	A	A	B
Intersection Summary	Other											
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%											
Analysis Period (min):	15											



Queues 3368 Carling Avenue
2016 Existing PM
1: Bedale Drive & Carling Avenue

	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group	60	933	22	37	1321	31	26
Lane Group Flow (vph)	0.58	0.61	0.03	0.21	0.87	0.05	0.04
v/c Ratio	41.3	16.2	1.4	14.9	24.4	9.2	10.7
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	41.3	16.2	1.4	14.9	24.4	9.2	10.7
Total Delay	5.4	45.2	0.0	2.7	75.2	1.1	1.2
Queue Length 50th (m)	#23.1	62.2	1.4	8.7	#105.4	5.8	5.6
Queue Length 95th (m)							
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.

HCM Signalized Intersection Capacity Analysis 3368 Carling Avenue
2016 Existing PM
1: Bedale Drive & Carling Avenue

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



August 25, 2016
Lisa Della Rosa
Page 13 of 13

Reference: 3368 Carling Avenue Transportation Brief

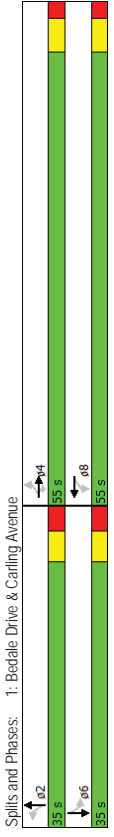
Appendix B2 – 2017 Future Conditions

Lanes, Volumes, Timings
1: Bedale Drive & Carling Avenue

Lanes, Volumes, Timings
1: Bedale Drive & Carling Avenue

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	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ft	0.950	0.850	0.950	0.993	0.993	0.985	0.985	0.974	0.974	0.974	0.974	0.974
Satd. Flow (prot)	1695	3390	1517	1695	3366	0	0	1605	0	0	1651	0
Flt Permitted	0.328	0.142	0.142	0.932	0.932	0.904	0.904	0.904	0.904	0.904	0.904	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	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Satd. Flow (RTOR)	38	9	9	43	43	7	7	7	7	7	7	7
Link Speed (k/h)	60	60	60	50	50	50	50	50	50	50	50	50
Link Distance (m)	97.5	106.7	106.7	85.7	85.7	71.9	71.9	71.9	71.9	71.9	71.9	71.9
Travel Time (s)	5.9	6.4	6.4	6.2	6.2	5.2	5.2	5.2	5.2	5.2	5.2	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	Right	Left	Right	Left	Right	Left	Right	Right
Median Width(m)	3.7	3.7	3.7	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	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	24	14	24	14
Number of Detectors	1	2	1	1	2	1	2	1	2	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	30.5	6.1	30.5	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	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	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	6.1	1.8	6.1
Detector 1 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+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	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	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	0.0	0.0	0.0
Detector 2 Position(m)	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
Detector 2 Size(m)	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Detector 2 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 2 Channel												
Detector 2 Extend(s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4	4	8	8	2	2	6	6	6	6	6	6
Permitted Phases	4	4	8	8	2	2	6	6	6	6	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	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	31.1	31.1	31.1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Total Split (%)	61.1%	61.1%	61.1%	61.1%	61.1%	61.1%	61.1%	61.1%	61.1%	61.1%	61.1%	61.1%
Maximum Green (s)	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Lost Time Adjust (s)	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 Lost Time (s)	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2
Actuated G/C Ratio	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
v/c Ratio	0.14	0.75	0.03	0.10	0.47	0.03	0.11	0.03	0.11	0.03	0.11	0.03
Control Delay	12.8	20.3	1.4	13.3	14.9	9.4	9.4	13.9	14.9	9.4	13.9	13.9
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	12.8	20.3	1.4	13.3	14.9	9.4	9.4	13.9	14.9	9.4	13.9	13.9
LOS	B	C	A	B	B	A	A	B	B	A	B	B
Approach Delay												
Approach LOS												
Intersection Summary	Other											
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 Capacity Utilization:	44.0%											
Analysis Period (min):	15											



Queues 3368 Carling Avenue
2017 Future AMI

HCM Signalized Intersection Capacity Analysis 3368 Carling Avenue
2017 Future AMI

1: Bedale Drive & Carling Avenue

	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							

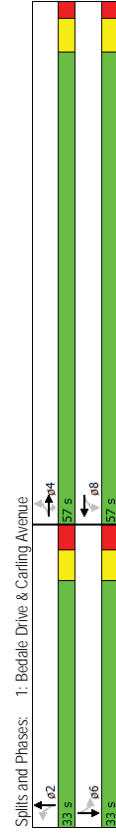
	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations	33	1030	17	10	611	30	19	3	40	9
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	5.6	5.6	5.6	5.6	5.6	5.6	5.6	6.1	6.1	6.1
Total Lost time (s)	1.00	0.95	1.00	1.00	0.95	1.00	0.91	1.00	0.95	0.95
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	0.99	0.98	1.00	0.97	0.97
Flt Protected	1695	3390	1517	1695	3366	1605	1605	1652	1652	1652
Satd. Flow (prot)	0.33	1.00	1.00	0.14	1.00	0.93	0.93	0.90	0.90	0.90
Flt Permitted	586	3390	1517	253	3366	1519	1519	1532	1532	1532
Satd. Flow (perm)	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Peak-hour factor, PHF	36	1120	18	11	664	33	21	3	43	10
Adj. Flow (vph)	0	0	10	0	5	0	0	26	0	4
RTOR Reduction (vph)	36	1120	8	11	692	0	0	41	0	15
Lane Group Flow (vph)	Permitted	NA	Permitted	NA	Permitted	NA	Permitted	NA	Permitted	NA
Turn Type	Protected	Phases	4	4	8	8	2	2	6	6
Permitted Phases	4	4	8	8	8	2	2	6	6	6
Actuated Green, G (s)	32.3	32.3	32.3	32.3	32.3	32.3	29.2	29.2	29.2	29.2
Effective Green, g (s)	32.3	32.3	32.3	32.3	32.3	32.3	29.2	29.2	29.2	29.2
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.44	0.44	0.40	0.40	0.40	0.40
Clearance Time (s)	5.6	5.6	5.6	5.6	5.6	5.6	6.1	6.1	6.1	6.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	258	1495	669	111	1485	605	605	611	611	611
v/s Ratio Prot	c0.33			0.21						
v/s Ratio Perm	0.06	0.01	0.04	0.04	0.03	0.03	0.03	0.01	0.01	0.01
v/c Ratio	0.14	0.75	0.01	0.10	0.47	0.07	0.07	0.02	0.02	0.02
Uniform Delay, d1	12.2	17.1	11.5	11.9	14.4	13.6	13.6	13.4	13.4	13.4
Progression Factor	1.00	1.00	1.00	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	0.2	0.1	0.1	0.1
Delay (s)	12.4	19.2	11.5	12.3	14.6	13.8	13.8	13.4	13.4	13.4
Level of Service	B	B	B	B	B	B	B	B	B	B
Approach Delay (s)	18.8	B	B	14.6	B	13.8	B	13.4	B	B
Approach LOS	B	B	B	B	B	B	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										

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

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	57.0	33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	63.3%	63.3%	36.7%	36.7%	36.7%	36.7%	36.7%	36.7%
Maximum Green (s)	51.4	51.4	51.4	51.4	51.4	51.4	26.9	26.9	26.9	26.9	26.9	26.9
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	1.9	1.9	1.9	1.9	1.9	1.9	2.8	2.8	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	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.6	5.6	6.1	6.1	6.1	6.1	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	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	9.0	9.0	9.0	9.0	9.0	9.0
Flash Dont Walk (s)	13.0	13.0	13.0	13.0	13.0	13.0	16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	39.9	39.9	39.9	39.9	39.9	39.9	27.2	27.2	27.2	27.2	27.2	27.2
Actuated G/C Ratio	0.51	0.51	0.51	0.51	0.51	0.51	0.34	0.34	0.34	0.34	0.34	0.34
v/c Ratio	0.65	0.55	0.03	0.20	0.79	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Control Delay	48.9	14.4	1.9	12.6	19.4	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.9	14.4	1.9	12.6	19.4	13.0	13.0	13.0	13.0	13.0	13.0	13.0
LOS	D	B	A	B	B	B	B	B	B	B	B	B
Approach Delay	16.1	16.1	16.1	16.1	16.1	16.1	13.0	13.0	13.0	13.0	13.0	13.0
Approach LOS	B	B	B	B	B	B	B	B	B	B	B	B
Intersection Summary	Other											
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%											
Analysis Period (min):	15											



	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	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑		↔	↔	↔	↔	↔
Volume (vph)	55	874	22	38	1123	113	9	4	19	13	10
Ideal Flow (vphpl)	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	0.99	1.00	0.92	0.94	0.94
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.99	0.92	0.99	0.92	0.97	0.97
Satd. Flow (prot)	1695	3390	1517	1695	3344	1617	1617	1638	1638	1638	1638
Flt Permitted	0.10	1.00	1.00	0.23	1.00	0.95	0.95	0.90	0.90	0.90	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
Adj. Flow (vph)	60	950	24	41	1221	123	10	4	21	14	11
RTOR Reduction (vph)	0	0	12	0	10	0	0	14	0	0	7
Lane Group Flow (vph)	60	950	12	41	1334	0	0	21	0	0	19
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4		4	8		8		2		6	
Permitted Phases	4		4	8		8		2		6	
Actuated Green, G (s)	39.9	39.9	39.9	39.9	39.9	39.9	27.2	27.2	27.2	27.2	27.2
Effective Green, g (s)	39.9	39.9	39.9	39.9	39.9	39.9	27.2	27.2	27.2	27.2	27.2
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.51	0.51	0.35	0.35	0.35	0.35	0.35
Clearance Time (s)	5.6	5.6	5.6	5.6	5.6	5.6	6.1	6.1	6.1	6.1	6.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	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
w/s Ratio Prot	0.28				c0.40						
w/s Ratio Perm	0.33		0.01	0.10		0.01		0.01			0.01
v/c Ratio	0.65	0.55	0.02	0.20	0.79	0.04		0.04			0.04
Uniform Delay, d1	14.3	13.3	9.7	10.7	16.0	17.1		17.1			17.1
Progression Factor	1.00	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			0.1
Delay (s)	28.6	13.7	9.7	11.1	18.5	17.3		17.3			17.2
Level of Service	C	B	A	B	B	B		B			B
Approach Delay (s)		14.5		18.3		17.3		17.3			17.2
Approach LOS		B		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