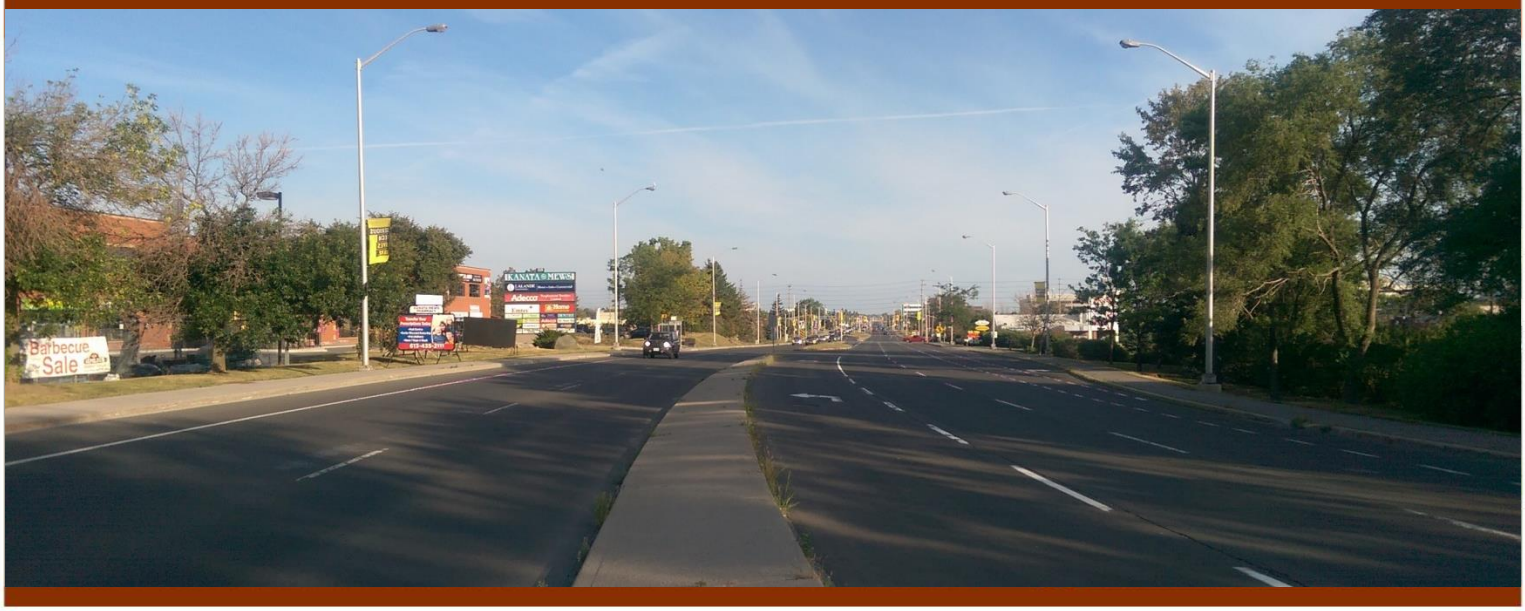

Kanata Mews Development
329 March Road, City of Ottawa

Transportation Brief

Prepared for:

Bascorp Management
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Ottawa, ON
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DRAFT

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August 19, 2016

MPCE File No. CP-15-0465

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APPENDICES

1.0 INTRODUCTION

McIntosh Perry Consulting Engineers Ltd. (MPCE) was retained by the Bascorp Management to complete a transportation brief for a proposed 4,000 square foot commercial development to be located at **329 March Road** (legal description being Lot 6, Concession 3) in the City of Ottawa. This investigation will outline the traffic related impacts that the proposed development will have on the abutting roadway system. The site has been analyzed for both the weekday a.m. and p.m. peak hours, as these time periods represent the peak conditions for traffic on the adjacent road network.

The proposed development is located in the City of Ottawa, approximately 20 km south-west of the downtown core in the suburb of Kanata. See **Figure 1** below for more information.

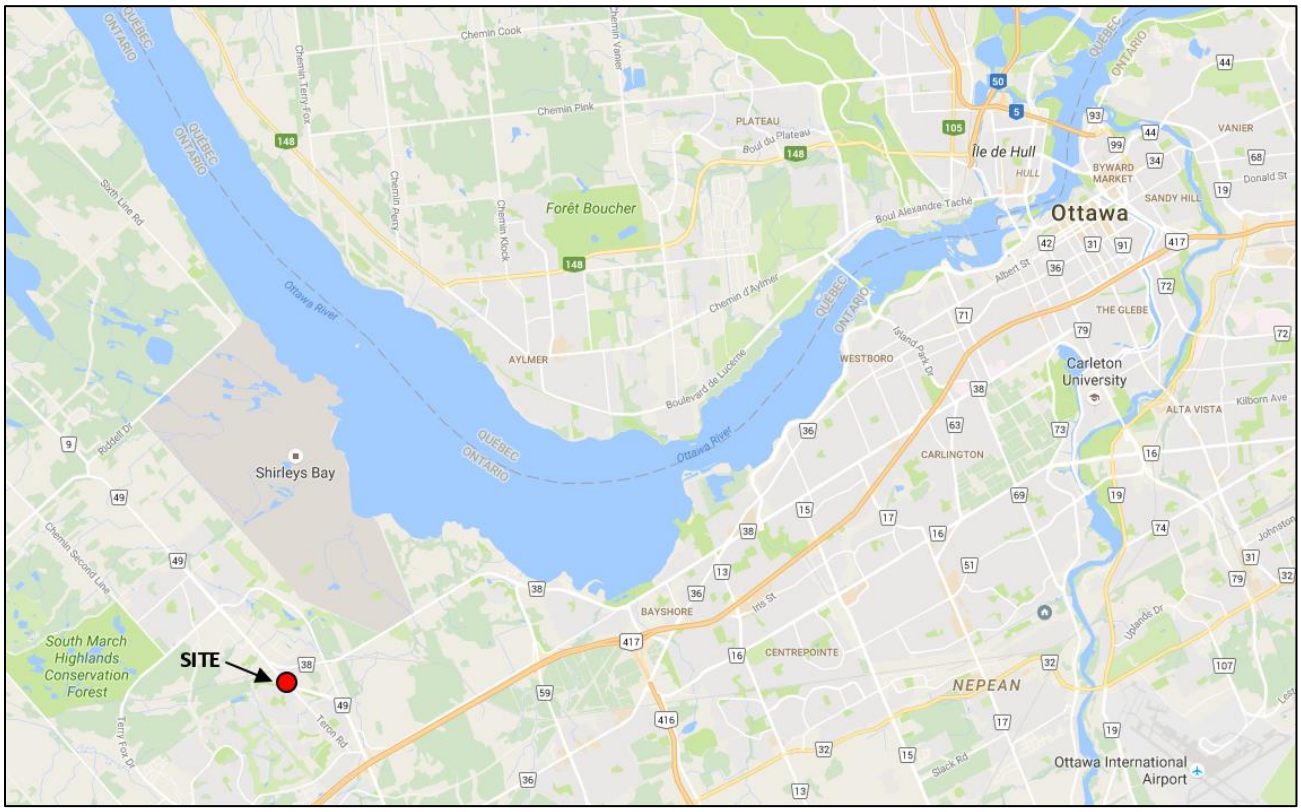

Figure 1: Key Plan (Google)

2.0 PROPOSED DEVELOPMENT

The subject site has a total area of approximately 1.7 hectares, upon which the developer plans to construct a new commercial building with a total gross-floor area of 4,102 square feet. See **Figure 2** below the location of the subject area used for this study.

Figure 2: Location Plan (geoOttawa)

The development is anticipated to consist of two or three separate units within the building, each occupied by a different tenant. From the preliminary site plan, it appears the owner wishes to divide the building into rental spaces: 2,006 square feet being used for a coffee shop and the remaining 2,096 square feet being used for up to two restaurant spaces.

Based on the information available at the time of completing this investigation, full buildout and occupancy of the proposed development is planned for 2017. As such, a horizon year of 2022 (full occupancy + 5 years) will be used for this study, as by this time all new site generated traffic will be captured within the surrounding road network. The subject site will be serviced by the two existing all-directional accesses that currently connect to the existing road network via March Road to the north and Steacie Drive to the south. Further information can be found in the site plan (KWN Architects Inc., 2016/07/18) attached in **Appendix A**.

For this report, the intersection of **March Road and the North Site Access** will be analyzed in detail, as this is the busiest intersection adjacent to the subject site. A majority of site generated traffic is anticipated to utilize this intersection; therefore it has been assumed that impacts to the intersection at Steacie Drive and Casson Way will be negligible.

3.0 EXISTING CONDITIONS

3.1 Site Location

The subject site is located within the community of Kanata in the City of Ottawa. The legal description of the site is Lot 6, Concession 3 in the Geographic Township of March, now the City of Ottawa, Ontario.

The subject site is currently developed with two commercial buildings, each accommodating multiple commercial tenants. It is our understanding that the proposed development is to occupy the southeast corner of the existing site, currently occupied by an existing asphalt parking lot. The site is currently zoned General Mixed Use (GM) and surrounded primarily by existing Commercial/Mixed Use and Industrial developments, as well as Residential areas.

There are two signalized intersections in close proximity to the subject site, specifically the intersection of March Road and Teron Road to the east of the north site access, and the shopping centre entrance off March Road to the west of the north site access.

3.2 Road Network

The existing road network adjacent to the subject site is shown in **Figure 2**. The following describes the existing roads within the study area:

- **March Road** (also known as Ottawa Road 49) is a divided arterial roadway under the jurisdiction of the City of Ottawa. Presently, the posted speed limit is 80 km/h in the vicinity of the subject site. March Road runs in an East-West direction and has a four-lane urban cross-section. It should also be noted that March Road has a dedicated westbound left-turn lane for access to the existing north entrance of the subject site.

Photo 1: March Road Looking Southeast at Existing Site Access (Google)

- **Steacie Drive** is an undivided collector road under the jurisdiction of the City of Ottawa. Presently, there is no posted speed limit in the vicinity of the subject site, therefore a speed limit of 50 km/h has been assumed as the road is within an urban area. Steacie Drive runs in an East-West direction and has a two-lane rural cross-section.

Photo 2: Steacie Drive Looking Southeast at Existing Site Access (Google)

3.3 Existing Traffic

In order to understand and fully appreciate the existing traffic volumes traveling through the study area, McIntosh Perry conducted a field visit during both the a.m. and p.m. peak hours on Tuesday August 9, 2016.

In addition to observing the overall performance of the subject area, traffic volume information was collected in the form of 15-minute counts at the intersection of March Road and the North site access. The results indicate that the morning peak hour for the study area occurs between **8:00** and **9:00 am**, while the afternoon peak hour occurs between **4:45** and **5:45 pm**. The existing (2016) traffic volumes for the weekday a.m. and p.m. peak hours are presented in **Figure 3**.

During the field investigations, traffic volumes were found to be steady in both directions. Volumes of heavy vehicle traffic were found to be negligible during the a.m. and p.m. periods, accounting for less than 1% of the total traffic volumes. For the purposes of this investigation, **2%** heavy vehicle traffic has been assumed in order to maintain a conservative estimate of traffic volumes.

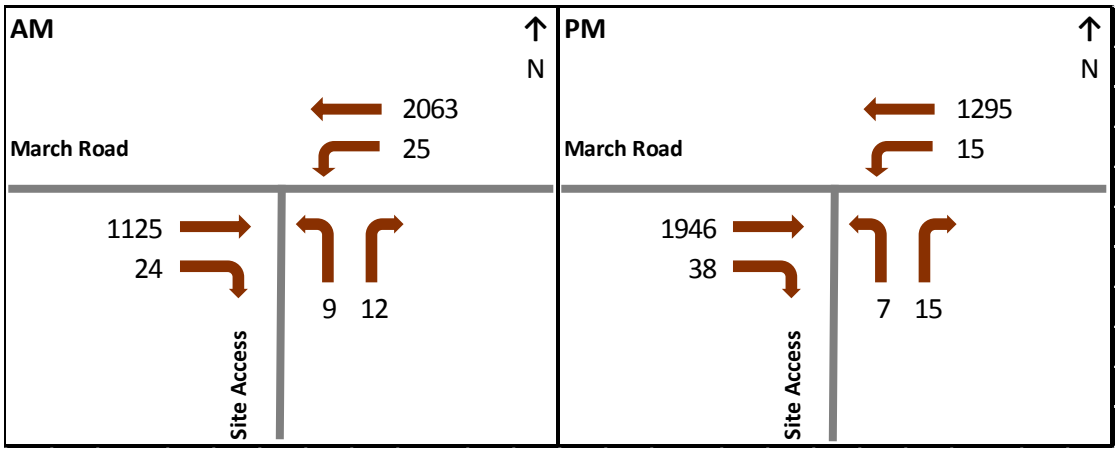

Figure 3: Existing Traffic Volumes (2016)

3.3.1 *Existing Pedestrian, Bicycle and Other Non-Auto Modes of Traffic*

Moderate volumes of pedestrian and bicycle traffic were observed in the study area during the peak hour field investigations. March Road forms part of the City of Ottawa's active transportation network, providing dedicated on-road bicycle lanes in both directions. Additionally, sidewalks on both sides of March Road provide pedestrian access to the subject site as well as the surrounding area. The majority of on-foot pedestrian traffic observed during the peak hour field investigations was traveling to and from the existing OC Transpo bus stop adjacent to the site.

There is currently an OC Transpo bus route along March Road in the area of the proposed development, with a stop located directly adjacent to the subject site and several others within walking distance. A portion of the OC Transpo System Map (effective as of June 2016) is presented in **Figure 4**.

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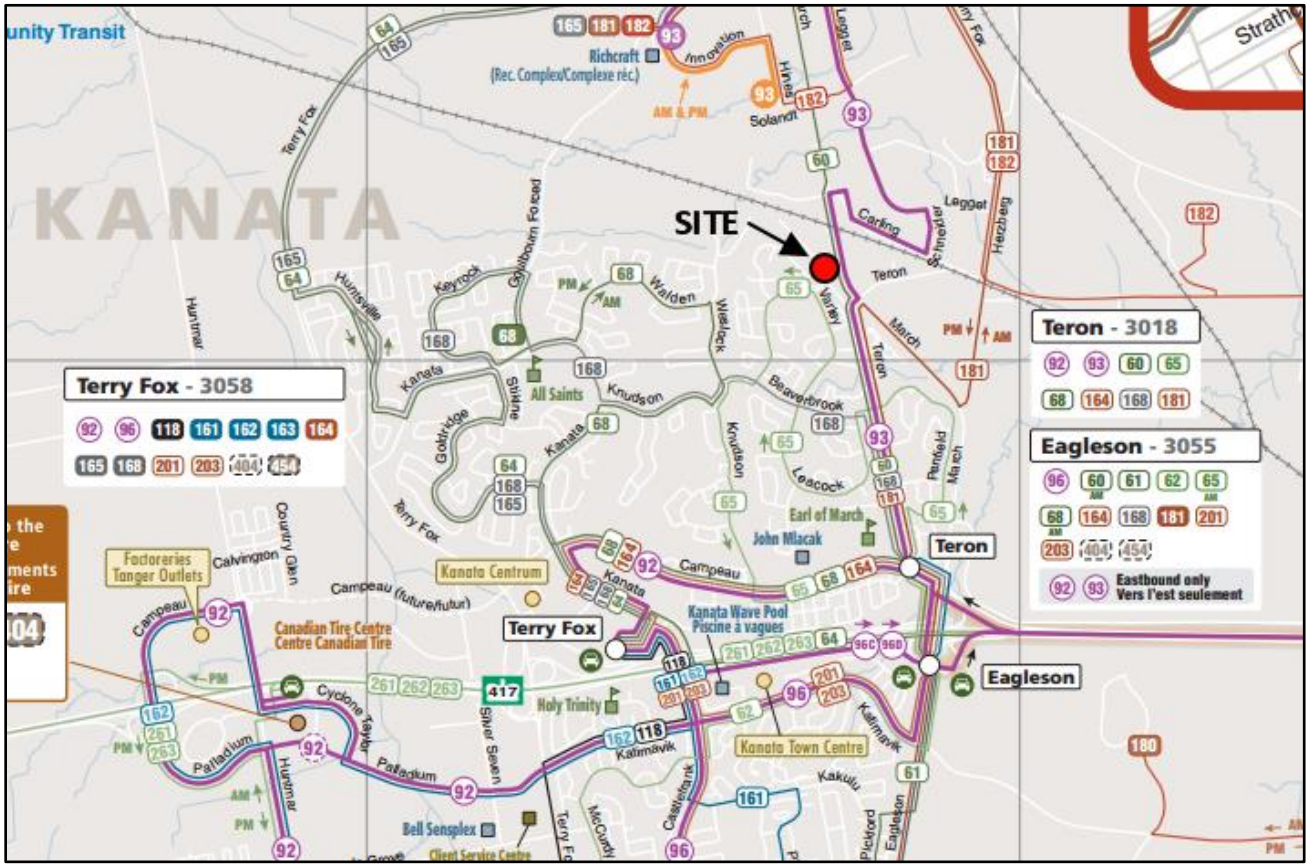

Figure 4: OC Transpo System Map

Specifically, the OC Transpo bus stops in close proximity to the subject site include one located directly adjacent to the site access (Stop #7986) as well as one on the opposite side of the road (Stop #7984). These stops are serviced by Route 93 (Lincoln Fields & Lebreton – Kanata North) and Express Route 60 (Mackenzie King – Kanata). Route 93 provides regular service on weekdays in 10-30 minute intervals, while Express Route 60 operates in 20 minute intervals only at peak periods, providing service eastbound in the morning and westbound in the afternoon. The nearest Transitway service station is the Eagleson Station, located approximately 2.5 km south of the subject site, and includes Park & Ride Facilities.

As the proposed development is expected to be a low level pedestrian traffic generator and the existing pedestrian and cycling infrastructure along March Road is well established in the area of the subject site, it is anticipated that active transportation will not be unduly impacted by the proposed development.

In order to facilitate and further encourage active transportation in the area, it is recommended that the proposed development include bicycle parking and connectivity to the surrounding pedestrian network.

3.4 Capacity and Level of Service Methodology

For definition purposes, the Level of Service (LOS) of an *unsignalized* intersection is determined by the overall volume to capacity (v/c) ratio. The v/c ratio for an intersection is defined as the sum of equivalent volumes for all critical movements divided by the sum of capacities for all critical movements (assuming that the v/c ratios for critical movements can be equalized).

The City of Ottawa has established a criterion that directly relates the v/c ratio of an intersection to a Level of Service rating. **Table 3.4.1** presents the Level of Service (LOS) categories for intersections, as defined by the *Transportation Impact Assessment Guideline*.

A Level of Service of "F" has a Volume to Capacity (v/c) ratio greater than 1.00, which suggests demand exceeds the available capacity of the intersection. This is indicative of excessive delays and queuing.

Table 3.4.1: LOS Definition for Intersections

Level of Service (LOS)	Volume to Capacity (v/c) Ratio
A	0 to 0.60
B	0.61 to 0.70
C	0.71 to 0.80
D	0.81 to 0.90
E	0.91 to 1.00
F	> 1.00

3.5 Existing Operating Conditions

The existing traffic volumes collected during the field investigation portion of this study were analyzed using *Synchro 8* software. **Table 3.5.1** summarizes the 2016 existing traffic operations at the intersection of March Road and the site access in terms of Volume/Capacity (v/c) ratio, Level of Service (LOS) and overall delay. A detailed summary of the intersection capacity analysis can be found in **Appendix B**.

Table 3.5.1: Existing Traffic Operation (2016)

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	v/c Ratio	Delay (sec)	LOS	v/c Ratio	Delay (sec)
March Road / North Site Access						
North Left-Turn (Site Access)	A	0.112	25.0	A	0.203	43.1
West Left-Turn (March Road)	A	0.049	11.9	A	0.067	20.8

Under existing traffic conditions, the unsignalized intersection of March Road and the north site access appears to be operating at an acceptable level of service during both the a.m. and p.m. peak hours. Total delay for turning movements are consistent with observations made in the field.

Westbound through traffic is not impeded by traffic entering the site due to the presence of an existing left-turn lane on March Road. Similarly, right-in right-out traffic at the site access is not anticipated to affect eastbound through traffic. As such, performance of these movements is not included in the traffic operation summary table.

4.0 FUTURE BACKGROUND TRAFFIC CONDITIONS

4.1 Annual Background Traffic Growth

The existing traffic volumes within the study area can be expected to grow over time due to the overall growth in the area. A study completed by the City of Ottawa has concluded that between 2016 and 2021, the population is expected to grow from 976,800 to 1,031,300 – a total growth of 5.58%. This translates into an anticipated yearly growth rate of 1.12%. In a conservative approach, an annual growth rate of **1.5%** has been applied to existing volumes in order to analyze traffic growth to the horizon years of 2017 and 2022.

For the purposes of this analysis, the horizon year of 2017 as by this time the development is anticipated to have reached full occupancy. Similarly, the horizon year of 2022 (full occupancy + 5 years) will be analyzed as by this time all new traffic generated but the subject site is expected to be captured within the surrounding road network.

4.2 Other Developments within the Study Area

At the time of preparing this brief, MPCE is aware of a proposed condominium development planned for construction approximately 0.3km east of the subject site on land municipally addressed as 1131 Teron Road. Although no site-plan was available at the time this report was prepared, it is our understanding that the development will consist of a nine-storey mid-rise apartment building to be serviced by a single all-directional access on Teron Road.

MPCE reviewed the Transportation Impact Assessment Study for the proposed development, prepared by D.J. Halpenny and Associates Ltd. (March 27, 2012), and although the development is expected to contribute additional traffic within the study area, it is anticipated that the above noted background traffic growth factors have accounted for this type of development.

4.3 Future Background Operating Conditions

4.3.1 *Full Occupancy (2017)*

The estimated future traffic growth rate (at 1.5% per year) was applied to the existing (2016) traffic volumes to produce the anticipated future 2017 background traffic volumes for the weekday a.m. and p.m. peak hours. The anticipated future 2022 background traffic volumes for both weekday a.m. and p.m. peak hours are presented in **Figure 5**.

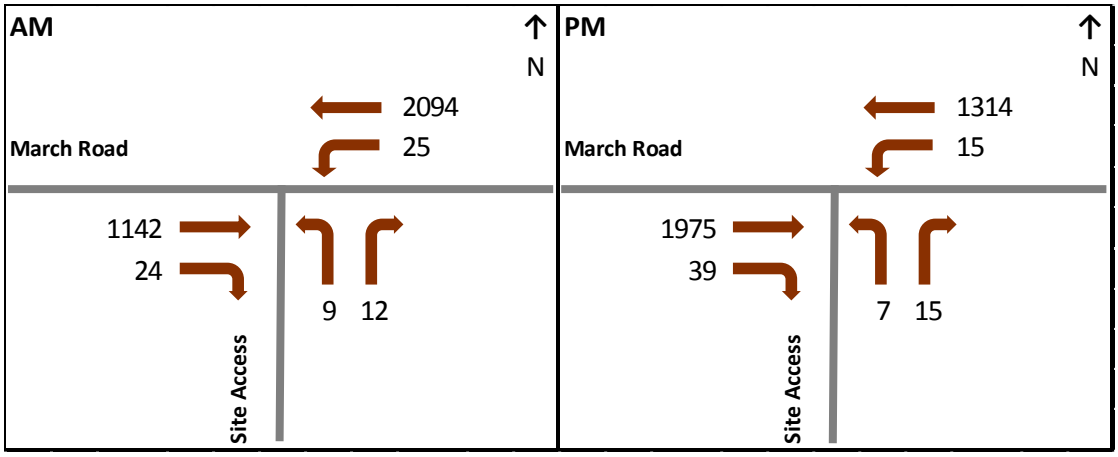

Figure 5: Future Background Traffic Volumes (2017)

Table 4.3.1 summarizes the 2017 future background traffic operations at the intersection of March Road and the site access in terms of Volume/Capacity (v/c) ratio, Level of Service (LOS) and overall delay. A detailed summary of the intersection capacity analysis can be found in **Appendix B**.

Table 4.3.1: Future Background Traffic Operation (2017)

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	v/c Ratio	Delay (sec)	LOS	v/c Ratio	Delay (sec)
March Road / North Site Access						
North Left-Turn (Site Access)	A	0.115	25.5	A	0.208	44.3
West Left-Turn (March Road)	A	0.050	12.0	A	0.069	21.3

Under future background traffic conditions at the 2017 horizon year, the intersection of March Road and the north site access is expected to operate at an acceptable level of service during both the a.m. and p.m. peak hours. Impacts to the v/c and delays for the site access are inconsequential when compared to the existing (2016) operation of the intersection.

4.3.2 *Full Occupancy + 5 years (2022)*

The estimated future traffic growth rate (at 1.5% per year) was applied to the existing (2016) traffic volumes to produce the anticipated future 2022 background traffic volumes for the weekday a.m. and p.m. peak hours. The anticipated future 2022 background traffic volumes for both weekday a.m. and p.m. peak hours are presented in **Figure 6**.

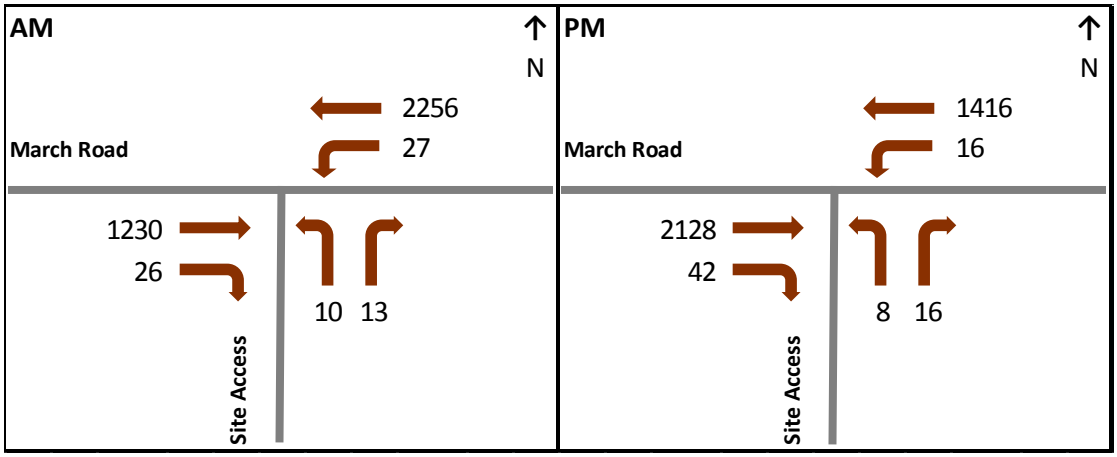

Figure 5: Future Background Traffic Volumes (2022)

Table 4.3.2 summarizes the 2022 future background traffic operations at the intersection of March Road and the site access in terms of Volume/Capacity (v/c) ratio, Level of Service (LOS) and overall delay. A detailed summary of the intersection capacity analysis can be found in **Appendix B**.

Table 4.3.2: Future Background Traffic Operation (2022)

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	v/c Ratio	Delay (sec)	LOS	v/c Ratio	Delay (sec)
March Road / North Site Access						
North Left-Turn (Site Access)	A	0.144	29.1	A	0.281	58.2
West Left-Turn (March Road)	A	0.059	12.7	A	0.086	24.4

Under future background traffic conditions at the 2022 horizon year, the intersection of March Road and the north site access is expected to operate at an acceptable level of service during both the a.m. and p.m. peak hours. Although there is an increase in the anticipated delay for the left-turn movements at the site access when compared to the existing (2016) conditions, a review of the v/c for the intersection indicates that the intersection can support additional traffic volumes without exceeding its capacity.

5.0 SITE GENERATED TRAFFIC

5.1 Traffic Generation

As outlined in previous sections of this report, the proposed development is anticipated to consist of a new 4,102 square foot commercial building divided between a 2,006 square foot coffee shop and 2,096 square feet of restaurant space. Traffic volumes generated by the proposed development were estimated using the ITE Trip Generation Manual (9th Edition).

It should be noted that the lowest trip generation rates were assumed due to the proximity of other coffee shops and restaurants as well as the sub-urban nature of the study area. The ITE Trip Generation Manual rates generally include a 10% modal share, therefore it is anticipated that the volumes generated will be sufficient in estimating the proposed development's trip ends for the purposes of this investigation.

Total automobile trip ends for the weekday a.m. and p.m. peak hours for the proposed development are summarized in **Table 5.1.1**.

Table 5.1.1: Proposed Development – Total Trip Generation

Land Use (ITE #)	Gross Floor Area (ft^2/1000)	Automobile Trips			
		AM		PM	
		In	Out	In	Out
Coffee Shop (936)	2.006	56	53	25	36
Restaurant (933)	2.096	53	35	15	15
TOTAL	**4.102**	**109**	**88**	**40**	**40**
		197		**80**	

Traffic generated by the new development is anticipated to consist of both primary and pass-by trips. **Primary trips** are those for which the new development is the ultimate destination, and their presence on the adjacent road network is directly attributed to the new development. Contrarily, **pass-by** trips consist of traffic which is already present on the adjacent road network and access the site due to its convenient location. Pass-by trips do not add new traffic to the adjacent road network, as they are drawn from the passing traffic stream when entering the site. As such, pass-by trips are subtracted from the through-volumes passing the site access.

Based on data collected from similar developments (ITE #934), it is estimated that approximately **49%** of site generated traffic will be pass-by trips in the a.m. peak period, while **50%** of traffic will be pass-by trips in the p.m. peak period. The total estimated primary and pass-by trip generation for the subject site are presented in **Table 5.1.2**.

Table 5.1.2: Proposed Development – Primary and Pass-By Trip Generation

Land Use (ITE #)	Automobile Trips – Primary (Pass-By)			
	AM		PM	
	In	Out	In	Out
Coffee Shop (936)	28 (28)	27 (26)	13 (13)	12 (12)
Restaurant (933)	27 (26)	18 (17)	8 (8)	7 (7)
TOTAL	**55 (54)**	**45 (43)**	**21 (21)**	**19 (19)**
	100 (97)		**40 (40)**	

Trips that are attracted to the subject site from the traffic volumes on roadways in its vicinity but require a diversion from that roadway to gain access to the site are referred to as **Diverted Linked trips**. Similar to primary trips, diverted linked trips add traffic to streets adjacent to the site, however they may not add traffic to the area's major travel routes. Although this development is anticipated to generate a nominal amount diverted linked trips, it should be noted that these trips have been assumed to be primary trips due to the limited study area.

5.2 Traffic Distribution

For the purposes of this investigation, the origin-destination distribution of the site generated traffic volumes by the proposed development has been estimated with consideration given to several factors, including existing traffic patterns and local population densities. Although a portion of the traffic traveling to and from the subject site is expected to utilize the south access at Steacie Drive, a majority of site generated traffic is expected to use the north access at March Road.

In a conservative approach, is has been assumed that traffic generated by the new development will utilize the north access exclusively for the purposes of this investigation. This assumption has been made as the north site access is the busiest intersection adjacent to the subject site and therefore more susceptible to impacts associated with increased traffic volumes. The development traffic volumes projected for the a.m. and p.m. peak hours are presented in **Figure 8**. Note that negative volumes denote the subtraction of pass-by trips from through traffic passing the site.

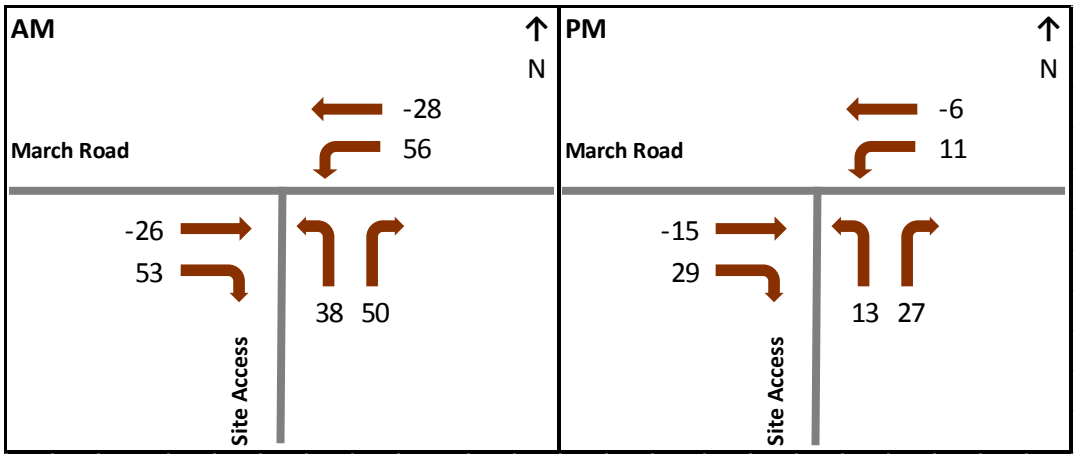

Figure 8: Projected Development Traffic

6.0 TOTAL FUTURE OPERATING CONDITIONS

This section presents the analysis and summarizes the effects of adding the total subject site generated traffic volumes to the anticipated future network in the a.m. and p.m. peak hours for bit the 2017 and 2022 horizon years.

6.1 Full Occupancy (2017)

The results of combining the subject site generated traffic volumes with the anticipated 2017 background traffic volumes for both the a.m. and p.m. peak hours are presented in **Figure 9**.

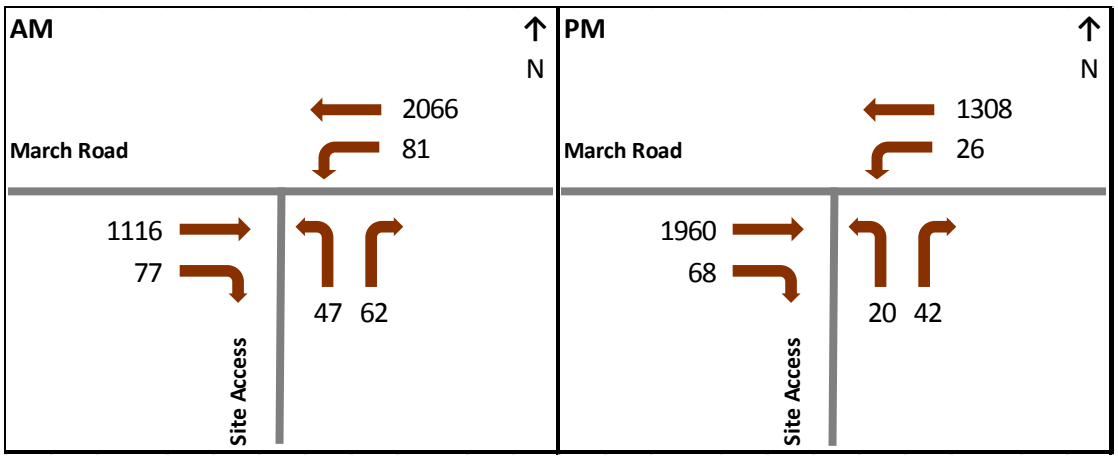

Figure 9: Total Traffic (2017)

A summary of the 2017 total future traffic operations at the intersection of March Road and the site access in terms of Volume/Capacity (v/c) ratio, Level of Service (LOS) and overall delay is presented in **Table 6.1.1**. A detailed summary of the intersection capacity analysis can be found in **Appendix B**.

Table 6.1.1: Total Future Traffic Operation (2017)

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	v/c Ratio	Delay (sec)	LOS	v/c Ratio	Delay (sec)
March Road / North Site Access						
North Left-Turn (Site Access)	B	0.677	60.4	B	0.602	76.9
West Left-Turn (March Road)	A	0.167	13.2	A	0.121	22.5

Under anticipated future (2017) traffic conditions at full occupancy, the intersection of March Road and the north site access is expected to operate at an acceptable level of service during both the a.m. and p.m. peak hours. Delays are anticipated to increase when compared to operation under background traffic, however the existing left-turn lane on March Road at the site access is anticipated to moderate any impacts on westbound through traffic and therefore no modifications to the existing intersection are recommended.

6.2 Full Occupancy + 5 Years (2022)

The results of combining the subject site generated traffic volumes with the anticipated 2017 background traffic volumes for both the a.m. and p.m. peak hours are presented in **Figure 10**.

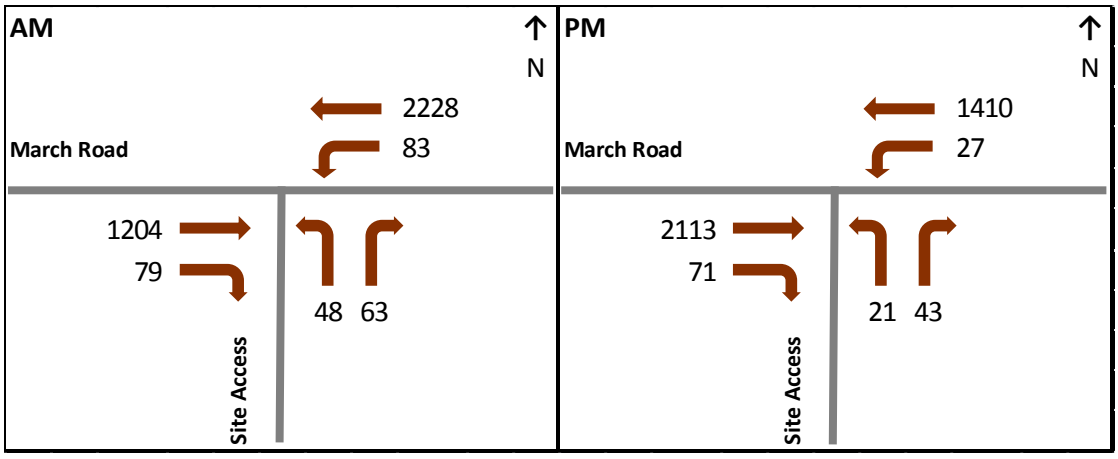

Figure 10: Total Traffic (2022)

A summary of the 2022 total future traffic operations at the intersection of March Road and the site access in terms of Volume/Capacity (v/c) ratio, Level of Service (LOS) and overall delay is presented in **Table 6.2.1**. A detailed summary of the intersection capacity analysis can be found in **Appendix B**.

Table 6.2.1: Total Future Traffic Operation (2022)

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	v/c Ratio	Delay (sec)	LOS	v/c Ratio	Delay (sec)
March Road / North Site Access						
North Left-Turn (Site Access)	C	0.783	82.7	C	0.748	114.5
West Left-Turn (March Road)	A	0.187	14.2	A	0.147	26.1

Under anticipated future (2022) traffic conditions, the intersection of March Road and the north site access is anticipated to operate at an acceptable level of service during both the a.m. and p.m. peak hours. Although the delay for the North left-turn onto March Road is anticipated to increase significantly when compared to existing conditions, the increase can be attributed to the increasing background traffic volumes. As such, the proposed development is expected to have a negligible impact on the intersection operation. No modifications to the existing intersection are recommended.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The subject site has a total area of approximately 1.7 hectares, upon which the developer plans to construct a new commercial building with a total gross-floor area of 4,102 square feet. From the preliminary site plan, it appears the owner wishes to divide the building into rental spaces: 2,006 square feet being used for a coffee shop and the remaining 2,096 square feet being used for up to two restaurant spaces. The subject site will be serviced by the two existing all-directional accesses that currently connect to the existing road network via March Road to the north and Steacie Drive and Casson Way to the south.

The subject site is anticipated to generate 55 inbound, 45 outbound and 97 pass-by trips during the weekday a.m. peak hour, and 21 inbound, 19 outbound and 40 pass-by trips during the p.m. peak hour.

For the purposes of this investigation, the intersection of March Road and the North Site Access was analyzed in detail, as this is the busiest intersection with the surrounding road network and therefore most likely to be impacted by increased traffic volumes. In a conservative approach, the intersection was analyzed under the assumption that all site generated traffic will be serviced by the north site access. The intersection at Steacie Drive and Casson Way is not anticipated to be effected by the proposed development.

Intersection analysis was completed using Synchro 8 software for the following scenarios:

- 2016 Existing Conditions;
- 2017 Horizon Conditions – Full build-out/occupancy (background and total traffic); and
- 2022 Horizon Conditions – Full build-out/occupancy + 5 years (background and total traffic).

Both a.m. and p.m. peak hours were analyzed for each of the above noted scenarios.

The analysis results indicate that the intersection is anticipated to operate at acceptable levels of service during the a.m. and p.m. peak hours through the 2022 horizon year. Although the delay for the North left-turn onto March Road is anticipated to increase significantly when compared to existing conditions, the increase can be attributed to the increasing background traffic volumes and, as such, the proposed development is expected to have a negligible impact on the intersection operation. Additionally, the existing left turn lane on March Road at the site access is anticipated to diminish any impacts on through traffic, therefore no modifications to the existing intersection are recommended.

Based on the intersection analysis completed as part of this investigation, McIntosh Perry concludes that the existing unsignalized intersection of March Road and the north site access will operate at acceptable levels of service during the weekday a.m. and p.m. peak hours to the horizon year of 2022. Similarly, the proposed development is expected to be a low level pedestrian traffic generator and the existing pedestrian and cycling infrastructure along March Road is well established in the area of the subject site. As such, it is anticipated that active transportation will not be unduly impacted by the proposed development.

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Appendix A

Proposed Site Plan

1 / A100 LOCATION PLAN
SCALE N.T.S.

LEGAL DESCRIPTION:

PART OF LOT 6, CONCESSION 3

GEOGRAPHIC TOWNSHIP OF MARCH

CITY OF OTTAWA

PREPARED BY
ANNIS, O'SULLIVAN, VOLLEBEKK ONTARIO
LAND SURVEYORS
MARCH 2, 2016

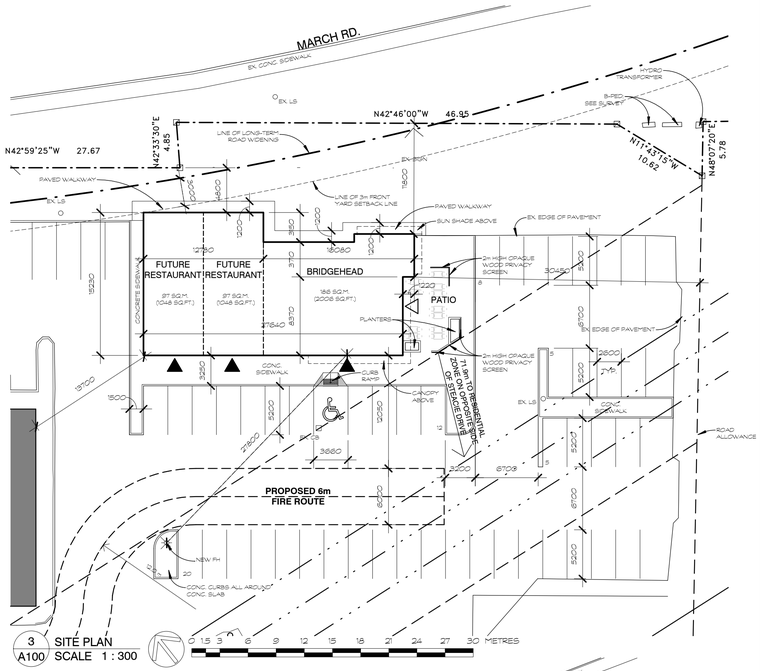
PROJECT ZONING REVIEW/STATISTICS

MUNICIPALITY: OTTAWA
MUNICIPAL ADDRESS: 329 MARCH RD.
REGISTERED OWNER: BASCORP MANAGEMENT
LOT AREA = 17,480 sq. m (188,087 sq.ft.) (4.32 ACRES)

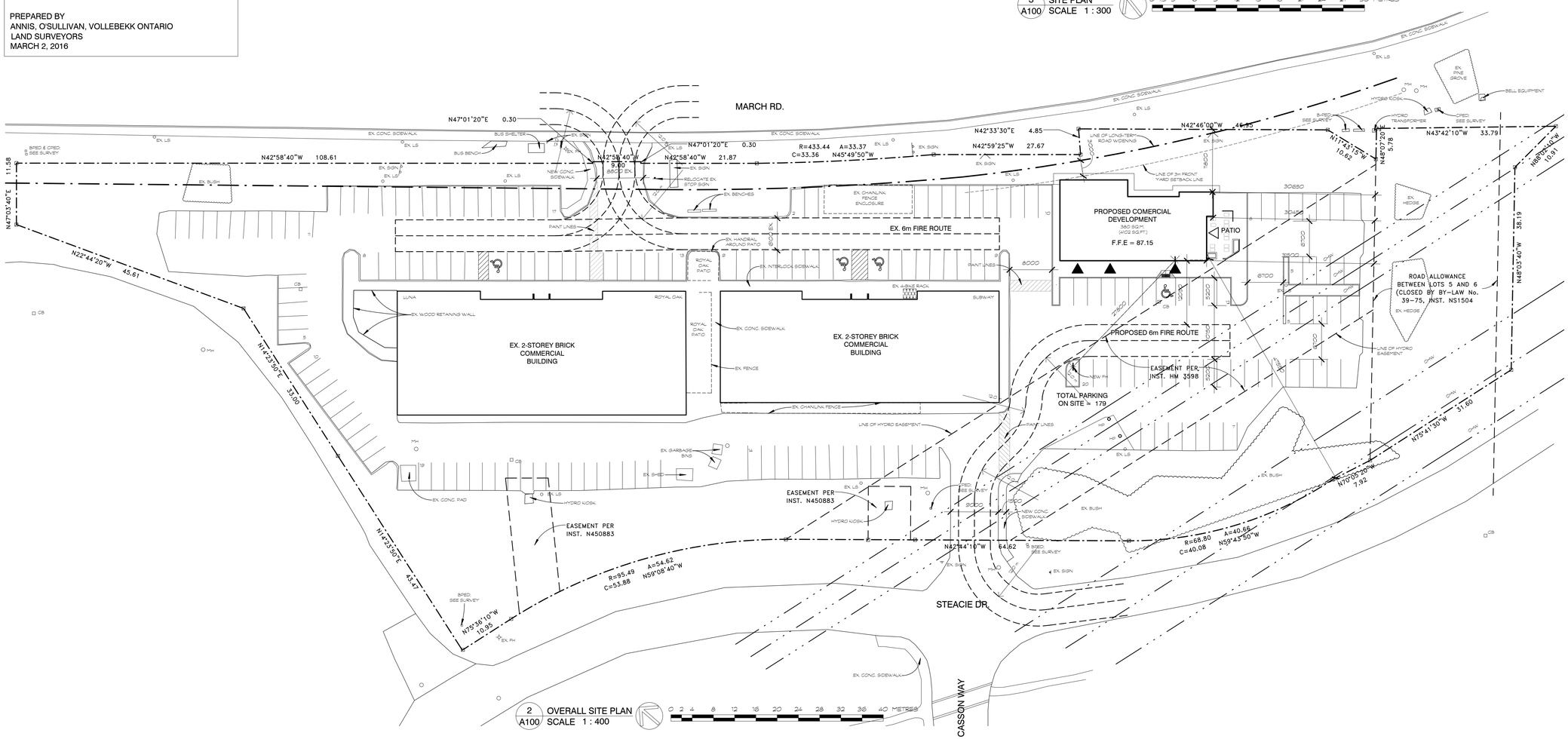
ZONING ANALYSIS:
OTTAWA
ZONING BY-LAW: 2008-250
ZONE SYMBOL: MA
PROPOSED USE: RESTAURANTS IN AN EXISTING SHOPPING CENTRE

EXISTING BUILDING AREAS	(SQ. M.)	(SQ. FT.)
NORTH BUILDING (No. 1)	2,464	26,527
SOUTH BUILDING (No. 2)	2,136	22,988
SUBTOTALS	4,600	49,515
PROPOSED		
BUILDING No. 3	380	4,102
TOTALS	4,980	53,617
RESTAURANT USES		
EXISTING: ROYAL OAK	372	4,000
LUNA	187	2,018
SUBWAY	187	1,800
SUBTOTAL	726	7,818
PROPOSED	380	4,102
TOTALS	1,106	1,916 +22%

DEVELOPMENT STANDARDS	REQUIRED	PROVIDED
MINIMUM LOT AREA	NO MIN.	17,480 sq. m
MINIMUM LOT WIDTH	NO MIN.	12.5m
MAXIMUM FLOOR SPACE INDEX	2	0.29
MINIMUM REQUIRED YARD		
FRONT YARD	3m	3m
INTERIOR SIDE YARD	NO MIN.	3.05m
REAR YARD	3m (@ STREET)	49.1m
	6m	5.5m
MAXIMUM BUILDING HEIGHT		
MINIMUM WIDTH OF LANDSCAPING		
ABUTTING A STREET	3.00m	3.00m
ALL OTHER CASES	NO MIN.	1.50m
PARKING SPACES		
SHOPPING CENTRE @ 3.5 / 100 sq.m.	179	179
LOADING SPACES (3.5 x 7)	2	2
BIKE PARKING SPACES @ 1 / 1500 sq.m.	4	4
PARKING FOR PHYSICALLY DISABLED (BY-LAW 2003-530)	2	4



3 / A100 SITE PLAN
SCALE 1 : 300



2 / A100 OVERALL SITE PLAN
SCALE 1 : 400

plot scale 1:1

SHEET SIZE: ARCH D (24"x36")

NOTES:

Contractor shall check and verify all dimensions on site and report any discrepancies to the Architect before proceeding.

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no.	revision	date

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detail no. 1 / A1 détail no.
sheet no. feuille no.

project / projet

PROPOSED COMERCIAL DEVELOPMENT BRDIGEHEAD COFFEE

329 MARCH ROAD OTTAWA, ON

designed by / conçu par	LK
approved by / approuvé par	LK
drawn by / dessiné par	AK
project no. / no. du projet	1633
date	2016 07 18
scale	as noted

drawing / dessin

SITE PLAN

revision / révision

sheet no. / no. de la feuille **A100**

Appendix B

Intersection Capacity Analysis Reports

Intersection	
Int Delay, s/veh	0.2

Movement	SET	SER	NWL	NWT	NEL	NER
Vol, veh/h	1125	24	25	2063	9	12
Conflicting Peds, #/hr	0	0	0	0	9	9
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	800	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1223	26	27	2242	10	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1258	0	2421	633
Stage 1	-	-	-	-	1245	-
Stage 2	-	-	-	-	1176	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	549	-	27	422
Stage 1	-	-	-	-	235	-
Stage 2	-	-	-	-	255	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	549	-	25	419
Mov Cap-2 Maneuver	-	-	-	-	120	-
Stage 1	-	-	-	-	233	-
Stage 2	-	-	-	-	242	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.1	25
HCM LOS			D

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	203	549	-	-	-
HCM Lane V/C Ratio	0.112	0.049	-	-	-
HCM Control Delay (s)	25	11.9	-	-	-
HCM Lane LOS	D	B	-	-	-
HCM 95th %tile Q(veh)	0.4	0.2	-	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	SET	SER	NWL	NWT	NEL	NER
Vol, veh/h	1946	38	15	1295	7	15
Conflicting Peds, #/hr	0	0	0	0	6	6
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	800	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2115	41	16	1408	8	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2163	0	2878	1084
Stage 1	-	-	-	-	2142	-
Stage 2	-	-	-	-	736	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	244	-	13	212
Stage 1	-	-	-	-	76	-
Stage 2	-	-	-	-	435	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	244	-	12	211
Mov Cap-2 Maneuver	-	-	-	-	61	-
Stage 1	-	-	-	-	76	-
Stage 2	-	-	-	-	406	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.2	43.1
HCM LOS			E

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	118	244	-	-	-
HCM Lane V/C Ratio	0.203	0.067	-	-	-
HCM Control Delay (s)	43.1	20.8	-	-	-
HCM Lane LOS	E	C	-	-	-
HCM 95th %tile Q(veh)	0.7	0.2	-	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	SET	SER	NWL	NWT	NEL	NER
Vol, veh/h	1142	24	25	2094	9	12
Conflicting Peds, #/hr	0	0	0	0	9	9
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	800	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1241	26	27	2276	10	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1276	0	2455	643
Stage 1	-	-	-	-	1263	-
Stage 2	-	-	-	-	1192	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	540	-	25	416
Stage 1	-	-	-	-	230	-
Stage 2	-	-	-	-	250	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	540	-	24	413
Mov Cap-2 Maneuver	-	-	-	-	117	-
Stage 1	-	-	-	-	228	-
Stage 2	-	-	-	-	238	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.1	25.5
HCM LOS			D

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	198	540	-	-	-
HCM Lane V/C Ratio	0.115	0.05	-	-	-
HCM Control Delay (s)	25.5	12	-	-	-
HCM Lane LOS	D	B	-	-	-
HCM 95th %tile Q(veh)	0.4	0.2	-	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	SET	SER	NWL	NWT	NEL	NER
Vol, veh/h	1975	39	15	1314	7	15
Conflicting Peds, #/hr	0	0	0	0	6	6
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	800	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2147	42	16	1428	8	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2195	0	2921	1101
Stage 1	-	-	-	-	2174	-
Stage 2	-	-	-	-	747	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	237	-	12	207
Stage 1	-	-	-	-	73	-
Stage 2	-	-	-	-	429	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	237	-	11	206
Mov Cap-2 Maneuver	-	-	-	-	59	-
Stage 1	-	-	-	-	73	-
Stage 2	-	-	-	-	400	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.2	44.3
HCM LOS			E

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	115	237	-	-	-
HCM Lane V/C Ratio	0.208	0.069	-	-	-
HCM Control Delay (s)	44.3	21.3	-	-	-
HCM Lane LOS	E	C	-	-	-
HCM 95th %tile Q(veh)	0.7	0.2	-	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	SET	SER	NWL	NWT	NEL	NER
Vol, veh/h	1230	26	27	2256	10	13
Conflicting Peds, #/hr	0	0	0	0	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	800	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1337	28	29	2452	11	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1375	0	2646	693
Stage 1	-	-	-	-	1361	-
Stage 2	-	-	-	-	1285	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	495	-	19	386
Stage 1	-	-	-	-	203	-
Stage 2	-	-	-	-	223	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	495	-	18	383
Mov Cap-2 Maneuver	-	-	-	-	102	-
Stage 1	-	-	-	-	201	-
Stage 2	-	-	-	-	210	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.2	29.1
HCM LOS			D

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	174	495	-	-	-
HCM Lane V/C Ratio	0.144	0.059	-	-	-
HCM Control Delay (s)	29.1	12.7	-	-	-
HCM Lane LOS	D	B	-	-	-
HCM 95th %tile Q(veh)	0.5	0.2	-	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	SET	SER	NWL	NWT	NEL	NER
Vol, veh/h	2128	42	16	1416	8	16
Conflicting Peds, #/hr	0	0	0	0	7	7
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	800	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2313	46	17	1539	9	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2366	0	3147	1186
Stage 1	-	-	-	-	2343	-
Stage 2	-	-	-	-	804	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	203	-	~ 8	181
Stage 1	-	-	-	-	58	-
Stage 2	-	-	-	-	401	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	203	-	~ 7	180
Mov Cap-2 Maneuver	-	-	-	-	47	-
Stage 1	-	-	-	-	58	-
Stage 2	-	-	-	-	367	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.3	58.2
HCM LOS			F

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	93	203	-	-	-
HCM Lane V/C Ratio	0.281	0.086	-	-	-
HCM Control Delay (s)	58.2	24.4	-	-	-
HCM Lane LOS	F	C	-	-	-
HCM 95th %tile Q(veh)	1	0.3	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	2.2

Movement	SET	SER	NWL	NWT	NEL	NER
Vol, veh/h	1116	77	81	2066	47	62
Conflicting Peds, #/hr	0	0	0	0	9	9
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	800	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1213	84	88	2246	51	67

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1306	0	2563	657
Stage 1	-	-	-	-	1264	-
Stage 2	-	-	-	-	1299	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	526	-	~ 21	407
Stage 1	-	-	-	-	229	-
Stage 2	-	-	-	-	220	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	526	-	~ 17	404
Mov Cap-2 Maneuver	-	-	-	-	100	-
Stage 1	-	-	-	-	227	-
Stage 2	-	-	-	-	183	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.5	60.4
HCM LOS			F

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	175	526	-	-	-
HCM Lane V/C Ratio	0.677	0.167	-	-	-
HCM Control Delay (s)	60.4	13.2	-	-	-
HCM Lane LOS	F	B	-	-	-
HCM 95th %tile Q(veh)	4	0.6	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	1.5

Movement	SET	SER	NWL	NWT	NEL	NER
Vol, veh/h	1960	68	26	1308	20	42
Conflicting Peds, #/hr	0	0	0	0	6	6
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	800	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2130	74	28	1422	22	46

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2210	0	2940	1108
Stage 1	-	-	-	-	2173	-
Stage 2	-	-	-	-	767	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	234	-	~ 12	204
Stage 1	-	-	-	-	73	-
Stage 2	-	-	-	-	419	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	234	-	~ 11	203
Mov Cap-2 Maneuver	-	-	-	-	58	-
Stage 1	-	-	-	-	73	-
Stage 2	-	-	-	-	369	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.4	76.9
HCM LOS			F

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	112	234	-	-	-
HCM Lane V/C Ratio	0.602	0.121	-	-	-
HCM Control Delay (s)	76.9	22.5	-	-	-
HCM Lane LOS	F	C	-	-	-
HCM 95th %tile Q(veh)	3	0.4	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	2.8

Movement	SET	SER	NWL	NWT	NEL	NER
Vol, veh/h	1204	79	83	2228	48	63
Conflicting Peds, #/hr	0	0	0	0	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	800	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1309	86	90	2422	52	68

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1405	0	2753	707
Stage 1	-	-	-	-	1362	-
Stage 2	-	-	-	-	1391	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	482	-	~ 16	378
Stage 1	-	-	-	-	203	-
Stage 2	-	-	-	-	196	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	482	-	~ 13	375
Mov Cap-2 Maneuver	-	-	-	-	87	-
Stage 1	-	-	-	-	201	-
Stage 2	-	-	-	-	159	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.5	82.7
HCM LOS			F

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	154	482	-	-	-
HCM Lane V/C Ratio	0.783	0.187	-	-	-
HCM Control Delay (s)	82.7	14.2	-	-	-
HCM Lane LOS	F	B	-	-	-
HCM 95th %tile Q(veh)	5	0.7	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	2.2

Movement	SET	SER	NWL	NWT	NEL	NER
Vol, veh/h	2113	71	27	1410	21	43
Conflicting Peds, #/hr	0	0	0	0	7	7
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	800	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2297	77	29	1533	23	47

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2381	0	3167	1194
Stage 1	-	-	-	-	2342	-
Stage 2	-	-	-	-	825	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	200	-	~ 8	179
Stage 1	-	-	-	-	58	-
Stage 2	-	-	-	-	391	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	200	-	~ 7	178
Mov Cap-2 Maneuver	-	-	-	-	47	-
Stage 1	-	-	-	-	58	-
Stage 2	-	-	-	-	334	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.5	114.5
HCM LOS			F

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	93	200	-	-	-
HCM Lane V/C Ratio	0.748	0.147	-	-	-
HCM Control Delay (s)	114.5	26.1	-	-	-
HCM Lane LOS	F	D	-	-	-
HCM 95th %tile Q(veh)	3.8	0.5	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon