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Technical Memorandum

Date: March 8, 2024 **Project No.:** 300057926.0000

Project Name: 559 Garner Road East Ancaster

Client Name: Garner South M.D. Developments Inc.

Submitted To: Mahum Riaz

Submitted By: Ethan McCaw

Reviewed By: Henry Centen, P. Eng.

1.0 Introduction

1.1 Background

R.J. Burnside & Associates Limited (Burnside) was retained by Garner South M.D. Developments Inc. to complete a Technical Traffic Memorandum for a proposed 99-unit, seven-storey, 8,872 m^2 (95,497 ft^2) condominium apartment building. During pre-consultation with all approval agencies, it was determined that the City of Hamilton does not require a full Traffic Impact Study, but rather a Technical Traffic Memorandum be completed for the proposed development. The terms of reference for this study were circulated to the City of Hamilton for comment and it was confirmed that the City's interest related to the operations of the Garner Road East / Southcote Road intersection.

The purpose of this memo is to review the forecasted traffic to be generated by the proposed development and review any traffic impacts that could occur as a result of the proposed development.

1.2 Scope of Work

The following scope of work for this Technical Memo was confirmed with the City of Hamilton prior to conducting this study and is consistent with the City of Hamilton's Traffic Impact Study Guidelines:

Analysis Scenarios	• Existing 2024 traffic conditions • Five-year horizon period background and total traffic conditions (2029)
Analysis Time Periods	• Weekday a.m. peak hour • Weekday p.m. peak hour
Analysis Intersections	• Garner Road East / Southcote Road • Southcote Road / Site Driveway

1.3 Intersection Analysis Methodology

Signalized and stop-controlled traffic operations were assessed for the intersections identified in the study area using the software Synchro 11, which employs methodology from the *Highway Capacity Manual (HCM 2000, HCM 2010 and HCM 6th Edition),* published by the Transportation Research Board National Research Council.

Synchro 11 can analyze both signalized and unsignalized intersections in a road corridor or network, accounting for the spacing, interaction, queues, and operations between intersections. The analysis in this study uses the HCM 2000 methodology.

Analysis Methodology for Signalized Intersections

Signalized intersection analysis considers two separate measures of performance:

- The capacity of all intersection movements, which is based on a volume-to-capacity ratio that measures the degree of capacity utilized.
- The level of service (LOS) for all intersection movements, which is based on the average control delay per vehicle for the various movements through the intersection and the average control delay for the overall intersection. Delay is an indicator of how long a vehicle must wait to complete a movement and is represented by a letter between A and F, with F being the longest delay. The link between LOS and delay (in seconds) for signalized intersections is summarized below.

LOS	Control Delay per Vehicle(s)
A	< 10
B	> 10 – 20
C	> 20 – 35
D	> 35 – 55
E	> 55 – 80
F	> 80

Analysis Methodology for Stop-Controlled Intersections

Stop-controlled intersection analysis considers two separate measures of performance:

- The capacity of the intersection's critical movements, which is based on a volume-to-capacity ratio.
- The LOS for the critical movements, which is based on the average control delay per vehicle for the various critical movements within the intersection. The link between LOS and delay (in seconds) for stop-controlled intersections is summarized below.

LOS	Control Delay per Vehicle(s)
A	0 – 10
B	> 10 – 15
C	> 15 – 25
D	> 25 – 35
E	> 35 – 50
F	> 50

2.0 Existing Conditions

2.1 Site Context

The proposed residential development is situated in the Community of Ancaster, within the City of Hamilton. The site is currently unoccupied with minor vegetation. To the north, the property is bounded by residential land uses. To the south and west, the property is bounded by Garner Road East and Southcote Road respectively. To the east, the property is bound by commercial land uses. Figure 1 illustrates the location of the subject site.

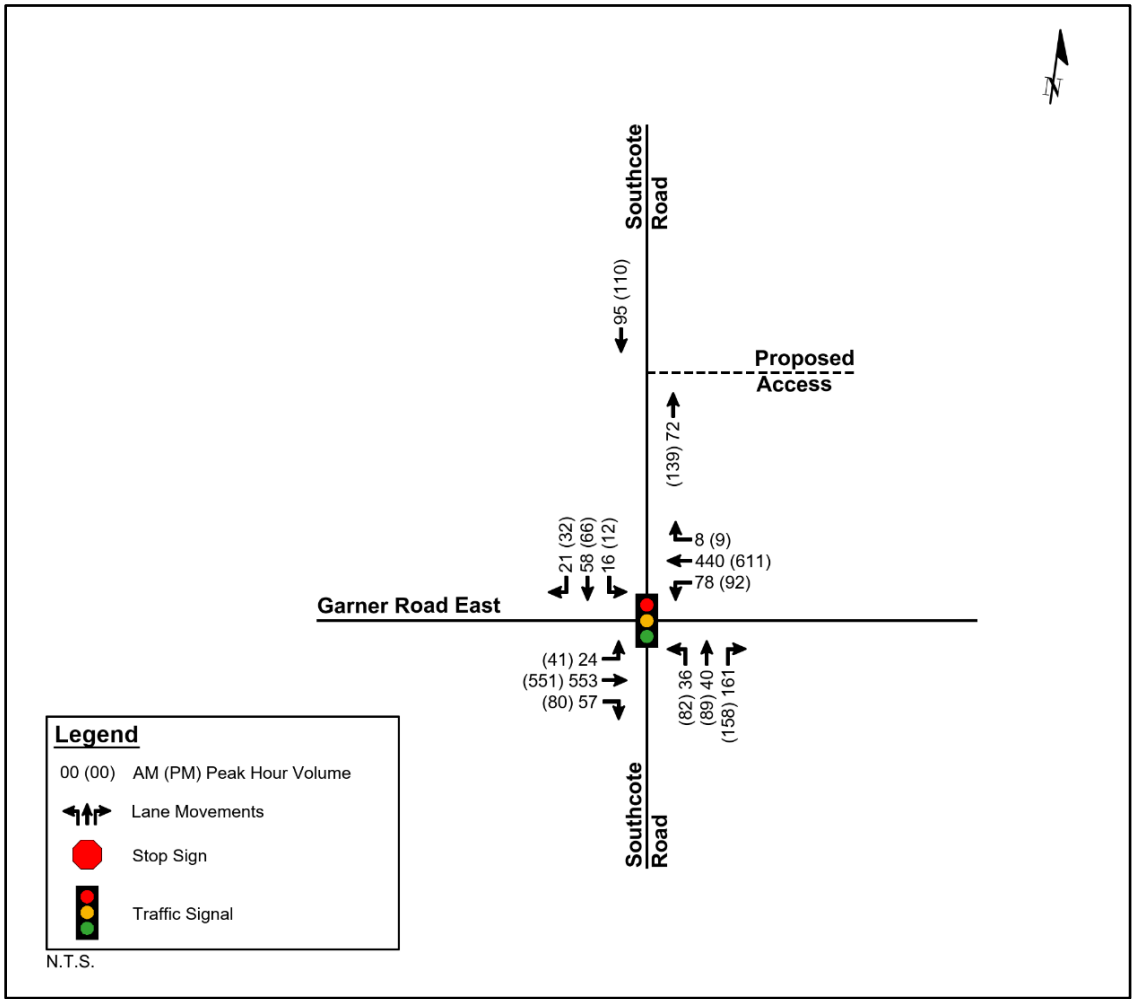
Figure 1: Site Location Figure

2.2 Existing Traffic Volumes

Updated Turning Movement Counts (TMCs) were conducted by Ontario Traffic Inc. (OTI) on behalf of Burnside at the intersection of Garner Road East and Southcote Road on Wednesday February 21, 2024. The traffic counts were conducted in the morning from 7 a.m. to 9 a.m. and in the afternoon from 4 p.m. to 6 p.m.

The resulting existing 2024 traffic volumes are illustrated in Figure 2. The updated traffic counts are provided in Appendix A.

Figure 2: Existing Traffic Volumes



3.0 Future Background Conditions

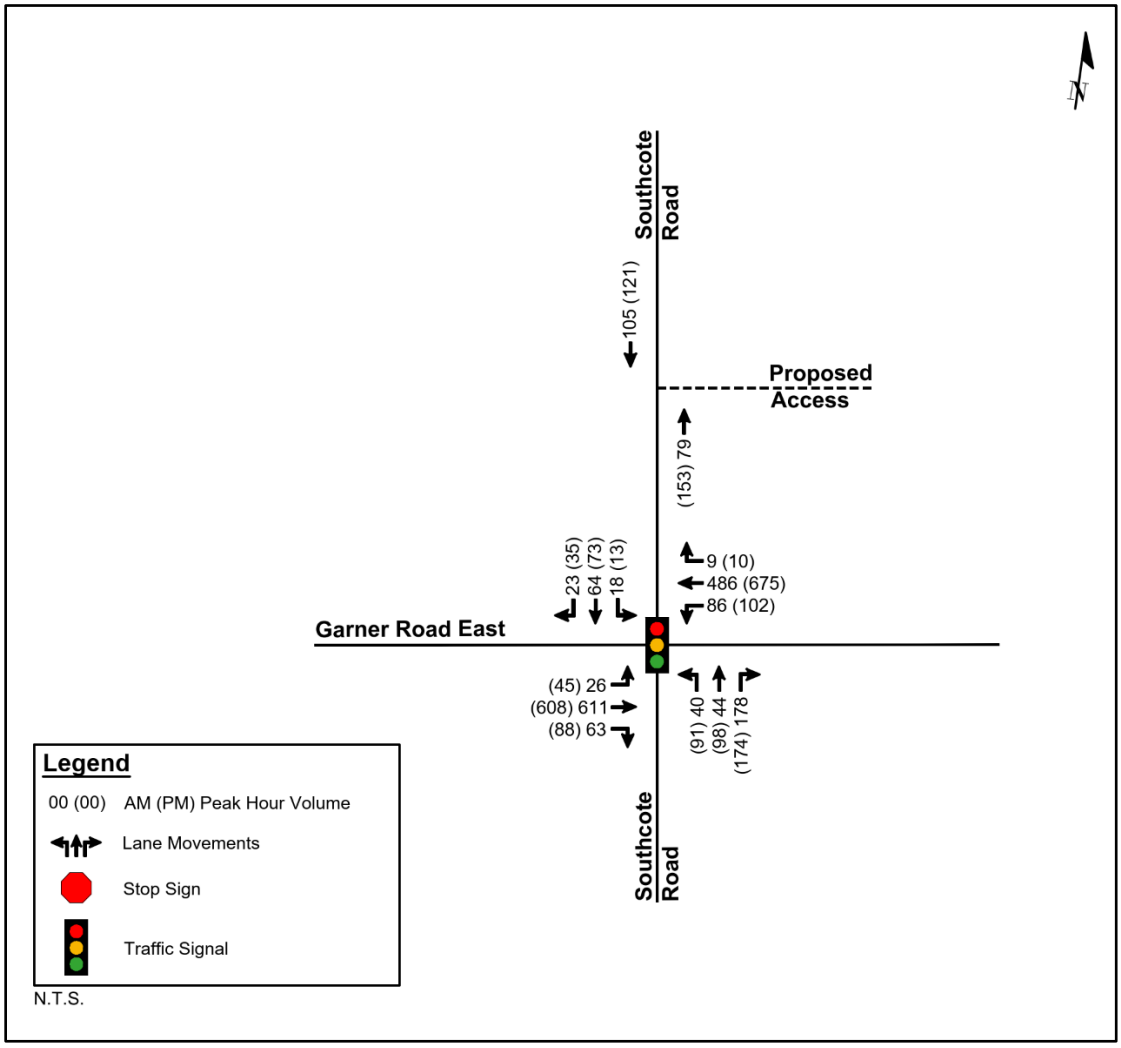
3.1 Background Traffic Growth

As per the City of Hamilton's Traffic Impact Study Guidelines and the absence of historical traffic data / traffic growth, a growth rate of 2% compounded annually was applied to all movements on Garner Road East and Southcote Road up to the five-year (2029) horizon period.

3.2 Background Traffic Volumes

Background traffic volumes consist of a traffic growth rate per annum (up to horizon year 2029) as well as the existing traffic volumes. The resulting background traffic volumes for the 2029 horizon period are illustrated in Figure 3.

Figure 3: Background Traffic Volumes

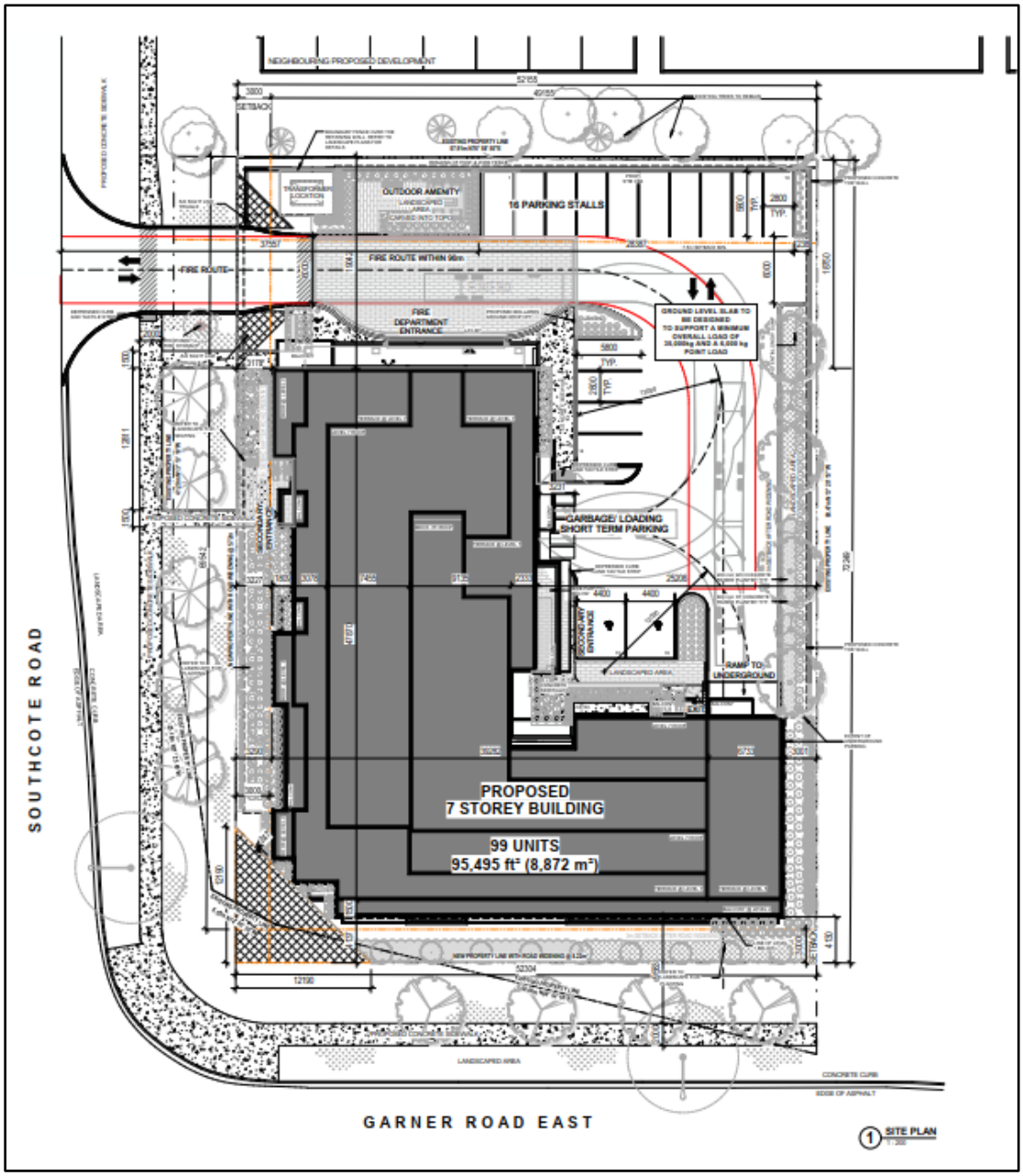


4.0 Proposed Development

According to the concept plan prepared by SRM Architects Inc. dated January 19, 2024, the proposed development will consist of a 99-unit, seven-storey, 8,872 m^2 (95,497 ft^2) condominium apartment building. Parking for the proposed development is to be provided via a two-level underground parking facility. Access to the site is proposed via a single full moves access from Southcote Road near the northern limits of the site.

The concept plan for the proposed residential development is provided in Figure 4.

Figure 4: Concept Site Plan



4.1 Traffic Generation

The proposed Trip Generation was based upon information contained in the publication *Trip Generation Manual, 11th Edition* (Institute of Transportation Engineers). The land use code (LUC) 221 – Multifamily Housing (Mid-Rise) was used in the generation of trips based on a general urban / suburban environment. The a.m. and p.m. peak hours of the proposed development are assumed to coincide with the peak hours of the adjacent street. The resulting trip generation is summarized in Table 1.

Table 1: Site Trip Generation

Land Use	A.M. Peak Hour			P.M. Peak Hour		
	In	Out	Total	In	Out	Total
Multifamily (Mid-Rise), LUC 221 – 99 units	9	28	37	24	15	39

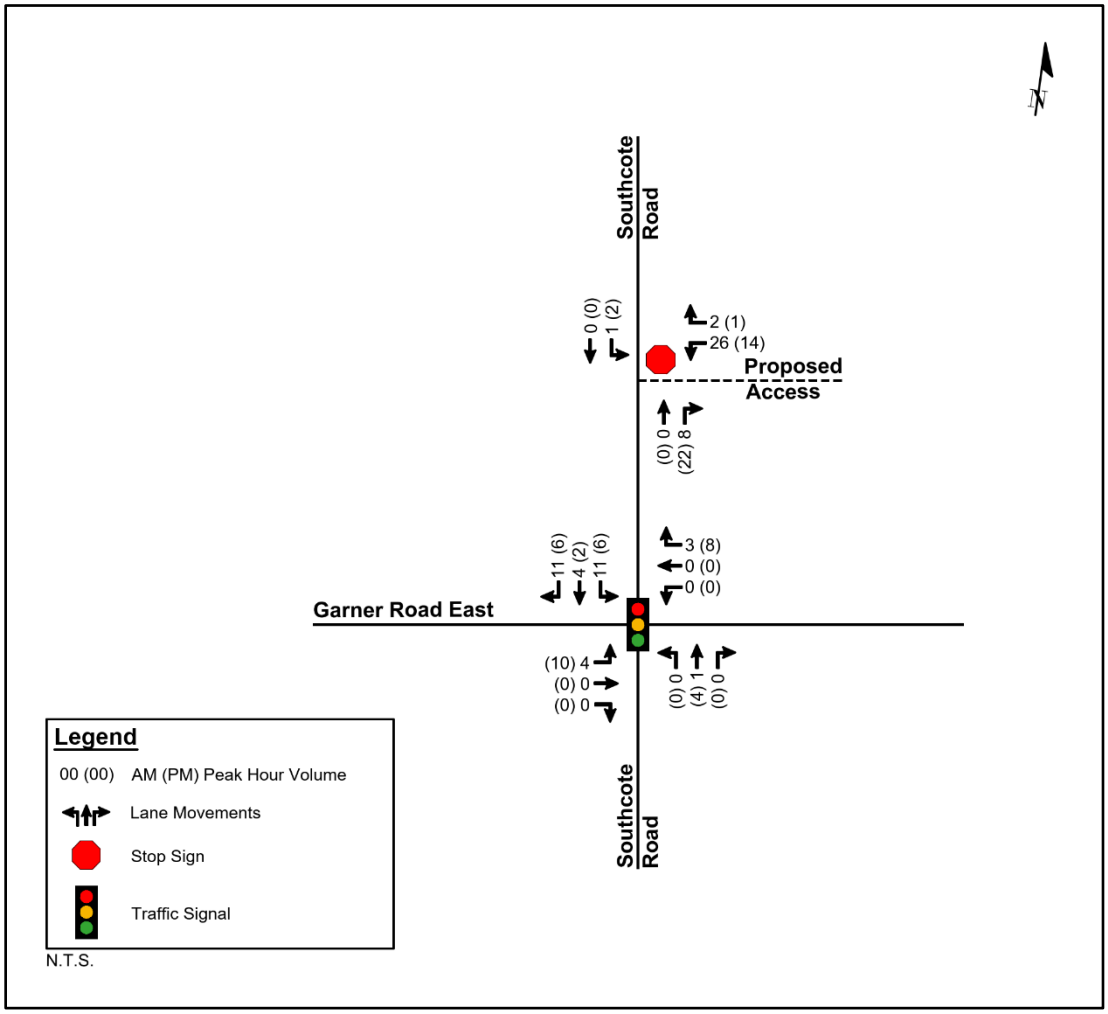
4.2 Trip Distribution and Assignment

Trip distribution and assignment were derived from the existing traffic patterns, the available road network, and the expected origin and destination of residents. The estimated distribution of site trips is outlined in Table 2 and illustrated in Figure 5.

Table 2: Site Trip Distribution

To / From	Via	Distribution
North	Southcote Road	7%
South	Southcote Road	15%
West	Garner Road East	40%
East	Garner Road East	38%
	Total	**100%**

Figure 5: Site Traffic Figure

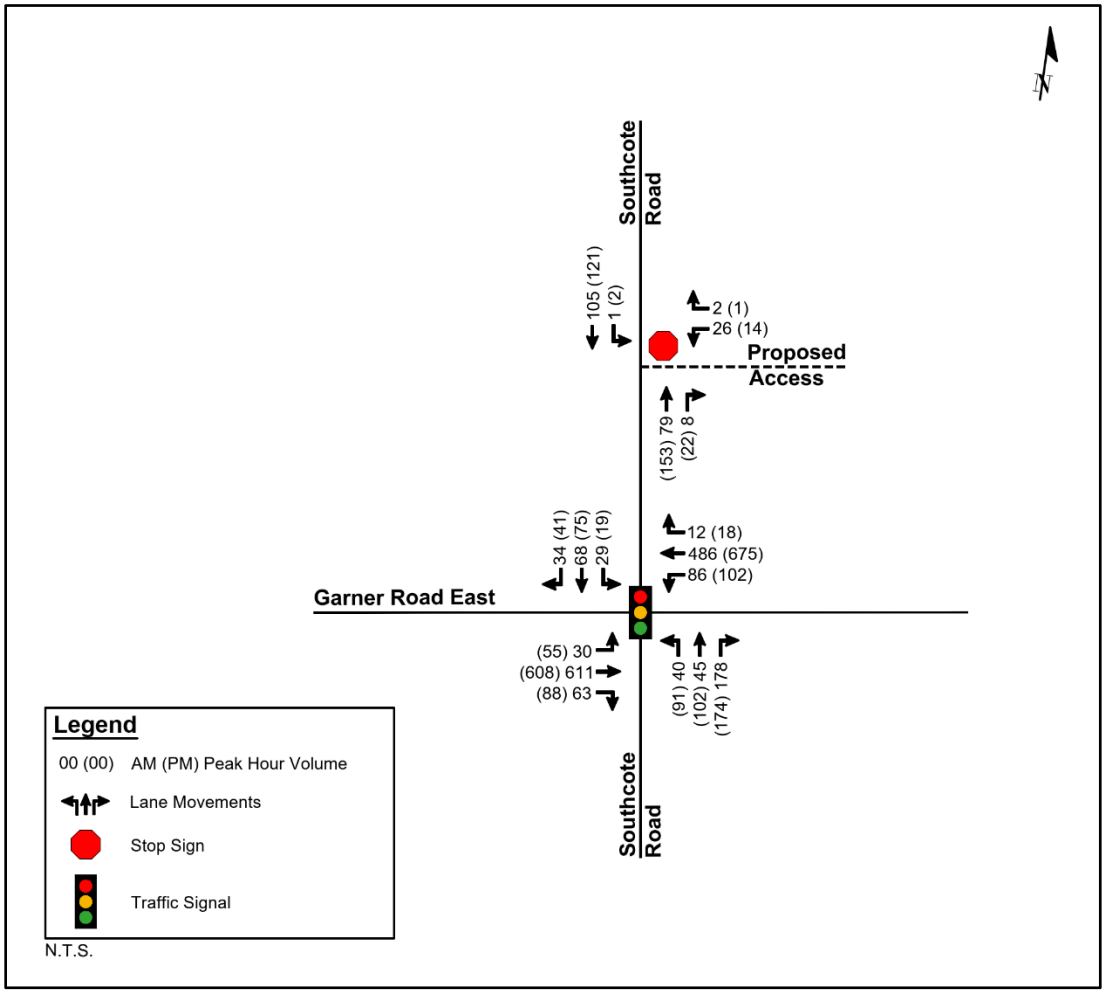


5.0 Total Traffic Conditions

5.1 Total Traffic Volumes

Total traffic volumes consist of the background traffic volumes (i.e., existing volumes plus annual growth to 2029) with the addition of the site trips. The resulting 2029 total traffic volumes are shown in Figure 6.

Figure 6: Total Traffic Volumes



6.0 Traffic Operations Analysis

Traffic operational analysis was conducted under existing and future traffic conditions for the weekday a.m. and p.m. peak hours at all study intersections. Queueing was reviewed using Synchro's 95th percentile queue. Comparisons of the existing storage and projected queue are also summarized. Detailed Synchro reports are provided in Appendices B through D.

Due to ongoing Information Technology (IT) security issues during the time of the analysis, existing signal timing parameters were unable to be obtained directly from the City. Therefore, for the purposes of this analysis, the signal timing parameters have been based on the input data for future signals as outlined in the City of Hamilton Traffic Impact Study Guidelines and further verified through a field visit.

6.1 Garner Road East / Southcote Road

Existing and future traffic operations for the intersection of Garner Road and Southcote Road are summarized in Table 3.

Table 3: Operational Analysis for Garner Road East / Southcote Road

Movement	Existing Storage / Link Distance (m)	Weekday A.M. Peak Hour			Weekday P.M. Peak Hour		
		v/c	LOS (delay, sec)	95th Queue (m)	v/c	LOS (delay, sec)	95th Queue (m)
Existing Conditions							
EBL	93	0.06	A (4.8)	3.0	0.13	A (7.0)	5.7
EBTR	100+	0.33	A (5.7)	26.4	0.32	A (6.4)	33.5
WBL	98	0.23	A (8.6)	14.9	0.27	B (10.7)	20.0
WBT	100+	0.54	B (11.2)	70.1	0.70	B (16.5)	138.3
WBR	68	0.01	A (6.3)	0.0	0.01	A (7.7)	0.0
NBL	28	0.20	C (23.8)	11.1	0.37	C (24.3)	20.4
NBTR	100+	0.30	C (24.4)	19.1	0.55	C (26.3)	36.2
SBL	20	0.15	C (23.7)	6.6	0.08	C (22.2)	5.2
SBTR	100+	0.26	C (24.1)	16.6	0.24	C (23.1)	18.6
Future Background Conditions							
EBL	93	0.07	A (5.4)	3.6	0.17	A (8.5)	6.5
EBTR	100+	0.37	A (6.3)	33.5	0.36	A (7.0)	40.4
WBL	98	0.28	A (9.7)	18.1	0.32	B (12.1)	24.0
WBT	100+	0.60	B (12.7)	87.0	0.79	C (20.1)	166.7
WBR	68	0.01	A (6.6)	0.0	0.01	A (8.0)	0.0
NBL	28	0.22	C (23.7)	11.9	0.39	C (24.2)	22.2
NBTR	100+	0.45	C (25.4)	26.3	0.61	C (27.5)	41.4
SBL	20	0.18	C (23.7)	7.0	0.10	C (22.0)	5.4
SBTR	100+	0.28	C (24.0)	17.9	0.26	C (23.0)	20.1
Future Total Conditions							
EBL	93	0.08	A (5.4)	4.0	0.22	A (8.8)	7.7
EBTR	100+	0.37	A (6.3)	33.8	0.37	A (7.1)	41.1
WBL	98	0.28	A (9.8)	18.3	0.33	B (12.2)	24.3
WBT	100+	0.60	B (12.8)	87.5	0.79	C (20.5)	168.6
WBR	68	0.01	A (6.7)	0.0	0.01	A (8.2)	0.0
NBL	28	0.22	C (23.7)	11.9	0.39	C (24.1)	22.2
NBTR	100+	0.45	C (25.4)	26.6	0.62	C (27.9)	42.8
SBL	20	0.29	C (24.8)	10.1	0.14	C (22.3)	7.2
SBTR	100+	0.32	C (24.2)	19.6	0.28	B (23.0)	21.1

Under existing and future traffic conditions, all movements are forecast to operate with excess capacity with a LOS C or better and delays under 26.0 seconds. Existing queues and projected queues are forecasted to be within the available storage.

6.2 Southcote Road / Proposed Driveway

The future traffic operations for the proposed driveway to the site along Southcote Road are summarized in Table 4.

Table 4: Operational Analysis for Southcote Road / Proposed Driveway

Movement	Storage / Link Distance (m)	Weekday A.M. Peak Hour			Weekday P.M. Peak Hour		
		v/c	LOS (delay, sec)	95th Queue (m)	v/c	LOS (delay, sec)	95th Queue (m)
WBLR	25	0.04	A (9.7)	0.9	0.02	B (10.3)	0.5
NBTR	90	0.06	A (0.0)	0.0	0.11	A (0.0)	0.0
SBLT	85	0.00	A (0.1)	0.0	0.00	A (0.1)	0.0

Under future total conditions, all movements at the intersection of Southcote Road and the site driveway are forecast to operate with excess capacity with a LOS B or better and delays under 11.0 seconds. Projected queues are and will be within the proposed storage.

7.0 Conclusions and Recommendations

Based on the analysis in this report, the main conclusions, and recommendations are as follows:

- The proposed development will consist of a 99-unit, seven-storey, 8,872 m^2 (95,497 ft^2) condominium apartment building with a two-level underground parking facility.
- It is forecast that the proposed residential development will generate only 37 vehicles per hour (two-way) during the weekday a.m. peak hour and 39 vehicles per hour during the weekday p.m. peak hour.
- Under existing and future traffic conditions, all movements are forecast to operate with excess capacity with a LOS C or better and delays under 26.0 seconds. Existing queues and projected queues are forecasted to be within the available storage.
- Under future total conditions, all movements at the intersection of Southcote Road and the site driveway are forecast to operate with excess capacity with a LOS B or better and delays under 11.0 seconds. Projected queues are and will be within the proposed storage.

R.J. Burnside & Associates Limited

Ethan McCaw
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EM:cr

Henry Centen, P.Eng.
Senior Transportation Engineer

Enclosures: Appendix A – Existing Traffic Counts
Appendix B – Existing Conditions Synchro Reports
Appendix C – Future Background Conditions Synchro Reports
Appendix D – Future Total Conditions Synchro Reports

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Appendix A

Existing Traffic Counts

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Peak Hour Diagram

Specified Period		One Hour Peak	
From:	07:00:00	From:	07:30:00
To:	09:00:00	To:	08:30:00

Intersection: Garner Rd E & Southcote Rd
Site Code: 2405400001
Count Date: Feb 21, 2024

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: Garner Rd E runs E/W

North Approach

	Out	In	Total
Cars	85	70	155
Trucks	10	1	11
Bicycles	0	1	1
	95	**72**	**167**

Southcote Rd

Bicycles	0	0	0	0
Trucks	3	3	4	0
Cars	18	55	12	0
Totals	**21**	**58**	**16**	**0**

Peds: 0

East Approach

	Out	In	Total
Cars	491	691	1182
Trucks	35	39	74
Bicycles	0	0	0
	526	**730**	**1256**

Garner Rd E

Bicycles	Trucks	Cars	Totals	
0	0	0	**0**	
0	0	24	**24**	
0	29	524	**553**	
0	1	56	**57**	

Peds: 0

Peds: 1

Garner Rd E

	Totals	Cars	Trucks	Bicycles
	0	0	0	0
	8	7	1	0
	440	407	33	0
	78	77	1	0

Peds: 0

West Approach

	Out	In	Total
Cars	604	460	1064
Trucks	30	37	67
Bicycles	0	0	0
	634	**497**	**1131**

Southcote Rd

Totals	**36**	**40**	**161**	**0**
Cars	35	39	155	0
Trucks	1	0	6	0
Bicycles	0	1	0	0

South Approach

	Out	In	Total
Cars	229	188	417
Trucks	7	5	12
Bicycles	1	0	1
	237	**193**	**430**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	15:00:00	From:	16:30:00
To:	18:00:00	To:	17:30:00

Intersection: Garner Rd E & Southcote Rd
Site Code: 2405400001
Count Date: Feb 21, 2024

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: Garner Rd E runs E/W

North Approach

	Out	In	Total
Cars	107	137	244
Trucks	2	2	4
Bicycles	1	0	1
	110	**139**	**249**

Southcote Rd

Bicycles	0	1	0	0
Trucks	1	1	0	0
Cars	31	64	12	0
Totals	**32**	**66**	**12**	**0**

East Approach

	Out	In	Total
Cars	705	709	1414
Trucks	7	12	19
Bicycles	0	0	0
	712	**721**	**1433**

Garner Rd E

Bicycles	Trucks	Cars	Totals
0	0	0	**0**
0	1	40	**41**
0	9	542	**551**
0	0	80	**80**

Peds: 0

Peds: 4

Peds: 5

Peds: 3

Garner Rd E

Totals	Cars	Trucks	Bicycles
0	0	0	0
9	9	0	0
611	604	7	0
92	92	0	0

West Approach

	Out	In	Total
Cars	662	716	1378
Trucks	10	9	19
Bicycles	0	0	0
	672	**725**	**1397**

Southcote Rd

Totals	**82**	**89**	**158**	**0**
Cars	81	88	155	0
Trucks	1	1	3	0
Bicycles	0	0	0	0

South Approach

	Out	In	Total
Cars	324	236	560
Trucks	5	1	6
Bicycles	0	1	1
	329	**238**	**567**

Cars - Trucks - Bicycles

Comments

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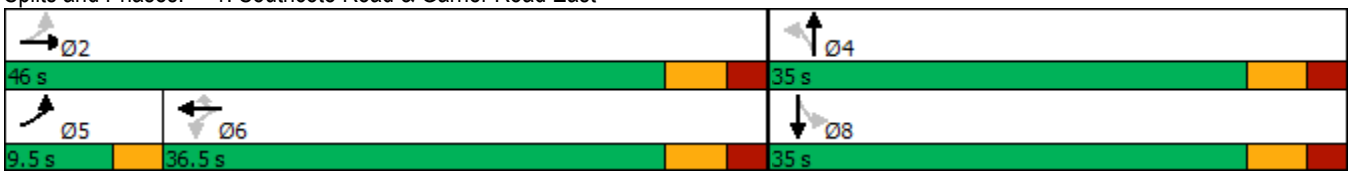
Appendix B

Existing Conditions Synchro Reports

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	24	553	78	440	8	36	40	16	58
Future Volume (vph)	24	553	78	440	8	36	40	16	58
Turn Type	pm+pt	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2		6			4		8
Permitted Phases	2		6		6	4		8	
Detector Phase	5	2	6	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	8.0	16.2	16.2	16.2	16.2	16.2	16.2	32.5	32.5
Total Split (s)	9.5	46.0	36.5	36.5	36.5	35.0	35.0	35.0	35.0
Total Split (%)	11.7%	56.8%	45.1%	45.1%	45.1%	43.2%	43.2%	43.2%	43.2%
Yellow Time (s)	3.0	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	0.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Lead/Lag	Lead		Lag	Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes	Yes				
Recall Mode	None	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	43.0	39.8	36.2	36.2	36.2	10.7	10.7	10.7	10.7
Actuated g/C Ratio	0.68	0.63	0.58	0.58	0.58	0.17	0.17	0.17	0.17
v/c Ratio	0.05	0.34	0.23	0.52	0.01	0.20	0.56	0.15	0.30
Control Delay	3.8	5.9	10.7	12.2	0.0	24.8	12.4	25.1	20.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.8	5.9	10.7	12.2	0.0	24.8	12.4	25.1	20.7
LOS	A	A	B	B	A	C	B	C	C
Approach Delay		5.9		11.8			14.3		21.5
Approach LOS		A		B			B		C

Intersection Summary	
Cycle Length: 81	
Actuated Cycle Length: 62.9	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 10.3	Intersection LOS: B
Intersection Capacity Utilization 54.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Southcote Road & Garner Road East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	709	91	512	9	42	234	19	91
v/c Ratio	0.05	0.34	0.23	0.52	0.01	0.20	0.56	0.15	0.30
Control Delay	3.8	5.9	10.7	12.2	0.0	24.8	12.4	25.1	20.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.8	5.9	10.7	12.2	0.0	24.8	12.4	25.1	20.7
Queue Length 50th (m)	0.8	15.8	3.6	25.5	0.0	4.3	4.7	1.9	6.8
Queue Length 95th (m)	3.0	26.4	14.9	70.1	0.0	11.1	19.1	6.6	16.6
Internal Link Dist (m)		262.5		156.2			168.9		95.0
Turn Bay Length (m)	93.0		98.0		68.0	28.0		20.0	
Base Capacity (vph)	580	2086	399	978	830	570	811	340	765
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.34	0.23	0.52	0.01	0.07	0.29	0.06	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	553	57	78	440	8	36	40	161	16	58	21
Future Volume (vph)	24	553	57	78	440	8	36	40	161	16	58	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)	3.0	6.2		6.2	6.2	6.2	6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.88		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1745	3286		1728	1701	1382	1694	1549		1395	1643	
Flt Permitted	0.38	1.00		0.38	1.00	1.00	0.70	1.00		0.51	1.00	
Satd. Flow (perm)	691	3286		695	1701	1382	1245	1549		743	1643	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	28	643	66	91	512	9	42	47	187	19	67	24
RTOR Reduction (vph)	0	7	0	0	0	4	0	156	0	0	20	0
Lane Group Flow (vph)	28	702	0	91	512	5	42	78	0	19	71	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	0%	5%	2%	1%	8%	13%	3%	0%	4%	25%	5%	14%
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	41.6	41.6		36.2	36.2	36.2	10.7	10.7		10.7	10.7	
Effective Green, g (s)	41.6	41.6		36.2	36.2	36.2	10.7	10.7		10.7	10.7	
Actuated g/C Ratio	0.64	0.64		0.56	0.56	0.56	0.17	0.17		0.17	0.17	
Clearance Time (s)	3.0	6.2		6.2	6.2	6.2	6.2	6.2		6.2	6.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	483	2112		388	951	773	205	256		122	271	
v/s Ratio Prot	0.00	c0.21			c0.30			c0.05			0.04	
v/s Ratio Perm	0.04			0.13		0.00	0.03			0.03		
v/c Ratio	0.06	0.33		0.23	0.54	0.01	0.20	0.30		0.16	0.26	
Uniform Delay, d1	4.7	5.2		7.2	9.0	6.3	23.3	23.7		23.1	23.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.4		1.4	2.2	0.0	0.5	0.7		0.6	0.5	
Delay (s)	4.8	5.7		8.6	11.2	6.3	23.8	24.4		23.7	24.1	
Level of Service	A	A		A	B	A	C	C		C	C	
Approach Delay (s)		5.6			10.7			24.3			24.0	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	64.7	Sum of lost time (s)	15.4
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	72	0	0	95
Future Volume (Veh/h)	0	0	72	0	0	95
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	78	0	0	103
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			119			
pX, platoon unblocked						
vC, conflicting volume	181	78			78	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	181	78			78	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	813	988			1533	

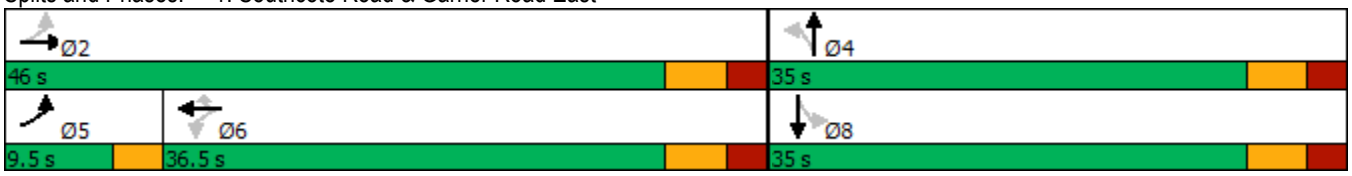
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	78	103
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1533
Volume to Capacity	0.00	0.05	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	8.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	41	551	92	611	9	82	89	12	66
Future Volume (vph)	41	551	92	611	9	82	89	12	66
Turn Type	pm+pt	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2		6			4		8
Permitted Phases	2		6		6	4		8	
Detector Phase	5	2	6	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	8.0	16.2	16.2	16.2	16.2	16.2	16.2	32.5	32.5
Total Split (s)	9.5	46.0	36.5	36.5	36.5	35.0	35.0	35.0	35.0
Total Split (%)	11.7%	56.8%	45.1%	45.1%	45.1%	43.2%	43.2%	43.2%	43.2%
Yellow Time (s)	3.0	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	0.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Lead/Lag	Lead		Lag	Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes	Yes				
Recall Mode	None	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	43.1	39.9	34.5	34.5	34.5	12.8	12.8	12.8	12.8
Actuated g/C Ratio	0.66	0.61	0.53	0.53	0.53	0.20	0.20	0.20	0.20
v/c Ratio	0.11	0.33	0.26	0.69	0.01	0.36	0.65	0.08	0.30
Control Delay	5.4	6.9	13.9	19.4	0.0	26.7	20.6	21.8	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.4	6.9	13.9	19.4	0.0	26.7	20.6	21.8	18.0
LOS	A	A	B	B	A	C	C	C	B
Approach Delay		6.8		18.4			22.2		18.4
Approach LOS		A		B			C		B

Intersection Summary	
Cycle Length: 81	
Actuated Cycle Length: 65.2	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 14.8	Intersection LOS: B
Intersection Capacity Utilization 64.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Southcote Road & Garner Road East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	45	686	100	664	10	89	269	13	107
v/c Ratio	0.11	0.33	0.26	0.69	0.01	0.36	0.65	0.08	0.30
Control Delay	5.4	6.9	13.9	19.4	0.0	26.7	20.6	21.8	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.4	6.9	13.9	19.4	0.0	26.7	20.6	21.8	18.0
Queue Length 50th (m)	1.4	16.2	6.6	59.2	0.0	9.4	15.8	1.3	7.5
Queue Length 95th (m)	5.7	33.5	20.0	#138.3	0.0	20.4	36.2	5.2	18.6
Internal Link Dist (m)		262.5		156.2			168.9		95.0
Turn Bay Length (m)	93.0		98.0		68.0	28.0		20.0	
Base Capacity (vph)	416	2065	379	962	865	551	784	360	768
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.33	0.26	0.69	0.01	0.16	0.34	0.04	0.14

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	551	80	92	611	9	82	89	158	12	66	32
Future Volume (vph)	41	551	80	92	611	9	82	89	158	12	66	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)	3.0	6.2		6.2	6.2	6.2	6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.90		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	3355		1743	1818	1561	1720	1613		1741	1693	
Flt Permitted	0.24	1.00		0.39	1.00	1.00	0.69	1.00		0.44	1.00	
Satd. Flow (perm)	437	3355		717	1818	1561	1246	1613		814	1693	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	599	87	100	664	10	89	97	172	13	72	35
RTOR Reduction (vph)	0	11	0	0	0	5	0	98	0	0	27	0
Lane Group Flow (vph)	45	675	0	100	664	5	89	171	0	13	80	0
Confl. Peds. (#/hr)			3	3			4		5	5		4
Heavy Vehicles (%)	2%	2%	0%	0%	1%	0%	1%	1%	2%	0%	2%	3%
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	41.2	41.2		34.5	34.5	34.5	12.8	12.8		12.8	12.8	
Effective Green, g (s)	41.2	41.2		34.5	34.5	34.5	12.8	12.8		12.8	12.8	
Actuated g/C Ratio	0.62	0.62		0.52	0.52	0.52	0.19	0.19		0.19	0.19	
Clearance Time (s)	3.0	6.2		6.2	6.2	6.2	6.2	6.2		6.2	6.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	342	2081		372	944	811	240	310		156	326	
v/s Ratio Prot	0.01	c0.20			c0.37			c0.11			0.05	
v/s Ratio Perm	0.07			0.14		0.00	0.07			0.02		
v/c Ratio	0.13	0.32		0.27	0.70	0.01	0.37	0.55		0.08	0.24	
Uniform Delay, d1	6.8	6.0		8.9	12.1	7.7	23.3	24.2		22.0	22.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.4		1.8	4.4	0.0	1.0	2.1		0.2	0.4	
Delay (s)	7.0	6.4		10.7	16.5	7.7	24.3	26.3		22.2	23.1	
Level of Service	A	A		B	B	A	C	C		C	C	
Approach Delay (s)		6.4			15.6			25.8			23.0	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	66.4	Sum of lost time (s)	15.4
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	139	0	0	110
Future Volume (Veh/h)	0	0	139	0	0	110
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	151	0	0	120
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			119			
pX, platoon unblocked						
vC, conflicting volume	271	151			151	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	271	151			151	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	723	901			1442	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	151	120
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1442
Volume to Capacity	0.00	0.09	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	10.6%	ICU Level of Service	A
Analysis Period (min)	15		

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

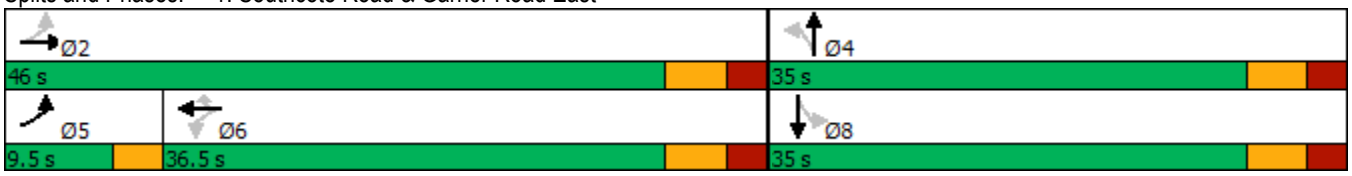
Appendix C

Future Background Conditions Synchro Reports

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	26	611	86	486	9	40	44	18	64
Future Volume (vph)	26	611	86	486	9	40	44	18	64
Turn Type	pm+pt	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2		6			4		8
Permitted Phases	2		6		6	4		8	
Detector Phase	5	2	6	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	8.0	16.2	16.2	16.2	16.2	16.2	16.2	32.5	32.5
Total Split (s)	9.5	46.0	36.5	36.5	36.5	35.0	35.0	35.0	35.0
Total Split (%)	11.7%	56.8%	45.1%	45.1%	45.1%	43.2%	43.2%	43.2%	43.2%
Yellow Time (s)	3.0	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	0.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Lead/Lag	Lead		Lag	Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes	Yes				
Recall Mode	None	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	43.1	39.9	36.3	36.3	36.3	11.6	11.6	11.6	11.6
Actuated g/C Ratio	0.67	0.62	0.57	0.57	0.57	0.18	0.18	0.18	0.18
v/c Ratio	0.06	0.38	0.27	0.59	0.01	0.21	0.62	0.17	0.32
Control Delay	4.3	6.7	12.5	14.5	0.0	24.4	16.7	25.4	20.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.3	6.7	12.5	14.5	0.0	24.4	16.7	25.4	20.5
LOS	A	A	B	B	A	C	B	C	C
Approach Delay		6.7		14.0			17.9		21.3
Approach LOS		A		B			B		C

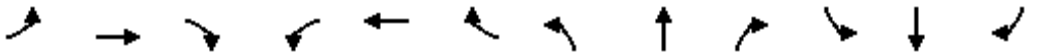
Intersection Summary	
Cycle Length: 81	
Actuated Cycle Length: 63.9	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 12.0	Intersection LOS: B
Intersection Capacity Utilization 58.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Southcote Road & Garner Road East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	30	783	100	565	10	47	258	21	101
v/c Ratio	0.06	0.38	0.27	0.59	0.01	0.21	0.62	0.17	0.32
Control Delay	4.3	6.7	12.5	14.5	0.0	24.4	16.7	25.4	20.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.3	6.7	12.5	14.5	0.0	24.4	16.7	25.4	20.5
Queue Length 50th (m)	0.9	18.2	4.1	29.3	0.0	4.8	9.9	2.1	7.8
Queue Length 95th (m)	3.6	33.5	18.1	87.0	0.0	11.9	26.3	7.0	17.9
Internal Link Dist (m)		262.5		156.2			168.9		95.0
Turn Bay Length (m)	93.0		98.0		68.0	28.0		20.0	
Base Capacity (vph)	528	2056	366	965	820	557	789	299	754
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.38	0.27	0.59	0.01	0.08	0.33	0.07	0.13

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	611	63	86	486	9	40	44	178	18	64	23
Future Volume (vph)	26	611	63	86	486	9	40	44	178	18	64	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)	3.0	6.2		6.2	6.2	6.2	6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.88		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1745	3286		1728	1701	1382	1694	1548		1395	1641	
Flt Permitted	0.33	1.00		0.36	1.00	1.00	0.69	1.00		0.45	1.00	
Satd. Flow (perm)	614	3286		646	1701	1382	1233	1548		664	1641	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	30	710	73	100	565	10	47	51	207	21	74	27
RTOR Reduction (vph)	0	7	0	0	0	4	0	134	0	0	21	0
Lane Group Flow (vph)	30	776	0	100	565	6	47	124	0	21	80	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	0%	5%	2%	1%	8%	13%	3%	0%	4%	25%	5%	14%
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	41.7	41.7		36.3	36.3	36.3	11.6	11.6		11.6	11.6	
Effective Green, g (s)	41.7	41.7		36.3	36.3	36.3	11.6	11.6		11.6	11.6	
Actuated g/C Ratio	0.63	0.63		0.55	0.55	0.55	0.18	0.18		0.18	0.18	
Clearance Time (s)	3.0	6.2		6.2	6.2	6.2	6.2	6.2		6.2	6.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	431	2085		356	939	763	217	273		117	289	
v/s Ratio Prot	0.00	c0.24			c0.33			c0.08			0.05	
v/s Ratio Perm	0.04			0.15		0.00	0.04			0.03		
v/c Ratio	0.07	0.37		0.28	0.60	0.01	0.22	0.45		0.18	0.28	
Uniform Delay, d1	5.3	5.7		7.8	9.9	6.6	23.2	24.2		23.0	23.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.5		2.0	2.9	0.0	0.5	1.2		0.7	0.5	
Delay (s)	5.4	6.3		9.7	12.7	6.6	23.7	25.4		23.7	24.0	
Level of Service	A	A		A	B	A	C	C		C	C	
Approach Delay (s)		6.2			12.2			25.1			23.9	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	65.7	Sum of lost time (s)	15.4
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	79	0	0	105
Future Volume (Veh/h)	0	0	79	0	0	105
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	86	0	0	114
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			119			
pX, platoon unblocked						
vC, conflicting volume	200	86			86	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	200	86			86	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	793	978			1523	

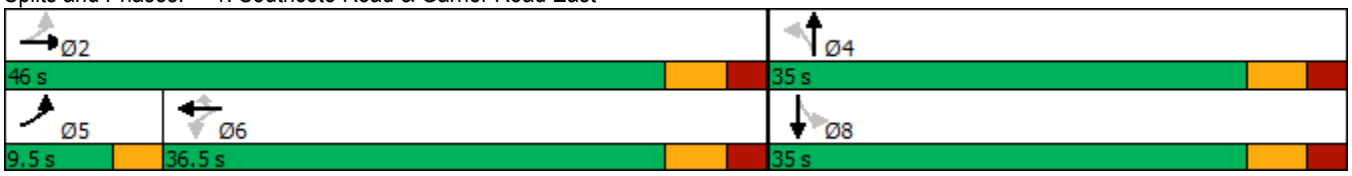
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	86	114
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1523
Volume to Capacity	0.00	0.05	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	8.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	45	608	102	675	10	91	98	13	73
Future Volume (vph)	45	608	102	675	10	91	98	13	73
Turn Type	pm+pt	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2		6			4		8
Permitted Phases	2		6		6	4		8	
Detector Phase	5	2	6	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	8.0	16.2	16.2	16.2	16.2	16.2	16.2	32.5	32.5
Total Split (s)	9.5	46.0	36.5	36.5	36.5	35.0	35.0	35.0	35.0
Total Split (%)	11.7%	56.8%	45.1%	45.1%	45.1%	43.2%	43.2%	43.2%	43.2%
Yellow Time (s)	3.0	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	0.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Lead/Lag	Lead		Lag	Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes	Yes				
Recall Mode	None	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	43.1	39.9	34.5	34.5	34.5	13.7	13.7	13.7	13.7
Actuated g/C Ratio	0.65	0.60	0.52	0.52	0.52	0.21	0.21	0.21	0.21
v/c Ratio	0.14	0.37	0.32	0.77	0.01	0.39	0.69	0.09	0.31
Control Delay	6.2	7.7	15.9	23.7	0.0	26.8	22.4	21.6	18.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.2	7.7	15.9	23.7	0.0	26.8	22.4	21.6	18.2
LOS	A	A	B	C	A	C	C	C	B
Approach Delay		7.6		22.4			23.5		18.6
Approach LOS		A		C			C		B

Intersection Summary	
Cycle Length: 81	
Actuated Cycle Length: 66.1	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 16.9	Intersection LOS: B
Intersection Capacity Utilization 69.5%	ICU Level of Service C
Analysis Period (min) 15	

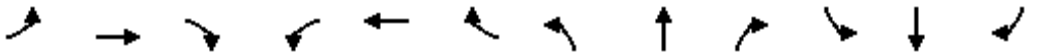
Splits and Phases: 1: Southcote Road & Garner Road East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	49	757	111	734	11	99	296	14	117
v/c Ratio	0.14	0.37	0.32	0.77	0.01	0.39	0.69	0.09	0.31
Control Delay	6.2	7.7	15.9	23.7	0.0	26.8	22.4	21.6	18.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.2	7.7	15.9	23.7	0.0	26.8	22.4	21.6	18.2
Queue Length 50th (m)	1.7	19.7	7.9	73.4	0.0	10.5	19.0	1.4	8.6
Queue Length 95th (m)	6.5	40.4	24.0	#166.7	0.0	22.2	41.4	5.4	20.1
Internal Link Dist (m)		262.5		156.2			168.9		95.0
Turn Bay Length (m)	93.0		98.0		68.0	28.0		20.0	
Base Capacity (vph)	355	2038	348	949	855	539	775	315	758
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.37	0.32	0.77	0.01	0.18	0.38	0.04	0.15

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	608	88	102	675	10	91	98	174	13	73	35
Future Volume (vph)	45	608	88	102	675	10	91	98	174	13	73	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)	3.0	6.2		6.2	6.2	6.2	6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.90		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	3355		1743	1818	1561	1720	1614		1741	1694	
Flt Permitted	0.19	1.00		0.36	1.00	1.00	0.68	1.00		0.40	1.00	
Satd. Flow (perm)	336	3355		669	1818	1561	1234	1614		724	1694	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	661	96	111	734	11	99	107	189	14	79	38
RTOR Reduction (vph)	0	11	0	0	0	5	0	97	0	0	26	0
Lane Group Flow (vph)	49	746	0	111	734	6	99	199	0	14	91	0
Confl. Peds. (#/hr)			3	3			4		5	5		4
Heavy Vehicles (%)	2%	2%	0%	0%	1%	0%	1%	1%	2%	0%	2%	3%
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	41.2	41.2		34.5	34.5	34.5	13.7	13.7		13.7	13.7	
Effective Green, g (s)	41.2	41.2		34.5	34.5	34.5	13.7	13.7		13.7	13.7	
Actuated g/C Ratio	0.61	0.61		0.51	0.51	0.51	0.20	0.20		0.20	0.20	
Clearance Time (s)	3.0	6.2		6.2	6.2	6.2	6.2	6.2		6.2	6.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	281	2053		342	931	800	251	328		147	344	
v/s Ratio Prot	0.01	c0.22			c0.40			c0.12			0.05	
v/s Ratio Perm	0.10			0.17		0.00	0.08			0.02		
v/c Ratio	0.17	0.36		0.32	0.79	0.01	0.39	0.61		0.10	0.26	
Uniform Delay, d1	8.2	6.5		9.6	13.4	8.0	23.2	24.3		21.8	22.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.5		2.5	6.7	0.0	1.0	3.2		0.3	0.4	
Delay (s)	8.5	7.0		12.1	20.1	8.0	24.2	27.5		22.0	23.0	
Level of Service	A	A		B	C	A	C	C		C	C	
Approach Delay (s)		7.1			18.9			26.7			22.9	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	67.3	Sum of lost time (s)	15.4
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	153	0	0	121
Future Volume (Veh/h)	0	0	153	0	0	121
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	166	0	0	132
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			119			
pX, platoon unblocked						
vC, conflicting volume	298	166			166	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	298	166			166	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	698	884			1424	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	166	132
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1424
Volume to Capacity	0.00	0.10	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.4%	ICU Level of Service	A
Analysis Period (min)	15		

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

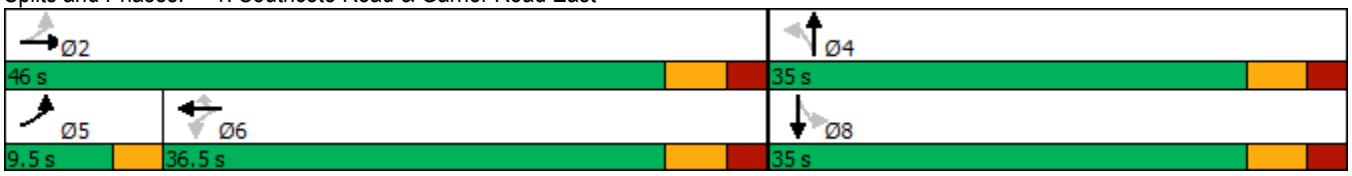
Appendix D

Future Total Conditions Synchro Reports

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	30	611	86	486	12	40	45	29	68
Future Volume (vph)	30	611	86	486	12	40	45	29	68
Turn Type	pm+pt	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2		6			4		8
Permitted Phases	2		6		6	4		8	
Detector Phase	5	2	6	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	8.0	16.2	16.2	16.2	16.2	16.2	16.2	32.5	32.5
Total Split (s)	9.5	46.0	36.5	36.5	36.5	35.0	35.0	35.0	35.0
Total Split (%)	11.7%	56.8%	45.1%	45.1%	45.1%	43.2%	43.2%	43.2%	43.2%
Yellow Time (s)	3.0	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	0.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Lead/Lag	Lead		Lag	Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes	Yes				
Recall Mode	None	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	43.1	39.9	36.3	36.3	36.3	11.7	11.7	11.7	11.7
Actuated g/C Ratio	0.67	0.62	0.57	0.57	0.57	0.18	0.18	0.18	0.18
v/c Ratio	0.07	0.38	0.27	0.59	0.02	0.21	0.62	0.28	0.37
Control Delay	4.4	6.8	12.5	14.6	0.0	24.4	16.7	28.7	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.4	6.8	12.5	14.6	0.0	24.4	16.7	28.7	20.0
LOS	A	A	B	B	A	C	B	C	C
Approach Delay		6.7		14.0			17.9		22.0
Approach LOS		A		B			B		C

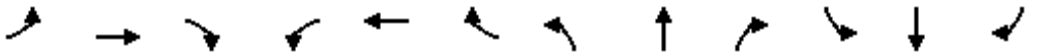
Intersection Summary	
Cycle Length: 81	
Actuated Cycle Length: 64	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 12.2	Intersection LOS: B
Intersection Capacity Utilization 67.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Southcote Road & Garner Road East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	35	783	100	565	14	47	259	34	119
v/c Ratio	0.07	0.38	0.27	0.59	0.02	0.21	0.62	0.28	0.37
Control Delay	4.4	6.8	12.5	14.6	0.0	24.4	16.7	28.7	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.4	6.8	12.5	14.6	0.0	24.4	16.7	28.7	20.0
Queue Length 50th (m)	1.0	18.2	4.1	29.3	0.0	4.8	10.0	3.5	8.7
Queue Length 95th (m)	4.0	33.8	18.3	87.5	0.0	11.9	26.6	10.1	19.6
Internal Link Dist (m)		262.5		156.2			168.9		95.0
Turn Bay Length (m)	93.0		98.0		68.0	28.0		20.0	
Base Capacity (vph)	528	2055	366	964	819	547	788	298	747
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.38	0.27	0.59	0.02	0.09	0.33	0.11	0.16

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	611	63	86	486	12	40	45	178	29	68	34
Future Volume (vph)	30	611	63	86	486	12	40	45	178	29	68	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)	3.0	6.2		6.2	6.2	6.2	6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.88		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1745	3286		1728	1701	1382	1694	1549		1395	1614	
Flt Permitted	0.33	1.00		0.36	1.00	1.00	0.68	1.00		0.45	1.00	
Satd. Flow (perm)	613	3286		646	1701	1382	1213	1549		662	1614	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	35	710	73	100	565	14	47	52	207	34	79	40
RTOR Reduction (vph)	0	7	0	0	0	6	0	134	0	0	29	0
Lane Group Flow (vph)	35	776	0	100	565	8	47	125	0	34	90	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	0%	5%	2%	1%	8%	13%	3%	0%	4%	25%	5%	14%
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	41.7	41.7		36.3	36.3	36.3	11.7	11.7		11.7	11.7	
Effective Green, g (s)	41.7	41.7		36.3	36.3	36.3	11.7	11.7		11.7	11.7	
Actuated g/C Ratio	0.63	0.63		0.55	0.55	0.55	0.18	0.18		0.18	0.18	
Clearance Time (s)	3.0	6.2		6.2	6.2	6.2	6.2	6.2		6.2	6.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	429	2082		356	938	762	215	275		117	286	
v/s Ratio Prot	0.00	c0.24			c0.33			c0.08			0.06	
v/s Ratio Perm	0.05			0.15		0.01	0.04			0.05		
v/c Ratio	0.08	0.37		0.28	0.60	0.01	0.22	0.45		0.29	0.32	
Uniform Delay, d1	5.3	5.8		7.8	9.9	6.7	23.1	24.2		23.5	23.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.5		2.0	2.9	0.0	0.5	1.2		1.4	0.6	
Delay (s)	5.4	6.3		9.8	12.8	6.7	23.7	25.4		24.8	24.2	
Level of Service	A	A		A	B	A	C	C		C	C	
Approach Delay (s)		6.3			12.2			25.1			24.3	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	65.8	Sum of lost time (s)	15.4
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	26	2	79	8	1	105
Future Volume (Veh/h)	26	2	79	8	1	105
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	2	86	9	1	114
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			119			
pX, platoon unblocked						
vC, conflicting volume	206	90			95	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	206	90			95	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	100			100	
cM capacity (veh/h)	786	973			1512	

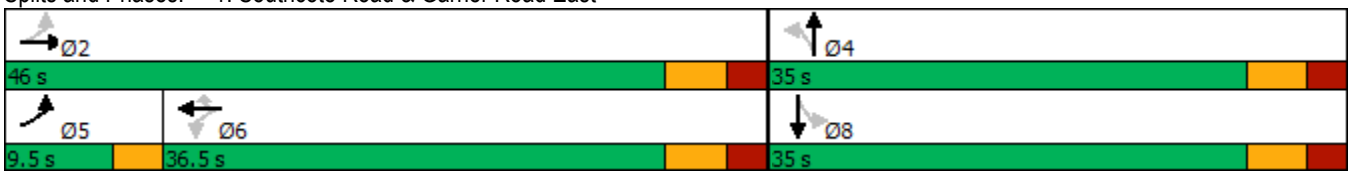
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	30	95	115
Volume Left	28	0	1
Volume Right	2	9	0
cSH	796	1700	1512
Volume to Capacity	0.04	0.06	0.00
Queue Length 95th (m)	0.9	0.0	0.0
Control Delay (s)	9.7	0.0	0.1
Lane LOS	A		A
Approach Delay (s)	9.7	0.0	0.1
Approach LOS	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	16.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	55	608	102	675	18	91	102	19	75
Future Volume (vph)	55	608	102	675	18	91	102	19	75
Turn Type	pm+pt	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2		6			4		8
Permitted Phases	2		6		6	4		8	
Detector Phase	5	2	6	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	8.0	16.2	16.2	16.2	16.2	16.2	16.2	32.5	32.5
Total Split (s)	9.5	46.0	36.5	36.5	36.5	35.0	35.0	35.0	35.0
Total Split (%)	11.7%	56.8%	45.1%	45.1%	45.1%	43.2%	43.2%	43.2%	43.2%
Yellow Time (s)	3.0	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	0.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Lead/Lag	Lead		Lag	Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes	Yes				
Recall Mode	None	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	43.2	40.0	34.5	34.5	34.5	14.0	14.0	14.0	14.0
Actuated g/C Ratio	0.65	0.60	0.52	0.52	0.52	0.21	0.21	0.21	0.21
v/c Ratio	0.17	0.37	0.32	0.78	0.02	0.38	0.69	0.14	0.33
Control Delay	6.6	7.8	16.1	24.2	0.1	26.5	23.1	22.6	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	7.8	16.1	24.2	0.1	26.5	23.1	22.6	17.9
LOS	A	A	B	C	A	C	C	C	B
Approach Delay		7.7		22.6			24.0		18.6
Approach LOS		A		C			C		B

Intersection Summary	
Cycle Length: 81	
Actuated Cycle Length: 66.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 17.1	Intersection LOS: B
Intersection Capacity Utilization 69.9%	ICU Level of Service C
Analysis Period (min) 15	

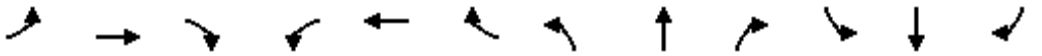
Splits and Phases: 1: Southcote Road & Garner Road East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	757	111	734	20	99	300	21	127
v/c Ratio	0.17	0.37	0.32	0.78	0.02	0.38	0.69	0.14	0.33
Control Delay	6.6	7.8	16.1	24.2	0.1	26.5	23.1	22.6	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	7.8	16.1	24.2	0.1	26.5	23.1	22.6	17.9
Queue Length 50th (m)	2.2	20.1	8.1	74.6	0.0	10.5	20.2	2.1	9.2
Queue Length 95th (m)	7.7	41.1	24.3	#168.6	0.0	22.2	42.8	7.2	21.1
Internal Link Dist (m)		262.5		156.2			168.9		95.0
Turn Bay Length (m)	93.0		98.0		68.0	28.0		20.0	
Base Capacity (vph)	351	2028	347	944	851	532	770	311	754
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.37	0.32	0.78	0.02	0.19	0.39	0.07	0.17

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	608	88	102	675	18	91	102	174	19	75	41
Future Volume (vph)	55	608	88	102	675	18	91	102	174	19	75	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)	3.0	6.2		6.2	6.2	6.2	6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.91		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	3355		1743	1818	1561	1720	1617		1741	1684	
Flt Permitted	0.18	1.00		0.36	1.00	1.00	0.68	1.00		0.39	1.00	
Satd. Flow (perm)	332	3355		669	1818	1561	1223	1617		716	1684	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	661	96	111	734	20	99	111	189	21	82	45
RTOR Reduction (vph)	0	11	0	0	0	10	0	93	0	0	30	0
Lane Group Flow (vph)	60	746	0	111	734	10	99	207	0	21	97	0
Confl. Peds. (#/hr)			3	3			4		5	5		4
Heavy Vehicles (%)	2%	2%	0%	0%	1%	0%	1%	1%	2%	0%	2%	3%
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	41.2	41.2		34.5	34.5	34.5	14.0	14.0		14.0	14.0	
Effective Green, g (s)	41.2	41.2		34.5	34.5	34.5	14.0	14.0		14.0	14.0	
Actuated g/C Ratio	0.61	0.61		0.51	0.51	0.51	0.21	0.21		0.21	0.21	
Clearance Time (s)	3.0	6.2		6.2	6.2	6.2	6.2	6.2		6.2	6.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	277	2044		341	927	796	253	334		148	348	
v/s Ratio Prot	0.01	c0.22			c0.40			c0.13			0.06	
v/s Ratio Perm	0.12			0.17		0.01	0.08			0.03		
v/c Ratio	0.22	0.37		0.33	0.79	0.01	0.39	0.62		0.14	0.28	
Uniform Delay, d1	8.4	6.6		9.7	13.6	8.2	23.1	24.4		21.9	22.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.5		2.5	6.9	0.0	1.0	3.6		0.4	0.4	
Delay (s)	8.8	7.1		12.2	20.5	8.2	24.1	27.9		22.3	23.0	
Level of Service	A	A		B	C	A	C	C		C	C	
Approach Delay (s)		7.3			19.1			27.0			22.9	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	67.6	Sum of lost time (s)	15.4
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	14	1	153	22	2	121
Future Volume (Veh/h)	14	1	153	22	2	121
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	1	166	24	2	132
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			119			
pX, platoon unblocked						
vC, conflicting volume	314	178			190	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	314	178			190	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	682	870			1396	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	16	190	134
Volume Left	15	0	2
Volume Right	1	24	0
cSH	691	1700	1396
Volume to Capacity	0.02	0.11	0.00
Queue Length 95th (m)	0.5	0.0	0.0
Control Delay (s)	10.3	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	10.3	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		19.4%	ICU Level of Service A
Analysis Period (min)		15	