



February 29, 2016

David Christa  
Chief Executive Officer  
Christa Development Corporation  
119 Victor Heights Pkwy.  
Victor, NY 14564

RE: Canandaigua Finger Lakes Resort – Canandaigua, NY  
Traffic Assessment Letter of Findings

Dear Mr. Christa,

McFarland Johnson, Inc. (MJ) has reviewed the existing and proposed traffic conditions associated with the Canandaigua Finger Lakes Resort development along with the previously approved traffic studies associated with this property and respectively submits this Letter of Findings. The intent of this letter is to analyze the impacts, if any, that the revised development may have on the existing roadway network and determine if the impacts vary from the previously approved traffic studies.

The parcel is located on Lakeshore Drive in the City of Canandaigua and is the last portion of the Rosepark development area which included park and mixed use development on the lake and lagoons back in 1989. Previous traffic studies were completed and approved for this parcel resulting in the approval of the current partially completed hotel facility, these studies include:

- The original “Village” portion of the Rosepark Development which proposed 70,000 square feet specialty retail, 15,000 square feet office, 125 room hotel with restaurant, lounge and conference facilities as well as 35 condominiums. Study completed by The Sear-Brown Group, Inc. in February 1989 and was part of the approved Environmental Impact Study (EIS).
- The Steamboat Landing Hotel and Conference Center traffic assessment which analyzed a 150 room hotel with conference facilities and site amenities and included analysis for provisions associated with special events. This traffic assessment was completed in 2009 by Stantec Inc. and approved by the City resulting in the current partially completed hotel structure.

This analysis is a revision and update to the Steamboat Landing Hotel and Conference Center traffic assessment as several components have changed since the prior study was completed; these include a new owner/developer with a new site plan, revised lodging uses, revised conference/banquet facilities and revised dining/entertainment facilities.

The proposed project includes a 208-room hotel, pool and fitness facilities, 8,864 square feet of conference room space, 4,250 square foot restaurant with 1,800 square foot outdoor patio, a lake side Tiki Bar and two event tents. As shown in the attached site plan in Figure 1, provided by McCord Landscape Architecture, access to the site is provided by two drives onto Lakeshore Drive. As depicted

in the site plan, 603 parking spaces within City owned lots and privately own parking lots/decks service the hotel resort and adjacent area attractions.

Lakeshore Drive currently has dedicated left turn lanes into both of the proposed site driveways and the west driveway also has an eastbound right turn lane into the site. Both driveways are proposed to have dual existing lanes and a single entrance lane, which are partially constructed today. The existing study area roadway geometry and intersection traffic control measures are shown in Figure 2.

### **2016 Background Traffic Volumes**

Background traffic volumes were established for this project by utilizing the counts performed/adjusted for the approved 2009 traffic assessment. These counts represented projections for typical June traffic along Lakeshore Drive as the area has a high seasonal variation. The 2009 background traffic volumes were not adjusted for annual background growth as NYSDOT historical traffic data in the area show traffic volumes have remained consistent since 2009, while some roads have seen slightly decreased volumes over the timeframe. It is believed that the background volumes provided in the 2009 report, which were seasonally adjusted by 30-45%, have conservatively estimated the existing 85<sup>th</sup> percentage traffic on the roadways.

### **Trip Distribution**

Development of a projected trip distribution model for this proposed project is based on existing traffic patterns along Lakeshore Drive. In general the study assumed that 55% of the proposed traffic will originate from the west and 45% will originate from the east, as shown in the attached Figure 4 - Trip Generation Volumes.

### **Trip Generation**

The proposed development will be completed in a single phase which includes the resort hotel and associated restaurant, conference amenities as well as the existing area attractions. For analysis purposes, site generated traffic was estimated using trip generation rates provided in the Institute of Transportation Engineers' (ITE) Trip Generation manual, 8th edition and based on the maximum number of seats/guests for the events land uses as shown in the Table 1 and distributed accordingly on Figure 4. ITE "Hotel" land use trip generation rates take into account typical conference and restaurant facilities within the hotel; however given the exterior conference and dining facilities along with the anticipated summer peak demand in the area, these specific trips were added to the typical hotel trips to be conservative. It was also conservatively assumed that the peak hours of trip generation for the events (conferences, weddings, The Canandaigua Lady cruises) would all simultaneously occur during the weekday evening and Saturday peaks.

Due to the nature of the proposed development, a multi-use credit was applied in the trip generation calculations. Multi-use accounts for vehicle trips which access the property and utilize multiple land uses, for examples: hotel guests eat at the restaurant, conference attendees stay at the hotel or Canandaigua Lady patrons stop at the Tiki Bar. A very conservative 25% multi-use credit was used when calculating the trip generation rates as it is not uncommon to see high multi-use percentages for similar facilities during their peak times of operations.

**Table 1 - Proposed Trip Generation**

Land Use	Units	Evening Peak			Saturday Peak		
		Enter	Exit	Total	Enter	Exit	Total
Trip Generation Based on Number of Rooms		0.313	0.277	0.590	0.403	0.317	0.720
Hotel (ITE Code 310)	208 rooms	65	58	123	84	66	150
Trip Generation Per 1,000 SF Gross Floor Area		5.018	2.472	7.490	6.384	4.436	10.820
Quality Restaurant (ITE Code 931)	6.05 KSF	30	15	45	39	27	65
Trip Generation Per 1,000 SF Gross Floor Area		5.306	2.734	8.040	5.387	2.653	8.040
Drinking Place (ITE Code 925)	1.5 KSF	8	4	12	8	4	12
Trip Generation Per Seat		0.280	0.070	0.350	0.293	0.158	0.450
Banquet/Conference Areas	1,040 seats	291	73	364	304	164	468
Trip Generation Per Maximum Guest Capacity		0.200	0.050	0.250	0.228	0.123	0.350
Canandaigua Lady	145 guests	29	7	36	33	18	51
<b>TOTAL BASE TRIPS</b>		<b>415</b>	<b>153</b>	<b>568</b>	<b>460</b>	<b>275</b>	<b>734</b>
MULTI-USE CREDIT 25% Reduction		-104	-38	-142	-115	-69	-184
<b>TOTAL SITE DRIVEWAY TRIPS</b>		<b>311</b>	<b>115</b>	<b>426</b>	<b>345</b>	<b>206</b>	<b>550</b>

\* Trip generation rates is based on ITE Trip Generation Manual 8th Edition for Trips Generated during the existing morning and evening peak hours at the study area intersection. To be conservative it was assumed that all land uses would have the same peak hour.

For SEQRA consistency, we reviewed the proposed traffic generated by the approved 1989 Rosepark EIS site plan for the same site which is shown on Figure 6. These approved EIS traffic volumes for the site were compared to the current Canandaigua Finger Lakes Resort development in Table 2 below, and on Figure 7. The current proposed development generates roughly 30% less traffic than the previously approved Rosepark Village development. The distribution of the site traffic is different as the travelling public's traffic patterns have changed over the past 27 years; however the overall traffic accessing the site will be less than previously project in the approved 1989 EIS.

**Table 2 - Trip Generation Comparison**

		1989 SEQR Approved Traffic Study	Proposed Canandaigua Lake Resort	Volume Difference	Percentage Difference
Trip Generation					
Evening Peak Hour	Entering	296	311	15	5%
	Exiting	318	115	-203	-64%
	<b>Total</b>	<b>614</b>	<b>426</b>	<b>-188</b>	<b>-31%</b>
Saturday Peak Hour	Entering	416	345	-71	-17%
	Exiting	390	206	-184	-47%
	<b>Total</b>	<b>806</b>	<b>551</b>	<b>-255</b>	<b>-32%</b>

## 2017 Proposed Traffic Volumes

Proposed traffic volumes shown in Figure 8 represent the 2016 background volumes combined with the additional estimated trips generated by the Canandaigua Finger Lakes Resort development.

### Capacity Analysis

A capacity analysis was performed using Synchro 8.0 traffic modeling software and the procedures defined in the 2010 Highway Capacity Manual to determine operating conditions for the 2016 Background and 2016 proposed scenarios. Synchro analysis printouts are attached to this letter for reference. The Level of Service Summary Table below shows the results of the capacity analysis as well as the capacity analysis results for the previous studies completed for this site.

**Table 3 – Level of Service**

Study Intersection	Approach and Movement		EVENING PEAK HOUR								SATURDAY PEAK HOUR							
			2016 Background		1989 Study Proposed	2009 Study		2016 Current Proposed		2016 Background		1989 Study Proposed	2009 Study		2016 Current Proposed			
			Delay	LOS	LOS	Delay	LOS	Delay	LOS	Delay	LOS	LOS	Delay	LOS	Delay	LOS		
Lakeshore Drive At Muar Street (Unsignalized)	Eastbound	L	8.5	a	a	8.4	a	8.4	a	8.5	a	a	8.7	a	8.6	a		
		T	0	a		0.0	a	0.0	a	0.0	a		0.0	a	0.0	a		
	Westbound	T	0	a	a	0.0	a	0.0	a	0.0	a	a	0.0	a	0.0	a		
		R	0	a		0.0	a	0.0	a	0.0	a		0.0	a	0.0	a		
	Southbound	L	24.2	c	e	28.2	d	44.2	e	28.7	d	e	35.0	e	47.6	e		
		R																
Lakeshore Drive At West Site Driveway (Unsignalized)	Eastbound	T	0	a	a	0.0	a	0.0	a	0.0	a	a	0.0	a	0.0	a		
		R	0	a		0.0	a	0.0	a	0.0	a		0.0	a	0.0	a		
	Westbound	L	8.8	a	a	10.3	b	9.5	a	8.6	a	a	10.0	b	9.3	a		
		T	0	a		0.0	a	0.0	a	0.0	a		0.0	a	0.0	a		
	Northbound	L	20.4	c	e	29.2	d	29.1	d	20.5	c	e	30.8	d	36.0	e		
		R	12.3	b	a	15.0	b	12.7	b	11.6	b	a	14.1	a	12.2	a		
Lakeshore Drive At East Site Driveway (Unsignalized)	Eastbound	T			a			0.0	a			a			0.0	a		
		R						0.0	a						0.0	a		
	Westbound	L			a			9.4	a			a			9.2	a		
		T						0.0	a						0.0	a		
	Northbound	L			c			31.1	d			d			32.9	d		
		R						13.4	b						13.1	b		

As shown in Table 3, the evening and Saturday peak hours will see some increases in delay for the southbound left turns from Muar Street onto Lakeshore Drive; however the increase in delay is comparable to those determined in the 1989 traffic study analysis. The Lakeshore Drive through movements will see no change in Level of Service (LOS) and negligible changes in delay. The proposed site driveway approaches will have comparable or improved levels of operation in comparison to the approved 1989 study results. The proposed driveway will have more delay than the background conditions existing in 2009 as there is much less traffic currently accessing the site than compared to the proposed conditions. Both of the proposed site driveways will operate at adequate levels of service during the typical peak hours of operation also referred to as the design traffic volumes which represent roughly the 85<sup>th</sup> percentile traffic volumes.

### Conclusion

Traffic generated by the proposed Canandaigua Finger Lake Resort development was conservatively calculated and is projected to generate around 30% less traffic than the previously approved Rosepark Village Mixed Use Development designed for the same site. The capacity analysis and the summary tables herein revealed that the proposed development will have a similar or less significant impact to the adjacent roadway traffic operations in comparison to the previously approved 1989 EIS. Although

the background traffic in the area has increase over the past 27 years, traffic models show similar levels of operations as those calculated in the original development's approval traffic study. The proposed site driveways are calculated to operate at adequate levels of operation for the design traffic volumes calculated.

Please do not hesitate to call should you require additional information or have any questions.

Sincerely yours,

McFARLAND-JOHNSON, INC.

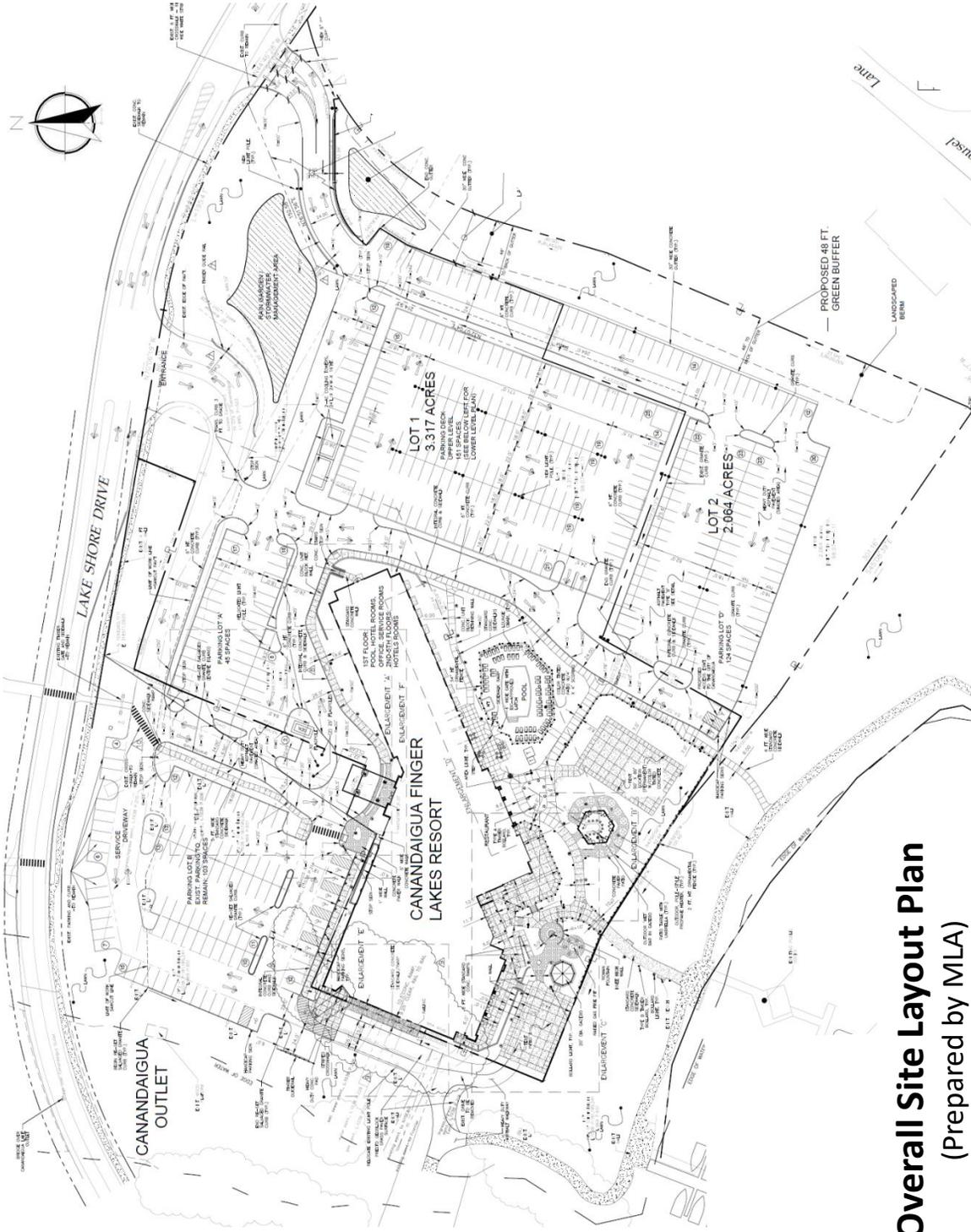


Adam J. Frosino, PE  
Project Manager

Cc. Doug C. McCord, McCord Landscape Architecture  
Jerry Goldman, Woods Oviatt Gilman

*References:*

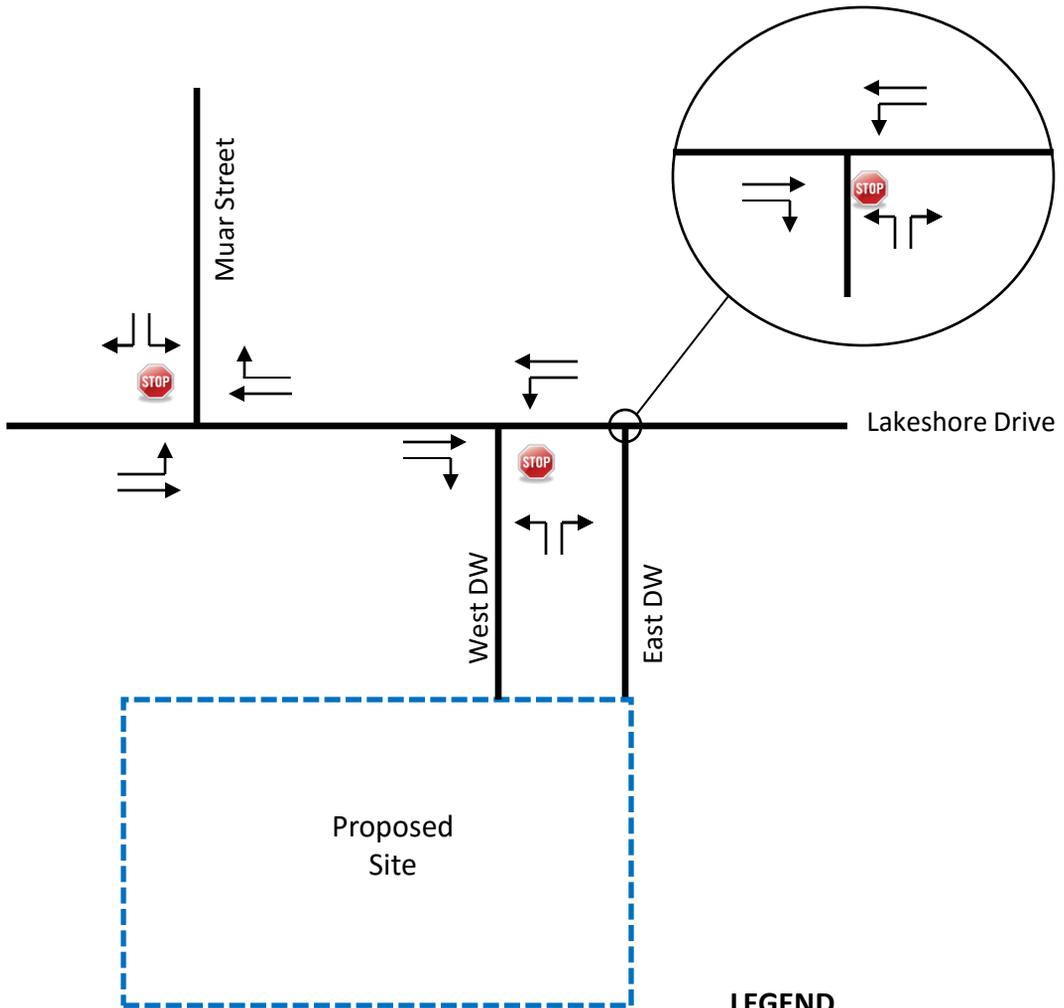
- *Trip Generation, Eighth Edition. Institute of Transportation Engineers. Washington, D.C. 2012.*
- *Trip Generation Handbook, Second Edition. Institute of Transportation Engineers. Washington, D.C. June 2004.*
- *Highway Capacity Manual 2010, Fifth Edition. Transportation Research Board. National Research Council, Washington, D.C. 2010.*
- *Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD). Federal Highway Administration. 2009.*
- "Draft Environmental Impact Statement for Rosepark A Mixed-Use Development along Canandaigua Lake". Prepared by Clark Engineers & Associates. July 1989.
- "Traffic Analysis for Rosepark A Mixed-Use Development along Canandaigua Lake". Prepared by The Sear-Brown Group, Inc. February 1989.
- "Steamboat Landing – Traffic Assessment." Letter from Stantec Inc. to McCord Landscape Architecture. April 16, 2009



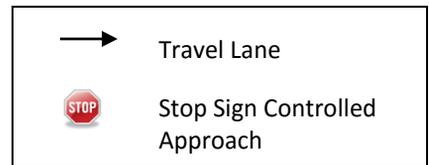
**Overall Site Layout Plan**  
 (Prepared by MLA)



Not to Scale



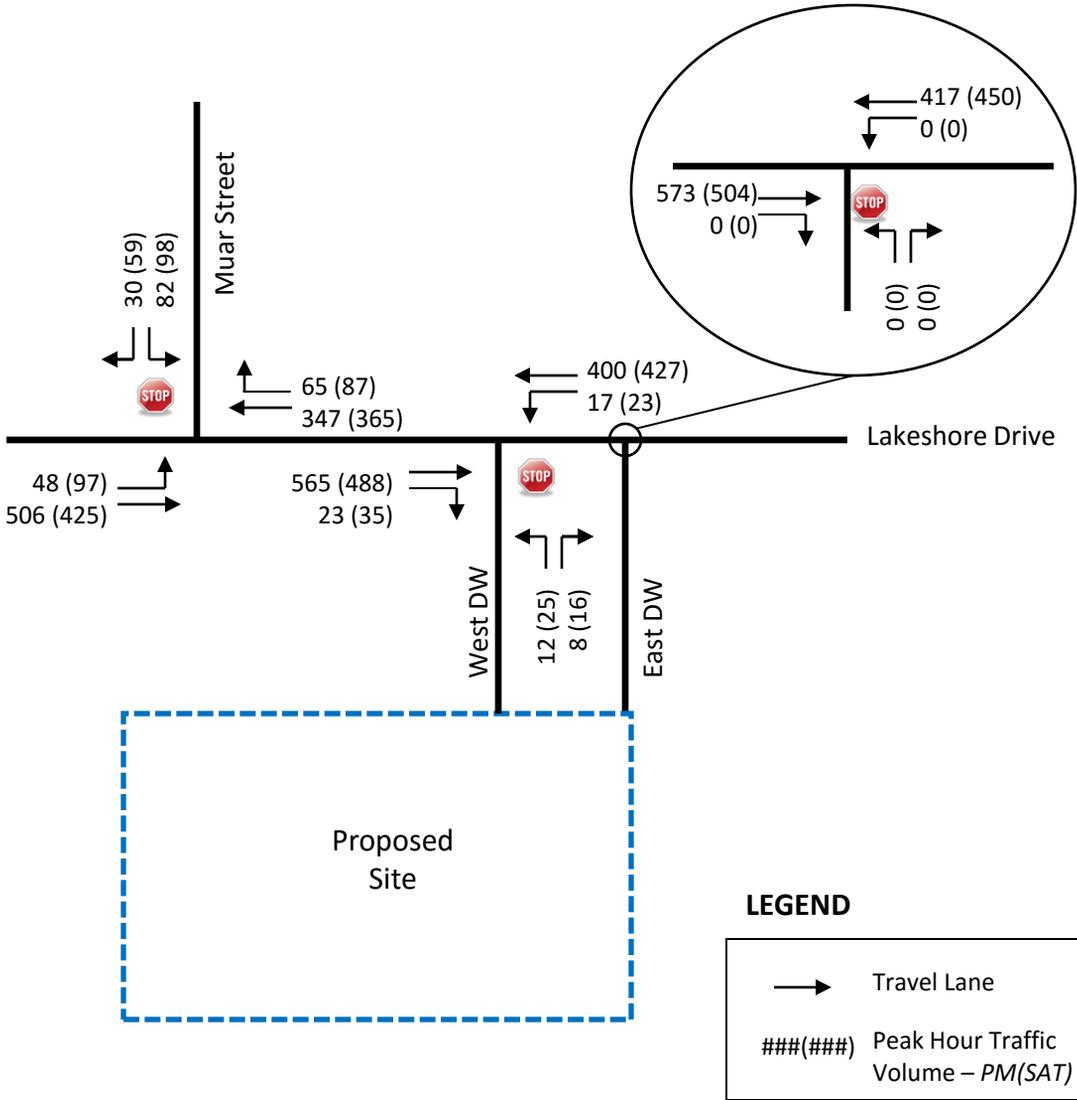
**LEGEND**



**Existing Intersection Geometry**



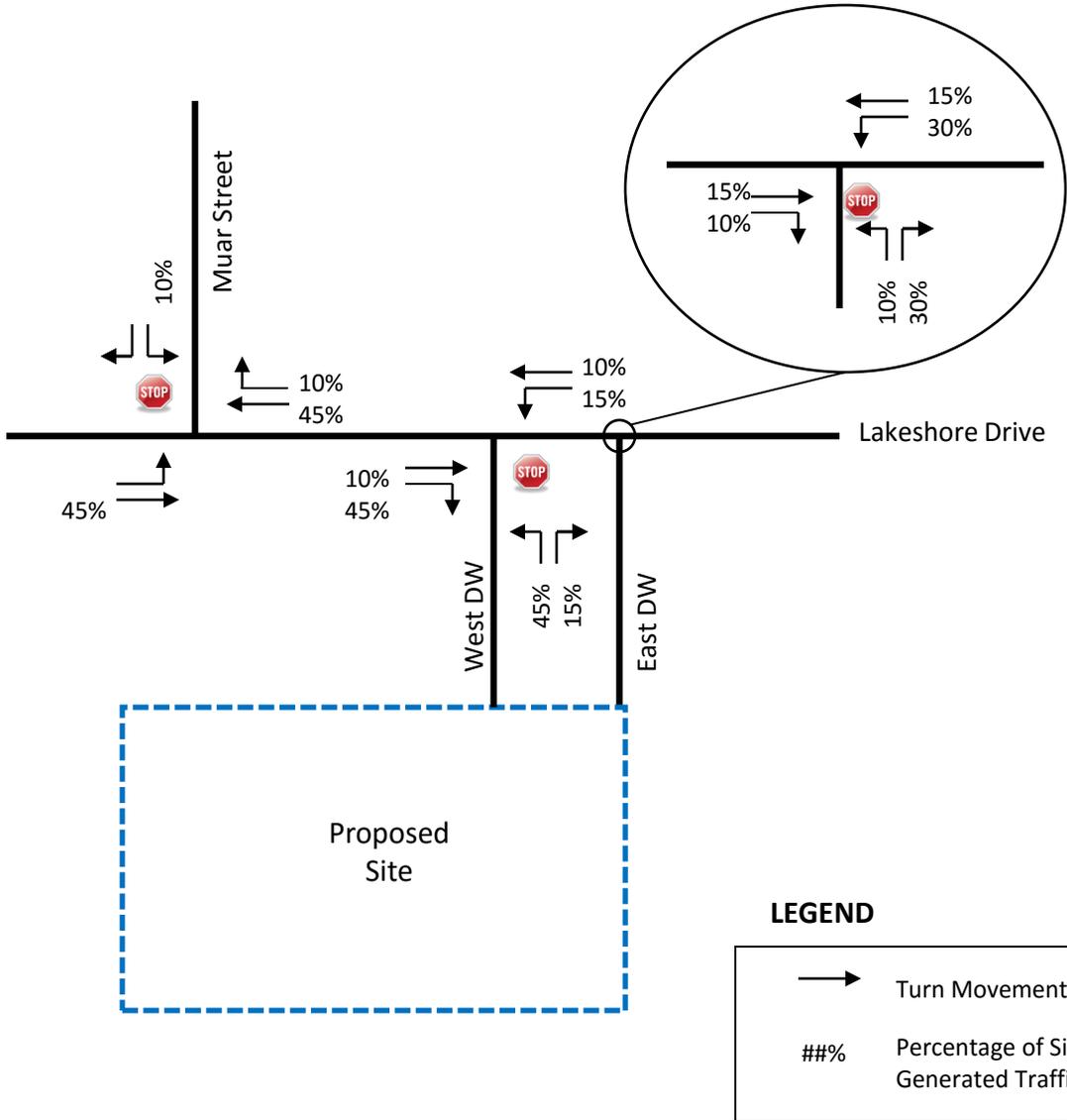
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**2016 Background Traffic Volumes**  
(Based on 2009 Report Background Traffic Volumes)



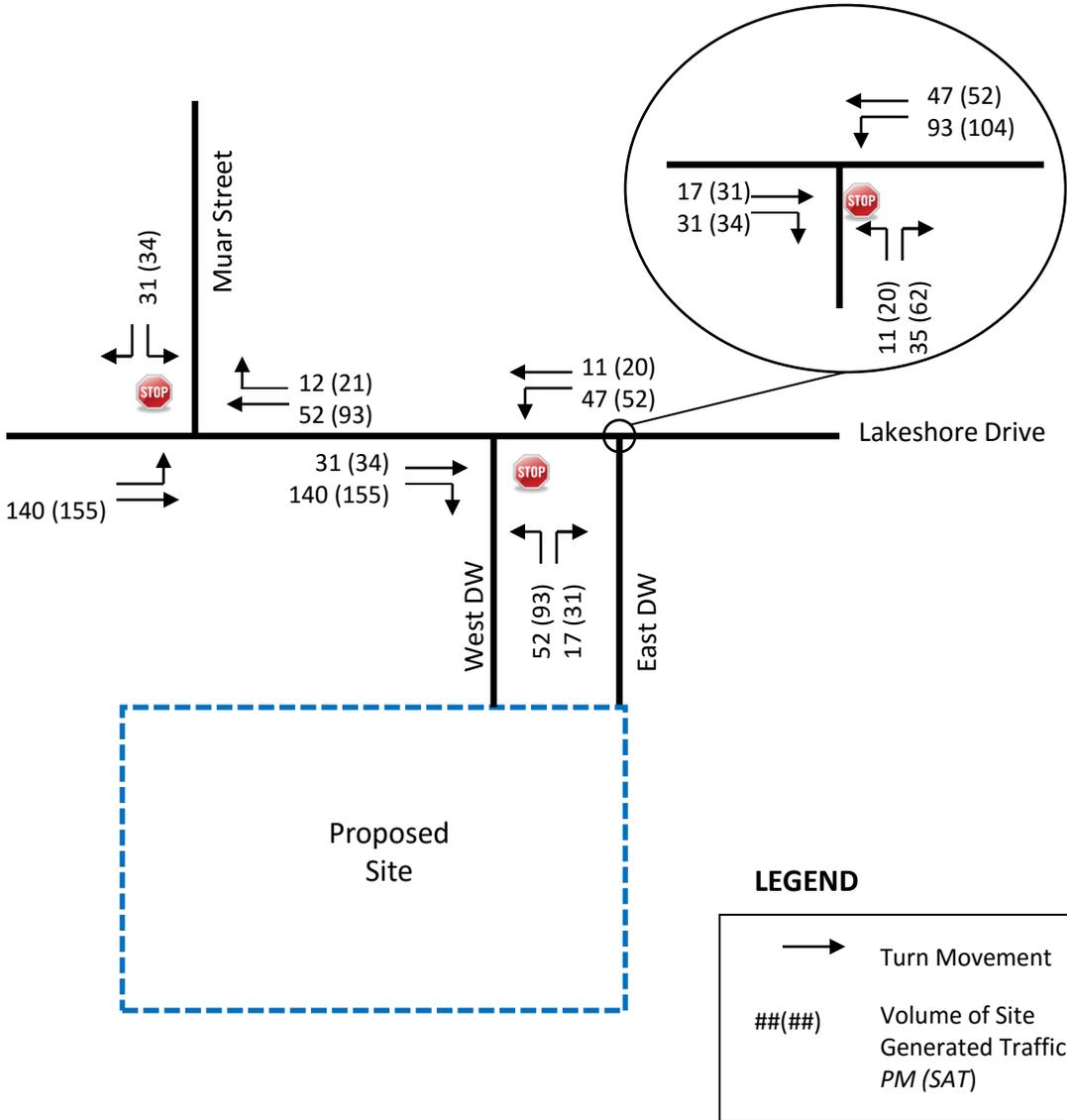
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## Proposed Trip Distribution



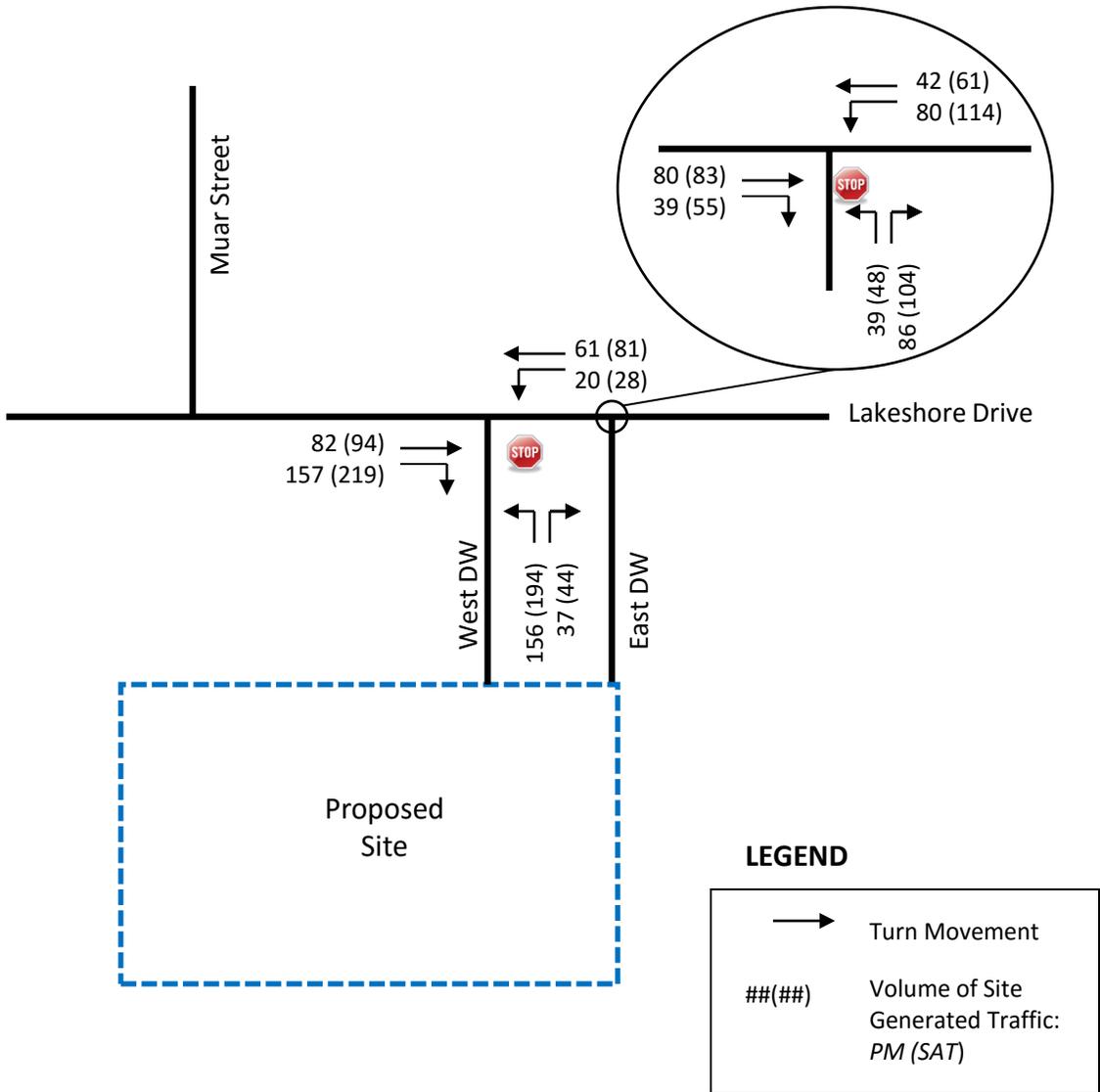
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**Proposed Trip Generation Volumes**



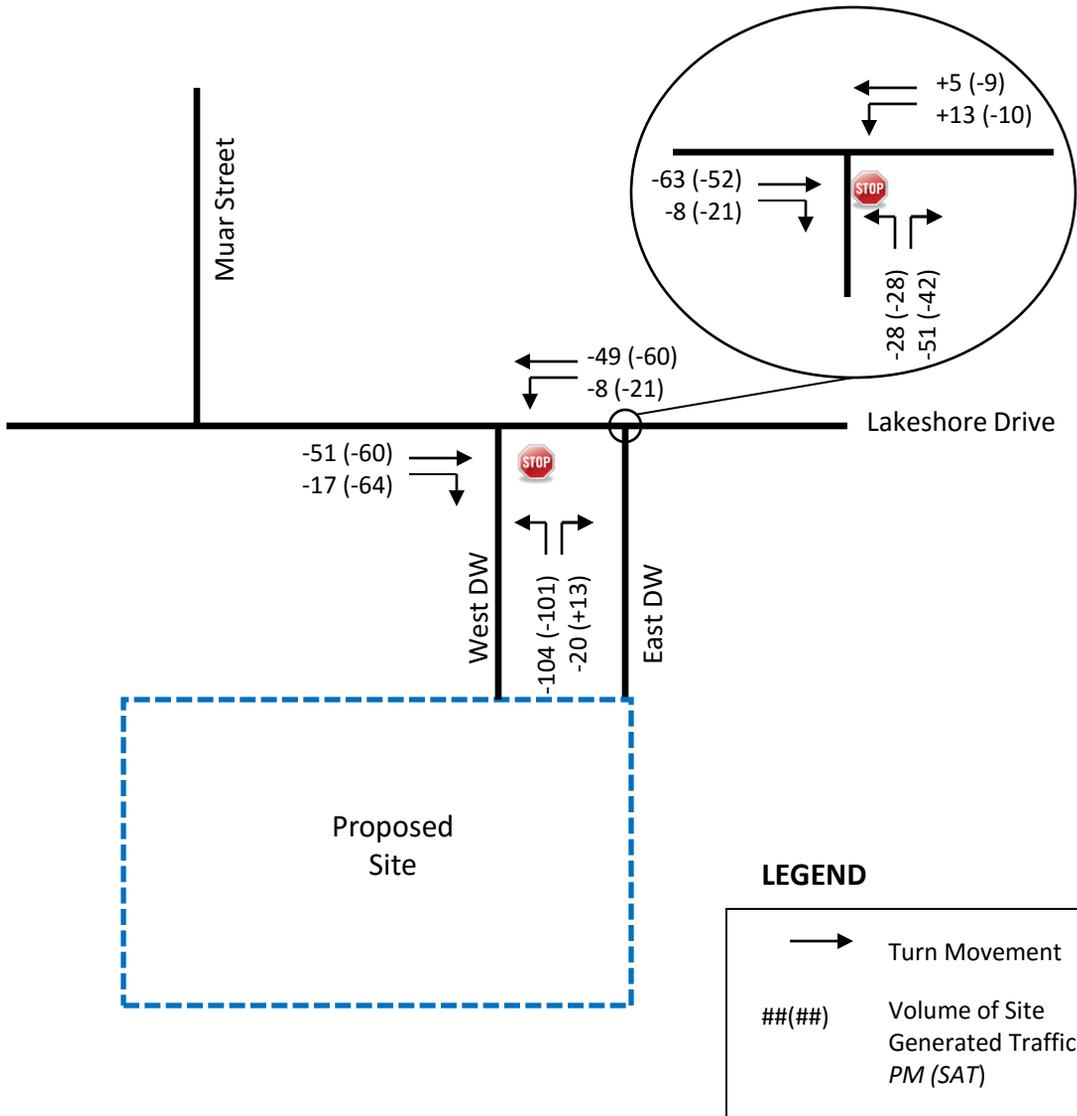
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## 1989 SEQR Approved Site Trip Generation Volumes



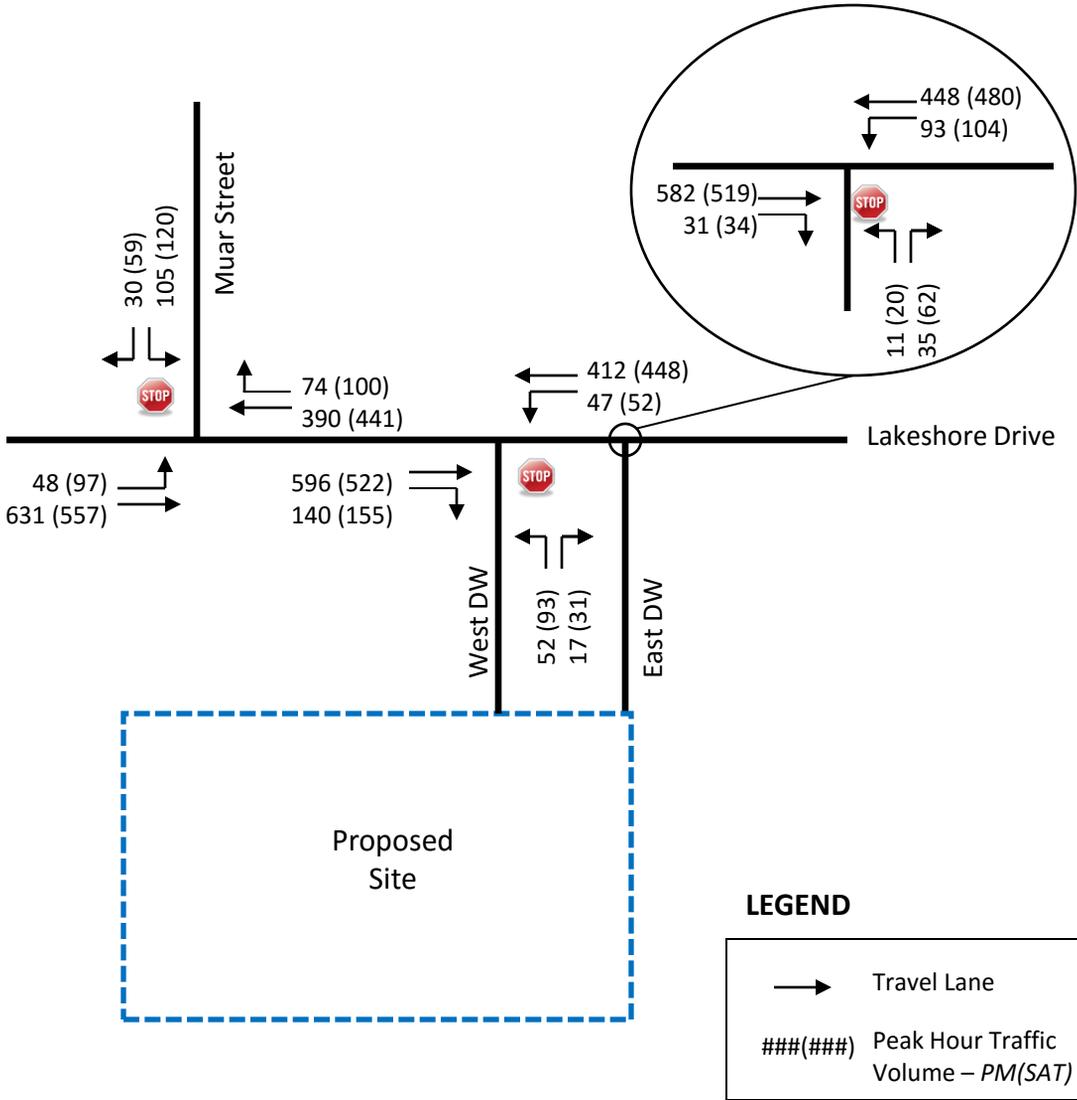
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**Trip Generation Difference**  
(Proposed Hotel Resort vs. 1989 SEQR Approved Site)



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**2016 Proposed Traffic Volumes**  
(Based on 2009 Report Background Traffic Volumes)

HCM Unsignalized Intersection Capacity Analysis  
 3: West Driveway & Lakeshore Drive

2016 Existing - PM  
 2/29/2016



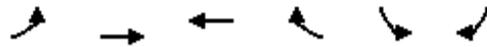
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (veh/h)	565	23	17	400	12	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	595	24	18	421	13	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			619		1052	595
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			619		1052	595
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		95	98
cM capacity (veh/h)			961		246	504

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	595	24	18	421	13	8
Volume Left	0	0	18	0	13	0
Volume Right	0	24	0	0	0	8
cSH	1700	1700	961	1700	246	504
Volume to Capacity	0.35	0.01	0.02	0.25	0.05	0.02
Queue Length 95th (ft)	0	0	1	0	4	1
Control Delay (s)	0.0	0.0	8.8	0.0	20.4	12.3
Lane LOS			A		C	B
Approach Delay (s)	0.0		0.4		17.1	
Approach LOS					C	

Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			39.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
5: Lakeshore Drive & Muar Street

2016 Existing - PM  
2/29/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↗	↖	↖	↖
Volume (veh/h)	48	506	347	65	82	30
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.85	0.85	0.86	0.86
Hourly flow rate (vph)	51	533	408	76	95	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						3
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	408				1042	408
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	408				1042	408
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				61	95
cM capacity (veh/h)	1151				243	643
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	51	533	408	76	130	
Volume Left	51	0	0	0	95	
Volume Right	0	0	0	76	35	
cSH	1151	1700	1700	1700	332	
Volume to Capacity	0.04	0.31	0.24	0.04	0.39	
Queue Length 95th (ft)	3	0	0	0	45	
Control Delay (s)	8.3	0.0	0.0	0.0	24.2	
Lane LOS	A				C	
Approach Delay (s)	0.7		0.0		24.2	
Approach LOS					C	
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization			37.8%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
3: West Driveway & Lakeshore Drive

2016 Existing - SAT  
2/29/2016



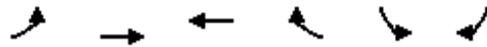
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↘	↑	↘	↗
Volume (veh/h)	488	35	23	427	25	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	514	37	24	449	26	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			551		1012	514
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			551		1012	514
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		90	97
cM capacity (veh/h)			1019		259	561

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	514	37	24	449	26	17
Volume Left	0	0	24	0	26	0
Volume Right	0	37	0	0	0	17
cSH	1700	1700	1019	1700	259	561
Volume to Capacity	0.30	0.02	0.02	0.26	0.10	0.03
Queue Length 95th (ft)	0	0	2	0	8	2
Control Delay (s)	0.0	0.0	8.6	0.0	20.5	11.6
Lane LOS			A		C	B
Approach Delay (s)	0.0		0.4		17.0	
Approach LOS					C	

Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			35.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
5: Lakeshore Drive & Muar Street

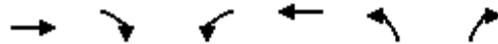
2016 Existing - SAT  
2/29/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↗	↖	↖	↖
Volume (veh/h)	97	425	365	87	98	59
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.84	0.84	0.94	0.94
Hourly flow rate (vph)	108	472	435	104	104	63
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						3
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	435				1122	435
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	435				1122	435
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				49	90
cM capacity (veh/h)	1125				206	621
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>	
Volume Total	108	472	435	104	167	
Volume Left	108	0	0	0	104	
Volume Right	0	0	0	104	63	
cSH	1125	1700	1700	1700	330	
Volume to Capacity	0.10	0.28	0.26	0.06	0.51	
Queue Length 95th (ft)	8	0	0	0	68	
Control Delay (s)	8.5	0.0	0.0	0.0	28.7	
Lane LOS	A				D	
Approach Delay (s)	1.6		0.0		28.7	
Approach LOS					D	
<b>Intersection Summary</b>						
Average Delay			4.5			
Intersection Capacity Utilization			40.0%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
3: West Driveway & Lakeshore Drive

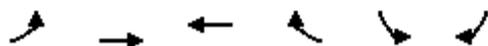
2016 Proposed - PM  
2/29/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (veh/h)	596	140	47	412	52	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	627	147	49	434	55	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			775		1160	627
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			775		1160	627
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		73	96
cM capacity (veh/h)			841		203	483
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	627	147	49	434	55	18
Volume Left	0	0	49	0	55	0
Volume Right	0	147	0	0	0	18
cSH	1700	1700	841	1700	203	483
Volume to Capacity	0.37	0.09	0.06	0.26	0.27	0.04
Queue Length 95th (ft)	0	0	5	0	26	3
Control Delay (s)	0.0	0.0	9.5	0.0	29.1	12.7
Lane LOS			A			B
Approach Delay (s)	0.0		1.0	25.1		
Approach LOS			D			
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			48.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
5: Lakeshore Drive & Muar Street

2016 Proposed - PM  
2/29/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	48	631	390	74	105	30
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.85	0.85	0.86	0.86
Hourly flow rate (vph)	51	664	459	87	122	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						3
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	459				1224	459
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	459				1224	459
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				35	94
cM capacity (veh/h)	1102				189	602
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>	
Volume Total	51	664	459	87	157	
Volume Left	51	0	0	0	122	
Volume Right	0	0	0	87	35	
cSH	1102	1700	1700	1700	243	
Volume to Capacity	0.05	0.39	0.27	0.05	0.65	
Queue Length 95th (ft)	4	0	0	0	100	
Control Delay (s)	8.4	0.0	0.0	0.0	44.2	
Lane LOS	A				E	
Approach Delay (s)	0.6		0.0		44.2	
Approach LOS					E	
<b>Intersection Summary</b>						
Average Delay			5.2			
Intersection Capacity Utilization			45.7%		ICU Level of Service	A
Analysis Period (min)			15			

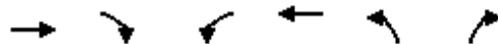
HCM Unsignalized Intersection Capacity Analysis  
 8: East Driveway & Lakeshore Drive

2016 Proposed - PM  
 2/29/2016

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	582	31	93	448	11	35
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	633	34	101	487	12	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			666		1339	649
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			666		1339	649
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			89		92	92
cM capacity (veh/h)			923		150	469
Direction, Lane #	SE 1	NW 1	NW 2	NE 1	NE 2	
Volume Total	666	101	487	12	38	
Volume Left	0	101	0	12	0	
Volume Right	34	0	0	0	38	
cSH	1700	923	1700	150	469	
Volume to Capacity	0.39	0.11	0.29	0.08	0.08	
Queue Length 95th (ft)	0	9	0	6	7	
Control Delay (s)	0.0	9.4	0.0	31.0	13.3	
Lane LOS		A		D	B	
Approach Delay (s)	0.0	1.6		17.6		
Approach LOS				C		
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			51.0%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 3: West Driveway & Lakeshore Drive

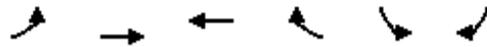
2016 Proposed - SAT  
 2/29/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (veh/h)	522	155	52	448	93	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	549	163	55	472	98	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			713	1131		549
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			713	1131		549
tC, single (s)			4.1	6.4		6.2
tC, 2 stage (s)						
tF (s)			2.2	3.5		3.3
p0 queue free %			94	54		94
cM capacity (veh/h)			887	211		535
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	549	163	55	472	98	33
Volume Left	0	0	55	0	98	0
Volume Right	0	163	0	0	0	33
cSH	1700	1700	887	1700	211	535
Volume to Capacity	0.32	0.10	0.06	0.28	0.46	0.06
Queue Length 95th (ft)	0	0	5	0	56	5
Control Delay (s)	0.0	0.0	9.3	0.0	36.0	12.2
Lane LOS			A			B
Approach Delay (s)	0.0		1.0		30.0	
Approach LOS					D	
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			46.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 5: Lakeshore Drive & Muar Street

2016 Proposed - SAT  
 2/29/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	97	557	441	100	120	59
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	1.00	0.92
Hourly flow rate (vph)	103	593	469	106	120	64
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						3
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	469				1268	469
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	469				1268	469
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				29	89
cM capacity (veh/h)	1092				168	594
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>	
Volume Total	103	593	469	106	184	
Volume Left	103	0	0	0	120	
Volume Right	0	0	0	106	64	
cSH	1092	1700	1700	1700	258	
Volume to Capacity	0.09	0.35	0.28	0.06	0.71	
Queue Length 95th (ft)	8	0	0	0	122	
Control Delay (s)	8.6	0.0	0.0	0.0	47.6	
Lane LOS	A				E	
Approach Delay (s)	1.3		0.0		47.6	
Approach LOS					E	
<b>Intersection Summary</b>						
Average Delay			6.6			
Intersection Capacity Utilization			45.2%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 8: East Driveway & Lakeshore Drive

2016 Proposed - SAT  
 2/29/2016



Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations	↩		↩	↩	↩	↩
Volume (veh/h)	519	34	104	480	20	62
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	564	37	113	522	22	67
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			601	1330	583	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			601	1330	583	
tC, single (s)			4.1	6.4	6.2	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			88	86	87	
cM capacity (veh/h)			976	151	512	

Direction, Lane #	SE 1	NW 1	NW 2	NE 1	NE 2
Volume Total	601	113	522	22	67
Volume Left	0	113	0	22	0
Volume Right	37	0	0	0	67
cSH	1700	976	1700	151	512
Volume to Capacity	0.35	0.12	0.31	0.14	0.13
Queue Length 95th (ft)	0	10	0	12	11
Control Delay (s)	0.0	9.2	0.0	32.9	13.1
Lane LOS		A		D	B
Approach Delay (s)	0.0	1.6		17.9	
Approach LOS				C	

Intersection Summary					
Average Delay			2.0		
Intersection Capacity Utilization			48.5%	ICU Level of Service	A
Analysis Period (min)			15		