



2599302 Ontario Ltd.

TRANSPORTATION IMPACT STUDY

PROPOSED HOTEL DEVELOPMENT

2157 LAKE SHORE BLVD WEST

CITY OF TORONTO

January 2020

19270



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January 31, 2020

Reference Number: 19270

Sandy Uppal

Stay Inn Hospitality
650 Evans Avenue
Toronto, ON
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Dear Ms. Sandy Uppal,

**RE: Transportation Impact Study
Proposed Hotel Development
2157 Lake Shore Boulevard West, City of Toronto**

LEA Consulting Ltd. is pleased to present the findings of our Transportation Impact Study for the proposed hotel development at 2157 Lake Shore Boulevard West in the City of Toronto. This TIS has been prepared on behalf of 2599302 Ontario Ltd. in support of a Zoning By-Law Amendment (ZBA) application. This report concludes that the traffic associated with the proposed development will have an acceptable impact on the surrounding road network. Furthermore, the proposed parking and loading supply is adequate. The report also concludes that trucks have sufficient room to maneuver within the site to access and egress the proposed loading bay.

Should you have any questions regarding this Transportation Impact Study, please do not hesitate to contact the undersigned at (905) 470-0015 ext. 291.

Yours truly,

LEA CONSULTING LTD.

Tony Chiu, P.Eng.
Project Manager

Timur Erkan, EIT
Transportation Analyst

Encl. Transportation Impact Study – 2157 Lake Shore Boulevard West, City of Toronto



Disclaimer

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1 INTRODUCTION

LEA Consulting Ltd. (LEA) was retained by 2599302 Ontario Ltd. to undertake a Transportation Impact Study (TIS) for the proposed development located at 2157 Lake Shore Boulevard West in the City of Toronto (herein referred to as the subject site). This TIS has been prepared in support of a Zoning By-Law Amendment (ZBA) application of the subject site. The subject site is located in the southeast corner of Lake Shore Boulevard West and Silver Moon Drive, bounded by Lake Shore Boulevard West to the north, Silver Moon Drive to the west and residential properties to the south and east. The subject site is currently undeveloped; the site location and study area is illustrated in **Figure 1-1** below.

Figure 1-1: Subject Site Location



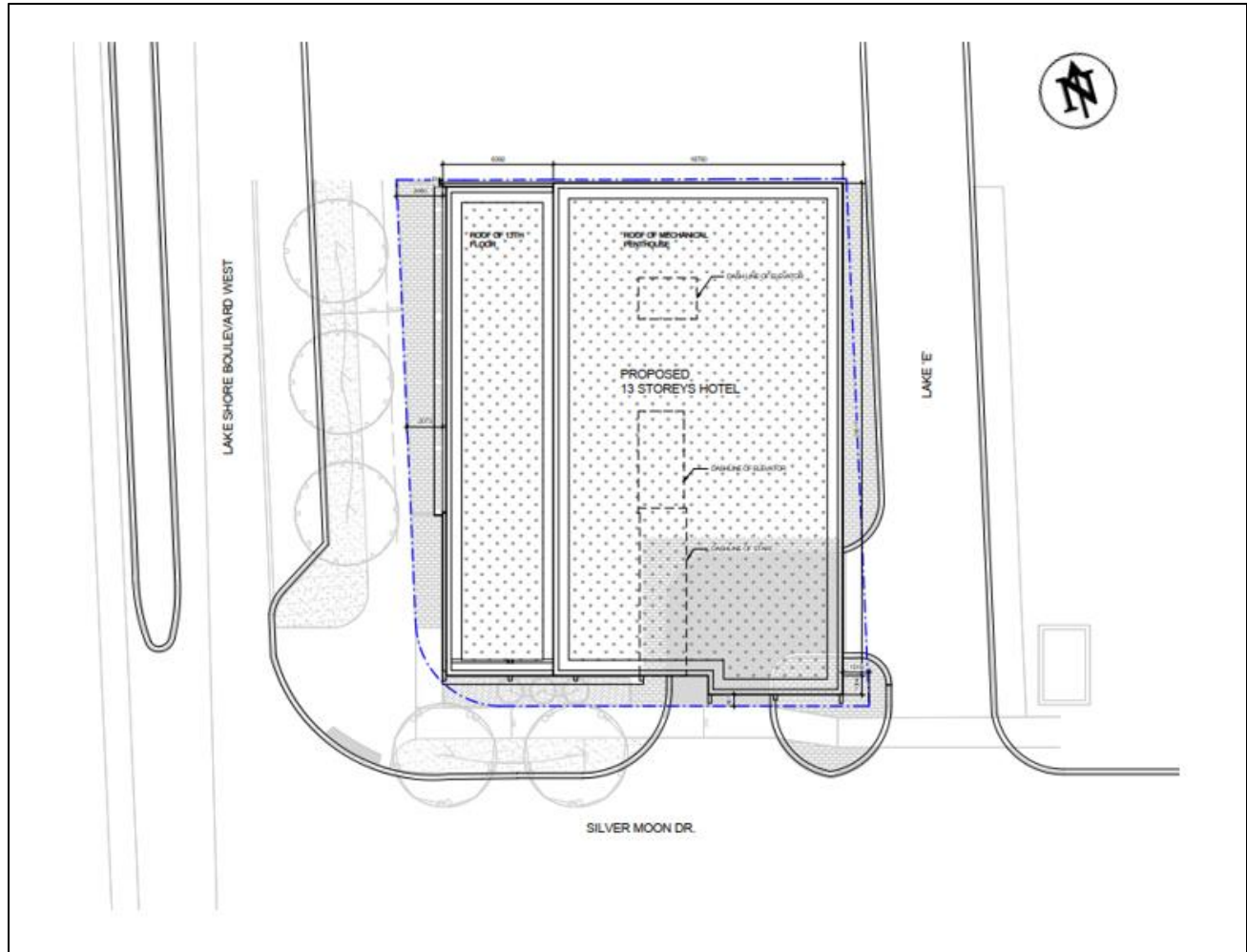
The purpose of this traffic study is to assess the proposed development from a transportation perspective, determine the traffic impacts to the adjacent road network over a five-year horizon (2025) and identify any required mitigation measures. Furthermore, this study provides a parking justification along with Transportation Demand Management (TDM) measures to encourage alternate modes of travel. Finally, this study includes a truck swept path assessment of the loading bay.

The proposed development consists of a 13-storey hotel, containing 165 suites and 158 m² of restaurant use. A total of 53 parking spaces will be provided on one level of underground garage, with access to the site provided via an existing ramp at the adjacent development. A summary of the preliminary site statistics is presented in **Table 1-1** with the site plan shown in **Figure 1-2**.

Table 1-1: Proposed Site Statistics

Land Use	Suites/GFA
Hotel	165 suites
Restaurant	158 m ²

Figure 1-2: Proposed Site Plan



Source: IBI Group (December 2019)

2 EXISTING CONDITIONS

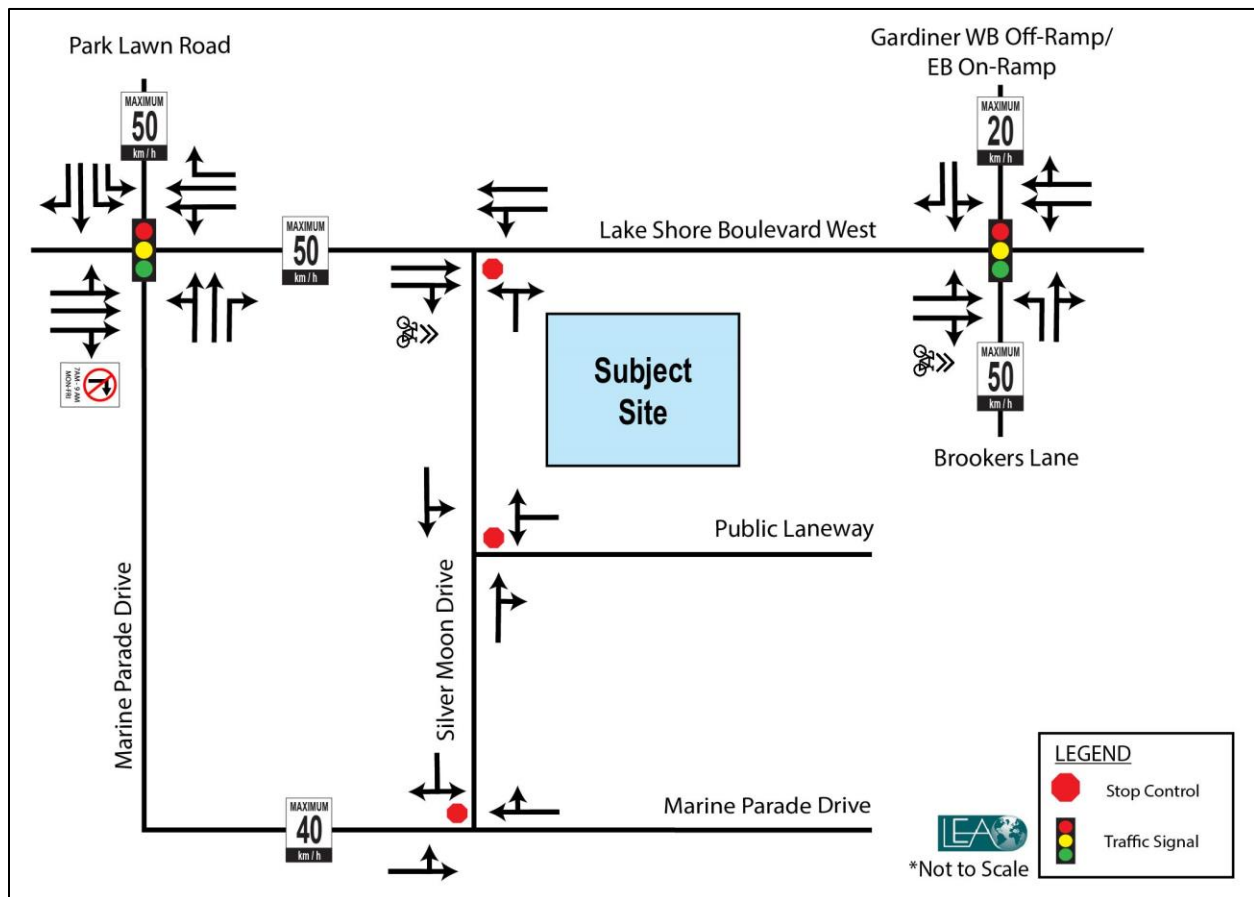
This section will identify and assess the existing transportation conditions present in the study area, including the road, transit, cyclist, and pedestrian networks. The study area was determined by assessing the size of the development and its anticipated transportation impact, and will include the following intersections:

- ▶ Lake Shore Boulevard West & Park Lawn Road/Marine Parade Drive (Signalized);
- ▶ Lake Shore Boulevard West & Brookers Lane/Gardiner Ramp (Signalized);
- ▶ Lake Shore Boulevard West & Silver Moon Drive (Unsignalized);
- ▶ Marine Parade Drive & Silver Moon Drive (Unsignalized); and
- ▶ Silver Moon Drive & Public Laneway (Unsignalized).

2.1 ROAD NETWORK

This subsection will describe the road network within the above-mentioned study area. All the roadways are under the City of Toronto’s jurisdiction and are described in detail below, with the existing intersection controls and lane configurations illustrated in **Figure 2-1**.

Figure 2-1: Existing Lane Configurations



- ▶ **Lake Shore Boulevard West** is a major arterial road that operates with a four-lane cross-section (two lanes per direction) in the area of the subject site. Streetcar rail tracks are present along the middle of the roadway with dedicated bike lanes on the east side of the road, extending east from Silver Moon Drive. Lake Shore Boulevard West operates with a posted speed limit of 50km/h.
- ▶ **Park Lawn Road** is a major arterial roadway with a four-lane cross-section (two lanes per direction) in the area of the subject site. The roadway operates with a posted speed limit of 50km/h.
- ▶ **Marine Parade Drive** is a collector roadway that operates with a two-lane cross-section (one lane per direction) within the study area. The roadway operates with a posted speed limit of 40 km/h with on-street parking permitted on the east side of the roadway.
- ▶ **Silver Moon Drive** is a local roadway with a two-lane cross-section (one lane per direction) within the area of the subject site. The roadway operates with a posted speed limit of 40 km/h.
- ▶ **Brookers Lane / Gardiner Expressway Ramp** operates with a two-lane cross-section (one lane per direction) in the area of the subject site. Brookers Lane is a collector roadway that extends east from Lakeshore Boulevard West while the Gardiner Expressway Westbound Off-Ramp and Eastbound On-Ramp extends west from Lakeshore Boulevard West. Brookers Lane operates with an unposted speed limit of 50km/h with on-street parking permitted on both sides of the roadway.

2.2 TRANSIT NETWORK

The area is well serviced by existing Toronto Transit Commission (TTC) services. Surface transit stops are present within a short walking distance and directly in front of the site, providing good accessibility to the TTC transit network. **Figure 2-2** illustrates the existing transit network in the area of the subject site. Service details of available transit routes are described below.

Figure 2-2: Existing Transit Services



Source: TTC System Map (November 2019)

Route 501 Queen is a streetcar route that operates generally in an east-west direction between Neville Park Loop and Long Branch Loop. Service is provided seven days a week and operates with headways of approximately 8-10 minutes during peak hours. Route 501 provides connections to TTC Subway Line 1 Yonge-University-Spadina via Osgoode Station and Queen Station.

Access Location: Route 501 is accessible in the study area in front of the subject site along Lake Shore Boulevard West.

Route 508 Lake Shore is a street car route that operates generally in an east-west direction between Long Branch Loop and the area of King Street East and Parliament Street. Service is provided Monday – Friday during peak hours with headways of approximately 20-minutes during peak hours. Route 508 provides connections to TTC Subway Line 1 Yonge-University-Spadina via St. Andrew Station and King Station. The two services of Route 508 are as follows:

- ▶ Eastbound 508 Lake Shore / Parliament: operates from Long Branch Loop to Parliament Street along Lakeshore Boulevard West and King Street. Service is provided Monday – Friday, during the morning peak period.
- ▶ Westbound 508 Lake Shore / Long Branch: operates from Parliament Street and King Street East to Long Branch Loop along King Street East and Lake Shore Boulevard West. Service is provided Monday – Friday during the afternoon peak period.

Access Location: Route 508 is accessible in the study area in front of the subject site along Lake Shore Boulevard West.

Route 145 Downtown/Humber Bay Express is an express bus route that operates generally in an east-west direction between Kipling Avenue and the area of King Street East and Berkeley Street. Service is provided at select stops with headways of approximately 30-minutes during peak hours. Route 145 provides connections to TTC Subway Line 1 Yonge-University-Spadina via St. Andrew Station and King Station. The two services of 145 are as follows:

- ▶ Route 145A: operates between Lake Shore Boulevard and Royal York Road and the area of King Street East and Sherbourne Street.
- ▶ Route 145B: operates between Lake Shore Boulevard and Kipling Avenue and the area of King Street East and Sherbourne Street.

Access Location: Route 145 is accessible in the study area in front of the subject site along Lake Shore Boulevard West.

Route 176 Mimico GO is a bus route that operates generally in an east-west direction between Mimico GO Station and Lake Shore Loop. Service is provided Monday – Friday during peak periods with headways of approximately 5-minutes. Route 176 provides connections to GO Transit services via Mimico Station.

Access Location: Route 176 is accessible in the study area in front of the subject site along Lake Shore Boulevard West.

Route 66 Prince Edward is a bus route that operates generally in a north-south direction between Old Mill Station on Line 2 Bloor-Danforth, the area of The Queensway and Stephen Drive, and the area of Lake Shore Boulevard West, Park Lawn Road, and Marine Parade. Service is provided seven days a week with

headways of approximately 20-minutes during peak periods. Route 66 provides connections to TTC Subway Line 2 Bloor-Danforth via Old Mill Station. The two services of 66 are as follows:

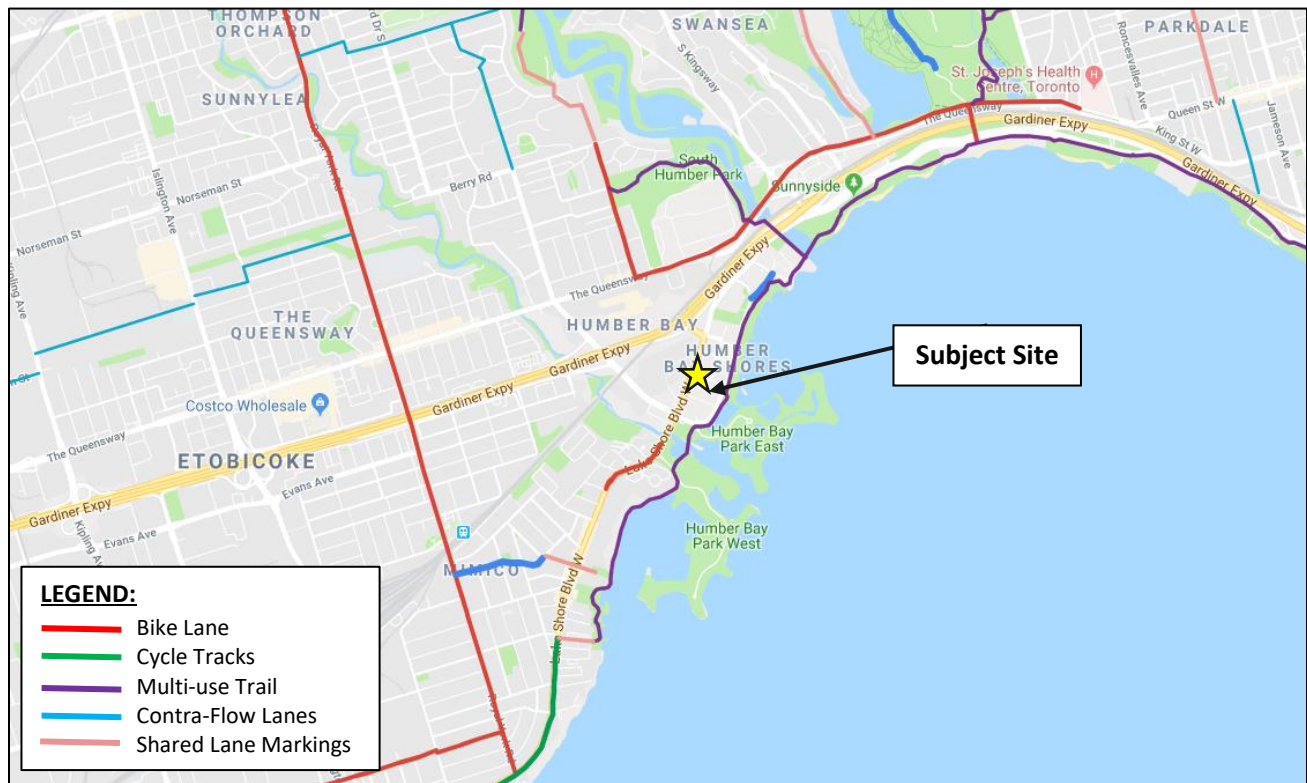
- ▶ Route 66A: operates between Old Mill Station and Lake Shore Boulevard and Ellis Avenue, seven days a week.
- ▶ Route 66B: operates between Old Mill Station and Lake Shore Boulevard and Marine Parade Drive, seven days a week.

Access Location: Route 66 is accessible in the study area in front of the subject site along Lake Shore Boulevard West.

2.3 EXISTING CYCLING NETWORK

Cycling facilities are available within the study area with dedicated bike lanes along Lake Shore Boulevard West. The Humber Bay Park East Trail runs from Mimico Waterfront Park in the west and connects with the Martin Goodman Trail in the east. The existing cycling network around the subject site is shown in **Figure 2-3**.

Figure 2-3: Existing Cycling and Trail Networks



Source: City of Toronto (December 2018)

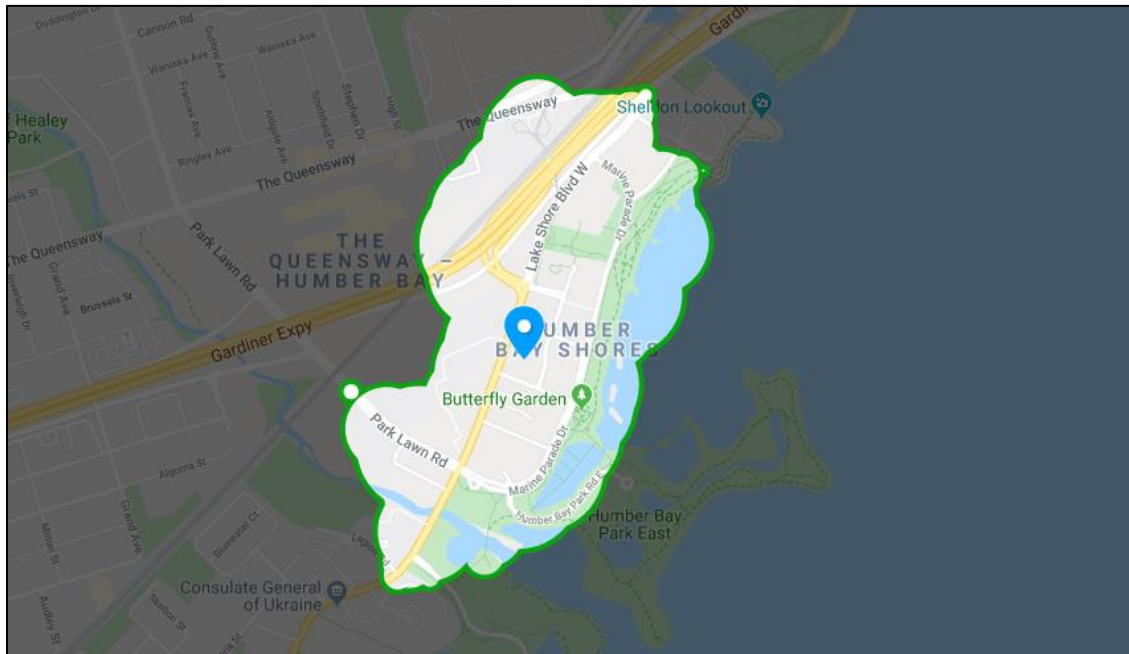
2.4 PEDESTRIAN NETWORK

The area in which the subject site is located is walkable with continuous sidewalks available on both sides of Lake Shore Boulevard West and Marine Parade Drive as well as on the north side of Silver Moon Drive. Crosswalks are provided at all signalized intersections. To verify the lane uses that support the area's walkability, the subject site was entered as a testable address in the Walk Score web application. The address of the subject site, 2157 Lake Shore Boulevard West, received a Walk Score of 68/100 – Somewhat

Walkable which indicates that some errands can be accomplished on foot. Nearby parks include Marine Parade Drive and Humber Bay Shores Park. Amenities along Lake Shore Boulevard West and Marine Parade Drive makes it a good location for a pleasant pedestrian experience.

A 10-minute walk from the subject site could permit an individual to reach Palace Pier Court in the north, Humber Bay Park Road West in the south, the area of Park Lawn Road and the rail corridor in the west, as well as Humber Bay Park East in the east. Within this area are amenities and services such as restaurants, cafes, commercial stores, grocery stores and parks. **Figure 2-4** shows the possible area an individual could reach within a 10-minute walk from the subject site.

Figure 2-4: Ten Minute Walking Distance from Subject Site



2.5 TRAFFIC DATA COLLECTION

Turning movement counts (TMCs) were used as the source of traffic data in the intersection capacity analysis. LEA collected traffic counts for the intersections within the study area during the weekday AM and PM peak periods between 7:00AM – 9:00AM and 4:00PM – 6:00PM, respectively. Signal timing plans at the signalized intersection were obtained from the City of Toronto.

Table 2-1 summarizes the traffic data utilized in this study, with detailed TMCs and signal timing plans provided in **Appendix A**.

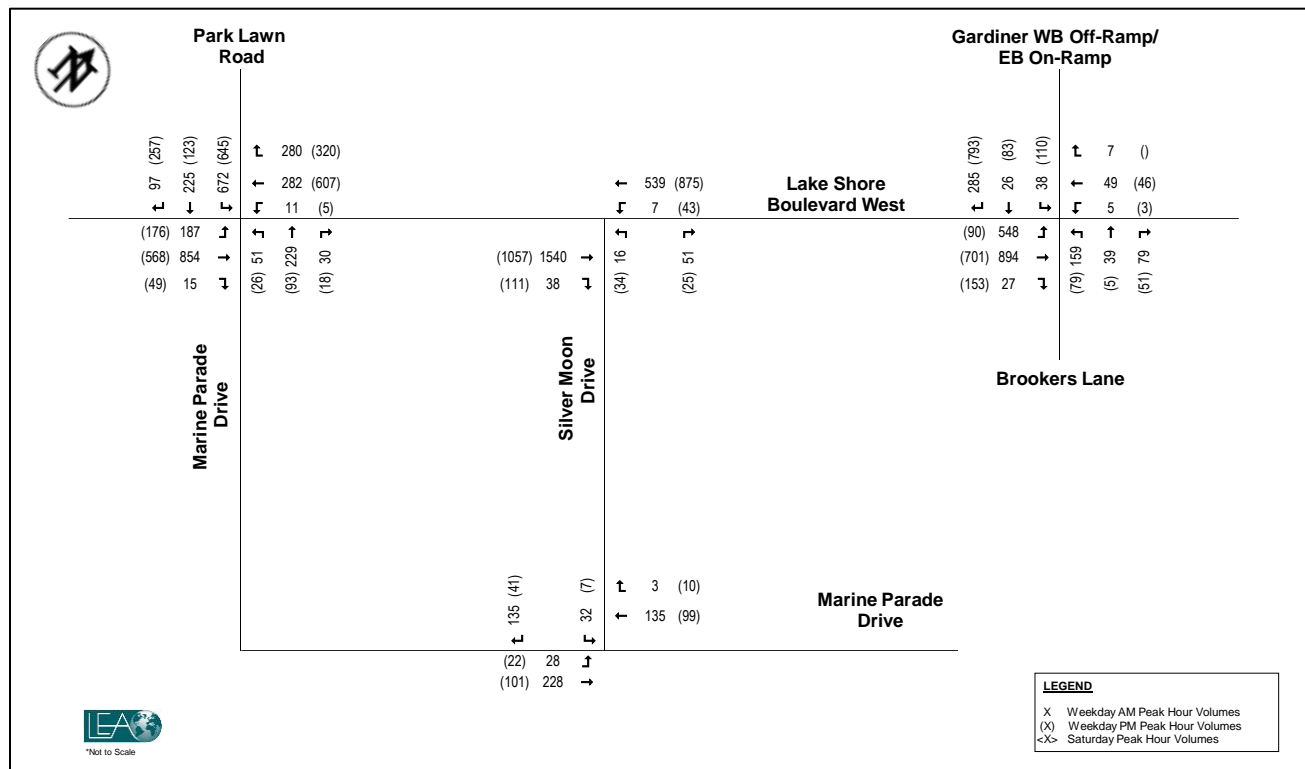
Table 2-1: Traffic Data Collection

Intersection	Survey Date	Source
Lake Shore Boulevard West & Park Lawn Road/Marine Parade	December 13, 2018	LEA Consulting
Lake Shore Boulevard West & Brookers Lane/Gardiner Ramp		
Lake Shore Boulevard West & Silver Moon Drive		
Marine Parade Drive & Silver Moon Drive		

2.6 INTERSECTION CAPACITY ANALYSIS - EXISTING

The capacity analysis for the study area was undertaken using Synchro version 9.1, which is based on the Highway Capacity Manual (2000) methodology and adhering to the City of Toronto’s guidelines for the *Preparation of Transportation Impact Studies and Guidelines* (July 2013). The intersection capacity was conducted for the weekday AM and PM peak hours. Peak Hour Factors (PHF) under existing conditions have been calculated for each intersection based on traffic counts conducted by LEA. In accordance with the City of Toronto Synchro Guidelines, a lost time adjustment of -1 was applied to all movements at signalized intersections. The existing traffic volumes in the study area during the weekday peak hours are illustrated in **Figure 2-5**.

Figure 2-5: Existing Peak Hour Traffic Volumes



The intersection capacity analysis results for the signalized and unsignalized intersections under existing conditions are summarized in **Table 2-2** and **Table 2-3**. Detailed capacity results can be found in **Appendix B**.

Table 2-2: Existing Capacity Analysis - Signalized Intersections

Intersection	Weekday AM Peak Hour								
	V/C	Delay (s)	LOS	Movement of Interest	V/C	Delay (s)	LOS	Queue (m)	
								50 th	95 th
Lake Shore Blvd & Brookers Ln / Gardiner Ramps	0.77	19.0	B	EBLTR	0.77	11.7	B	91.5	157.0
				WBLTR	0.03	4.7	A	1.5	4.5
				NBL	0.65	44.0	D	30.9	48.8
				NBTR	0.18	34.8	C	6.9	20.8
				SBLT	0.27	35.7	D	11.7	22.2
				SBR	0.19	34.9	C	0.0	20.2
Lake Shore Blvd & Marine Parade Dr / Park Lawn Rd	0.68	39.3	D	EBLTR	0.58	28.3	C	81.2	101.1
				WBLT	0.32	36.1	D	36.2	49.8
				WBR	0.22	13.9	B	7.9	19.7
				NBLT	0.67	61.5	E	44.5	58.8
				NBR	0.03	52.5	D	0.0	0.0
				SBL	0.81	55.7	E	102.0	126.3
				SBT	0.52	48.1	D	60.5	89.2
SBR	0.07	39.0	D	0.0	11.9				
Intersection	Weekday PM Peak Hour								
	V/C	Delay (s)	LOS	Movement of Interest	V/C	Delay (s)	LOS	Queue (m)	
								50 th	95 th
Lake Shore Blvd & Brookers Ln / Gardiner Ramps	0.51	23.4	C	EBLTR	0.47	9.2	A	44.3	77.7
				WBLTR	0.03	5.9	A	1.6	4.8
				NBL	0.38	34.4	C	14.4	25.5
				NBTR	0.05	30.9	C	0.8	9.8
				SBLT	0.62	39.0	D	37.5	54.3
				SBR	0.52	35.9	D	0.0	36.2
Lake Shore Blvd & Marine Parade Dr / Park Lawn Rd	0.57	39.2	D	EBLTR	0.43	25.0	C	51.9	65.2
				WBLT	0.66	48.4	D	84.2	106.0
				WBR	0.41	44.3	D	26.1	59.3
				NBLT	0.44	62.4	E	17.8	28.2
				NBR	0.02	59.1	E	0.0	0.0
				SBL	0.59	42.8	D	82.5	103.2
				SBT	0.22	36.3	D	26.7	43.8
SBR	0.18	35.8	D	0.0	21.0				

Under existing conditions, both signalized intersections operate well during both peak hours. All individual movements are operating with residual capacity during both peak hours. No constraints have been identified under existing conditions.

Table 2-3: Existing Capacity Analysis - Unsignalized Intersections

Intersection	Movement of Interest	Weekday AM Peak Hour					
		Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
Lake Shore Blvd & Silver Moon Dr	WBLT	8	353	1.0	0.6	0.02	A
	NBLR	72	130	62.4	21.6	0.55	F
Marine Parade Dr & Silver Moon Dr	EBLT	32	1409	1.0	0.6	0.02	A
	SBLR	192	784	11.1	7.7	0.24	B
Intersection	Movement of Interest	Weekday PM Peak Hour					
		Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
Lake Shore Blvd & Silver Moon Dr	WBLT	44	519	2.7	2.2	0.08	A
	NBLR	61	103	81.3	22.6	0.59	F
Marine Parade Dr & Silver Moon Dr	EBLT	24	1447	1.4	0.4	0.02	A
	SBLR	53	859	9.5	1.6	0.06	A

Both of the unsignalized intersections are operating within capacity under existing conditions for both peak hours. At the intersection of Lake Shore Boulevard/Silver Moon Drive, the capacity analysis reported a control delay of 62.4 seconds and 81.3 seconds for the shared NBLR movement during the AM and PM peak hours, respectively. These delays correspond to a LOS F, representing congested traffic conditions. However, it is our understanding that this intersection will be signalized under future background and future total conditions, alleviating this constraint. This will be further discussed in **Section 3.3**. Therefore, no constraints have been identified at the studied unsignalized intersections.

3 FUTURE BACKGROUND TRAFFIC CONDITIONS

For the analysis of future background traffic conditions, this study considers a five-year horizon to the year 2025. Future background traffic includes the traffic added to the network from other future developments within the surrounding study area, corridor growth, as well as all planned infrastructure improvements within the study area. The future background conditions will be used as the baseline for evaluating the impact of the proposed development.

3.1 BACKGROUND DEVELOPMENTS

Seven (7) background developments have been identified within the surrounding study area. Detailed information of the background developments included in our analysis were obtained from the City of Toronto’s Development Application Inventory. The background developments are summarized in **Table 3-1**.

Table 3-1: Background Developments

Development Address	Site Statistics	Application Status	Source (Date)
2143-2147 Lake Shore Blvd West	887 residential units 3,933 m ² commercial/retail	DP of Condo Under Review	WSP (January 2015)
2161-2165 Lake Shore Blvd West	660 residential Units 3471 m ² commercial/retail	NOAC Issued Feb 8 2018	BA Group (September 2015)
2183 Lake Shore Blvd West	1,258 residential units 5,105 m ² commercial	DP of Condo Under Review	BA Group (February 2014)
2150-2194 Lake Shore Blvd West & Park Lawn Road	7,500 residential units 42,500 m ² commercial 42,500 m ² office 20,500 m ² hotel	OPA Under Review	BA Group (September 2019)
2151-2153 Lake Shore Blvd West	157 residential units	Draft Plan Approved April 2017	-
10 Park Lawn Road	523 residential units 1,230 m ² commercial	SPA Under Review	-
42 Park Lawn Road	321 residential units	Rezoning Approved Feb 19 2014	-

The background development traffic volumes were extracted from the respective traffic studies for their development applications, and subsequently assigned to the study area road network. Excerpts from the studies are provided in **Appendix C**. However, detailed traffic study reports were not available for all of the background developments. Therefore, trip generation methodology and trip distribution patterns were adopted from TIS reports of similar developments for these proposed projects.

3.2 CORRIDOR GROWTH

Historical TMC data was reviewed along Lake Shore Boulevard West to determine the corridor growth rate during both analysis periods. The calculated growth rates were all negative, and therefore a 0% growth rate was conservatively applied. This is consistent with the assumptions made in the Christies Transportation Master Plan (2150 Lake Shore Boulevard West) prepared by BA Group. It is assumed that the growth in the area will be associated with the background developments, which is already accounted for as per **Section 3.1** above.

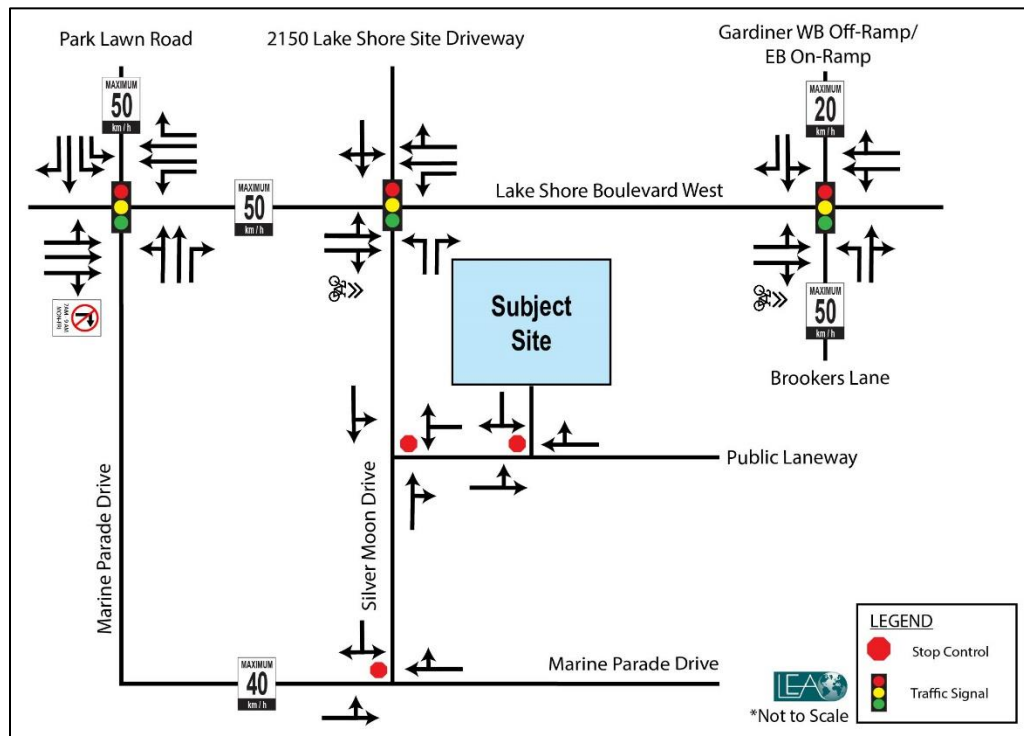
3.3 ROAD NETWORK IMPROVEMENTS

The future background and future total traffic analysis was based mostly on the existing road network configuration, with minor alterations as outlined in the Humber Bay Shores Precinct TIS prepared by MMM Group and AECOM and the Christies Transportation Master Plan (2150 Lake Shore Boulevard West) prepared by BA Group. The network modifications that were adopted in the aforementioned studies include:

- ▶ Addition of segregated WBL turn lane at the intersection of Lake Shore Boulevard/Park Lawn Road as per the Humber Bay Shores Precinct TIS.
- ▶ Signalization at the intersection of Lake Shore Boulevard/Silver Moon Drive as per the Humber Bay Shores Precinct TIS. It was assumed that this signalized intersection would operate with a cycle length of 140 seconds under both peak periods, similar to the intersection downstream (Lake Shore Boulevard/Park Lawn Road).
- ▶ Addition of segregated WBL turn lane at the intersection of Lake Shore Boulevard/Silver Moon Drive as per the Humber Bay Shores Precinct TIS.
- ▶ Separation of shared NBLR into one (1) NBL turn lane and one (1) NBR turn lane intersection of Lake Shore Boulevard/Silver Moon Drive as per the Humber Bay Shores Precinct TIS.
- ▶ Addition of shared SBLTR lane at the intersection of Lake Shore Boulevard/Silver Moon Drive as per the Christies Transportation Master Plan (2150 Lake Shore Boulevard West). This approach connects to the proposed development at 2150 Lake Shore Boulevard.

The future road network and lane configurations with the inclusion of the proposed development and its associated site access is illustrated in **Figure 3-1**.

Figure 3-1: Future Lane Configurations

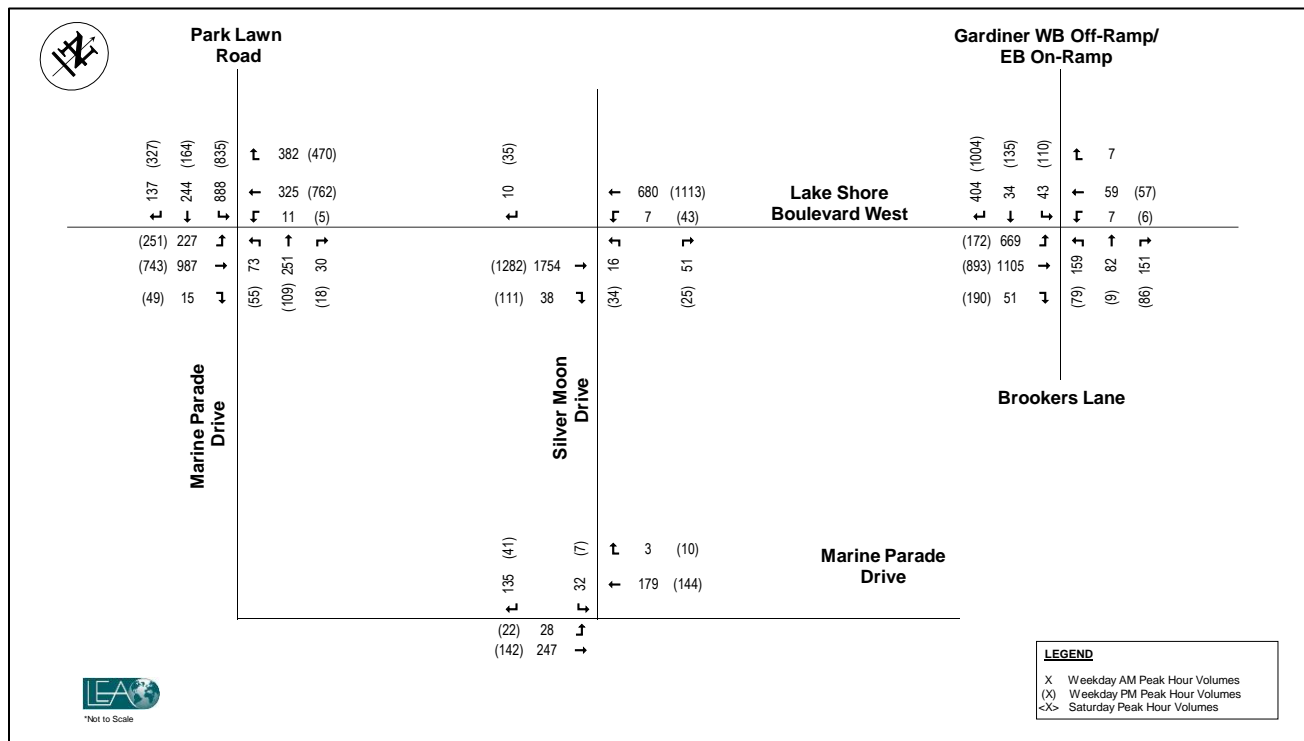


It should also be noted that in the Christies Transportation Master Plan (2150 Lake Shore Boulevard West) conducted by BA Group, an east-west arterial road that extends from the Park Lawn Road/Gardiner Expressway off-ramp and realigns the existing on-ramp at Brookers Lane is proposed. The new arterial road is proposed to relieve congestion on Park Lawn Road and Lake Shore Boulevard West. Given the unknown timeline of the proposed road and to maintain a conservative analysis, the new arterial roadway has not been included within our analysis of future background and future total conditions.

3.4 INTERSECTION CAPACITY ANALYSIS – FUTURE BACKGROUND

The future background traffic conditions were determined by incorporating background development traffic to the existing traffic volumes. The future background traffic volumes for the AM and PM peak hours are illustrated in Figure 3-2.

Figure 3-2: Future Background Peak Hour Traffic Volumes



The intersection capacity analysis was completed for the weekday AM and PM peak hours with the results for the studied signalized intersections summarized in Table 3-2. Detailed capacity results can be found in Appendix D.

Table 3-2: Future Background Capacity Analysis - Signalized Intersections

Intersection	Weekday AM Peak Hour								
	V/C	Delay (s)	LOS	Movement of Interest	V/C	Delay (s)	LOS	Queue (m)	
								50 th	95 th
Lake Shore Blvd & Brookers Ln / Gardiner Ramps	0.93	29.6	C	EBLTR	0.96	26.4	C	159.8	#268.5
				WBLTR	0.04	4.8	A	1.9	5.3
				NBL	0.66	44.1	D	31.0	48.8
				NBTR	0.57	39.7	D	30.7	51.8
				SBLT	0.50	39.2	D	14.6	27.7
				SBR	0.27	35.5	D	0.0	24.4
Lake Shore Blvd & Marine Parade Dr / Park Lawn Rd	0.83	44.7	D	EBLTR	0.78	38.9	D	111.1	136.2
				WBL	0.13	43.1	D	2.7	9.0
				WBT	0.40	44.4	D	44.5	60.2
				WBR	0.35	17.6	B	27.2	48.0
				NBLT	0.71	61.2	E	51.4	66.5
				NBR	0.03	50.8	D	0.0	0.0
				SBL	0.91	60.4	E	138.4	#177.6
				SBT	0.49	42.6	D	62.3	90.6
Lake Shore Blvd & Silver Moon Dr	0.61	4.2	A	EBLTR	0.62	2.6	A	0.0	87.2
				WBL	0.05	1.3	A	0.0	1.1
				WBTR	0.24	1.1	A	0.0	19.6
				NBL	0.31	69.5	E	4.8	13.0
				SBLTR	0.01	65.5	E	0.0	0.0
Intersection	Weekday PM Peak Hour								
	V/C	Delay (s)	LOS	Movement of Interest	V/C	Delay (s)	LOS	Queue (m)	
								50 th	95 th
Lake Shore Blvd & Brookers Ln / Gardiner Ramps	0.73	29.4	C	EBLTR	0.70	15.1	B	96.6	125.5
				WBLTR	0.04	7.6	A	2.8	5.9
				NBL	0.36	30.8	C	12.7	26.2
				NBTR	0.08	27.7	C	1.3	12.9
				SBLT	0.64	36.1	D	43.2	69.4
				SBR	0.82	47.0	D	13.4	#133.6
Lake Shore Blvd & Marine Parade Dr / Park Lawn Rd	0.71	39.1	D	EBLTR	0.58	29.2	C	75.1	92.7
				WBL	0.04	37.3	D	1.1	4.9
				WBT	0.78	52.7	D	109.3	134.3
				WBR	0.35	15.6	B	16.4	35.0
				NBLT	0.53	61.8	E	24.6	36.4
				NBR	0.02	57.3	E	0.0	0.0
				SBL	0.77	48.5	D	114.4	139.7
				SBT	0.30	37.7	D	36.6	57.1
Lake Shore Blvd & Silver Moon Dr	0.47	4.7	A	EBLTR	0.48	2.8	A	39.6	59.7
				WBL	0.16	2.7	A	1.6	4.8
				WBTR	0.37	2.2	A	27.5	41.6
				NBL	0.40	65.9	E	9.9	21.5
				NBTR	0.02	61.5	E	0.0	0.0
				SBLTR	0.02	61.6	E	0.0	0.0

Under future background conditions, all signalized intersections continue operating well during both peak hours. All individual movements are operating with residual capacity, during both peak periods. It should be noted that the signal timing plan for the intersection of Lake Shore Boulevard/Park Lawn Road was optimized during the AM peak period; the existing cycle length was maintained. The signal timing plan optimization is summarized in **Table 3-3** below.

Table 3-3: Future Signal Timing Plan for Lake Shore Blvd & Park Lawn Rd

Intersection	Peak Period	EB		WB		NB	SB	Cycle (s)
		L	TR	L	TR	LTR	LTR	
Lake Shore Blvd & Park Lawn Rd	AM	16	58	0	42	33	49	140
	PM	Same as existing timing plans						140

Note: The SB & NB phases are called separately

The intersections capacity analysis results for the unsignalized intersection under future background conditions are summarized in **Table 3-4**.

Table 3-4: Future Background Capacity Analysis - Unsignalized Intersections

Intersection	Movement of Interest	Weekday AM Peak Hour					
		Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
Marine Parade Dr & Silver Moon Dr	EBLT	32	1350	1.0	0.6	0.02	A
	SBLR	192	728	11.7	8.5	0.26	B
Intersection	Movement of Interest	Weekday PM Peak Hour					
		Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
Marine Parade Dr & Silver Moon Dr	EBLT	24	1388	1.1	0.4	0.02	A
	SBLR	53	797	9.8	1.7	0.07	A

The unsignalized intersection of Marine Parade Drive/Silver Moon Drive is expected to operate at similar levels of service with the addition of background development traffic. All movements are expected to operate with significant residual capacity during both peak hours.

4 SITE-GENERATED TRAFFIC

The proposed development will introduce 165 hotel rooms along with 158 m² of restaurant uses. The sections below discuss in detail the calculation, distribution and assignment of site-generated single-occupant vehicle (SOV) trips.

4.1 MODAL SPLIT

Transportation Tomorrow Survey (TTS) doesn't provide modal split data for hotel-based trips. Since a large portion of hotel guests arrive from the airport, most guests would utilize taxi services, rideshare or transit to get to hotels. To maintain a conservative analysis, a non-auto reduction was not applied.

4.2 VEHICLE TRIP GENERATION

The trip generation for the proposed development has been estimated using the ITE Trip Generation Manual 10th Edition average rates for Hotel (LUC 310). The average trip rate was used instead of the trip rate equation since there wasn't a very high coefficient of determination (R^2) of the equations. It should be noted that the restaurant is assumed to be ancillary for the future guests and employees of the proposed hotel and the immediate community. The trip generation is summarized in **Table 4-1**.

Table 4-1: Auto Trip Generation

Land Use	Mode	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Hotel (LUC 310) 165 Rooms	Directional Distribution	59%	41%	100%	51%	49%	100%
	Average Trip Rate	T=0.47 x			T=0.60 x		
	Trips Generated	46	32	78	50	49	99

The proposed hotel is forecasted to generate 78 two-way trips (46 inbound and 32 outbound) in the weekday AM peak hour, 99 two-way trips (50 inbound and 49 outbound) in the weekday PM peak hour.

4.3 VEHICLE TRIP DISTRIBUTION AND ASSIGNMENT

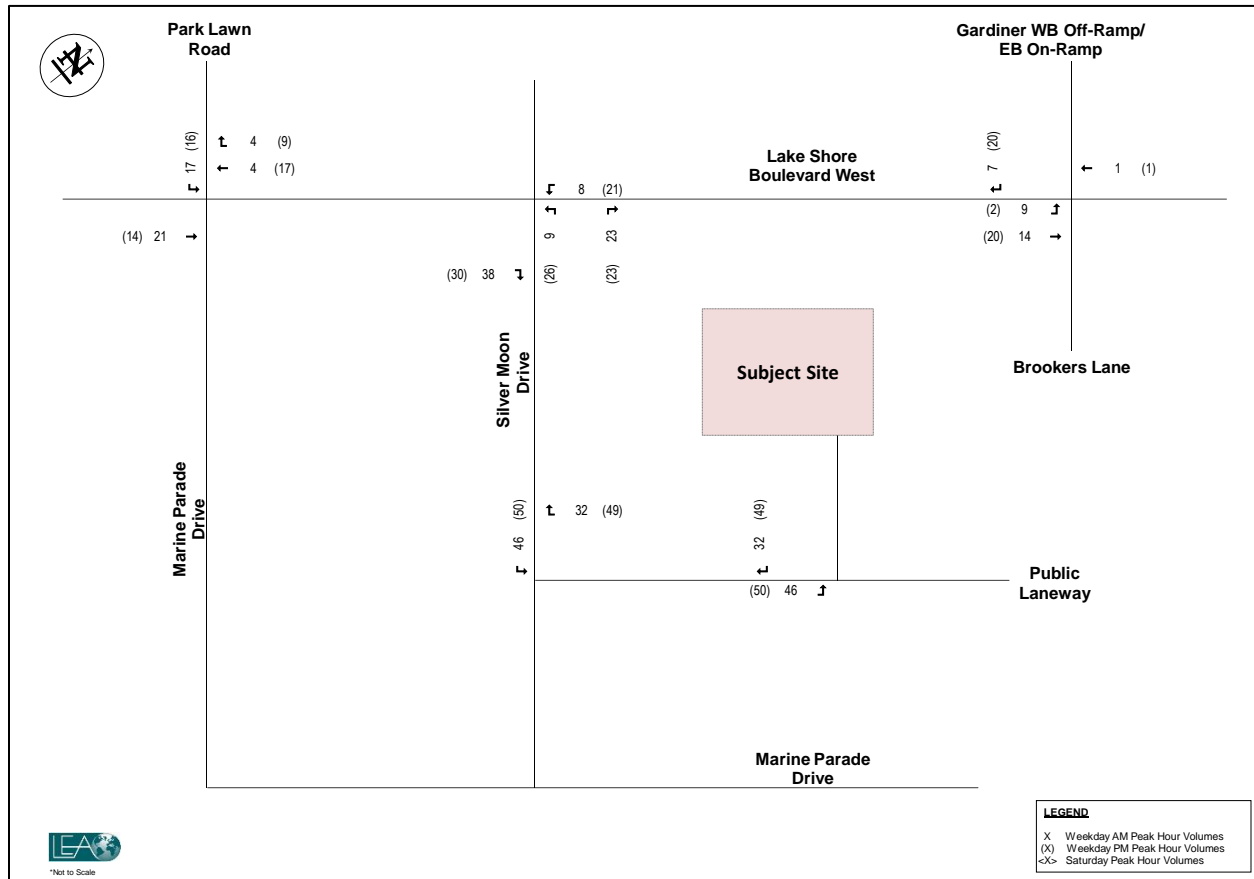
Since the Transportation Tomorrow Survey (TTS) doesn't provide information on hotel-based trips, the trip distribution of site traffic was estimated using the existing distribution of traffic in the studied network. The trip distribution for the auto trips at the subject site is summarized in **Table 4-2**.

Table 4-2: Directional Trip Distribution

Direction	Route	AM Peak Hour		PM Peak Hour	
		Inbound	Outbound	Inbound	Outbound
Northbound	Park Lawn Road	-	14%	-	19%
Southbound	Park Lawn Road	36%	-	31%	-
Eastbound	Lake Shore Boulevard W	46%	45%	28%	41%
	Gardiner Expressway (On)	-	27%	-	5%
Westbound	Lake Shore Boulevard W	3%	14%	2%	35%
	Gardiner Expressway (Off)	15%	-	39%	-
	Total	100%	100%	100%	100%

The site-generated traffic volumes for the weekday AM and PM peak hours are illustrated in **Figure 4-1**.

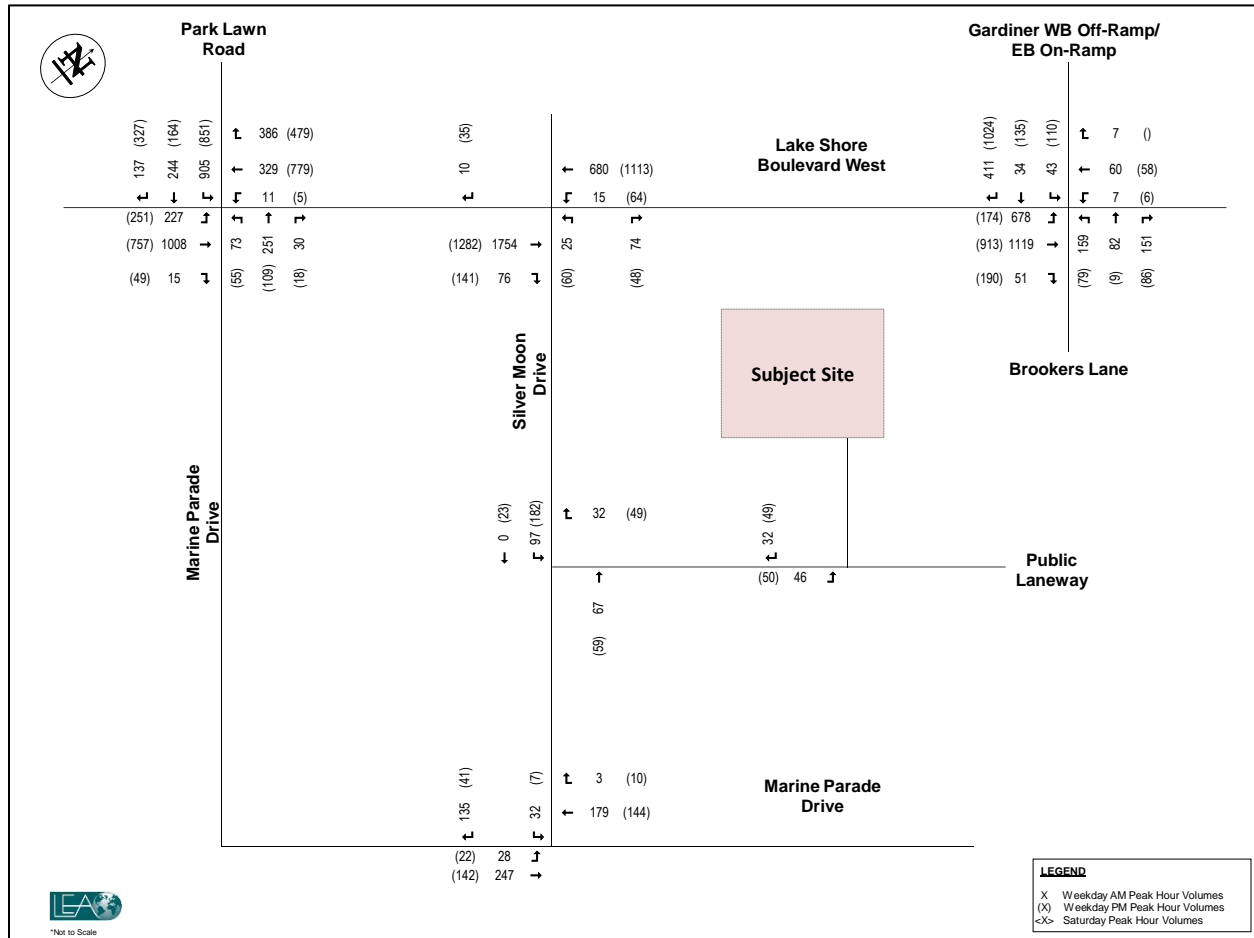
Figure 4-1: Site Generated Peak Hour Traffic Volumes



5 FUTURE TOTAL TRAFFIC CONDITIONS

Future total traffic conditions include the future background developments, in addition to the site trips generated by the proposed development. The future total traffic volumes for the AM and PM peak hours are illustrated in **Figure 5-1**.

Figure 5-1: Future Total Peak Hour Traffic Volumes



5.1 INTERSECTION CAPACITY ANALYSIS – FUTURE TOTAL

The intersection capacity analysis was completed for the weekday AM and PM peak hours with the results for the studied signalized intersections summarized in **Table 5-1**. The future background timing plans were maintained in future total analyses. Detailed capacity results are found in **Appendix E**.

Table 5-1: Future Total Capacity Analysis - Signalized Intersections

Intersection	Weekday AM Peak Hour								
	V/C	Delay (s)	LOS	Movement of Interest	V/C	Delay (s)	LOS	Queue (m)	
								50 th	95 th
Lake Shore Blvd & Brookers Ln / Gardiner Ramps	0.94	31.2	C	EBLTR	0.97	28.8	C	166.9	#274.3
				WBLTR	0.04	4.8	A	2.0	5.3
				NBL	0.66	44.1	D	31.0	48.8
				NBTR	0.58	39.9	D	31.4	52.3
				SBLT	0.50	39.2	D	14.6	27.7
				SBR	0.27	35.6	D	0.0	24.6
Lake Shore Blvd & Marine Parade Dr / Park Lawn Rd	0.85	45.5	D	EBLTR	0.79	39.5	D	113.7	139.3
				WBL	0.14	43.5	D	2.7	9.1
				WBT	0.40	44.5	D	45.2	61.0
				WBR	0.35	17.7	B	27.8	49.0
				NBLT	0.71	61.2	E	51.4	66.5
				NBR	0.03	50.8	D	0.0	0.0
				SBL	0.93	62.7	E	142.0	#183.2
				SBT	0.49	42.6	D	62.3	90.6
Lake Shore Blvd & Silver Moon Dr	0.65	7.5	A	EBLTR	0.67	5.2	A	83.1	131.1
				WBL	0.12	3.7	A	0.6	2.8
				WBTR	0.25	2.4	A	16.8	28.0
				NBL	0.22	73.5	E	7.8	m17.0
				NBTR	0.44	80.5	F	16.6	m33.0
				SBLTR	0.01	58.7	E	0.0	0.0
Intersection	Weekday PM Peak Hour								
	V/C	Delay (s)	LOS	Movement of Interest	V/C	Delay (s)	LOS	Queue (m)	
								50 th	95 th
Lake Shore Blvd & Brookers Ln / Gardiner Ramps	0.76	31.9	C	EBLTR	0.71	15.4	B	100.0	129.5
				WBLTR	0.04	7.6	A	2.9	5.9
				NBL	0.36	30.8	C	12.7	26.2
				NBTR	0.08	27.7	C	1.3	12.9
				SBLT	0.64	36.1	D	43.2	69.4
				SBR	0.88	53.4	D	16.9	#143.0
Lake Shore Blvd & Marine Parade Dr / Park Lawn Rd	0.72	39.5	D	EBLTR	0.59	29.4	C	76.4	94.1
				WBL	0.04	37.3	D	1.1	4.9
				WBT	0.80	53.6	D	112.4	137.9
				WBR	0.36	15.7	B	17.5	37.0
				NBLT	0.53	61.8	E	24.6	36.4
				NBR	0.02	57.3	E	0.0	0.0
				SBL	0.78	49.2	D	117.5	143.3
				SBT	0.30	37.7	D	36.6	57.1
Lake Shore Blvd & Silver Moon Dr	0.51	7.3	A	EBLTR	0.51	3.5	A	49.3	75.9
				WBL	0.26	4.5	A	3.1	9.6
				WBTR	0.38	2.7	A	32.7	50.7
				NBL	0.55	75.7	E	18.0	m32.6
				NBTR	0.03	107.6	F	0.4	m6.4
				SBLTR	0.02	59.3	E	0.0	0.0

Under future total conditions, the studied intersections are operating with similar LOS as the future background conditions. All signalized intersections continue to operate with overall acceptable levels of service and within the roadway capacity during both peak periods. No constraints have been identified. Based on the capacity analysis results in Table 5-1, it is concluded that the subject site will have acceptable impacts on the signalized intersections within the study area.

The intersections capacity analysis results for the unsignalized intersections under future total conditions are summarized in **Table 5-2**.

Table 5-2: Future Total Capacity Analysis - Unsignalized Intersections

Intersection	Movement of Interest	Weekday AM Peak Hour					
		Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
Marine Parade Dr & Silver Moon Dr	EBLT	32	1350	1.0	0.6	0.02	A
	SBLR	192	728	11.7	8.5	0.26	B
Silver Moon Dr & Public Laneway	WBLR	35	995	8.8	0.9	0.04	A
	SBLT	105	1540	7.5	1.8	0.07	A
Public Laneway & Site Access	EBLT	50	1623	7.3	0.8	0.03	A
	SBLR	35	1085	8.4	0.8	0.03	A
Intersection	Movement of Interest	Weekday PM Peak Hour					
		Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
Marine Parade Dr & Silver Moon Dr	EBLT	24	1388	1.1	0.4	0.02	A
	SBLR	53	797	9.8	1.7	0.07	A
Silver Moon Dr & Public Laneway	WBLR	53	1006	8.8	1.3	0.05	A
	SBLT	223	1551	6.9	3.5	0.13	A
Public Laneway & Site Access	EBLT	54	1623	7.3	0.8	0.03	A
	SBLR	53	1085	8.5	1.2	0.05	A

The unsignalized intersection of Marine Parade Drive/Silver Moon Drive is expected to continue operating at good LOS, with all movements operating with residual capacity and minimal delays under future total conditions for both peak hours. Furthermore, the site access and public laneway are expected to operate acceptably with ample capacity. Therefore, all unsignalized intersections can accommodate the site-generated traffic.

6 VEHICULAR PARKING REVIEW

This section will review the vehicular and bicycle parking standards based on the applicable requirements for the subject site and provide justification to support the proposed parking provisions.

6.1 PROPOSED PARKING SUPPLY

The proposed development will provide a total parking supply of 54 spaces. This will include 14 tri-level stackers (42 parking spaces), 2 regular accessible parking spaces and 10 regular parking spaces at the adjacent development. It should be noted that an agreement has been made with the property owner of the adjacent development to allow 10 of the parking spaces to be located on their property. Access will be provided at the southeast corner of the underground parking facility. The parking configuration, including the supply on the adjacent site can be found in **Appendix F**. Moreover, a total of 12 electrical parking spaces are proposed to meet the Toronto Green Standards (TGS) requirements.

6.2 ZONING BY-LAW REQUIREMENTS

The subject site is governed by the Former City of Etobicoke By-Law No. 11,737. However, it is noted that the former City of Etobicoke By-Law was passed in 1997. Thus, the City of Toronto By-Law 569-2013 parking rates were reviewed as a comparison. The subject site is not located within any policy areas, therefore the parking standards for “All Other Areas” was applied to the proposed development. The parking provisions from former City of Etobicoke By-Law 11,737 and City of Toronto 569-2013 are summarized in **Table 6-1**.

Table 6-1: Vehicle Parking Requirements

Land Use	Rooms /GFA	Zoning By-Law 569-2013 (All Other Areas)		Former Etobicoke By-Law 11,737		Proposed Supply
		Vehicular Parking Rate	Required Spaces	Vehicular Parking Rate	Required Spaces	
Hotel	165	1.0/guest room	165	1.0/guest room	165	54 ¹
Restaurant	158 m ²	-	0	-	0	0

1 - Including 10 spaces provided from adjacent site

According to both of the aforementioned By-laws, a total of 165 parking spaces are required for the hotel development. Furthermore, no parking spaces are required for the restaurant use due to its gross floor area being less than 200 m². The proposed parking supply of 54 spaces is deficient from the minimum by-law requirements of 111 spaces. The proposed parking supply equates to a supply rate of 0.33 spaces per unit.

6.3 PARKING JUSTIFICATION

In order to justify the proposed parking supply, LEA conducted a proxy parking utilization survey and reviewed the objectives outlined in the Provincial Policy Statement (PPS), Ontario’s Five Year Climate Change Action Plan and the City of Toronto Official Plan. To further support the pursued parking supply and encourage multi-modal travel to and from the site, several TDM measured have been recommended in **Section 8**.

6.3.1 Proxy Parking Survey

To quantify the anticipated parking demand to be exhibited by the subject site, a parking demand survey was conducted at Hotel X located at 111 Princes' Boulevard. The proxy site location was selected based on the similarity in transportation characteristics. Both the proxy site location and subject site are near various streetcars and bus routes, without higher order transit nearby. Therefore, the proxy site is expected to exhibit travel and parking behaviours similar to the proposed development. The details of the surveyed hotel are summarized in **Table 6-2**. It should be noted that the proxy site has been confirmed and approved by the City, the correspondence can be found in **Appendix G**.

Table 6-2: Proxy Site Details

Land Use/Description	Details
Hotel	404 Guest Rooms
Restaurant & Bars	2 Restaurants & 2 Bars
Cinema	250 Seat Cinema
Night Club	Operating from 9:00 PM – 1:00 AM
Meeting Space	60,000 ft ²
Sports Club	24 hours, 7 Days a week
Spa	Operating from 9:00 AM – 8:00 PM
Parking Supply	411 Parking Spaces

In order to capture the peak parking demand of the hotel guests only, the parking survey was conducted from 2:00 AM to 7:00 AM to exclude the parking demand associated with the other uses. The parking utilization surveys were conducted on Wednesday November 20, 2019 and Saturday November 23, 2019 at 30-minute time intervals.

Based on the results of the surveys, it was noted that the peak parking demand was still increasing at 7:00 AM. Consequently, another parking utilization survey was conducted on Thursday November 28, 2019 from 2:00 AM-2:00 PM. The peak parking demand rates for the three surveys have been derived and summarized in **Table 6-3** with detailed results in **Appendix H**. The peak demand of the hotel was calculated by subtracting the parking demand of the reserved sports club from the total parking demand. The sports club was the only amenity with reserved and marked parking. It should be noted that the total demand after 7:00 AM during the third survey may include parking demand from some of the other amenities and facilities, particularly the meeting rooms. Therefore, the peak parking demands of the final survey represent a conservative estimation.

Table 6-3: Parking Survey Results

Survey Date	Total Peak Demand	Hotel Peak Demand	Time Observed	Peak Demand Rate ¹
Wed. Nov 20	134	117	6:30 AM – 7:00 AM	0.29 spaces/room
Sat. Nov 23	79	69	6:30 AM – 7:00 AM	0.17 spaces/room
Thur. Nov 28	153	133	11:00 AM – 11:30 AM	0.33 spaces/room
MAX DEMAND RATE				0.33 spaces/room

1- Peak demand rate of the hotel component only

The maximum parking demand occurred from 11:00-11:30 AM on Thursday November 28, 2019 and equated to a demand rate of 0.33 spaces per hotel room. This peak demand rate is equivalent to the proposed supply rate. Given the time period of the peak parking demand, it should be reiterated that this is a conservative estimation and includes the parking demand of visitors coming for the meeting space, spa and/or restaurants. The subject site does not have a meeting space. As such, it is expected that the proposed development will exhibit a peak parking demand slightly less than the results in Table 6-3. Given these findings, the subject site is proposed to provide sufficient parking.

6.3.2 The Provincial Policy Statement

The Provincial Policy Statement (PPS) outlines the Ontario government's policies on land use planning and provides direction in ensuring the development of healthy and sustainable communities with a thriving economy. Under Section 3 of the Planning Act, all decisions affecting land use planning matters "shall be consistent with" the PPS. One of the key matters pertaining to PPS policies includes the promotion of transportation decisions that increase active transportation and transit usage. As stated under Section 1.8.1 b. of the PPS, **planning authorities shall support land use and development patterns which: "promote the use of active transportation and transit in and between residential, employment (including commercial and industrial) and institutional uses and other areas;"**

Through proposing reduced parking spaces for employees and visitors, the proposed development is in support of the changing paradigm which shifts away from the provision of excess parking. The subject site is located in a well-serviced transit network, with a number of daily amenities available within a ten-minute walking distance radius. Therefore, this decision to provide less parking spaces aids in promoting mobility options that are not automobile dependent, such as active transportation and transit.

6.3.3 Ontario's Five Year Climate Change Action Plan

Ontario's Five Year Climate Change Action Plan was announced in June 2016 with the objective of fighting climate change with several areas of action. **The plan recognizes the vital role transportation and land use planning takes in effectively reducing greenhouse gas pollution.** Some of those actions include: implementing Transportation Demand Management Plans to limit single occupant vehicle trips, supporting cycling and walking for daily commutes, and **eliminating minimum parking requirements for municipal zoning bylaws over the next five years.**

The proposed development's decision to provide less parking spaces than required from the City's zoning bylaw acknowledges that the land within the Humber Bay Shores Precinct Plan should not be used for excess parking, but rather for further land-development opportunities that support a future shifting towards lower auto-dependency. The subject site is located within walkable distance of several transit stops, rendering car ownership for residents in this neighborhood as an option rather than a necessity, which would reduce fossil fuel consumption and traffic congestion.

6.3.4 City of Toronto Official Plan

The City's Official Plan sets out a framework for how the municipality will grow. The City of Toronto Official Plan envisions a safe and attractive city that ensures a good quality of life, while also placing importance in maintaining a healthy natural environment. **Sustainable development in the future would include neighbourhoods that total to complete communities, and walkable streets with transit as an attractive choice of travel.**

Under **Section 2.1, Policy 1 d), the Official Plan states to reduce auto-dependency and improve air quality.** Furthermore, Section 2.2 states the importance of the City's transportation network in supporting Toronto's growth over the next 30 years. This section highlights the connection between transportation

and land use planning in increasing accessibility in the City, as accessibility is achieved by both mobility and proximity. Therefore, the Official Plan supports ideas which combine the two elements to maximize accessibility for its residents.

These elements of complete communities, reducing auto-dependency, preserving the environment, and increasing accessibility are supported by the proposed development with reduced parking. Reduced parking acts as a deterrent to car ownership, and **allows more land to be developed for amenities to meet the daily needs of employees and visitors.** The convenient and well serviced location of this development allows for the reduction in parking availability, and supports the Official Plan vision.

7 BICYCLE PARKING REVIEW

The subject site is governed by the Former City of Etobicoke By-Law No. 11,737. However, it is noted that the former City of Etobicoke By-Law doesn't have requirements for bicycle parking. Therefore, the subject site will comply to the requirements set forth by Zoning By-Law 569-2013 and the corresponding Toronto Green Standards (TGS) requirements for bicycle parking. The subject site is in Bicycle Zone 2 as defined by the By-law; **Table 7-1** summarizes the application of the minimum bicycle parking rates to the subject site.

Table 7-1: Bicycle Parking Requirements

Land Use	Rooms/GFA	Minimum Rates		Requirement		Proposed	
		Short-Term	Long-Term	Short-Term	Long-Term	Short-Term	Long-Term
Hotel	165	-	-	-	-	-	-
Restaurant	158 m ²	3 + 0.25/100m ²	0.13/100m ²	4	1	4	1
TOTAL				4	1	4	1

The restaurant uses will be required to provide a total of 4-short-term bicycle parking spaces and 1 long-term bicycle parking space to meet the TGS requirements for Bicycle Zone 2. The subject site will meet the Zoning By-Law and TGS requirements.

8 LOADING REVIEW

The subject site is governed by the Former City of Etobicoke By-Law No. 11,737. It is noted that the former City of Etobicoke By-Law suggests that no loading is required for the subject site. Therefore, as a comparison, the City of Toronto Zoning By-Law 569-2013 was reviewed with respect to loading. **Table 8-1** below summarizes the application of the Zoning By-Law requirements to the subject site.

Table 8-1: Loading Requirements

Land Use	GFA	Loading Spaces Required			
		A	B	C	G
Hotel	7,318 m ²	-	1	1	0
Restaurant	158 m ²	-	-	-	-
Total Required		-	1	1	-
Proposed Supply		0	1*	1*	0

*Note: Type B and Type C loading space will be shared

One shared Type B/C loading space is proposed on site which can accommodate garbage trucks, medium-sized delivery trucks or smaller and courier vans. The proposed loading provision is expected to meet the needs of the hotel development.

A review of the site circulation demonstrates that garbage trucks can manoeuvre in and out of the proposed loading space. Swept path diagrams illustrating loading and vehicular functionality is available in **Appendix I**.

9 TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) is a set of strategies which strive towards a more efficient transportation network by influencing travel behaviour. Effective TDM measures can reduce vehicle usage and encourage people to engage in more sustainable methods of travel. In addition to the active transportation and transit routes in the area, which are discussed in detail under **Section 2.0**, there are several opportunities to incorporate TDM measures that support alternative modes of transportation. The recommendations should enhance non-single occupant vehicle trips for the future guests of the proposed hotel development. In efforts to reduce single occupancy auto vehicle trips generated on-site by 15% as per the Toronto Green Standard Version 3, a variety of multimodal infrastructure strategies and TDM measures have been detailed below.

9.1 PEDESTRIAN-BASED RECOMMENDED STRATEGIES

- ▶ Building entrances are to be oriented close to the street with direct connections to the pedestrian pathways.

The proposed pedestrian entrance to the building is oriented to Lake Shore Boulevard West, providing convenient access for pedestrians, transit users, and cyclists. To further enhance the pedestrian realm and consider persons with mobility difficulties, the passageways should be well lit with enhanced landscaping and minimal barriers to provide a clear pedestrian corridor. This will improve aesthetics and increase the sense of security for pedestrians.

- ▶ Provide enhanced landscaping that would encourage walking and pedestrian activity.

Pedestrian-scale lighting could be provided along the exterior of the building, at pedestrian access points, and along the sidewalks at Lake Shore Boulevard West and Silver Moon Drive to promote a safe pedestrian environment. Landscaping furniture such as benches and waste receptacles can be provided to create a pedestrian and activity oriented building frontage.

- ▶ Walking distance to nearby amenities.

The subject site is situated in a developing area with nearby amenities and services that are reachable within a 10-minute walk. Within the study area, there are a number of eating establishments as well as offices that will cater to future employees and guests of the proposed hotel use. This mixed land use neighbourhood facilitates walking trips and reduces the need for SOV's.

9.2 TRANSIT-BASED RECOMMENDED STRATEGIES

- ▶ Connection to transit network.

There are existing transit stops located in front of the subject site along Lake Shore Boulevard West. The stops are serviced by Route 501 Queen, Route 508 Lake Shore, and Route 145 Downtown/Humber Bay Express, which all provides connections to TTC Subway Line 1 Yonge-University-Spadina. Additionally, the stops are also serviced by Route 66 Prince Edward, which provides connections to TTC Subway Line 2 Bloor-Danforth. These routes provide future hotel guests with an alternative mode for travelling between the hotel and their destinations within the City.

► Communication strategy & transit incentive program

In order for hotel guests and employees to take advantage of the various transit services surrounding the subject site, it is recommended that the owners provide information packages and communications to increase transit awareness and multi-modal transport by encouraging active transportations and different travel demand management programs. The information packages should contain public transit information such as route maps and schedule timetables. Furthermore, route and scheduling information could be provided as displays in the lobby or lunchroom, or through real-time updated digital displays in the elevator or in a central location in all of the buildings. It is recommended that the owner coordinate an information session with the City of Toronto to deliver and promote transit incentive to residents that work in the City.

► Provision of pre-loaded Presto Cards to new tenants.

It is recommended that Presto Cards with a pre-loaded value (waiving the \$6 card purchase fee) be provided to future employees of the proposed hotel to encourage use of transit services in the area. This will provide employees with free trials of transit services and an opportunity for them to experience its benefits. It is common to provide what is equivalent to a month's supply of daily commuting.

9.3 CYCLING-BASED RECOMMENDED STRATEGIES

► The proposed development should provide short and long-term bicycle parking.

The subject development will provide bicycle parking facilities to support and encourage active transportation. The short-term bicycle spaces should be located in highly visible and convenient areas close to the building entrances for visitors. Long-term bicycle parking should be provided in secured and weather-protected locations, including storage rooms, bicycle lockers and underground parking areas.

As discussed in **Section 7.0**, a total supply of 5 parking spaces (4 short-term and 1 long-term) meets the requirements as outlined in the City of Toronto Zoning By-Law 569-2013 for Bike Zone 2.

► Promote and increase cycling awareness.

Provide information packages to encourage cycling as a viable opportunity of active transportation. This should include educating employees on the health and environmental benefits of cycling, as well as providing maps of the cycling network and available infrastructure in the surrounding area. The applicant will provide the information packages and communications to be distributed to future staff of the proposed hotel. A designated Information Centre should be set up within the lobby area to provide updated information on Smart Commute initiatives and multi-modal connections.

► Provide sources that offer bicycle training skills to employees.

Given the existing cycling infrastructure surrounding the subject site, there are opportunities for classes or training to be provided on site to teach employees basic bicycle skills appropriate for everyday traveling to and from the site. While the idea of cycling can be intimidating to first-time cyclists, cycling skills training will increase their understanding of the safety measures need in traveling in mix traffic, while also helping enhance cycling behavior on the road (ex. CAN-BIKE certification course).

10 CONCLUSIONS

- ▶ The proposed development consists of a 13-storey hotel, containing 165 suites and 158 m² of restaurant use. A total of 54 parking spaces are proposed within one level of underground garage. The site will be accessible via a Public Laneway from Silver Moon Drive.
- ▶ The site is well serviced by the existing TTC buses and streetcars with stops directly in front of the site, or within a short walking distance. The routes provide connections to TTC Subway Line 2 Bloor Danforth, and Line 1 Yonge-University-Spadina.
- ▶ Under existing conditions, the studied intersections operate at good levels of service. All movements are found to operate with minimal delays and within the roadway capacity in both the weekday AM and PM peak hours.
- ▶ Historical TMC data was reviewed and a 0% growth rate was conservatively applied along Lake Shore Boulevard. The future background traffic conditions were forecasted based on the traffic generated by 7 background developments in the vicinity of the subject site.
- ▶ Under future background traffic conditions, the studied intersections continue to operate acceptably without any constraints during the weekday AM and PM peak hours.
- ▶ The proposed hotel development is estimated to generate 78 and 99 two-way vehicle trips during the weekday AM and PM peak hours, respectively.
- ▶ Future total conditions were determined by adding the site generated traffic to the future background volumes as calculated above.
- ▶ Under future total conditions, all studied intersections operate similarly to future background conditions. All intersections are expected to operate without any constraints and with ample capacity. The site-generated traffic can be readily accommodated by the surrounding road network without the need for any improvements.
- ▶ Based on our review of the Provincial Policy Statement, Growth Plan for the Greater Golden Horseshow, Ontario's Five Year Climate Change Action Plan, City of Toronto Official Plan, and the proxy site parking utilization data, it is concluded that the proposed parking supply is adequate.
- ▶ The bicycle provisions meet the City of Toronto Zoning By-law 569-2013 and TGS Tier 1 requirements for Bicycle Zone 2.
- ▶ The loading provisions meet the needs of the hotel development.
- ▶ Several TDM measures have been recommended to reduce single-occupant vehicle trips and encourage alternative modes of travel including the provision of Presto Cards for future hotel staff, enhanced landscaping, as well as secured bicycle parking facilities. The proximity to an existing transit network further reduces the necessity of a vehicle and promotes transit usage. The reduced parking supply is also an effective strategy to reduce auto dependency.

Client No

APPENDIX A

Existing Traffic Data & Signal Timing Plans

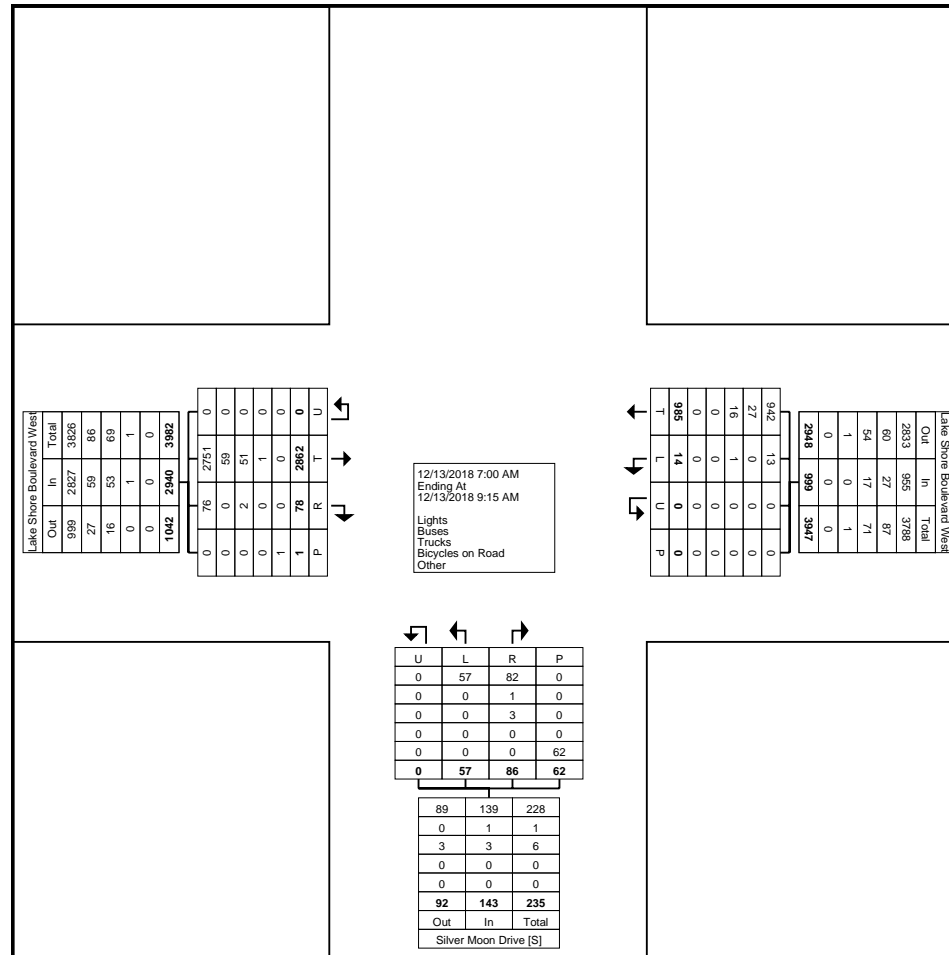
Project Name

LEA Consulting Ltd.
 625 Cochrane Drive
 Markam, Ontario, Canada L3R 9R9
 905-470-0015 x240 akung@LEA.ca

Count Name:
 19270_SilverMoonDr&LakeShoreBlvdW-AM
 Site Code: 19270
 Start Date: 12/13/2018
 Page No: 1

Turning Movement Data

Start Time	Lake Shore Boulevard West Westbound					Silver Moon Drive Northbound					Lake Shore Boulevard West Eastbound				Int. Total	
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds		App. Total
7:00 AM	106	1	0	0	107	13	12	0	3	25	10	269	0	0	279	411
7:15 AM	98	2	0	0	100	10	14	0	2	24	11	314	0	0	325	449
7:30 AM	107	2	0	0	109	6	10	0	10	16	4	367	0	1	371	496
7:45 AM	134	3	0	0	137	15	8	0	20	23	3	424	0	0	427	587
Hourly Total	445	8	0	0	453	44	44	0	35	88	28	1374	0	1	1402	1943
8:00 AM	149	1	0	0	150	10	5	0	11	15	7	371	0	0	378	543
8:15 AM	132	2	0	0	134	13	3	0	10	16	17	393	0	0	410	560
8:30 AM	124	1	0	0	125	13	0	0	2	13	11	352	0	0	363	501
8:45 AM	134	2	0	0	136	6	5	0	4	11	15	370	0	0	385	532
Hourly Total	539	6	0	0	545	42	13	0	27	55	50	1486	0	0	1536	2136
9:00 AM	1	0	0	0	1	0	0	0	0	0	0	2	0	0	2	3
Grand Total	985	14	0	0	999	86	57	0	62	143	78	2862	0	1	2940	4082
Approach %	98.6	1.4	0.0	-	-	60.1	39.9	0.0	-	-	2.7	97.3	0.0	-	-	-
Total %	24.1	0.3	0.0	-	24.5	2.1	1.4	0.0	-	3.5	1.9	70.1	0.0	-	72.0	-
Lights	942	13	0	-	955	82	57	0	-	139	76	2751	0	-	2827	3921
% Lights	95.6	92.9	-	-	95.6	95.3	100.0	-	-	97.2	97.4	96.1	-	-	96.2	96.1
Buses	27	0	0	-	27	1	0	0	-	1	0	59	0	-	59	87
% Buses	2.7	0.0	-	-	2.7	1.2	0.0	-	-	0.7	0.0	2.1	-	-	2.0	2.1
Trucks	16	1	0	-	17	3	0	0	-	3	2	51	0	-	53	73
% Trucks	1.6	7.1	-	-	1.7	3.5	0.0	-	-	2.1	2.6	1.8	-	-	1.8	1.8
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	1
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	62	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-



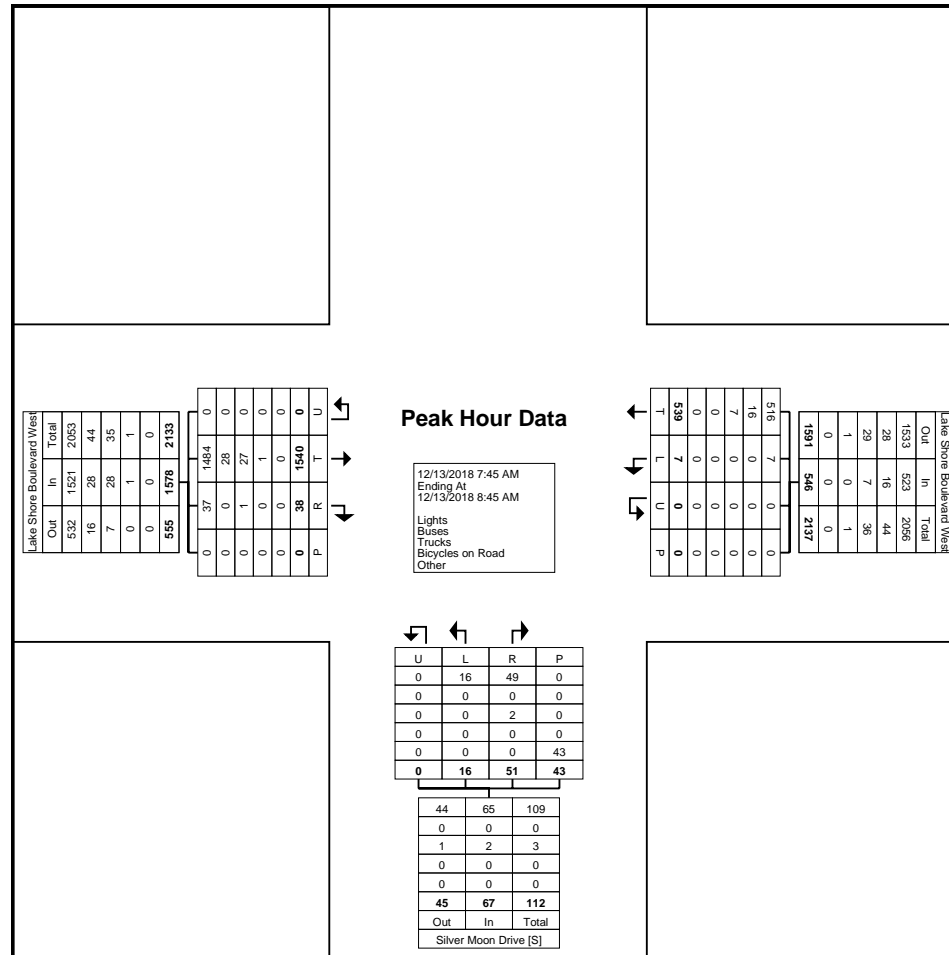
Turning Movement Data Plot

LEA Consulting Ltd.
 625 Cochrane Drive
 Markam, Ontario, Canada L3R 9R9
 905-470-0015 x240 akung@LEA.ca

Count Name:
 19270_SilverMoonDr&LakeShoreBlvdW-AM
 Site Code: 19270
 Start Date: 12/13/2018
 Page No: 3

Turning Movement Peak Hour Data (7:45 AM)

Start Time	Lake Shore Boulevard West Westbound					Silver Moon Drive Northbound					Lake Shore Boulevard West Eastbound					Int. Total
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	
7:45 AM	134	3	0	0	137	15	8	0	20	23	3	424	0	0	427	587
8:00 AM	149	1	0	0	150	10	5	0	11	15	7	371	0	0	378	543
8:15 AM	132	2	0	0	134	13	3	0	10	16	17	393	0	0	410	560
8:30 AM	124	1	0	0	125	13	0	0	2	13	11	352	0	0	363	501
Total	539	7	0	0	546	51	16	0	43	67	38	1540	0	0	1578	2191
Approach %	98.7	1.3	0.0	-	-	76.1	23.9	0.0	-	-	2.4	97.6	0.0	-	-	-
Total %	24.6	0.3	0.0	-	24.9	2.3	0.7	0.0	-	3.1	1.7	70.3	0.0	-	72.0	-
PHF	0.904	0.583	0.000	-	0.910	0.850	0.500	0.000	-	0.728	0.559	0.908	0.000	-	0.924	0.933
Lights	516	7	0	-	523	49	16	0	-	65	37	1484	0	-	1521	2109
% Lights	95.7	100.0	-	-	95.8	96.1	100.0	-	-	97.0	97.4	96.4	-	-	96.4	96.3
Buses	16	0	0	-	16	0	0	0	-	0	0	28	0	-	28	44
% Buses	3.0	0.0	-	-	2.9	0.0	0.0	-	-	0.0	0.0	1.8	-	-	1.8	2.0
Trucks	7	0	0	-	7	2	0	0	-	2	1	27	0	-	28	37
% Trucks	1.3	0.0	-	-	1.3	3.9	0.0	-	-	3.0	2.6	1.8	-	-	1.8	1.7
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	1
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.1	-	-	0.1	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	43	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-



Turning Movement Peak Hour Data Plot (7:45 AM)

LEA Consulting Ltd.
625 Cochrane Drive
Markam, Ontario, Canada L3R 9R9
905-470-0015 x240 akung@LEA.ca

Count Name:
19270_SilverMoonDr&LakeShoreBlvdW-AM
Site Code: 19270
Start Date: 12/13/2018
Page No: 5

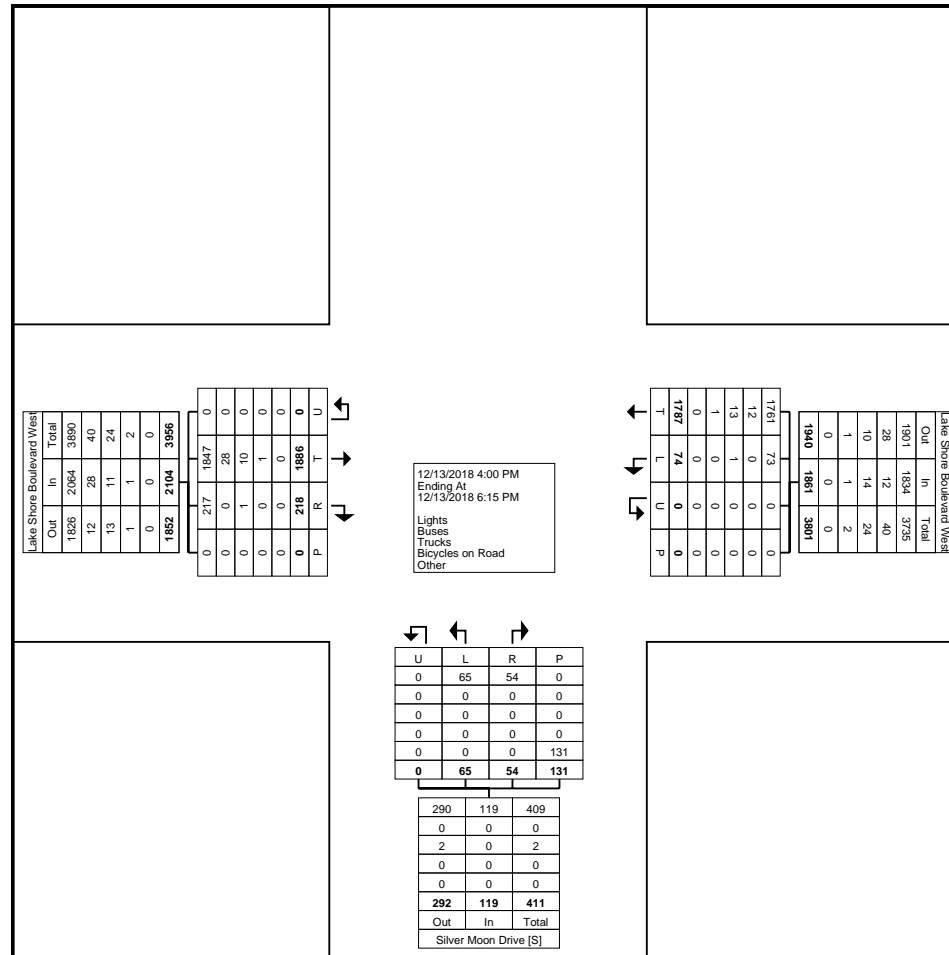
LEA Consulting Ltd.
625 Cochrane Drive

Markam, Ontario, Canada L3R 9R9
905-470-0015 x240 akung@LEA.ca

Count Name:
19270_SilverMoonDr&LakeShoreBlvdW-PM
Site Code: 19270
Start Date: 12/13/2018
Page No: 1

Turning Movement Data

Start Time	Lake Shore Boulevard West Westbound					Silver Moon Drive Northbound					Lake Shore Boulevard West Eastbound					Int. Total
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	
4:00 PM	195	5	0	0	200	8	7	0	22	15	28	196	0	0	224	439
4:15 PM	210	9	0	0	219	5	10	0	14	15	33	200	0	0	233	467
4:30 PM	248	8	0	0	256	7	8	0	10	15	22	212	0	0	234	505
4:45 PM	259	9	0	0	268	9	6	0	14	15	24	220	0	0	244	527
Hourly Total	912	31	0	0	943	29	31	0	60	60	107	828	0	0	935	1938
5:00 PM	211	8	0	0	219	5	8	0	10	13	19	261	0	0	280	512
5:15 PM	232	8	0	0	240	5	11	0	14	16	26	273	0	0	299	555
5:30 PM	249	14	0	0	263	10	3	0	25	13	31	243	0	0	274	550
5:45 PM	183	13	0	0	196	5	12	0	22	17	35	280	0	0	315	528
Hourly Total	875	43	0	0	918	25	34	0	71	59	111	1057	0	0	1168	2145
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Grand Total	1787	74	0	0	1861	54	65	0	131	119	218	1886	0	0	2104	4084
Approach %	96.0	4.0	0.0	-	-	45.4	54.6	0.0	-	-	10.4	89.6	0.0	-	-	-
Total %	43.8	1.8	0.0	-	45.6	1.3	1.6	0.0	-	2.9	5.3	46.2	0.0	-	51.5	-
Lights	1761	73	0	-	1834	54	65	0	-	119	217	1847	0	-	2064	4017
% Lights	98.5	98.6	-	-	98.5	100.0	100.0	-	-	100.0	99.5	97.9	-	-	98.1	98.4
Buses	12	0	0	-	12	0	0	0	-	0	0	28	0	-	28	40
% Buses	0.7	0.0	-	-	0.6	0.0	0.0	-	-	0.0	0.0	1.5	-	-	1.3	1.0
Trucks	13	1	0	-	14	0	0	0	-	0	1	10	0	-	11	25
% Trucks	0.7	1.4	-	-	0.8	0.0	0.0	-	-	0.0	0.5	0.5	-	-	0.5	0.6
Bicycles on Road	1	0	0	-	1	0	0	0	-	0	0	1	0	-	1	2
% Bicycles on Road	0.1	0.0	-	-	0.1	0.0	0.0	-	-	0.0	0.0	0.1	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.8	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	130	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	99.2	-	-	-	-	-	-	-



Turning Movement Data Plot

LEA Consulting Ltd.
 625 Cochrane Drive
 Markam, Ontario, Canada L3R 9R9
 905-470-0015 x240 akung@LEA.ca

Count Name:
 19270_SilverMoonDr&LakeShoreBlvdW-PM
 Site Code: 19270
 Start Date: 12/13/2018
 Page No: 3

Turning Movement Peak Hour Data (5:00 PM)

Start Time	Lake Shore Boulevard West Westbound					Silver Moon Drive Northbound					Lake Shore Boulevard West Eastbound					Int. Total
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	
5:00 PM	211	8	0	0	219	5	8	0	10	13	19	261	0	0	280	512
5:15 PM	232	8	0	0	240	5	11	0	14	16	26	273	0	0	299	555
5:30 PM	249	14	0	0	263	10	3	0	25	13	31	243	0	0	274	550
5:45 PM	183	13	0	0	196	5	12	0	22	17	35	280	0	0	315	528
Total	875	43	0	0	918	25	34	0	71	59	111	1057	0	0	1168	2145
Approach %	95.3	4.7	0.0	-	-	42.4	57.6	0.0	-	-	9.5	90.5	0.0	-	-	-
Total %	40.8	2.0	0.0	-	42.8	1.2	1.6	0.0	-	2.8	5.2	49.3	0.0	-	54.5	-
PHF	0.879	0.768	0.000	-	0.873	0.625	0.708	0.000	-	0.868	0.793	0.944	0.000	-	0.927	0.966
Lights	866	43	0	-	909	25	34	0	-	59	111	1038	0	-	1149	2117
% Lights	99.0	100.0	-	-	99.0	100.0	100.0	-	-	100.0	100.0	98.2	-	-	98.4	98.7
Buses	5	0	0	-	5	0	0	0	-	0	0	14	0	-	14	19
% Buses	0.6	0.0	-	-	0.5	0.0	0.0	-	-	0.0	0.0	1.3	-	-	1.2	0.9
Trucks	4	0	0	-	4	0	0	0	-	0	0	4	0	-	4	8
% Trucks	0.5	0.0	-	-	0.4	0.0	0.0	-	-	0.0	0.0	0.4	-	-	0.3	0.4
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	1
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.1	-	-	0.1	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	71	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-

LEA Consulting Ltd.
625 Cochrane Drive
Markam, Ontario, Canada L3R 9R9
905-470-0015 x240 akung@LEA.ca

Count Name:
19270_SilverMoonDr&LakeShoreBlvdW-PM
Site Code: 19270
Start Date: 12/13/2018
Page No: 5

LEA CONSULTING LTD

625 Cochrane Drive 9th Floor
Markham, Ontario, L3R 9R9

Project No.: 19270
Location: Brookers Ln & Lake Shore Blvd
Weather: Light Snow
Surveyor(s): Tevin Luu & Terence Zeng

File Name : Brookers&LakeShore-THU-AM
Site Code : 19270035
Start Date : 2018-12-13
Page No : 1

Groups Printed- Cars - Trucks - Buses

Start Time	Gardiner Expressway On/Off Ramp Southbound					Lake Shore Boulevard West Westbound					Brookers Lane Northbound					Lake Shore Boulevard West Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00	4	4	43	0	51	0	18	3	0	21	39	11	10	13	73	58	214	5	0	277	422
07:15	4	2	62	1	69	0	15	4	0	19	30	11	17	4	62	84	232	8	0	324	474
07:30	15	10	58	0	83	0	11	2	0	13	41	5	16	6	68	134	239	6	0	379	543
07:45	8	4	84	0	96	3	9	0	0	12	32	6	24	2	64	125	240	5	0	370	542
Total	31	20	247	1	299	3	53	9	0	65	142	33	67	25	267	401	925	24	0	1350	1981
08:00	6	7	72	0	85	1	14	2	0	17	45	15	22	1	83	125	212	6	0	343	528
08:15	9	5	71	0	85	1	15	3	0	19	41	13	17	1	72	164	203	10	0	377	553
08:30	25	4	73	0	102	1	12	3	0	16	28	11	15	3	57	140	184	3	0	327	502
08:45	17	4	62	0	83	2	14	1	0	17	33	13	9	3	58	124	216	7	0	347	505
Total	57	20	278	0	355	5	55	9	0	69	147	52	63	8	270	553	815	26	0	1394	2088
Grand Total	88	40	525	1	654	8	108	18	0	134	289	85	130	33	537	954	1740	50	0	2744	4069
Apprch %	13.5	6.1	80.3	0.2		6	80.6	13.4	0		53.8	15.8	24.2	6.1		34.8	63.4	1.8	0		
Total %	2.2	1	12.9	0	16.1	0.2	2.7	0.4	0	3.3	7.1	2.1	3.2	0.8	13.2	23.4	42.8	1.2	0	67.4	
Cars	81	39	504	1	625	8	98	18	0	124	289	85	128	30	532	936	1649	50	0	2635	3916
% Cars	92	97.5	96	100	95.6	100	90.7	100	0	92.5	100	100	98.5	90.9	99.1	98.1	94.8	100	0	96	96.2
Trucks	7	1	19	0	27	0	3	0	0	3	0	0	2	3	5	15	62	0	0	77	112
% Trucks	8	2.5	3.6	0	4.1	0	2.8	0	0	2.2	0	0	1.5	9.1	0.9	1.6	3.6	0	0	2.8	2.8
Buses	0	0	2	0	2	0	7	0	0	7	0	0	0	0	0	3	29	0	0	32	41
% Buses	0	0	0.4	0	0.3	0	6.5	0	0	5.2	0	0	0	0	0	0.3	1.7	0	0	1.2	1

LEA CONSULTING LTD

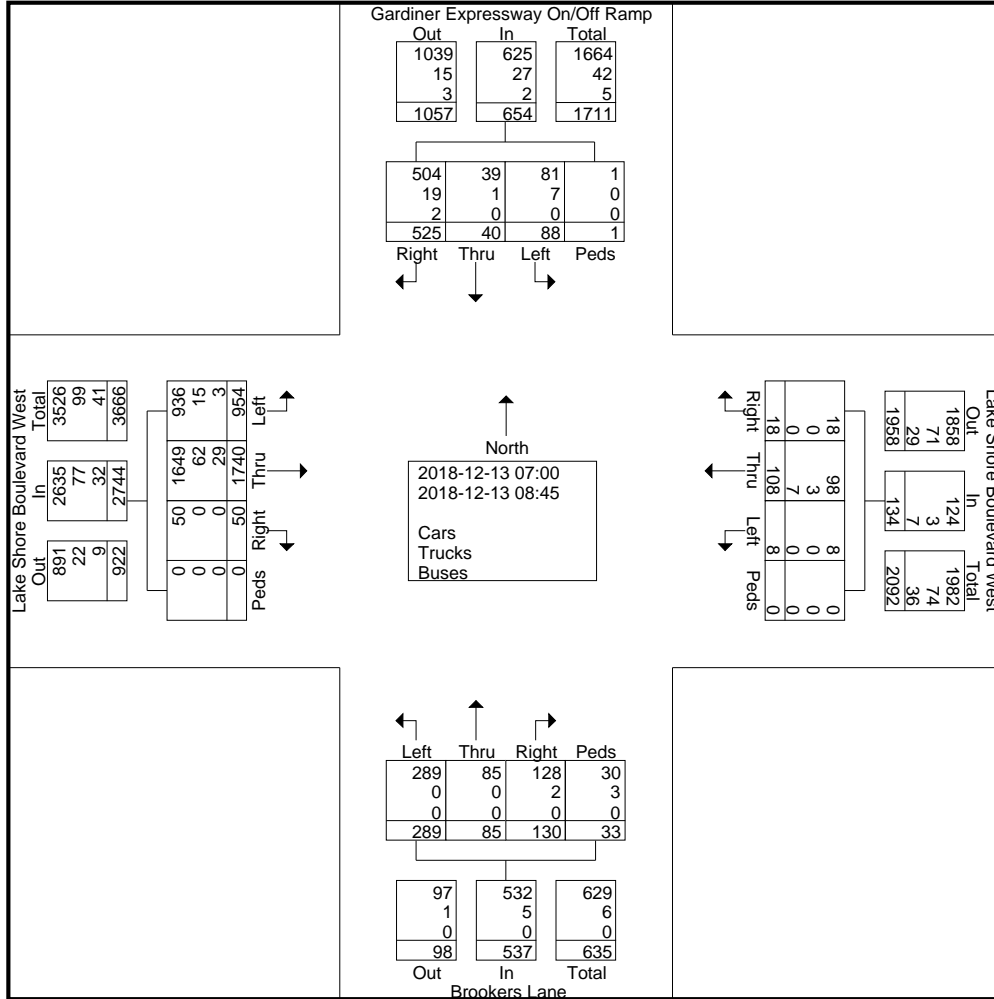
625 Cochrane Drive 9th Floor
Markham, Ontario, L3R 9R9

File Name : Brookers&LakeShore-THU-AM

Site Code : 19270035

Start Date : 2018-12-13

Page No : 2

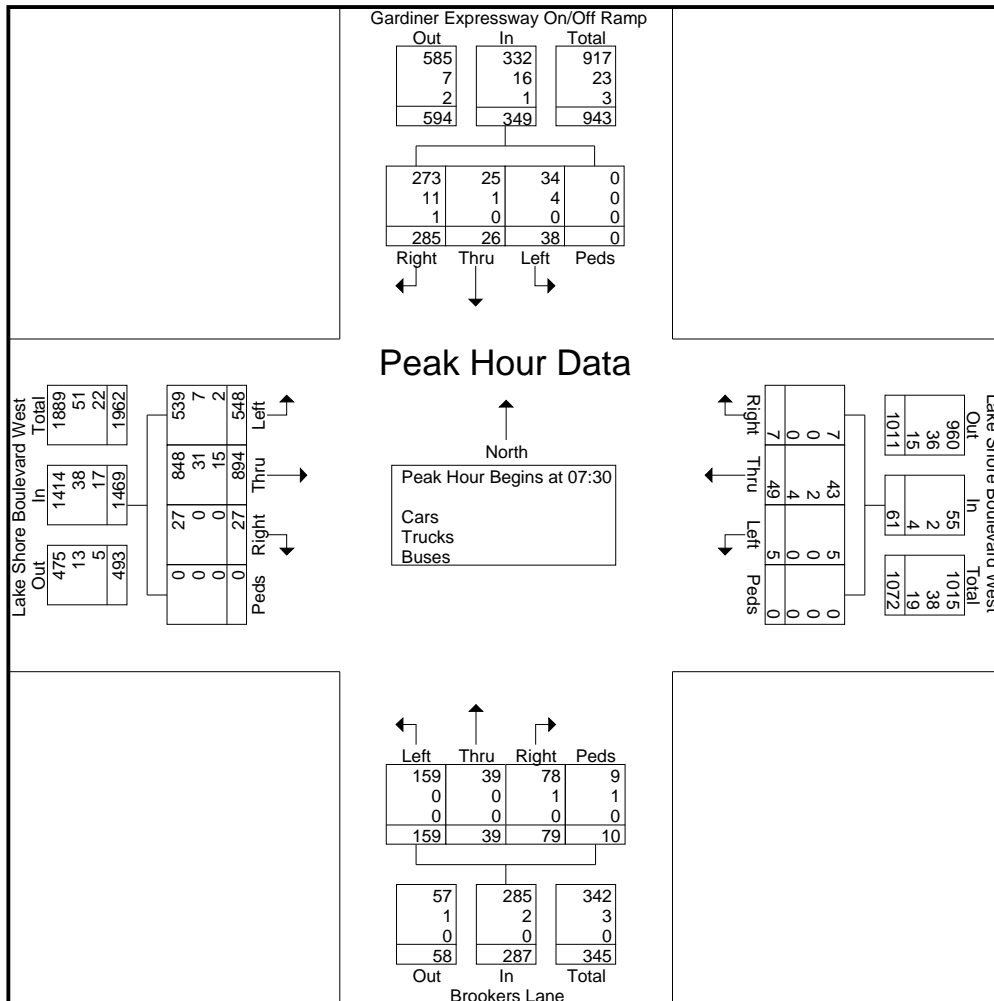


LEA CONSULTING LTD

625 Cochrane Drive 9th Floor
Markham, Ontario, L3R 9R9

File Name : Brookers&LakeShore-THU-AM
Site Code : 19270035
Start Date : 2018-12-13
Page No : 3

Start Time	Gardiner Expressway On/Off Ramp Southbound					Lake Shore Boulevard West Westbound					Brookers Lane Northbound					Lake Shore Boulevard West Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30																					
07:30	15	10	58	0	83	0	11	2	0	13	41	5	16	6	68	134	239	6	0	379	543
07:45	8	4	84	0	96	3	9	0	0	12	32	6	24	2	64	125	240	5	0	370	542
08:00	6	7	72	0	85	1	14	2	0	17	45	15	22	1	83	125	212	6	0	343	528
08:15	9	5	71	0	85	1	15	3	0	19	41	13	17	1	72	164	203	10	0	377	553
Total Volume	38	26	285	0	349	5	49	7	0	61	159	39	79	10	287	548	894	27	0	1469	2166
% App. Total	10.9	7.4	81.7	0		8.2	80.3	11.5	0		55.4	13.6	27.5	3.5		37.3	60.9	1.8	0		
PHF	.633	.650	.848	.000	.909	.417	.817	.583	.000	.803	.883	.650	.823	.417	.864	.835	.931	.675	.000	.969	.979
Cars	34	25	273	0	332	5	43	7	0	55	159	39	78	9	285	539	848	27	0	1414	2086
% Cars	89.5	96.2	95.8	0	95.1	100	87.8	100	0	90.2	100	100	98.7	90.0	99.3	98.4	94.9	100	0	96.3	96.3
Trucks	4	1	11	0	16	0	2	0	0	2	0	0	1	1	2	7	31	0	0	38	58
% Trucks	10.5	3.8	3.9	0	4.6	0	4.1	0	0	3.3	0	0	1.3	10.0	0.7	1.3	3.5	0	0	2.6	2.7
Buses	0	0	1	0	1	0	4	0	0	4	0	0	0	0	0	2	15	0	0	17	22
% Buses	0	0	0.4	0	0.3	0	8.2	0	0	6.6	0	0	0	0	0	0.4	1.7	0	0	1.2	1.0



LEA CONSULTING LTD

625 Cochrane Drive 9th Floor
Markham, Ontario, L3R 9R9

Project No.: 19270
Location: Brookers Ln & Lake Shore Blvd
Weather: Light Snow
Surveyor(s): Tevin Luu & Terence Zeng

File Name : Brookers&LakeShore-THU-PM
Site Code : 19270035
Start Date : 2018-12-13
Page No : 1

Groups Printed- Cars - Trucks - Buses

Start Time	Gardiner Expressway On/Off Ramp Southbound					Lake Shore Boulevard West Westbound					Brookers Lane Northbound					Lake Shore Boulevard West Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
16:00	14	25	169	0	208	0	5	0	0	5	8	2	10	7	27	23	146	21	0	190	430
16:15	35	15	186	0	236	0	10	0	0	10	12	4	15	6	37	27	142	35	0	204	487
16:30	35	25	223	0	283	0	14	0	0	14	14	1	9	11	35	28	153	38	1	220	552
16:45	34	13	224	0	271	1	5	0	0	6	14	1	10	6	31	18	164	36	0	218	526
Total	118	78	802	0	998	1	34	0	0	35	48	8	44	30	130	96	605	130	1	832	1995
17:00	17	25	164	0	206	1	13	0	0	14	26	1	15	14	56	23	179	44	0	246	522
17:15	24	20	182	0	226	1	14	0	0	15	25	2	17	14	58	21	205	35	0	261	560
17:30	22	18	180	0	220	0	12	2	0	14	17	2	11	18	48	20	182	42	0	244	526
17:45	18	21	153	0	192	2	7	0	0	9	15	2	10	12	39	15	196	44	0	255	495
Total	81	84	679	0	844	4	46	2	0	52	83	7	53	58	201	79	762	165	0	1006	2103
Grand Total	199	162	1481	0	1842	5	80	2	0	87	131	15	97	88	331	175	1367	295	1	1838	4098
Apprch %	10.8	8.8	80.4	0		5.7	92	2.3	0		39.6	4.5	29.3	26.6		9.5	74.4	16.1	0.1		
Total %	4.9	4	36.1	0	44.9	0.1	2	0	0	2.1	3.2	0.4	2.4	2.1	8.1	4.3	33.4	7.2	0	44.9	
Cars	194	162	1468	0	1824	5	73	2	0	80	131	15	97	87	330	170	1337	294	1	1802	4036
% Cars	97.5	100	99.1	0	99	100	91.2	100	0	92	100	100	100	98.9	99.7	97.1	97.8	99.7	100	98	98.5
Trucks	3	0	12	0	15	0	1	0	0	1	0	0	0	1	1	4	7	1	0	12	29
% Trucks	1.5	0	0.8	0	0.8	0	1.2	0	0	1.1	0	0	0	1.1	0.3	2.3	0.5	0.3	0	0.7	0.7
Buses	2	0	1	0	3	0	6	0	0	6	0	0	0	0	0	1	23	0	0	24	33
% Buses	1	0	0.1	0	0.2	0	7.5	0	0	6.9	0	0	0	0	0	0.6	1.7	0	0	1.3	0.8

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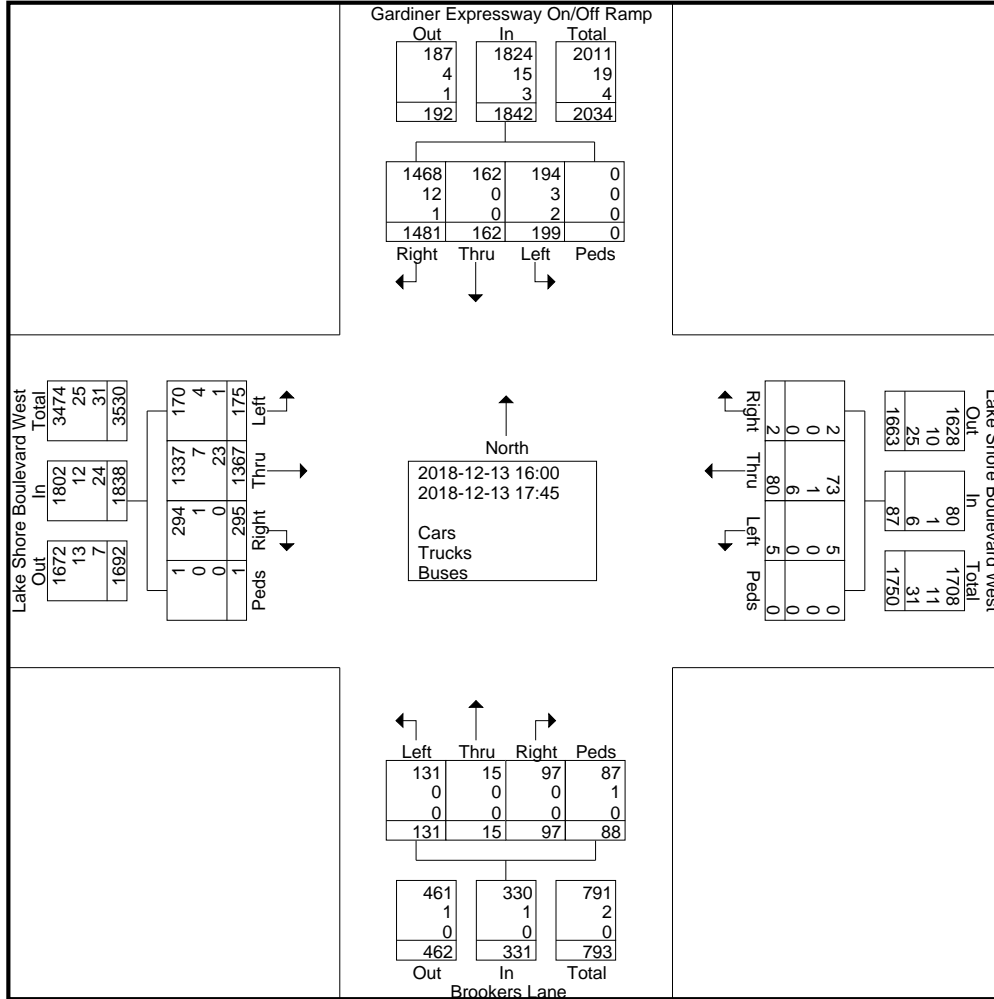
625 Cochrane Drive 9th Floor
Markham, Ontario, L3R 9R9

File Name : Brookers&LakeShore-THU-PM

Site Code : 19270035

Start Date : 2018-12-13

Page No : 2

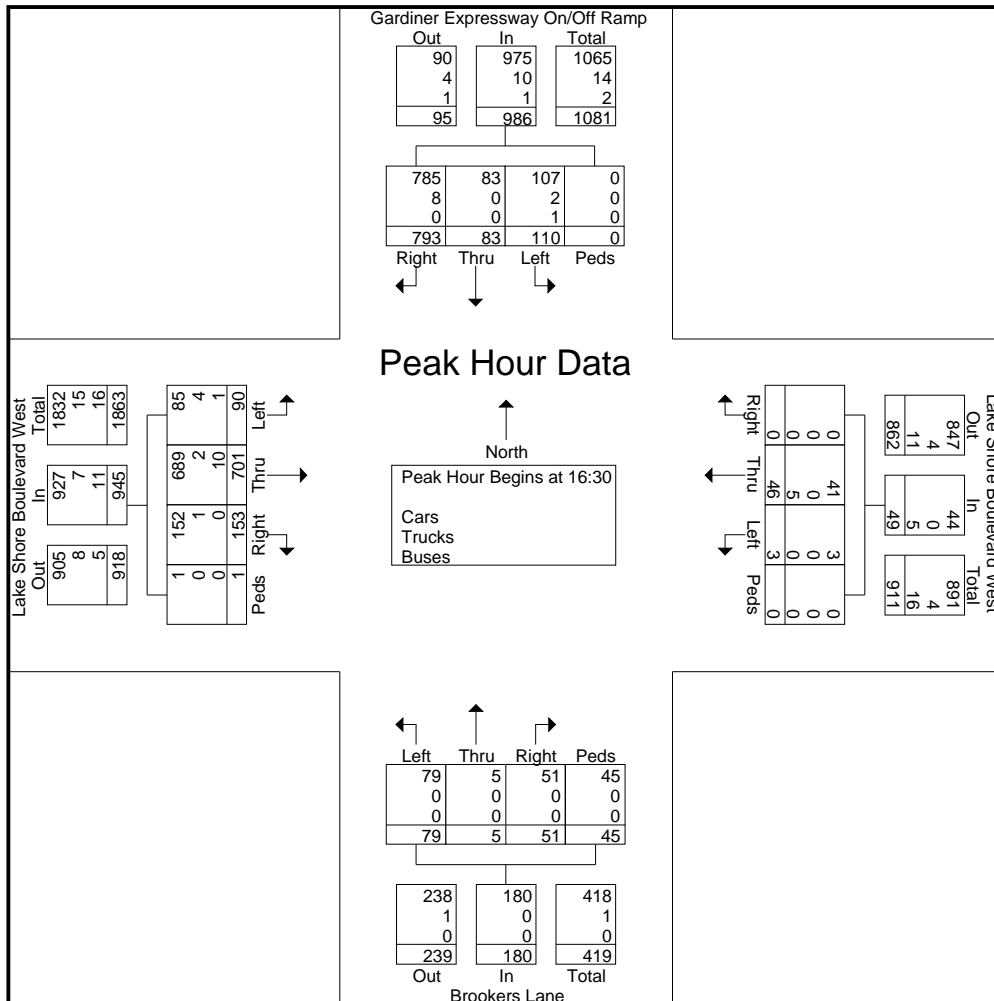


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625 Cochrane Drive 9th Floor
Markham, Ontario, L3R 9R9

File Name : Brookers&LakeShore-THU-PM
Site Code : 19270035
Start Date : 2018-12-13
Page No : 3

Start Time	Gardiner Expressway On/Off Ramp Southbound					Lake Shore Boulevard West Westbound					Brookers Lane Northbound					Lake Shore Boulevard West Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 16:30																					
16:30	35	25	223	0	283	0	14	0	0	14	14	1	9	11	35	28	153	38	1	220	552
16:45	34	13	224	0	271	1	5	0	0	6	14	1	10	6	31	18	164	36	0	218	526
17:00	17	25	164	0	206	1	13	0	0	14	26	1	15	14	56	23	179	44	0	246	522
17:15	24	20	182	0	226	1	14	0	0	15	25	2	17	14	58	21	205	35	0	261	560
Total Volume	110	83	793	0	986	3	46	0	0	49	79	5	51	45	180	90	701	153	1	945	2160
% App. Total	11.2	8.4	80.4	0		6.1	93.9	0	0		43.9	2.8	28.3	25		9.5	74.2	16.2	0.1		
PHF	.786	.830	.885	.000	.871	.750	.821	.000	.000	.817	.760	.625	.750	.804	.776	.804	.855	.869	.250	.905	.964
Cars	107	83	785	0	975	3	41	0	0	44	79	5	51	45	180	85	689	152	1	927	2126
% Cars	97.3	100	99.0	0	98.9	100	89.1	0	0	89.8	100	100	100	100	100	94.4	98.3	99.3	100	98.1	98.4
Trucks	2	0	8	0	10	0	0	0	0	0	0	0	0	0	0	4	2	1	0	7	17
% Trucks	1.8	0	1.0	0	1.0	0	0	0	0	0	0	0	0	0	0	4.4	0.3	0.7	0	0.7	0.8
Buses	1	0	0	0	1	0	5	0	0	5	0	0	0	0	0	1	10	0	0	11	17
% Buses	0.9	0	0	0	0.1	0	10.9	0	0	10.2	0	0	0	0	0	1.1	1.4	0	0	1.2	0.8



LEA CONSULTING LTD

625 Cochrane Drive 9th Floor
Markham, Ontario, L3R 9R9

Project No.: 19270
Location: Park Lawn Rd & Lake Shore Blvd
Weather: Light Snow
Surveyor(s): Jeff Tang & Susan Cho

File Name : ParkLawn&LakeShore-THU-AM
Site Code : 19270022
Start Date : 2018-12-13
Page No : 1

Groups Printed- Cars - Trucks - Buses

Start Time	Park Lawn Road Southbound					Lake Shore Boulevard West Westbound					Marine Parade Drive Northbound					Lake Shore Boulevard West Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00	97	29	22	17	165	2	44	84	10	140	3	32	7	4	46	63	172	4	9	248	599
07:15	151	14	19	15	199	4	42	70	7	123	2	33	8	2	45	57	165	1	17	240	607
07:30	119	49	24	24	216	1	48	81	5	135	6	29	6	5	46	70	211	1	9	291	688
07:45	225	42	18	16	301	3	74	70	7	154	10	52	3	4	69	46	236	2	19	303	827
Total	592	134	83	72	881	10	208	305	29	552	21	146	24	15	206	236	784	8	54	1082	2721
08:00	169	45	27	7	248	1	73	80	4	158	15	51	10	3	79	54	208	4	11	277	762
08:15	145	60	22	26	253	4	73	70	6	153	11	61	9	4	85	41	225	4	13	283	774
08:30	133	78	30	15	256	3	62	60	6	131	15	65	8	4	92	46	185	5	6	242	721
08:45	175	61	31	9	276	0	67	65	3	135	5	38	2	10	55	74	199	4	14	291	757
Total	622	244	110	57	1033	8	275	275	19	577	46	215	29	21	311	215	817	17	44	1093	3014
Grand Total	1214	378	193	129	1914	18	483	580	48	1129	67	361	53	36	517	451	1601	25	98	2175	5735
Apprch %	63.4	19.7	10.1	6.7		1.6	42.8	51.4	4.3		13	69.8	10.3	7		20.7	73.6	1.1	4.5		
Total %	21.2	6.6	3.4	2.2	33.4	0.3	8.4	10.1	0.8	19.7	1.2	6.3	0.9	0.6	9	7.9	27.9	0.4	1.7	37.9	
Cars	1174	349	185	128	1836	18	453	566	48	1085	55	337	37	34	463	441	1552	24	97	2114	5498
% Cars	96.7	92.3	95.9	99.2	95.9	100	93.8	97.6	100	96.1	82.1	93.4	69.8	94.4	89.6	97.8	96.9	96	99	97.2	95.9
Trucks	38	13	8	1	60	0	14	14	0	28	8	11	2	2	23	9	33	1	1	44	155
% Trucks	3.1	3.4	4.1	0.8	3.1	0	2.9	2.4	0	2.5	11.9	3	3.8	5.6	4.4	2	2.1	4	1	2	2.7
Buses	2	16	0	0	18	0	16	0	0	16	4	13	14	0	31	1	16	0	0	17	82
% Buses	0.2	4.2	0	0	0.9	0	3.3	0	0	1.4	6	3.6	26.4	0	6	0.2	1	0	0	0.8	1.4

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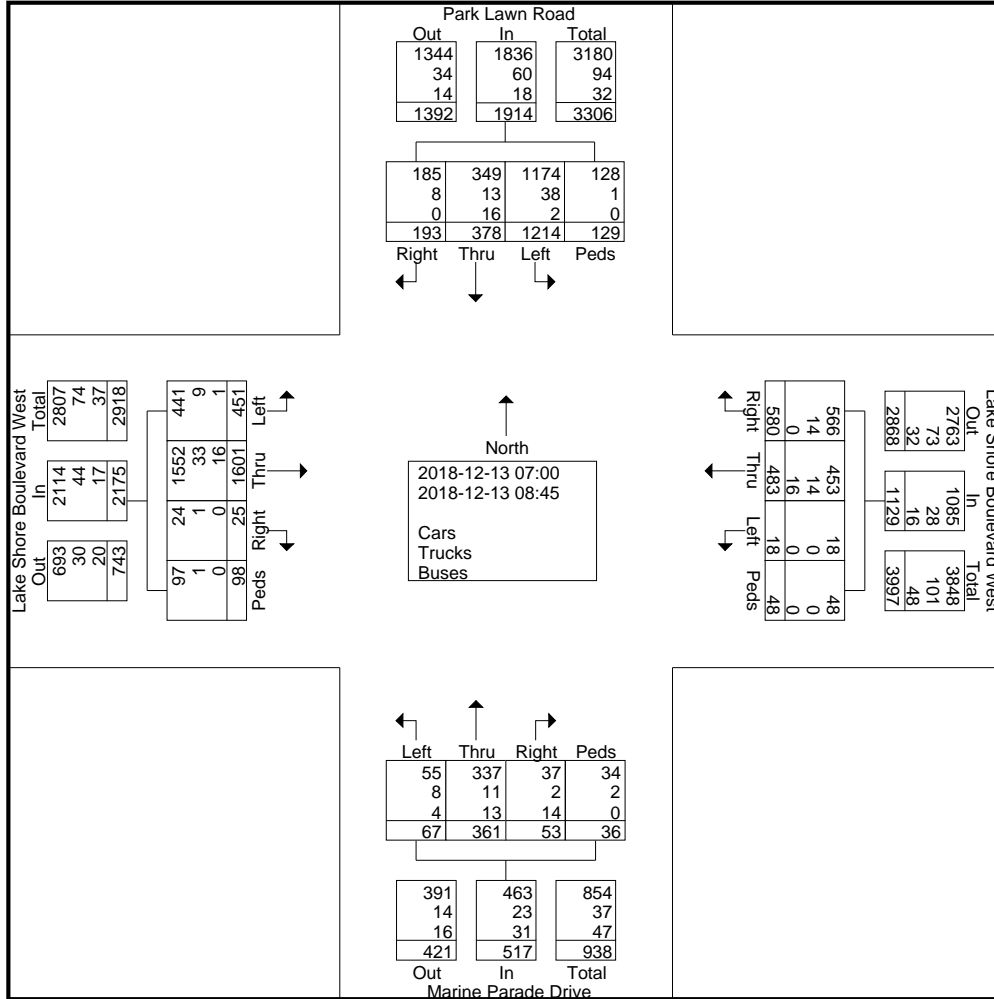
625 Cochrane Drive 9th Floor
Markham, Ontario, L3R 9R9

File Name : ParkLawn&LakeShore-THU-AM

Site Code : 19270022

Start Date : 2018-12-13

Page No : 2



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625 Cochrane Drive 9th Floor
Markham, Ontario, L3R 9R9

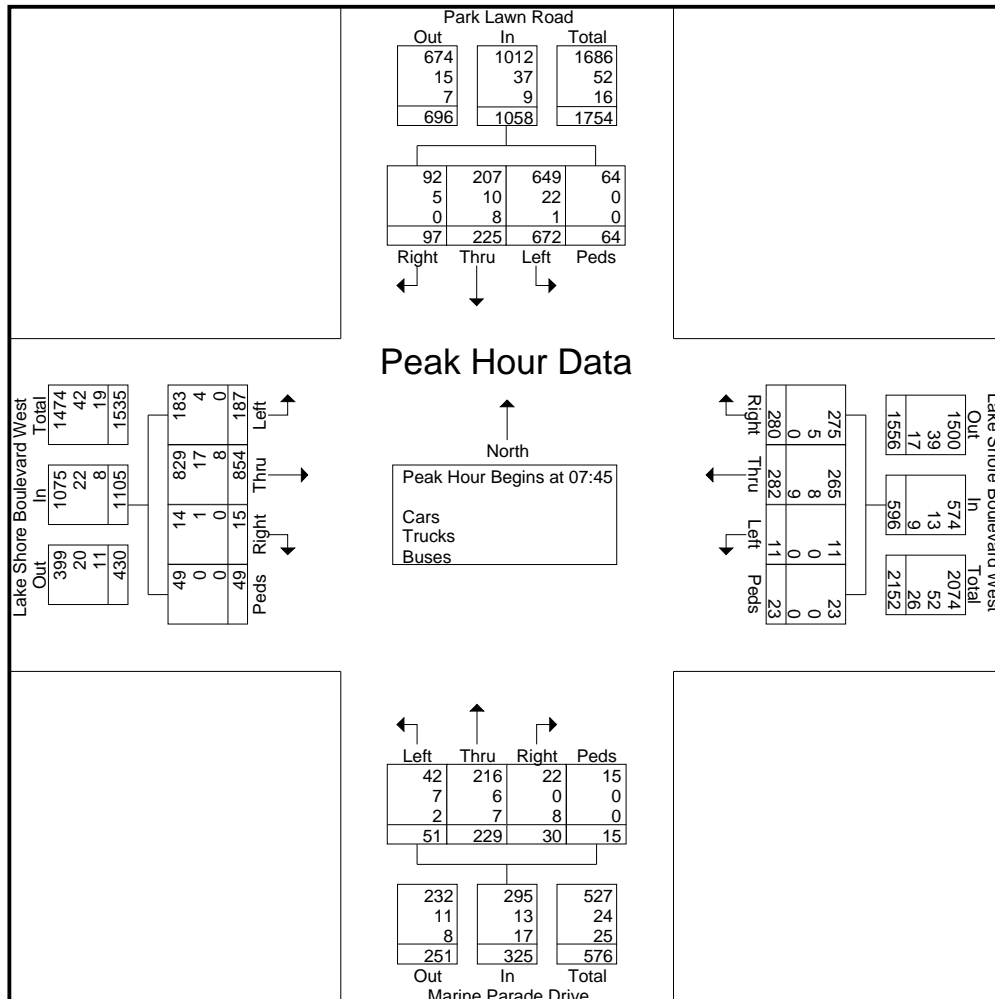
File Name : ParkLawn&LakeShore-THU-AM

Site Code : 19270022

Start Date : 2018-12-13

Page No : 3

Start Time	Park Lawn Road Southbound					Lake Shore Boulevard West Westbound					Marine Parade Drive Northbound					Lake Shore Boulevard West Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45																					
07:45	225	42	18	16	301	3	74	70	7	154	10	52	3	4	69	46	236	2	19	303	827
08:00	169	45	27	7	248	1	73	80	4	158	15	51	10	3	79	54	208	4	11	277	762
08:15	145	60	22	26	253	4	73	70	6	153	11	61	9	4	85	41	225	4	13	283	774
08:30	133	78	30	15	256	3	62	60	6	131	15	65	8	4	92	46	185	5	6	242	721
Total Volume	672	225	97	64	1058	11	282	280	23	596	51	229	30	15	325	187	854	15	49	1105	3084
% App. Total	63.5	21.3	9.2	6		1.8	47.3	47	3.9		15.7	70.5	9.2	4.6		16.9	77.3	1.4	4.4		
PHF	.747	.721	.808	.615	.879	.688	.953	.875	.821	.943	.850	.881	.750	.938	.883	.866	.905	.750	.645	.912	.932
Cars	649	207	92	64	1012	11	265	275	23	574	42	216	22	15	295	183	829	14	49	1075	2956
% Cars	96.6	92.0	94.8	100	95.7	100	94.0	98.2	100	96.3	82.4	94.3	73.3	100	90.8	97.9	97.1	93.3	100	97.3	95.8
Trucks	22	10	5	0	37	0	8	5	0	13	7	6	0	0	13	4	17	1	0	22	85
% Trucks	3.3	4.4	5.2	0	3.5	0	2.8	1.8	0	2.2	13.7	2.6	0	0	4.0	2.1	2.0	6.7	0	2.0	2.8
Buses	1	8	0	0	9	0	9	0	0	9	2	7	8	0	17	0	8	0	0	8	43
% Buses	0.1	3.6	0	0	0.9	0	3.2	0	0	1.5	3.9	3.1	26.7	0	5.2	0	0.9	0	0	0.7	1.4



LEA CONSULTING LTD

625 Cochrane Drive 9th Floor
Markham, Ontario, L3R 9R9

Project No.: 19270
Location: Park Lawn Rd & Lake Shore Blvd
Weather: Light Snow
Surveyor(s): Jeff Tang & Susan Cho

File Name : ParkLawn&LakeShore-THU-PM
Site Code : 19270022
Start Date : 2018-12-13
Page No : 1

Groups Printed- Cars - Trucks - Buses

Start Time	Park Lawn Road Southbound					Lake Shore Boulevard West Westbound					Marine Parade Drive Northbound					Lake Shore Boulevard West Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
16:00	148	25	44	4	221	0	126	54	16	196	12	27	4	17	60	31	81	7	35	154	631
16:15	120	29	69	14	232	0	137	72	13	222	13	40	7	2	62	42	129	2	20	193	709
16:30	149	16	55	10	230	1	169	63	11	244	6	35	10	5	56	40	108	5	19	172	702
16:45	128	26	60	4	218	0	178	72	9	259	8	36	7	6	57	50	109	8	13	180	714
Total	545	96	228	32	901	1	610	261	49	921	39	138	28	30	235	163	427	22	87	699	2756
17:00	139	24	72	12	247	0	166	80	2	248	5	30	3	1	39	50	152	5	19	226	760
17:15	166	37	53	8	264	0	141	104	14	259	7	29	4	1	41	39	113	26	19	197	761
17:30	143	26	57	30	256	1	187	65	11	264	6	18	7	8	39	46	149	8	16	219	778
17:45	197	36	75	13	321	4	113	71	9	197	8	16	4	0	28	41	154	10	19	224	770
Total	645	123	257	63	1088	5	607	320	36	968	26	93	18	10	147	176	568	49	73	866	3069
Grand Total	1190	219	485	95	1989	6	1217	581	85	1889	65	231	46	40	382	339	995	71	160	1565	5825
Apprch %	59.8	11	24.4	4.8		0.3	64.4	30.8	4.5		17	60.5	12	10.5		21.7	63.6	4.5	10.2		
Total %	20.4	3.8	8.3	1.6	34.1	0.1	20.9	10	1.5	32.4	1.1	4	0.8	0.7	6.6	5.8	17.1	1.2	2.7	26.9	
Cars	1182	201	481	95	1959	6	1194	576	84	1860	61	212	35	38	346	329	976	71	160	1536	5701
% Cars	99.3	91.8	99.2	100	98.5	100	98.1	99.1	98.8	98.5	93.8	91.8	76.1	95	90.6	97.1	98.1	100	100	98.1	97.9
Trucks	8	3	1	0	12	0	10	5	1	16	1	4	1	2	8	7	7	0	0	14	50
% Trucks	0.7	1.4	0.2	0	0.6	0	0.8	0.9	1.2	0.8	1.5	1.7	2.2	5	2.1	2.1	0.7	0	0	0.9	0.9
Buses	0	15	3	0	18	0	13	0	0	13	3	15	10	0	28	3	12	0	0	15	74
% Buses	0	6.8	0.6	0	0.9	0	1.1	0	0	0.7	4.6	6.5	21.7	0	7.3	0.9	1.2	0	0	1	1.3

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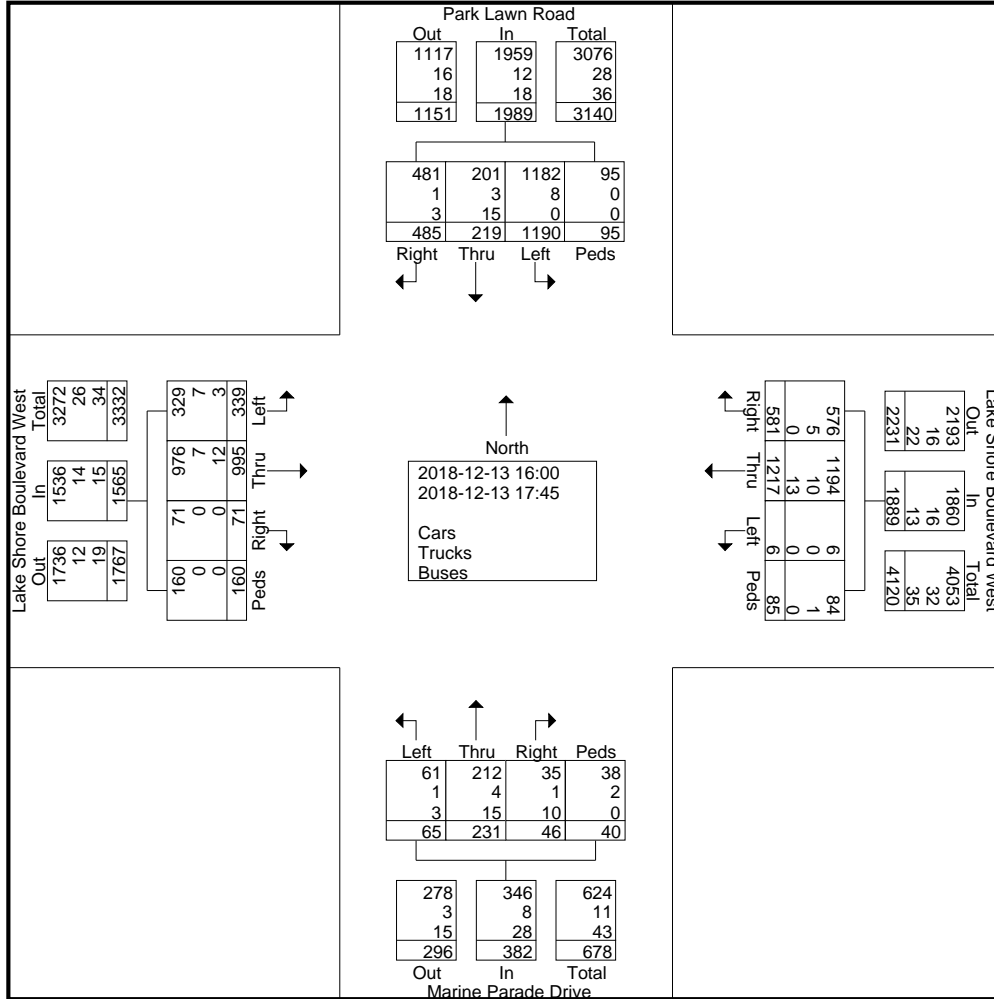
625 Cochrane Drive 9th Floor
Markham, Ontario, L3R 9R9

File Name : ParkLawn&LakeShore-THU-PM

Site Code : 19270022

Start Date : 2018-12-13

Page No : 2



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625 Cochrane Drive 9th Floor
Markham, Ontario, L3R 9R9

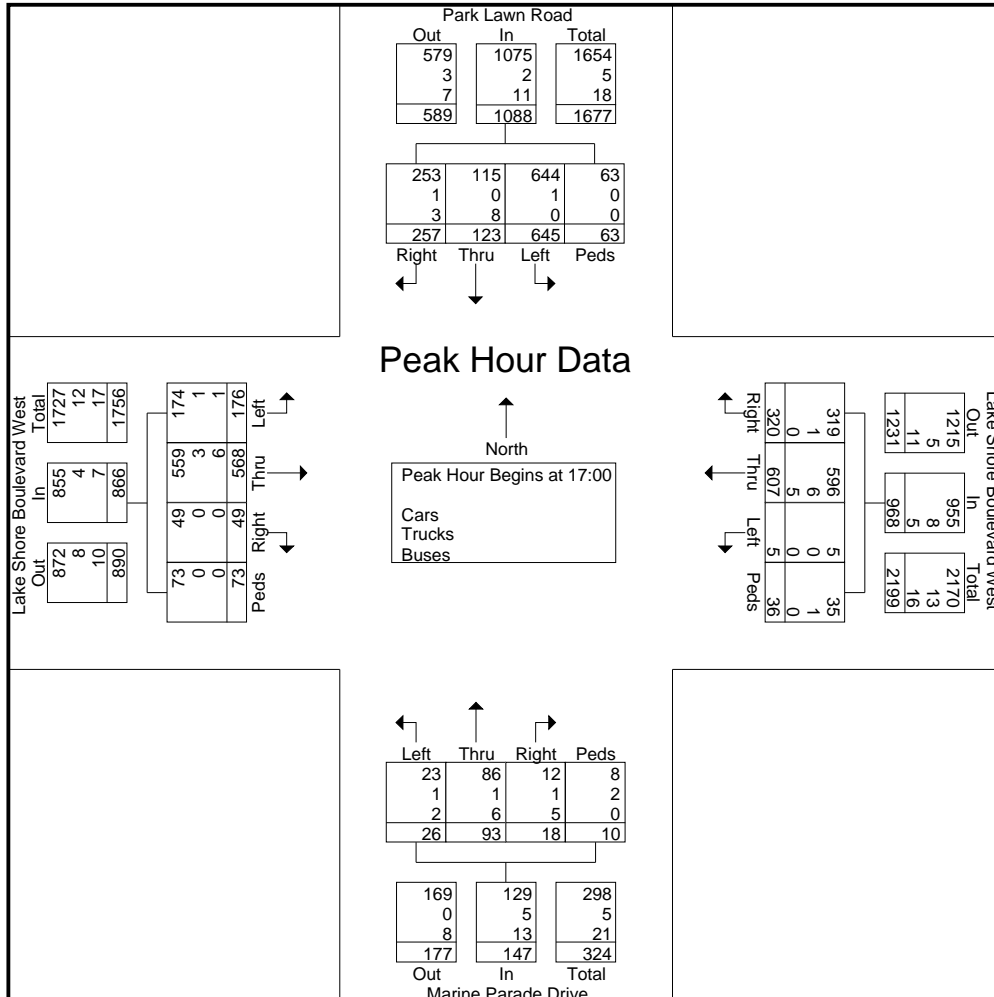
File Name : ParkLawn&LakeShore-THU-PM

Site Code : 19270022

Start Date : 2018-12-13

Page No : 3

Start Time	Park Lawn Road Southbound					Lake Shore Boulevard West Westbound					Marine Parade Drive Northbound					Lake Shore Boulevard West Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 17:00																					
17:00	139	24	72	12	247	0	166	80	2	248	5	30	3	1	39	50	152	5	19	226	760
17:15	166	37	53	8	264	0	141	104	14	259	7	29	4	1	41	39	113	26	19	197	761
17:30	143	26	57	30	256	1	187	65	11	264	6	18	7	8	39	46	149	8	16	219	778
17:45	197	36	75	13	321	4	113	71	9	197	8	16	4	0	28	41	154	10	19	224	770
Total Volume	645	123	257	63	1088	5	607	320	36	968	26	93	18	10	147	176	568	49	73	866	3069
% App. Total	59.3	11.3	23.6	5.8		0.5	62.7	33.1	3.7		17.7	63.3	12.2	6.8		20.3	65.6	5.7	8.4		
PHF	.819	.831	.857	.525	.847	.313	.811	.769	.643	.917	.813	.775	.643	.313	.896	.880	.922	.471	.961	.958	.986
Cars	644	115	253	63	1075	5	596	319	35	955	23	86	12	8	129	174	559	49	73	855	3014
% Cars	99.8	93.5	98.4	100	98.8	100	98.2	99.7	97.2	98.7	88.5	92.5	66.7	80.0	87.8	98.9	98.4	100	100	98.7	98.2
Trucks	1	0	1	0	2	0	6	1	1	8	1	1	1	2	5	1	3	0	0	4	19
% Trucks	0.2	0	0.4	0	0.2	0	1.0	0.3	2.8	0.8	3.8	1.1	5.6	20.0	3.4	0.6	0.5	0	0	0.5	0.6
Buses	0	8	3	0	11	0	5	0	0	5	2	6	5	0	13	1	6	0	0	7	36
% Buses	0	6.5	1.2	0	1.0	0	0.8	0	0	0.5	7.7	6.5	27.8	0	8.8	0.6	1.1	0	0	0.8	1.2



LEA CONSULTING LTD

625 Cochrane Drive 9th Floor
Markham, Ontario, L3R 9R9

Project No.: 19270
Location: Silver Moon & Marine Parade
Weather: Light Snow
Surveyor(s): Natalie Law

File Name : SilverMoon&MarineParade-THU-AM
Site Code : 19270020
Start Date : 2018-12-13
Page No : 1

Groups Printed- Cars - Trucks - Buses

Start Time	Silver Moon Drive Southbound				Marine Parade Drive Westbound				Marine Parade Drive Eastbound				Int. Total
	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	
07:00	0	12	0	12	18	0	1	19	2	4	2	8	39
07:15	4	16	0	20	20	1	1	22	0	3	3	6	48
07:30	2	23	0	25	16	0	2	18	4	18	1	23	66
07:45	2	34	0	36	32	6	6	44	2	29	5	36	116
Total	8	85	0	93	86	7	10	103	8	54	11	73	269
08:00	7	28	0	35	37	2	5	44	4	52	1	57	136
08:15	10	49	0	59	32	0	6	38	6	59	9	74	171
08:30	6	38	0	44	33	1	3	37	13	67	5	85	166
08:45	9	20	0	29	33	0	3	36	5	50	0	55	120
Total	32	135	0	167	135	3	17	155	28	228	15	271	593
Grand Total	40	220	0	260	221	10	27	258	36	282	26	344	862
Apprch %	15.4	84.6	0		85.7	3.9	10.5		10.5	82	7.6		
Total %	4.6	25.5	0	30.2	25.6	1.2	3.1	29.9	4.2	32.7	3	39.9	
Cars	38	218	0	256	194	8	19	221	33	270	1	304	781
% Cars	95	99.1	0	98.5	87.8	80	70.4	85.7	91.7	95.7	3.8	88.4	90.6
Trucks	2	2	0	4	13	2	7	22	2	10	23	35	61
% Trucks	5	0.9	0	1.5	5.9	20	25.9	8.5	5.6	3.5	88.5	10.2	7.1
Buses	0	0	0	0	14	0	1	15	1	2	2	5	20
% Buses	0	0	0	0	6.3	0	3.7	5.8	2.8	0.7	7.7	1.5	2.3

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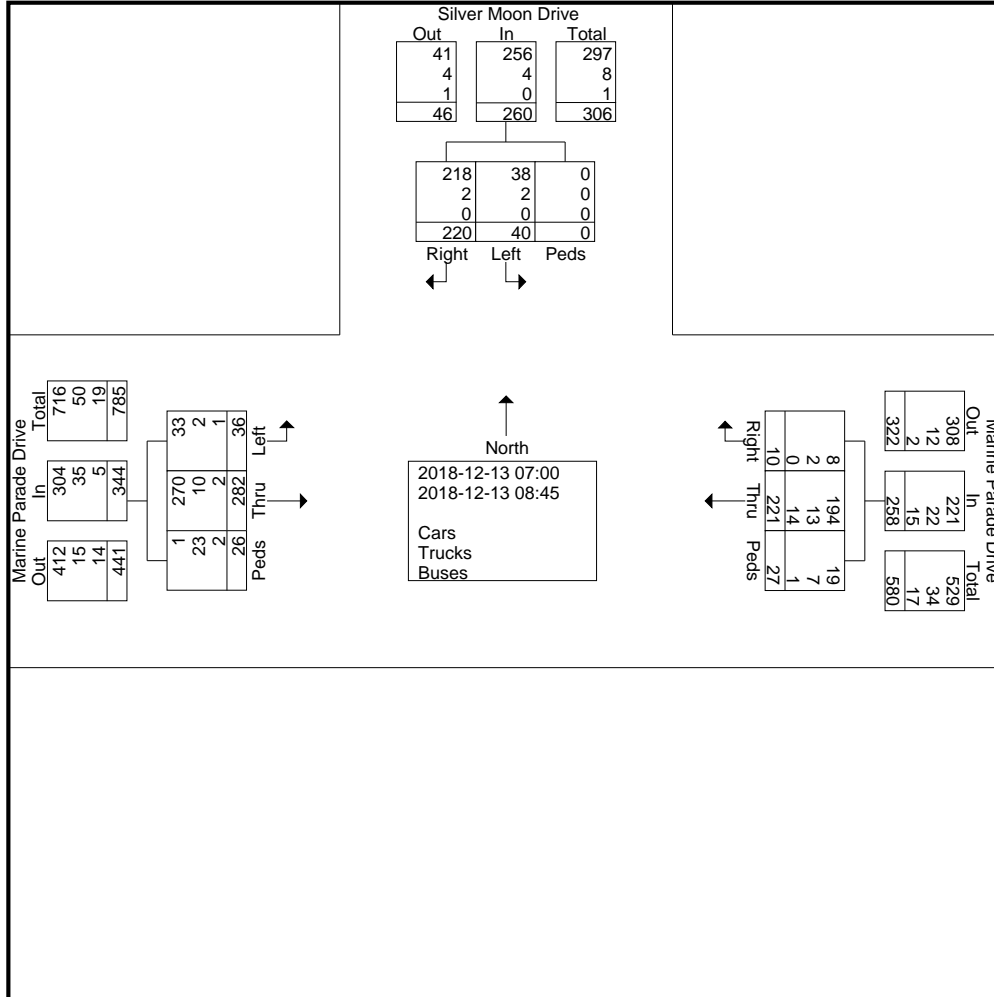
625 Cochrane Drive 9th Floor
Markham, Ontario, L3R 9R9

File Name : SilverMoon&MarineParade-THU-AM

Site Code : 19270020

Start Date : 2018-12-13

Page No : 2



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625 Cochrane Drive 9th Floor
Markham, Ontario, L3R 9R9

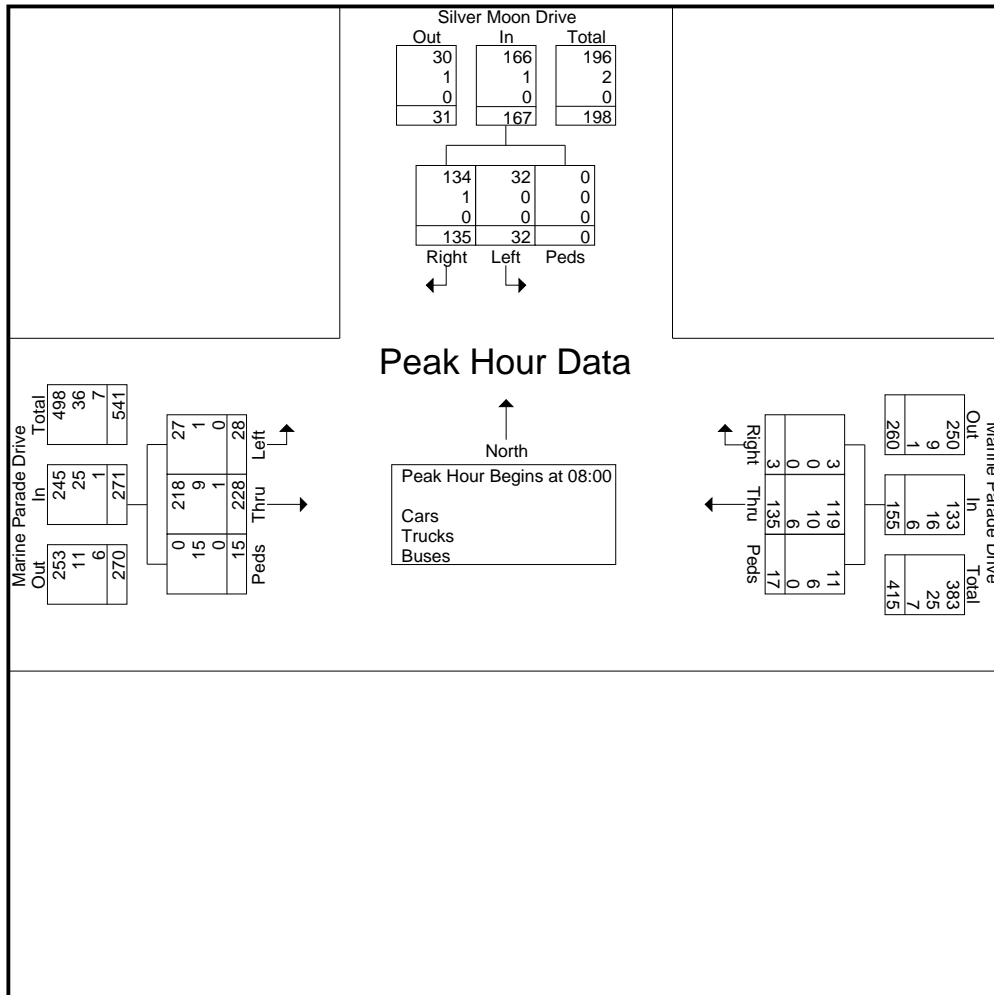
File Name : SilverMoon&MarineParade-THU-AM

Site Code : 19270020

Start Date : 2018-12-13

Page No : 3

Start Time	Silver Moon Drive Southbound				Marine Parade Drive Westbound				Marine Parade Drive Eastbound				Int. Total
	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00													
08:00	7	28	0	35	37	2	5	44	4	52	1	57	136
08:15	10	49	0	59	32	0	6	38	6	59	9	74	171
08:30	6	38	0	44	33	1	3	37	13	67	5	85	166
08:45	9	20	0	29	33	0	3	36	5	50	0	55	120
Total Volume	32	135	0	167	135	3	17	155	28	228	15	271	593
% App. Total	19.2	80.8	0		87.1	1.9	11		10.3	84.1	5.5		
PHF	.800	.689	.000	.708	.912	.375	.708	.881	.538	.851	.417	.797	.867
Cars	32	134	0	166	119	3	11	133	27	218	0	245	544
% Cars	100	99.3	0	99.4	88.1	100	64.7	85.8	96.4	95.6	0	90.4	91.7
Trucks	0	1	0	1	10	0	6	16	1	9	15	25	42
% Trucks	0	0.7	0	0.6	7.4	0	35.3	10.3	3.6	3.9	100	9.2	7.1
Buses	0	0	0	0	6	0	0	6	0	1	0	1	7
% Buses	0	0	0	0	4.4	0	0	3.9	0	0.4	0	0.4	1.2



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625 Cochrane Drive 9th Floor
Markham, Ontario, L3R 9R9

Project No.: 19270
Location: Silver Moon & Marine Parade
Weather: Light Snow
Surveyor(s): Natalie Law

File Name : SilverMoon&MarineParade-THU-PM
Site Code : 19270020
Start Date : 2018-12-13
Page No : 1

Groups Printed- Cars - Trucks - Buses

Start Time	Silver Moon Drive Southbound				Marine Parade Drive Westbound				Marine Parade Drive Eastbound				Int. Total
	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	
16:00	1	12	0	13	18	2	8	28	5	26	2	33	74
16:15	4	8	0	12	34	3	4	41	7	25	0	32	85
16:30	0	7	0	7	25	2	8	35	3	23	1	27	69
16:45	2	14	1	17	22	3	4	29	7	27	1	35	81
Total	7	41	1	49	99	10	24	133	22	101	4	127	309
17:00	2	10	2	14	22	0	4	26	8	24	0	32	72
17:15	2	8	0	10	15	4	5	24	11	18	0	29	63
17:30	1	10	0	11	21	3	8	32	11	21	0	32	75
17:45	1	12	0	13	15	2	6	23	12	26	1	39	75
Total	6	40	2	48	73	9	23	105	42	89	1	132	285
Grand Total	13	81	3	97	172	19	47	238	64	190	5	259	594
Apprch %	13.4	83.5	3.1		72.3	8	19.7		24.7	73.4	1.9		
Total %	2.2	13.6	0.5	16.3	29	3.2	7.9	40.1	10.8	32	0.8	43.6	
Cars	13	79	3	95	156	19	45	220	63	189	2	254	569
% Cars	100	97.5	100	97.9	90.7	100	95.7	92.4	98.4	99.5	40	98.1	95.8
Trucks	0	2	0	2	2	0	2	4	1	1	2	4	10
% Trucks	0	2.5	0	2.1	1.2	0	4.3	1.7	1.6	0.5	40	1.5	1.7
Buses	0	0	0	0	14	0	0	14	0	0	1	1	15
% Buses	0	0	0	0	8.1	0	0	5.9	0	0	20	0.4	2.5

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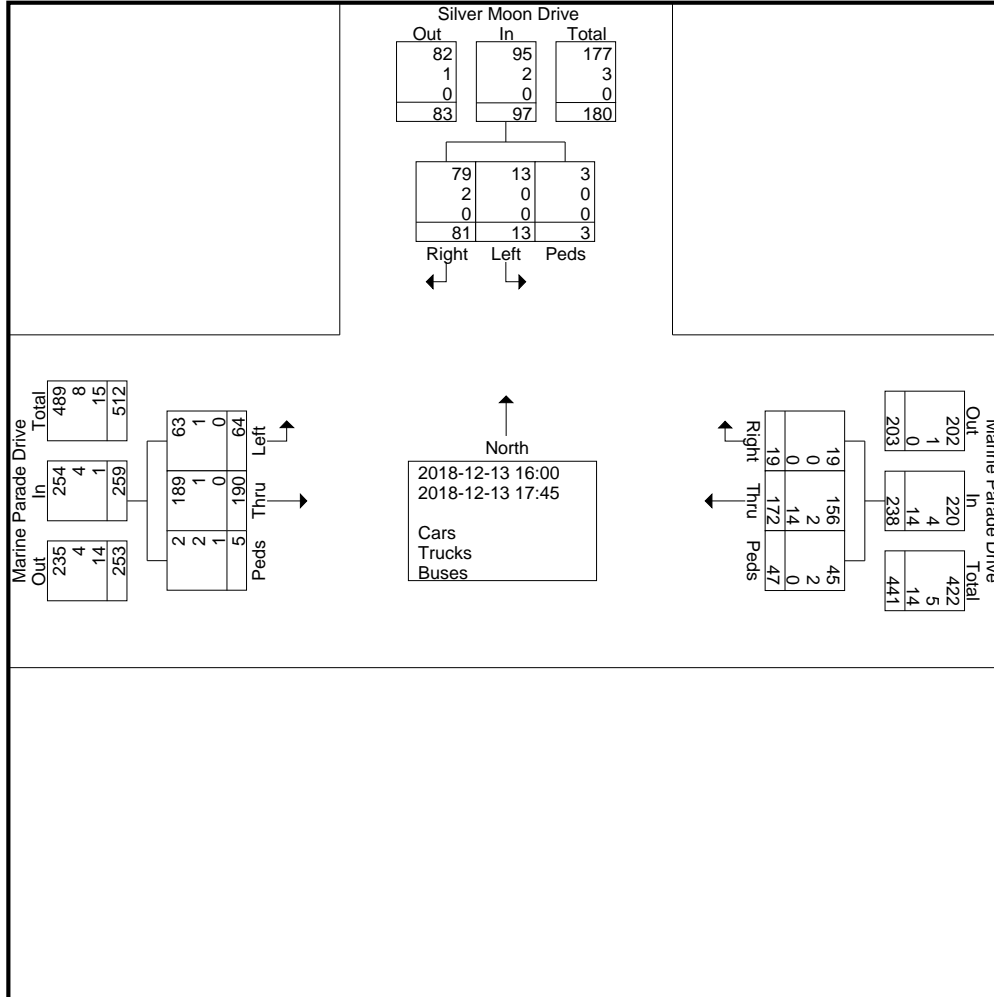
625 Cochrane Drive 9th Floor
Markham, Ontario, L3R 9R9

File Name : SilverMoon&MarineParade-THU-PM

Site Code : 19270020

Start Date : 2018-12-13

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625 Cochrane Drive 9th Floor
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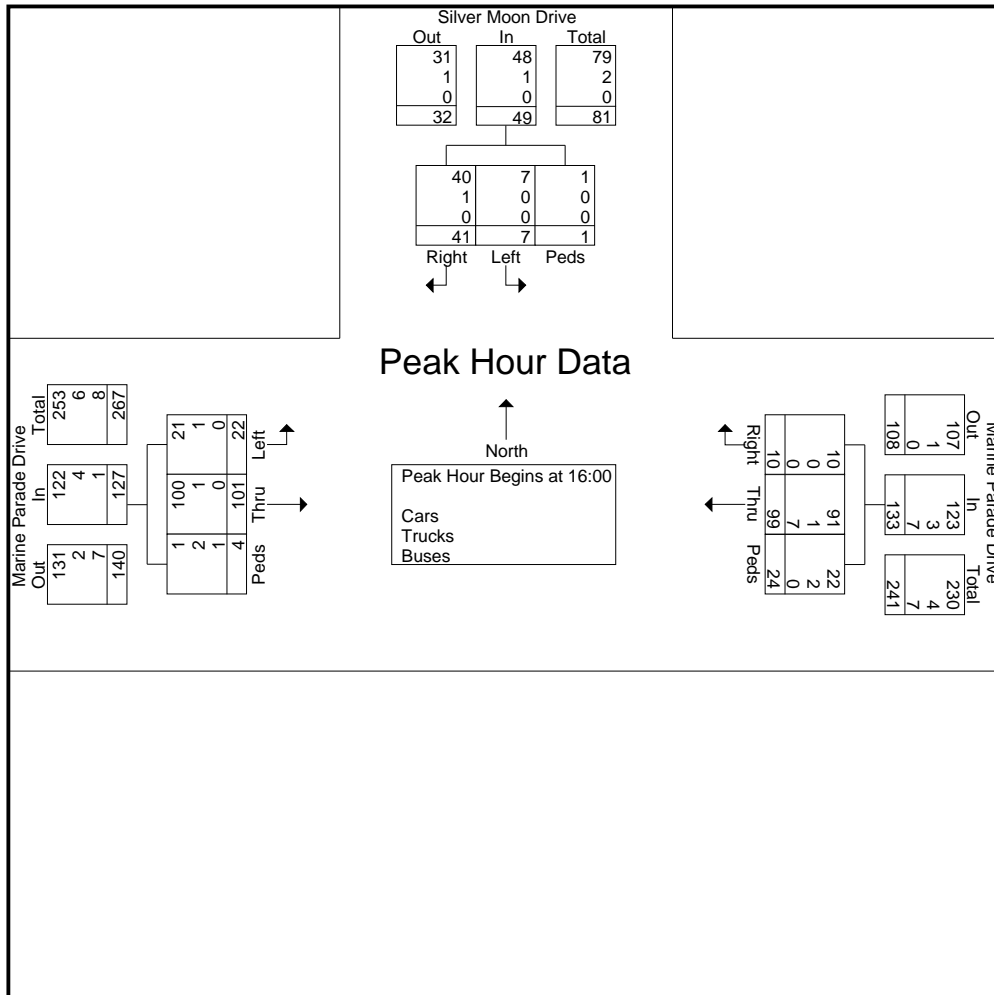
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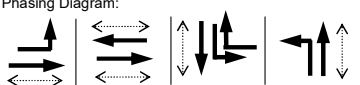
Site Code : 19270020

Start Date : 2018-12-13

Page No : 3

Start Time	Silver Moon Drive Southbound				Marine Parade Drive Westbound				Marine Parade Drive Eastbound				Int. Total
	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 16:00													
16:00	1	12	0	13	18	2	8	28	5	26	2	33	74
16:15	4	8	0	12	34	3	4	41	7	25	0	32	85
16:30	0	7	0	7	25	2	8	35	3	23	1	27	69
16:45	2	14	1	17	22	3	4	29	7	27	1	35	81
Total Volume	7	41	1	49	99	10	24	133	22	101	4	127	309
% App. Total	14.3	83.7	2		74.4	7.5	18		17.3	79.5	3.1		
PHF	.438	.732	.250	.721	.728	.833	.750	.811	.786	.935	.500	.907	.909
Cars	7	40	1	48	91	10	22	123	21	100	1	122	293
% Cars	100	97.6	100	98.0	91.9	100	91.7	92.5	95.5	99.0	25.0	96.1	94.8
Trucks	0	1	0	1	1	0	2	3	1	1	2	4	8
% Trucks	0	2.4	0	2.0	1.0	0	8.3	2.3	4.5	1.0	50.0	3.1	2.6
Buses	0	0	0	0	7	0	0	7	0	0	1	1	8
% Buses	0	0	0	0	7.1	0	0	5.3	0	0	25.0	0.8	2.6



LOCATION:		Lake Shore Blvd W & Park Lawn Rd / Marine Parade Dr						DISTRICT:		Etobicoke - York							
MODE/COMMENT:		FXT with 2-wire Polara APS, UPS & LBO Signs - RLC (EB)						COMPUTER SYSTEM:		TransSuite							
TCS:		230						CONTROLLER/CABINET TYPE:		Peek ATC-1000 / TS2T1							
PREPARED/CHECKED BY:		RI / DS						CONFLICT FLASH:		Red & Red							
PREPARATION DATE:		June 22, 2017						DESIGN WALK SPEED:		1.0 m/s (FDW based on full crossing @ 1.2 m/s)							
IMPLEMENTATION DATE:		May 16, 2018						CHANNEL/DROP:		4086/25							
								FIRMWARE VERSION:		3.018.1.2976							
NEMA Phase	Local Plan Split Table	OFF	AM	PM	NGHT	WKND	GRDN	Phase Mode (Fixed/Demanded or Callable)	Remarks								
		All Other Times	06:30-09:30 M-F	15:00-19:00 M-F	22:00-06:30 Daily	10:30-18:30 Sat-Sun	Gardiner Closure										
		Pattern 1	Pattern 2	Pattern 3	Pattern 4	Pattern 5	Pattern 16										
		Split 1	Split 2	Split 3	Split 4	Split 5	Split 16										
1	NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT								Pedestrian Minimums: EWWK = 7 sec, EWFD = 27 sec NSWK = 7 sec, NSF (West Side) = 27 sec NSF (East Side) = 19 sec NB and SB phases are called separately. SB phase is always called before NB phase. Unallocated time for NB phase is given to EWG. NB phase is callable by vehicle actuation. If a vehicle call is received, the minimum NBG is 7 seconds. If ongoing vehicle demand exists on the stopbar loop, NBG is capable of providing vehicle extensions up to the maximum. Extension time is based on vehicle demand and is taken from EWG. NSWK pedestrian (West side) display on during SB vehicle phase 3. NSDW (West side) pedestrian display on during callable NB vehicle phase 4.							
2	Lake Shore Blvd W	WLK 7 FDW 27 MIN 34 MAX1 55 AMB 4 ALR 3 SPLIT	61	63	56	54	64	64	Fixed	Side Street Passage Time = 3 sec Left-Turn Passage Time = 2 sec APS on during FULL WALK periods when activated by push button and no arrows are displayed. APS is activated on June 30, 2015 but the Volume is turned off to minimize the confusion for NSWK for east side and west side.							
3	Park Lawn Rd	WLK 7 FDW 27 MIN 34 MAX1 38 AMB 4 ALR 3 SPLIT	45	43	50	42	42	42	Fixed	Ring Structure: <table style="display: inline-table; border-collapse: collapse;"> <tr><td style="border: 1px solid black; padding: 2px;">2</td><td style="border: 1px solid black; padding: 2px;">3</td><td style="border: 1px solid black; padding: 2px;">4</td></tr> <tr><td style="border: 1px solid black; padding: 2px;">5</td><td style="border: 1px solid black; padding: 2px;">6</td><td style="border: 1px solid black; padding: 2px;">7</td><td style="border: 1px solid black; padding: 2px;">8</td></tr> </table> Phasing Diagram:  Script 1 is used for driving LBO signs during EB NRTs. Load switch 7 is used to drive LBO signs. SBLA/SBG and WBRA are displayed simultaneously.	2	3	4	5	6	7	8
2	3	4															
5	6	7	8														
4	Marine Parade Dr	WLK 7 FDW 19 MIN 7 MAX1 26 AMB 4 ALR 3 SPLIT	34	34	34	34	34	34	Callable by stopbar loop and push button, Extendable by Stopbar Loop.								
5		WLK FDW MIN 6 MAX1 7 AMB 3 ALR 1 SPLIT	11	11	11		18	15	Fixed								
6	Lake Shore Blvd W	WLK 7 FDW 27 MIN 34 MAX1 44 AMB 4 ALR 3 SPLIT	50	52	45	54	46	49	Fixed								
7	ACTIVATED	WLK 7 FDW 27 MIN 34 MAX1 38 AMB 4 ALR 3 SPLIT	45	43	50	42	42	42									
8	ACTIVATED	WLK 7 FDW 19 MIN 7 MAX1 26 AMB 4 ALR 3 SPLIT	34	34	34	34	34	34									
	CL OF		140 3	140 4	140 12	130 72	140 9	140 136									

Notes: EBRT restriction from 7:00am - 9:00am, M-F
 RLC activated on Oct 6, 2017 @ 12:01 am

LOCATION: Lake Shore Blvd W & Gardiner On-/Off-Ramp / Brookers Ln MODE/COMMENT: SA2-VMG with PR TCS: 1944 PREPARED/CHECKED BY: IBI / RI / PV PREPARATION DATE: October 28, 2016 IMPLEMENTATION DATE: December 1, 2016	DISTRICT: Etobicoke York COMPUTER SYSTEM: TransSuite CONTROLLER/CABINET TYPE: Econolite ASC/3-2100/M CONFLICT FLASH: Red & Red DESIGN WALK SPEED: 1.0 m/s (FDW based on full crossing at 1.2 m/s) CHANNEL/DROP: 5004 / 30 CONTROLLER FIRMWARE: 2.47.10	
--	---	--

NEMA Phase	Local Plan System Plan	OFF	AM	PM	NGHT	WKND	GRDN	Phase Mode (Fixed/Demanded or Callible)	Remarks
		All Other Times	06:30-09:30	15:00-19:00	22:00-06:30	10:30-18:30	Gardiner Closure		
		Pattern 1	Pattern 2	Pattern 3	Pattern 4	Pattern 5	Pattern 16		
1 	WLK FDW MIN MAX1 AMB ALR SPLIT								Pedestrian Minimums: EWWK = 7 sec, EWFD = 22 sec NSWK = 7 sec, NSFD = 22 sec NS phase is callable by vehicle or pedestrian actuation. If a vehicle call is received, the minimum NSG is 7 seconds. If ongoing vehicle demand exists on the stopbar loop, the NSG is capable of providing vehicle extensions up to the maximum. If a pedestrian call is received, the pedestrian minimums will be served. The NSWK & NSFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle/pedestrian demand and is taken from the EWG.
2 Lake Shore Blvd W 	WLK 7 FDW 22 MIN 29 MAX1 47 AMB 4 ALR 3 SPLIT							Fixed	Side Street Passage Time = 3 sec Left-Turn Passage Time = 2 sec
3 	WLK FDW MIN MAX1 AMB ALR SPLIT								
4 Brookers Ln. 	WLK 7 FDW 22 MIN 7 MAX1 29 AMB 4 ALR 3 SPLIT								Callable by Stopbar loop and/or Pushbutton; Extendable by Stopbar loop.
5 	WLK FDW MIN 6 MAX1 6 AMB 3 ALR 1 SPLIT								Callable/Extendable by Setback Loop
6 Lake Shore Blvd W. 	WLK 7 FDW 22 MIN 29 MAX1 47 AMB 4 ALR 3 SPLIT								Fixed
7 	WLK FDW MIN MAX1 AMB ALR SPLIT								
8 Gardiner on/off-ramp 	WLK 7 FDW 22 MIN 7 MAX1 29 AMB 4 ALR 3 SPLIT								Callable by Stopbar loop and/or Pushbutton; Extendable by Stopbar loop.
	CL OF VP	90 11 22	100 15 22	100 21 22	88 16 22	100 21 22	110 103 22		

NOTES:



APPENDIX B

Intersection Capacity Analysis Results – Existing Conditions

Queues

1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W

Existing

AM Peak

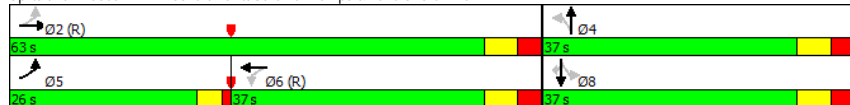


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations		↕↕		↕↕	↔	↔		↕	↕
Traffic Volume (vph)	548	894	5	49	159	39	38	26	285
Future Volume (vph)	548	894	5	49	159	39	38	26	285
Lane Group Flow (vph)	0	1499	0	62	162	121	0	66	291
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	6	6	4	4	8	8	8
Permitted Phases	2		6		4		8		8
Detector Phase	5	2	6	6	4	4	8	8	8
Switch Phase									
Minimum Initial (s)	6.0	29.0	29.0	29.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
Total Split (s)	26.0	63.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	26.0%	63.0%	37.0%	37.0%	37.0%	37.0%	37.0%	37.0%	37.0%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag					
Lead-Lag Optimize?	Yes		Yes	Yes					
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None	None	None
v/c Ratio		0.77		0.03	0.66	0.32		0.27	0.56
Control Delay		14.5		5.4	49.7	15.1		35.9	8.3
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		14.5		5.4	49.7	15.1		35.9	8.3
Queue Length 50th (m)		91.5		1.5	30.9	6.9		11.7	0.0
Queue Length 95th (m)		157.0		4.5	48.8	20.8		22.2	20.2
Internal Link Dist (m)		223.1		109.4		71.9		56.1	
Turn Bay Length (m)				40.0					
Base Capacity (vph)		1953		1994	420	577		416	682
Starvation Cap Reductn		0		0	0	0		0	0
Spillback Cap Reductn		0		0	0	0		0	0
Storage Cap Reductn		0		0	0	0		0	0
Reduced v/c Ratio		0.77		0.03	0.39	0.21		0.16	0.43

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 15 (15%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated

Splits and Phases: 1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W



HCM Signalized Intersection Capacity Analysis

1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W

Existing

AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↔	↔			↕	↕
Traffic Volume (vph)	548	894	27	5	49	7	159	39	79	38	26	285
Future Volume (vph)	548	894	27	5	49	7	159	39	79	38	26	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0			6.0	6.0
Lane Util. Factor		0.95			0.95		1.00	1.00			1.00	1.00
Frpb, ped/bikes		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
Frt		1.00			0.98		1.00	0.90			1.00	0.85
Flt Protected		0.98			1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)		3403			3222		1805	1683			1707	1553
Flt Permitted		0.81			0.88		0.71	1.00			0.76	1.00
Satd. Flow (perm)		2801			2857		1357	1683			1342	1553
Peak-hour factor, PHF		0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)		559	912	28	5	50	7	162	40	81	39	27
RTOR Reduction (vph)		0	1	0	0	2	0	0	66	0	0	0
Lane Group Flow (vph)		0	1498	0	0	60	0	162	55	0	0	66
Confl. Peds. (#/hr)				9	9							
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)		2%	5%	0%	0%	12%	0%	0%	0%	1%	11%	4%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6		4			8		8
Permitted Phases	2				6		4			8		8
Actuated Green, G (s)		68.7			68.7		17.3	17.3			17.3	17.3
Effective Green, g (s)		69.7			69.7		18.3	18.3			18.3	18.3
Actuated g/C Ratio		0.70			0.70		0.18	0.18			0.18	0.18
Clearance Time (s)		7.0			7.0		7.0	7.0			7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		1952			1991		248	307			245	284
v/s Ratio Prot								0.03				
v/s Ratio Perm		c0.53			0.02		c0.12				0.05	0.03
v/c Ratio		0.77			0.03		0.65	0.18			0.27	0.19
Uniform Delay, d1		9.9			4.7		37.9	34.5			35.1	34.6
Progression Factor		1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		1.9			0.0		6.1	0.3			0.6	0.3
Delay (s)		11.7			4.7		44.0	34.8			35.7	34.9
Level of Service		B			A		D	C			D	C
Approach Delay (s)		11.7			4.7		40.0				35.0	
Approach LOS		B			A		D				D	

Intersection Summary

HCM 2000 Control Delay: 19.0
 HCM 2000 Volume to Capacity ratio: 0.77
 Actuated Cycle Length (s): 100.0
 Intersection Capacity Utilization: 70.3%
 Analysis Period (min): 15
 HCM 2000 Level of Service: B
 Sum of lost time (s): 15.0
 ICU Level of Service: C
 Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
2: Silver Moon Drive & Lake Shore Blvd W

Existing
AM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔		↔↔		↔↔	
Traffic Volume (veh/h)	1540	38	7	539	16	51
Future Volume (Veh/h)	1540	38	7	539	16	51
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	1656	41	8	580	17	55
Pedestrians	43					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	4					
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)	268		247			
pX, platoon unblocked						
vC, conflicting volume	1740		2026		892	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1740		2026		892	
tC, single (s)	4.1		6.8		7.0	
tC, 2 stage (s)						
tF (s)	2.2		3.5		3.3	
p0 queue free %	98		65		80	
cM capacity (veh/h)	353		48		273	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	1104	593	201	387	72	
Volume Left	0	0	8	0	17	
Volume Right	0	41	0	0	55	
cSH	1700	1700	353	1700	130	
Volume to Capacity	0.65	0.35	0.02	0.23	0.55	
Queue Length 95th (m)	0.0	0.0	0.6	0.0	21.6	
Control Delay (s)	0.0	0.0	1.0	0.0	62.4	
Lane LOS	A		F			
Approach Delay (s)	0.0		0.3		62.4	
Approach LOS	A		F			
Intersection Summary						
Average Delay	2.0					
Intersection Capacity Utilization	54.6%		ICU Level of Service		A	
Analysis Period (min)	15					

Queues
3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W

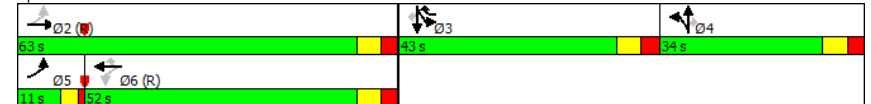
Existing
AM Peak

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔		↔↔		↔↔		↔↔		↔↔	
Traffic Volume (vph)	187	854	11	282	280	229	30	672	225	97
Future Volume (vph)	187	854	11	282	280	229	30	672	225	97
Lane Group Flow (vph)	0	1135	0	315	301	301	32	723	242	104
Turn Type	pm+pt	NA	Perm	NA	pm+ov	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6	6	3	4	3	3		
Permitted Phases	2		6		6		4			3
Detector Phase	5	2	6	6	3	4	4	3	3	3
Switch Phase										
Minimum Initial (s)	6.0	34.0	34.0	34.0	34.0	7.0	7.0	34.0	34.0	34.0
Minimum Split (s)	10.0	41.0	41.0	41.0	41.0	33.0	33.0	41.0	41.0	41.0
Total Split (s)	11.0	63.0	52.0	52.0	43.0	34.0	34.0	43.0	43.0	43.0
Total Split (%)	7.9%	45.0%	37.1%	37.1%	30.7%	24.3%	24.3%	30.7%	30.7%	30.7%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	C-Max	C-Max	C-Max	Max	None	None	Max	Max	Max
v/c Ratio		0.59		0.32	0.31	0.67	0.12	0.81	0.52	0.22
Control Delay		27.9		36.4	3.7	64.9	0.9	56.2	48.7	6.2
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		27.9		36.4	3.7	64.9	0.9	56.2	48.7	6.2
Queue Length 50th (m)		81.2		36.2	7.9	44.5	0.0	102.0	60.5	0.0
Queue Length 95th (m)		101.1		49.8	19.7	58.8	0.0	126.3	89.2	11.9
Internal Link Dist (m)		117.3		137.5		84.9		139.4		
Turn Bay Length (m)	40.0									
Base Capacity (vph)	1922		991		984		661		335	
Starvation Cap Reductn	0		0		0		0		0	
Spillback Cap Reductn	0		0		0		0		0	
Storage Cap Reductn	0		0		0		0		0	
Reduced v/c Ratio	0.59		0.32		0.31		0.46		0.10	

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 4 (3%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated

Splits and Phases: 3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W



HCM Signalized Intersection Capacity Analysis

Existing

3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W

AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↕↔			↔↕↔	↕		↔↕↔	↕	↔↕↔	↕	↕
Traffic Volume (vph)	187	854	15	11	282	280	51	229	30	672	225	97
Future Volume (vph)	187	854	15	11	282	280	51	229	30	672	225	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0		6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		0.91			0.95	1.00		0.95	1.00	0.97	1.00	1.00
Frb, ped/bikes		1.00			1.00	0.95		1.00	0.95	1.00	1.00	0.93
Flpb, ped/bikes		0.99			1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00			1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4954			3406	1505		3306	1210	3400	1759	1428
Flt Permitted		0.77			0.88	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3837			3016	1505		3306	1210	3400	1759	1428
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	201	918	16	12	303	301	55	246	32	723	242	104
RTOR Reduction (vph)	0	1	0	0	0	92	0	0	28	0	0	77
Lane Group Flow (vph)	0	1134	0	0	315	209	0	301	4	723	242	27
Confl. Peds. (#/hr)	64		15	15		64	49		23	23		49
Heavy Vehicles (%)	2%	3%	7%	0%	6%	2%	18%	6%	27%	3%	8%	5%
Turn Type	pm+pt	NA		Perm	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2			6	3	4	4		3	3	
Permitted Phases	2			6		6			4			3
Actuated Green, G (s)		65.0			45.0	81.0		18.0	18.0	36.0	36.0	36.0
Effective Green, g (s)		66.0			46.0	83.0		19.0	19.0	37.0	37.0	37.0
Actuated g/C Ratio		0.47			0.33	0.59		0.14	0.14	0.26	0.26	0.26
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1944				990	956		448	164	898	464	377
v/s Ratio Prot	c0.07					0.06		c0.09		c0.21		0.14
v/s Ratio Perm	c0.20					0.10	0.08		0.00			0.02
v/c Ratio	0.58				0.32	0.22		0.67	0.03	0.81	0.52	0.07
Uniform Delay, d1	27.0				35.2	13.3		57.5	52.5	48.1	43.9	38.6
Progression Factor	1.00				1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3				0.8	0.5		3.9	0.1	7.6	4.1	0.4
Delay (s)	28.3				36.1	13.9		61.5	52.5	55.7	48.1	39.0
Level of Service	C				D	B		E	D	E	D	D
Approach Delay (s)	28.3				25.2			60.6			52.4	
Approach LOS	C				C			E			D	

Intersection Summary			
HCM 2000 Control Delay	39.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	120.2%	ICU Level of Service	H
Analysis Period (min)	15		

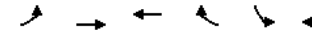
c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

Existing

4: Marine Parade Drive & Silver Moon Drive

AM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (veh/h)	28	228	135	3	32	135
Future Volume (Veh/h)	28	228	135	3	32	135
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	32	262	155	3	37	155
Pedestrians					11	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	158				494	156
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	158				494	156
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				93	83
cM capacity (veh/h)	1409				522	892

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	294	158	192
Volume Left	32	0	37
Volume Right	0	3	155
cSH	1409	1700	784
Volume to Capacity	0.02	0.09	0.24
Queue Length 95th (m)	0.6	0.0	7.7
Control Delay (s)	1.0	0.0	11.1
Lane LOS	A		B
Approach Delay (s)	1.0	0.0	11.1
Approach LOS			B

Intersection Summary			
Average Delay		3.8	
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 5: Silver Moon Drive & Public Lane

Existing
 AM Peak



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control	Stop			Free		
Grade	0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0	0				0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0				0
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)	1029	1091				1636
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	0				0
Volume Left	0	0				0
Volume Right	0	0				0
cSH	1700	1700				1700
Volume to Capacity	0.00	0.00				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			0.0%		ICU Level of Service A	
Analysis Period (min)	15					

Queues

1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W

Existing

PM Peak

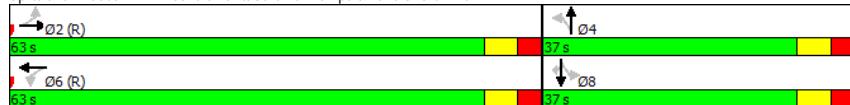


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations		↕↕		↕↕	↖	↖		↗	↗
Traffic Volume (vph)	90	701	3	46	79	5	110	83	793
Future Volume (vph)	90	701	3	46	79	5	110	83	793
Lane Group Flow (vph)	0	983	0	51	82	58	0	201	826
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		2		6		4		8	
Permitted Phases		2		6		4		8	
Detector Phase		2		6		4		8	
Switch Phase									
Minimum Initial (s)	29.0	29.0	29.0	29.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
Total Split (s)	63.0	63.0	63.0	63.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	63.0%	63.0%	63.0%	63.0%	37.0%	37.0%	37.0%	37.0%	37.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.0		-1.0		-1.0		-1.0	
Total Lost Time (s)		6.0		6.0		6.0		6.0	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None
v/c Ratio		0.48		0.03	0.38	0.15		0.62	0.83
Control Delay		9.9		7.6	36.3	9.6		42.9	10.7
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		9.9		7.6	36.3	9.6		42.9	10.7
Queue Length 50th (m)		44.3		1.6	14.4	0.8		37.5	0.0
Queue Length 95th (m)		77.7		4.8	25.5	9.8		54.3	36.2
Internal Link Dist (m)		223.1		109.4		71.9		56.1	
Turn Bay Length (m)					40.0				
Base Capacity (vph)		2061		1995	307	544		457	1059
Starvation Cap Reductn		0		0	0	0		0	0
Spillback Cap Reductn		0		0	0	0		0	0
Storage Cap Reductn		0		0	0	0		0	0
Reduced v/c Ratio		0.48		0.03	0.27	0.11		0.44	0.78

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 21 (21%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated

Splits and Phases: 1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W



HCM Signalized Intersection Capacity Analysis

1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W

Existing

PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↖	↖	↖		↗	↗
Traffic Volume (vph)	90	701	153	3	46	0	79	5	51	110	83	793
Future Volume (vph)	90	701	153	3	46	0	79	5	51	110	83	793
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0			6.0	6.0
Lane Util. Factor		0.95			0.95		1.00	1.00			1.00	1.00
Frbp, ped/bikes		0.98			1.00		1.00	1.00			1.00	0.99
Flpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	1.00
Frt		0.98			1.00		1.00	0.86			1.00	0.85
Flt Protected		1.00			1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)		3376			3258		1804	1640			1816	1578
Flt Permitted		0.91			0.92		0.52	1.00			0.79	1.00
Satd. Flow (perm)		3098			3017		990	1640			1477	1578
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	94	730	159	3	48	0	82	5	53	115	86	826
RTOR Reduction (vph)	0	13	0	0	0	0	0	41	0	0	0	645
Lane Group Flow (vph)	0	970	0	0	51	0	82	17	0	0	201	181
Confl. Peds. (#/hr)			45	45			1					1
Heavy Vehicles (%)	6%	2%	1%	0%	11%	0%	0%	0%	0%	3%	0%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases		2			6			4			8	
Actuated Green, G (s)		65.1			65.1		20.9	20.9			20.9	20.9
Effective Green, g (s)		66.1			66.1		21.9	21.9			21.9	21.9
Actuated g/C Ratio		0.66			0.66		0.22	0.22			0.22	0.22
Clearance Time (s)		7.0			7.0		7.0	7.0			7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		2047			1994		216	359			323	345
v/s Ratio Prot							0.01					
v/s Ratio Perm		c0.31			0.02		0.08				c0.14	0.11
v/c Ratio		0.47			0.03		0.38	0.05			0.62	0.52
Uniform Delay, d1		8.4			5.8		33.3	30.8			35.3	34.5
Progression Factor		1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		0.8			0.0		1.1	0.1			3.7	1.4
Delay (s)		9.2			5.9		34.4	30.9			39.0	35.9
Level of Service		A			A		C	C			D	D
Approach Delay (s)		9.2			5.9		32.9				36.5	
Approach LOS		A			A		C				D	

Intersection Summary

HCM 2000 Control Delay: 23.4, HCM 2000 Level of Service: C
 HCM 2000 Volume to Capacity ratio: 0.51
 Actuated Cycle Length (s): 100.0, Sum of lost time (s): 12.0
 Intersection Capacity Utilization: 94.2%, ICU Level of Service: F
 Analysis Period (min): 15
 c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
2: Silver Moon Drive & Lake Shore Blvd W

Existing
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔		↔↔		↔↔	
Traffic Volume (veh/h)	1057	111	43	875	34	25
Future Volume (Veh/h)	1057	111	43	875	34	25
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	1090	114	44	902	35	26
Pedestrians	71					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	6					
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)	268		247			
pX, platoon unblocked						
vC, conflicting volume			1275		1757 673	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1275		1757 673	
tC, single (s)			4.1		6.8 6.9	
tC, 2 stage (s)						
tF (s)			2.2		3.5 3.3	
p0 queue free %			92		48 93	
cM capacity (veh/h)			519		67 379	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	727	477	345	601	61	
Volume Left	0	0	44	0	35	
Volume Right	0	114	0	0	26	
cSH	1700	1700	519	1700	103	
Volume to Capacity	0.43	0.28	0.08	0.35	0.59	
Queue Length 95th (m)	0.0	0.0	2.2	0.0	22.6	
Control Delay (s)	0.0	0.0	2.7	0.0	81.3	
Lane LOS			A		F	
Approach Delay (s)	0.0		1.0		81.3	
Approach LOS					F	
Intersection Summary						
Average Delay			2.7			
Intersection Capacity Utilization			66.1%		ICU Level of Service C	
Analysis Period (min)			15			

Queues
3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W

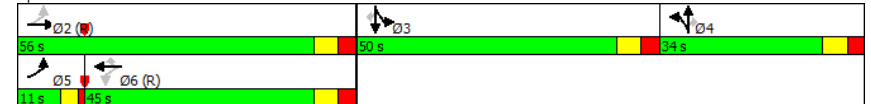
Existing
PM Peak

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔↔		↔↔		↔↔		↔↔		↔↔	
Traffic Volume (vph)	176	568	5	607	320	93	18	645	123	257
Future Volume (vph)	176	568	5	607	320	93	18	645	123	257
Lane Group Flow (vph)	0	801	0	618	323	120	18	652	124	260
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	Split	NA	Perm
Protected Phases	5	2		6		4		3	3	
Permitted Phases	2		6		6		4			3
Detector Phase	5	2	6	6	6	4	4	3	3	3
Switch Phase										
Minimum Initial (s)	6.0	34.0	34.0	34.0	34.0	7.0	7.0	34.0	34.0	34.0
Minimum Split (s)	10.0	41.0	41.0	41.0	41.0	33.0	33.0	41.0	41.0	41.0
Total Split (s)	11.0	56.0	45.0	45.0	45.0	34.0	34.0	50.0	50.0	50.0
Total Split (%)	7.9%	40.0%	32.1%	32.1%	32.1%	24.3%	24.3%	35.7%	35.7%	35.7%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.0		-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		6.0		6.0		6.0		6.0		6.0
Lead/Lag	Lead		Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	C-Max	C-Max	C-Max	C-Max	None	None	Max	Max	Max
v/c Ratio		0.44		0.66	0.57	0.45	0.09	0.59	0.22	0.42
Control Delay		23.9		48.7	18.7	66.0	0.9	43.1	36.7	6.1
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		23.9		48.7	18.7	66.0	0.9	43.1	36.7	6.1
Queue Length 50th (m)		51.9		84.2	26.1	17.8	0.0	82.5	26.7	0.0
Queue Length 95th (m)		65.2		106.0	59.3	28.2	0.0	103.2	43.8	21.0
Internal Link Dist (m)		117.3		128.1		84.9		139.4		
Turn Bay Length (m)	40.0									
Base Capacity (vph)		1827		933	563	657	319	1100	558	625
Starvation Cap Reductn		0		0	0	0	0	0	0	0
Spillback Cap Reductn		0		0	0	0	0	0	0	0
Storage Cap Reductn		0		0	0	0	0	0	0	0
Reduced v/c Ratio		0.44		0.66	0.57	0.18	0.06	0.59	0.22	0.42

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 21 (15%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated

Splits and Phases: 3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W



HCM Signalized Intersection Capacity Analysis

Existing

3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W

PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕↕			↕↕	↕		↕↕	↕	↕↕↕	↕	↕
Traffic Volume (vph)	176	568	49	5	607	320	26	93	18	645	123	257
Future Volume (vph)	176	568	49	5	607	320	26	93	18	645	123	257
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0		6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		0.91			0.95	1.00		0.95	1.00	0.97	1.00	1.00
Frb, ped/bikes		1.00			1.00	0.91		1.00	0.93	1.00	1.00	0.90
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		0.99			1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4977			3538	1471		3287	1126	3502	1776	1424
Flt Permitted		0.65			0.95	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3291			3351	1471		3287	1126	3502	1776	1424
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	178	574	49	5	613	323	26	94	18	652	124	260
RTOR Reduction (vph)	0	4	0	0	0	154	0	0	17	0	0	178
Lane Group Flow (vph)	0	797	0	0	618	169	0	120	1	652	124	82
Confl. Peds. (#/hr)	63		8	8		63	73		35	35		73
Confl. Bikes (#/hr)						1			2			
Heavy Vehicles (%)	1%	2%	0%	0%	2%	0%	11%	8%	33%	0%	7%	2%
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2			6		4	4		3	3	
Permitted Phases	2			6		6			4			3
Actuated Green, G (s)		65.5			38.0	38.0		10.5	10.5	43.0	43.0	43.0
Effective Green, g (s)		66.5			39.0	39.0		11.5	11.5	44.0	44.0	44.0
Actuated g/C Ratio		0.48			0.28	0.28		0.08	0.08	0.31	0.31	0.31
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1858			933	409		270	92	1100	558	447
v/s Ratio Prot		c0.08						c0.04		c0.19	0.07	
v/s Ratio Perm		0.13			c0.18	0.12			0.00			0.06
v/c Ratio		0.43			0.66	0.41		0.44	0.02	0.59	0.22	0.18
Uniform Delay, d1		24.2			44.7	41.2		61.2	59.1	40.4	35.4	34.9
Progression Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.7			3.7	3.1		1.2	0.1	2.4	0.9	0.9
Delay (s)		25.0			48.4	44.3		62.4	59.1	42.8	36.3	35.8
Level of Service		C			D	D		E	E	D	D	D
Approach Delay (s)		25.0			47.0			62.0			40.3	
Approach LOS		C			D			E			D	

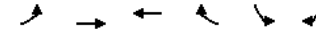
Intersection Summary			
HCM 2000 Control Delay	39.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

Existing

4: Marine Parade Drive & Silver Moon Drive

PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (veh/h)	22	101	99	10	7	41
Future Volume (Veh/h)	22	101	99	10	7	41
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	24	111	109	11	8	45
Pedestrians		22	1		1	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		2	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	121				276	138
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	121				276	138
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				99	95
cM capacity (veh/h)	1447				705	893

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	135	120	53
Volume Left	24	0	8
Volume Right	0	11	45
cSH	1447	1700	859
Volume to Capacity	0.02	0.07	0.06
Queue Length 95th (m)	0.4	0.0	1.6
Control Delay (s)	1.4	0.0	9.5
Lane LOS	A		A
Approach Delay (s)	1.4	0.0	9.5
Approach LOS			A

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	29.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
 5: Silver Moon Drive & Public Lane

Existing
 PM Peak



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control	Stop			Free		
Grade	0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0	0				0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0				0
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)	1029	1091				1636
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	0				0
Volume Left	0	0				0
Volume Right	0	0				0
cSH	1700	1700				1700
Volume to Capacity	0.00	0.00				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			0.0%		ICU Level of Service A	
Analysis Period (min)	15					



APPENDIX C

Background Development TIS Excerpts

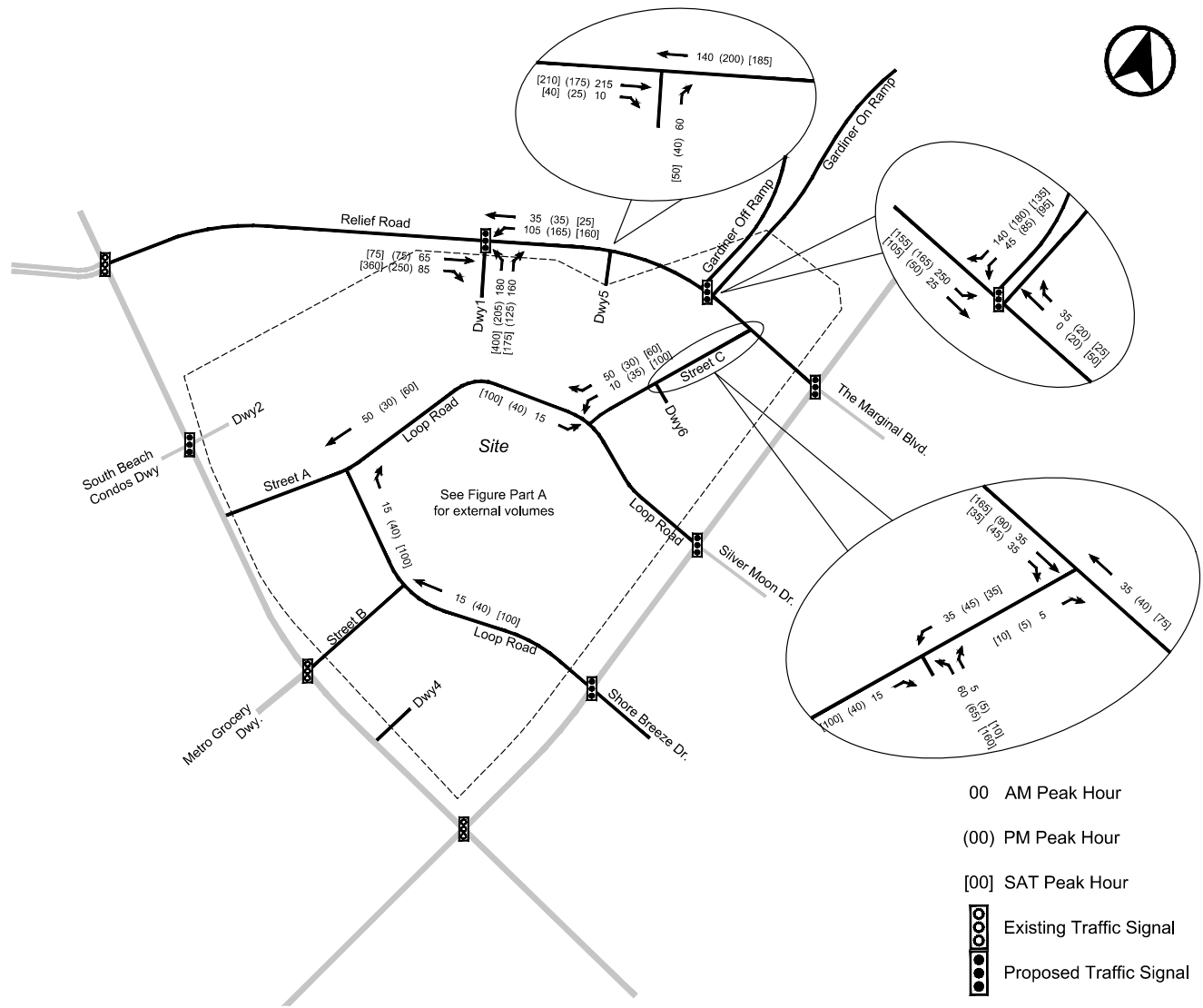


FIGURE 87B SITE DEVELOPMENT TOTAL TRAFFIC VOLUMES - INTERNAL
 2150 LAKE SHORE BOULEVARD WEST - URBAN TRANSPORTATION CONSIDERATIONS
 OPA - VOL 2: TECHNICAL STUDY

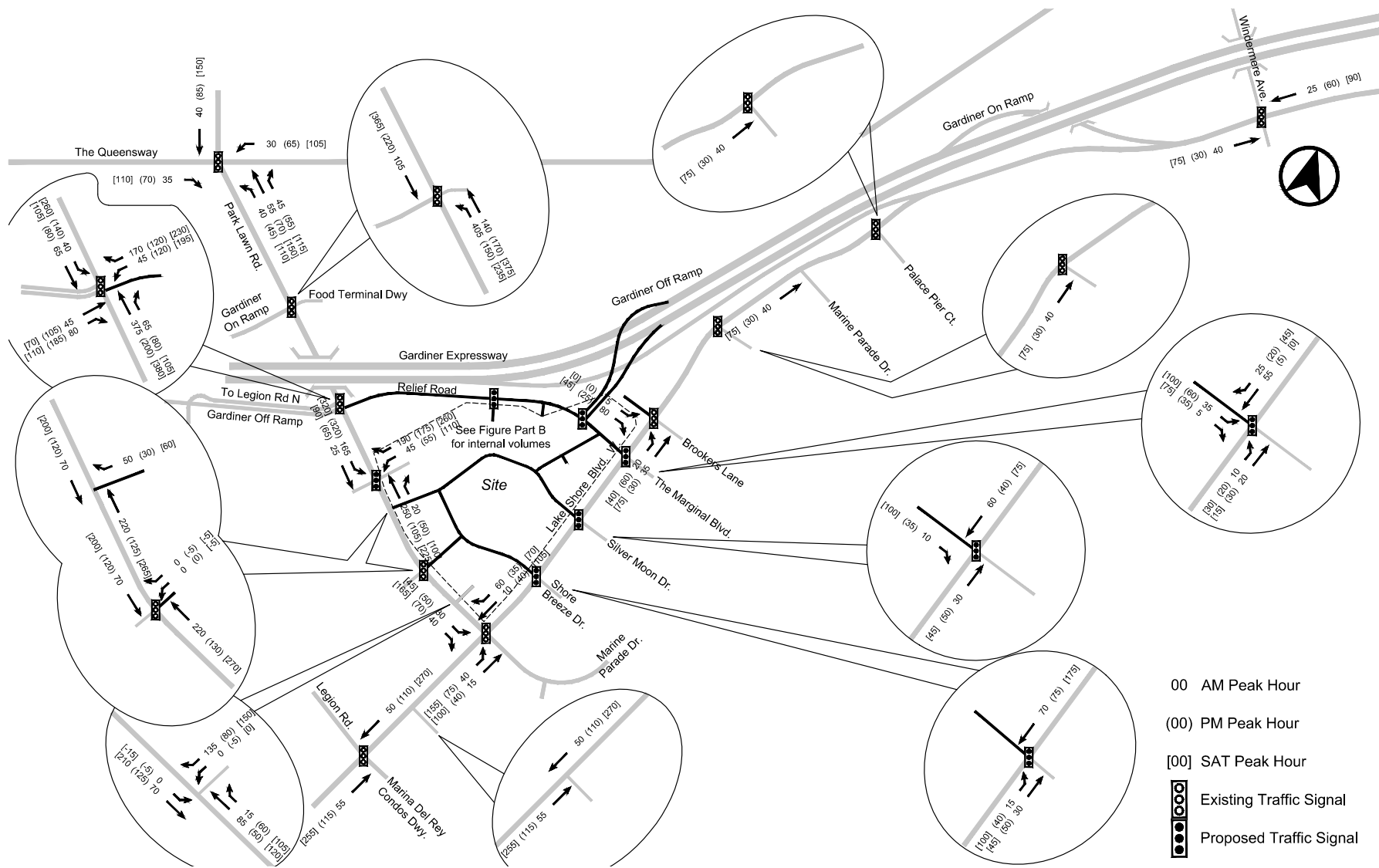


FIGURE 88A NET NEW SITE DEVELOPMENT TRAFFIC VOLUMES - EXTERNAL

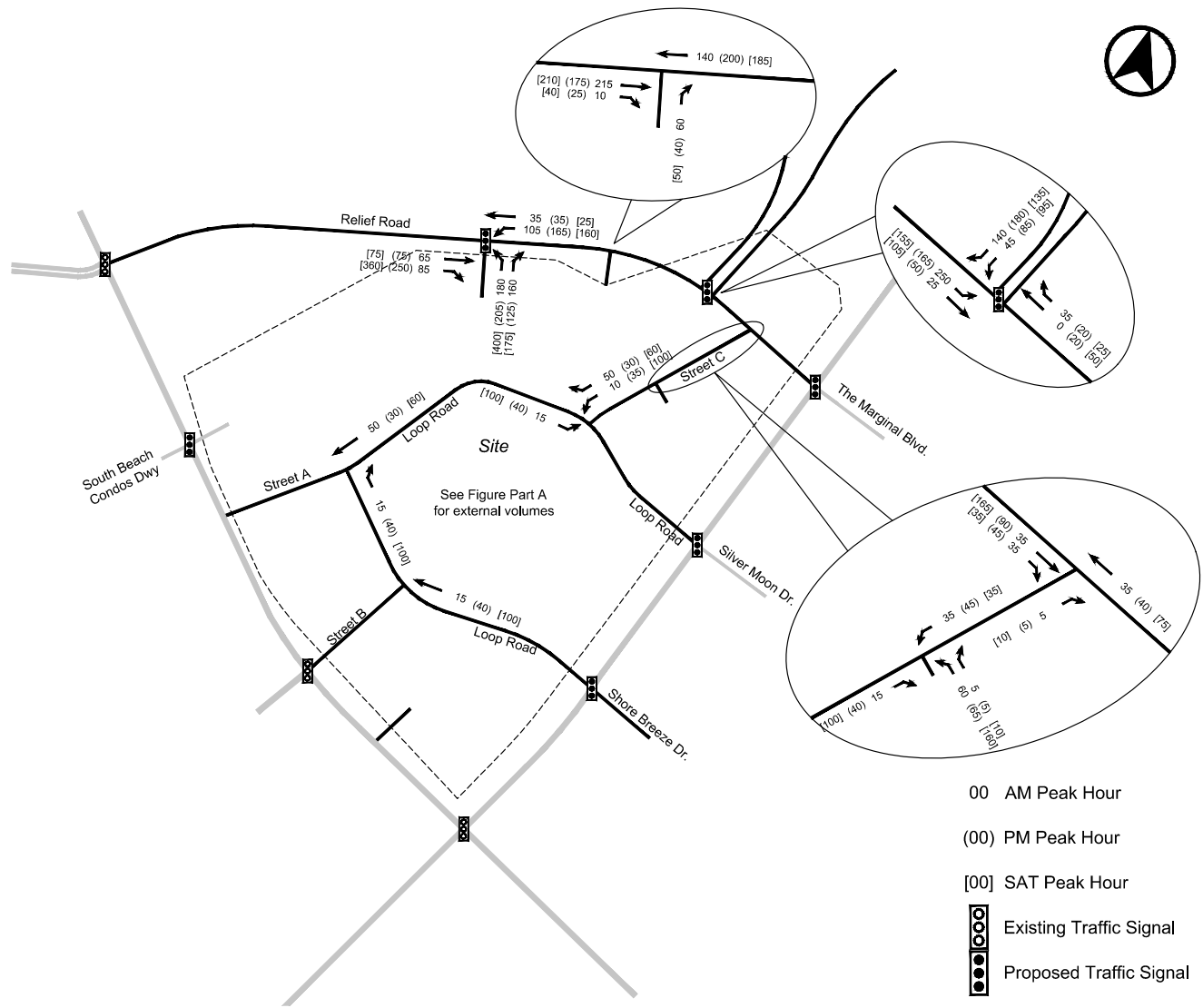


FIGURE 88B NET NEW SITE DEVELOPMENT TRAFFIC VOLUMES - INTERNAL
 2150 LAKE SHORE BOULEVARD WEST - URBAN TRANSPORTATION CONSIDERATIONS
 OPA - VOL 2: TECHNICAL STUDY

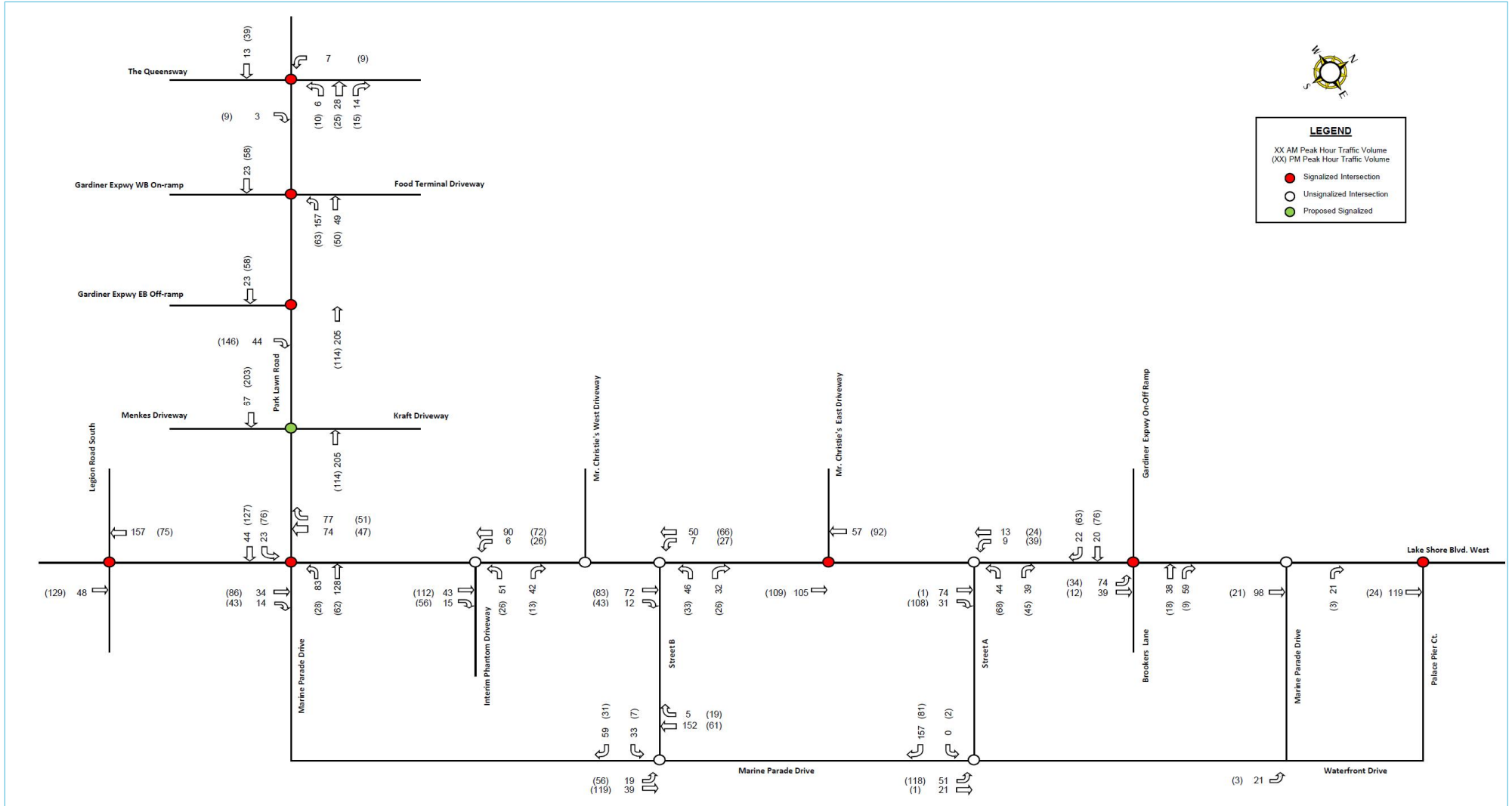


Figure 10. Humber Bay Shores Developments Interim Site Total Traffic Volumes



APPENDIX D

Intersection Capacity Analysis Results – Future Background Conditions

Queues

1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W

12/24/2019



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations		↕↕		↕↕	↔	↔		↕	↕
Traffic Volume (vph)	669	1105	7	59	159	82	43	34	404
Future Volume (vph)	669	1105	7	59	159	82	43	34	404
Lane Group Flow (vph)	0	1863	0	74	162	238	0	79	412
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	6	6	4	4	8	8	8
Permitted Phases	2		6		4		8		8
Detector Phase	5	2	6	6	4	4	8	8	8
Switch Phase									
Minimum Initial (s)	6.0	29.0	29.0	29.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
Total Split (s)	26.0	63.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	26.0%	63.0%	37.0%	37.0%	37.0%	37.0%	37.0%	37.0%	37.0%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag					
Lead-Lag Optimize?	Yes		Yes	Yes					
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None	None	None
v/c Ratio		0.96	0.04	0.66	0.64		0.50	0.66	
Control Delay		29.1	5.5	49.9	32.8		46.4	8.9	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		29.1	5.5	49.9	32.8		46.4	8.9	
Queue Length 50th (m)		159.8	1.9	31.0	30.7		14.6	0.0	
Queue Length 95th (m)		#268.5	5.3	48.8	51.8		27.7	24.4	
Internal Link Dist (m)		223.1	109.4		71.9		56.1		
Turn Bay Length (m)				40.0					
Base Capacity (vph)		1941	1914	415	575		265	765	
Starvation Cap Reductn		0	0	0	0		0	0	
Spillback Cap Reductn		0	0	0	0		0	0	
Storage Cap Reductn		0	0	0	0		0	0	
Reduced v/c Ratio		0.96	0.04	0.39	0.41		0.30	0.54	

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 15 (15%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W



Future Background 12/24/2019 AM Peak

Synchro 9 Report
Page 1

HCM Signalized Intersection Capacity Analysis

1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W

12/24/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↔	↔			↕	↕
Traffic Volume (vph)	669	1105	51	7	59	7	159	82	151	43	34	404
Future Volume (vph)	669	1105	51	7	59	7	159	82	151	43	34	404
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0			6.0	6.0
Lane Util. Factor		0.95			0.95		1.00	1.00			1.00	1.00
Frbp, ped/bikes		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
Frt		1.00			0.99		1.00	0.90			1.00	0.85
Flt Protected		0.98			1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)		3399			3228		1805	1690			1713	1553
Flt Permitted		0.80			0.85		0.71	1.00			0.49	1.00
Satd. Flow (perm)		2785			2747		1341	1690			856	1553
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	683	1128	52	7	60	7	162	84	154	44	35	412
RTOR Reduction (vph)	0	2	0	0	2	0	0	61	0	0	0	336
Lane Group Flow (vph)	0	1861	0	0	72	0	162	177	0	0	79	76
Confl. Peds. (#/hr)			9	9								
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	2%	5%	0%	0%	12%	0%	0%	0%	1%	11%	4%	4%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			4			8	
Permitted Phases	2				6			4			8	
Actuated Green, G (s)		68.6			68.6		17.4	17.4			17.4	17.4
Effective Green, g (s)		69.6			69.6		18.4	18.4			18.4	18.4
Actuated g/C Ratio		0.70			0.70		0.18	0.18			0.18	0.18
Clearance Time (s)		7.0			7.0		7.0	7.0			7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		1938			1911		246	310			157	285
v/s Ratio Prot								0.10				
v/s Ratio Perm		c0.67			0.03		c0.12				0.09	0.05
v/c Ratio		0.96			0.04		0.66	0.57			0.50	0.27
Uniform Delay, d1		13.9			4.7		37.9	37.2			36.7	35.0
Progression Factor		1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		12.4			0.0		6.2	2.5			2.5	0.5
Delay (s)		26.4			4.8		44.1	39.7			39.2	35.5
Level of Service		C			A		D	D			D	D
Approach Delay (s)		26.4			4.8		41.5				36.1	
Approach LOS		C			A		D				D	

Intersection Summary

HCM 2000 Control Delay 29.6 HCM 2000 Level of Service C
 HCM 2000 Volume to Capacity ratio 0.93
 Actuated Cycle Length (s) 100.0 Sum of lost time (s) 15.0
 Intersection Capacity Utilization 89.3% ICU Level of Service E
 Analysis Period (min) 15
 c Critical Lane Group

Future Background 12/24/2019 AM Peak

Synchro 9 Report
Page 2

Queues

2: Silver Moon Drive & Lake Shore Blvd W

12/24/2019

	→	↖	←	↙	↑	↓
Lane Group	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations	↔↔	↖	↕↕	↙	↖↖	↕↕
Traffic Volume (vph)	1754	7	680	16	0	0
Future Volume (vph)	1754	7	680	16	0	0
Lane Group Flow (vph)	1927	8	731	17	55	11
Turn Type	NA	Perm	NA	custom	NA	NA
Protected Phases	2		6			4
Permitted Phases		6		8		
Detector Phase	2	6	6	8		4
Switch Phase						
Minimum Initial (s)	29.0	29.0	29.0	7.0		7.0
Minimum Split (s)	35.0	35.0	35.0	32.0		32.0
Total Split (s)	87.0	87.0	87.0	53.0		53.0
Total Split (%)	62.1%	62.1%	62.1%	37.9%		37.9%
Yellow Time (s)	4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0		-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0		5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	None		None
v/c Ratio	0.59	0.04	0.22	0.17	0.14	0.04
Control Delay	2.4	1.9	1.0	65.3	0.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	1.9	1.0	65.3	0.7	0.2
Queue Length 50th (m)	0.0	0.0	0.0	4.8	0.0	0.0
Queue Length 95th (m)	87.2	1.1	19.6	13.0	0.0	0.0
Internal Link Dist (m)	93.8		223.1		23.9	22.6
Turn Bay Length (m)		7.5		7.5		
Base Capacity (vph)	3283	179	3273	566	407	703
Starvation Cap Reductn	172	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.04	0.22	0.03	0.14	0.02

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated

Splits and Phases: 2: Silver Moon Drive & Lake Shore Blvd W



HCM Signalized Intersection Capacity Analysis

2: Silver Moon Drive & Lake Shore Blvd W

12/24/2019

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕		↖	↕↕		↖	↖			↕↕	
Traffic Volume (vph)	0	1754	38	7	680	0	16	0	51	0	0	10
Future Volume (vph)	0	1754	38	7	680	0	16	0	51	0	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0		5.0	3.0			5.0	
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00			1.00	
Frbp, ped/bikes		1.00		1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes		1.00		0.99	1.00		1.00	1.00			1.00	
Frt		1.00		1.00	1.00		1.00	0.85			0.86	
Flt Protected		1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)		3481		1792	3471		1805	1568			1644	
Flt Permitted		1.00		0.10	1.00		0.87	1.00			1.00	
Satd. Flow (perm)		3481		188	3471		1652	1568			1644	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	1886	41	8	731	0	17	0	55	0	0	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	55	0	0	11	0
Lane Group Flow (vph)	0	1927	0	8	731	0	17	0	0	0	0	0
Confl. Peds. (#/hr)			43	43								
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	3%	2%	0%	4%	0%	0%	0%	3%	0%	0%	0%
Turn Type		NA		Perm	NA		custom	NA			NA	
Protected Phases		2		6	6		8		4		4	
Permitted Phases		2		6	6		8		4		4	
Actuated Green, G (s)		124.4		124.4	124.4		3.6	0.0			3.6	
Effective Green, g (s)		125.4		125.4	125.4		4.6	0.0			4.6	
Actuated g/C Ratio		0.90		0.90	0.90		0.03	0.00			0.03	
Clearance Time (s)		6.0		6.0	6.0		6.0		6.0		6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0		3.0		3.0	
Lane Grp Cap (vph)		3117		168	3109		54	0			54	
v/s Ratio Prot		c0.55			0.21						0.00	
v/s Ratio Perm				0.04			c0.01					
v/c Ratio		0.62		0.05	0.24		0.31	0.00			0.01	
Uniform Delay, d1		1.7		0.8	1.0		66.2	70.0			65.5	
Progression Factor		1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.9		0.5	0.2		3.3	0.0			0.0	
Delay (s)		2.6		1.3	1.1		69.5	70.0			65.5	
Level of Service		A		A	A		E	E			E	
Approach Delay (s)		2.6			1.1		69.9				65.5	
Approach LOS		A			A		E				E	

Intersection Summary

HCM 2000 Control Delay: 4.2
 HCM 2000 Volume to Capacity ratio: 0.61
 Actuated Cycle Length (s): 140.0
 Intersection Capacity Utilization: 64.8%
 Analysis Period (min): 15
 HCM 2000 Level of Service: A
 Sum of lost time (s): 11.0
 ICU Level of Service: C
 Critical Lane Group

Queues

3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W

12/24/2019

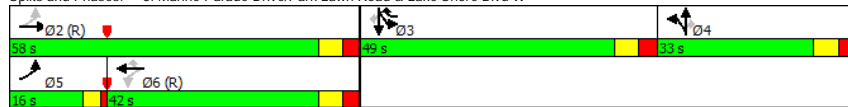


Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑	↑
Traffic Volume (vph)	227	987	11	325	382	251	30	888	244	137
Future Volume (vph)	227	987	11	325	382	251	30	888	244	137
Lane Group Flow (vph)	0	1321	12	349	411	348	32	955	262	147
Turn Type	pm+pt	NA	Perm	NA	pm+ov	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6	6	3	4		3	3	
Permitted Phases	2		6		6		4			3
Detector Phase	5	2	6	6	3	4	4	3	3	3
Switch Phase										
Minimum Initial (s)	6.0	34.0	34.0	34.0	34.0	7.0	7.0	34.0	34.0	34.0
Minimum Split (s)	10.0	41.0	41.0	41.0	41.0	33.0	33.0	41.0	41.0	41.0
Total Split (s)	16.0	58.0	42.0	42.0	49.0	33.0	33.0	49.0	49.0	49.0
Total Split (%)	11.4%	41.4%	30.0%	30.0%	35.0%	23.6%	23.6%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	C-Max	C-Max	C-Max	Max	None	None	Max	Max	Max
v/c Ratio		0.79	0.13	0.40	0.43	0.71	0.11	0.91	0.49	0.27
Control Delay	38.7	44.8	44.7	8.4	64.4	0.8	60.6	43.2	6.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	38.7	44.8	44.7	8.4	64.4	0.8	60.6	43.2	6.6	
Queue Length 50th (m)	111.1	2.7	44.5	27.2	51.4	0.0	138.4	62.3	0.0	
Queue Length 95th (m)	136.2	9.0	60.2	48.0	66.5	0.0	177.6	90.6	16.2	
Internal Link Dist (m)	117.3		125.9		84.9			139.4		
Turn Bay Length (m)		7.5		40.0						
Base Capacity (vph)	1676	89	875	945	633	327	1044	540	540	
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	0.79	0.13	0.40	0.43	0.55	0.10	0.91	0.49	0.27	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 4 (3%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 125
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W



Future Background 12/24/2019 AM Peak

Synchro 9 Report
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HCM Signalized Intersection Capacity Analysis

3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W

12/24/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↑	↑↑	↑↑		↑↑	↑↑	↑↑	↑	↑
Traffic Volume (vph)	227	987	15	11	325	382	73	251	30	888	244	137
Future Volume (vph)	227	987	15	11	325	382	73	251	30	888	244	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		0.91		1.00	0.95	1.00		0.95	1.00	0.97	1.00	1.00
Frbp, ped/bikes		1.00		1.00	1.00	0.96		1.00	0.95	1.00	1.00	0.93
Flpb, ped/bikes		0.99		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99		0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4957		1800	3406	1519		3285	1210	3400	1759	1428
Flt Permitted		0.74		0.18	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3698		349	3406	1519		3285	1210	3400	1759	1428
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	244	1061	16	12	349	411	78	270	32	955	262	147
RTOR Reduction (vph)	0	1	0	0	0	88	0	0	27	0	0	102
Lane Group Flow (vph)	0	1320	0	12	349	323	0	348	5	955	262	45
Confl. Peds. (#/hr)	64		15	15		64	49		23	23		49
Heavy Vehicles (%)	2%	3%	7%	0%	6%	2%	18%	6%	27%	3%	8%	5%
Turn Type	pm+pt	NA		Perm	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		6	3	4	4		3	3		3
Permitted Phases	2			6		6			4			3
Actuated Green, G (s)		57.0		35.0	35.0	77.0		20.0	20.0	42.0	42.0	42.0
Effective Green, g (s)		58.0		36.0	36.0	79.0		21.0	21.0	43.0	43.0	43.0
Actuated g/C Ratio		0.41		0.26	0.26	0.56		0.15	0.15	0.31	0.31	0.31
Clearance Time (s)		7.0		7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0
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)	1702		89	875	922		492	181	1044	540	540	438
v/s Ratio Prot	c0.11			0.10	0.11		c0.11		c0.28	0.15		
v/s Ratio Perm	c0.22			0.03	0.11				0.00			0.03
v/c Ratio	0.78			0.13	0.40	0.35		0.71	0.03	0.91	0.49	0.10
Uniform Delay, d1	35.4			40.0	43.0	16.6		56.6	50.8	46.7	39.5	34.7
Progression Factor	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5			3.1	1.4	1.0		4.6	0.1	13.6	3.1	0.5
Delay (s)	38.9			43.1	44.4	17.6		61.2	50.8	60.4	42.6	35.2
Level of Service	D			D	D	B		E	D	E	D	D
Approach Delay (s)	38.9			30.1				60.3			54.2	
Approach LOS	D			C				E			D	

Intersection Summary

HCM 2000 Control Delay 44.7 HCM 2000 Level of Service D
 HCM 2000 Volume to Capacity ratio 0.83
 Actuated Cycle Length (s) 140.0 Sum of lost time (s) 21.0
 Intersection Capacity Utilization 120.8% ICU Level of Service H
 Analysis Period (min) 15
 c Critical Lane Group

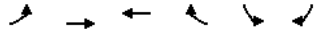
Future Background 12/24/2019 AM Peak

Synchro 9 Report
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HCM Unsignalized Intersection Capacity Analysis

4: Marine Parade Drive & Silver Moon Drive

12/24/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	
Traffic Volume (veh/h)	28	247	179	3	32	135
Future Volume (Veh/h)	28	247	179	3	32	135
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	32	284	206	3	37	155
Pedestrians			11			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.2			
Percent Blockage			1			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	209			566	208	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	209			566	208	
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			92	81	
cM capacity (veh/h)	1350			473	835	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	316	209	192			
Volume Left	32	0	37			
Volume Right	0	3	155			
cSH	1350	1700	728			
Volume to Capacity	0.02	0.12	0.26			
Queue Length 95th (m)	0.6	0.0	8.5			
Control Delay (s)	1.0	0.0	11.7			
Lane LOS	A		B			
Approach Delay (s)	1.0	0.0	11.7			
Approach LOS			B			
Intersection Summary						
Average Delay		3.6				
Intersection Capacity Utilization		44.2%		ICU Level of Service	A	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

5: Silver Moon Drive & Public Lane

12/24/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑		↑		↑	↑
Traffic Volume (veh/h)	0	0	0	0	51	0
Future Volume (Veh/h)	0	0	0	0	51	0
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	0	0	55	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						48
pX, platoon unblocked						
vC, conflicting volume	110	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	110	0			0	
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			97	
cM capacity (veh/h)	862	1091			1636	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	0	55			
Volume Left	0	0	55			
Volume Right	0	0	0			
cSH	1700	1700	1636			
Volume to Capacity	0.00	0.00	0.03			
Queue Length 95th (m)	0.0	0.0	0.8			
Control Delay (s)	0.0	0.0	7.3			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	7.3			
Approach LOS	A					
Intersection Summary						
Average Delay			7.3			
Intersection Capacity Utilization		6.7%		ICU Level of Service	A	
Analysis Period (min)		15				

Queues

1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W

12/24/2019



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations		↕↕		↕↕	↖	↖		↗	↗
Traffic Volume (vph)	172	893	6	57	79	9	110	135	1004
Future Volume (vph)	172	893	6	57	79	9	110	135	1004
Lane Group Flow (vph)	0	1307	0	65	82	99	0	256	1046
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		2		6		4		8	
Permitted Phases		2		6		4		8	
Detector Phase		2		6		4		8	
Switch Phase									
Minimum Initial (s)	29.0	29.0	29.0	29.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
Total Split (s)	63.0	63.0	63.0	63.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	63.0%	63.0%	63.0%	63.0%	37.0%	37.0%	37.0%	37.0%	37.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.0		-1.0		-1.0		-1.0	
Total Lost Time (s)		6.0		6.0		6.0		6.0	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None
v/c Ratio		0.70		0.04	0.36	0.20		0.64	0.93
Control Delay		16.2		9.1	32.8	7.7		39.4	19.8
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		16.2		9.1	32.8	7.7		39.4	19.8
Queue Length 50th (m)		96.6		2.8	12.7	1.3		43.2	13.4
Queue Length 95th (m)		125.5		5.9	26.2	12.9		69.4	#133.6
Internal Link Dist (m)		223.1		109.4		71.9		56.1	
Turn Bay Length (m)					40.0				
Base Capacity (vph)		1868		1772	270	571		469	1148
Starvation Cap Reductn		0		0	0	0		0	0
Spillback Cap Reductn		0		0	0	0		0	0
Storage Cap Reductn		0		0	0	0		0	0
Reduced v/c Ratio		0.70		0.04	0.30	0.17		0.55	0.91

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 21 (21%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W



Future Background 12/24/2019 PM Peak

Synchro 9 Report
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HCM Signalized Intersection Capacity Analysis

1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W

12/24/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↖	↖	↖		↗	↗
Traffic Volume (vph)	172	893	190	6	57	0	79	9	86	110	135	1004
Future Volume (vph)	172	893	190	6	57	0	79	9	86	110	135	1004
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0			6.0	6.0
Lane Util. Factor		0.95			0.95		1.00	1.00			1.00	1.00
Frbp, ped/bikes		0.99			1.00		1.00	1.00			1.00	0.99
Flpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	1.00
Frt		0.98			1.00		1.00	0.86			1.00	0.85
Flt Protected		0.99			1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)		3372			3265		1804	1641			1834	1578
Flt Permitted		0.89			0.88		0.46	1.00			0.81	1.00
Satd. Flow (perm)		3016			2879		873	1641			1515	1578
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	179	930	198	6	59	0	82	9	90	115	141	1046
RTOR Reduction (vph)	0	13	0	0	0	0	0	66	0	0	0	704
Lane Group Flow (vph)	0	1294	0	0	65	0	82	33	0	0	256	342
Confl. Peds. (#/hr)			45	45			1					1
Heavy Vehicles (%)	6%	2%	1%	0%	11%	0%	0%	0%	0%	3%	0%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		8
Actuated Green, G (s)		60.6			60.6		25.4	25.4			25.4	25.4
Effective Green, g (s)		61.6			61.6		26.4	26.4			26.4	26.4
Actuated g/C Ratio		0.62			0.62		0.26	0.26			0.26	0.26
Clearance Time (s)		7.0			7.0		7.0	7.0			7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		1857			1773		230	433			399	416
v/s Ratio Prot							0.02					
v/s Ratio Perm		c0.43			0.02		0.09				0.17	c0.22
v/c Ratio		0.70			0.04		0.36	0.08			0.64	0.82
Uniform Delay, d1		12.9			7.5		29.9	27.6			32.6	34.6
Progression Factor		1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		2.2			0.0		1.0	0.1			3.5	12.4
Delay (s)		15.1			7.6		30.8	27.7			36.1	47.0
Level of Service		B			A		C	C			D	D
Approach Delay (s)		15.1			7.6		29.1				44.9	
Approach LOS		B			A		C				D	

Intersection Summary

HCM 2000 Control Delay: 29.4, HCM 2000 Level of Service: C
 HCM 2000 Volume to Capacity ratio: 0.73
 Actuated Cycle Length (s): 100.0, Sum of lost time (s): 12.0
 Intersection Capacity Utilization: 107.3%, ICU Level of Service: G
 Analysis Period (min): 15
 c Critical Lane Group

Future Background 12/24/2019 PM Peak

Synchro 9 Report
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Queues

2: Silver Moon Drive & Lake Shore Blvd W

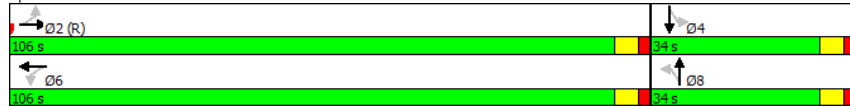
12/24/2019

	→	↖	←	↙	↑	↓
Lane Group	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations	↕↕	↖	↕↕	↖	↕↕	↕↕
Traffic Volume (vph)	1282	43	1113	34	0	0
Future Volume (vph)	1282	43	1113	34	0	0
Lane Group Flow (vph)	1436	44	1147	35	26	36
Turn Type	NA	Perm	NA	Perm	NA	NA
Protected Phases	2		6		8	4
Permitted Phases		6		8		
Detector Phase	2	6	6	8	8	4
Switch Phase						
Minimum Initial (s)	29.0	29.0	29.0	7.0	7.0	7.0
Minimum Split (s)	35.0	35.0	35.0	32.0	32.0	32.0
Total Split (s)	106.0	106.0	106.0	34.0	34.0	34.0
Total Split (%)	75.7%	75.7%	75.7%	24.3%	24.3%	24.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	Max	Max	None	None	None
v/c Ratio	0.48	0.15	0.36	0.34	0.14	0.15
Control Delay	2.9	3.3	2.4	70.1	1.6	1.3
Queue Delay	0.3	0.0	0.2	0.0	0.0	0.0
Total Delay	3.2	3.3	2.6	70.1	1.6	1.3
Queue Length 50th (m)	39.6	1.6	27.5	9.9	0.0	0.0
Queue Length 95th (m)	59.7	4.8	41.6	21.5	0.0	0.0
Internal Link Dist (m)	97.6		223.1		23.9	34.8
Turn Bay Length (m)		7.5		7.5		
Base Capacity (vph)	3015	288	3148	288	392	439
Starvation Cap Reductn	759	0	1084	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.15	0.56	0.12	0.07	0.08

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated

Splits and Phases: 2: Silver Moon Drive & Lake Shore Blvd W



Future Background 12/24/2019 PM Peak

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HCM Signalized Intersection Capacity Analysis

2: Silver Moon Drive & Lake Shore Blvd W

12/24/2019

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕		↖	↕↕		↖	↕↕		↖	↕↕	↕↕
Traffic Volume (vph)	0	1282	111	43	1113	0	34	0	25	0	0	35
Future Volume (vph)	0	1282	111	43	1113	0	34	0	25	0	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0		5.0	5.0		5.0		5.0
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00		1.00		1.00
Frbp, ped/bikes		0.98		1.00	1.00		1.00	1.00		1.00		1.00
Flpb, ped/bikes		1.00		0.97	1.00		1.00	1.00		1.00		1.00
Frt		0.99		1.00	1.00		1.00	0.85		0.86		0.86
Flt Protected		1.00		0.95	1.00		0.95	1.00		1.00		1.00
Satd. Flow (prot)		3422		1754	3574		1805	1615		1611		1611
Flt Permitted		1.00		0.17	1.00		0.73	1.00		1.00		1.00
Satd. Flow (perm)		3422		317	3574		1394	1615		1611		1611
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1322	114	44	1147	0	35	0	26	0	0	36
RTOR Reduction (vph)	0	2	0	0	0	0	0	24	0	0	34	0
Lane Group Flow (vph)	0	1434	0	44	1147	0	35	2	0	0	2	0
Confl. Peds. (#/hr)			71	71								
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	2%	2%	2%
Turn Type	NA		Perm	NA	NA		Perm	NA	NA	NA	NA	NA
Protected Phases	2			6			8			4		4
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)		120.1		120.1	120.1		7.9	7.9		7.9		7.9
Effective Green, g (s)		121.1		121.1	121.1		8.9	8.9		8.9		8.9
Actuated g/C Ratio		0.86		0.86	0.86		0.06	0.06		0.06		0.06
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0		6.0		6.0
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0		3.0
Lane Grp Cap (vph)		2960		274	3091		88	102		102		102
v/s Ratio Prot		c0.42		0.32			0.00			0.00		0.00
v/s Ratio Perm				0.14			c0.03					
v/c Ratio		0.48		0.16	0.37		0.40	0.02		0.02		0.02
Uniform Delay, d1		2.2		1.5	1.9		63.0	61.4		61.5		61.5
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2		0.6		1.3	0.3		2.9	0.1		0.1		0.1
Delay (s)		2.8		2.7	2.2		65.9	61.5		61.6		61.6
Level of Service		A		A	A		E	E		E		E
Approach Delay (s)		2.8		2.2			64.0			61.6		61.6
Approach LOS		A		A			E			E		E

Intersection Summary

HCM 2000 Control Delay: 4.7 HCM 2000 Level of Service: A
 HCM 2000 Volume to Capacity ratio: 0.48
 Actuated Cycle Length (s): 140.0 Sum of lost time (s): 10.0
 Intersection Capacity Utilization: 56.3% ICU Level of Service: B
 Analysis Period (min): 15
 c Critical Lane Group

Future Background 12/24/2019 PM Peak

Synchro 9 Report
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Queues

3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W

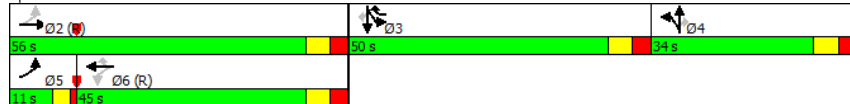
12/24/2019

	↖	→	↙	←	↘	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗↘↙↘↙↘↙↘↙↘↙									
Traffic Volume (vph)	251	743	5	762	470	109	18	835	164	327
Future Volume (vph)	251	743	5	762	470	109	18	835	164	327
Lane Group Flow (vph)	0	1054	5	770	475	166	18	843	166	330
Turn Type	pm+pt	NA	Perm	NA	pm+ov	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6	6	3	4	4	3	3	3
Permitted Phases	2		6		6		4			3
Detector Phase	5	2	6	6	3	4	4	3	3	3
Switch Phase										
Minimum Initial (s)	6.0	34.0	34.0	34.0	34.0	7.0	7.0	34.0	34.0	34.0
Minimum Split (s)	10.0	41.0	41.0	41.0	41.0	33.0	33.0	41.0	41.0	41.0
Total Split (s)	11.0	56.0	45.0	45.0	50.0	34.0	34.0	50.0	50.0	50.0
Total Split (%)	7.9%	40.0%	32.1%	32.1%	35.7%	24.3%	24.3%	35.7%	35.7%	35.7%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	C-Max	C-Max	C-Max	Max	None	Max	Max	Max	Max
v/c Ratio		0.59	0.04	0.78	0.45	0.53	0.08	0.77	0.30	0.49
Control Delay		27.8	38.0	53.1	5.1	66.2	0.8	48.9	38.1	6.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		27.8	38.0	53.1	5.1	66.2	0.8	48.9	38.1	6.2
Queue Length 50th (m)		75.1	1.1	109.3	16.4	24.6	0.0	114.4	36.6	0.0
Queue Length 95th (m)		92.7	4.9	134.3	35.0	36.4	0.0	139.7	57.1	23.6
Internal Link Dist (m)		117.3		122.3		84.9			139.4	
Turn Bay Length (m)			7.5		40.0					
Base Capacity (vph)		1772	136	985	1050	651	319	1100	558	673
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		0.59	0.04	0.78	0.45	0.25	0.06	0.77	0.30	0.49

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 21 (15%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 125
 Control Type: Actuated-Coordinated

Splits and Phases: 3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W



Future Background 12/24/2019 PM Peak

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HCM Signalized Intersection Capacity Analysis

3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W

12/24/2019

	↖	→	↙	←	↘	↑	↗	↘	↓	↙		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗↘↙↘↙↘↙↘↙↘↙											
Traffic Volume (vph)	251	743	49	5	762	470	55	109	18	835	164	327
Future Volume (vph)	251	743	49	5	762	470	55	109	18	835	164	327
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		0.91		1.00	0.95	1.00		0.95	1.00	0.97	1.00	1.00
Frbp, ped/bikes		1.00		1.00	1.00	0.96		1.00	0.93	1.00	1.00	0.90
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99		0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4988		1801	3539	1548		3257	1127	3502	1776	1424
Flt Permitted		0.66		0.26	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3337		492	3539	1548		3257	1127	3502	1776	1424
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	254	751	49	5	770	475	56	110	18	843	166	330
RTOR Reduction (vph)	0	3	0	0	0	133	0	0	16	0	0	226
Lane Group Flow (vph)	0	1051	0	5	770	342	0	166	2	843	166	104
Conf. Peds. (#/hr)		63		8	8	63		73		35		73
Conf. Bikes (#/hr)								1		2		
Heavy Vehicles (%)	1%	2%	0%	0%	2%	0%	11%	8%	33%	0%	7%	2%
Turn Type	pm+pt	NA		Perm	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2			6	3	4	4		3	3	
Permitted Phases	2			6		6			4			3
Actuated Green, G (s)		63.5		38.0	38.0	81.0		12.5	12.5	43.0	43.0	43.0
Effective Green, g (s)		64.5		39.0	39.0	83.0		13.5	13.5	44.0	44.0	44.0
Actuated g/C Ratio		0.46		0.28	0.28	0.59		0.10	0.10	0.31	0.31	0.31
Clearance Time (s)		7.0		7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0
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)		1802		137	985	984		314	108	1100	558	447
v/s Ratio Prot		c0.09			c0.22	0.11		c0.05		c0.24	0.09	
v/s Ratio Perm		0.17		0.01		0.11			0.00			0.07
v/c Ratio		0.58		0.04	0.78	0.35		0.53	0.02	0.77	0.30	0.23
Uniform Delay, d1		27.8		36.8	46.6	14.6		60.2	57.2	43.4	36.3	35.5
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.4		0.5	6.2	1.0		1.6	0.1	5.1	1.4	1.2
Delay (s)		29.2		37.3	52.7	15.6		61.8	57.3	48.5	37.7	36.7
Level of Service		C		D	D	B		E	E	D	D	D
Approach Delay (s)		29.2			38.6			61.4			44.2	
Approach LOS		C			D			E			D	

Intersection Summary

HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	118.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

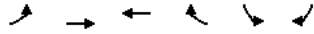
Future Background 12/24/2019 PM Peak

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HCM Unsignalized Intersection Capacity Analysis

4: Marine Parade Drive & Silver Moon Drive

12/24/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	
Traffic Volume (veh/h)	22	142	144	10	7	41
Future Volume (Veh/h)	22	142	144	10	7	41
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	24	156	158	11	8	45
Pedestrians		22	1		1	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		2	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	170				370	186
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	170				370	186
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				99	95
cM capacity (veh/h)	1388				623	839
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	180	169	53			
Volume Left	24	0	8			
Volume Right	0	11	45			
cSH	1388	1700	797			
Volume to Capacity	0.02	0.10	0.07			
Queue Length 95th (m)	0.4	0.0	1.7			
Control Delay (s)	1.1	0.0	9.8			
Lane LOS	A		A			
Approach Delay (s)	1.1	0.0	9.8			
Approach LOS			A			
Intersection Summary						
Average Delay		1.8				
Intersection Capacity Utilization		36.2%		ICU Level of Service	A	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

5: Silver Moon Drive & Public Lane

12/24/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑		↑			↑
Traffic Volume (veh/h)	0	0	0	0	132	0
Future Volume (Veh/h)	0	0	0	0	132	0
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	0	0	143	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						48
pX, platoon unblocked						
vC, conflicting volume	286	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	286	0			0	
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			91	
cM capacity (veh/h)	647	1091			1636	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	0	143			
Volume Left	0	0	143			
Volume Right	0	0	0			
cSH	1700	1700	1636			
Volume to Capacity	0.00	0.00	0.09			
Queue Length 95th (m)	0.0	0.0	2.3			
Control Delay (s)	0.0	0.0	7.4			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	7.4			
Approach LOS			A			
Intersection Summary						
Average Delay			7.4			
Intersection Capacity Utilization			10.6%	ICU Level of Service	A	
Analysis Period (min)			15			



APPENDIX E

Intersection Capacity Analysis Results – Future Background Conditions

Queues

1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W

12/24/2019



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations		↑↑		↑↑	←	↑		↑	↑
Traffic Volume (vph)	678	1119	7	60	159	82	43	34	411
Future Volume (vph)	678	1119	7	60	159	82	43	34	411
Lane Group Flow (vph)	0	1886	0	75	162	238	0	79	419
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	6	6	4	4	8	8	8
Permitted Phases	2		6		4		8		8
Detector Phase	5	2	6	6	4	4	8	8	8
Switch Phase									
Minimum Initial (s)	6.0	29.0	29.0	29.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
Total Split (s)	26.0	63.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	26.0%	63.0%	37.0%	37.0%	37.0%	37.0%	37.0%	37.0%	37.0%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.0		-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)		6.0		6.0	6.0	6.0		6.0	6.0
Lead/Lag	Lead		Lag		Lag				
Lead-Lag Optimize?	Yes		Yes		Yes				
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None	None	None
Act Effct Green (s)		69.6		69.6	18.4	18.4		18.4	18.4
Actuated g/C Ratio		0.70		0.70	0.18	0.18		0.18	0.18
v/c Ratio		0.97		0.04	0.66	0.64		0.50	0.67
Control Delay		31.5		5.5	49.9	33.5		46.4	9.0
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		31.5		5.5	49.9	33.5		46.4	9.0
LOS		C		A	D	C		D	A
Approach Delay		31.5		5.5		40.1		14.9	
Approach LOS		C		A		D		B	
Queue Length 50th (m)		166.9		2.0	31.0	31.4		14.6	0.0
Queue Length 95th (m)		#274.3		5.3	48.8	52.3		27.7	24.6
Internal Link Dist (m)		223.1		109.4		71.9		56.1	
Turn Bay Length (m)				40.0					
Base Capacity (vph)		1939		1911	415	573		265	770
Starvation Cap Reductn		0		0	0	0		0	0
Spillback Cap Reductn		0		0	0	0		0	0
Storage Cap Reductn		0		0	0	0		0	0
Reduced v/c Ratio		0.97		0.04	0.39	0.42		0.30	0.54

Intersection Summary

Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 15 (15%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 29.2	Intersection LOS: C
Intersection Capacity Utilization 90.0%	ICU Level of Service E
Analysis Period (min) 15	

Future Total 12/24/2019 AM Peak

Synchro 9 Report
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Queues

1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W

12/24/2019

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

Splits and Phases: 1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W



Future Total 12/24/2019 AM Peak

Synchro 9 Report
Page 2

HCM Signalized Intersection Capacity Analysis

1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W

12/24/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↕	↕			↕	↕
Traffic Volume (vph)	678	1119	51	7	60	7	159	82	151	43	34	411
Future Volume (vph)	678	1119	51	7	60	7	159	82	151	43	34	411
Ideal Flow (vp/hpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0			6.0	6.0
Lane Util. Factor		0.95			0.95		1.00	1.00			1.00	1.00
Frb, ped/bikes		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
Frt		1.00			0.99		1.00	0.90			1.00	0.85
Flt Protected		0.98			1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)		3399			3228		1805	1690			1713	1553
Flt Permitted		0.80			0.85		0.71	1.00			0.49	1.00
Satd. Flow (perm)		2784			2745		1341	1690			856	1553
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	692	1142	52	7	61	7	162	84	154	44	35	419
RTOR Reduction (vph)	0	2	0	0	2	0	0	59	0	0	0	342
Lane Group Flow (vph)	0	1884	0	0	73	0	162	179	0	0	79	77
Confl. Peds. (#/hr)			9	9								
Confl. Bikes (#/hr)								1				
Heavy Vehicles (%)	2%	5%	0%	0%	12%	0%	0%	0%	1%	11%	4%	4%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		6			4			8		8
Permitted Phases	2			6			4			8		8
Actuated Green, G (s)		68.6			68.6		17.4	17.4			17.4	17.4
Effective Green, g (s)		69.6			69.6		18.4	18.4			18.4	18.4
Actuated g/C Ratio		0.70			0.70		0.18	0.18			0.18	0.18
Clearance Time (s)		7.0			7.0		7.0	7.0			7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		1937			1910		246	310			157	285
v/s Ratio Prot								0.11				
v/s Ratio Perm		c0.68			0.03			c0.12			0.09	0.05
v/c Ratio		0.97			0.04		0.66	0.58			0.50	0.27
Uniform Delay, d1		14.3			4.7		37.9	37.3			36.7	35.0
Progression Factor		1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		14.5			0.0		6.2	2.6			2.5	0.5
Delay (s)		28.8			4.8		44.1	39.9			39.2	35.6
Level of Service		C			A		D	D			D	D
Approach Delay (s)		28.8			4.8		41.6				36.1	
Approach LOS		C			A		D				D	

Intersection Summary			
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

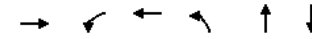
Future Total 12/24/2019 AM Peak

Synchro 9 Report
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Queues

2: Silver Moon Drive & Lake Shore Blvd W

12/24/2019



Lane Group	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations	↕↕	↕	↕↕	↕	↕	↕↕
Traffic Volume (vph)	1754	15	680	25	0	0
Future Volume (vph)	1754	15	680	25	0	0
Lane Group Flow (vph)	1968	16	731	27	80	11
Turn Type	NA	Perm	NA	Perm	NA	NA
Protected Phases	2		6		8	4
Permitted Phases		6		8		
Detector Phase	2	6	6	8	8	4
Switch Phase						
Minimum Initial (s)	29.0	29.0	29.0	7.0	7.0	7.0
Minimum Split (s)	35.0	35.0	35.0	32.0	32.0	32.0
Total Split (s)	87.0	87.0	87.0	53.0	53.0	53.0
Total Split (%)	62.1%	62.1%	62.1%	37.9%	37.9%	37.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	118.1	118.1	118.1	11.9	11.9	11.9
Actuated g/C Ratio	0.84	0.84	0.84	0.08	0.08	0.08
v/c Ratio	0.67	0.12	0.25	0.22	0.52	0.03
Control Delay	5.7	4.5	2.6	75.0	66.8	0.2
Queue Delay	0.7	0.0	0.0	0.0	0.0	0.0
Total Delay	6.4	4.5	2.6	75.0	66.8	0.2
LOS	A	A	A	E	E	A
Approach Delay	6.4		2.6		68.9	0.2
Approach LOS	A		A		E	A
Queue Length 50th (m)	83.1	0.6	16.8	7.8	16.6	0.0
Queue Length 95th (m)	131.1	2.8	28.0	m17.0	m33.0	0.0
Internal Link Dist (m)	93.4		223.1		23.9	22.6
Turn Bay Length (m)		7.5		7.5		
Base Capacity (vph)	2917	136	2927	488	552	703
Starvation Cap Reductn	541	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.12	0.25	0.06	0.14	0.02

Intersection Summary	
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.67
Intersection Signal Delay:	7.8
Intersection Capacity Utilization:	67.4%
Intersection LOS:	A
ICU Level of Service:	C
Analysis Period (min):	15

Future Total 12/24/2019 AM Peak

Synchro 9 Report
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Queues

2: Silver Moon Drive & Lake Shore Blvd W

12/24/2019

m Volume for 95th percentile queue is metered by upstream signal.

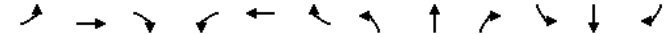
Splits and Phases: 2: Silver Moon Drive & Lake Shore Blvd W

<p>02 (R) 87 s 53 s</p>	<p>04 53 s 87 s</p>
<p>06 (R) 87 s 53 s</p>	<p>08 53 s 87 s</p>

HCM Signalized Intersection Capacity Analysis

2: Silver Moon Drive & Lake Shore Blvd W

12/24/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕		↕	↕↕		↕	↕			↕↕	
Traffic Volume (vph)	0	1754	76	15	680	0	25	0	74	0	0	10
Future Volume (vph)	0	1754	76	15	680	0	25	0	74	0	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0		5.0	5.0				5.0
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00				1.00
Frbp, ped/bikes		0.99		1.00	1.00		1.00	1.00				1.00
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00				1.00
Frt		0.99		1.00	1.00		1.00	0.85				0.86
Flt Protected		1.00		0.95	1.00		0.95	1.00				1.00
Satd. Flow (prot)		3458		1805	3471		1805	1568				1644
Flt Permitted		1.00		0.08	1.00		0.75	1.00				1.00
Satd. Flow (perm)		3458		161	3471		1426	1568				1644
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	1886	82	16	731	0	27	0	80	0	0	11
RTOR Reduction (vph)	0	1	0	0	0	0	0	21	0	0	10	0
Lane Group Flow (vph)	0	1967	0	16	731	0	27	59	0	0	1	0
Confl. Peds. (#/hr)			43	43								
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	3%	2%	0%	4%	0%	0%	0%	3%	0%	0%	0%
Turn Type		NA		Perm	NA		Perm	NA				NA
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		117.1		117.1	117.1		10.9	10.9				10.9
Effective Green, g (s)		118.1		118.1	118.1		11.9	11.9				11.9
Actuated g/C Ratio		0.84		0.84	0.84		0.09	0.09				0.09
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0				6.0
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0				3.0
Lane Grp Cap (vph)		2917		135	2928		121	133				139
v/s Ratio Prot		c0.57			0.21			c0.04				0.00
v/s Ratio Perm				0.10			0.02					
v/c Ratio		0.67		0.12	0.25		0.22	0.44				0.01
Uniform Delay, d1		4.0		1.9	2.2		59.7	60.9				58.6
Progression Factor		1.00		1.00	1.00		1.21	1.28				1.00
Incremental Delay, d2		1.3		1.8	0.2		0.9	2.3				0.0
Delay (s)		5.2		3.7	2.4		73.5	80.5				58.7
Level of Service		A		A	A		E	F				E
Approach Delay (s)		5.2			2.4			78.7				58.7
Approach LOS		A			A			E				E

Intersection Summary

HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W

12/24/2019



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕↕	↕	↕↕	↕↕	↕↕	↕↕	↕↕	↕	↕
Traffic Volume (vph)	227	1008	11	329	386	251	30	905	244	137
Future Volume (vph)	227	1008	11	329	386	251	30	905	244	137
Lane Group Flow (vph)	0	1344	12	354	415	348	32	973	262	147
Turn Type	pm+pt	NA	Perm	NA	pm+ov	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6	6	3	4		3	3	
Permitted Phases	2		6		6		4			3
Detector Phase	5	2	6	6	3	4	4	3	3	3
Switch Phase										
Minimum Initial (s)	6.0	34.0	34.0	34.0	34.0	7.0	7.0	34.0	34.0	34.0
Minimum Split (s)	10.0	41.0	41.0	41.0	41.0	33.0	33.0	41.0	41.0	41.0
Total Split (s)	16.0	58.0	42.0	42.0	49.0	33.0	33.0	49.0	49.0	49.0
Total Split (%)	11.4%	41.4%	30.0%	30.0%	35.0%	23.6%	23.6%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	C-Max	C-Max	C-Max	Max	None	None	Max	Max	Max
Act Effct Green (s)		58.0	36.0	36.0	79.0	21.0	21.0	43.0	43.0	43.0
Actuated g/C Ratio		0.41	0.26	0.26	0.56	0.15	0.15	0.31	0.31	0.31
v/c Ratio		0.80	0.14	0.40	0.44	0.71	0.11	0.93	0.49	0.27
Control Delay		39.3	45.3	44.8	8.6	64.4	0.8	62.8	43.2	6.6
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		39.3	45.3	44.8	8.6	64.4	0.8	62.8	43.2	6.6
LOS		D	D	D	A	E	A	E	D	A
Approach Delay		39.3		25.5		59.0			53.1	
Approach LOS		D		C		E			D	
Queue Length 50th (m)		113.7	2.7	45.2	27.8	51.4	0.0	142.0	62.3	0.0
Queue Length 95th (m)		139.3	9.1	61.0	49.0	66.5	0.0	#183.2	90.6	16.2
Internal Link Dist (m)		117.3		126.3		84.9			139.4	
Turn Bay Length (m)			7.5		40.0					
Base Capacity (vph)		1674	85	875	945	633	327	1044	540	540
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		0.80	0.14	0.40	0.44	0.55	0.10	0.93	0.49	0.27

Intersection Summary

Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 4 (3%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 43.4	Intersection LOS: D
Intersection Capacity Utilization 120.8%	ICU Level of Service H
Analysis Period (min) 15	

Future Total 12/24/2019 AM Peak

Synchro 9 Report
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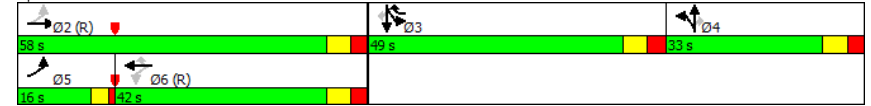
Queues

3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W

12/24/2019

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

Splits and Phases: 3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W



Future Total 12/24/2019 AM Peak

Synchro 9 Report
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HCM Signalized Intersection Capacity Analysis

3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W

12/24/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↕↔		↔	↕↕	↕		↕↕	↕	↕↕↕	↕	↕
Traffic Volume (vph)	227	1008	15	11	329	386	73	251	30	905	244	137
Future Volume (vph)	227	1008	15	11	329	386	73	251	30	905	244	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		0.91		1.00	0.95	1.00		0.95	1.00	0.97	1.00	1.00
Frb, ped/bikes		1.00		1.00	1.00	0.96		1.00	0.95	1.00	1.00	0.93
Flpb, ped/bikes		0.99		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99		0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4959		1800	3406	1519		3285	1210	3400	1759	1428
Flt Permitted		0.74		0.18	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3694		334	3406	1519		3285	1210	3400	1759	1428
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	244	1084	16	12	354	415	78	270	32	973	262	147
RTOR Reduction (vph)	0	1	0	0	0	88	0	0	27	0	0	102
Lane Group Flow (vph)	0	1343	0	12	354	327	0	348	5	973	262	45
Confl. Peds. (#/hr)	64		15	15		64	49		23	23		49
Heavy Vehicles (%)	2%	3%	7%	0%	6%	2%	18%	6%	27%	3%	8%	5%
Turn Type	pm+pt	NA		Perm	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2			6	3	4	4		3	3	
Permitted Phases	2			6		6			4			3
Actuated Green, G (s)		57.0		35.0	35.0	77.0		20.0	20.0	42.0	42.0	42.0
Effective Green, g (s)		58.0		36.0	36.0	79.0		21.0	21.0	43.0	43.0	43.0
Actuated g/C Ratio		0.41		0.26	0.26	0.56		0.15	0.15	0.31	0.31	0.31
Clearance Time (s)		7.0		7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0
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)		1702		85	875	922		492	181	1044	540	438
v/s Ratio Prot		c0.11			0.10	0.11		c0.11		c0.29	0.15	
v/s Ratio Perm		c0.22		0.04		0.11			0.00			0.03
v/c Ratio		0.79		0.14	0.40	0.35		0.71	0.03	0.93	0.49	0.10
Uniform Delay, d1		35.7		40.1	43.1	16.6		56.6	50.8	47.1	39.5	34.7
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.8		3.5	1.4	1.1		4.6	0.1	15.6	3.1	0.5
Delay (s)		39.5		43.5	44.5	17.7		61.2	50.8	62.7	42.6	35.2
Level of Service		D		D	D	B		E	D	E	D	D
Approach Delay (s)		39.5			30.2			60.3			56.0	
Approach LOS		D			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	45.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	120.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

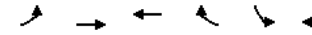
Future Total 12/24/2019 AM Peak

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HCM Unsignalized Intersection Capacity Analysis

4: Marine Parade Drive & Silver Moon Drive

12/24/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (veh/h)	28	247	179	3	32	135
Future Volume (Veh/h)	28	247	179	3	32	135
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	32	284	206	3	37	155
Pedestrians					11	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	209				566	208
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	209				566	208
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				92	81
cM capacity (veh/h)	1350				473	835

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	316	209	192
Volume Left	32	0	37
Volume Right	0	3	155
cSH	1350	1700	728
Volume to Capacity	0.02	0.12	0.26
Queue Length 95th (m)	0.6	0.0	8.5
Control Delay (s)	1.0	0.0	11.7
Lane LOS	A		B
Approach Delay (s)	1.0	0.0	11.7
Approach LOS			B

Intersection Summary			
Average Delay		3.6	
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)		15	

Future Total 12/24/2019 AM Peak

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HCM Unsignalized Intersection Capacity Analysis

5: Silver Moon Drive & Public Lane

12/24/2019

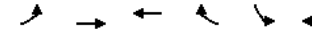


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	0	32	67	0	97	0
Future Volume (Veh/h)	0	32	67	0	97	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	35	73	0	105	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)					48	
pX, platoon unblocked						
vC, conflicting volume	283	73			73	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	283	73			73	
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	96			93	
cM capacity (veh/h)	663	995			1540	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	35	73	105			
Volume Left	0	0	105			
Volume Right	35	0	0			
cSH	995	1700	1540			
Volume to Capacity	0.04	0.04	0.07			
Queue Length 95th (m)	0.9	0.0	1.8			
Control Delay (s)	8.8	0.0	7.5			
Lane LOS	A		A			
Approach Delay (s)	8.8	0.0	7.5			
Approach LOS	A					
Intersection Summary						
Average Delay		5.1				
Intersection Capacity Utilization		22.0%	ICU Level of Service	A		
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

6: Public Lane & Site Access

12/24/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (veh/h)	46	0	0	0	0	32
Future Volume (Veh/h)	46	0	0	0	0	32
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)	50	0	0	0	0	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				100	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				100	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				100	97
cM capacity (veh/h)	1623				871	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	50	0	35			
Volume Left	50	0	0			
Volume Right	0	0	35			
cSH	1623	1700	1085			
Volume to Capacity	0.03	0.00	0.03			
Queue Length 95th (m)	0.8	0.0	0.8			
Control Delay (s)	7.3	0.0	8.4			
Lane LOS	A		A			
Approach Delay (s)	7.3	0.0	8.4			
Approach LOS			A			
Intersection Summary						
Average Delay		7.8				
Intersection Capacity Utilization		13.3%	ICU Level of Service	A		
Analysis Period (min)		15				

Queues

1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W

12/24/2019



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations		↕↕		↕↕	↔	↔		↕	↕
Traffic Volume (vph)	174	913	6	58	79	9	110	135	1024
Future Volume (vph)	174	913	6	58	79	9	110	135	1024
Lane Group Flow (vph)	0	1330	0	66	82	99	0	256	1067
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		2		6		4		8	
Permitted Phases		2		6		4		8	
Detector Phase		2		6		4		8	
Switch Phase									
Minimum Initial (s)	29.0	29.0	29.0	29.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
Total Split (s)	63.0	63.0	63.0	63.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	63.0%	63.0%	63.0%	63.0%	37.0%	37.0%	37.0%	37.0%	37.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.0		-1.0		-1.0		-1.0	
Total Lost Time (s)		6.0		6.0		6.0		6.0	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None
v/c Ratio		0.71		0.04	0.36	0.20		0.64	0.95
Control Delay		16.6		9.1	32.7	7.7		39.4	23.1
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		16.6		9.1	32.7	7.7		39.4	23.1
Queue Length 50th (m)		100.0		2.9	12.7	1.3		43.2	16.9
Queue Length 95th (m)		129.5		5.9	26.2	12.9		69.4	#143.0
Internal Link Dist (m)		223.1		109.4		71.9		56.1	
Turn Bay Length (m)					40.0				
Base Capacity (vph)		1870		1770	270	571		469	1148
Starvation Cap Reductn		0		0	0	0		0	0
Spillback Cap Reductn		0		0	0	0		0	0
Storage Cap Reductn		0		0	0	0		0	0
Reduced v/c Ratio		0.71		0.04	0.30	0.17		0.55	0.93

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 21 (21%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W



Future Total 12/24/2019 PM Peak

Synchro 9 Report
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HCM Signalized Intersection Capacity Analysis

1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W

12/24/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↔	↔		↕	↕	↕
Traffic Volume (vph)	174	913	190	6	58	0	79	9	86	110	135	1024
Future Volume (vph)	174	913	190	6	58	0	79	9	86	110	135	1024
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0			6.0	6.0
Lane Util. Factor		0.95			0.95		1.00	1.00			1.00	1.00
Frbp, ped/bikes		0.99			1.00		1.00	1.00			1.00	0.99
Flpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	1.00
Frt		0.98			1.00		1.00	0.86			1.00	0.85
Flt Protected		0.99			1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)		3375			3264		1804	1641			1834	1578
Flt Permitted		0.89			0.88		0.46	1.00			0.81	1.00
Satd. Flow (perm)		3019			2877		873	1641			1515	1578
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	181	951	198	6	60	0	82	9	90	115	141	1067
RTOR Reduction (vph)	0	13	0	0	0	0	0	66	0	0	0	703
Lane Group Flow (vph)	0	1317	0	0	66	0	82	33	0	0	256	364
Confl. Peds. (#/hr)			45	45			1					1
Heavy Vehicles (%)	6%	2%	1%	0%	11%	0%	0%	0%	0%	3%	0%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases		2			6			4			8	
Actuated Green, G (s)		60.6			60.6		25.4	25.4			25.4	25.4
Effective Green, g (s)		61.6			61.6		26.4	26.4			26.4	26.4
Actuated g/C Ratio		0.62			0.62		0.26	0.26			0.26	0.26
Clearance Time (s)		7.0			7.0		7.0	7.0			7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		1859			1772		230	433			399	416
v/s Ratio Prot								0.02				
v/s Ratio Perm		c0.44			0.02		0.09				0.17	c0.23
v/c Ratio		0.71			0.04		0.36	0.08			0.64	0.88
Uniform Delay, d1		13.1			7.5		29.9	27.6			32.6	35.2
Progression Factor		1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		2.3			0.0		1.0	0.1			3.5	18.2
Delay (s)		15.4			7.6		30.8	27.7			36.1	53.4
Level of Service		B			A		C	C			D	D
Approach Delay (s)		15.4			7.6		29.1				50.1	
Approach LOS		B			A		C				D	

Intersection Summary

HCM 2000 Control Delay 31.9 HCM 2000 Level of Service C
 HCM 2000 Volume to Capacity ratio 0.76
 Actuated Cycle Length (s) 100.0 Sum of lost time (s) 12.0
 Intersection Capacity Utilization 108.5% ICU Level of Service G
 Analysis Period (min) 15
 c Critical Lane Group

Future Total 12/24/2019 PM Peak

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Queues

2: Silver Moon Drive & Lake Shore Blvd W

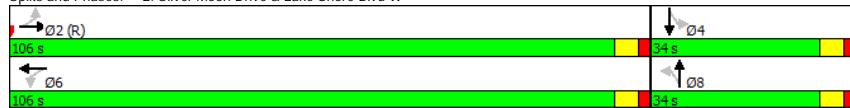
12/24/2019

	→	↖	←	↗	↑	↓
Lane Group	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations	↔↔	↖	↕↕	↗	↔↔	↕↕
Traffic Volume (vph)	1282	64	1113	60	0	0
Future Volume (vph)	1282	64	1113	60	0	0
Lane Group Flow (vph)	1467	66	1147	62	49	36
Turn Type	NA	Perm	NA	Perm	NA	NA
Protected Phases	2		6		8	4
Permitted Phases		6		8		
Detector Phase	2	6	6	8	8	4
Switch Phase						
Minimum Initial (s)	29.0	29.0	29.0	7.0	7.0	7.0
Minimum Split (s)	35.0	35.0	35.0	32.0	32.0	32.0
Total Split (s)	106.0	106.0	106.0	34.0	34.0	34.0
Total Split (%)	75.7%	75.7%	75.7%	24.3%	24.3%	24.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	Max	Max	None	None	None
v/c Ratio	0.50	0.25	0.37	0.49	0.23	0.13
Control Delay	3.8	5.3	3.0	80.5	11.4	1.1
Queue Delay	0.3	0.0	0.2	0.0	0.0	0.0
Total Delay	4.1	5.3	3.3	80.5	11.4	1.1
Queue Length 50th (m)	49.3	3.1	32.7	18.0	0.4	0.0
Queue Length 95th (m)	75.9	9.6	50.7	m32.6	m6.4	0.0
Internal Link Dist (m)	89.0		223.1		23.9	34.8
Turn Bay Length (m)		7.5		7.5		
Base Capacity (vph)	2933	267	3087	288	392	439
Starvation Cap Reductn	686	0	1032	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.25	0.56	0.22	0.13	0.08

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%) Referenced to phase 2:EBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Silver Moon Drive & Lake Shore Blvd W



Future Total 12/24/2019 PM Peak

HCM Signalized Intersection Capacity Analysis

2: Silver Moon Drive & Lake Shore Blvd W

12/24/2019

	↖	→	↘	↙	←	↗	↖	↙	↑	↘	↗	↓	↖	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↕↕		↖	↕↕		↗	↔↔	↗	↔↔	↕↕			
Traffic Volume (vph)	0	1282	141	64	1113	0	60	0	48	0	0	35		
Future Volume (vph)	0	1282	141	64	1113	0	60	0	48	0	0	35		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0		5.0	5.0		5.0		5.0		
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00		1.00		1.00		
Frbp, ped/bikes		0.97		1.00	1.00		1.00	1.00		1.00		1.00		
Flpb, ped/bikes		1.00		0.98	1.00		1.00	1.00		1.00		1.00		
Frt		0.99		1.00	1.00		1.00	0.85		1.00		0.86		
Flt Protected		1.00		0.95	1.00		0.95	1.00		1.00		1.00		
Satd. Flow (prot)		3393		1760	3574		1805	1615				1611		
Flt Permitted		1.00		0.16	1.00		0.73	1.00		1.00		1.00		
Satd. Flow (perm)		3393		301	3574		1394	1615				1611		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1322	145	66	1147	0	62	0	49	0	0	36		
RTOR Reduction (vph)	0	3	0	0	0	0	0	45	0	0	33	0		
Lane Group Flow (vph)	0	1464	0	66	1147	0	62	4	0	0	3	0		
Confl. Peds. (#/hr)			71	71										
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	2%	2%	2%		
Turn Type		NA		Perm	NA		Perm	NA		NA		NA		
Protected Phases		2			6			8				4		
Permitted Phases		2			6			8				4		
Actuated Green, G (s)		117.7		117.7	117.7		10.3	10.3				10.3		
Effective Green, g (s)		118.7		118.7	118.7		11.3	11.3				11.3		
Actuated g/C Ratio		0.85		0.85	0.85		0.08	0.08				0.08		
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0				6.0		
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0				3.0		
Lane Grp Cap (vph)		2876		255	3030		112	130				130		
v/s Ratio Prot		c0.43			0.32			0.00				0.00		
v/s Ratio Perm				0.22			c0.04							
v/c Ratio		0.51		0.26	0.38		0.55	0.03				0.02		
Uniform Delay, d1		2.9		2.1	2.4		61.9	59.3				59.3		
Progression Factor		1.00		1.00	1.00		1.13	1.81				1.00		
Incremental Delay, d2		0.6		2.4	0.4		5.8	0.1				0.1		
Delay (s)		3.5		4.5	2.7		75.7	107.6				59.3		
Level of Service		A		A	A		E	F				E		
Approach Delay (s)		3.5			2.8			89.8				59.3		
Approach LOS		A			A			F				E		

Intersection Summary

HCM 2000 Control Delay: 7.3 HCM 2000 Level of Service: A
 HCM 2000 Volume to Capacity ratio: 0.51
 Actuated Cycle Length (s): 140.0 Sum of lost time (s): 10.0
 Intersection Capacity Utilization: 71.5% ICU Level of Service: C
 Analysis Period (min): 15
 c Critical Lane Group

Future Total 12/24/2019 PM Peak

Queues

3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W

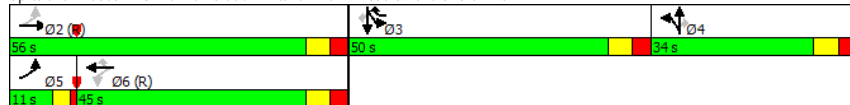
12/24/2019

	↖	→	↙	←	↘	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↖↗	↖	↗	↖↗	↖↗	↖↗	↖↗	↖↗	↖↗
Traffic Volume (vph)	251	757	5	779	479	109	18	851	164	327
Future Volume (vph)	251	757	5	779	479	109	18	851	164	327
Lane Group Flow (vph)	0	1068	5	787	484	166	18	860	166	330
Turn Type	pm+pt	NA	Perm	NA	pm+ov	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6	6	3	4	4	3	3	3
Permitted Phases	2		6		6		4			3
Detector Phase	5	2	6	6	3	4	4	3	3	3
Switch Phase										
Minimum Initial (s)	6.0	34.0	34.0	34.0	34.0	7.0	7.0	34.0	34.0	34.0
Minimum Split (s)	10.0	41.0	41.0	41.0	41.0	33.0	33.0	41.0	41.0	41.0
Total Split (s)	11.0	56.0	45.0	45.0	50.0	34.0	34.0	50.0	50.0	50.0
Total Split (%)	7.9%	40.0%	32.1%	32.1%	35.7%	24.3%	24.3%	35.7%	35.7%	35.7%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	C-Max	C-Max	C-Max	Max	None	Max	Max	Max	Max
v/c Ratio		0.60	0.04	0.80	0.46	0.53	0.08	0.78	0.30	0.49
Control Delay	28.0	38.2	54.0	5.3	66.2	0.8	49.6	38.1	6.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.0	38.2	54.0	5.3	66.2	0.8	49.6	38.1	6.2	
Queue Length 50th (m)	76.4	1.1	112.4	17.5	24.6	0.0	117.5	36.6	0.0	
Queue Length 95th (m)	94.1	4.9	137.9	37.0	36.4	0.0	143.3	57.1	23.6	
Internal Link Dist (m)	117.3		130.8		84.9			139.4		
Turn Bay Length (m)		7.5		40.0						
Base Capacity (vph)	1774	135	985	1050	651	319	1100	558	673	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.04	0.80	0.46	0.25	0.06	0.78	0.30	0.49	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 21 (15%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 125
 Control Type: Actuated-Coordinated

Splits and Phases: 3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W



Future Total 12/24/2019 PM Peak

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HCM Signalized Intersection Capacity Analysis

3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W

12/24/2019

	↖	→	↙	←	↘	↑	↗	↘	↓	↙		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↖↗		↖	↗	↖↗		↖↗	↖↗	↖↗	↖↗	↖↗
Traffic Volume (vph)	251	757	49	5	779	479	55	109	18	851	164	327
Future Volume (vph)	251	757	49	5	779	479	55	109	18	851	164	327
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.91	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.97	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	0.96	1.00	0.96	1.00	0.93	1.00	1.00	1.00	0.90
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.99	1.00	1.00	0.85	1.00	0.85	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.99		0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	4990		1801	3539	1548		3257	1127	3502	1776	1424	1424
Flt Permitted	0.66		0.26	1.00	1.00		0.98	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3342		484	3539	1548		3257	1127	3502	1776	1424	1424
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	254	765	49	5	787	484	56	110	18	860	166	330
RTOR Reduction (vph)	0	3	0	0	0	133	0	0	16	0	0	226
Lane Group Flow (vph)	0	1065	0	5	787	351	0	166	2	860	166	104
Confl. Peds. (#/hr)	63		8	8		63	73		35	35		73
Confl. Bikes (#/hr)						1			2			
Heavy Vehicles (%)	1%	2%	0%	0%	2%	0%	11%	8%	33%	0%	7%	2%
Turn Type	pm+pt	NA		Perm	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2			6	3	4	4		3	3	
Permitted Phases	2			6		6			4			3
Actuated Green, G (s)		63.5		38.0	38.0	81.0		12.5	12.5	43.0	43.0	43.0
Effective Green, g (s)		64.5		39.0	39.0	83.0		13.5	13.5	44.0	44.0	44.0
Actuated g/C Ratio		0.46		0.28	0.28	0.59		0.10	0.10	0.31	0.31	0.31
Clearance Time (s)		7.0		7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0
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)		1804		134	985	984		314	108	1100	558	447
v/s Ratio Prot		c0.09			c0.22	0.11		c0.05		c0.25	0.09	
v/s Ratio Perm		0.18		0.01	0.11			0.00				0.07
v/c Ratio		0.59		0.04	0.80	0.36		0.53	0.02	0.78	0.30	0.23
Uniform Delay, d1		28.0		36.8	46.9	14.7		60.2	57.2	43.6	36.3	35.5
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.4		0.5	6.8	1.0		1.6	0.1	5.5	1.4	1.2
Delay (s)		29.4		37.3	53.6	15.7		61.8	57.3	49.2	37.7	36.7
Level of Service		C		D	D	B		E	E	D	D	D
Approach Delay (s)		29.4			39.2			61.4			44.7	
Approach LOS		C			D			E			D	

Intersection Summary

HCM 2000 Control Delay: 39.5
 HCM 2000 Level of Service: D
 HCM 2000 Volume to Capacity ratio: 0.72
 Actuated Cycle Length (s): 140.0
 Sum of lost time (s): 21.0
 Intersection Capacity Utilization: 118.1%
 ICU Level of Service: H
 Analysis Period (min): 15
 Critical Lane Group

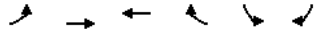
Future Total 12/24/2019 PM Peak

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HCM Unsignalized Intersection Capacity Analysis

4: Marine Parade Drive & Silver Moon Drive

12/24/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	
Traffic Volume (veh/h)	22	142	144	10	7	41
Future Volume (Veh/h)	22	142	144	10	7	41
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	24	156	158	11	8	45
Pedestrians		22	1		1	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		2	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	170				370	186
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	170				370	186
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				99	95
cM capacity (veh/h)	1388				623	839
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	180	169	53			
Volume Left	24	0	8			
Volume Right	0	11	45			
cSH	1388	1700	797			
Volume to Capacity	0.02	0.10	0.07			
Queue Length 95th (m)	0.4	0.0	1.7			
Control Delay (s)	1.1	0.0	9.8			
Lane LOS	A		A			
Approach Delay (s)	1.1	0.0	9.8			
Approach LOS			A			
Intersection Summary						
Average Delay		1.8				
Intersection Capacity Utilization		36.2%		ICU Level of Service	A	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

5: Silver Moon Drive & Public Lane

12/24/2019

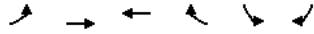


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑		↑			↑
Traffic Volume (veh/h)	0	49	59	0	182	23
Future Volume (Veh/h)	0	49	59	0	182	23
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	53	64	0	198	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						48
pX, platoon unblocked						
vC, conflicting volume	485	64			64	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	485	64			64	
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	95			87	
cM capacity (veh/h)	475	1006			1551	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	53	64	223			
Volume Left	0	0	198			
Volume Right	53	0	0			
cSH	1006	1700	1551			
Volume to Capacity	0.05	0.04	0.13			
Queue Length 95th (m)	1.3	0.0	3.5			
Control Delay (s)	8.8	0.0	6.9			
Lane LOS	A		A			
Approach Delay (s)	8.8	0.0	6.9			
Approach LOS	A					
Intersection Summary						
Average Delay		5.9				
Intersection Capacity Utilization		28.0%		ICU Level of Service	A	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

6: Public Lane & Site Access

12/24/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	
Traffic Volume (veh/h)	50	0	0	0	0	49
Future Volume (Veh/h)	50	0	0	0	0	49
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)	54	0	0	0	0	53
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0			108	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0			108	0	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	97			100	95	
cM capacity (veh/h)	1623			860	1085	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	54	0	53			
Volume Left	54	0	0			
Volume Right	0	0	53			
cSH	1623	1700	1085			
Volume to Capacity	0.03	0.00	0.05			
Queue Length 95th (m)	0.8	0.0	1.2			
Control Delay (s)	7.3	0.0	8.5			
Lane LOS	A		A			
Approach Delay (s)	7.3	0.0	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay		7.9				
Intersection Capacity Utilization		13.3%		ICU Level of Service	A	
Analysis Period (min)		15				



APPENDIX F

Intersection Capacity Analysis Results – Future Total Conditions

Queues

1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W

12/24/2019



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations		↕↕		↕↕	↖	↖		↗	↗
Traffic Volume (vph)	678	1119	7	60	159	82	43	34	411
Future Volume (vph)	678	1119	7	60	159	82	43	34	411
Lane Group Flow (vph)	0	1886	0	75	162	238	0	79	419
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	6	6	4	4	8	8	8
Permitted Phases	2		6		4		8		8
Detector Phase	5	2	6	6	4	4	8	8	8
Switch Phase									
Minimum Initial (s)	6.0	29.0	29.0	29.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
Total Split (s)	26.0	63.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	26.0%	63.0%	37.0%	37.0%	37.0%	37.0%	37.0%	37.0%	37.0%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.0		-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)		6.0		6.0	6.0	6.0		6.0	6.0
Lead/Lag	Lead		Lag	Lag					
Lead-Lag Optimize?	Yes		Yes	Yes					
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None	None	None
Act Effct Green (s)		69.6		69.6	18.4	18.4		18.4	18.4
Actuated g/C Ratio		0.70		0.70	0.18	0.18		0.18	0.18
v/c Ratio		0.97		0.04	0.66	0.64		0.50	0.67
Control Delay		31.5		5.5	49.9	33.5		46.4	9.0
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		31.5		5.5	49.9	33.5		46.4	9.0
LOS		C		A	D	C		D	A
Approach Delay		31.5		5.5		40.1		14.9	
Approach LOS		C		A		D		B	
Queue Length 50th (m)		166.9		2.0	31.0	31.4		14.6	0.0
Queue Length 95th (m)		#274.3		5.3	48.8	52.3		27.7	24.6
Internal Link Dist (m)		223.1		109.4		71.9		56.1	
Turn Bay Length (m)				40.0					
Base Capacity (vph)		1939		1911	415	573		265	770
Starvation Cap Reductn		0		0	0	0		0	0
Spillback Cap Reductn		0		0	0	0		0	0
Storage Cap Reductn		0		0	0	0		0	0
Reduced v/c Ratio		0.97		0.04	0.39	0.42		0.30	0.54

Intersection Summary

Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 15 (15%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 29.2	Intersection LOS: C
Intersection Capacity Utilization 90.0%	ICU Level of Service E
Analysis Period (min) 15	

Future Total 12/24/2019 AM Peak

Synchro 9 Report
Page 1

Queues

1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W

12/24/2019

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

Splits and Phases: 1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W



Future Total 12/24/2019 AM Peak

Synchro 9 Report
Page 2

HCM Signalized Intersection Capacity Analysis

1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W

12/24/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↕	↕			↕	↕
Traffic Volume (vph)	678	1119	51	7	60	7	159	82	151	43	34	411
Future Volume (vph)	678	1119	51	7	60	7	159	82	151	43	34	411
Ideal Flow (vp/hpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0			6.0	6.0
Lane Util. Factor		0.95			0.95		1.00	1.00			1.00	1.00
Frb, ped/bikes		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
Frt		1.00			0.99		1.00	0.90			1.00	0.85
Flt Protected		0.98			1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)		3399			3228		1805	1690			1713	1553
Flt Permitted		0.80			0.85		0.71	1.00			0.49	1.00
Satd. Flow (perm)		2784			2745		1341	1690			856	1553
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	692	1142	52	7	61	7	162	84	154	44	35	419
RTOR Reduction (vph)	0	2	0	0	2	0	0	59	0	0	0	342
Lane Group Flow (vph)	0	1884	0	0	73	0	162	179	0	0	79	77
Confl. Peds. (#/hr)			9	9								
Confl. Bikes (#/hr)								1				
Heavy Vehicles (%)	2%	5%	0%	0%	12%	0%	0%	0%	1%	11%	4%	4%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		6			4			8		8
Permitted Phases	2			6			4			8		8
Actuated Green, G (s)		68.6			68.6		17.4	17.4			17.4	17.4
Effective Green, g (s)		69.6			69.6		18.4	18.4			18.4	18.4
Actuated g/C Ratio		0.70			0.70		0.18	0.18			0.18	0.18
Clearance Time (s)		7.0			7.0		7.0	7.0			7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		1937			1910		246	310			157	285
v/s Ratio Prot								0.11				
v/s Ratio Perm		c0.68			0.03			c0.12			0.09	0.05
v/c Ratio		0.97			0.04		0.66	0.58			0.50	0.27
Uniform Delay, d1		14.3			4.7		37.9	37.3			36.7	35.0
Progression Factor		1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		14.5			0.0		6.2	2.6			2.5	0.5
Delay (s)		28.8			4.8		44.1	39.9			39.2	35.6
Level of Service		C			A		D	D			D	D
Approach Delay (s)		28.8			4.8		41.6				36.1	
Approach LOS		C			A		D				D	

Intersection Summary			
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

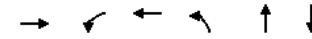
Future Total 12/24/2019 AM Peak

Synchro 9 Report
Page 3

Queues

2: Silver Moon Drive & Lake Shore Blvd W

12/24/2019



Lane Group	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations	↕↕	↕	↕↕	↕	↕	↕↕
Traffic Volume (vph)	1754	15	680	25	0	0
Future Volume (vph)	1754	15	680	25	0	0
Lane Group Flow (vph)	1968	16	731	27	80	11
Turn Type	NA	Perm	NA	Perm	NA	NA
Protected Phases	2		6		8	4
Permitted Phases		6		8		
Detector Phase	2	6	6	8	8	4
Switch Phase						
Minimum Initial (s)	29.0	29.0	29.0	7.0	7.0	7.0
Minimum Split (s)	35.0	35.0	35.0	32.0	32.0	32.0
Total Split (s)	87.0	87.0	87.0	53.0	53.0	53.0
Total Split (%)	62.1%	62.1%	62.1%	37.9%	37.9%	37.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	118.1	118.1	118.1	11.9	11.9	11.9
Actuated g/C Ratio	0.84	0.84	0.84	0.08	0.08	0.08
v/c Ratio	0.67	0.12	0.25	0.22	0.52	0.03
Control Delay	5.7	4.5	2.6	75.0	66.8	0.2
Queue Delay	0.7	0.0	0.0	0.0	0.0	0.0
Total Delay	6.4	4.5	2.6	75.0	66.8	0.2
LOS	A	A	A	E	E	A
Approach Delay	6.4		2.6		68.9	0.2
Approach LOS	A		A		E	A
Queue Length 50th (m)	83.1	0.6	16.8	7.8	16.6	0.0
Queue Length 95th (m)	131.1	2.8	28.0	m17.0	m33.0	0.0
Internal Link Dist (m)	93.4		223.1		23.9	22.6
Turn Bay Length (m)		7.5		7.5		
Base Capacity (vph)	2917	136	2927	488	552	703
Starvation Cap Reductn	541	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.12	0.25	0.06	0.14	0.02

Intersection Summary	
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.67
Intersection Signal Delay:	7.8
Intersection Capacity Utilization:	67.4%
Intersection LOS:	A
ICU Level of Service:	C
Analysis Period (min):	15

Future Total 12/24/2019 AM Peak

Synchro 9 Report
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Queues

2: Silver Moon Drive & Lake Shore Blvd W

12/24/2019

m Volume for 95th percentile queue is metered by upstream signal.

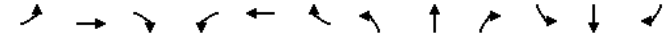
Splits and Phases: 2: Silver Moon Drive & Lake Shore Blvd W

<p>02 (R) 87 s</p>	<p>04 53 s</p>
<p>06 (R) 87 s</p>	<p>08 53 s</p>

HCM Signalized Intersection Capacity Analysis

2: Silver Moon Drive & Lake Shore Blvd W

12/24/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕		↕	↕↕		↕	↕			↕↕	
Traffic Volume (vph)	0	1754	76	15	680	0	25	0	74	0	0	10
Future Volume (vph)	0	1754	76	15	680	0	25	0	74	0	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0		5.0	5.0				5.0
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00				1.00
Frbp, ped/bikes		0.99		1.00	1.00		1.00	1.00				1.00
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00				1.00
Frt		0.99		1.00	1.00		1.00	0.85				0.86
Flt Protected		1.00		0.95	1.00		0.95	1.00				1.00
Satd. Flow (prot)		3458		1805	3471		1805	1568				1644
Flt Permitted		1.00		0.08	1.00		0.75	1.00				1.00
Satd. Flow (perm)		3458		161	3471		1426	1568				1644
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	1886	82	16	731	0	27	0	80	0	0	11
RTOR Reduction (vph)	0	1	0	0	0	0	0	21	0	0	10	0
Lane Group Flow (vph)	0	1967	0	16	731	0	27	59	0	0	1	0
Confl. Peds. (#/hr)			43	43								
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	3%	2%	0%	4%	0%	0%	0%	3%	0%	0%	0%
Turn Type		NA		Perm	NA		Perm	NA				NA
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		117.1		117.1	117.1		10.9	10.9				10.9
Effective Green, g (s)		118.1		118.1	118.1		11.9	11.9				11.9
Actuated g/C Ratio		0.84		0.84	0.84		0.09	0.09				0.09
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0				6.0
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0				3.0
Lane Grp Cap (vph)		2917		135	2928		121	133				139
v/s Ratio Prot		c0.57			0.21			c0.04				0.00
v/s Ratio Perm				0.10			0.02					
v/c Ratio		0.67		0.12	0.25		0.22	0.44				0.01
Uniform Delay, d1		4.0		1.9	2.2		59.7	60.9				58.6
Progression Factor		1.00		1.00	1.00		1.21	1.28				1.00
Incremental Delay, d2		1.3		1.8	0.2		0.9	2.3				0.0
Delay (s)		5.2		3.7	2.4		73.5	80.5				58.7
Level of Service		A		A	A		E	F				E
Approach Delay (s)		5.2			2.4			78.7				58.7
Approach LOS		A			A			E				E

Intersection Summary

HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W

12/24/2019



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕↕	↕	↕↕	↕↕	↕↕	↕↕	↕↕	↕	↕
Traffic Volume (vph)	227	1008	11	329	386	251	30	905	244	137
Future Volume (vph)	227	1008	11	329	386	251	30	905	244	137
Lane Group Flow (vph)	0	1344	12	354	415	348	32	973	262	147
Turn Type	pm+pt	NA	Perm	NA	pm+ov	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6	6	3	4		3	3	
Permitted Phases	2		6		6		4			3
Detector Phase	5	2	6	6	3	4	4	3	3	3
Switch Phase										
Minimum Initial (s)	6.0	34.0	34.0	34.0	34.0	7.0	7.0	34.0	34.0	34.0
Minimum Split (s)	10.0	41.0	41.0	41.0	41.0	33.0	33.0	41.0	41.0	41.0
Total Split (s)	16.0	58.0	42.0	42.0	49.0	33.0	33.0	49.0	49.0	49.0
Total Split (%)	11.4%	41.4%	30.0%	30.0%	35.0%	23.6%	23.6%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	C-Max	C-Max	C-Max	Max	None	None	Max	Max	Max
Act Effct Green (s)		58.0	36.0	36.0	79.0	21.0	21.0	43.0	43.0	43.0
Actuated g/C Ratio		0.41	0.26	0.26	0.56	0.15	0.15	0.31	0.31	0.31
v/c Ratio		0.80	0.14	0.40	0.44	0.71	0.11	0.93	0.49	0.27
Control Delay		39.3	45.3	44.8	8.6	64.4	0.8	62.8	43.2	6.6
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		39.3	45.3	44.8	8.6	64.4	0.8	62.8	43.2	6.6
LOS		D	D	D	A	E	A	E	D	A
Approach Delay		39.3		25.5		59.0			53.1	
Approach LOS		D		C		E			D	
Queue Length 50th (m)		113.7	2.7	45.2	27.8	51.4	0.0	142.0	62.3	0.0
Queue Length 95th (m)		139.3	9.1	61.0	49.0	66.5	0.0	#183.2	90.6	16.2
Internal Link Dist (m)		117.3		126.3		84.9			139.4	
Turn Bay Length (m)			7.5		40.0					
Base Capacity (vph)		1674	85	875	945	633	327	1044	540	540
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		0.80	0.14	0.40	0.44	0.55	0.10	0.93	0.49	0.27

Intersection Summary

Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 4 (3%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 43.4	Intersection LOS: D
Intersection Capacity Utilization 120.8%	ICU Level of Service H
Analysis Period (min) 15	

Future Total 12/24/2019 AM Peak

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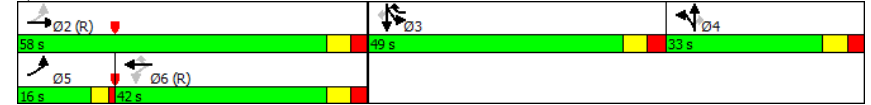
Queues

3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W

12/24/2019

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

Splits and Phases: 3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W



Future Total 12/24/2019 AM Peak

Synchro 9 Report
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HCM Signalized Intersection Capacity Analysis

3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W

12/24/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↕↔		↔	↕↕↔	↔		↕↕↔	↔	↔↕↔	↔	↔
Traffic Volume (vph)	227	1008	15	11	329	386	73	251	30	905	244	137
Future Volume (vph)	227	1008	15	11	329	386	73	251	30	905	244	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		0.91		1.00	0.95	1.00		0.95	1.00	0.97	1.00	1.00
Frb, ped/bikes		1.00		1.00	1.00	0.96		1.00	0.95	1.00	1.00	0.93
Flpb, ped/bikes		0.99		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99		0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4959		1800	3406	1519		3285	1210	3400	1759	1428
Flt Permitted		0.74		0.18	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3694		334	3406	1519		3285	1210	3400	1759	1428
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	244	1084	16	12	354	415	78	270	32	973	262	147
RTOR Reduction (vph)	0	1	0	0	0	88	0	0	27	0	0	102
Lane Group Flow (vph)	0	1343	0	12	354	327	0	348	5	973	262	45
Confl. Peds. (#/hr)	64		15	15		64	49		23	23		49
Heavy Vehicles (%)	2%	3%	7%	0%	6%	2%	18%	6%	27%	3%	8%	5%
Turn Type	pm+pt	NA		Perm	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2			6	3	4	4		3	3	
Permitted Phases	2			6		6			4			3
Actuated Green, G (s)		57.0		35.0	35.0	77.0		20.0	20.0	42.0	42.0	42.0
Effective Green, g (s)		58.0		36.0	36.0	79.0		21.0	21.0	43.0	43.0	43.0
Actuated g/C Ratio		0.41		0.26	0.26	0.56		0.15	0.15	0.31	0.31	0.31
Clearance Time (s)		7.0		7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0
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)		1702		85	875	922		492	181	1044	540	438
v/s Ratio Prot		c0.11			0.10	0.11		c0.11		c0.29	0.15	
v/s Ratio Perm		c0.22		0.04		0.11			0.00			0.03
v/c Ratio		0.79		0.14	0.40	0.35		0.71	0.03	0.93	0.49	0.10
Uniform Delay, d1		35.7		40.1	43.1	16.6		56.6	50.8	47.1	39.5	34.7
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.8		3.5	1.4	1.1		4.6	0.1	15.6	3.1	0.5
Delay (s)		39.5		43.5	44.5	17.7		61.2	50.8	62.7	42.6	35.2
Level of Service		D		D	D	B		E	D	E	D	D
Approach Delay (s)		39.5			30.2			60.3			56.0	
Approach LOS		D			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	45.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	120.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

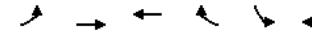
Future Total 12/24/2019 AM Peak

Synchro 9 Report
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HCM Unsignalized Intersection Capacity Analysis

4: Marine Parade Drive & Silver Moon Drive

12/24/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕↔	↕↕↔		↕↕↔	
Traffic Volume (veh/h)	28	247	179	3	32	135
Future Volume (Veh/h)	28	247	179	3	32	135
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	32	284	206	3	37	155
Pedestrians					11	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	209				566	208
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	209				566	208
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				92	81
cM capacity (veh/h)	1350				473	835

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	316	209	192
Volume Left	32	0	37
Volume Right	0	3	155
cSH	1350	1700	728
Volume to Capacity	0.02	0.12	0.26
Queue Length 95th (m)	0.6	0.0	8.5
Control Delay (s)	1.0	0.0	11.7
Lane LOS	A		B
Approach Delay (s)	1.0	0.0	11.7
Approach LOS			B

Intersection Summary			
Average Delay		3.6	
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)		15	

Future Total 12/24/2019 AM Peak

Synchro 9 Report
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HCM Unsignalized Intersection Capacity Analysis

5: Silver Moon Drive & Public Lane

12/24/2019

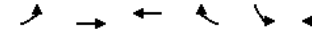


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	0	32	67	0	97	0
Future Volume (Veh/h)	0	32	67	0	97	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	35	73	0	105	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)					48	
pX, platoon unblocked						
vC, conflicting volume	283	73			73	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	283	73			73	
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	96			93	
cM capacity (veh/h)	663	995			1540	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	35	73	105			
Volume Left	0	0	105			
Volume Right	35	0	0			
cSH	995	1700	1540			
Volume to Capacity	0.04	0.04	0.07			
Queue Length 95th (m)	0.9	0.0	1.8			
Control Delay (s)	8.8	0.0	7.5			
Lane LOS	A		A			
Approach Delay (s)	8.8	0.0	7.5			
Approach LOS	A					
Intersection Summary						
Average Delay		5.1				
Intersection Capacity Utilization		22.0%	ICU Level of Service	A		
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

6: Public Lane & Site Access

12/24/2019

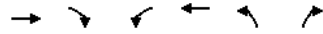


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (veh/h)	46	0	0	0	0	32
Future Volume (Veh/h)	46	0	0	0	0	32
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	0	0	0	0	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				100	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				100	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				100	97
cM capacity (veh/h)	1623				871	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	50	0	35			
Volume Left	50	0	0			
Volume Right	0	0	35			
cSH	1623	1700	1085			
Volume to Capacity	0.03	0.00	0.03			
Queue Length 95th (m)	0.8	0.0	0.8			
Control Delay (s)	7.3	0.0	8.4			
Lane LOS	A		A			
Approach Delay (s)	7.3	0.0	8.4			
Approach LOS			A			
Intersection Summary						
Average Delay		7.8				
Intersection Capacity Utilization		13.3%	ICU Level of Service	A		
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

17: Lake Shore Blvd W

12/24/2019



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
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)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)	150		117			
pX, platoon unblocked						
vC, conflicting volume			0		0 0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		0 0	
tC, single (s)			4.1		6.8 6.9	
tC, 2 stage (s)						
tF (s)			2.2		3.5 3.3	
p0 queue free %			100		100 100	
cM capacity (veh/h)			1622		1023 1084	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	
Volume Total	0	0	0	0	0	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	0	0	
cSH	1700	1700	1700	1700	1700	
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	
Lane LOS						
Approach Delay (s)	0.0		0.0			
Approach LOS						
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%		ICU Level of Service A	
Analysis Period (min)			15			

Queues

1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W

12/24/2019



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations		↕↕		↕↕	↔	↔		↕	↕
Traffic Volume (vph)	174	913	6	58	79	9	110	135	1024
Future Volume (vph)	174	913	6	58	79	9	110	135	1024
Lane Group Flow (vph)	0	1330	0	66	82	99	0	256	1067
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		2		6		4		8	
Permitted Phases		2		6		4		8	
Detector Phase		2		6		4		8	
Switch Phase									
Minimum Initial (s)	29.0	29.0	29.0	29.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
Total Split (s)	63.0	63.0	63.0	63.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	63.0%	63.0%	63.0%	63.0%	37.0%	37.0%	37.0%	37.0%	37.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.0		-1.0		-1.0		-1.0	
Total Lost Time (s)		6.0		6.0		6.0		6.0	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None
v/c Ratio		0.71		0.04	0.36	0.20		0.64	0.95
Control Delay		16.6		9.1	32.7	7.7		39.4	23.1
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		16.6		9.1	32.7	7.7		39.4	23.1
Queue Length 50th (m)		100.0		2.9	12.7	1.3		43.2	16.9
Queue Length 95th (m)		129.5		5.9	26.2	12.9		69.4	#143.0
Internal Link Dist (m)		223.1		109.4		71.9		56.1	
Turn Bay Length (m)					40.0				
Base Capacity (vph)		1870		1770	270	571		469	1148
Starvation Cap Reductn		0		0	0	0		0	0
Spillback Cap Reductn		0		0	0	0		0	0
Storage Cap Reductn		0		0	0	0		0	0
Reduced v/c Ratio		0.71		0.04	0.30	0.17		0.55	0.93

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 21 (21%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W



Future Total 12/24/2019 PM Peak

Synchro 9 Report
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HCM Signalized Intersection Capacity Analysis

1: Brookers Lane/Gardiner Ramps & Lake Shore Blvd W

12/24/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↔	↔			↕	↕
Traffic Volume (vph)	174	913	190	6	58	0	79	9	86	110	135	1024
Future Volume (vph)	174	913	190	6	58	0	79	9	86	110	135	1024
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0			6.0	6.0
Lane Util. Factor		0.95			0.95		1.00	1.00			1.00	1.00
Frbp, ped/bikes		0.99			1.00		1.00	1.00			1.00	0.99
Flpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	1.00
Frt		0.98			1.00		1.00	0.86			1.00	0.85
Flt Protected		0.99			1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)		3375			3264		1804	1641			1834	1578
Flt Permitted		0.89			0.88		0.46	1.00			0.81	1.00
Satd. Flow (perm)		3019			2877		873	1641			1515	1578
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	181	951	198	6	60	0	82	9	90	115	141	1067
RTOR Reduction (vph)	0	13	0	0	0	0	0	66	0	0	0	703
Lane Group Flow (vph)	0	1317	0	0	66	0	82	33	0	0	256	364
Confl. Peds. (#/hr)			45	45			1					1
Heavy Vehicles (%)	6%	2%	1%	0%	11%	0%	0%	0%	0%	3%	0%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases		2			6			4			8	
Actuated Green, G (s)		60.6			60.6		25.4	25.4			25.4	25.4
Effective Green, g (s)		61.6			61.6		26.4	26.4			26.4	26.4
Actuated g/C Ratio		0.62			0.62		0.26	0.26			0.26	0.26
Clearance Time (s)		7.0			7.0		7.0	7.0			7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		1859			1772		230	433			399	416
v/s Ratio Prot							0.02					
v/s Ratio Perm		c0.44			0.02		0.09				0.17	c0.23
v/c Ratio		0.71			0.04		0.36	0.08			0.64	0.88
Uniform Delay, d1		13.1			7.5		29.9	27.6			32.6	35.2
Progression Factor		1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		2.3			0.0		1.0	0.1			3.5	18.2
Delay (s)		15.4			7.6		30.8	27.7			36.1	53.4
Level of Service		B			A		C	C			D	D
Approach Delay (s)		15.4			7.6		29.1				50.1	
Approach LOS		B			A		C				D	

Intersection Summary

HCM 2000 Control Delay 31.9 HCM 2000 Level of Service C
 HCM 2000 Volume to Capacity ratio 0.76
 Actuated Cycle Length (s) 100.0 Sum of lost time (s) 12.0
 Intersection Capacity Utilization 108.5% ICU Level of Service G
 Analysis Period (min) 15
 c Critical Lane Group

Future Total 12/24/2019 PM Peak

Synchro 9 Report
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Queues

2: Silver Moon Drive & Lake Shore Blvd W

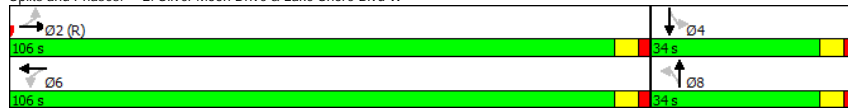
12/24/2019

	→	↖	←	↙	↑	↓
Lane Group	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations	↕↕	↖	↕↕	↖	↕↕	↕↕
Traffic Volume (vph)	1282	64	1113	60	0	0
Future Volume (vph)	1282	64	1113	60	0	0
Lane Group Flow (vph)	1467	66	1147	62	49	36
Turn Type	NA	Perm	NA	Perm	NA	NA
Protected Phases	2		6		8	4
Permitted Phases		6		8		
Detector Phase	2	6	6	8	8	4
Switch Phase						
Minimum Initial (s)	29.0	29.0	29.0	7.0	7.0	7.0
Minimum Split (s)	35.0	35.0	35.0	32.0	32.0	32.0
Total Split (s)	106.0	106.0	106.0	34.0	34.0	34.0
Total Split (%)	75.7%	75.7%	75.7%	24.3%	24.3%	24.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	Max	Max	None	None	None
v/c Ratio	0.50	0.25	0.37	0.49	0.23	0.13
Control Delay	3.8	5.3	3.0	80.5	11.4	1.1
Queue Delay	0.3	0.0	0.2	0.0	0.0	0.0
Total Delay	4.1	5.3	3.3	80.5	11.4	1.1
Queue Length 50th (m)	49.3	3.1	32.7	18.0	0.4	0.0
Queue Length 95th (m)	75.9	9.6	50.7	m32.6	m6.4	0.0
Internal Link Dist (m)	89.0		223.1		23.9	34.8
Turn Bay Length (m)		7.5		7.5		
Base Capacity (vph)	2933	267	3087	288	392	439
Starvation Cap Reductn	686	0	1032	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.25	0.56	0.22	0.13	0.08

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%) Referenced to phase 2:EBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Silver Moon Drive & Lake Shore Blvd W



Future Total 12/24/2019 PM Peak

HCM Signalized Intersection Capacity Analysis

2: Silver Moon Drive & Lake Shore Blvd W

12/24/2019

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕		↖	↕↕		↖	↕↕		↖	↕↕	↕↕
Traffic Volume (vph)	0	1282	141	64	1113	0	60	0	48	0	0	35
Future Volume (vph)	0	1282	141	64	1113	0	60	0	48	0	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0		5.0	5.0			5.0	
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00			1.00	
Frbp, ped/bikes		0.97		1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes		1.00		0.98	1.00		1.00	1.00			1.00	
Frt		0.99		1.00	1.00		1.00	0.85			0.86	
Flt Protected		1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)		3393		1760	3574		1805	1615			1611	
Flt Permitted		1.00		0.16	1.00		0.73	1.00			1.00	
Satd. Flow (perm)		3393		301	3574		1394	1615			1611	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1322	145	66	1147	0	62	0	49	0	0	36
RTOR Reduction (vph)	0	3	0	0	0	0	0	45	0	0	33	0
Lane Group Flow (vph)	0	1464	0	66	1147	0	62	4	0	0	3	0
Confl. Peds. (#/hr)			71	71								
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	2%	2%	2%
Turn Type		NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			8			4	
Permitted Phases		2			6			8			4	
Actuated Green, G (s)		117.7		117.7	117.7		10.3	10.3			10.3	
Effective Green, g (s)		118.7		118.7	118.7		11.3	11.3			11.3	
Actuated g/C Ratio		0.85		0.85	0.85		0.08	0.08			0.08	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0			6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		2876		255	3030		112	130			130	
v/s Ratio Prot		c0.43			0.32			0.00			0.00	
v/s Ratio Perm				0.22				c0.04				
v/c Ratio		0.51		0.26	0.38		0.55	0.03			0.02	
Uniform Delay, d1		2.9		2.1	2.4		61.9	59.3			59.3	
Progression Factor		1.00		1.00	1.00		1.13	1.81			1.00	
Incremental Delay, d2		0.6		2.4	0.4		5.8	0.1			0.1	
Delay (s)		3.5		4.5	2.7		75.7	107.6			59.3	
Level of Service		A		A	A		E	F			E	
Approach Delay (s)		3.5			2.8			89.8			59.3	
Approach LOS		A			A			F			E	

Intersection Summary

HCM 2000 Control Delay: 7.3 HCM 2000 Level of Service: A
 HCM 2000 Volume to Capacity ratio: 0.51
 Actuated Cycle Length (s): 140.0 Sum of lost time (s): 10.0
 Intersection Capacity Utilization: 71.5% ICU Level of Service: C
 Analysis Period (min): 15
 c Critical Lane Group

Future Total 12/24/2019 PM Peak

Queues

3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W

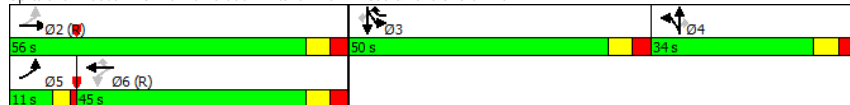
12/24/2019

	↖	→	↙	←	↘	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↖↗	↖	↗	↖↗	↖↗	↖↗	↖↗	↖↗	↖↗
Traffic Volume (vph)	251	757	5	779	479	109	18	851	164	327
Future Volume (vph)	251	757	5	779	479	109	18	851	164	327
Lane Group Flow (vph)	0	1068	5	787	484	166	18	860	166	330
Turn Type	pm+pt	NA	Perm	NA	pm+ov	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6	6	3	4	4	3	3	3
Permitted Phases	2		6		6		4			3
Detector Phase	5	2	6	6	3	4	4	3	3	3
Switch Phase										
Minimum Initial (s)	6.0	34.0	34.0	34.0	34.0	7.0	7.0	34.0	34.0	34.0
Minimum Split (s)	10.0	41.0	41.0	41.0	41.0	33.0	33.0	41.0	41.0	41.0
Total Split (s)	11.0	56.0	45.0	45.0	50.0	34.0	34.0	50.0	50.0	50.0
Total Split (%)	7.9%	40.0%	32.1%	32.1%	35.7%	24.3%	24.3%	35.7%	35.7%	35.7%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	C-Max	C-Max	C-Max	Max	None	Max	Max	Max	Max
v/c Ratio		0.60	0.04	0.80	0.46	0.53	0.08	0.78	0.30	0.49
Control Delay	28.0	38.2	54.0	5.3	66.2	0.8	49.6	38.1	6.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.0	38.2	54.0	5.3	66.2	0.8	49.6	38.1	6.2	
Queue Length 50th (m)	76.4	1.1	112.4	17.5	24.6	0.0	117.5	36.6	0.0	
Queue Length 95th (m)	94.1	4.9	137.9	37.0	36.4	0.0	143.3	57.1	23.6	
Internal Link Dist (m)	117.3		130.8		84.9			139.4		
Turn Bay Length (m)		7.5		40.0						
Base Capacity (vph)	1774	135	985	1050	651	319	1100	558	673	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.04	0.80	0.46	0.25	0.06	0.78	0.30	0.49	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 21 (15%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 125
 Control Type: Actuated-Coordinated

Splits and Phases: 3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W



Future Total 12/24/2019 PM Peak

Synchro 9 Report
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HCM Signalized Intersection Capacity Analysis

3: Marine Parade Drive/Park Lawn Road & Lake Shore Blvd W

12/24/2019

	↖	→	↙	←	↘	↑	↗	↘	↓	↙		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↖↗		↖	↗	↖↗		↖↗	↖↗	↖↗	↖↗	↖↗
Traffic Volume (vph)	251	757	49	5	779	479	55	109	18	851	164	327
Future Volume (vph)	251	757	49	5	779	479	55	109	18	851	164	327
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.91	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.97	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	0.96	1.00	0.96	1.00	0.93	1.00	1.00	1.00	0.90
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.99	1.00	1.00	0.85	1.00	0.85	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.99		0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	4990		1801	3539	1548		3257	1127	3502	1776	1424	1424
Flt Permitted	0.66		0.26	1.00	1.00		0.98	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3342		484	3539	1548		3257	1127	3502	1776	1424	1424
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	254	765	49	5	787	484	56	110	18	860	166	330
RTOR Reduction (vph)	0	3	0	0	0	133	0	0	16	0	0	226
Lane Group Flow (vph)	0	1065	0	5	787	351	0	166	2	860	166	104
Confl. Peds. (#/hr)	63		8	8		63	73		35	35		73
Confl. Bikes (#/hr)						1			2			
Heavy Vehicles (%)	1%	2%	0%	0%	2%	0%	11%	8%	33%	0%	7%	2%
Turn Type	pm+pt	NA		Perm	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2			6	3	4	4		3	3	
Permitted Phases	2			6		6			4			3
Actuated Green, G (s)		63.5		38.0	38.0	81.0		12.5	12.5	43.0	43.0	43.0
Effective Green, g (s)		64.5		39.0	39.0	83.0		13.5	13.5	44.0	44.0	44.0
Actuated g/C Ratio		0.46		0.28	0.28	0.59		0.10	0.10	0.31	0.31	0.31
Clearance Time (s)		7.0		7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0
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)		1804		134	985	984		314	108	1100	558	447
v/s Ratio Prot		c0.09			c0.22	0.11		c0.05		c0.25	0.09	
v/s Ratio Perm		0.18		0.01		0.11			0.00			0.07
v/c Ratio		0.59		0.04	0.80	0.36		0.53	0.02	0.78	0.30	0.23
Uniform Delay, d1		28.0		36.8	46.9	14.7		60.2	57.2	43.6	36.3	35.5
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.4		0.5	6.8	1.0		1.6	0.1	5.5	1.4	1.2
Delay (s)		29.4		37.3	53.6	15.7		61.8	57.3	49.2	37.7	36.7
Level of Service		C		D	D	B		E	E	D	D	D
Approach Delay (s)		29.4			39.2			61.4			44.7	
Approach LOS		C			D			E			D	

Intersection Summary

HCM 2000 Control Delay: 39.5
 HCM 2000 Level of Service: D
 HCM 2000 Volume to Capacity ratio: 0.72
 Actuated Cycle Length (s): 140.0
 Sum of lost time (s): 21.0
 Intersection Capacity Utilization: 118.1%
 ICU Level of Service: H
 Analysis Period (min): 15
 c Critical Lane Group

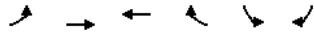
Future Total 12/24/2019 PM Peak

Synchro 9 Report
Page 6

HCM Unsignalized Intersection Capacity Analysis

4: Marine Parade Drive & Silver Moon Drive

12/24/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	
Traffic Volume (veh/h)	22	142	144	10	7	41
Future Volume (Veh/h)	22	142	144	10	7	41
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	24	156	158	11	8	45
Pedestrians		22	1		1	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		2	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	170				370	186
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	170				370	186
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				99	95
cM capacity (veh/h)	1388				623	839
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	180	169	53			
Volume Left	24	0	8			
Volume Right	0	11	45			
cSH	1388	1700	797			
Volume to Capacity	0.02	0.10	0.07			
Queue Length 95th (m)	0.4	0.0	1.7			
Control Delay (s)	1.1	0.0	9.8			
Lane LOS	A		A			
Approach Delay (s)	1.1	0.0	9.8			
Approach LOS			A			
Intersection Summary						
Average Delay		1.8				
Intersection Capacity Utilization		36.2%		ICU Level of Service	A	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

5: Silver Moon Drive & Public Lane

12/24/2019

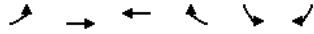


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑		↑			↑
Traffic Volume (veh/h)	0	49	59	0	182	23
Future Volume (Veh/h)	0	49	59	0	182	23
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	53	64	0	198	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						48
pX, platoon unblocked						
vC, conflicting volume	485	64			64	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	485	64			64	
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	95			87	
cM capacity (veh/h)	475	1006			1551	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	53	64	223			
Volume Left	0	0	198			
Volume Right	53	0	0			
cSH	1006	1700	1551			
Volume to Capacity	0.05	0.04	0.13			
Queue Length 95th (m)	1.3	0.0	3.5			
Control Delay (s)	8.8	0.0	6.9			
Lane LOS	A		A			
Approach Delay (s)	8.8	0.0	6.9			
Approach LOS	A					
Intersection Summary						
Average Delay		5.9				
Intersection Capacity Utilization		28.0%		ICU Level of Service	A	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

6: Public Lane & Site Access

12/24/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	
Traffic Volume (veh/h)	50	0	0	0	0	49
Future Volume (Veh/h)	50	0	0	0	0	49
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)	54	0	0	0	0	53
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				108	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				108	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				100	95
cM capacity (veh/h)	1623				860	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	54	0	53			
Volume Left	54	0	0			
Volume Right	0	0	53			
cSH	1623	1700	1085			
Volume to Capacity	0.03	0.00	0.05			
Queue Length 95th (m)	0.8	0.0	1.2			
Control Delay (s)	7.3	0.0	8.5			
Lane LOS	A		A			
Approach Delay (s)	7.3	0.0	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay		7.9				
Intersection Capacity Utilization		13.3%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

17: Lake Shore Blvd W

12/24/2019



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
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)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	155			113		
pX, platoon unblocked						
vC, conflicting volume				0	0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				0	0	0
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				100	100	100
cM capacity (veh/h)				1622	1023	1084
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	
Volume Total	0	0	0	0	0	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	0	0	
cSH	1700	1700	1700	1700	1700	
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						
Intersection Summary						
Average Delay				0.0		
Intersection Capacity Utilization				0.0%		ICU Level of Service
Analysis Period (min)				15		



APPENDIX G

Proxy Parking Location Correspondence

Timur Erkan

From: Felipe Vernaza
Sent: November 14, 2019 3:53 PM
To: Timur Erkan
Cc: Tony Chiu
Subject: FW: 2157 Lakeshore

Hey Timur,

See below. Please coordinate with Ken Lo for the parking survey. Weekend and typical weekday. Check when is the soonest this can be done.

Felipe

Felipe Vernaza, P.Eng.

Senior Project Engineer

LEA Consulting Ltd.



T: 905-470-0015 ext. 288 E: fvernaza@lea.ca W: www.LEA.ca

From: Nissrine Bouslama [mailto:Nissrine.Bouslama@toronto.ca]

Sent: Thursday, November 14, 2019 3:50 PM

To: Felipe Vernaza <fvernaza@lea.ca>

Subject: RE: 2157 Lakeshore

Hi Felipe,

Thank you for the information. The proxy survey location and hours are acceptable to justify the proposed parking deficiency.

Thanks,

Nissrine

From: Felipe Vernaza [mailto:fvernaza@lea.ca]

Sent: November 12, 2019 2:30 PM

To: Nissrine Bouslama <Nissrine.Bouslama@toronto.ca>

Cc: Timur Erkan <terkan@lea.ca>

Subject: 2157 Lakeshore

Thanks Nissrine,

No, the hotel would not have conference rooms. It would have a small restaurant component of about 157 sq. m. that would be ancillary and mostly for the guests.

I've attached the email sent to Luigi in case you don't have it.

Let me know if you have any questions.

Regards,

Felipe Vernaza, P.Eng.

Senior Project Engineer

LEA Consulting Ltd.

T: 905-470-0015 ext. 288 E: fvernaza@lea.ca W: www.LEA.ca



From: Nissrine Bouslama [<mailto:Nissrine.Bouslama@toronto.ca>]

Sent: Tuesday, November 12, 2019 1:14 PM

To: Felipe Vernaza <fvernaza@lea.ca>

Subject: RE: Transportation Services manager

Hi Felipe,

Luigi is now the manager of North York area as well. He can be reached at (416) 395-7458.

I have been assigned the application at 2157 Lake Shore Avenue West. I am unfamiliar with the proposal, would the hotel have conference rooms? If that is the case, then an overnight survey would not be sufficient.

Best regards,

Nissrine Bouslama

Transportation Planning Technologist

Transportation Services

Etobicoke York District

City of Toronto

399 The West Mall

Toronto, Ontario M9C 2Y2

Telephone: 416-394-8417

E-mail: nissrine.bouslama@toronto.ca

From: Felipe Vernaza [<mailto:fvernaza@lea.ca>]

Sent: November 12, 2019 1:06 PM

To: Nissrine Bouslama <Nissrine.Bouslama@toronto.ca>

Subject: Transportation Services manager

Hi Nissrine,

Hope this email finds you well despite the snow lol.

Quick question – is Luigi now the manager for North York Transportation Services? If not, do you know who the manager would be?

Felipe



APPENDIX H

Proxy Parking Survey Results

Hotel X, 111 Princes' Boulevard - Parking Demand Summary

Project No.: 19270.200

Supply	Surface		B1			B2
	Valet	Unmarked	Reserved - Sports Club	Hotel	Reserved	
Total Spaces	7	6	62	84	8	259
Obstructed	0	0	0	0	0	19
Available	7	6	62	84	8	240

Surveyor: Joel Xiong
Survey Date: Wednesday November 20, 2019

Supply	Surface		B1			B2
	Valet	Unmarked	Reserved - Sports Club	Hotel	Reserved	
2:00	1	1	8	50	1	45
2:30	1	1	8	50	1	45
3:00	1	1	8	50	1	46
3:30	1	1	8	50	1	46
4:00	1	1	8	50	1	46
4:30	1	1	8	50	1	46
5:00	1	1	8	49	1	46
5:30	1	1	8	50	1	46
6:00	2	1	12	51	1	53
6:30	4	1	14	52	1	55
7:00	4	1	17	54	1	57

Surveyor: Joel Xiong
Survey Date: Saturday November 23, 2019

Supply	Surface		B1			B2
	Valet	Unmarked	Reserved - Sports Club	Hotel	Reserved	
2:00	2	2	4	36	1	29
2:30	2	2	4	36	1	29
3:00	2	2				
3:30	2	2				
4:00	2	2				
4:30	2	2				
5:00	2	2				
5:30	2	1				
6:00	2	1				
6:30	2	2				
7:00	2	2				

IN	OUT	difference
0	0	0
1	0	1
0	0	0
0	0	0
5	2	3
3	1	2
6	4	2
2	1	1

Surveyor: Joel Xiong
Survey Date: Thursday November 28, 2019

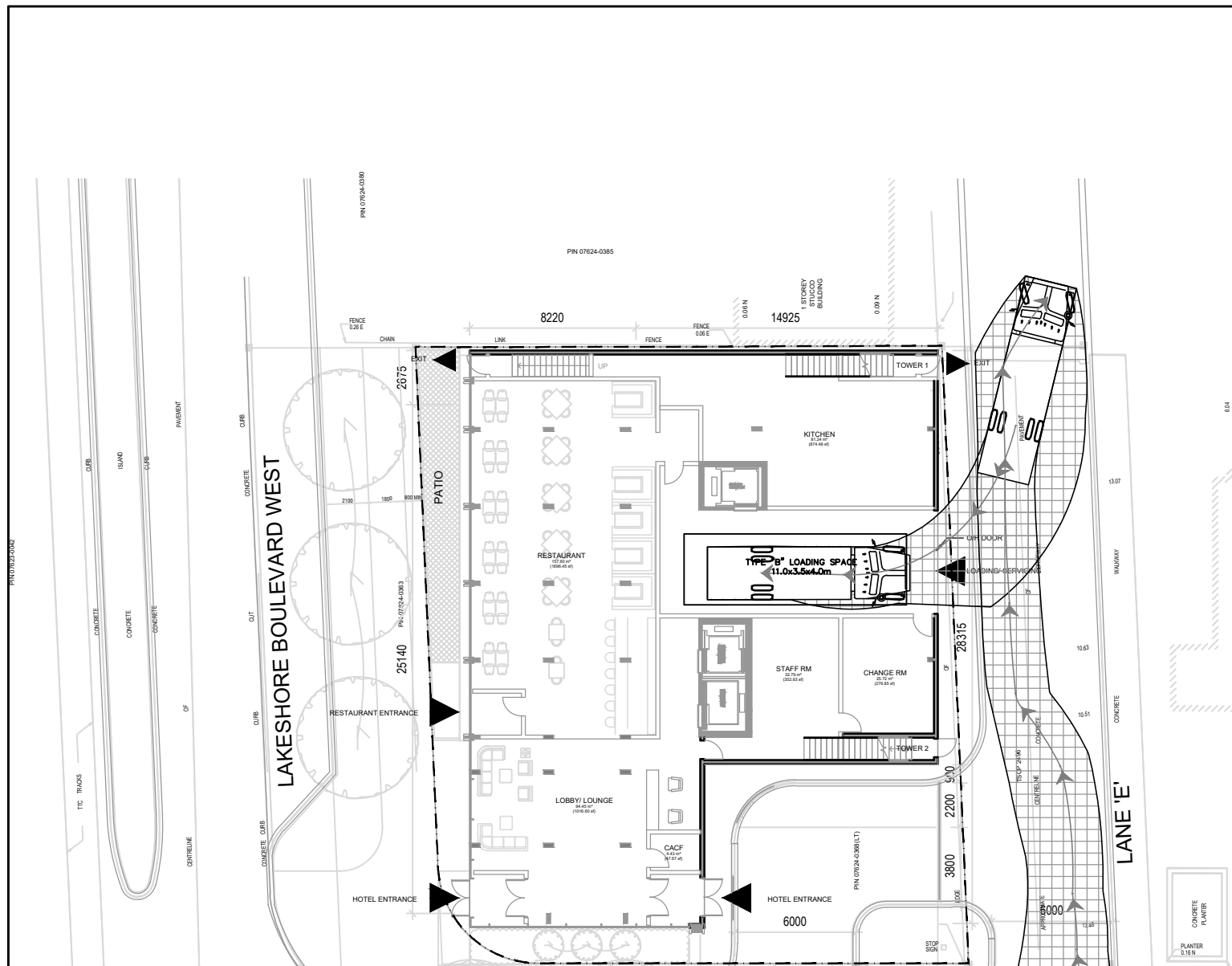
Supply	Surface		B1	B2	Total
	Valet	Unmarked	Reserved		
2:00	2	2	54		47
2:30	2	2	55		47
3:00	2	2			
3:30	2	2			
4:00	2	2			
4:30	2	2			
5:00	2	2			
5:30	0	2			
6:00	0	2			
6:30	0	4			
7:00	0	3			
7:30	0	2			
8:00	0	2			
8:30	0	2			
9:00	0	2			
9:30	1	2			
10:00	2	2			
10:30	3	3			
11:00	3	5			
11:30	3	3			
12:00	3	4			
12:30	3	5			
13:00	3	5			
13:30	3	4			
14:00	3	3			

IN	OU	difference	Total
0	0	0	105
1	0	1	106
0	0	0	107
0	0	0	107
2	1	1	107
7	4	3	106
7	1	6	109
11	3	8	117
6	1	5	124
6	3	3	128
6	4	2	131
2	2	0	133
6	4	2	133
9	4	5	136
5	1	4	142
4	1	3	148
5	7	-2	153
5	6	-1	149
6	6	0	149
3	2	1	150
3	1	2	151
1	1	0	151

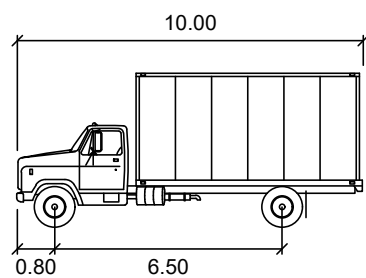


APPENDIX I

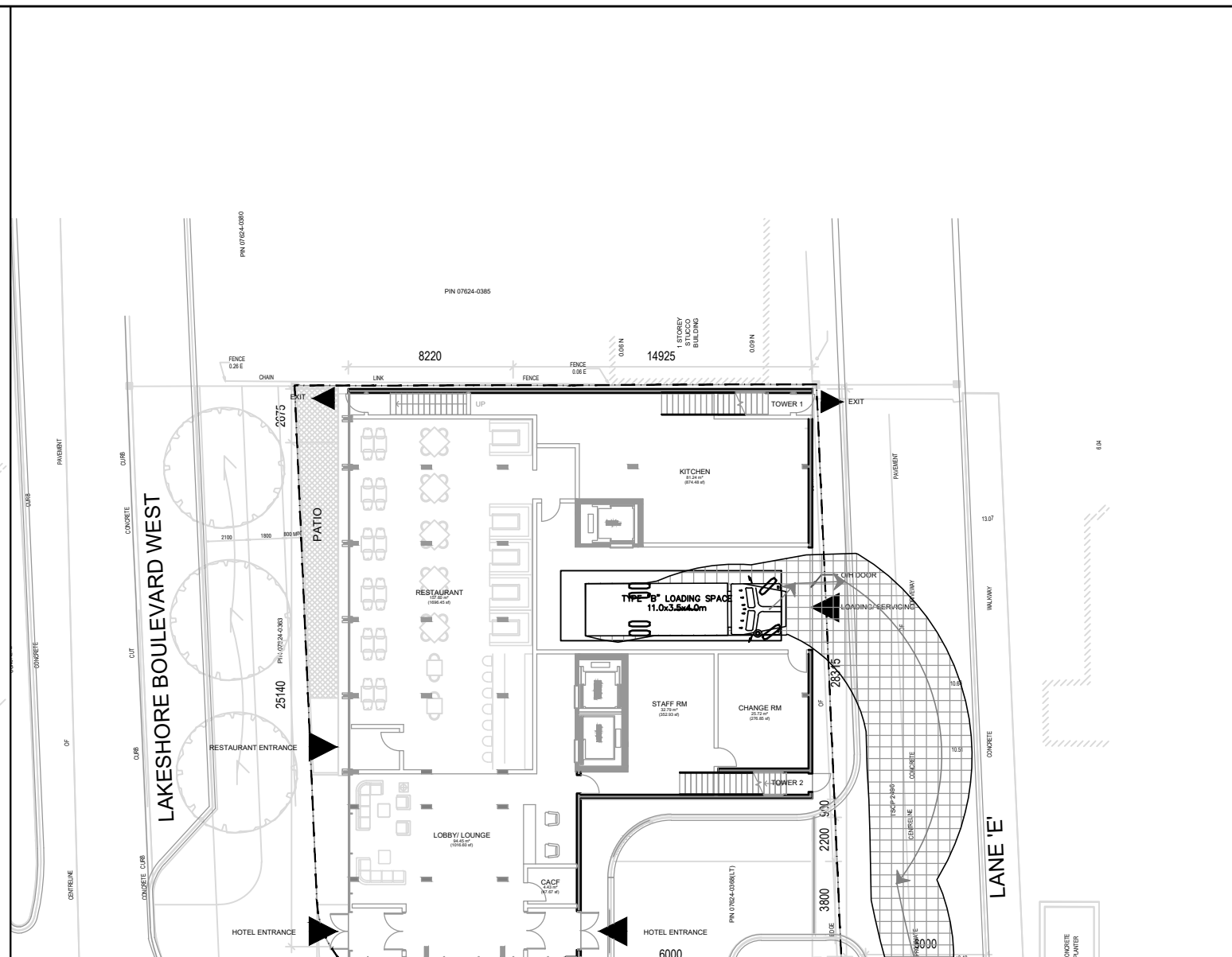
Loading Swept Path Diagrams



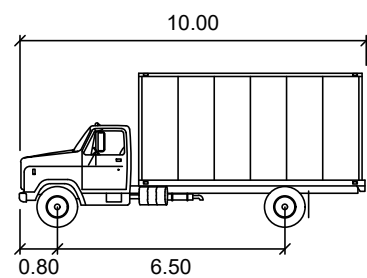
REVERSE IN



MSU	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.1

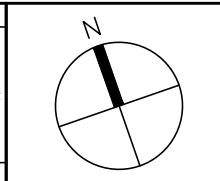


FORWARD OUT



MSU	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.1

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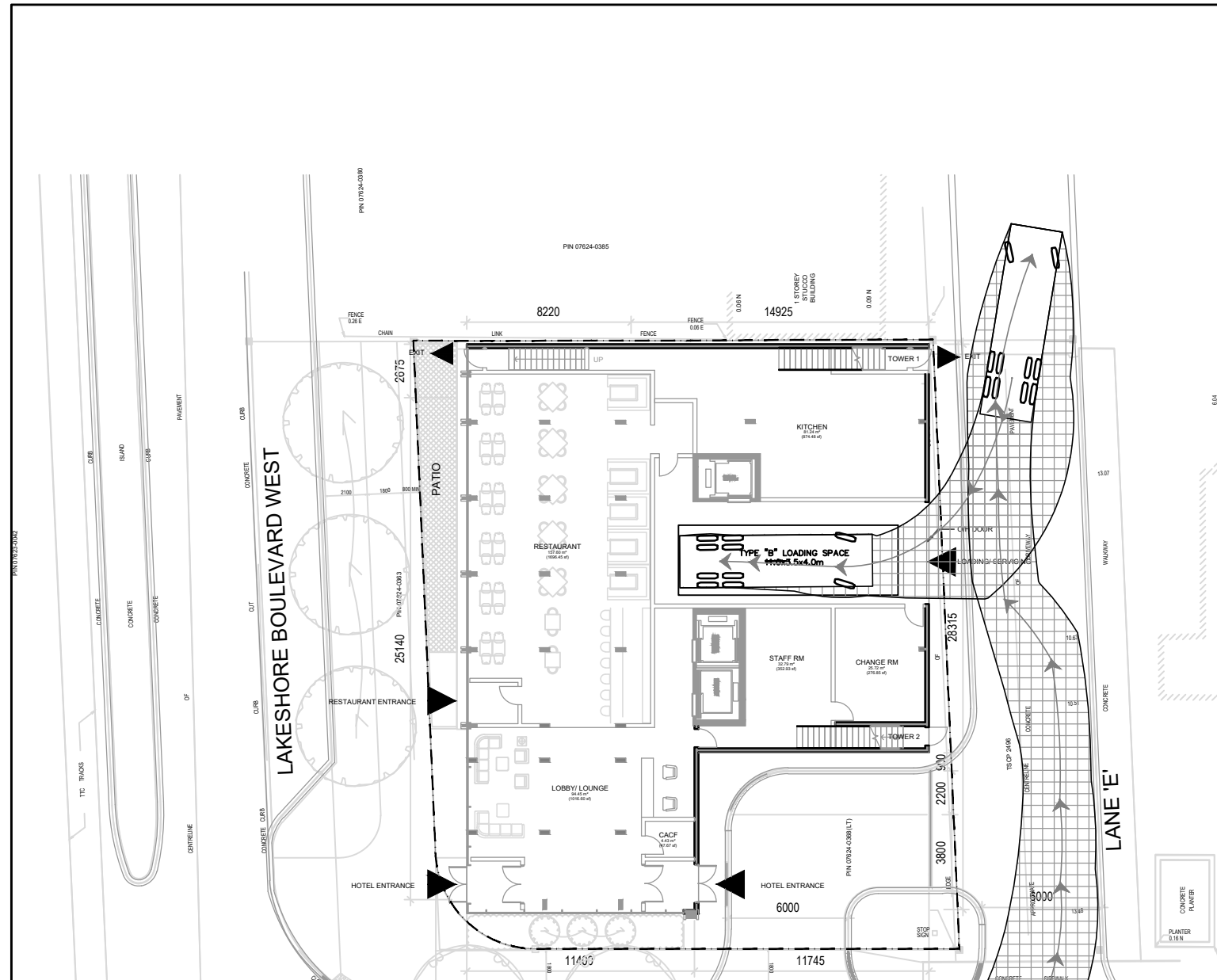
Project No.
19270-230
 Date
JAN. 31, 2019

2157 LAKESHORE BLVD.W
 TORONTO ONTARIO

1:300

GROUND FLOOR – LOADING REVIEW
DELIVERY TRUCK (MSU)
ENTRY AND EXIT PATH

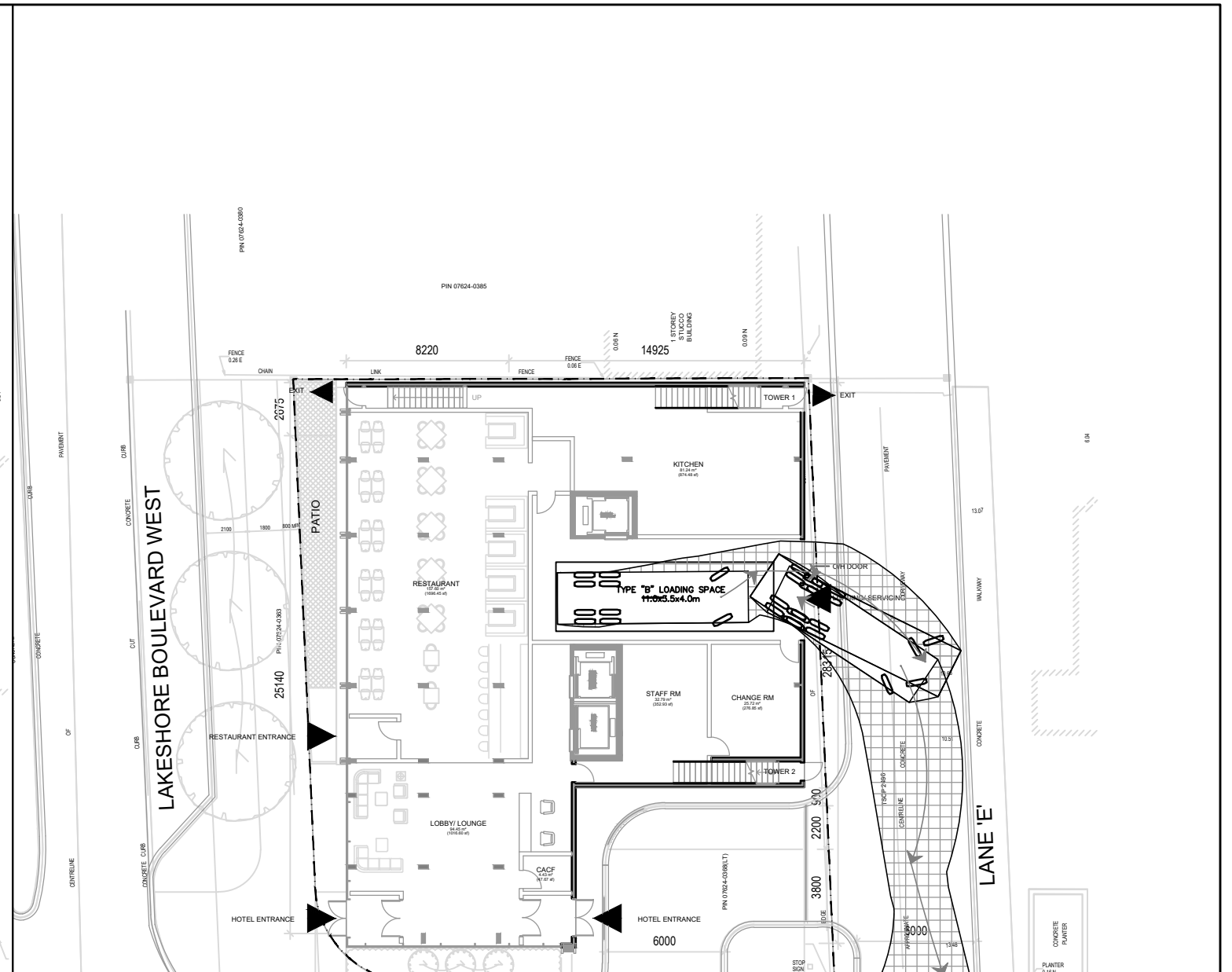
Drawing No.
001



REVERSE IN

Garbage Miller meters

Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 30.0°

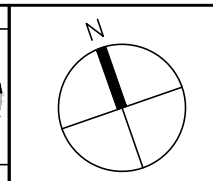


FORWARD OUT

Garbage Miller meters

Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 30.0°

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Project No.
19270-230

Date
JAN. 31, 2019

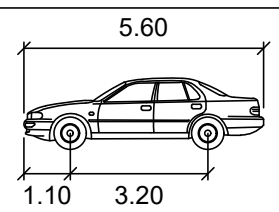
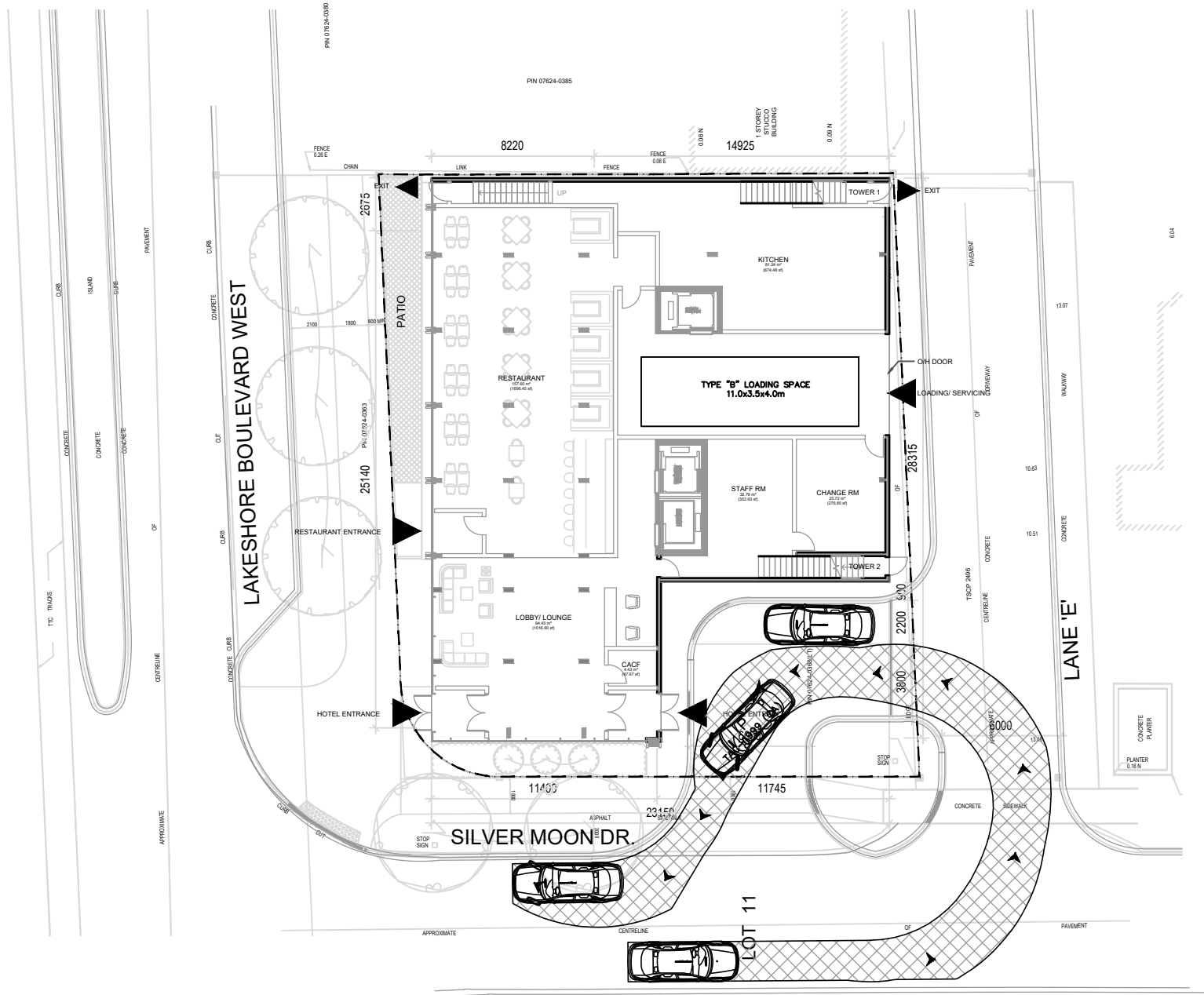
2157 LAKESHORE BLVD.W
TORONTO ONTARIO

1:300

GROUND FLOOR – LOADING REVIEW
PRIVATE GARBAGE TRUCK
ENTRY AND EXIT PATH

Drawing No.
002

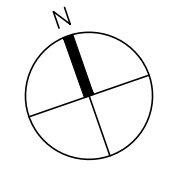
(FORMERLY THE TORONTO-HAMILTON HIGHWAY)
 (BY THE TORONTO AND DISTRICT OF YORK)
 (TRANSFERRED TO MUNICIPAL AUTHORITY BY PART 17 OF THE TORONTO AND DISTRICT OF YORK ACT (R.S.O. 1990, CHAPTER 17)
 ASSUMED BY BY-LAW N° 58-80 (UNREGISTERED)
 PIN 07252-042



P

	meters
Width	: 2.00
Track	: 2.00
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

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Project No.
19270-230

Date
 JAN. 31, 2019

2157 LAKESHORE BLVD.W
 TORONTO ONTARIO

1:300

GROUND FLOOR – LOADING REVIEW
PASSENGER VEHICLE
ENTRY AND EXIT PATH

Drawing No.
003

