



MMM GROUP



Humber Bay Shores Landowners Group

## **Humber Bay Shores Mixed-Use Developments Updated Traffic Impact Study**

**Prepared by:**

**AECOM**

300 – 300 Town Centre Boulevard      905 477 8400    tel  
Markham, ON, Canada L3R 5Z6      905 477 1456    fax  
[www.aecom.com](http://www.aecom.com)

**MMM GROUP LIMITED**

100 Commerce Valley Drive West      905 882 1100    tel  
Thornhill, ON, Canada L3T 0A1      905 882 0055    fax  
[www.mmm.ca](http://www.mmm.ca)

**Date:**

August, 2014

## Statement of Qualifications and Limitations

The attached Report (the “Report”) has been prepared by AECOM Canada Ltd. (“Consultant”) for the benefit of the client (“Client”) in accordance with the agreement between Consultant and Client, including the scope of work detailed therein (the “Agreement”).

The information, data, recommendations and conclusions contained in the Report (collectively, the “Information”):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the “Limitations”);
- represents Consultant’s professional judgement in light of the Limitations and industry standards for the preparation of similar reports;
- may be based on information provided to Consultant which has not been independently verified;
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
- must be read as a whole and sections thereof should not be read out of such context;
- was prepared for the specific purposes described in the Report and the Agreement; and
- in the case of subsurface, environmental or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time.

Consultant shall be entitled to rely upon the accuracy and completeness of information that was provided to it and has no obligation to update such information. Consultant accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of subsurface, environmental or geotechnical conditions, is not responsible for any variability in such conditions, geographically or over time.

Consultant agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but Consultant makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information or any part thereof.

Without in any way limiting the generality of the foregoing, any estimates or opinions regarding probable construction costs or construction schedule provided by Consultant represent Consultant’s professional judgement in light of its experience and the knowledge and information available to it at the time of preparation. Since Consultant has no control over market or economic conditions, prices for construction labour, equipment or materials or bidding procedures, Consultant, its directors, officers and employees are not able to, nor do they, make any representations, warranties or guarantees whatsoever, whether express or implied, with respect to such estimates or opinions, or their variance from actual construction costs or schedules, and accept no responsibility for any loss or damage arising therefrom or in any way related thereto. Persons relying on such estimates or opinions do so at their own risk.

Except (1) as agreed to in writing by Consultant and Client; (2) as required by-law; or (3) to the extent used by governmental reviewing agencies for the purpose of obtaining permits or approvals, the Report and the Information may be used and relied upon only by Client.

Consultant accepts no responsibility, and denies any liability whatsoever, to parties other than Client who may obtain access to the Report or the Information for any injury, loss or damage suffered by such parties arising from their use of, reliance upon, or decisions or actions based on the Report or any of the Information (“improper use of the Report”), except to the extent those parties have obtained the prior written consent of Consultant to use and rely upon the Report and the Information. Any injury, loss or damages arising from improper use of the Report shall be borne by the party making such use.

This Statement of Qualifications and Limitations is attached to and forms part of the Report and any use of the Report is subject to the terms hereof.



AECOM  
300 – 300 Town Centre Boulevard  
Markham, ON, Canada L3R 5Z6  
www.aecom.com

905 477 8400 tel  
905 477 1456 fax



MMM GROUP  
100 Commerce Valley Drive West  
Thornhill, ON, Canada L3R 0A1  
www.mmm.ca

905 882 1100 tel  
905 882 0055 fax

August 20, 2014

Mr. Gabe DiMartino, MCIP, RPP  
c/o Humber Bay Shores Landowners Group  
200 King Street West, Suite 1602  
Toronto, ON  
M5H 3TA

Dear Mr. DiMartino:

**Project No: 60119908 / 16-08091**

**Regarding: Humber Bay Shores Mixed-Use Developments Updated Traffic Impact Study**

Please find attached a copy of the Updated Traffic Study final report for the Humber Bay Shores Mixed-Use Development. This report documents the updated study findings, conclusions, and recommendations related to the updated development statistics for the Humber Bay Shores Precinct Plan.

Sincerely,  
**AECOM Canada Ltd.**

Sheri Harmsworth, P.Eng.  
Senior Project Manager  
Transportation Planning

**MMM Group Limited**

C. Alan Mihalj, P.Eng.  
Partner  
Transportation Planning

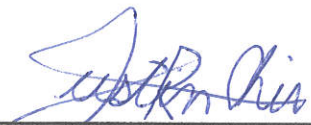
JC:mm  
Encl.

## Revision Log

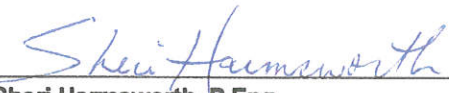
Revision #	Revised By	Date	Issue / Revision Description
1	JPPA		Updated to address City comments and revised lane configurations according to April 19 communication and to update assessment to reflect updated Precinct Plan information of June 2011
2	JPPA	September 2012	Updated to address C. Alan Mihalj's comments sent on August 15, 2012
3	JC	October 2013	Updated to address change in unit counts
4	JC	July 2014	Updated to address change in unit counts and trip rates

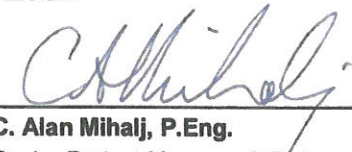
## TEAM Signatures

Report Prepared By:

  
 \_\_\_\_\_  
**Justin Chin, P.Eng.**  
 Transportation Engineer  
 AECOM

Report Reviewed By:

  
 \_\_\_\_\_  
**Sheri Hamsworth, P.Eng.**  
 Senior Project Manager, Transportation Planning  
 AECOM

  
 \_\_\_\_\_  
**C. Alan Mihalj, P.Eng.**  
 Senior Project Manager & Partner  
 MMM Group Limited

# Table of Contents

## Statement of Qualifications and Limitations

### Letter of Transmittal

	page
<b>1. Introduction and Background .....</b>	<b>1</b>
1.1 Study Area and Site Location .....	2
1.2 Study Area Intersections .....	3
<b>2. Existing Conditions .....</b>	<b>4</b>
2.1 Existing Traffic Volumes.....	4
2.2 Intersection Operations, Existing Conditions .....	4
<b>3. Future Background Conditions.....</b>	<b>11</b>
3.1 Future Background Developments .....	11
3.2 Trip Generation Rates.....	11
3.3 Trip Distribution .....	12
3.4 Future Background Developments Site Traffic.....	12
3.5 Future Background Traffic, Interim Scenario .....	14
3.6 Future Background Traffic Operations, Interim Scenario.....	14
<b>4. Proposed Mixed-Use Developments and Future Traffic Conditions .....</b>	<b>24</b>
4.1 Humber Bay Shores Developments, Interim Precinct Plan .....	24
4.2 Humber Bay Shores Developments, Interim Traffic Conditions.....	24
4.2.1 Humber Bay Shores Developments Interim Total Traffic.....	24
4.2.2 Left Turn Lane Warrant Analysis, Interim Scenario .....	31
4.2.3 Total Traffic Operations, Interim Scenario.....	31
4.2.4 Internal Site Intersection Operations, Interim Scenario.....	37
4.3 Humber Bay Shores Developments, Ultimate Precinct Plan .....	38
4.4 Humber Bay Shores Developments, Ultimate Traffic Conditions.....	40
4.4.1 Humber Bay Shores Developments Ultimate Total Traffic.....	40
4.4.2 Left Turn Lane Warrant Analysis, Ultimate Scenario .....	41
4.4.3 Total Traffic Operations, Ultimate Scenario.....	45
4.4.4 Internal Site Intersection Operations, Ultimate Scenario.....	51
4.5 Queuing Lengths Comparison.....	55
4.5.1 Impact of Legion Road Connection on the Study Area .....	56
<b>5. Summary of Conclusions .....</b>	<b>57</b>

**List of Figures**

Figure 1. Study Area and Site Location ..... 2

Figure 2. Existing Traffic Volumes, AM and PM Peak Hours..... 6

Figure 3. Existing Intersection Lane Configurations ..... 7

Figure 4. Future Background Developments Site Traffic, Interim Scenario..... 15

Figure 5. Future Background Developments Site Traffic, Ultimate Scenario ..... 16

Figure 6. Future Background Total Traffic Volumes Interim Scenario..... 17

Figure 7. Future Background Intersection Lane Configurations..... 18

Figure 8. Humber Bay Shores Developments, Ownership Plan ..... 26

Figure 9. Humber Bay Shores Mixed-Use Developments, Proposed Interim Precinct Plan ..... 27

Figure 10. Humber Bay Shores Developments Interim Site Total Traffic Volumes ..... 29

Figure 11. Future Total Volumes, Interim Scenario..... 30

Figure 12. Interim Intersection Lane Configurations ..... 32

Figure 13. Humber Bay Shores Developments, Ultimate Precinct Plan..... 39

Figure 14. Humber Bay Shores Developments Ultimate Site Total Traffic Volumes ..... 42

Figure 15. Pass-By Traffic, Ultimate Scenario ..... 43

Figure 16. Future Total Traffic Volumes, Ultimate Scenario ..... 44

Figure 17. Ultimate Intersection Lane Configurations ..... 46

Figure 18. Internal Traffic Volumes, Ultimate Scenario ..... 53

**List of Tables**

Table 1. Study Area Intersections ..... 3

Table 2. Intersection Operations, AM Peak Hour, Existing Conditions ..... 8

Table 3. Intersection Operations, PM Peak Hour, Existing Conditions ..... 9

Table 4. Background Developments Assumptions (City Planning July 2008) ..... 11

Table 5. Trip Generation Rates, Interim and Ultimate Traffic Scenarios ..... 12

Table 6. Generated Trips from Background Developments (Interim) ..... 13

Table 7. Generated Trips from Background Developments (Ultimate) ..... 13

Table 8. Traffic Operations Signalized Intersections AM Peak Hour, Future Background..... 19

Table 9. Traffic Operations Signalized Intersections PM Peak Hour, Future Background..... 20

Table 10. Traffic Operations Unsignalized Intersections AM Peak Hour, Future Background ..... 22

Table 11. Traffic Operations Unsignalized Intersections PM Peak Hour, Future Background ..... 23

Table 12. Trip Generation, Interim Precinct Plan..... 28

Table 13. Future Total Traffic Operations Signalized Intersections, AM Peak Hour, Interim Scenario ..... 33

Table 14. Future Total Traffic Operations Signalized Intersections, PM Peak Hour, Interim Scenario ..... 34

Table 15. Future Total Traffic Operations Unsignalized Intersections, AM Peak Hour, Interim Scenario..... 36

Table 16. Future Total Traffic Operations Unsignalized Intersections, PM Peak Hour, Interim Scenario..... 36

Table 17. Trip Generation, Ultimate Precinct Plan..... 40

Table 18. Future Total Traffic Operations Signalized Intersections, AM Peak Hour, Ultimate Scenario ..... 47

Table 19. Future Total Traffic Operations Signalized Intersections, PM Peak Hour, Ultimate Scenario ..... 48

Table 20. Future Total Traffic Operations Unsignalized Intersections, AM Peak Hour, Ultimate Scenario ..... 50

Table 21. Future Total Traffic Operations Unsignalized Intersections, PM Peak Hour, Ultimate Scenario ..... 51

Table 22. Future Total Internal Site Traffic Operations, AM Peak Hour, Ultimate Scenario ..... 52

Table 23. Future Total Internal Site Traffic Operations, PM Peak Hour, Ultimate Scenario ..... 54

Table 24. Queuing Lengths Estimates Comparison..... 55

Table 25. Potential Traffic Diversions With Legion Road Connection..... 56

## Appendices

- Appendix A. Existing Intersection Turning Movement Counts
- Appendix B. Level of Service Definitions
- Appendix C. Intersection Capacity Analysis, Existing Conditions
- Appendix D. List of Future Background Developments and Locations
- Appendix E. Trip Distribution Sheets
- Appendix F. Intersection Capacity and Queuing Analysis, Future Background Total Traffic Interim Scenario
- Appendix G. Left Turn Lane Warrant Analysis, Interim Scenario
- Appendix H. Intersection Capacity and Queuing Analysis, Future Total Traffic Interim Scenario
- Appendix I. Left Turn Lane Warrant Analysis, Ultimate Traffic Scenario
- Appendix J. Intersection Capacity and Queuing Analysis, Future Total Traffic Ultimate Scenario
- Appendix K. Intersection Capacity Analysis Internal Site, Future Total Traffic Ultimate Scenario



# 1. Introduction and Background

AECOM was retained by MMM Group on behalf of the Humber Bay Shores Landowners Group to conduct a traffic impact study to establish the traffic impacts on the adjacent roadways from the proposed Humber Bay Shores Precinct Plan mixed-use developments to be located at the southeast quadrant of the Lake Shore Boulevard and Park Lawn Road/Marine Parade Drive intersection. A number of traffic impact studies have been conducted in the study area, in consultation with the City of Toronto Planning Department, which established the traffic impact potential of any proposed background developments. The Humber Bay Shores mixed-use developments were documented as Motel Strip in the previous traffic studies conducted in the proximity of the Lake Shore Boulevard and Park Lawn Road intersection. In addition, Lea Consulting Ltd. and MMM Group previously completed traffic impact studies for the proposed developments to be located on Park Lawn Road and Lake Shore Boulevard West.

The City of Toronto directed all consultants working on traffic impact studies in the proximity of the Lake Shore Boulevard and Park Lawn Road intersection to be consistent with the following items:

1. Future background development assumptions;
2. Trips generation rates;
3. General traffic distribution;
4. Future roadway configuration; and
5. Traffic operation analysis parameters.

The City of Toronto has initiated a Class Environmental Assessment (EA) for the Legion Road Extension and resizing of the Stormwater Management (SWM) facility located north of Lake Shore Boulevard and west of Park Lawn Road. AECOM has worked on this Class EA project and have included both the options with and without the Legion Road connection (between existing Legion Road North and South) in the traffic analyses. The City of Toronto provided AECOM with an updated list of potential developments in the study area network dated, July 2008, which was incorporated in the traffic analyses.

The Legion Road Extension EA project, conducted by AECOM, confirmed the need for an underpass connecting Legion Road North and South. The previous traffic reports identified the requirement for a southbound double left turn lane at the Lake Shore Boulevard and Park Lawn Road intersection without the Legion Road connection, but the Class EA traffic report indicated the need for a southbound double left turn lane at this intersection with the Legion Road connection. However, the traffic impact studies conducted by MMM Group and Lea Consulting Ltd. assumed a worse-case scenario, without the Legion Road extension. Therefore, this traffic report adopts the same assumptions thereby resulting in a conservative approach to assessing the traffic impacts resulting from the Humber Bay Shores proposed developments.

Another study titled “Mimico 20/20 Land Use Study – Transportation”<sup>1</sup> was completed by HDR Corporation on November 2012 with the aim of identifying transportation issues related to the growth and revitalization of the Mimico Community. Similar to the Humber Bay Shores traffic impact study, the Mimico 20/20 report analyzes existing traffic conditions and future traffic conditions after the introduction of proposed developments in the study area.

AECOM and MMM Group have prepared this updated Traffic Impact Study Report, which supersedes the original November 2009 and updated October 2013 Traffic Studies, accounts for the updated development statistics for the Precinct Plan as of June 2013, and also accounts for the City of Toronto review comments indicated during a project meeting held on November 20, 2013. These comments include modified lane configurations and assumptions for the traffic analysis in order to be consistent with the approved Mimico 20/20 study. For the purpose of this study, Park Lawn Road will be defined as North-South, while Lake Shore Boulevard West and Marine Parade Drive (except at the Park Lawn intersection) will be defined as East-West.

---

<sup>1</sup> *Mimico 20/20 Land Use Study – Transportation, HDR Corporation, November 2012*



### 1.1 Study Area and Site Location

The study area includes Marine Parade Drive to the south, The Queensway to the north, Park Lawn Road and Legion Road South to the west, and Palace Pier Court to the east. Currently, Park Lawn Road and The Queensway have cross-sections of basically four lanes with auxiliary turning lanes at most of the intersections. Legion Road South and Palace Pier Court have two lane cross-sections. Lake Shore Boulevard West has a two lane cross-section east of the Gardiner Expressway On-Off ramp and forms T-intersections with Marine Parade Drive and Palace Pier Court. Marine Parade Drive is a four lane roadway to the south of the Lake Shore Boulevard/Park Lawn Road intersection and runs east-west to the south of the proposed developments. Marine Parade Drive reduces to a two lane cross-section approximately 230 metres easterly of the existing driveway onto this roadway. The posted speed limits of the study area roadways vary from 40 to 60 km/h. The study area network and site location is shown in **Figure 1**.



**Figure 1. Study Area and Site Location**

## 1.2 Study Area Intersections

The study area consists of signalized and unsignalized intersections as presented in **Table 1**.

**Table 1. Study Area Intersections**

No.	Intersections	Traffic Control Type
1	The Queensway at Park Lawn Road	Signal
2	Park Lawn Road at Gardiner Expressway WB On-ramp	Signal
3	Park Lawn Road at Gardiner Expressway EB Off-ramp	Signal
4	Park Lawn Road at Lake Shore Boulevard	Signal
5	Lake Shore Boulevard at Legion Road South	Signal
6	Lake Shore Boulevard at Mr. Christie's West Driveway	Stop
7	Lake Shore Boulevard at Mr. Christie's East Driveway	Signal
8	Lake Shore Boulevard at Proposed Development Existing Driveway	Stop
9	Lake Shore Boulevard at Gardiner Expressway On/Off-ramp – Brookers Lane	Signal
10	Lake Shore Boulevard at Marine Parade Drive	Stop
11	Lake Shore Boulevard at Palace Pier Court	Signal
12	Marine Parade Drive at Proposed Development Existing Driveway	Stop
13	Gardiner Expressway EB Off-ramp at Legion Road North	Signal

## 2. Existing Conditions

This section presents an overview of the existing conditions in the study area such as existing traffic volumes, lane configurations, and overall traffic operations.

### 2.1 Existing Traffic Volumes

The existing turning movement counts (TMC) for the weekday AM and PM peak hours for the following intersections were taken from the Legion Road Extension Class EA Study Traffic Report prepared by AECOM:

- The Queensway at Park Lawn Road;
- Park Lawn Road at Gardiner Expressway WB On-ramp; and
- Gardiner Expressway EB Off-ramp at Park Lawn Road.

The existing turning movement counts for the weekday AM and PM peak hours for the following intersections were adopted from the previously approved Mimico 20/20 study:

- Lake Shore Boulevard at Legion Road South; and
- Lake Shore Boulevard at Park Lawn Road.

MMM Group provided the existing turning movement counts of the following intersections:

- Lake Shore Boulevard at Mr. Christie's West Driveway;
- Lake Shore Boulevard at Proposed Development Existing Driveway;
- Lake Shore Boulevard at Mr. Christie's East Driveway;
- Lake Shore Boulevard at Gardiner Expressway On-Off ramp;
- Lake Shore Boulevard at Marine Parade Drive;
- Lake Shore Boulevard at Palace Pier Court; and
- Marine Parade Drive at Proposed Developments Existing Driveway.

In the Mimico 20/20 study, the traffic data for the intersection of Park Lawn Road at Lake Shore Boulevard was derived from an average of several sets of TMC data. This was due to significant fluctuations in traffic volumes at this intersection caused by the variable operations of the Gardiner Expressway.

The resulting TMCs are shown in **Figure 2** and detailed TMC count sheets (which also identify the dates of the TMCs) are provided in **Appendix A**.

### 2.2 Intersection Operations, Existing Conditions

The traffic operations analyses conducted at all of the study area intersections used the Synchro 7.0 software package which is based on the Highway Capacity Manual (HCM) methodologies. These analyses provide a detailed assessment of traffic operations in the study area including level of service (LOS), delay and volume to capacity (V/C) ratios for each of the intersection approaches and movements. The LOS definitions for signalized and unsignalized intersections are provided in **Appendix B**.

The existing traffic volumes were analyzed using existing lane configurations as shown in **Figure 3**, as well as the existing signal timings. In order to be consistent with the previous traffic studies completed in the proximity of the

study area, traffic operational input parameters in the Synchro software, such as peak hour factor and saturation flow rates, were kept the same. The results of the capacity analyses of the study area intersections are summarized in **Tables 2 and 3**. Detailed Synchro output sheets are provided in **Appendix C**. Two reports are provided in **Appendix C**, the Synchro Timing report and the HCM report. **Tables 2 and 3** summarize the HCM measures of effectiveness, including LOS, V/C ratio, and delay.



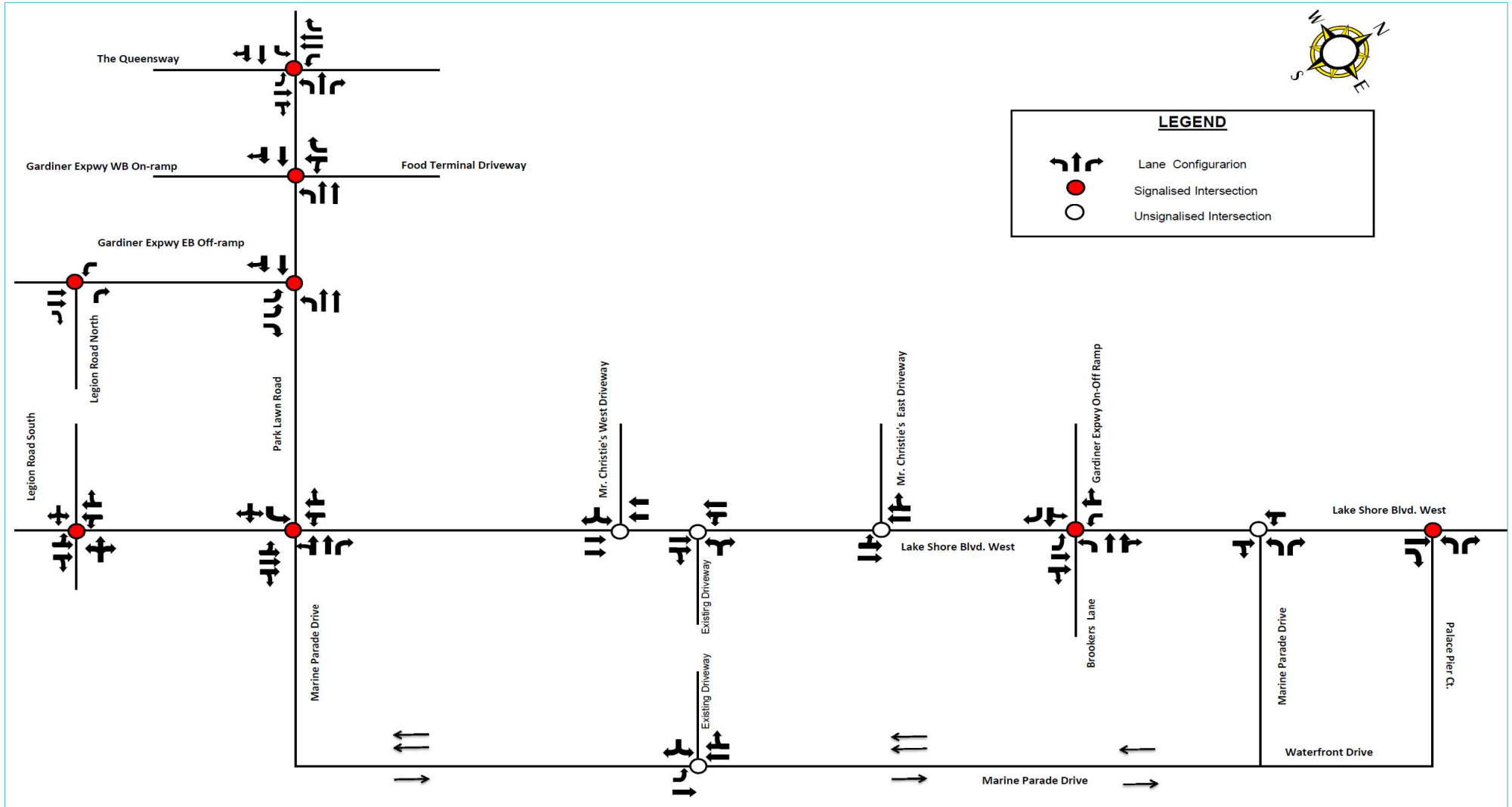


Figure 3. Existing Intersection Lane Configurations

**Table 2. Intersection Operations, AM Peak Hour, Existing Conditions**

Intersection	Average Control Delay(s) <i>(HCM-Synchro)</i>	Level of Service (v/c ratio) <i>(HCM-Synchro)</i>	Movement	Delay(s) <i>(HCM-Synchro)</i>	v/c Ratio <i>(HCM-Synchro)</i>	Level of Service <i>(HCM-Synchro)</i>	Average Queue Length (m) <i>(SimTraffic)</i>	95 <sup>th</sup> Percentile Queue Length (m) <i>(SimTraffic)</i>
<b>Signalized Intersections</b>								
The Queensway at Park Lawn Road	33.9	C(0.77)	EBL	23.6	0.41	C	24.7	48.9
			EBT-TR	40.8	0.92	D	97.6	152.6
			WBL	50.2	0.89	D	40.9	58.5
			WBT-T	10.8	0.26	B	27.3	45.1
			WBR	9.3	0.03	A	3.7	20.5
			NBL	31.5	0.45	C	20.1	36.9
			NBT	28.0	0.49	C	31.7	52.6
			NBR	32.5	0.65	C	20.1	67.7
			SBL	42.3	0.65	D	22.4	41.8
Park Lawn Road at Gardiner Expressway WB On-ramp	14.1	B(0.76)	WBL-T	36.5	0.50	D	22.5	41.6
			WBR	32.1	0.02	C	6.2	17.4
			NBL	20.8	0.86	C	46.0	70.2
			NBT-T	4.7	0.33	A	21.0	55.7
			SBT-TR	16.2	0.38	B	57.5	118.0
Park Lawn Road at Gardiner Expressway EB Off-ramp	21.7	C(0.72)	EBL-L	10.4	0.33	B	39.5	56.0
			EBR	19.0	0.73	B	13.6	36.2
			NBL	23.5	0.06	C	2.2	8.3
			NBT-T	33.0	0.71	C	40.6	66.6
			SBT-TR	25.4	0.28	C	24.5	37.6
Park Lawn Road at Lake Shore Boulevard West	85.9	<b>F(1.05)</b>	EBLT-T-TR	97.6	<b>1.27dl</b>	<b>F</b>	139.3	169.7
			WBLT-TR	18.8	0.38	B	49.6	73.2
			NBLT-T	38.8	0.65	D	19.6	42.7
			NBR	30.6	0.02	C	5.1	15.6
			SBL	110.0	<b>1.11</b>	<b>F</b>	261.9	393.1
			SBLTR	126.1	<b>1.15</b>	<b>F</b>	263.7	397.1
Legion Road South at Lake Shore Boulevard West	8.2	A(0.52)	EBLT-TR	5.8	0.51	A	236.2	300.4
			WBLT-TR	3.9	0.22	A	11.6	27.8
			NBLTR	27.9	0.15	C	18.8	48.4
			SBLTR	33.9	0.58	C	39.6	67.2
Gardiner Expressway WB Off-ramp at Lake Shore Boulevard West	9.3	A(0.54)	EBL	8.5	0.61	A	19.6	26.8
			EBT-TR	8.1	0.57	A	47.3	50.3
			WBL	-	-	-	-	-
			WBTR	17.2	0.18	B	9.1	25.1
			NBL	26.9	0.44	C	18.0	35.1
			NBT-TR	23.8	0.05	C	9.0	25.4
			SBLT	25.3	0.25	C	7.5	19.6
			SBR	0.3	0.20	A	-	-
Mr. Christie's East Driveway at Lake Shore Boulevard West	0.5	A(0.54)	EBLT-T	0.7	0.54	A	67.4	101.1
			WBT-TR	0.1	0.16	A	5.8	24.3
			SBL-R	-	-	-	-	-
Gardiner Expressway EB Off-Ramp at Legion Rd North	2.8	A(0.47)	EBT-T	3.0	0.57	A	10.9	31.8
			EBR	1.7	0.02	A	-	-
			WBL	14.2	0.28	B	5.0	14.7
			NBR	0.2	0.14	A	33.4	77.1
Palace Pier Court at Lake Shore Boulevard West	28.6	C(0.78)	EBT	29.2	<b>0.95</b>	C	79.8	138.8
			EBR	4.8	0.06	A	3.0	15.4
			NBL	35.5	0.14	D	6.5	17.0
			NBR	34.3	0.05	C	9.0	19.1



**Table 2. Intersection Operations, AM Peak Hour, Existing Conditions**

Intersection	Average Control Delay(s) (HCM-Synchro)	Level of Service (v/c ratio) (HCM-Synchro)	Movement	Delay(s) (HCM-Synchro)	v/c Ratio (HCM-Synchro)	Level of Service (HCM-Synchro)	Average Queue Length (m) (SimTraffic)	95 <sup>th</sup> Percentile Queue Length (m) (SimTraffic)
<b>Unsignalized Intersections</b>								
Mr. Christie's West Driveway at Lake Shore Boulevard West			EBT-T	0.0	0.51	-	92.3	118.6
			WBT-T	0.0	0.15	-	0.7	4.6
			SBLR	12.0	0.01	B	1.6	7.0
Lake Shore Boulevard West at Existing Driveway			EBT-TR	0.0	0.68	-	12.7	23.3
			WBLT-T	0.4	0.20	A	1.3	6.4
			NBLR	46.0	0.04	E	1.3	6.6
Marine Parade Drive at Existing Driveway			EBL	7.6	0.00	A	-	-
			EBT	0.0	0.03	-	-	-
			WBT-TR	0.0	0.07	-	-	-
			SBLR	0.0	0.00	A	-	-
Lake Shore Boulevard West at Marine Parade Drive (East)			EBTR	0.0	0.74	-	3.8	16.1
			WBLT	0.0	0.0	-	-	-
			NBL	29.6	0.28	D	4.3	12.2
			NBR	-	-	-	10.4	22.3

Notes: EBL= eastbound left, NBT= northbound through, WBLTR= westbound shared left-through-right, EBL-R, separate eastbound left-right, dl = defacto left turning lane.

**Table 3. Intersection Operations, PM Peak Hour, Existing Conditions**

Intersection	Average Control Delay(s) (HCM-Synchro)	Level of Service (v/c ratio) (HCM-Synchro)	Movement	Delay(s) (HCM-Synchro)	v/c Ratio (HCM-Synchro)	Level of Service (HCM-Synchro)	Average Queue Length (m) (SimTraffic)	95 <sup>th</sup> Percentile Queue Length (m) (SimTraffic)
<b>Signalized Intersections</b>								
The Queensway at Park Lawn Road	29.8	C(0.83)	EBL	62.9	0.88	E	118.9	171.2
			EBT-TR	26.8	0.60	C	100.1	186.0
			WBL	24.9	0.80	C	127.3	141.5
			WBT-T	10.5	0.43	B	293.1	629.9
			WBR	8.0	0.06	A	13.4	40.5
			NBL	42.9	0.58	D	22.1	36.0
			NBT	43.0	0.74	D	45.5	72.5
			NBR	33.6	0.36	C	-	-
			SBL	51.7	0.55	D	10.0	17.7
Park Lawn Road at Gardiner Expressway WB On-ramp	6.6	A(0.55)	WBL-T	33.4	0.13	C	3.1	14.9
			WBR	32.6	0.01	C	2.8	9.2
			NBL	6.5	0.63	A	25.1	40.6
			NBT-T	3.2	0.33	A	12.6	27.9
			SBT-TR	9.1	0.39	A	33.0	81.2
Park Lawn Road at Gardiner Expressway EB Off-ramp	20.1	C(0.55)	EBL-L	11.5	0.29	B	34.9	54.5
			EBR	15.8	0.54	B	11.6	28.3
			NBL	23.8	0.20	C	14.9	33.3
			NBT-T	27.2	0.56	C	39.3	57.1
			SBT-TR	24.9	0.41	C	30.2	47.4
Park Lawn Road at Lake Shore Boulevard West	46.5	D(0.87)	EBLT-T-TR	18.7	<b>2.40dl</b>	B	139.2	140.0
			WBLT-TR	27.7	0.84	C	63.0	85.9
			NBLT-T	34.4	0.35	C	10.6	19.3
			NBR	32.3	0.01	C	1.4	4.9
			SBL	110.9	<b>1.13</b>	F	211.9	404.3
SBLTR	70.1	<b>0.99</b>	E	222.4	411.5			

**Table 3. Intersection Operations, PM Peak Hour, Existing Conditions**

Intersection	Average Control Delay(s)	Level of Service (v/c ratio)	Movement	Delay(s)	v/c Ratio	Level of Service	Average Queue Length (m)	95 <sup>th</sup> Percentile Queue Length (m)
	(HCM-Synchro)	(HCM-Synchro)		(HCM-Synchro)	(HCM-Synchro)		(HCM-Synchro)	(SimTraffic)
Legion Road South at Lake Shore Boulevard West	4.2	A(0.45)	EBLT-TR	2.7	0.28	A	32.4	80.5
			WBLT-TR	3.6	0.48	A	43.7	81.8
			NBLTR	28.1	0.04	C	4.9	15.6
			SBLTR	29.2	0.21	C	5.9	13.8
Gardiner Expressway WB Off-ramp at Lake Shore Boulevard West	16.1	B(0.46)	EBL	7.0	0.26	A	14.0	26.7
			EBT-TR	8.0	0.42	A	42.1	56.6
			WBL	13.8	0.01	B	-	-
			WBTR	14.8	0.17	B	16.4	29.7
			NBL	20.3	0.19	C	7.1	15.3
			NBT-TR	19.0	0.01	B	3.5	9.4
			SBLT	24.2	0.56	C	28.8	54.9
			SBR	24.0	0.56	C	-	-
Mr. Christie's East Driveway at Lake Shore Boulevard West	0.2	A(0.31)	EBT-T	0.2	0.31	A	6.7	24.7
			WBT-TR	0.2	0.29	A	6.1	25.8
			SBL-R	-	-	-	-	-
Gardiner Expressway EB Off-Ramp at Legion Rd North	4.3	A(0.46)	EBT-T	4.0	0.48	A	84.6	375.6
			EBR	3.0	0.10	A	-	-
			WBL	12.4	0.39	B	12.0	21.7
			NBR	0.1	0.06	A	2.3	11.6
Palace Pier Court at Lake Shore Boulevard West	9.5	A(0.31)	EBT	7.6	0.37	A	25.9	52.4
			EBR	5.9	0.13	A	9.6	30.2
			NBL	31.7	0.11	C	4.3	13.6
			NBR	30.7	0.02	C	2.4	7.3
<b>Unsignalized Intersections</b>								
Mr. Christie's West Driveway at Lake Shore Boulevard West			EBT-T	0.0	0.30	-	-	-
			WBT-T	0.0	0.30	-	-	-
			SBLR	20.5	0.08	C	6.9	15.4
Lake Shore Boulevard West at Existing Driveway			EBT-TR	0.0	0.20	-	-	-
			WBLT-T	0.1	0.40	A	-	-
			NBLR	18.7	0.02	C	1.3	6.6
Marine Parade Drive at Existing Driveway			EBL	7.5	0.00	A	-	-
			EBT	0.0	0.07	-	-	-
			WBT-TR	0.0	0.05	-	-	-
			SBLR	9.8	0.01	A	0.6	3.9
Lake Shore Boulevard West at Marine Parade Drive (East)			EBTR	0.0	0.42	-	-	-
			WBLT	0.2	0.00	A	-	-
			NBL	14.4	0.09	B	4.3	10.5
			NBR	-	-	-	4.3	9.6

Notes: EBL= eastbound left, NBT= northbound through, WBLTR= westbound shared left-through-right, EBL-R, separate eastbound left-right, dl = defacto left turning lane

Tables 2 and 3 indicate that all the signalized intersections in the study area are operating at an overall LOS “D” or better with V/C ratios of 0.87 or better during both the AM and PM peak hours with the exception of the Lake Shore Boulevard/Park Lawn Road intersection which operates with a LOS “F” and V/C ratio of 1.05 during the AM peak hour. Most of the individual movements are operating at LOS “D” or better with V/C ratios of 0.92 or better with the following exceptions where LOS “E” or worse is experienced:

- Lake Shore Boulevard / Park Lawn Road
  - EBL (AM Peak), EB & SB movements (PM Peak)

Also, the Lake Shore Boulevard/Palace Pier Court intersection operates with a v/c ratio of 0.95 in the AM Peak with a LOS ‘C’. With respect to unsignalized intersections, the approach that experiences the highest delay is the northbound Existing Driveway approach to Lake Shore Boulevard during the AM peak hour (LOS ‘E’).

### 3. Future Background Conditions

#### 3.1 Future Background Developments

The City of Toronto provided an updated list of background development assumptions, dated July 2008, within the study area. These were provided to AECOM for use in the Legion Road Extension EA project and were applied to the previous revision of the study. However, these assumptions were updated to remain consistent with the Mimico 20/20 report. This list is provided in **Appendix D. Table 4** presents the list of future background developments, land use and site statistics for all the developments. The future background developments with the status of under construction, approved, pending, proposed, potential, and development potential were considered in the analysis. All the developments with the status of occupied were ignored since it can be assumed that trips to and from these developments were already included in the existing TMCs. Block numbers indicate a reference point of the development on a figure provided in **Appendix D**.

**Table 4. Background Developments Assumptions (City Planning July 2008)**

Block	Development/Location	Units / Floor Area (sq. m.)				
		Condominiums	Townhouses	Office	Retail	Industrial
1	2077 Lake Shore Boulevard West	145	-	676	725	-
2b*	Monarch – Nautilus	377	-	-	2,139	-
4	Amexon	588	-	3,725	1,570	-
5	42 Park Lawn Road	345	-	-	-	-
6	36 Park Lawn Road	344	-	-	900	-
7	2200 Lake Shore Boulevard West (Menkes)	1,302	-	-	5,862	-
8	Empire (formerly Fogh) Beyond the sea 2246 Lake Shore Boulevard West	240	-	577	-	-
9	2256 Lake Shore Boulevard West	-	-	12,762	-	-
10	Polish Alliance	200	-	-	-	-
11	Mystic Point	372	-	-	-	-
17	Kraft	-	-	5,000	-	15,000

Note: \* Latest site statistics were provided from the site plan application dated December 23, 2008 provided in Appendix D.

#### 3.2 Trip Generation Rates

Trip generation rates used for the future potential background developments were developed by the MMM Group and Lea Consulting Ltd. in consultation with the City. As a result of interview surveys conducted, a transit modal split of 10 percent was assumed in the existing conditions and it was estimated that due to the proposed LRT along Lake Shore Boulevard in the future, the transit modal split in the area will grow to 20 percent; however, the City approved Mimico 20/20 report utilized a 30 percent transit modal split. Therefore, it was decided that two future traffic scenarios, interim and ultimate would be examined. It was assumed to use 10 percent and 30 percent transit modal splits in the interim and ultimate traffic scenario, respectively for consistency between traffic studies.

**Table 5** presents the trip generation rates for the interim and ultimate traffic scenarios.

**Table 5. Trip Generation Rates, Interim and Ultimate Traffic Scenarios**

Land Use	Source	Unit	Trip Rates (Vehicles per Hour)					
			Interim Scenario					
			AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Residential	LEA	Units	0.04	0.26	0.30	0.17	0.07	0.24
Office	ITE(710)	100 sq.m.	1.47	0.20	1.67	0.27	1.33	1.60
Industrial	ITE(140)	100 sq.m.	0.53	0.25	0.78	0.41	0.38	0.79
Commercial	ITE(820)	100 sq.m.	0.68	0.43	1.11	1.07	1.13	2.19
	Pass-By PM		-	-	-	34%	34%	-
	Interaction		-	-	-	11%	15%	-

Source	Unit	Trip Rates (Vehicles per Hour)					
		Ultimate Scenario					
		AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
City of Toronto	Units	0.026	0.201	0.227	0.131	0.053	0.184
ITE(710)	100 sq.m.	1.022	0.147	1.169	0.189	0.931	1.120
ITE(140)	100 sq.m.	0.53	0.25	0.78	0.41	0.38	0.79
ITE(820)	100 sq.m.	0.462	0.294	0.756	1.379	1.428	2.807
	Pass-By PM	-	-	-	20%	20%	-
	Interaction	-	-	-	10%	10%	-

### 3.3 Trip Distribution

The MMM Group and Lea Consulting Ltd. developed trip distribution scenarios for the land uses described in **Table 4**. To do so, they utilized traffic surveys, TTS data and reports provided by the City of Toronto. The City of Toronto also provided AECOM with trip distribution and trip assignment worksheets for each of the future background developments listed in the **Table 4** and also for the proposed Humber Bay Shores Mixed-use developments. These can be found in **Appendix E**.

### 3.4 Future Background Developments Site Traffic

The City of Toronto requested that a proposed signalized intersection at Park Lawn Road, to be located approximately 220 metres north of Lake Shore Boulevard West, be included in the traffic analyses. The City's request assumes that the Menkes and Kraft site driveways onto Park Lawn Road will be aligned. Accordingly, this aligned intersection has been assessed in all future traffic operation analyses. The site traffic for the background developments (**Table 4**) were generated using the trip generation rates listed in **Table 5**, for both the interim and ultimate traffic scenarios, and were assigned to the area road network using trip distribution scenarios as discussed in Section 3.3 and provided in **Appendix E**. The generated trips for the background developments are presented in **Tables 6** and **7**. The resulting future background developments site traffic for the interim and ultimate traffic scenarios are shown in **Figures 4** and **5**, respectively.

**Table 6. Generated Trips from Background Developments (Interim)**

Block	Development/Location	Land Use	Size (units/100m <sup>2</sup> )	Trips					
				AM Peak			PM Peak		
				IN	OUT	TOTAL	IN	OUT	TOTAL
1	2077 Lake Shore Boulevard West	Residential	145	6	38	44	25	10	35
		Commercial	725	5	3	8	14	15	29
		Office	676	10	1	11	2	9	11
2b	Monarch – Nautilus 2123 Lake Shore Boulevard West	Residential	377	15	98	113	50	26	76
		Commercial	2139	15	9	24	20	22	42
4	Amexon	Residential	588	16	118	134	77	31	108
		Commercial	3075	14	9	23	28	30	58
5	42 Park Lawn Road	Residential	345	9	69	78	45	18	63
6	36 Park Lawn Road	Residential	344	14	89	103	58	24	83
		Commercial	900	6	4	10	8	8	16
7	2200 Lake Shore Boulevard West (Menkes)	Residential	1302	52	339	391	221	68	289
		Commercial	5862	26	25	51	54	58	112
8	Empire (formerly Fogh) Beyond the sea 2246 Lake Shore Boulevard West	Residential	240	10	62	72	41	12	53
		Office	577	8	1	10	5	8	13
9	2256 Lake Shore Boulevard West	Office	12762	188	26	213	34	170	204
10	Polish Alliance	Residential	200	8	52	60	34	14	48
11	Mystic Point	Residential	372	15	97	112	63	19	82
17	Kraft	Office	5000	74	10	84	14	67	80
		Industrial	15000	80	38	117	62	57	119

**Table 7. Generated Trips from Background Developments (Ultimate)**

Block	Development/Location	Land Use	Size (units/100m <sup>2</sup> )	Trips					
				AM Peak			PM Peak		
				IN	OUT	TOTAL	IN	OUT	TOTAL
1	2077 Lake Shore Boulevard West	Residential	145	4	29	33	19	8	27
		Commercial	725	3	2	5	10	10	20
		Office	676	7	1	8	1	6	8
2b	Monarch – Nautilus 2123 Lake Shore Boulevard West	Residential	377	10	76	86	50	20	70
		Commercial	2139	10	6	16	20	22	42
4	Amexon	Residential	588	16	118	134	77	31	108
		Commercial	3075	14	9	23	28	30	58
5	42 Park Lawn Road	Residential	345	9	69	78	45	18	63
6	36 Park Lawn Road	Residential	344	9	69	78	45	18	63
		Commercial	900	4	3	7	8	8	16
7	2200 Lake Shore Boulevard West (Menkes)	Residential	1302	34	262	296	171	68	239
		Commercial	5862	26	17	43	54	58	112
8	Empire (formerly Fogh) Beyond the sea 2246 Lake Shore Boulevard West	Residential	240	6	48	54	31	12	43
		Office	577	6	1	7	5	5	10
9	2256 Lake Shore Boulevard West	Office	12762	130	19	149	24	119	143
10	Polish Alliance	Residential	200	5	40	45	26	11	37
11	Mystic Point	Residential	372	10	75	84	49	19	68
17	Kraft	Office	5000	51	7	58	9	47	56
		Industrial	15000	68	32	99	53	48	101

### 3.5 Future Background Traffic, Interim Scenario

Since trip generation rates for the interim background traffic scenario are higher than the ultimate background traffic scenario, traffic operations for the future background developments for the interim traffic scenarios were considered conservative and presented in this report. The existing traffic volumes (**Figure 2**) were added to future background developments site traffic interim scenario (**Figure 4**) and the resulting future background total traffic volumes interim scenario without the Legion Road extension are shown in **Figure 6**. The ultimate background traffic volumes depicted in **Figure 5** were not used in the assessment.

### 3.6 Future Background Traffic Operations, Interim Scenario

The future background traffic volumes for the interim scenario and intersection lane configurations (**Figure 7**) were used in the traffic operational analysis. The existing signal timings were optimized where it was necessary with set cycle lengths and additional phases were introduced at the intersection of Lake Shore Boulevard and Park Lawn Road.

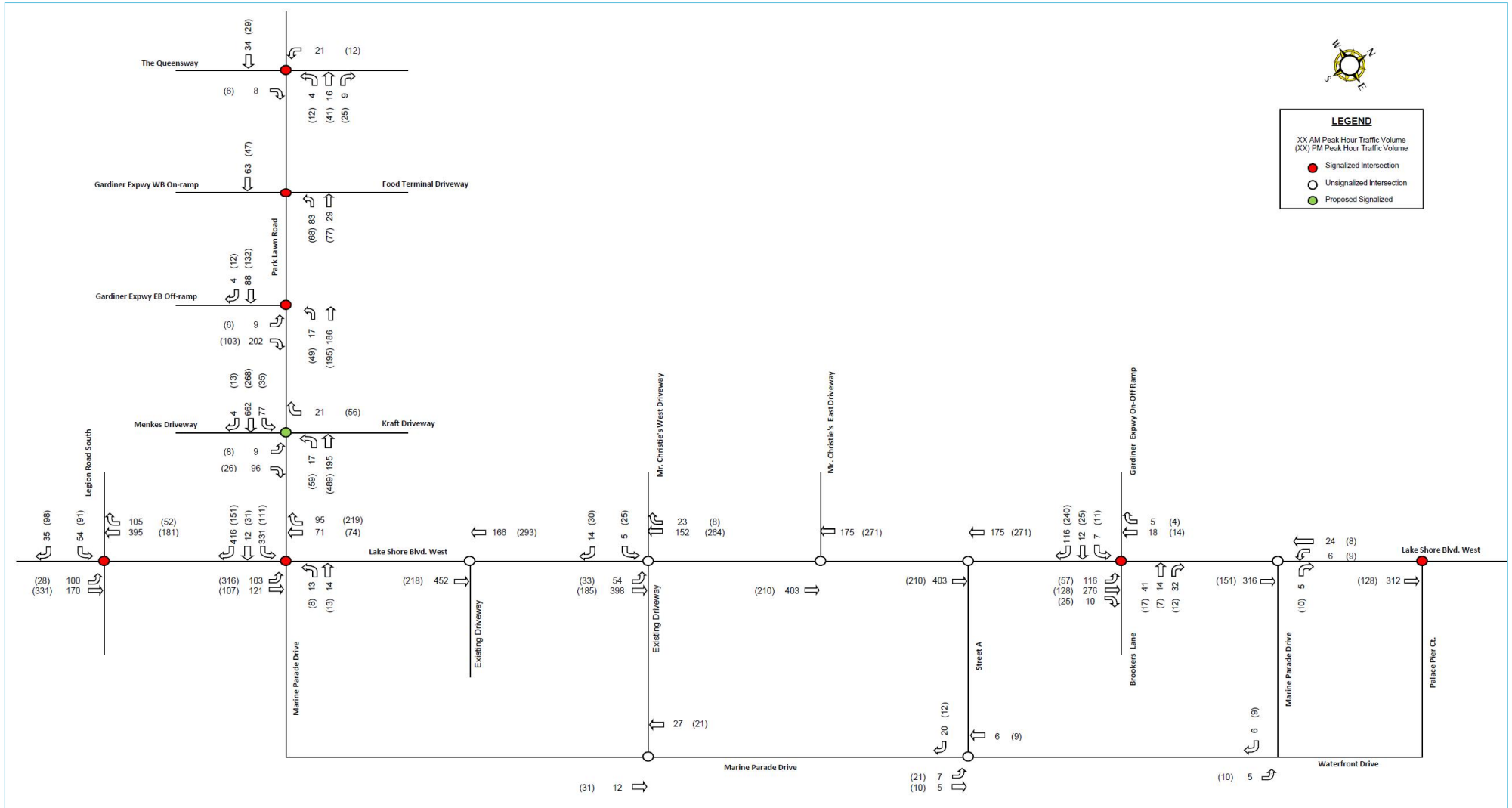


Figure 4. Future Background Developments Site Traffic, Interim Scenario



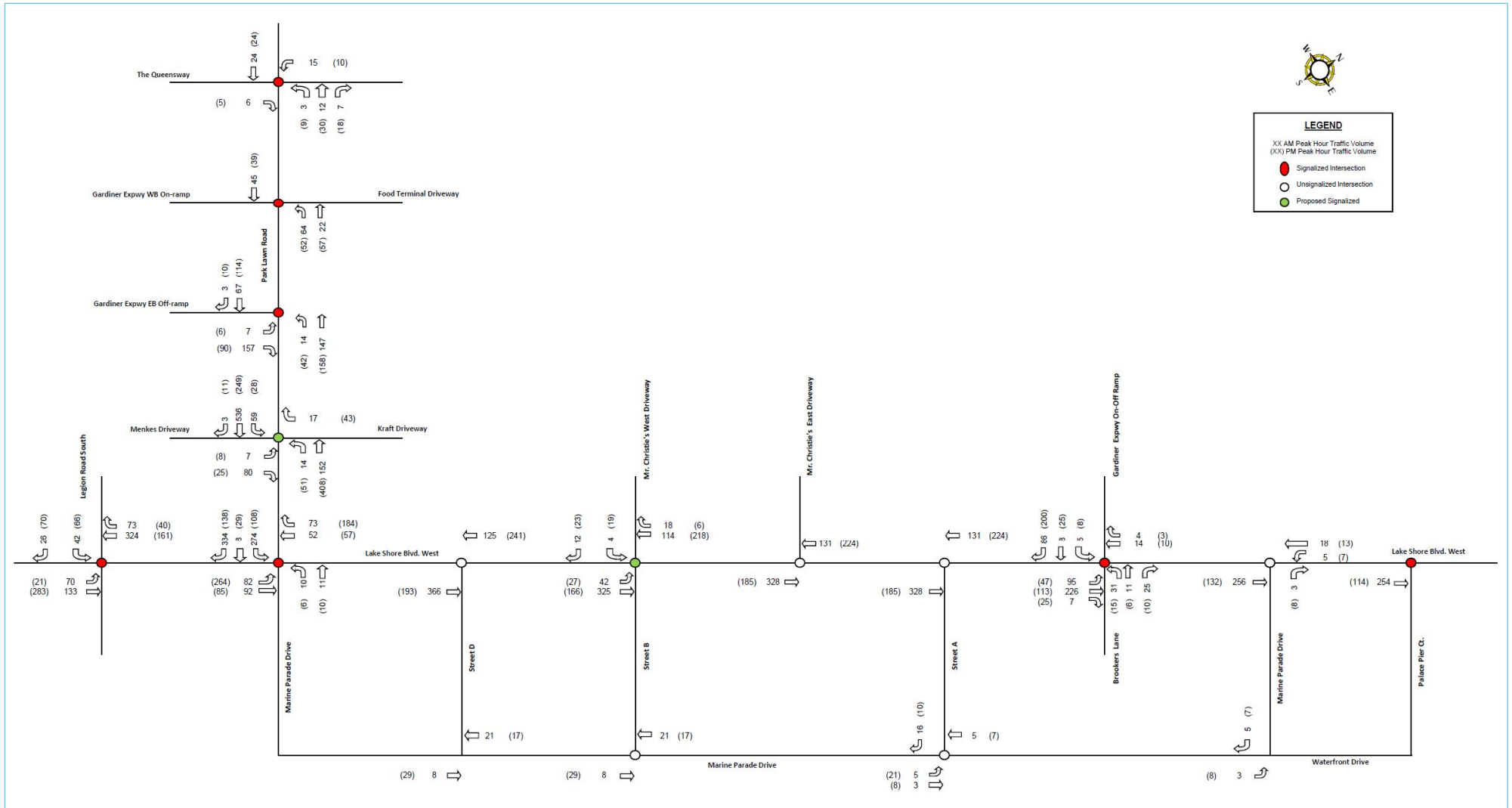


Figure 5. Future Background Developments Site Traffic, Ultimate Scenario



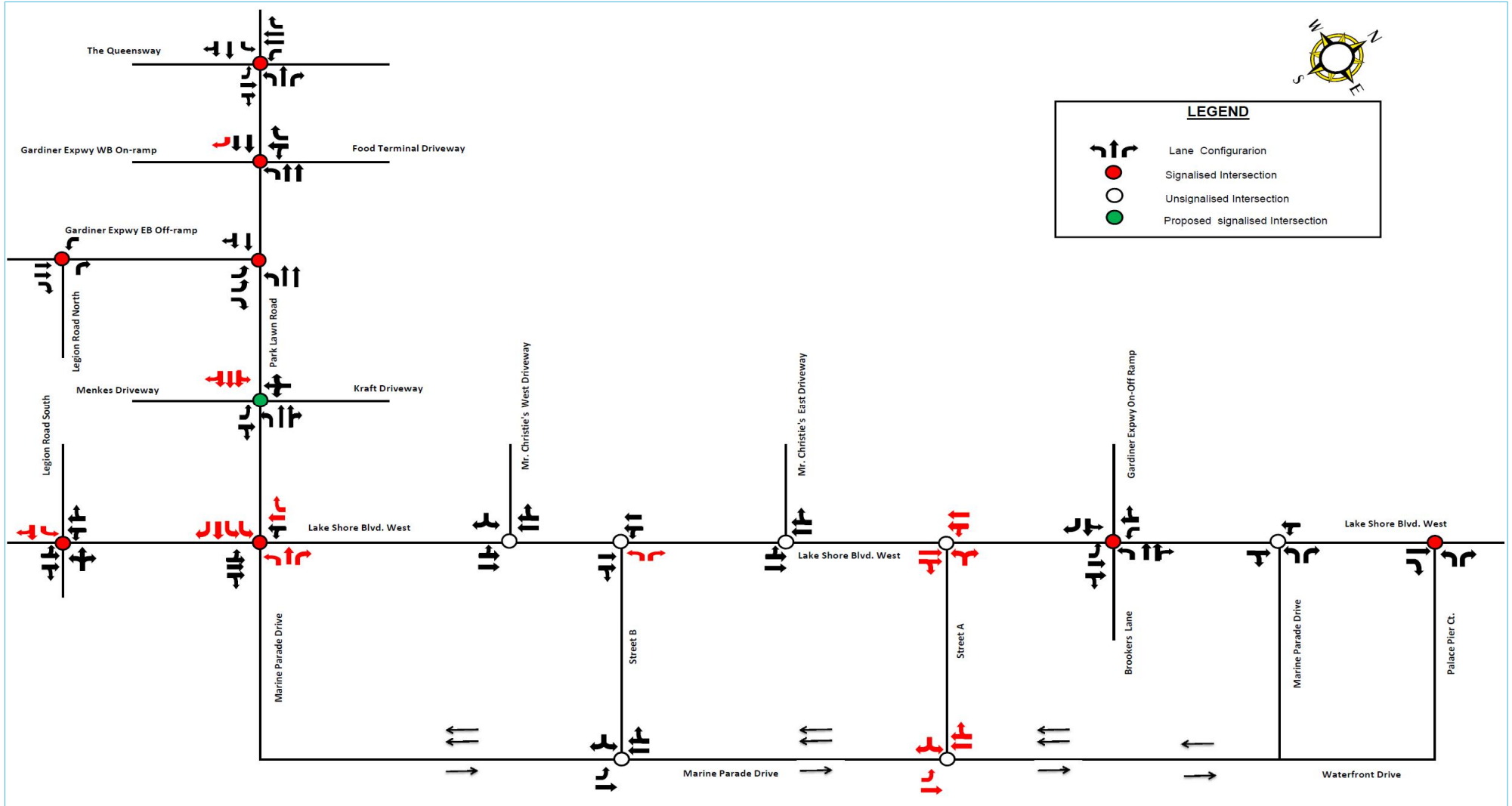


Figure 7. Future Background Intersection Lane Configurations

The queuing analysis was conducted to determine the storage capacity requirements of the turning lanes using the SimTraffic software adopting the following methodologies:

- A seeding time of 10 minutes at the start of each run;
- A recoding time of 15 minutes (PHF Applied);
- All other parameters were set to the SimTraffic default values; and
- Five separate runs were undertaken. Simulation runs were observed to detect instances where vehicles stall and create infinite queues; these seeds were discarded from the average queue calculations.

The results of the capacity and queuing analyses for the study area intersections are summarized in **Tables 8** and **9** for the AM and PM peak hours, respectively. Detailed Synchro and SimTraffic output sheets are provided in **Appendix F**.

**Table 8. Traffic Operations Signalized Intersections AM Peak Hour, Future Background**

Intersection	Average Control Delay(s) <i>(HCM-Synchro)</i>	Level of Service (v/c ratio) <i>(HCM-Synchro)</i>	Movement	Delay(s) <i>(HCM-Synchro)</i>	v/c Ratio <i>(HCM-Synchro)</i>	Level of Service <i>(HCM-Synchro)</i>	Average Queue Length (m) <i>(SimTraffic)</i>	95 <sup>th</sup> Percentile Queue Length (m) <i>(SimTraffic)</i>
<b>Signalized Intersections</b>								
<b>The Queensway at Park Lawn Road</b>	41.5	D(0.81)	EBL	20.0	0.28	C	24.1	75.5
			EBT-TR	41.3	0.86	D	132.2	198.5
			WBL	55.4	0.88	E	75.6	132.9
			WBT-T	17.1	0.29	B	30.7	80.5
			WBR	14.8	0.03	B	4.0	17.2
			NBL	47.8	0.70	D	22.9	51.2
			NBT	53.9	0.81	D	42.6	88.8
			NBR	39.0	<b>0.90</b>	D	6.7	35.4
			SBL	39.3	0.55	D	37.9	69.5
<b>Park Lawn Road at Gardiner Expressway WB On-Ramp</b>	8.9	A(0.58)	WBTL	57.7	0.59	E	28.5	57.8
			WBR	48.2	0.02	D	5.2	14.1
			NBL	5.3	0.59	A	63.3	121.2
			NBT-T	1.8	0.31	A	24.2	45.8
			SBT-T	15.4	0.19	B	8.8	20.7
<b>Park Lawn Road at Gardiner Expressway EB Off-Ramp</b>	11.4	B(0.64)	SBR	11.6	0.51	B	31.8	57.4
			EBL-L	28.2	0.49	C	202.0	359.2
			EBR	2.1	0.64	A	33.5	43.3
			NBL	9.1	0.08	A	9.4	32.6
			NBT-T	8.4	0.53	A	52.5	76.3
<b>Park Lawn Road at Menkes-Kraft Driveway</b>	13.7	B(0.55)	SBT-TR	14.4	0.22	B	42.5	65.3
			EBL	40.4	0.05	D	0.4	3.2
			EBTR	41.1	0.13	D	15.8	31.5
			WBLTR	50.5	0.01	D	3.6	9.5
			NBL	8.1	0.08	A	0.8	4.1
<b>Park Lawn Road at Lake Shore Boulevard West</b>	83.9	<b>F(1.04)</b>	NBT-TR	17.2	0.45	B	30.0	55.8
			SBTL-T-TR	9.8	0.66	A	164.2	183.7
			EBLT-T-TR	88.6	<b>1.13dl</b>	F	289.4	366.0
			WBTL-T	17.8	0.30	B	29.5	47.2
			WBR	10.8	0.23	B	16.1	28.0
			NBL	45.1	0.26	D	14.5	38.9
			NBT	55.6	0.70	E	39.4	68.8
			NBR	42.6	0.05	D	4.3	12.4
<b>Legion Road South at Lake Shore Boulevard West</b>	15.7	B(0.82)	SBL-L	162.7	<b>1.27</b>	F	194.5	200.3
			SBT	8.0	0.07	A	82.3	236.9
			SBR	20.2	0.62	C	32.3	97.3
			EBLT-TR	14.6	0.82	B	250.9	260.4
			WBTL-TR	5.5	0.42	A	16.4	28.4
			NBLTR	41.9	0.14	D	19.6	45.7
			SBL	67.9	0.80	E	55.5	98.2
			SBTR	41.0	0.03	D	7.2	14.6

**Table 8. Traffic Operations Signalized Intersections AM Peak Hour, Future Background**

Intersection	Average Control Delay(s) (HCM-Synchro)	Level of Service (v/c ratio) (HCM-Synchro)	Movement	Delay(s) (HCM-Synchro)	v/c Ratio (HCM-Synchro)	Level of Service (HCM-Synchro)	Average Queue Length (m) (SimTraffic)	95 <sup>th</sup> Percentile Queue Length (m) (SimTraffic)
Gardiner Expressway WB Off-Ramp at Lake Shore Boulevard West	16.1	B(0.68)	EBL	4.9	0.70	A	-	-
			EBT-TR	4.9	0.61	A	-	-
			WBL	-	-	-	-	-
			WBTR	13.5	0.16	B	-	-
			NBL	58.4	0.72	E	-	-
			NBT-TR	43.0	0.15	D	-	-
			SBLT	45.9	0.39	D	-	-
Mr. Christie's East Driveway at Lake Shore Boulevard West	0.1	A(0.67)	EBLT-T	0.1	0.67	A	60.7	91.8
			WBT-TR	0.1	0.21	A	-	-
Gardiner Expressway EB Off-Ramp at Legion Rd North	3.1	A(0.50)	EBT-T	3.2	0.59	A	142.6	323.9
			EBR	1.7	0.02	A	4.7	39.7
			WBL	17.1	0.36	B	12.1	24.0
			NBR	0.3	0.20	A	136.3	255.5
Palace Pier Court at Lake Shore Boulevard West	59.0	E(0.96)	EBT	62.6	1.10	E	-	-
			EBR	1.0	0.05	A	-	-
			NBL	42.5	0.18	D	-	-
			NBR	35.9	0.06	D	-	-

Notes: EBL= eastbound left, NBT= northbound through, WBLTR= westbound shared left-through-right, EBL-R, separate eastbound left-right, dl = defacto left turning lane

**Table 9. Traffic Operations Signalized Intersections PM Peak Hour, Future Background**

Intersection	Average Control Delay(s) (HCM-Synchro)	Level of Service (v/c ratio) (HCM-Synchro)	Movement	Delay(s) (HCM-Synchro)	v/c Ratio (HCM-Synchro)	Level of Service (HCM-Synchro)	Average Queue Length (m) (SimTraffic)	95 <sup>th</sup> Percentile Queue Length (m) (SimTraffic)
<b>Signalized Intersections</b>								
The Queensway at Park Lawn Road	40.0	D(0.79)	EBL	28.7	0.63	C	53.8	91.4
			EBT-TR	51.3	0.88	D	101.7	146.3
			WBL	36.4	0.75	D	61.6	96.5
			WBT-T	25.9	0.60	C	151.2	513.4
			WBR	19.3	0.09	B	1.3	4.6
			NBL	37.8	0.64	D	20.3	32.1
			NBT	41.8	0.74	D	52.2	89.8
			NBR	42.7	0.25	D	-	-
			SBL	44.9	0.26	D	16.9	28.5
Park Lawn Road at Gardiner Expressway WB On-Ramp	6.3	A(0.49)	SBT-TR	53.1	0.74	D	75.0	98.6
			WBTLT	54.9	0.21	D	4.6	13.9
			WBR	53.1	0.01	D	4.3	13.1
			NBL	3.1	0.52	A	42.9	78.3
			NBT-T	1.2	0.35	A	16.4	30.7
			SBT-T	6.8	0.20	A	18.0	36.4
Park Lawn Road at Gardiner Expressway EB Off-Ramp	8.1	A(0.41)	SBR	16.1	0.32	B	23.8	32.2
			EBL-L	18.3	0.50	B	51.2	194.4
			EBR	0.8	0.41	A	14.9	32.0
			NBL	6.8	0.27	A	11.5	22.5
			NBT-T	8.2	0.49	A	24.7	45.7
SBT-TR	6.8	0.36	A	32.3	46.7			

**Table 9. Traffic Operations Signalized Intersections PM Peak Hour, Future Background**

Intersection	Average Control Delay(s) <i>(HCM-Synchro)</i>	Level of Service (v/c ratio) <i>(HCM-Synchro)</i>	Movement	Delay(s) <i>(HCM-Synchro)</i>	v/c Ratio <i>(HCM-Synchro)</i>	Level of Service <i>(HCM-Synchro)</i>	Average Queue Length (m) <i>(SimTraffic)</i>	95 <sup>th</sup> Percentile Queue Length (m) <i>(SimTraffic)</i>
Park Lawn Road at Menkes-Kraft Driveway	5.9	A(0.37)	EBL	54.8	0.12	D	3.0	11.2
			EBTR	53.8	0.02	D	6.5	12.0
			WBLTR	54.0	0.04	D	6.9	12.9
			NBL	6.9	0.23	A	5.5	12.1
			NBT-TR	5.6	0.38	A	17.5	35.0
			SBLT-T-TR	2.5	0.35	A	34.5	66.4
Park Lawn Road at Lake Shore Boulevard West	31.2	C(0.78)	EBLT-T-TR	20.9	<b>3.23dl</b>	C	283.8	315.7
			WBLT-T	23.6	0.60	C	66.9	91.7
			WBR	23.9	0.40	C	12.1	18.1
			NBL	63.4	0.25	E	3.0	11.5
			NBT	65.3	0.40	E	14.8	28.2
			NBR	76.1	0.01	E	-	-
			SBL-L	53.2	0.89	D	174.5	212.7
			SBT	25.0	0.13	C	59.9	196.5
			SBR	38.8	0.80	D	86.3	150.0
Legion Road South at Lake Shore Boulevard West	9.5	A(0.58)	EBLT-TR	5.8	0.51	A	247.9	248.9
			WBLT-TR	4.4	0.56	A	58.2	71.0
			NBLTR	44.8	0.04	D	38.8	64.7
			SBL	58.9	0.68	E	96.4	105.3
			SBTR	47.2	0.30	D	217.4	381.4
Gardiner Expressway WB Off-Ramp at Lake Shore Boulevard West	34.3	C(0.91)	EBL	24.0	0.66	C	18.7	23.6
			EBT-TR	34.6	0.87	C	46.9	50.4
			WBL	42.3	0.07	D	-	-
			WBTR	43.4	0.33	D	22.5	45.2
			NBL	12.3	0.12	B	13.2	27.6
			NBT-TR	11.5	0.02	B	7.6	16.1
			SBLT	14.2	0.27	B	17.4	24.0
			SBR	41.5	<b>0.93</b>	D	26.2	96.2
Mr. Christie's East Driveway at Lake Shore Boulevard West	0.2	A(0.37)	EBLT-T	0.2	0.37	A	62.5	82.5
			WBT-TR	0.1	0.37	A	24.6	73.6
Gardiner Expressway EB Off-Ramp at Legion Rd North	5.7	A(0.50)	EBT-T	5.2	0.52	A	62.6	213.3
			EBR	3.7	0.10	A	-	-
			WBL	14.3	0.45	B	15.7	28.4
			NBR	0.1	0.08	A	2.4	12.1
Palace Pier Court at Lake Shore Boulevard West	8.4	A(0.43)	EBT	7.4	0.61	A	25.6	45.0
			EBR	7.6	0.13	A	7.8	13.0
			NBL	17.3	0.09	B	7.3	19.9
			NBR	21.5	0.02	C	3.8	9.3

Notes: EBL= eastbound left, NBT= northbound through, WBLTR= westbound shared left-through-right, EBL-R, separate eastbound left-right, dl = defacto left turning lane

The capacity analyses results presented in **Tables 6** and **7** indicate that the addition of future background developments traffic will slightly increase the delay at study area intersections. Most of the movements can still be accommodated within acceptable LOS during both the AM and PM peak hours, with exception of the following:

- The Queensway / Park Lawn Road
  - AM Peak: WBL, SBT-TR
- Park Lawn Road / Gardiner Expressway WB On-Ramp
  - AM Peak: WBLT

- Park Lawn Road / Lake Shore Boulevard
  - AM Peak: EB, NBT, SBL
  - PM Peak: EB, NB, SBL
- Lake Shore Boulevard / Gardiner Expressway WB Off-Ramp
  - AM Peak: NBL
  - PM Peak: SBR
- Lake Shore Boulevard / Legion Road South
  - AM Peak: SBL
  - PM Peak: SBL
- Lake Shore Boulevard / Palace Pier Court
  - AM Peak: EBT

The eastbound movement at the Lake Shore Boulevard/Park Lawn Road intersection operates as a defacto left-turn lane during both AM and PM peak hours and is above the theoretical capacity but operates with a LOS “C”. The northbound movements are expected to operate at a LOS “E” with low v/c ratios. **Tables 10** and **11** present the intersection capacity and queuing analysis of the study area unsignalized intersections in the AM and PM hours.

**Table 10. Traffic Operations Unsignalized Intersections AM Peak Hour, Future Background**

Intersection	Average Control Delay(s) <i>(HCM-Synchro)</i>	Level of Service (v/c ratio) <i>(HCM-Synchro)</i>	Movement	Delay(s) <i>(HCM-Synchro)</i>	v/c Ratio <i>(HCM-Synchro)</i>	Level of Service <i>(HCM-Synchro)</i>	Average Queue Length (m) <i>(SimTraffic)</i>	95 <sup>th</sup> Percentile Queue Length (m) <i>(SimTraffic)</i>
<b>Unsignalized Intersections</b>								
Mr. Christie’s West Driveway at Lake Shore Boulevard West			EBLT-T	1.7	0.84	A	85.5	142.9
			WBT-TR	0.0	0.27	-	0.4	2.9
			SBLR	21.3	0.10	C	28.6	70.9
Lake Shore Boulevard West at Street B			EBT-TR	0.0	0.85	-	11.4	22.7
			WBLT-T	0.6	0.28	A	1.0	8.6
			NBL	196.6	0.10	F	0.8	4.8
		NBR	12.0	0.00	B	0.7	4.5	
Lake Shore Boulevard at Street A			EBT-TR	0.0	0.85	-	-	-
			WBLT-T	0.0	0.28	-	-	-
			NBLR	0.0	0.00	A	-	-
Lake Shore Boulevard West at Marine Parade Drive (East)			EBTR	0.0	<b>0.93</b>	-	-	-
			WBLT	6.6	0.07	A	-	-
			NBL	1197.2	<b>2.35</b>	F	-	-
		NBR	948.0	<b>2.39</b>	F	-	-	
Marine Parade Drive at Street A			EBL	7.6	0.01	A	-	-
			EBT	0.0	0.04	-	-	-
			WBT-TR	0.0	0.08	-	-	-
		SBLR	8.9	0.02	A	-	-	
Marine Parade Drive at Street B			EBL	7.7	0.00	A	-	-
			EBT	0.0	0.04	-	-	-
			WBT-TR	0.0	0.08	-	-	-
		SBLR	0.0	0.00	A	-	-	



**Table 11. Traffic Operations Unsignalized Intersections PM Peak Hour, Future Background**

Intersection	Average Control Delay(s) <i>(HCM-Synchro)</i>	Level of Service (v/c ratio) <i>(HCM-Synchro)</i>	Movement	Delay(s) <i>(HCM-Synchro)</i>	v/c Ratio <i>(HCM-Synchro)</i>	Level of Service <i>(HCM-Synchro)</i>	Average Queue Length (m) <i>(SimTraffic)</i>	95 <sup>th</sup> Percentile Queue Length (m) <i>(SimTraffic)</i>
<b>Unsignalized Intersections</b>								
Mr. Christie's West Driveway at Lake Shore Boulevard West			EBLT-T	2.0	0.48	A	104.1	107.9
			WBT-TR	0.0	0.51	-	-	-
			SBLR	94.7	0.72	F	70.8	80.9
Lake Shore Boulevard West at Street B			EBT-TR	0.0	0.49	-	11.4	25.7
			WBLT-T	0.1	0.51	A	-	-
			NBL	65.5	0.02	F	-	-
			NBR	13.0	0.01	B	3.4	8.8
Lake Shore Boulevard at Street A			EBT-TR	0.0	0.49	-	72.6	87.6
			WBLT-T	0.0	0.51	-	5.5	27.8
			NBLR	0.0	0.00	A	-	-
Lake Shore Boulevard West at Marine Parade Drive (East)			EBTR	0.0	0.51	-	-	-
			WBLT	1.7	0.02	A	-	-
			NBL	19.3	0.12	C	5.2	11.5
			NBR	16.1	0.12	C	4.7	9.5
Marine Parade Drive at Street A			EBL	7.6	0.02	A	1.2	6.2
			EBT	0.0	0.08	-	-	-
			WBT-TR	0.0	0.06	-	-	-
			SBLR	8.7	0.01	A	2.6	9.5
Marine Parade Drive at Street B			EBL	7.6	0.00	A	-	-
			EBT	0.0	0.09	-	1.3	6.6
			WBT-TR	0.0	0.06	-	-	-
			SBLR	10.1	0.01	B	-	-

The capacity and queuing analyses results presented in **Tables 10** and **11** indicate that three side street movements at the unsignalized intersections will experience significant delays: the northbound approach to Lake Shore Boulevard West from Street B (AM and PM peak hour), northbound approach at Marine Parade Drive-East (AM peak hour), and the southbound approach at Mr. Christie's West Driveway (PM peak hour). This operation may be acceptable for driveways during peak generation periods, especially if 95<sup>th</sup> percentile queues are not significant. The SimTraffic simulation results indicated minor queues for the northbound approach of Street B during both AM and PM peak hours; however queues are shown to be significant at the southbound approach to Lake Shore Boulevard West from Mr. Christie's West Driveway (during both AM and PM peak hours).

## 4. Proposed Mixed-Use Developments and Future Traffic Conditions

The proposed Humber Bay Shores mixed-use developments will consist of two development scenarios, interim and ultimate. It should be noted that the purpose of the interim scenario was to assess a worst case scenario where some of the properties were developed prior to the construction of Street C. However, this scenario is not meant to represent the actual phasing of the individual Humber Bay Shores Precinct Plan developments and is only meant to be illustrative that the projects can be developed on an interim basis.

In both the development scenarios, residential and commercial land uses are being proposed. The following sections present the proposed developments site statistics, proposed driveway locations and movements, estimates of site traffic to be generated, left-turn lane warrant analyses at the proposed driveways, and traffic operational analyses for both the interim and ultimate traffic scenarios. **Figure 8** illustrates the individual development parcels of the Humber Bay Shores Precinct Plan.

### 4.1 Humber Bay Shores Developments, Interim Precinct Plan

The proposed Humber Bay Shores site plan for the interim scenario is shown in **Figure 9**. This interim development scenario will consist of residential and commercial land uses and be accessible from Lake Shore Boulevard West by way of Street A, Street B and an interim driveway for the Phantom site (adjacent to future Street D) and from Marine Parade Drive by way of Street A and Street B. All five proposed driveways will permit all directional turning and through movements. This development scenario proposes the following intersections with Lake Shore Boulevard and Marine Parade Road:

1. Lake Shore Boulevard at Interim Phantom Driveway;
2. Lake Shore Boulevard at Street B;
3. Lake Shore Boulevard at Street A;
4. Marine Parade Drive at Street B; and
5. Marine Parade Drive at Street A.

The Interim Phantom driveway, Street B and Street A along Lake Shore Boulevard West are located at approximate distances of 154 metres, 265 metres, and 412 metres, respectively, east from the centre of the Lake Shore Boulevard West and Park Lawn Road intersection. Currently, an existing West Driveway at the Mr. Christie's development located north of Lake Shore Boulevard West would have a small offset which may create some operational conflicts and has, therefore, been assumed to be realigned with the proposed Street B of the Humber Bay Shores developments. The proposed Streets B and A are approximately 147 metres apart and also permit full moves traffic from Marine Parade Drive.

### 4.2 Humber Bay Shores Developments, Interim Traffic Conditions

#### 4.2.1 Humber Bay Shores Developments Interim Total Traffic

The site traffic from the proposed interim precinct plan was estimated using trip rates presented in **Table 5**. The proposed residential and commercial land uses for the interim scenario are presented in **Table 12**. **Table 12** indicates that the residential developments will generate 85 trips inbound and 553 trips outbound, resulting in 638 trips in total in the AM peak hour. In the PM peak hour, the residential developments will generate 361 trips inbound and 149 trips outbound, resulting in 510 trips in total. The commercial developments will generate 76 trips inbound and 48 trips outbound, resulting in 124 trips in total in the AM peak hour. In the PM peak hour, the commercial developments will

generate 217 trips inbound and 235 trips outbound, resulting in 453 trips in total. However, these commercial development trips include shared and pass-by trips in the PM peak hour. Some “rounding errors” may be present that account for the difference between in-trips plus out-trips versus indicated totals.

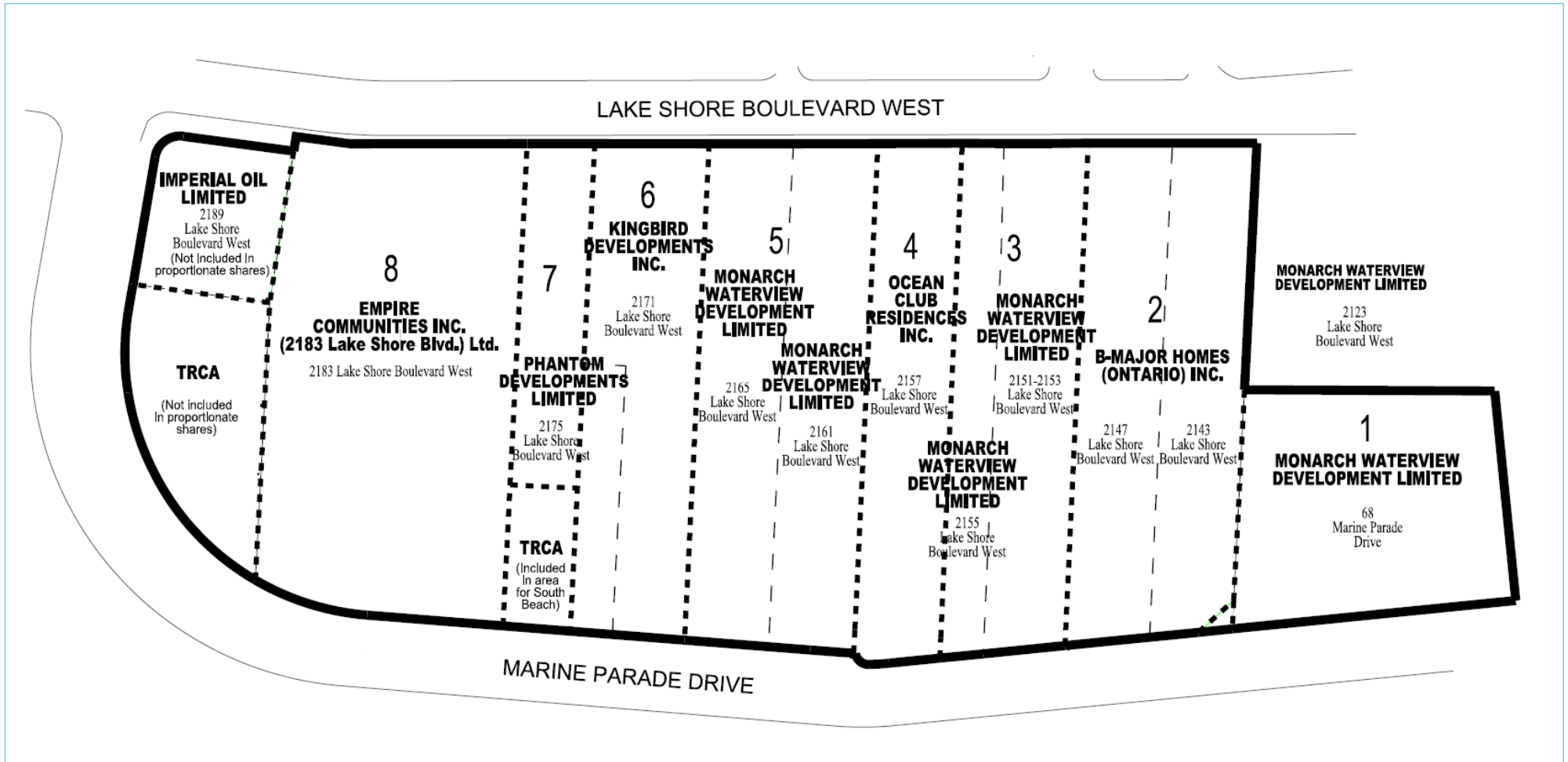


Figure 8. Humber Bay Shores Developments, Ownership Plan

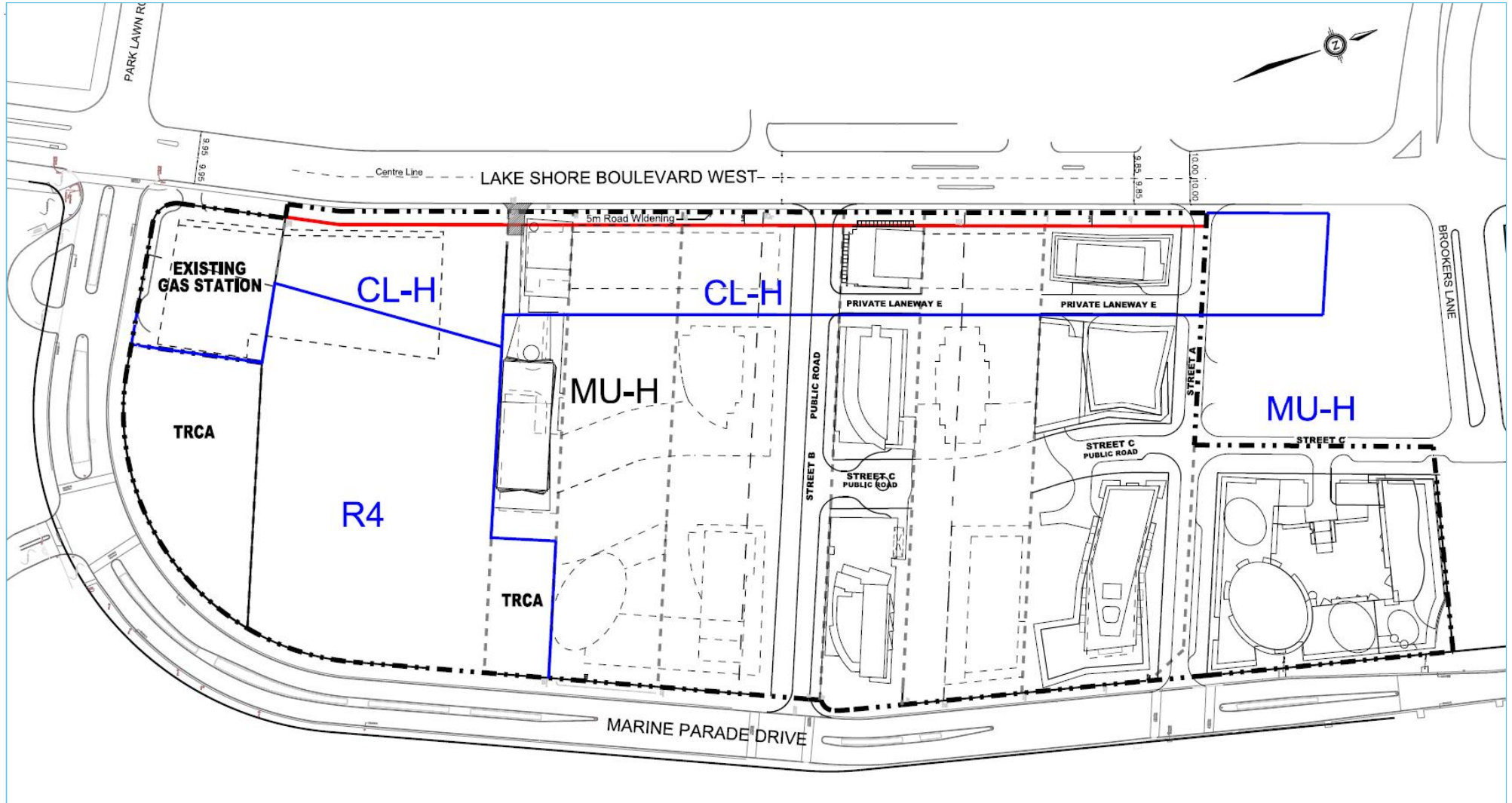


Figure 9. Humber Bay Shores Mixed-Use Developments, Proposed Interim Precinct Plan

**Table 12. Trip Generation, Interim Precinct Plan**

Ownership	Land Use	Size	Code	Trip Rate Weekday AM			Trip Rate Weekday PM		
<b>Residential Developments</b>		<b>Units</b>		<b>In</b>	<b>Out</b>	<b>Total</b>	<b>In</b>	<b>Out</b>	<b>Total</b>
<b>Trip Rate</b>			(/Unit)	<u>0.04</u>	<u>0.26</u>	<u>0.30</u>	<u>0.17</u>	<u>0.07</u>	<u>0.24</u>
1 Monarch (Waterview) – 2131/9 Lakeshore	Condominiums	344	LEA	14	89	103	58	24	83
2 B-Major Homes – 2143/7 Lakeshore		887		35	231	266	151	62	213
4 Ocean Club – 2157 Lakeshore		516		21	134	155	88	36	124
7 Phantom - 2175 Lakeshore		378		15	98	113	64	26	91
<b>Total Residential Units</b>		<b>2,125</b>							
<b>Total Trips Residential Developments</b>				<b>85</b>	<b>553</b>	<b>638</b>	<b>361</b>	<b>149</b>	<b>510</b>
<b>Commercial/Retail Developments</b>		<b>GFA Sq. m</b>		<b>In</b>	<b>Out</b>	<b>Total</b>	<b>In</b>	<b>Out</b>	<b>Total</b>
<b>Trip Rate</b>			(/100 m <sup>2</sup> )	<u>0.68</u>	<u>0.43</u>	<u>1.11</u>	<u>1.94</u>	<u>2.10</u>	<u>4.04</u>
1 Monarch (Waterview) – 2131/9 Lakeshore	Commercial	2,416	ITE (820)	16	10	27	47	51	98
2 B-Major Homes – 2143/7 Lakeshore		3,933		27	17	44	76	83	159
4 Ocean Club – 2157 Lakeshore		3,357		23	14	37	65	70	136
7 Phantom - 2175 Lakeshore		1,500		10	6	17	29	32	61
<b>Total Commercial Gross Floor Area</b>		<b>11,206</b>							
<b>Total Commercial Trips</b>				<b>76</b>	<b>48</b>	<b>124</b>	<b>217</b>	<b>235</b>	<b>453</b>
<i>Pass-By Trip Reduction 34%</i>							-0.66	-0.71	-1.37
<i>Trip Rate</i>							<u>-0.66</u>	<u>-0.71</u>	<u>-1.37</u>
<i>Trip Rate Used</i>							<u>-0.66</u>	<u>-0.66</u>	<u>-1.32</u>
<i>Total Pass-By Trips</i>							<b>-74</b>	<b>-74</b>	<b>-148</b>
<i>Shared Trip Reduction (In = 11%, Out = 15%)</i>							-0.21	-0.32	-0.53
<i>Trip Rate</i>							<u>-0.21</u>	<u>-0.32</u>	<u>-0.53</u>
<i>Total Shared Trips</i>							<b>-24</b>	<b>-35</b>	<b>-59</b>
<b>Net Trip Rate Commercial</b>				<u>0.68</u>	<u>0.43</u>	<u>1.11</u>	<u>1.07</u>	<u>1.13</u>	<u>2.19</u>
<b>Net Trips Commercial Developments</b>				<b>76</b>	<b>48</b>	<b>124</b>	<b>120</b>	<b>126</b>	<b>246</b>
<b>Total Net Trips</b>				<b>161</b>	<b>601</b>	<b>762</b>	<b>481</b>	<b>275</b>	<b>756</b>

The proposed interim developments will generate net 161 trips inbound and net 601 trips outbound, resulting in a net total of 762 trips in the AM peak hour. In the PM peak hour, they will generate net 481 trips inbound and net 275 trips outbound, resulting in a net total of 756 trips.

The estimated residential and commercial trips were assigned to the area internal road network and driveways based on the most logical route choices. Trips outside of the development were assigned using trip distribution information provided by the City of Toronto (**Appendix E**).

The proposed Humber Bay Shores mixed use development envisions land uses that are consistent with the Motel Strip Secondary Plan but represent an intensification of the subject area. Accordingly, the traffic assumptions have been updated from those assumptions presented in previous traffic studies. The proposed Humber Bay Shores Precinct Plan contemplates less commercial floor space and more residential units than what was proposed in the original Motel Strip Secondary Plan, which results in a change in inbound and outbound traffic travel patterns. **Table 12** indicates that outbound trips in the AM peak hour and inbound trips in the PM peak hour are dominant.

The resulting total site traffic volumes from the proposed interim Precinct Plan are shown in **Figure 10**. The estimated total interim site traffic volumes (**Figure 10**) were added to future background traffic interim scenario (**Figure 6**) and are illustrated in **Figure 11**.

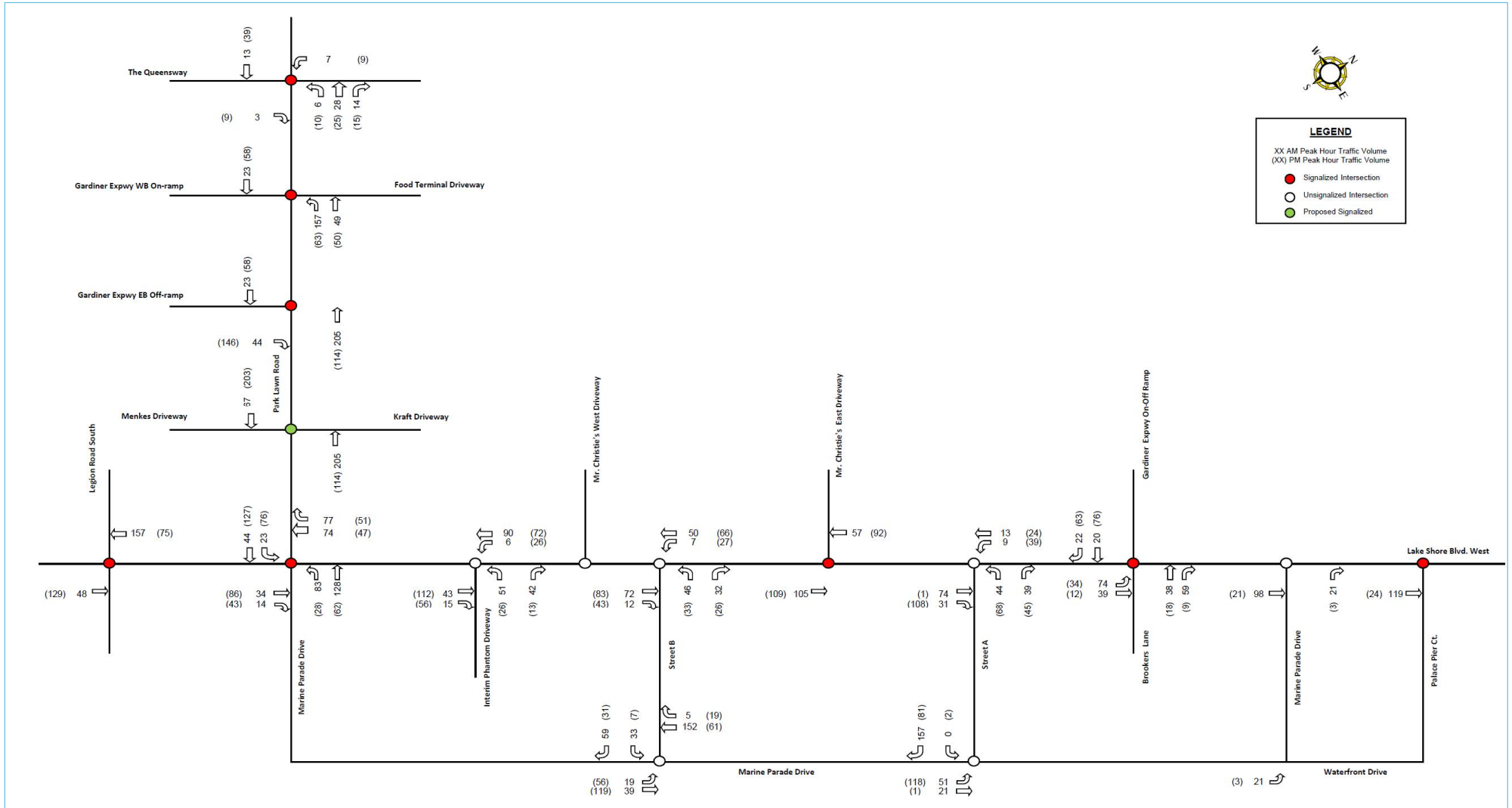
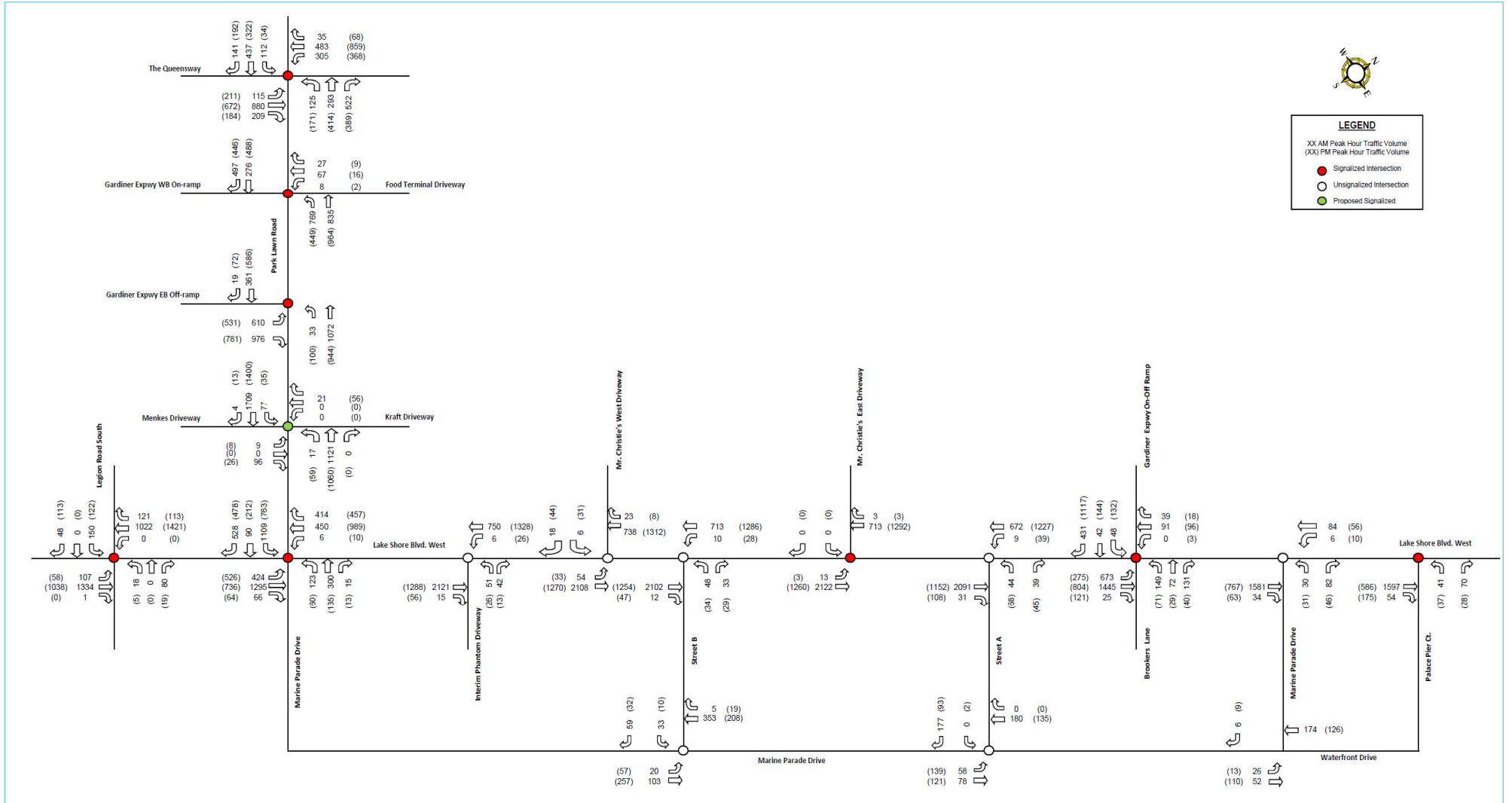


Figure 10. Humber Bay Shores Developments Interim Site Total Traffic Volumes





**Figure 11. Future Total Volumes, Interim Scenario**

#### 4.2.2 Left Turn Lane Warrant Analysis, Interim Scenario

The left turn lane warrant analyses were conducted using the *Geometric Design Standards for Ontario Highways* manual published by the Ministry of Transportation Ontario (MTO). The left turn lane warrant analyses, and determination of storage lane lengths for unsignalized intersections are based on left-turning and opposing design hourly volumes. Since Marine Parade Drive is a 4-lane roadway, Figure EB-1, *Four-Lane Undivided Highways Unsignalized* from the MTO Geometric Design Guidelines was used in this analysis.

- **Marine Parade Drive at the Street B intersection:**

The left-turn lane warrant analysis was conducted at this unsignalized intersection using the AM and PM peak hour traffic volumes for the eastbound (advancing) and westbound (approaching) approaches. Based on the analysis results, it was concluded that the eastbound approach would require an exclusive left-turn lane with a minimum storage length of 15 metres, for the future total interim traffic scenario. However, a storage length of 60 metres will be provided based on requirements from the City of Toronto Transportation and Works Department.

- **Marine Parade Drive at the Street A intersection:**

The left-turn lane warrant analysis was conducted at this unsignalized intersection using the AM and PM peak hours traffic volumes for the eastbound (advancing) and westbound (approaching) approaches. Based on the analysis results, it is concluded that the eastbound approach will require an exclusive left-turn lane with a minimum storage length of 15 metres, for the future total interim traffic scenario. However, a storage length of 50 metres will be provided based on requirements from the City of Toronto Transportation and Works Department.

The left-turn lane warrant analyses sheets are provided in **Appendix G**.

#### 4.2.3 Total Traffic Operations, Interim Scenario

Total future traffic volumes for the interim scenario and interim intersection lane configurations (**Figure 7**) were used in the traffic operational analyses. The existing signal timings were optimized where it was necessary. The queuing analyses were repeated using similar methodologies to determine the storage needs for the turning lanes.

The analysis of the Lake Shore Boulevard/Park Lawn Road intersection includes the proposed City modifications to the southbound, westbound and northbound approaches to accommodate background traffic:

- **Southbound approach**

One exclusive right turn lane, one through lane, plus two exclusive left-turn lanes;

- **Westbound approach**

Addition of an exclusive right turn lane; and

- **Northbound approach**

Exclusive left turn lane, through lane and exclusive right turn lane.

The interim intersection lane configurations for the future total traffic scenario are illustrated in **Figure 12**. Lane configurations marked in red denote modified lane configurations from the previously assessed scenario (background). The results of the capacity and queuing analysis for the study area signalized intersections with the interim scenario lane configurations, as discussed above, are summarized in **Tables 13** and **14** for the AM and PM peak hours, respectively. Detailed Synchro and SimTraffic output sheets are provided in **Appendix H**.

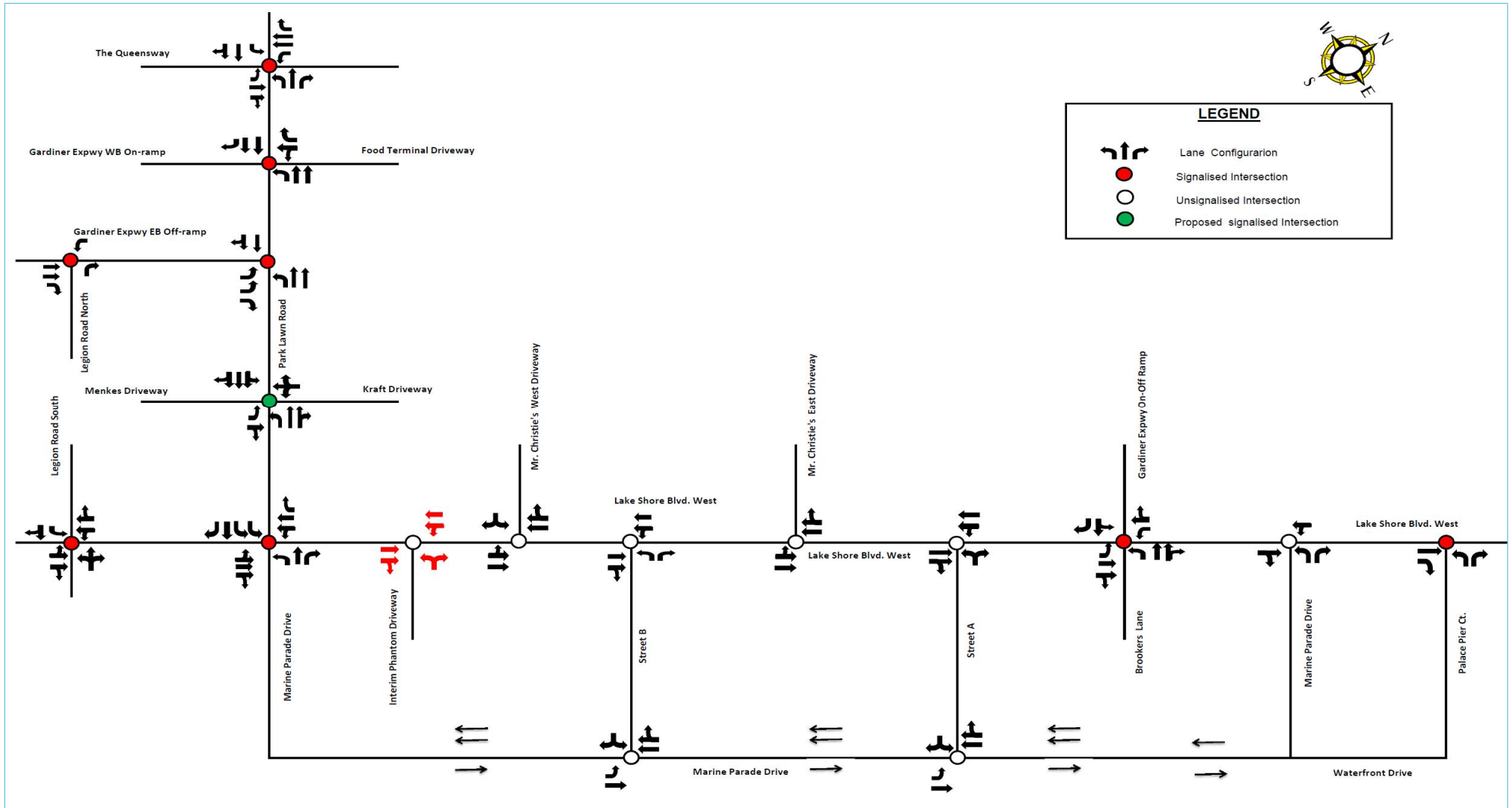


Figure 12. Interim Intersection Lane Configurations

**Table 13. Future Total Traffic Operations Signalized Intersections, AM Peak Hour, Interim Scenario**

Intersection	Average Control Delay(s) <i>(HCM-Synchro)</i>	Level of Service (v/c ratio) <i>(HCM-Synchro)</i>	Movement	Delay(s) <i>(HCM-Synchro)</i>	v/c Ratio <i>(HCM-Synchro)</i>	Level of Service <i>(HCM-Synchro)</i>	Average Queue Length (m) <i>(SimTraffic)</i>	95 <sup>th</sup> Percentile Queue Length (m) <i>(SimTraffic)</i>
<b>Signalized Intersections</b>								
The Queensway at Park Lawn Road	44.2	D(0.84)	EBL	20.5	0.29	C	14.2	23.6
			EBT-TR	42.8	0.87	D	138.0	166.3
			WBL	61.9	<b>0.91</b>	<b>E</b>	58.6	89.4
			WBT-T	17.3	0.29	B	24.2	38.0
			WBR	15.0	0.03	B	8.9	29.9
			NBL	47.6	0.73	D	19.4	33.0
			NBT	61.5	0.88	<b>E</b>	40.1	62.4
			NBR	44.9	<b>0.92</b>	D	-	-
			SBL	41.0	0.60	D	37.5	70.2
SBT-TR	57.1	0.86	<b>E</b>	186.3	293.5			
Park Lawn Road at Gardiner Expressway WB On-Ramp	13.6	B(0.70)	WBL-T	57.7	0.59	<b>E</b>	34.8	52.7
			WBR	48.2	0.02	D	5.5	13.9
			NBL	12.0	0.73	B	86.4	164.9
			NBT-T	4.6	0.33	A	11.5	27.1
			SBT-T	19.7	0.25	B	15.7	23.5
			SBR	19.3	0.64	B	48.6	71.6
Park Lawn Road at Gardiner Expressway EB Off-Ramp	10.0	A(0.67)	EBL-L	32.6	0.55	C	241.0	312.7
			EBR	2.3	0.67	A	34.9	35.1
			NBL	2.6	0.07	A	5.4	14.3
			NBT-T	4.1	0.60	A	31.0	67.5
			SBT-TR	10.6	0.22	B	47.2	74.0
Park Lawn Road at Menkes-Kraft Driveway	11.7	B(0.60)	EBL	40.4	0.05	D	4.4	11.1
			EBTR	41.4	0.15	D	9.1	16.8
			WBLTR	50.5	0.01	D	2.6	5.7
			NBL	4.3	0.08	A	2.6	6.9
			NBT-TR	10.8	0.55	B	40.8	89.4
			SBLT-T-TR	10.1	0.72	B	163.7	196.4
Park Lawn Road at Lake Shore Boulevard West	130.8	<b>F(1.16)</b>	EBLT-T-TR	173.6	<b>1.44dl</b>	<b>F</b>	290.8	310.5
			WBLT-T	29.4	0.43	C	28.4	47.4
			WBR	54.3	0.28	D	19.0	43.9
			NBL	73.8	0.78	<b>E</b>	34.7	74.3
			NBT	72.2	<b>0.90</b>	<b>E</b>	226.8	334.6
			NBR	38.4	0.04	D	70.8	252.7
			SBL	194.2	<b>1.34</b>	<b>F</b>	157.6	250.6
			SBT	31.0	0.18	C	82.5	208.3
			SBR	67.1	0.82	<b>E</b>	13.1	24.2
Legion Road South at Lake Shore Boulevard West	17.8	B(0.88)	EBLT-TR	20.4	<b>0.90</b>	C	250.8	254.3
			WBLT-TR	4.9	0.49	A	37.3	81.2
			NBLTR	42.1	0.16	D	83.9	138.5
			SBL	67.9	0.80	<b>E</b>	97.1	98.8
			SBTR	41.0	0.03	D	262.6	332.3
Gardiner Expressway WB Off-Ramp at Lake Shore Boulevard West	16.6	B(0.74)	EBL	5.4	0.78	A	17.6	30.2
			EBT-TR	3.5	0.63	A	46.0	46.4
			WBL	-	-	-	-	-
			WBTR	16.6	0.18	B	33.0	71.0
			NBL	58.8	0.73	<b>E</b>	33.4	42.9
			NBT-TR	44.5	0.34	D	57.7	110.3
			SBLT	47.5	0.50	D	37.4	72.7
			SBR	44.5	0.30	D	50.3	146.0
Mr. Christie's East Driveway at Lake Shore Boulevard West	0.1	A(0.71)	EBLT-T	0.1	0.71	A	64.3	79.8
			WBT-TR	0.1	0.22	A	-	-

**Table 13. Future Total Traffic Operations Signalized Intersections, AM Peak Hour, Interim Scenario**

Intersection	Average Control Delay(s)	Level of Service (v/c ratio)	Movement	Delay(s)	v/c Ratio	Level of Service	Average Queue Length (m)	95 <sup>th</sup> Percentile Queue Length (m)
	(HCM-Synchro)	(HCM-Synchro)		(HCM-Synchro)	(HCM-Synchro)		(HCM-Synchro)	(SimTraffic)
Gardiner Expressway EB Off-Ramp at Legion Rd North	3.1	A(0.52)	EBT-T	3.3	0.60	A	91.8	236.2
			EBR	1.7	0.02	A	14.3	72.0
			WBL	17.8	0.36	B	12.4	23.6
			NBR	0.3	0.20	A	98.8	168.3
Palace Pier Court at Lake Shore Boulevard West	90.9	<b>F(1.04)</b>	EBT	97.6	<b>0.48</b>	<b>F</b>	33.8	57.1
			EBR	1.5	0.40	A	1.3	6.5
			NBL	41.7	0.87	D	4.2	13.0
			NBR	36.0	0.77	D	10.3	22.8

Notes: EBL= eastbound left, NBT= northbound through, WBLTR= westbound shared left-through-right, EBL-R, separate eastbound left-right, dl = defacto left turning lane

**Table 14. Future Total Traffic Operations Signalized Intersections, PM Peak Hour, Interim Scenario**

Intersection	Average Control Delay(s)	Level of Service (v/c ratio)	Movement	Delay(s)	v/c Ratio	Level of Service	Average Queue Length (m)	95 <sup>th</sup> Percentile Queue Length (m)
	(HCM-Synchro)	(HCM-Synchro)		(HCM-Synchro)	(HCM-Synchro)		(HCM-Synchro)	(SimTraffic)
<b>Signalized Intersections</b>								
The Queensway at Park Lawn Road	37.7	D(0.87)	EBL	25.5	0.66	C	56.5	133.6
			EBT-TR	65.3	<b>1.01</b>	<b>E</b>	126.0	192.2
			WBL	29.4	0.79	C	118.2	154.0
			WBT-T	24.9	0.70	C	132.5	223.4
			WBR	17.8	0.10	B	7.8	28.6
			NBL	49.7	0.83	D	20.0	38.5
			NBT	35.6	0.78	D	43.2	71.8
			NBR	25.3	0.36	C	-	-
			SBL	30.8	0.26	C	6.8	16.8
Park Lawn Road at Gardiner Expressway WB On-Ramp	6.3	A(0.59)	SBT-TR	34.3	0.63	C	51.6	75.7
			WBL-T	54.9	0.21	D	3.6	12.5
			WBR	53.1	0.01	D	0.7	4.4
			NBL	7.8	0.63	A	37.5	66.6
			NBT-T	2.6	0.37	A	12.4	26.3
			SBT-T	7.4	0.23	A	23.9	46.5
Park Lawn Road at Gardiner Expressway EB Off-Ramp	9.2	A(0.51)	SBR	8.6	0.32	A	18.6	39.0
			EBL-L	18.3	0.50	B	34.5	64.9
			EBR	1.2	0.51	A	25.2	43.5
			NBL	9.1	0.29	A	11.0	19.6
			NBT-T	11.6	0.56	B	29.9	54.7
Park Lawn Road at Menkes-Kraft Driveway	4.9	A(0.42)	SBT-TR	8.0	0.39	A	26.9	54.9
			EBL	54.8	0.12	D	1.5	7.7
			EBTR	53.8	0.02	D	6.0	14.1
			WBLTR	54.0	0.04	D	5.9	11.1
			NBL	6.8	0.29	A	5.2	16.4
			NBT-TR	5.1	0.42	A	13.5	33.2
			SBLT-T-TR	1.6	0.41	A	50.8	119.0

**Table 14. Future Total Traffic Operations Signalized Intersections, PM Peak Hour, Interim Scenario**

Intersection	Average Control Delay(s)	Level of Service (v/c ratio)	Movement	Delay(s)	v/c Ratio	Level of Service	Average Queue Length (m)	95 <sup>th</sup> Percentile Queue Length (m)
	(HCM-Synchro)	(HCM-Synchro)		(HCM-Synchro)	(HCM-Synchro)		(HCM-Synchro)	(SimTraffic)
Park Lawn Road at Lake Shore Boulevard West	38.1	D(0.86)	EBLT-T-TR	28.0	<b>3.72dl</b>	C	285.2	358.0
			WBLT-T	25.9	0.65	C	25.8	66.5
			WBR	25.7	0.47	C	15.8	38.5
			NBL	62.2	0.46	E	10.1	23.6
			NBT	66.4	0.62	E	34.5	87.2
			NBR	68.8	0.01	E	1.4	5.7
			SBL	78.0	<b>1.00</b>	E	146.6	225.4
			SBT	24.3	0.32	C	86.0	205.0
Legion Road South at Lake Shore Boulevard West	8.9	A(0.60)	SBR	33.9	0.77	C	39.4	114.0
			EBLT-TR	6.7	0.58	A	249.9	257.2
			WBLT-TR	3.1	0.59	A	25.5	45.5
			NBLTR	44.8	0.04	D	4.1	10.8
			SBL	58.9	0.68	E	63.9	111.9
Gardiner Expressway WB Off-Ramp at Lake Shore Boulevard West	40.5	<b>D(0.97)</b>	SBTR	47.5	0.32	D	47.2	151.1
			EBL	31.9	0.79	C	20.6	35.8
			EBT-TR	35.8	<b>0.92</b>	D	56.3	72.0
			WBL	41.3	0.07	D	-	-
			WBTR	42.9	0.34	D	37.4	77.5
			NBL	11.7	0.13	B	21.9	45.1
			NBT-TR	11.0	0.03	B	9.5	44.7
			SBLT	14.5	0.34	B	11.9	44.5
Mr. Christie's East Driveway at Lake Shore Boulevard West	0.2	A(0.40)	SBR	56.3	<b>1.00</b>	E	119.9	125.4
			EBLT-T	0.2	0.40	A	61.5	78.5
Gardiner Expressway EB Off-Ramp at Legion Rd North	6.0	A(0.54)	WBT-TR	0.2	0.40	A	4.8	29.4
			EBT-T	5.4	0.57	A	32.4	128.2
			EBR	3.6	0.10	A	-	-
			WBL	16.2	0.47	B	15.8	27.1
Palace Pier Court at Lake Shore Boulevard West	8.7	A(0.45)	NBR	0.1	0.08	A	4.5	18.4
			EBT	8.3	0.64	A	28.1	49.7
			EBR	7.7	0.13	A	14.9	41.2
			NBL	14.7	0.09	B	5.4	17.1
			NBR	14.3	0.02	B	3.8	10.3

Notes: EBL= eastbound left, NBT= northbound through, WBLTR= westbound shared left-through-right, EBL-R, separate eastbound left-right, dl = defacto left turning lane

**Tables 13 and 14** indicate that, half of the study area signalized intersections will operate at an overall LOS “D” or better, and V/C ratios of 0.86 or lower during both the AM and PM peak hours. The exception intersections are:

- Park Lawn Road at Lake Shore Boulevard West during the AM peak hour period (LOS “F”; V/C ratio of 1.16); The shared left-through lane is shown to operate as a left-turn lane only.
- Gardiner Expressway WB Off-Ramp at Lake Shore Boulevard during the PM peak hour period (LOS “D”; V/C ratio of 0.97);
- The Queensway at Park Lawn Road during the PM peak hour period (LOS “D”; V/C ratio of 0.87);
- Lake Shore Boulevard at Legion Road South during AM peak hour period (LOS “B”; V/C ratio of 0.88); and
- Palace Pier Court at Lake Shore Boulevard West during the AM peak hour (LOS “F”; V/C ratio of 1.04). With respect to individual intersection movements, the eastbound through movement will operate at LOS “F”.

There is still residual capacity available in some of the study area intersections to accommodate traffic in the future. The capacity and queuing analyses for the unsignalized intersections for the future total interim traffic scenario, for the AM and PM peak hours, are shown in **Tables 13 and 14**.

**Table 15. Future Total Traffic Operations Unsignalized Intersections, AM Peak Hour, Interim Scenario**

Intersection	Average Control Delay(s) <i>(HCM-Synchro)</i>	Level of Service (v/c ratio) <i>(HCM-Synchro)</i>	Movement	Delay(s) <i>(HCM-Synchro)</i>	v/c Ratio <i>(HCM-Synchro)</i>	Level of Service <i>(HCM-Synchro)</i>	Average Queue Length (m) <i>(SimTraffic)</i>	95 <sup>th</sup> Percentile Queue Length (m) <i>(SimTraffic)</i>
<b>Unsignalized Intersections</b>								
Mr. Christie's West Driveway at Lake Shore Boulevard West			EBLT-T	1.8	0.88	A	89.2	112.6
			WBT-TR	0.0	0.31	-	-	-
			SBLR	26.0	0.13	D	55.2	92.7
Lake Shore Boulevard West at Street B			EBT-TR	0.0	0.88	-	11.1	20.1
			WBLT-T	2.3	0.30	A	2.1	10.8
			NBL	>1000	<b>3.43</b>	<b>F</b>	13.6	29.5
			NBR	12.3	0.07	B	6.8	14.5
Lake Shore Boulevard West at Marine Parade Drive (East)			EBTR	0.0	<b>0.99</b>	-	-	-
			WBLT	11.2	0.10	B	-	-
			NBL	>1000	<b>4.23</b>	<b>F</b>	5.4	14.2
			NBR	>1000	<b>5.48</b>	<b>F</b>	10.3	19.8
Marine Parade Drive at Street B			EBL	8.1	0.02	A	1.2	6.2
			EBT	0.0	0.07	-	-	-
			WBT-TR	0.0	0.15	-	-	-
			SBLR	11.6	0.15	B	12.4	17.7
Lake Shore Boulevard West at Street A			EBT-TR	0.0	0.46	-	77.0	87.1
			WBLT-T	39.2	0.28	<b>E</b>	36.0	45.8
			NBLR	>1000	<b>4.13</b>	<b>F</b>	75.0	75.0
Lake Shore Boulevard West at Interim Phantom Driveway			EBT-TR	0.0	0.83	-	69.3	91.5
			WBLT-T	1.0	0.29	A	-	-
			NBLR	836.2	<b>2.35</b>	<b>F</b>	85.8	99.3
Street A at Marine Parade Drive			EBL	7.7	0.05	A	1.3	6.7
			EBT	0.0	0.05	-	-	-
			WBT-TR	0.0	0.08	-	-	-
			SBLR	9.8	0.20	A	12.5	18.6

**Table 16. Future Total Traffic Operations Unsignalized Intersections, PM Peak Hour, Interim Scenario**

Intersection	Average Control Delay(s) <i>(HCM-Synchro)</i>	Level of Service (v/c ratio) <i>(HCM-Synchro)</i>	Movement	Delay(s) <i>(HCM-Synchro)</i>	v/c Ratio <i>(HCM-Synchro)</i>	Level of Service <i>(HCM-Synchro)</i>	Average Queue Length (m) <i>(SimTraffic)</i>	95 <sup>th</sup> Percentile Queue Length (m) <i>(SimTraffic)</i>
<b>Unsignalized Intersections</b>								
Mr. Christie's West Driveway at Lake Shore Boulevard West			EBLT-T	2.1	0.53	A	87.1	109.7
			WBT-TR	0.0	0.55	-	-	-
			SBLR	168.0	<b>0.94</b>	<b>F</b>	47.8	89.5
Lake Shore Boulevard West at Street B			EBT-TR	0.0	0.52	-	9.9	19.8
			WBLT-T	1.8	0.54	A	3.3	20.5
			NBL	260.2	0.89	<b>F</b>	9.0	22.8
			NBR	15.3	0.08	C	12.3	28.7
Lake Shore Boulevard West at Marine Parade Drive (East)			EBTR	0.0	0.52	-	-	-
			WBLT	1.8	0.02	A	1.5	6.8
			NBL	20.1	0.12	C	4.7	11.0
			NBR	16.8	0.14	C	6.3	13.1
Marine Parade Drive at Street B			EBL	7.9	0.05	A	2.2	8.7
			EBT	0.0	0.17	-	-	-
			WBT-TR	0.0	0.09	-	-	-
			SBLR	10.7	0.07	B	7.5	13.9
Lake Shore Boulevard West at Street A			EBT-TR	0.0	0.49	-	68.7	97.4
			WBLT-T	2.4	0.52	A	24.9	31.1
			NBLR	527.3	<b>1.83</b>	<b>F</b>	70.4	77.3
Lake Shore Boulevard West at Interim Phantom Driveway			EBT-TR	0.0	0.51	-	61.1	88.3
			WBLT-T	1.4	0.52	A	2.6	15.6
			NBLR	97.1	<b>0.52</b>	<b>F</b>	6.0	14.4
Street A at Marine Parade Drive			EBL	7.8	0.11	A	3.0	12.6
			EBT	0.0	0.08	-	-	-
			WBT-TR	0.0	0.06	-	-	-
			SBLR	9.3	0.11	A	9.9	13.4



The capacity and queuing analyses results, presented in **Tables 15** and **16**, indicate that most of the unsignalized intersection approaches will operate at acceptable levels of service during both the AM and PM peak hours with exceptions at the northbound approaches at all Humber Bay Shores development streets/interim driveway along Lake Shore Boulevard West during the AM and PM peak hour periods and only at one southbound approach (at the intersection of Mr. Christie's West) during the PM peak period. Excessive delays have been observed in the traffic operational analyses due to significant traffic volumes along Lake Shore Boulevard West in both the AM and PM peak hours. Both the proposed streets along Marine Parade Drive will operate at very good levels of service during both the AM and PM peak hours.

There is still capacity available at both the proposed streets along Marine Parade Drive where the projected traffic volumes are lower along this roadway. Most likely, trips will divert from Lake Shore Boulevard to Marine Parade Drive since Street A and Street B are proposed to be connected to Lake Shore Boulevard and Marine Parade Drive. Alternatively, outbound left turn vehicles on Street A may also choose to divert via the built segment of Street C to the Brookers Lane/Lake Shore Boulevard West traffic signals, since there is excess capacity available at this signalized intersection.

In addition, it was previously proposed by the City of Toronto to shift the existing traffic signal from the Mr. Christie's East Driveway to the future Street B/Lake Shore Boulevard intersection, which is proposed in the ultimate scenario. It is expected that this signal relocation will occur when warranted and this likely will occur at or soon after completion of the interim development scenario.

The proposed interim Phantom driveway (to be replaced by Future Street D), in the interim traffic scenario, is isolated and the estimated northbound left turn trips are 51 and 26 in the AM and PM peak hours, respectively. It is anticipated that those trips will be able to find gaps in Lake Shore Boulevard West traffic to make their turns.

The northbound left and right turn movements at the existing intersection of Lake Shore Boulevard West/Marine Parade Drive (East) will operate at LOS "F" during the AM peak hour. However, the SimTraffic simulation indicated shorter queues (2 to 3 vehicles) for this movement.

#### 4.2.4 Internal Site Intersection Operations, Interim Scenario

A review of total future traffic conditions for the interim scenario indicates that vehicle trips expected to be generated by the site can be accommodated by the proposed internal site network. A preliminary assessment was also conducted to determine the impact to traffic operations, should additional landowners decide to move their plans forward and develop in the interim scenario. The assessment included an examination of interim access and egress opportunities for each of these additional developments. The following potential scenarios were reviewed:

- **Development of Monarch Site (2151–2155 Lake Shore Boulevard West):**

In the event that Monarch develops 2151-2155 Lake Shore Boulevard West in the interim scenario, site access would be provided via Street 'C', which would be built as part of the subject development and link the portions of Street 'C' situated on the adjacent Ocean Club and B-Major sites, which in turn would provide a connection for all three developments to Street 'A', Street 'B' and Brookers Lane. The development of 2151–2155 Lake Shore Boulevard West is expected to have a minor impact on traffic operations in the interim scenario, resulting from the east-west connection of Street 'A' and Brookers Lane via Street 'C', which provides for more efficient access and egress to Marine Parade Drive and Lake Shore Boulevard West from the development proposal.

- **Development of Monarch Site (2161 & 2165 Lake Shore Boulevard West):**

In the event that Monarch develops 2161 and 2165 Lake Shore Boulevard West, site access would be provided via Street 'C', which would be built as part of the subject development and would connect to Street 'B', which provides direct access to Lake Shore Boulevard West to the north and Marine Parade Drive to the south. The analysis indicates that the subject development can be accommodated in the interim scenario with minimal impact to internal traffic operations.



- **Development of Kingbird Site (2171 Lake Shore Boulevard West):**

If the Kingbird site is developed in the interim scenario, access to the site could be provided via Street 'C' if the adjacent Monarch site (2161 & 2165 Lake Shore Boulevard West) to the east is simultaneously developed, providing a direct connection to Street 'B'. If the adjacent Monarch site is not developed in the interim scenario, the site would be rendered landlocked and a temporary access to the site via Marine Parade Drive and/or Lake Shore Boulevard West would need to be examined. Based on a review of the preliminary site concept plan for 2171 Lake Shore Boulevard West, it would appear that direct vehicular access off Lake Shore Boulevard West would not be feasible due to building placement; however a temporary connection to Marine Parade Drive is possible. This temporary site access would accommodate full turning movements to and from the site with the site traffic readily accommodated with minimal impact to Marine Parade traffic operations.

- **Development of Empire Communities Site (2183 Lake Shore Boulevard West):**

In the event that Empire Communities develops 2183 Lake Shore Boulevard West in the interim scenario, the residential and commercial developments proposed for the subject site would be accessed via Street 'D', which connects to Lake Shore Boulevard to the north and Marine Parade Drive to the south. Street 'D' would be constructed as part of the development of 2183 Lake Shore Boulevard West and provide direct access to the Phantom site (2175 Lake Shore Boulevard West) located immediately to the east, eliminating the need for a temporary access to the Phantom site in the interim scenario off of Lake Shore Boulevard West. The development of 2183 Lake Shore Boulevard is expected to have minimal impact on internal traffic operations.

Based on the above preliminary analysis, it is apparent that should additional landowners decide to move their plans forward and develop in the interim scenario, traffic generation from these additional developments are expected to be accommodated with minimal impact to internal traffic operations. Interim access and egress opportunities are also available for each of these additional developments, however further analysis is required to determine the specific design of the access and egress to the Kingbird site, once the site plan for 2171 Lake Shore Boulevard West has been finalized.

### 4.3 Humber Bay Shores Developments, Ultimate Precinct Plan

The proposed Humber Bay Shores site plan for the ultimate scenario is shown in **Figure 13**. The developments will consist of residential and commercial land uses and be accessible by three public streets connecting Lake Shore Boulevard to Marine Parade Drive. Due to the proposed LRT route along Lake Shore Boulevard West, all left-in and left out movements will be restricted at the unsignalized streets. The proposed Humber Bay Shores mixed-use developments will have access and egress from Lake Shore Boulevard and Marine Parade Drive by way of the following intersections with the allowed movements and type of control:

- **Lake Shore Boulevard at Street D**  
This proposed unsignalized T-intersection will be slightly west of the interim Phantom driveway, which will now be closed, and will permit right-in/right-out movements only.
- **Lake Shore Boulevard at Street B/Mr. Christie's Relocated Driveway**  
This proposed 4-legged intersection will be signalized in the ultimate traffic scenario and will allow all movements.
- **Lake Shore Boulevard at Street A**  
This proposed unsignalized T-intersection in the ultimate scenario will allow right-in/right-out movements only.
- **Marine Parade Drive at Street D**  
This proposed unsignalized T-intersection in the ultimate scenario will allow right-in/right-out movements only.
- **Street C**  
This proposed street runs between Street D and Street A and intersections with Street B.

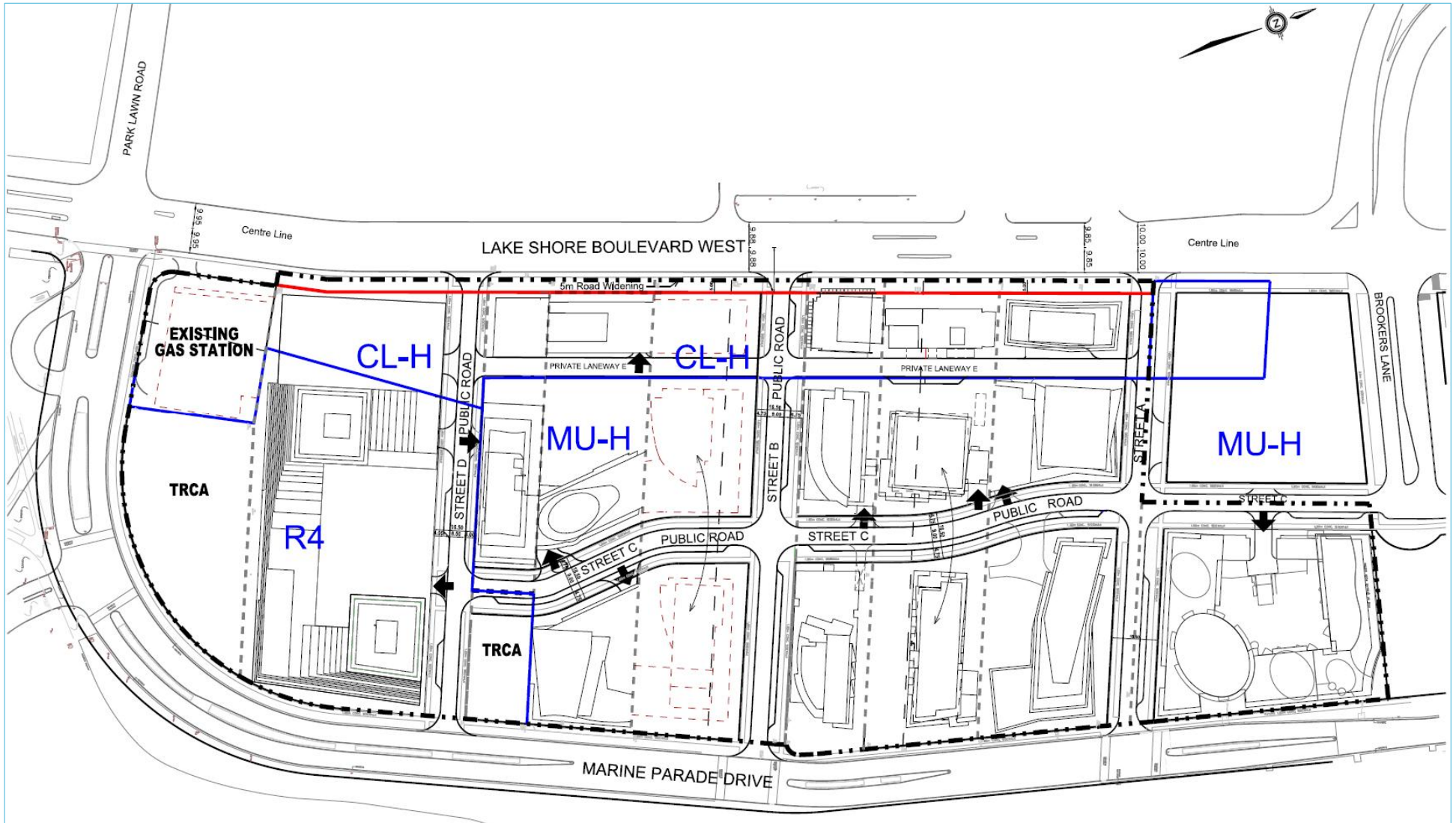


Figure 13. Humber Bay Shores Developments, Ultimate Precinct Plan

- **Marine Parade Drive at Street B**  
This proposed unsignalized T-intersection in the ultimate scenario will allow all movements.
- **Marine Parade Drive at Street A**  
This proposed unsignalized T-intersection in the ultimate scenario will allow all movements.

**4.4 Humber Bay Shores Developments, Ultimate Traffic Conditions**

**4.4.1 Humber Bay Shores Developments Ultimate Total Traffic**

The site traffic from the proposed ultimate Precinct Plan was estimated using trip rates presented in **Table 5** for the ultimate traffic scenario for both the residential and commercial land uses as displayed in **Table 17**. **Table 17** indicates that the residential developments will generate 137 trips inbound and 1,060 trips outbound, resulting in 1,197 trips in total in the AM peak hour. They will produce 691 trips inbound and 279 trips outbound, resulting in 970 trips in total in the PM peak hour. The proposed commercial developments will generate net 109 trips inbound and net 69 trips outbound, resulting in a net 178 trips in total in the AM peak hour. In the PM peak hour they produce net 227 trips inbound and net 237 trips outbound, resulting in a net 464 trips in total. It is anticipated that the commercial development will attract a total of 130 pass-by trips in the PM peak hour. Due to the mixed-use type of developments, there would be opportunity for shared trips (internal) which were estimated at 66 trips in the PM peak hour.

**Table 17. Trip Generation, Ultimate Precinct Plan**

Ownership		Land Use	Size	Code	Trip Rate Weekday AM			Trip Rate Weekday PM		
Parcel	Residential Developments		Units		In	Out	Total	In	Out	Total
<b>Trip Rate</b>				(/Unit)	<u>0.026</u>	<u>0.201</u>	<u>0.227</u>	<u>0.131</u>	<u>0.053</u>	<u>0.184</u>
1	Monarch (Waterview) – 2131/9 Lakeshore	Condominiums	344	LEA	9	69	78	45	18	63
2	B-Major Homes – 2143/7 Lakeshore		887		23	178	201	116	47	163
3	Monarch Waterview – 2151/5 Lakeshore		622		16	125	141	81	33	114
4	Ocean Club – 2157 Lakeshore		516		13	104	117	68	27	95
5	Monarch Waterview – 2161/5 Lakeshore		700		18	141	159	92	37	129
6	Kingbird – 2171 Lakeshore		540		14	109	123	71	29	99
7	Phantom – 2175 Lakeshore		378		10	76	86	50	20	70
8	Empire Communities – 2183 Lakeshore		1,285		33	258	292	168	68	236
<b>Total Residential Units</b>			<b>5,272</b>							
<b>Total Trips Residential Developments</b>					<b>137</b>	<b>1,060</b>	<b>1,197</b>	<b>691</b>	<b>279</b>	<b>970</b>
Parcel	Commercial/Retail Developments		GFA Sq. m		In	Out	Total	In	Out	Total
<b>Trip Rate</b>				(/100 m <sup>2</sup> )	<u>0.462</u>	<u>0.294</u>	<u>0.756</u>	<u>1.379</u>	<u>1.428</u>	<u>2.807</u>
1	Monarch (Waterview) – 2131/9 Lakeshore	Commercial	2,416	ITE (820)	11	7	18	33	35	68
2	B-Major Homes – 2143/7 Lakeshore		3,933		18	12	30	54	56	110
3	Monarch Waterview – 2151/5 Lakeshore		1,991		9	6	15	27	28	56
4	Ocean Club – 2157 Lakeshore		3,357		16	10	25	46	48	94
5	Monarch Waterview – 2161/5 Lakeshore		3,968		18	12	30	55	57	111
6	Kingbird – 2171 Lakeshore		1,532		7	5	12	21	22	43
7	Phantom – 2175 Lakeshore		1,500		7	4	11	21	21	42
8	Empire Communities – 2183 Lakeshore		4,820		22	14	36	66	69	135
<b>Total Commercial Gross Floor Area</b>			<b>23,517</b>							
<b>Total Commercial Trips</b>					<b>109</b>	<b>69</b>	<b>178</b>	<b>324</b>	<b>336</b>	<b>660</b>
Pass-By Trip Reduction 20%								-0.28	-0.29	-0.56
<u>Trip Rate</u>								<u>-0.28</u>	<u>-0.29</u>	<u>-0.56</u>
<u>Trip Rate Used</u>								<u>-0.28</u>	<u>-0.28</u>	<u>-0.56</u>
Total Pass-By Trips								<b>-65</b>	<b>-65</b>	<b>-130</b>
Shared Trip Reduction (In = 10%, Out = 10%)								-0.14	-0.14	-0.28
<u>Trip Rate</u>								<u>-0.14</u>	<u>-0.14</u>	<u>-0.28</u>
Total Shared Trips								<b>-32</b>	<b>-34</b>	<b>-66</b>
<b>Net Trips Commercial Developments</b>					<b>109</b>	<b>69</b>	<b>178</b>	<b>227</b>	<b>237</b>	<b>464</b>
<b>Total Net Trips</b>					<b>246</b>	<b>1,129</b>	<b>1,375</b>	<b>918</b>	<b>517</b>	<b>1,434</b>

The proposed ultimate developments will generate net 246 trips inbound and net 1,129 trips outbound, resulting in a net 1,375 trips in total in the AM peak hour. In the PM peak hour they produce net 918 trips inbound and net 517 trips outbound, resulting in a net 1,434 trips in total.

The total estimated inbound/outbound trips from the residential and commercial developments were assigned to the internal road network through driveways based on most logical routes. Outside of the development boundary, trips were assigned using information from the trip distribution (**Appendix E**).

The resulting total site traffic from the proposed Ultimate Precinct Plan is shown in **Figure 14**. Pass-by trips are shown in **Figure 15**. The existing traffic volumes (**Figure 2**), future background traffic volumes ultimate scenario (**Figure 5**) and estimated total site traffic (**Figure 14**) were added to develop future total ultimate scenario volumes which are illustrated in **Figure 16**.

#### 4.4.2 Left Turn Lane Warrant Analysis, Ultimate Scenario

The left-turn lane warrant analyses were repeated for the unsignalized intersections along Marine Parade Drive to confirm the left-turn lane storage requirements due to the increase in the left-turning volumes in the ultimate traffic scenario.

- **Marine Parade Drive at the Street B intersection:**

The left-turn lane warrant analysis was repeated at this unsignalized intersection using the AM and PM peak hour traffic volumes for the eastbound (advancing) and westbound (approaching) approaches. Based on the previous analysis results, it was concluded that an exclusive left-turn lane should be provided at the eastbound approach under future total interim scenario. As noted previously, a storage length of 60 metres will be provided based on requirements from the City of Toronto Transportation & Works Department, which will be sufficient under the future total ultimate traffic scenario.

- **Marine Parade Drive at the Street A intersection:**

The left-turn lane warrant analysis was conducted at this unsignalized intersection using the AM and PM peak hour traffic volumes for the eastbound (advancing) and westbound (approaching) approaches. Based on the warrant analysis results, it was concluded that the eastbound approach will be provided with an exclusive left-turn lane with 50 metres of storage based on requirements from the City of Toronto Transportation & Works Department in the interim conditions would be sufficient to handle left turning volumes under the future total ultimate traffic scenario.

The left-turn lane warrant analysis sheets are provided in **Appendix I**.

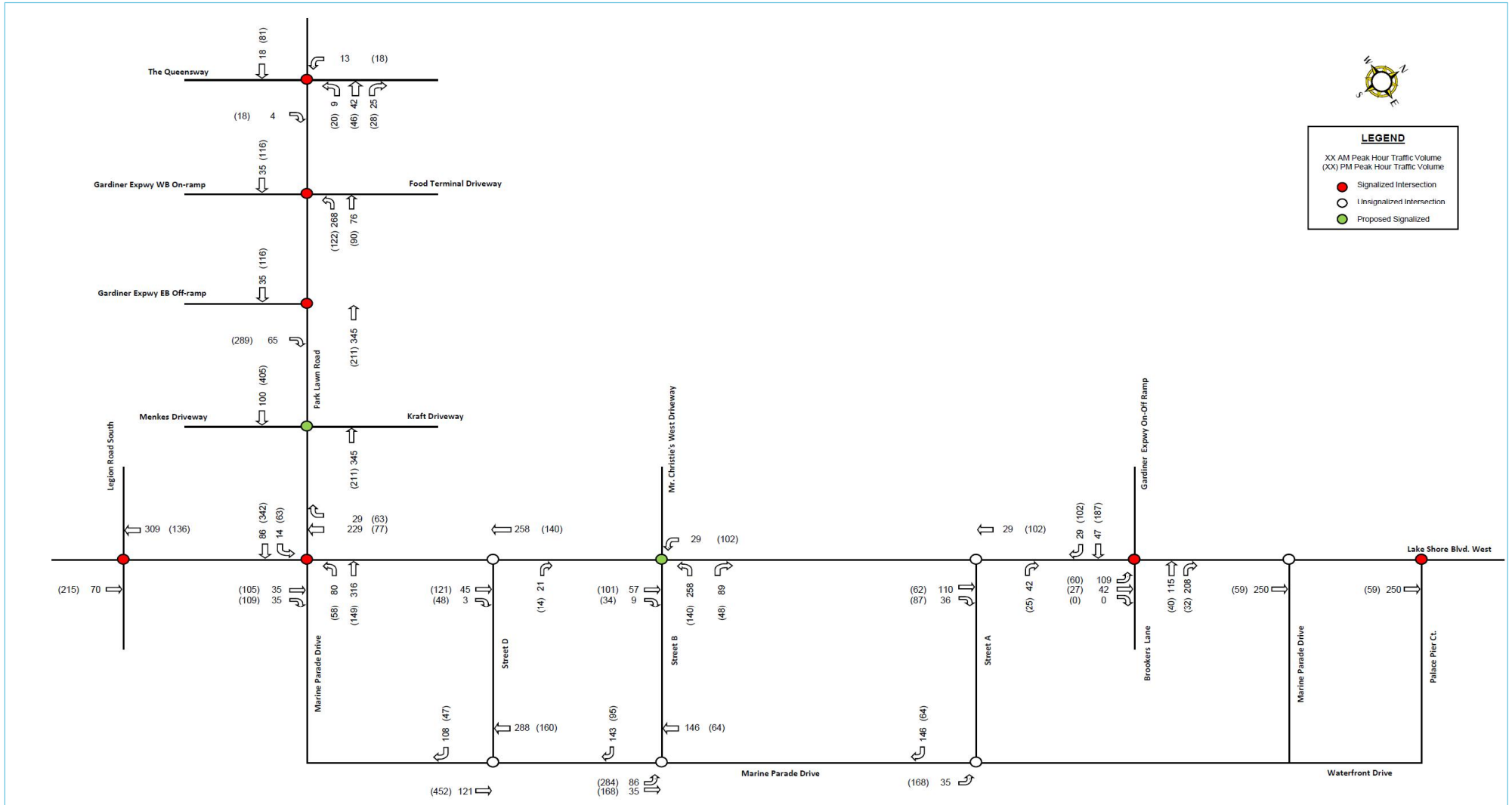


Figure 14. Humber Bay Shores Developments Ultimate Site Total Traffic Volumes

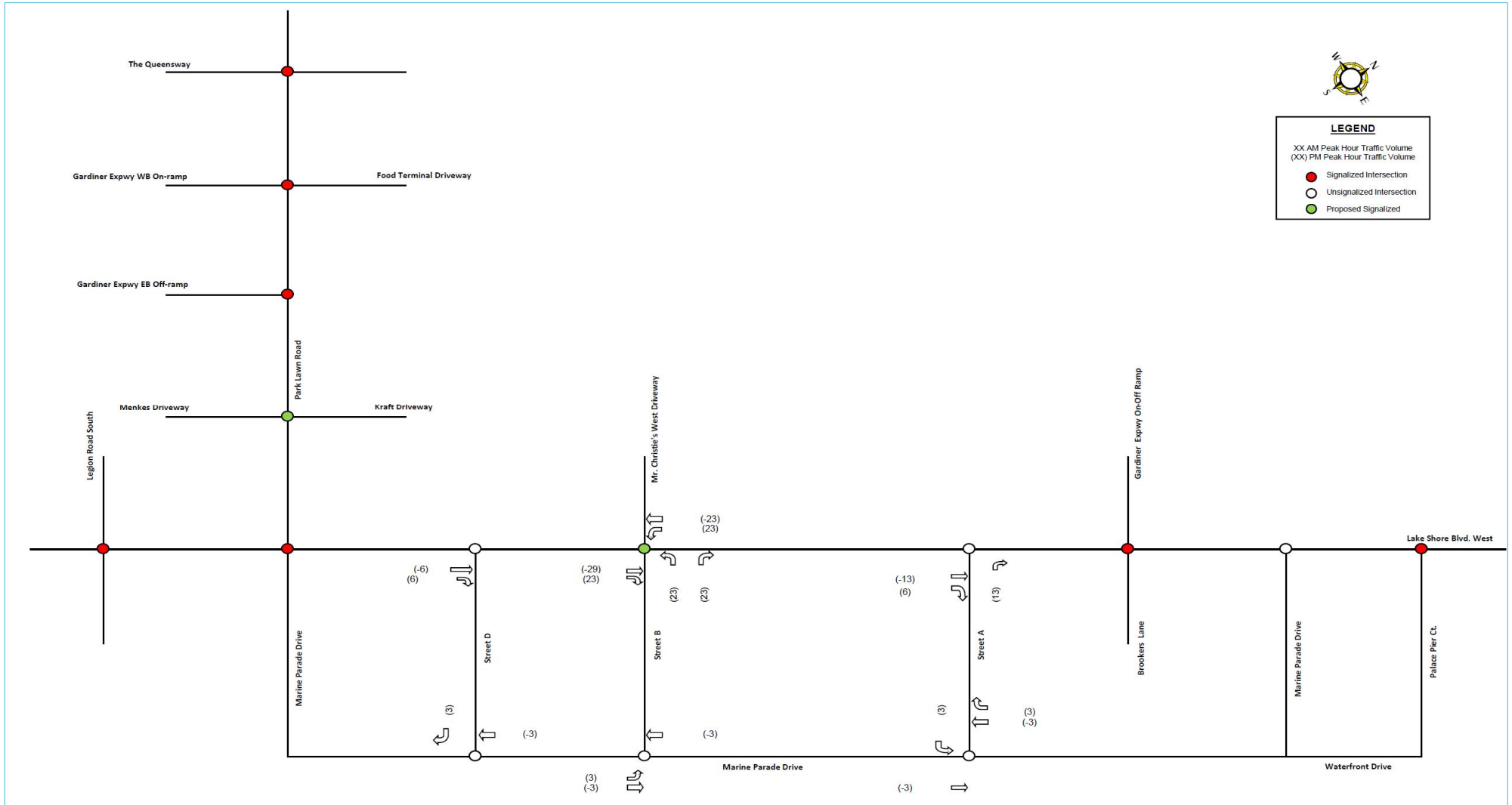


Figure 15. Pass-By Traffic, Ultimate Scenario



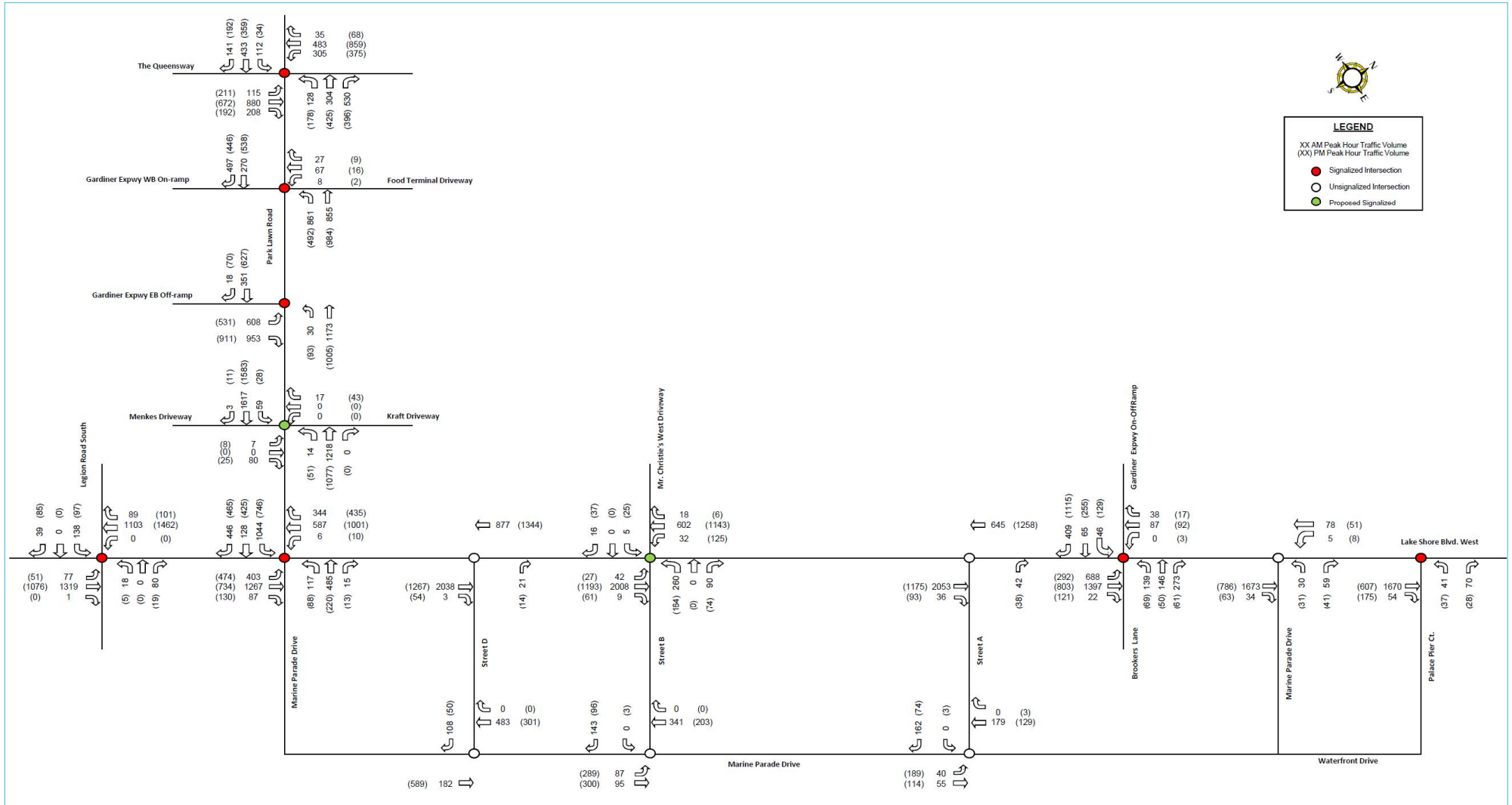


Figure 16. Future Total Traffic Volumes, Ultimate Scenario

#### 4.4.3 Total Traffic Operations, Ultimate Scenario

Net total future traffic volumes (**Figure 15** plus **Figure 16**) for the ultimate scenario were used in the traffic operational analyses. The signal timings used in the ultimate scenario used set cycle lengths and were optimized where necessary. Furthermore, the signal timings at the intersection of Park Lawn Road/Lake Shore Boulevard were optimized and the cycle length set to 120 seconds. In conjunction with this, the Marine Parade Drive northbound left turn lane must be shifted further to the west so that the path of these turning vehicles does not overlap with the turning path of the south-to-eastbound left turning vehicles in the outer left turn lane on Park Lawn Road.

Through consultation with the City of Toronto, it was established that pedestrian crossings must be maintained for all intersection approaches. With pedestrian crossings in place, minimum pedestrian green times are required to allow for pedestrians to cross their respective approaches and less green time is available for the critical turning movements. Therefore, the intersection of Park Lawn Road/Lake Shore Boulevard is expected to operate above critical thresholds.

The ultimate intersection lane configuration (**Figure 17**) includes several revisions compared to the interim scenario:

- Park Lawn Road / Lake Shore Boulevard
  - WB left/thru-thru-right to left-thru-thru-right
  - EB left/thru-thru-right to left-thru-thru/right
- Park Lawn Road / Gardiner Expressway EB Off-Ramp
  - EB left-left-right to left-left/right-right
- Lake Shore Boulevard / Street D
  - WB left/thru-thru to dual thru
  - NB left/right to right
- Lake Shore Boulevard / Street B
  - EB thru-thru/right to left-thru-thru/right
  - WB left/thru-thru to left-thru-thru/right
  - NB left-right to left-thru/right
  - SB re-aligned with Mr. Christie's Access
- Lake Shore Boulevard / Street A
  - WB left/thru-thru to dual thru
  - NB left/right to right

The eastbound and westbound left turn movements at the Park Lawn Road/Lake Shore Boulevard intersection were given exclusive turning lanes to reflect the proposed future lane configuration after the implementation of light rail transit on Lake Shore Boulevard.

The queuing analyses were repeated using the same simulation methodologies applied in the previous assessments.

The results of the capacity and queuing analysis for the study area intersections are summarized in **Tables 18 and 19** for the AM and PM peak hours, respectively. Detailed Synchro and SimTraffic output sheets are provided in **Appendix J**.



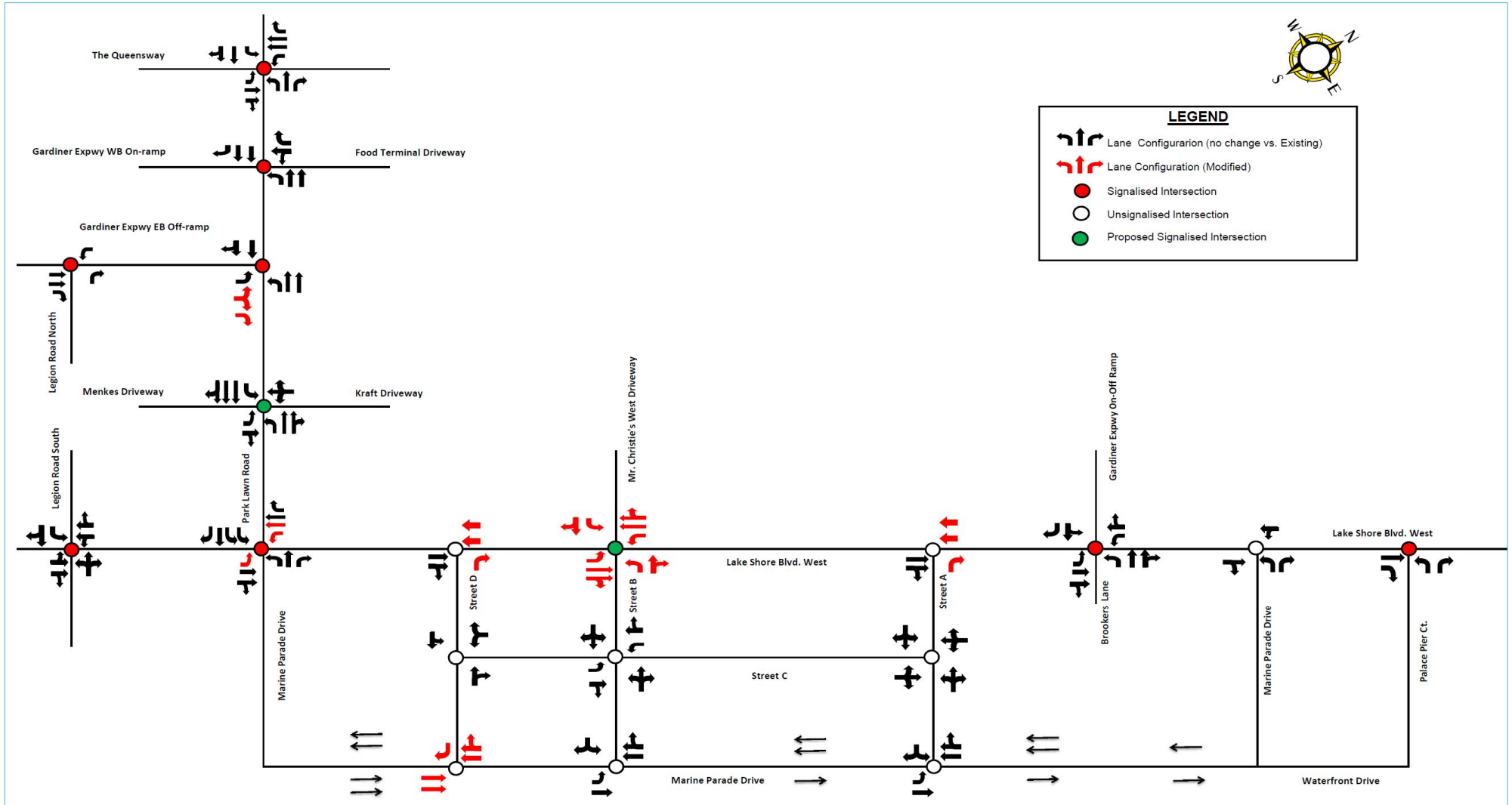


Figure 17. Ultimate Intersection Lane Configurations

**Table 18. Future Total Traffic Operations Signalized Intersections, AM Peak Hour, Ultimate Scenario**

Intersection	Average Control Delay(s) <i>(HCM-Synchro)</i>	Level of Service (v/c ratio) <i>(HCM-Synchro)</i>	Movement	Delay(s) <i>(HCM-Synchro)</i>	v/c Ratio <i>(HCM-Synchro)</i>	Level of Service <i>(HCM-Synchro)</i>	Average Queue Length (m) <i>(SimTraffic)</i>	95 <sup>th</sup> Percentile Queue Length (m) <i>(SimTraffic)</i>
<b>Signalized Intersections</b>								
The Queensway at Park Lawn Road	48.9	D(0.84)	EBL	21.4	0.30	C	59.3	160.9
			EBT-TR	63.3	<b>1.00</b>	<b>E</b>	257.3	330.5
			WBL	52.8	0.88	D	114.4	154.0
			WBT-T	20.4	0.33	C	155.6	409.8
			WBR	17.6	0.04	B	7.8	27.0
			NBL	34.1	0.59	C	15.0	40.5
			NBT	41.1	0.67	D	43.3	73.6
			NBR	62.4	<b>0.81</b>	E	17.3	64.8
			SBL	39.0	0.52	D	32.8	65.4
Park Lawn Road at Gardiner Expressway WB On-Ramp	27.6	C(0.75)	SBT-TR	47.7	0.80	D	96.5	132.6
			WBL-T	51.4	0.56	D	26.3	48.0
			WBR	43.7	0.02	D	10.3	21.0
			NBL	13.1	<b>0.80</b>	B	57.8	124.4
			NBT-T	4.3	0.34	A	19.1	38.2
			SBT-T	37.4	0.32	D	41.1	109.1
Park Lawn Road at Gardiner Expressway EB Off-Ramp	20.3	C(0.76)	SBR	82.7	0.62	F	131.8	208.3
			EBL-LR	26.7	0.73	C	228.0	335.4
			EBR	21.8	0.53	C	27.5	48.9
			NBL	14.2	0.08	B	4.9	20.1
			NBT-T	17.7	0.78	B	67.5	112.6
Park Lawn Road at Menkes-Kraft Driveway	12.4	B(0.55)	SBT-TR	8.7	0.25	A	72.3	156.5
			EBL	35.5	0.03	D	2.0	7.7
			EBTR	37.4	0.25	D	30.7	71.3
			WBLTR	45.5	0.01	D	3.1	9.1
			NBL	12.0	0.11	B	1.6	7.5
			NBT-TR	16.8	0.63	B	48.9	90.8
Park Lawn Road at Lake Shore Boulevard West	154.7	F(1.54)	SBL	8.1	0.24	A	12.4	59.0
			SBT-T-TR	7.7	0.49	A	163.2	198.1
			EBL	616.9	<b>2.25</b>	<b>F</b>	285.7	298.8
			EBT-TR	137.1	1.20	F	286.1	354.7
			WBL	33.8	0.12	C	0.6	3.4
			WBT-T	39.4	0.65	D	60.4	95.4
			WBR	34.7	0.35	C	38.8	72.0
			NBL	34.7	0.39	C	14.1	46.3
			NBT	72.6	<b>0.97</b>	<b>E</b>	266.4	374.9
			NBR	30.5	0.04	C	191.4	407.1
Legion Road South at Lake Shore Boulevard West	12.1	B(0.78)	SBL-L	234.1	<b>1.40</b>	<b>F</b>	192.7	198.9
			SBT	12.4	0.15	B	157.8	262.2
			SBR	16.2	0.50	B	44.1	147.9
			EBLT-TR	13.7	0.85	B	236.2	309.5
			WBLT-TR	7.2	0.58	A	53.4	114.3
Gardiner Expressway WB Off- ramp at Lake Shore Boulevard West	16.3	B(0.74)	NBLTR	23.8	0.19	C	29.2	56.5
			SBL	27.6	0.55	C	68.9	120.5
			SBTR	22.7	0.03	C	62.7	198.6
			EBL	14.9	0.81	B	27.4	44.6
			EBT-TR	11.7	0.68	B	60.4	64.7
			WBL	-	-	-	-	-
			WBTR	25.5	0.25	C	22.9	58.7
			NBL	34.8	0.56	C	27.0	41.6
			NBT-TR	35.2	0.86dr	D	40.3	70.7
			SBLT	38.3	0.62	D	20.0	41.6
			SBR	0.4	0.28	A	14.2	74.6

**Table 18. Future Total Traffic Operations Signalized Intersections, AM Peak Hour, Ultimate Scenario**

Intersection	Average Control Delay(s)	Level of Service (v/c ratio)	Movement	Delay(s)	v/c Ratio	Level of Service	Average Queue Length (m)	95 <sup>th</sup> Percentile Queue Length (m)
	(HCM-Synchro)	(HCM-Synchro)		(HCM-Synchro)	(HCM-Synchro)	(HCM-Synchro)	(SimTraffic)	(SimTraffic)
Street B/ Mr. Christie's West Driveway at Lake Shore Boulevard West	27.0	C(0.91)	EBL	5.8	0.08	A	15.1	57.9
			EBT-TR	19.6	<b>0.90</b>	B	107.7	128.3
			WBL	36.0	0.49	D	10.5	26.0
			WBT-TR	11.8	0.32	B	32.2	60.9
			NBL	117.6	1.07	<b>F</b>	78.5	98.6
			NBTR	37.9	0.29	D	25.8	54.5
			SBL	45.8	0.04	D	1.9	7.2
Gardiner Expressway EB Off-Ramp at Legion Rd North	3.7	A(0.55)	EBT-T	3.4	0.55	A	287.4	630.9
			EBR	1.5	0.02	A	2.8	30.1
			WBL	34.8	0.56	C	5.7	15.3
			NBR	0.3	0.19	A	102.6	165.6
Palace Pier Court at Lake Shore Boulevard West	210.1	<b>F(1.11)</b>	EBT	228.4	<b>1.45</b>	<b>F</b>	116.3	130.5
			EBR	7.0	0.06	A	6.7	29.4
			NBL	33.4	0.10	C	6.9	16.6
			NBR	34.1	0.14	C	12.1	26.0

Notes: dr = defacto right turning lane

**Table 19. Future Total Traffic Operations Signalized Intersections, PM Peak Hour, Ultimate Scenario**

Intersection	Average Control Delay (s)	Level of Service (v/c ratio)	Movement	Delay(s)	v/c Ratio	Level of Service	Average Queue Length (m)	95 <sup>th</sup> Percentile Queue Length (m)
	(HCM-Synchro)	(HCM-Synchro)		(HCM-Synchro)	(HCM-Synchro)	(HCM-Synchro)	(SimTraffic)	(SimTraffic)
<b>Signalized Intersections</b>								
The Queensway at Park Lawn Road	34.9	C(0.86)	EBL	24.1	0.65	C	85.4	172.1
			EBT-TR	56.3	<b>0.97</b>	<b>E</b>	131.8	200.7
			WBL	37.8	0.86	D	129.0	135.8
			WBT-T	26.7	0.73	C	328.4	643.7
			WBR	18.8	0.10	B	12.3	35.3
			NBL	52.6	0.89	D	38.8	69.6
			NBT	26.0	0.78	C	38.0	64.4
			NBR	12.5	0.41	B	1.4	13.1
			SBL	30.4	0.26	C	5.6	14.2
Park Lawn Road at Gardiner Expressway WB On-Ramp	9.8	A(0.65)	WBL-T	39.7	0.17	D	5.5	19.6
			WBR	38.5	0.01	D	3.5	12.3
			NBL	6.4	0.73	A	50.9	93.6
			NBT-T	3.0	0.40	A	17.6	55.1
			SBT-T	9.6	0.30	A	32.9	76.5
			SBR	27.1	0.32	C	30.3	64.0
Park Lawn Road at Gardiner Expressway EB Off-Ramp	19.4	B(0.66)	EBL-LR	22.7	0.76	C	174.7	325.8
			EBR	26.2	0.76	C	30.7	43.3
			NBL	10.6	0.31	B	15.5	33.4
			NBT-T	11.5	0.59	B	48.2	78.4
			SBT-TR	23.0	0.42	C	106.8	198.1
Park Lawn Road at Menkes-Kraft Driveway	4.8	A(0.47)	EBL	39.3	0.09	D	3.0	10.1
			EBTR	39.5	0.13	D	7.5	18.1
			WBLTR	38.8	0.03	D	5.4	12.4
			NBL	11.8	0.34	B	9.7	23.9
			NBT-TR	7.8	0.49	A	34.7	63.9
			SBL	0.8	0.08	A	23.6	86.4
SBT-T-TR	0.9	0.43	A	157.2	196.3			

**Table 19. Future Total Traffic Operations Signalized Intersections, PM Peak Hour, Ultimate Scenario**

Intersection	Average Control Delay (s)	Level of Service (v/c ratio)	Movement	Delay(s)	v/c Ratio	Level of Service	Average Queue Length (m)	95th Percentile Queue Length (m)
	(HCM-Synchro)	(HCM-Synchro)		(HCM-Synchro)	(HCM-Synchro)		(HCM-Synchro)	(SimTraffic)
Park Lawn Road at Lake Shore Boulevard West	83.2	F(1.13)	EBL	227.9	1.40	F	279.2	312.7
			EBT-TR	18.0	0.53	B	275.7	360.3
			WBL	26.1	0.06	C	5.2	29.6
			WBT-T	59.6	0.99	E	82.0	84.6
			WBR	35.3	0.67	D	45.0	71.5
			NBL	41.5	0.54	D	21.6	45.6
			NBT	45.7	0.70	D	49.6	78.6
			NBR	34.5	0.01	C	2.9	9.3
			SBL-L	213.1	1.35	F	195.7	200.9
			SBT	27.4	0.64	C	193.5	213.4
			SBR	23.7	0.46	C	116.4	253.4
Legion Road South at Lake Shore Boulevard West	8.3	A(0.61)	EBLT-TR	6.1	0.58	A	155.4	286.8
			WBLT-TR	6.4	0.63	A	69.9	123.7
			NBLTR	32.2	0.04	C	5.2	11.8
			SBL	37.5	0.54	D	23.9	43.8
			SBTR	34.0	0.28	C	11.1	21.7
Gardiner Expressway WB Off-ramp at Lake Shore Boulevard West	9.0	A(0.77)	EBL	1.9	0.47	A	23.5	42.4
			EBT-TR	2.3	0.55	A	38.8	71.8
			WBL	17.9	0.02	B	0.6	3.5
			WBTR	19.3	0.20	B	16.4	30.7
			NBL	25.2	0.41	C	13.1	25.0
			NBT-TR	21.0	0.07	C	13.5	26.6
			SBLT	37.4	0.81	D	56.6	98.7
SBR	3.6	0.77	A	106.1	170.8			
Street B/ Mr. Christie's West Driveway at Lake Shore Boulevard West	22.4	C(0.67)	EBL	10.8	0.11	B	7.9	36.2
			EBT-TR	23.5	0.79	C	70.2	112.0
			WBL	15.3	0.52	B	27.6	57.3
			WBT-TR	20.1	0.70	C	78.2	84.0
			NBL	30.6	0.55	C	43.2	74.9
			NBTR	26.1	0.05	C	9.1	20.3
			SBL	36.9	0.18	D	4.3	12.5
SBTR	35.7	0.02	D	11.4	20.4			
Gardiner Expressway EB Off-Ramp at Legion Rd North	6.9	A(0.61)	EBT-T	6.5	0.62	A	152.2	447.0
			EBR	3.6	0.10	A	17.7	80.2
			WBL	17.5	0.60	B	28.3	49.5
			NBR	0.1	0.08	A	26.5	81.5
Palace Pier Court at Lake Shore Boulevard West	19.9	B(0.47)	EBT	23.4	0.81	C	51.1	86.4
			EBR	10.9	0.17	B	25.9	54.4
			NBL	12.5	0.06	B	4.2	11.8
			NBR	12.2	0.02	B	3.4	11.2

The capacity analyses results presented in **Tables 18 and 19** indicate that, with the exception of two intersections, the study area signalized intersections will operate at an overall LOS “D” or better and V/C ratios of 0.92 or lower during both the AM and PM peak hours. The two exception intersections are:

- Park Lawn Road at Lake Shore Boulevard West (V/C ratio of 1.54 and overall LOS “F” during the AM and V/C ratio of 1.13 and overall LOS “F” during the PM peak hour); and
- Palace Pier Court at Lake Shore Boulevard West (V/C ratio of 1.11 with overall LOS “F” during the AM peak hour).

The results show that the overall intersection of Park Lawn Road/Lake Shore Boulevard will continue to operate above the theoretical capacity with high delay. It should be noted that the southbound left-turn movement will

continue to operate above critical thresholds; however, there is additional capacity for the southbound through movement. Therefore, it is likely that traffic will naturally shift and use Marine Parade Drive as an alternate route.

Traffic volumes accessing the Palace Pier Court are shown to surpass capacity thresholds; therefore, the use of two eastbound through lanes should increase the capacity of the intersection and reduce delays.

With respect to individual intersection movements, some are shown to operate at LOS “E” and “F”. The capacity and queuing analyses for the unsignalized intersection for the future total ultimate traffic scenario for the AM and PM peak hours are shown in **Tables 20** and **21**, respectively.

**Table 20. Future Total Traffic Operations Unsignalized Intersections, AM Peak Hour, Ultimate Scenario**

Intersection	Average Control Delay (s) <i>(HCM-Synchro)</i>	Level of Service (v/c ratio) <i>(HCM-Synchro)</i>	Movement	Delay(s) <i>(HCM-Synchro)</i>	v/c Ratio <i>(HCM-Synchro)</i>	Level of Service <i>(HCM-Synchro)</i>	Average Queue Length (m) <i>(SimTraffic)</i>	95 <sup>th</sup> Percentile Queue Length (m) <i>(SimTraffic)</i>
<b>Unsignalized Intersections</b>								
Lake Shore Boulevard West at Marine Parade Drive (East)			EBTR	0.0	1.05	-	97.7	226.8
			WBTL	7.8	0.07	A	1.5	7.6
			NBL	>1000	<b>3.41</b>	<b>F</b>	6.4	17.8
			NBR	>1000	<b>3.78</b>	<b>F</b>	21.3	55.2
Marine Parade Drive at Street B			EBL	8.3	0.08	A	5.2	17.2
			EBT	0.0	0.06	-	-	-
			WBT-TR	0.0	0.14	-	20.0	69.2
			SBLR	10.3	0.19	B	25.7	58.3
Lake Shore Boulevard West at Street A			EBT-TR	0.0	0.87	-	86.1	109.9
			WBT-T	0.0	0.20	-	0.8	3.9
			NBR	16.1	0.12	C	59.8	88.9
Lake Shore Boulevard West at Street D			EBT-TR	0.0	0.85	-	60.4	74.8
			WBT-T	0.0	0.27	-	-	-
			NBR	11.1	0.04	B	10.1	29.7
Street A at Marine Parade Drive			EBL	7.7	0.03	A	0.5	4.0
			EBT	0.0	0.03	-	-	-
			WBT-TR	0.0	0.08	-	-	-
			SBLR	9.7	0.19	A	12.1	18.5
Street D at Marine Parade Drive			EBT-T	0.0	0.06	-	-	-
			WBT-TR	0.0	0.20	-	36.0	77.8
			SBR	10.8	0.16	B	28.9	59.4

Notes: Where “Err” is shown, the values have significantly surpassed critical thresholds

**Table 21. Future Total Traffic Operations Unsignalized Intersections, PM Peak Hour, Ultimate Scenario**

Intersection	Average Control Delay (s) <i>(HCM-Synchro)</i>	Level of Service (v/c ratio) <i>(HCM-Synchro)</i>	Movement	Delay(s) <i>(HCM-Synchro)</i>	v/c Ratio <i>(HCM-Synchro)</i>	Level of Service <i>(HCM-Synchro)</i>	Average Queue Length (m) <i>(SimTraffic)</i>	95 <sup>th</sup> Percentile Queue Length (m) <i>(SimTraffic)</i>
<b>Unsignalized Intersections</b>								
Lake Shore Boulevard West at Marine Parade Drive (East)			EBTR	0.0	0.54	-	0.3	3.2
			WBTL	1.6	0.01	A	1.3	6.6
			NBL	20.4	0.12	C	4.4	9.6
			NBR	17.1	0.13	C	4.2	9.7
Marine Parade Drive at Street B			EBL	8.5	0.24	A	9.5	20.7
			EBT	0.0	0.20	-	0.3	3.2
			WBT-TR	0.0	0.09	-	0.3	3.2
			SBLR	10.4	0.14	B	9.3	13.0
Lake Shore Boulevard West at Street A			EBT-TR	0.0	0.50	-	27.3	85.5
			WBT-T	0.0	0.40	-	21.9	30.7
			NBR	10.2	0.06	B	5.9	12.7
Lake Shore Boulevard West at Street D			EBT-TR	0.0	0.53	-	6.6	31.3
			WBT-T	0.0	0.42	-	106.3	109.7
			NBR	11.4	0.03	B	1.8	7.6
Street A at Marine Parade Drive			EBL	7.9	0.14	A	4.1	12.8
			EBT	0.0	0.07	-	-	-
			WBT-TR	0.0	0.05	-	-	-
			SBLR	9.4	0.09	A	10.1	15.4
Street D at Marine Parade Drive			EBT-T	0.0	0.19	-	-	-
			WBT-TR	0.0	0.13	-	-	-
			SBR	9.5	0.07	A	8.1	14.7

The capacity and queuing analysis results presented in **Tables 20** and **21** indicate that all unsignalized intersections will operate at excellent levels of service during both the AM and PM peak hours with the exception of the northbound movements at the T-intersection of Lake Shore Boulevard West at Marine Parade Drive (East) during the AM peak hour. However, these turning movements on Marine Parade Drive northbound exist today, and with the completion of the Precinct Plan roads in the future, these movements could be directed to use the future signalized Lake Shore Boulevard / Street B intersection.

**4.4.4 Internal Site Intersection Operations, Ultimate Scenario**

To assess the internal site intersection operations under total future traffic conditions following the complete build-out of the proposed development, vehicle trips expected to be generated by the site were assigned to the internal site network.

**Figure 18** illustrates the total traffic volumes at the internal site intersections for the weekday AM and PM peak hours for the ultimate scenario.

The results of the capacity analysis for the internal site intersections are summarized in **Table 22**. Detailed Synchro output sheets are provided in **Appendix K**.

**Table 22. Future Total Internal Site Traffic Operations, AM Peak Hour, Ultimate Scenario**

Intersection	Movement	AM Peak Hour			
		Delay (sec)	v/c ratio	Level of Service	95th Percentile Queue Length (m)
<b>Empire Communities Access No.1 At Street D / Laneway E</b>	EBL-T-R	9	0.03	A	0.8
	WBL-T-R	0	0.00	A	0.0
	NBL-T-R	0	0.00	A	0.0
	SBL-T-R	0	0.00	A	0.0
<b>Empire Communities Access No.2 At Street D / Street C</b>	EBL-T-R	12	0.32	B	10.5
	WBL-T-R	12	0.18	B	5.1
	NBL-T-R	0	0.00	A	0.0
	SBL-T-R	5	0.04	A	0.9
<b>Laneway E At Street B</b>	EBL-T-R	12	0.01	B	0.2
	WBL-T-R	10	0.01	B	0.2
	NBL-T-R	0	0.00	A	0.0
	SBL-T-R	1	0.00	A	0.1
<b>Street C At Street B</b>	EBL	16	0.33	C	10.9
	EBT-R	12	0.39	B	14.1
	WBL	15	0.16	B	4.2
	WBT-R	10	0.24	B	7.3
	NBL-T-R	2	0.01	A	0.3
<b>Laneway E At Street A</b>	SBL-T-R	1	0.00	A	0.1
	EBL-R	9	0.00	A	0.0
	NBT-L	0	0.00	A	0.0
<b>Street C At Street A</b>	SBT-R	0	0.02	A	0.0
	EBL-T-R	17	0.60	C	31.1
	WBL-T-R	11	0.16	B	4.2
	NBL-T-R	1	0.00	A	0.1
	SBL-T-R	1	0.01	A	0.1

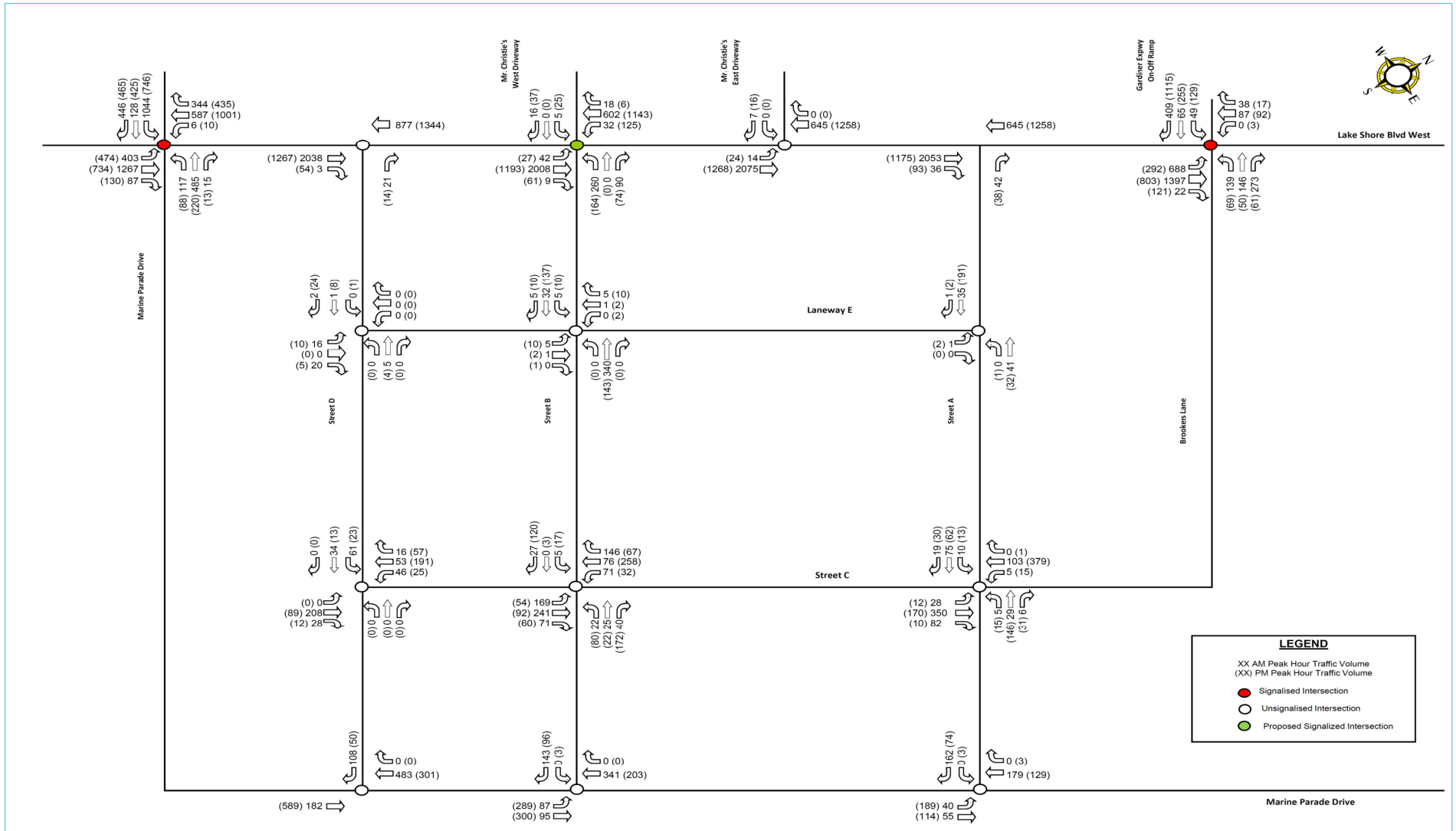


Figure 18. Internal Traffic Volumes, Ultimate Scenario



As shown in **Table 22**, under ultimate total traffic conditions, during the weekday AM peak hour, all internal site intersections are expected to operate at a good LOS C or better. All individual turning movements at all internal site intersections are expected to operate with minimal delay and small volume/capacity ratios.

**Table 23. Future Total Internal Site Traffic Operations, PM Peak Hour, Ultimate Scenario**

Intersection	Movement	PM Peak Hour			
		Delay (sec)	v/c ratio	Level of Service	95th Percentile Queue Length (m)
Empire Communities Access No.1 At Street D / Laneway E	EBL-T-R	9	0.01	A	0.3
	WBL-T-R	0	0.00	A	0.0
	NBL-T-R	0	0.00	A	0.0
	SBL-T-R	0	0.00	A	0.0
Empire Communities Access No.2 At Street D / Street C	EBL-T-R	10	0.12	A	3.1
	WBL-T-R	11	0.32	B	10.4
	NBL-T-R	0	0.00	A	0.0
	SBL-T-R	5	0.01	A	0.3
Laneway E At Street B	EBL-T-R	11	0.02	B	0.5
	WBL-T-R	10	0.02	A	0.4
	NBL-T-R	0	0.00	A	0.0
	SBL-T-R	1	0.01	A	0.2
Street C At Street B	EBL	26	0.24	D	6.9
	EBT-R	13	0.26	B	7.7
	WBL	15	0.08	C	2.1
	WBT-R	21	0.60	C	30.0
	NBL-T-R	3	0.05	A	1.3
	SBL-T-R	1	0.01	A	0.3
Laneway E At Street A	EBL-R	10	0.00	A	0.1
	NBT-L	0	0.00	A	0.0
	SBT-R	0	0.11	A	0.0
Street C At Street A	EBL-T-R	15	0.35	B	11.7
	WBL-T-R	23	0.67	C	38.9
	NBL-T-R	1	0.01	A	0.2
	SBL-T-R	1	0.01	A	0.2

As shown in **Table 23**, during the weekday PM peak hour, with one exception, all internal site intersections are expected to operate at LOS C or better with all individual turning movements operating with minimal delay and small volume/capacity ratios. The eastbound left-turn lane at the intersection of Street B/Street C is expected to operate at LOS D (based on a delay of 26 seconds) during the weekday PM peak hour. However, this turning movement is expected to operate at a good volume/capacity ratio of 0.24, thus indicating there is sufficient capacity to accommodate the left-turning vehicles. All remaining turning movements at this intersection are expected to operate at a good LOS, minimal delay and small volume/capacity ratio.

Based on the above analysis, the following traffic control measures are recommended at the internal site intersections for optimal traffic operations:

- two-way stop on the Street 'C' east and westbound approaches of the Street 'A'/Street 'C' intersection;
- two-way stop on the Street 'C' east and westbound approaches of the Street 'B'/Street 'C' intersection;
- stop-sign on the east (driveway) and westbound (Street 'C') approach of the Street 'C'/Street 'D' intersection;
- stop-sign on the eastbound (Laneway) approach at the Laneway 'E'/Street 'A' intersection;
- two-way stop on the east and westbound (Laneway) approaches at the Laneway 'E'/Street 'B' intersection; and
- stop-sign on the east (driveway) and westbound (Laneway) approach at the Laneway 'E'/Street 'D' intersection.

## 4.5 Queuing Lengths Comparison

The average and 95<sup>th</sup> percentile queuing length estimates from the SimTraffic simulation were compared to observe the impacts of each of the traffic scenarios on the study area signalized intersections, which are presented in **Table 24**. It is to be noted that existing available storage lengths are approximately measured and rounded.

**Table 24. Queuing Lengths Estimates Comparison**

Intersection	Queuing Lengths Comparison							
	Movements	Approximate Available Storage Length (m)	Future Background Conditions		Future Total Interim Conditions		Future Total Ultimate Conditions	
			Average Queue Length (m)	95 <sup>th</sup> Queue Length (m)	Average Queue Length (m)	95 <sup>th</sup> Queue Length (m)	Average Queue Length (m)	95 <sup>th</sup> Queue Length (m)
The Queensway at Park Lawn Road	EBL	50	53.8	91.4	56.5	133.6	85.4	172.1
	WBL	50	75.6	132.9	118.2	154.0	129.0	154.0
	WBR	20	4.0	17.2	8.9	29.9	12.3	35.3
	NBL	50	22.9	51.2	20.0	38.5	38.8	69.6
	NBR	#	6.7	35.4	-	-	17.3	64.8
	SBL	25	37.9	69.5	37.5	70.2	32.8	65.4
Park Lawn Road at Gardiner Expressway WB On-Ramp	NBL	200	63.3	78.3	86.4	164.9	57.8	124.4
	SBR	220	31.8	57.4	48.6	71.6	131.8	208.3
Park Lawn Road at Gardiner Expressway EB Off-Ramp	EBLLR	-	202.0	359.2	241.0	312.7	228.0	335.4
	EBR	35	33.5	43.3	35.0	35.1	30.7	48.9
	NBL	27	11.5	32.6	11.0	19.6	15.5	33.4
Park Lawn Road at Menkes-Kraft Driveway	NBL	30	5.5	12.1	5.2	16.4	9.7	23.9
	SBL	-	164.2	167.0	163.7	167.7	23.6	86.4
Park Lawn Road at Lake Shore Boulevard West	EBL	-	289.1	294.3	290.0	309.9	285.7	312.7
	WBR	45	16.1	28.0	19.0	43.9	45.0	72.0
	WBL	-	66.9	82.6	25.3	60.0	5.2	29.6
	NBL	55	14.5	38.9	34.7	74.3	21.6	46.3
	SBLL	100	194.5	212.7	157.6	250.6	195.7	200.9
	SBR	-	86.3	150.0	39.4	114.0	116.4	253.4
Gardiner Expressway WB Off-Ramp at Lake Shore Boulevard West	EBL	30	18.7	23.6	20.6	35.8	27.4	44.6
	WBR	-	-	-	-	-	-	-
	WBL	60	-	-	-	-	0.6	3.5
	NBL	50	13.2	27.6	33.4	45.1	27.0	41.6
	NBR	-	-	-	16.8	46.2	-	-
	SBL	-	17.4	24.0	37.4	72.7	20.0	98.7
	SBR	#	26.2	96.2	119.9	146.0	106.1	170.8
Street B - Mr. Christie's Driveway at Lake Shore Boulevard West	EBL	-	104.1	142.9	89.2	94.5	15.1	57.9
	WBL	-	-	-	-	-	27.6	57.3

Note: # Full lane available

**Table 24** presents the critical queue lengths from the AM and PM peak hours queuing analyses. The queuing analyses comparison indicates that the storage lengths for the turning lanes at most of the study area intersections will need to be extended in the future. Looking at the storage length estimates for the southbound double left turn lanes at the Lake Shore Boulevard/Park Lawn Road intersection, and northbound left-turn lane storage of the proposed Menkes-Kraft's Driveway along Park Lawn Road, it appears that the access may have to be relocated northerly in order to accommodate both storage requirements.

4.5.1 Impact of Legion Road Connection on the Study Area

As indicated by the Legion Road Extension EA project, with the Legion Road connection in place, there is a potential for traffic diversions from Park Lawn Road to the Legion Road connection since it will be the closest alternative north-south corridor. Based on the information presented in Table 7 of the Class EA report, prepared by AECOM, the estimated traffic diversions from Park Lawn Road to the Legion Road connection are shown in **Table 23**.

**Table 25. Potential Traffic Diversions With Legion Road Connection**

Period	With Proposed Legion Road Extension		
	NB	SB	Both Directions
AM Peak Hour	11%	25%	<b>18%</b>
PM Peak Hour	14%	25%	<b>20%</b>

**Table 25** indicates that there is a potential traffic diversion of 11 percent in the northbound and 25 percent in the southbound from Park Lawn Road to the Legion Road connection in the ultimate scenario in the AM peak hour. In the PM peak hour, estimated traffic diversions are 14 percent in the northbound and 25 percent in the southbound. As a result of the Legion Road connection being in place in the ultimate scenario, the eastbound and southbound approaches of the Lake Shore Boulevard/Park Lawn Road intersection would operate with the improved levels of service.

## 5. Summary of Conclusions

Based on the traffic analyses presented in this report, it can be concluded that the Humber Bay Shores Precinct Plan can be fully developed as proposed and that traffic generated by the full build-out of the Precinct Plan can be accommodated by both the boundary road network and intersections, and the internal road network and intersections. A number of additional intersection improvements are recommended in conjunction with the build-out of the Humber Bay Shores Precinct Plan in addition to those already planned by the City of Toronto. These additional improvements are as follows:

- it is recommended that by the completion of the build-out of the Humber Bay Shores Precinct Plan, the Gardiner Expressway EB Off-Ramp at Park Lawn Boulevard be re-configured from its current dual left-turn lanes plus right-turn lane, to a left-turn lane, shared left-turn/right-turn lane, and right turn lane; and,

Noted below is a full summary of the specific study conclusions:

### Existing Traffic Conditions:

- Under the existing traffic conditions, most of the study area signalized and unsignalized intersections are operating at good levels of service (with exception of the eastbound approach to Park Lawn Road at Lake Shore Boulevard West during the AM peak hour and the southbound left turn during the PM peak hour).

### Future Background Traffic Conditions:

- The addition of future background developments traffic will slightly increase delays at the study area signalized intersections but can be accommodated within the acceptable levels of service during both the AM and PM peak hours;
- The Lake Shore Boulevard West/ Park Lawn Road intersection capacity analyses indicated capacity deficiencies with the existing lane configurations under future background conditions. Mitigating measures proposed include the following modifications to the southbound and northbound approaches:
  - Southbound approach – One through lane, one exclusive right turn lane and dual left turn lanes;
  - Northbound approach – Exclusive left-turn lane and one through lane, and one exclusive right-turn lane;
  - Westbound approach – Exclusive right-turn lane
- The results of the traffic operational analyses for the unsignalized intersections indicated that some movements of the unsignalized intersections will experience significant delays that can be expected at stop-controlled streets on major arterials; however, the SimTraffic simulation results indicated relatively short queues at those movements; and
- The queue length estimate comparisons indicate that extension of the existing storage lengths will be needed in future for the turning lanes at most of the study area intersections.

### Future Total Traffic Conditions, Interim Traffic Scenario:

- The proposed Humber Bay Shores mixed-use development envisions land uses that are consistent with the Motel Strip Secondary Plan but represents an intensification of the subject area. Accordingly, the traffic assumptions have been updated from those assumptions presented in previous traffic studies. The proposed Humber Bay Shores Precinct Plan contemplates less commercial floor space and more residential units than what was proposed in the original Motel Strip Secondary Plan, which results in a change in traffic travel patterns in the AM peak hour (outbound) and in the PM peak hour (inbound);
- The left-turn lane warrant analysis for the unsignalized intersection of Marine Parade Drive with Street B indicated that at the eastbound approach, an exclusive left-turn lane with 15 metres storage (plus taper) is required; however, a 60 metre storage is recommended based on requirements of City Transportation & Works Department, and is included in the approved design;
- The left-turn lane warrant analysis for the unsignalized intersection of Marine Parade Drive with Street A indicated that at the eastbound approach, an exclusive left-turn lane with 15 metres storage (plus taper) is required; however, a 50 metre storage is recommended based on requirements of City Transportation & Works Department, and is included in the approved design;
- The Lake Shore Boulevard West/ Park Lawn Road intersection capacity analyses indicated capacity deficiencies with the lane configurations used in future background conditions. As a mitigating measure, the addition of an exclusive right-turn lane to the westbound approach on Lake Shore Boulevard West is proposed.
- Half of the signalized intersections within the study area will operate at LOS “D” or better, with V/C ratios of 0.86 or lower during both the AM and PM peak hours. The intersection of Park Lawn Road at Lake Shore Boulevard will operate at a high V/C ratio, however they will operate at an acceptable LOS during the PM peak hour. The intersection of Palace Pier Court at Lake Shore Boulevard West will operate at LOS “F” during the AM peak period and in order to mitigate this condition, it is recommended to provide two eastbound through lanes, one of them being shared with right turn movements. The intersections of Park Lawn Road/Queensway and Lake Shore Boulevard West/Gardiner Expressway WB Off-Ramp are approaching their theoretical capacities.
- With respect to the individual movements of the study area unsignalized intersections, some will operate at LOS “E” and “F”. There is still residual capacity available in some of the study area intersections to accommodate more traffic in future;
- Excessive delays were observed at all the left-out movements onto Lake Shore Boulevard from the proposed Humber Bay Shores developments. However, it is expected that outbound left turn vehicles on Street A will divert via the east segment of Street C to use the traffic signals at the Brookers Lane/Lake Shore Boulevard West intersection, while outbound left turn vehicles on Street B can alternatively divert south to Marine Parade Drive in order to connect to Lake Shore Boulevard West. Nevertheless, it is recommended that consideration be given to relocating the existing traffic signal from the Mr. Christie’s East Driveway to the proposed Street B/Lake Shore Boulevard intersection, which is proposed in the ultimate scenario;
- The queuing length estimates comparisons indicate that extension of the existing storage lengths will be needed in the future for the turning lanes at most of the study area intersections; and
- Should additional landowners decide to move their plans forward and develop in the interim scenario, traffic generation from these additional developments are expected to be accommodated with minimal impact to internal traffic operations. Interim access and egress opportunities are also available for each of these additional developments, however further analysis is required to determine the specific design of the access and egress to the Kingbird development site, once the site plan for 2171 Lake Shore Boulevard West has been finalized.

**Future Total Traffic Conditions, Ultimate Traffic Scenario:**

- The left-turn lane warrant analysis, repeated for the unsignalized intersection of Marine Parade Drive with Street B, indicated that a 15 metre exclusive left-turn lane for the eastbound approach would be warranted under the ultimate future total scenario. The 60 metre (plus taper) storage length will have already been provided under the interim future total scenario based on requirements of City Transportation & Works Department;
- The left-turn lane warrant analysis, repeated for the unsignalized intersection of Marine Parade Drive with Street A indicated that the eastbound approach provided with an exclusive left-turn lane with 15 metres storage (plus taper) in the interim scenario, is still appropriate for the ultimate scenario, however a storage length of 50 metres (plus taper) will be provided based on requirements from the City of Toronto Transportation and Works Department;
- The above-noted recommended storage lengths for the various left-turn lanes on the roads of the Humber Bay Shores Precinct Plan are already included in the approved Precinct Plan road design and the Core Servicing Agreement;
- The capacity analyses results indicated that most of the study area signalized intersections will operate at an overall LOS "D" or better with V/C ratios of 0.92 or lower, during both the AM and PM peak hours, with the exception of Park Lawn Road at Lake Shore Boulevard West (AM and PM peak hour) and the intersection of Palace Pier Court at Lake Shore Boulevard West during the AM peak hour. With respect to individual intersection movements, some are shown to operate at LOS "E" and "F";
- In order to achieve the forecast traffic operation results at the intersection of Park Lawn Boulevard and the Gardiner Expressway EB Off-Ramp, it is recommended that the Off-Ramp be re-configured from its current dual left-turn lanes plus right-turn lane, to a left-turn lane, shared left-turn/right-turn lane, and right turn lane;
- The capacity and queuing analyses results indicate that all unsignalized intersections will operate at excellent levels of service during the PM peak hour. During the AM peak hour, the northbound turn movements at the Lake Shore Boulevard West/ Marine Parade Drive (East) intersection, which will experience significant delays;
- It should be noted that the intersection of Lake Shore Boulevard with Marine Parade Drive (East) was identified as a signalized intersection in both the interim and ultimate traffic scenarios in the previous traffic studies. Monitoring of traffic operations of this intersection is recommended to investigate the traffic signal requirement in future. There is potential to relocate the existing traffic signals at Palace Pier Court to Marine Parade Drive to accommodate left-turning vehicles from the site while providing gaps for traffic at Palace Pier Court;
- In order to accommodate the future storage length estimates for the southbound double left-turn lanes at the Lake Shore Boulevard West/ Park Lawn Road intersection and the northbound left-turn lane of the proposed Menkes-Kraft's Driveway along Park Lawn Road, this driveway would have to be shifted to the north; and
- The internal site intersection operations analysis indicated that all internal site intersection movements will operate at a good LOS "C" or better during the weekday AM peak hour and a good LOS "D" or better during the weekday PM peak hour. No critical turning movements exist at any of the internal site intersections, with ample reserve capacity to accommodate future growth.

### Legion Road Extension, Ultimate Traffic Scenario:

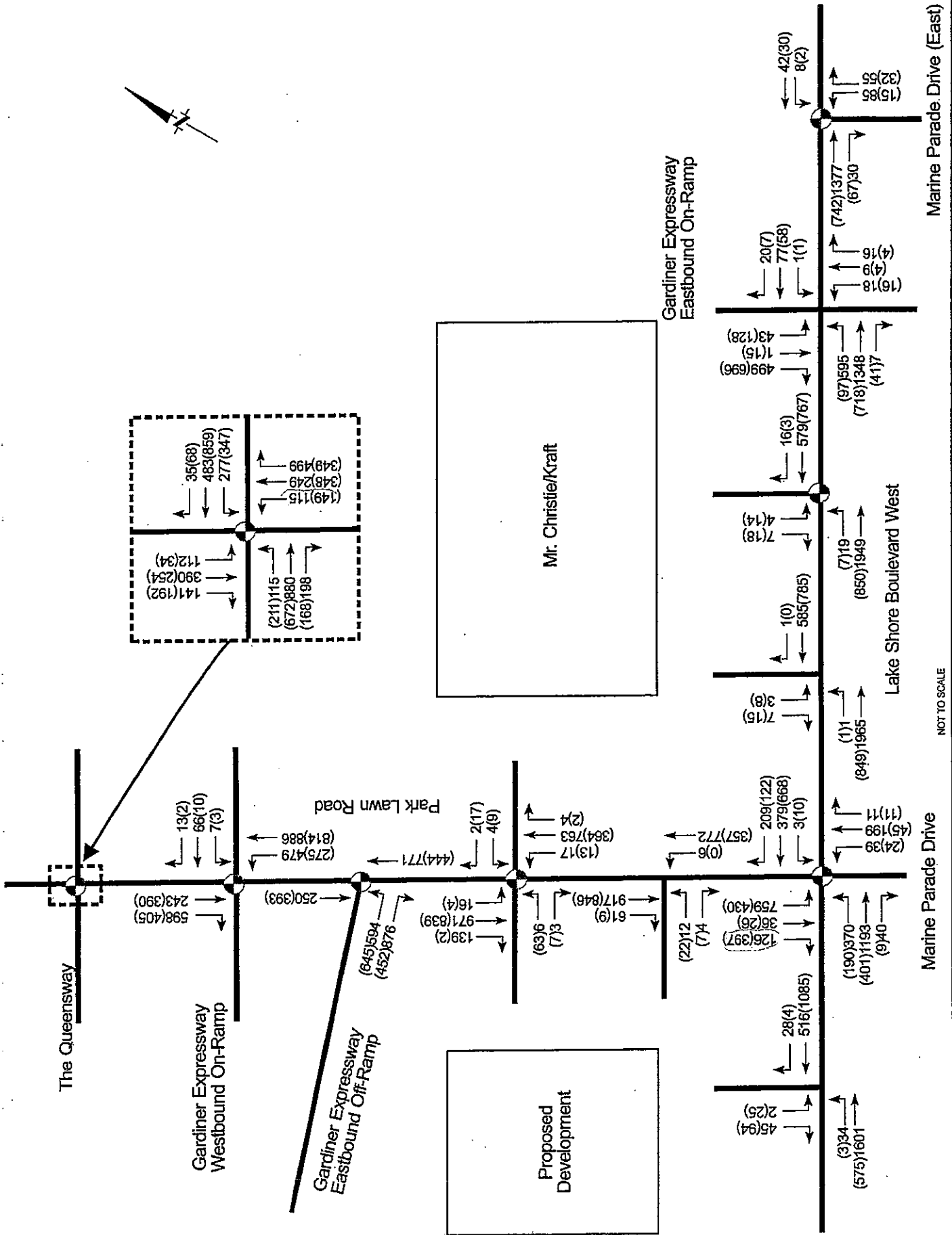
- The Legion Road Extension EA project has presented estimates for the potential traffic diversions from Park Lawn Road to the Legion Road connection being the closest alternative north-south corridor. These estimates are:
  - 11 percent from the northbound and 25 percent from the southbound in the AM peak hour;
  - 14 percent from the northbound and 25 percent from the southbound in the PM peak hour;
  - In all, 18 percent and 20 percent in the AM and PM peak hours, respectively; and
  - With the proposed Legion Road extension in place in the future, the eastbound and southbound approaches of the Lake Shore Boulevard and Park Lawn Road intersection will operate at better levels of service, therefore, traffic operations presented in this report can be considered conservative.

In summary, based on the traffic analyses presented in this traffic study report, it is concluded that the Humber Bay Shores Precinct Plan can be fully developed as proposed and that traffic generated by the full build-out of the Precinct Plan can be accommodated by both the boundary road network and intersections, and the internal road network and intersections, provided that the recommended improvements are implemented.



# Appendix A

## Existing Intersection Turning Movement Counts



**Figure 3**  
Existing Turning Movement

Signalized Intersection  
XX(xx) - A.M. (P.M.) Peak Hour





# City of Toronto - Traffic Data Centre & Safety Bureau

## Turning Movement Count Summary Report

PARK LAWN RD AT F G GARDINER EXPY N TCS Survey Date: 2007-Apr-18 (Wednesday)  
Survey Type: Routine Hours

Time Period	Vehicle Type	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND			Peds	Bike	Other									
		Exits	Left	Thru	Right	Total	Exits	Left	Thru	Right	Total	Exits	Left				Thru	Right	Total						
07:45-08:45	CAR	717	521	699	0	1,220	0	0	0	0	180	0	175	482	658	1,037	4	34	18	56	N	0	0	0	
	TRK	57	8	48	0	56	0	0	0	0	12	0	3	14	22	55	4	33	9	46	S	0	0	0	
	BUS	10	0	10	0	10	0	0	0	0	6	0	6	1	7	1	0	0	0	0	E	0	0	0	0
	<b>TOTAL:</b>	<b>784</b>	<b>529</b>	<b>757</b>	<b>0</b>	<b>1,286</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>198</b>	<b>0</b>	<b>190</b>	<b>497</b>	<b>687</b>	<b>1,093</b>	<b>8</b>	<b>67</b>	<b>27</b>	<b>102</b>					
16:15-17:15	CAR	823	311	815	0	1,126	0	0	0	0	380	0	378	431	809	753	2	11	8	21	N	1	0	0	
	TRK	17	7	16	0	23	0	0	0	0	1	0	1	13	14	25	0	5	1	6	S	0	0	0	
	BUS	6	0	6	0	6	0	0	0	0	4	0	4	2	6	2	0	0	0	0	E	3	0	0	0
	<b>TOTAL:</b>	<b>846</b>	<b>318</b>	<b>837</b>	<b>0</b>	<b>1,155</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>385</b>	<b>0</b>	<b>383</b>	<b>446</b>	<b>829</b>	<b>780</b>	<b>2</b>	<b>16</b>	<b>9</b>	<b>27</b>					
OFF HR AVG	CAR	418	241	398	0	639	0	0	0	0	228	0	223	300	523	582	5	41	20	66	N	2	0	0	0
	TRK	37	15	36	0	51	0	0	0	0	17	0	14	19	33	61	3	27	1	31	S	1	0	0	0
	BUS	1	0	1	0	1	0	0	0	0	2	0	2	1	3	1	0	0	0	0	E	0	0	0	0
	<b>TOTAL:</b>	<b>456</b>	<b>256</b>	<b>435</b>	<b>0</b>	<b>691</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>247</b>	<b>0</b>	<b>239</b>	<b>320</b>	<b>559</b>	<b>644</b>	<b>8</b>	<b>68</b>	<b>21</b>	<b>97</b>					
07:30-09:30	CAR	1,329	873	1,298	0	2,171	0	0	0	0	398	0	390	837	1,227	1,762	8	52	31	91	N	0	0	0	0
	TRK	113	23	98	0	121	0	0	0	0	26	0	19	27	46	122	7	72	15	94	S	0	0	0	0
	BUS	16	0	16	0	16	0	0	0	0	11	0	11	1	12	1	0	0	0	0	E	0	0	0	0
	<b>TOTAL:</b>	<b>1,458</b>	<b>896</b>	<b>1,412</b>	<b>0</b>	<b>2,308</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>435</b>	<b>0</b>	<b>420</b>	<b>865</b>	<b>1,285</b>	<b>1,885</b>	<b>15</b>	<b>124</b>	<b>46</b>	<b>185</b>					
16:00-18:00	CAR	1,585	614	1,568	0	2,182	0	0	0	0	774	0	770	822	1,592	1,454	4	18	17	39	N	8	0	0	0
	TRK	33	9	31	0	40	0	0	0	0	5	0	5	22	27	38	0	7	2	9	S	1	0	0	0
	BUS	12	0	12	0	12	0	0	0	0	9	0	9	2	11	2	0	0	0	0	E	13	0	0	0
	<b>TOTAL:</b>	<b>1,630</b>	<b>623</b>	<b>1,611</b>	<b>0</b>	<b>2,234</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>788</b>	<b>0</b>	<b>784</b>	<b>846</b>	<b>1,630</b>	<b>1,494</b>	<b>4</b>	<b>25</b>	<b>19</b>	<b>48</b>					
07:30-18:00	CAR	4,585	2,452	4,459	0	6,911	0	0	0	0	2,083	0	2,053	2,858	4,911	5,542	30	232	126	388	N	14	0	0	0
	TRK	295	93	273	0	366	0	0	0	0	98	0	81	124	205	402	17	185	22	224	S	5	0	0	0
	BUS	33	0	33	0	33	0	0	0	0	26	0	26	8	34	8	0	0	0	0	E	14	0	0	0
	<b>TOTAL:</b>	<b>4,913</b>	<b>2,545</b>	<b>4,765</b>	<b>0</b>	<b>7,310</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,207</b>	<b>0</b>	<b>2,160</b>	<b>2,990</b>	<b>5,150</b>	<b>5,952</b>	<b>47</b>	<b>417</b>	<b>148</b>	<b>612</b>					

Total 8 Hour Vehicle Volume: 13,072  
 Total 8 Hour Bicycle Volume: 0  
 Total 8 Hour Intersection Volume: 13,072

# Ontario Traffic Inc.

<b>Morning Peak Diagram</b>	<b>Specified Period</b> From: 7:00:00 To: 9:00:00	<b>One Hour Peak</b> From: 7:30:00 To: 8:30:00
-----------------------------	---	--

<b>Municipality:</b> City of Toronto <b>Site #:</b> 0901200004 <b>Intersection:</b> Gardiner Expwy EB Off-Ramp & Pa <b>TFR File #:</b> 1 <b>Count date:</b> 29-Jan-09	<b>Weather conditions:</b>  <b>Person(s) who counted:</b>
---	---

**\*\* Signalized Intersection \*\***      **Major Road:** Gardiner Expwy EB Off-Ramp runs

North Leg Total: 1546 North Entering: 264 North Peds: 0 Peds Cross: ∞	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black;">Cyclists 0    7</td> <td style="border-right: 1px solid black;">7</td> <td style="border-right: 1px solid black;">↑</td> <td>Cyclists 11</td> </tr> <tr> <td style="border-right: 1px solid black;">Trucks 1    11</td> <td style="border-right: 1px solid black;">12</td> <td style="border-right: 1px solid black;">↑</td> <td>Trucks 53</td> </tr> <tr> <td style="border-right: 1px solid black;">Cars 14    231</td> <td style="border-right: 1px solid black;">245</td> <td style="border-right: 1px solid black;">↑</td> <td>Cars 1218</td> </tr> <tr> <td style="border-right: 1px solid black;">Totals 15    249</td> <td></td> <td></td> <td>Totals 1282</td> </tr> </table>	Cyclists 0    7	7	↑	Cyclists 11	Trucks 1    11	12	↑	Trucks 53	Cars 14    231	245	↑	Cars 1218	Totals 15    249			Totals 1282	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black;">Cyclists Trucks Cars Totals</td> <td style="text-align: center;">↙   ↓</td> <td style="text-align: center;">Park Lawn Road</td> </tr> <tr> <td style="border-right: 1px solid black;">0    2    29    31</td> <td></td> <td></td> </tr> <tr> <td style="border-right: 1px solid black;">←</td> <td style="text-align: center;">N</td> <td></td> </tr> <tr> <td style="border-right: 1px solid black;">Gardiner Expwy EB Off-Ramp</td> <td style="text-align: center;">W    S</td> <td style="text-align: center;">E</td> </tr> <tr> <td style="border-right: 1px solid black;">Cyclists Trucks Cars Totals</td> <td style="text-align: center;">↑</td> <td></td> </tr> <tr> <td style="border-right: 1px solid black;">2    34    565    601</td> <td></td> <td></td> </tr> <tr> <td style="border-right: 1px solid black;">0    25    706    731</td> <td style="text-align: center;">↓</td> <td></td> </tr> <tr> <td style="border-right: 1px solid black;">2    59    1272</td> <td style="text-align: center;">↙   ↑</td> <td style="text-align: center;">Park Lawn Road</td> </tr> </table>	Cyclists Trucks Cars Totals	↙   ↓	Park Lawn Road	0    2    29    31			←	N		Gardiner Expwy EB Off-Ramp	W    S	E	Cyclists Trucks Cars Totals	↑		2    34    565    601			0    25    706    731	↓		2    59    1272	↙   ↑	Park Lawn Road
Cyclists 0    7	7	↑	Cyclists 11																																							
Trucks 1    11	12	↑	Trucks 53																																							
Cars 14    231	245	↑	Cars 1218																																							
Totals 15    249			Totals 1282																																							
Cyclists Trucks Cars Totals	↙   ↓	Park Lawn Road																																								
0    2    29    31																																										
←	N																																									
Gardiner Expwy EB Off-Ramp	W    S	E																																								
Cyclists Trucks Cars Totals	↑																																									
2    34    565    601																																										
0    25    706    731	↓																																									
2    59    1272	↙   ↑	Park Lawn Road																																								
Peds Cross: ∞ West Peds: 7 West Entering: 1333 West Leg Total: 1364	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black;">Cars 937</td> <td style="border-right: 1px solid black;">↓</td> <td style="border-right: 1px solid black;">Cars 15    653</td> <td style="border-right: 1px solid black;">668</td> </tr> <tr> <td style="border-right: 1px solid black;">Trucks 36</td> <td></td> <td style="border-right: 1px solid black;">Trucks 1    19</td> <td style="border-right: 1px solid black;">20</td> </tr> <tr> <td style="border-right: 1px solid black;">Cyclists 7</td> <td></td> <td style="border-right: 1px solid black;">Cyclists 0    9</td> <td style="border-right: 1px solid black;">9</td> </tr> <tr> <td style="border-right: 1px solid black;">Totals 980</td> <td></td> <td style="border-right: 1px solid black;">Totals 16    681</td> <td></td> </tr> </table>	Cars 937	↓	Cars 15    653	668	Trucks 36		Trucks 1    19	20	Cyclists 7		Cyclists 0    9	9	Totals 980		Totals 16    681		Peds Cross: ∞ South Peds: 2 South Entering: 697 South Leg Total: 1677																								
Cars 937	↓	Cars 15    653	668																																							
Trucks 36		Trucks 1    19	20																																							
Cyclists 7		Cyclists 0    9	9																																							
Totals 980		Totals 16    681																																								

## Comments

# Ontario Traffic Inc.

## Afternoon Peak Diagram

### Specified Period

From: 17:00:00

To: 19:00:00

### One Hour Peak

From: 17:30:00

To: 18:30:00

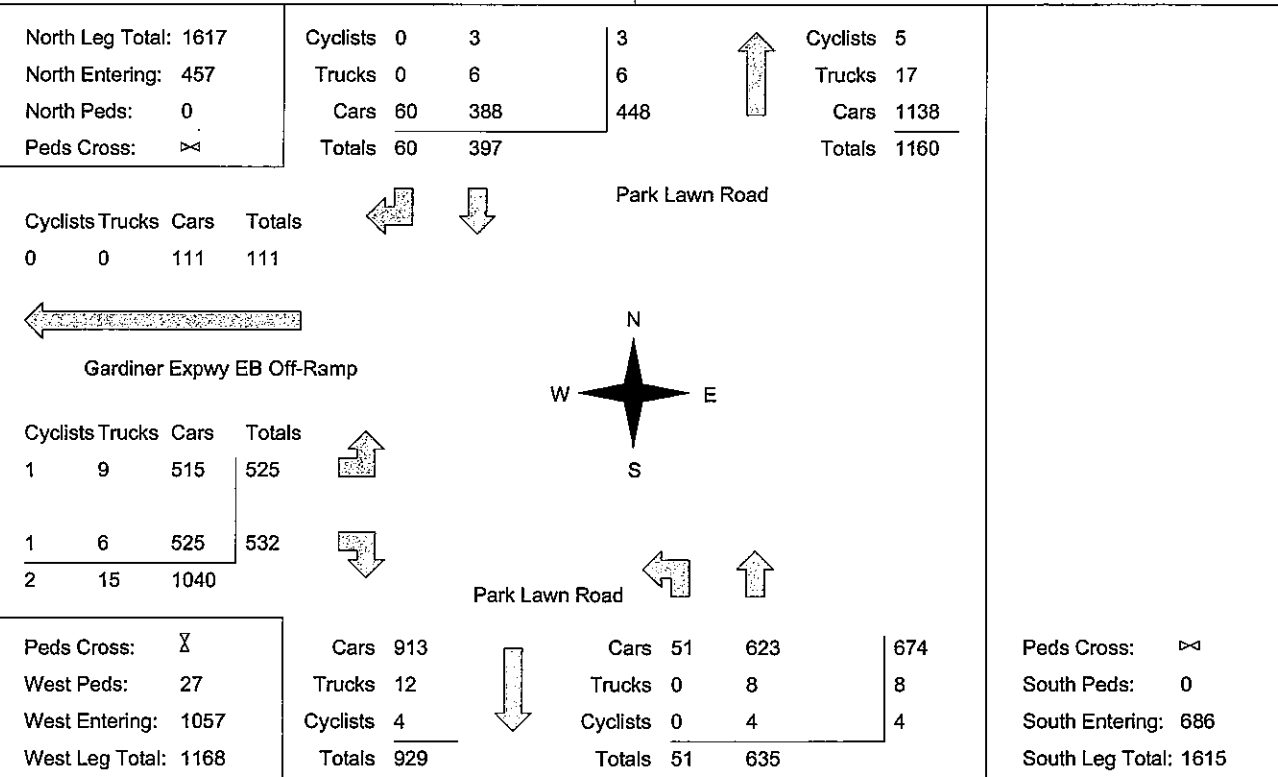
**Municipality:** City of Toronto  
**Site #:** 0901200004  
**Intersection:** Gardiner Expwy EB Off-Ramp & Pa  
**TFR File #:** 1  
**Count date:** 29-Jan-09

**Weather conditions:**

**Person(s) who counted:**

**\*\* Signalized Intersection \*\***

**Major Road:** Gardiner Expwy EB Off-Ramp runs



### Comments

# Ontario Traffic Inc.

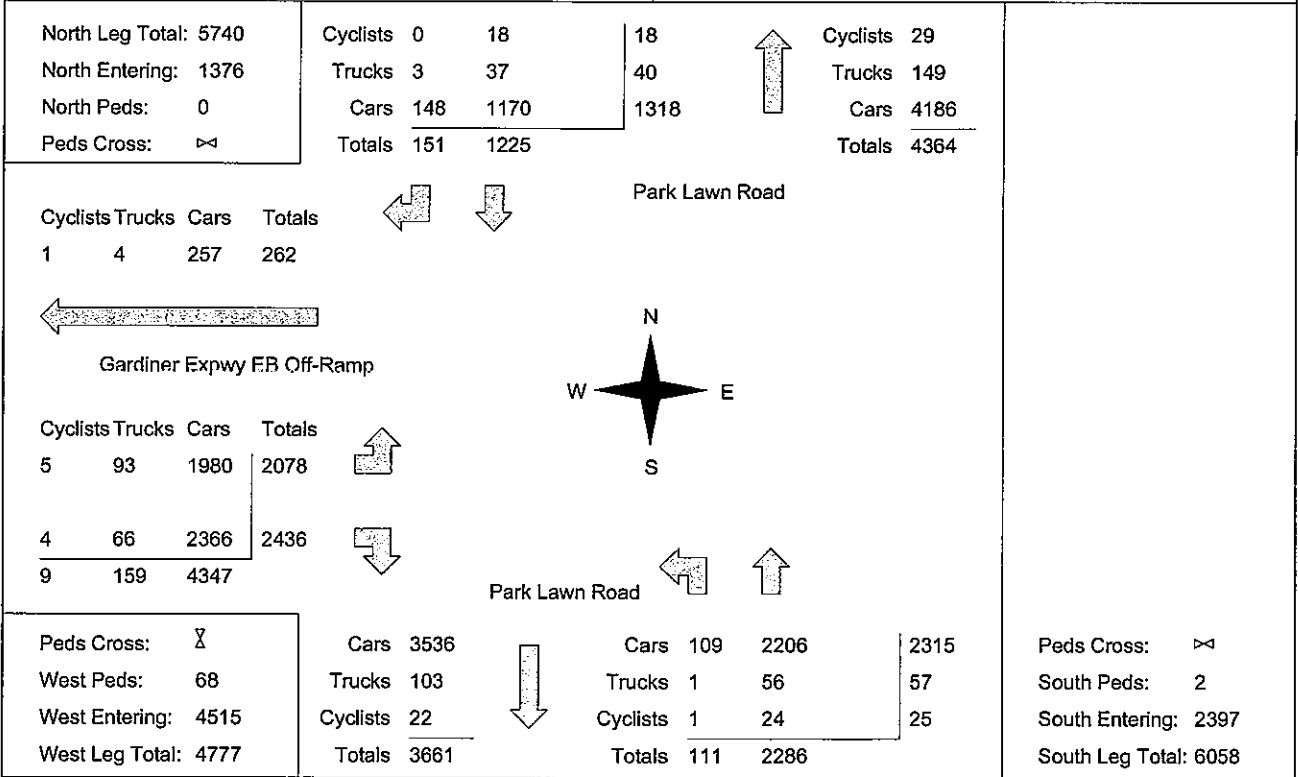
## Total Count Diagram

**Municipality:** City of Toronto  
**Site #:** 0901200004  
**Intersection:** Gardiner Expwy EB Off-Ramp & Pa  
**TFR File #:** 1  
**Count date:** 29-Jan-09

**Weather conditions:**  
**Person(s) who counted:**

**\*\* Signalized Intersection \*\***

**Major Road:** Gardiner Expwy EB Off-Ramp runs



### Comments

# Ontario Traffic Inc. Traffic Count Summary

<b>North Approach Totals</b>												
Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds	North/South Total Approaches	Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	0	207	17	224	0	858	8:00:00	13	621	0	634	0
9:00:00	0	254	18	272	0	819	9:00:00	10	537	0	547	2
17:00:00	0	0	0	0	0	3	17:00:00	0	3	0	3	0
18:00:00	0	332	56	388	0	976	18:00:00	40	548	0	588	0
19:00:00	0	430	60	490	0	1115	19:00:00	48	577	0	625	0
<b>Totals:</b>	0	1223	151	1374	0	3771		111	2286	0	2397	2
<b>East Approach Totals</b>												
Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds	East/West Total Approaches	Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	0	0	0	0	0	1110	8:00:00	463	1	646	1110	7
9:00:00	0	0	0	0	0	1330	9:00:00	586	0	744	1330	6
17:00:00	0	0	0	0	0	1	17:00:00	0	0	1	1	0
18:00:00	0	0	0	0	0	1032	18:00:00	534	0	498	1032	17
19:00:00	0	0	0	0	0	1042	19:00:00	495	0	547	1042	38
<b>Totals:</b>	0	0	0	0	0	4515		2078	1	2436	4515	68
<b>Calculated Values for Traffic Crossing Major Street</b>												
Hours Ending:	7:00	8:00	9:00	17:00		18:00	19:00	19:00	19:00			
Crossing Values:	0	641	553	3		605	663	663	663			



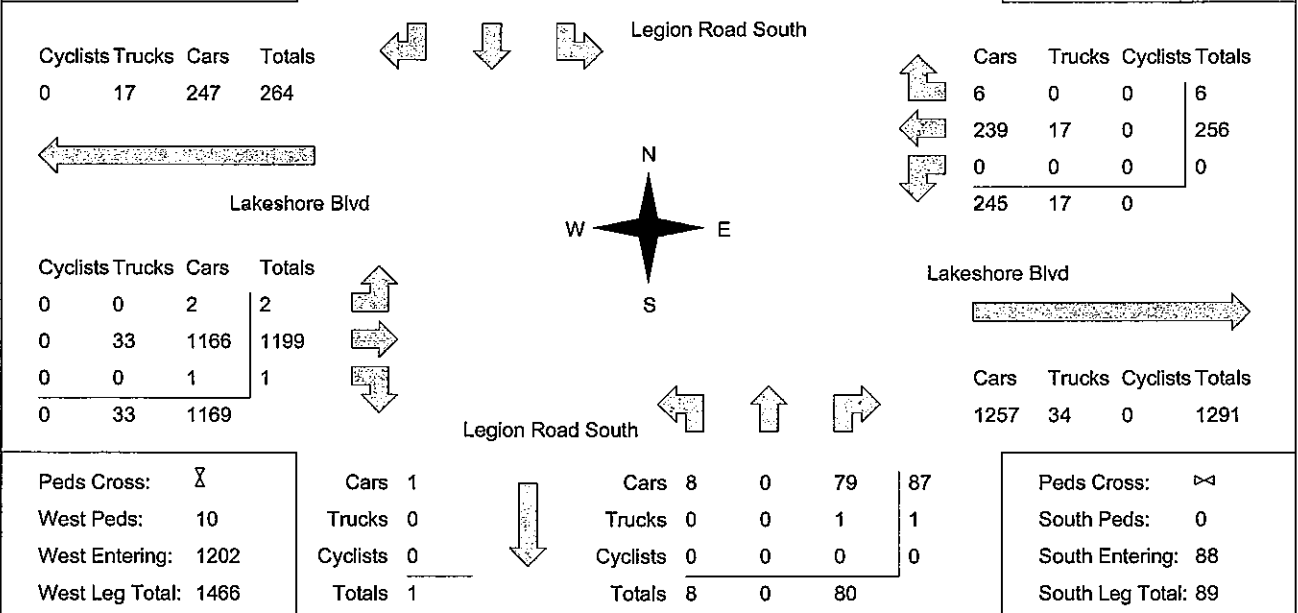
# Ontario Traffic Inc.

<b>Morning Peak Diagram</b>	<b>Specified Period</b> From: 7:00:00 To: 9:00:00	<b>One Hour Peak</b> From: 7:30:00 To: 8:30:00
-----------------------------	---	--

<b>Municipality:</b> City of Toronto <b>Site #:</b> 0901200005 <b>Intersection:</b> Lakeshore Blvd & Legion Road Sou <b>TFR File #:</b> 6 <b>Count date:</b> 29-Jan-09	<b>Weather conditions:</b>  <b>Person(s) who counted:</b>
--	---

<b>** Signalized Intersection **</b>	<b>Major Road:</b> Lakeshore Blvd runs W/E
--------------------------------------	--

North Leg Total: 20 North Entering: 12 North Peds: 7 Peds Cross: 8	<table style="border-collapse: collapse; margin: auto;"> <tr><td>Cyclists</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Cars</td><td>0</td><td>0</td><td>12</td><td>12</td></tr> <tr style="border-top: 1px solid black;"><td>Totals</td><td>0</td><td>0</td><td>12</td><td></td></tr> </table>	Cyclists	0	0	0	0	Trucks	0	0	0	0	Cars	0	0	12	12	Totals	0	0	12			Cyclists 0 Trucks 0 Cars 8 Totals 8	East Leg Total: 1553 East Entering: 262 East Peds: 8 Peds Cross: 8
Cyclists	0	0	0	0																				
Trucks	0	0	0	0																				
Cars	0	0	12	12																				
Totals	0	0	12																					



## Comments

# Ontario Traffic Inc.

## Afternoon Peak Diagram

### Specified Period

From: 17:00:00

To: 19:00:00

### One Hour Peak

From: 17:00:00

To: 18:00:00

**Municipality:** City of Toronto  
**Site #:** 0901200005  
**Intersection:** Lakeshore Blvd & Legion Road Sou  
**TFR File #:** 6  
**Count date:** 29-Jan-09

**Weather conditions:**

**Person(s) who counted:**

**\*\* Signalized Intersection \*\***

**Major Road:** Lakeshore Blvd runs W/E

North Leg Total: 30 North Entering: 14 North Peds: 13 Peds Cross: 8	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Trucks</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">3</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">11</td> <td style="padding: 2px;">14</td> <td style="padding: 2px;">14</td> </tr> <tr> <td style="padding: 2px;">Totals</td> <td style="padding: 2px;">3</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">11</td> <td style="padding: 2px;">14</td> <td style="padding: 2px;">14</td> </tr> </table>	Cyclists	0	0	0	0	0	Trucks	0	0	0	0	0	Cars	3	0	11	14	14	Totals	3	0	11	14	14		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Trucks</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">16</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">16</td> </tr> <tr> <td style="padding: 2px;">Totals</td> <td style="padding: 2px;">16</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">16</td> </tr> </table>	Cyclists	0	0	0	0	Trucks	0	0	0	0	Cars	16	0	0	16	Totals	16	0	0	16	East Leg Total: 1370 East Entering: 842 East Peds: 22 Peds Cross: 8																																																																						
Cyclists	0	0	0	0	0																																																																																																																	
Trucks	0	0	0	0	0																																																																																																																	
Cars	3	0	11	14	14																																																																																																																	
Totals	3	0	11	14	14																																																																																																																	
Cyclists	0	0	0	0																																																																																																																		
Trucks	0	0	0	0																																																																																																																		
Cars	16	0	0	16																																																																																																																		
Totals	16	0	0	16																																																																																																																		
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">16</td> <td style="padding: 2px;">821</td> <td style="padding: 2px;">837</td> </tr> </table> </td> <td style="width: 10%; text-align: center; padding: 5px;">     </td> <td style="width: 25%; text-align: center; padding: 5px;">                 Legion Road South             </td> <td style="width: 10%; text-align: center; padding: 5px;">     </td> <td style="width: 30%; padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> </tr> <tr> <td style="padding: 2px;">Trucks</td> <td style="padding: 2px;">816</td> <td style="padding: 2px;">16</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">832</td> </tr> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Totals</td> <td style="padding: 2px;">826</td> <td style="padding: 2px;">16</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">842</td> </tr> </table> </td> </tr> <tr> <td colspan="5" style="text-align: center; padding: 10px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">6</td> <td style="padding: 2px;">6</td> </tr> <tr> <td style="padding: 2px;">Trucks</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">497</td> <td style="padding: 2px;">507</td> </tr> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Totals</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">503</td> <td style="padding: 2px;">513</td> </tr> </table> </td> <td style="width: 10%; text-align: center; padding: 5px;">     </td> <td style="width: 25%; text-align: center; padding: 5px;">                 Lakeshore Blvd             </td> <td style="width: 10%; text-align: center; padding: 5px;">     </td> <td style="width: 30%; padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">518</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">528</td> </tr> </table> </td> </tr> </table> </td> </tr> <tr> <td style="padding: 5px;">                 Peds Cross: 8                  West Peds: 9                  West Entering: 513                  West Leg Total: 1350             </td> <td style="padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">12</td> </tr> <tr> <td style="padding: 2px;">Trucks</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Totals</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">12</td> </tr> </table> </td> <td style="text-align: center; padding: 5px;"> </td> <td style="padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">12</td> </tr> <tr> <td style="padding: 2px;">Trucks</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Totals</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">12</td> </tr> </table> </td> <td style="padding: 5px;">                 Peds Cross: 8                  South Peds: 18                  South Entering: 12                  South Leg Total: 12             </td> </tr> </table>					<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">16</td> <td style="padding: 2px;">821</td> <td style="padding: 2px;">837</td> </tr> </table>	Cyclists	0	16	821	837	  	Legion Road South	  	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> </tr> <tr> <td style="padding: 2px;">Trucks</td> <td style="padding: 2px;">816</td> <td style="padding: 2px;">16</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">832</td> </tr> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Totals</td> <td style="padding: 2px;">826</td> <td style="padding: 2px;">16</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">842</td> </tr> </table>	Cars	10	0	0	10	Trucks	816	16	0	832	Cyclists	0	0	0	0	Totals	826	16	0	842	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">6</td> <td style="padding: 2px;">6</td> </tr> <tr> <td style="padding: 2px;">Trucks</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">497</td> <td style="padding: 2px;">507</td> </tr> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Totals</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">503</td> <td style="padding: 2px;">513</td> </tr> </table> </td> <td style="width: 10%; text-align: center; padding: 5px;">     </td> <td style="width: 25%; text-align: center; padding: 5px;">                 Lakeshore Blvd             </td> <td style="width: 10%; text-align: center; padding: 5px;">     </td> <td style="width: 30%; padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">518</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">528</td> </tr> </table> </td> </tr> </table>					<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">6</td> <td style="padding: 2px;">6</td> </tr> <tr> <td style="padding: 2px;">Trucks</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">497</td> <td style="padding: 2px;">507</td> </tr> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Totals</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">503</td> <td style="padding: 2px;">513</td> </tr> </table>	Cyclists	0	0	6	6	Trucks	0	10	497	507	Cars	0	0	0	0	Totals	0	10	503	513	  	Lakeshore Blvd	  	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">518</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">528</td> </tr> </table>	Cars	518	10	0	528	Peds Cross: 8 West Peds: 9 West Entering: 513 West Leg Total: 1350	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">12</td> </tr> <tr> <td style="padding: 2px;">Trucks</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Totals</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">12</td> </tr> </table>	Cars	0	2	0	10	12	Trucks	0	0	0	0	0	Cyclists	0	0	0	0	0	Totals	0	2	0	10	12		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">12</td> </tr> <tr> <td style="padding: 2px;">Trucks</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Totals</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">12</td> </tr> </table>	Cars	2	0	10	12	Trucks	0	0	0	0	Cyclists	0	0	0	0	Totals	2	0	10	12	Peds Cross: 8 South Peds: 18 South Entering: 12 South Leg Total: 12
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">16</td> <td style="padding: 2px;">821</td> <td style="padding: 2px;">837</td> </tr> </table>	Cyclists	0	16	821	837	  	Legion Road South	  	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> </tr> <tr> <td style="padding: 2px;">Trucks</td> <td style="padding: 2px;">816</td> <td style="padding: 2px;">16</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">832</td> </tr> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Totals</td> <td style="padding: 2px;">826</td> <td style="padding: 2px;">16</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">842</td> </tr> </table>	Cars	10	0	0	10	Trucks	816	16	0	832	Cyclists	0	0	0	0	Totals	826	16	0	842																																																																																									
Cyclists	0	16	821	837																																																																																																																		
Cars	10	0	0	10																																																																																																																		
Trucks	816	16	0	832																																																																																																																		
Cyclists	0	0	0	0																																																																																																																		
Totals	826	16	0	842																																																																																																																		
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">6</td> <td style="padding: 2px;">6</td> </tr> <tr> <td style="padding: 2px;">Trucks</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">497</td> <td style="padding: 2px;">507</td> </tr> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Totals</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">503</td> <td style="padding: 2px;">513</td> </tr> </table> </td> <td style="width: 10%; text-align: center; padding: 5px;">     </td> <td style="width: 25%; text-align: center; padding: 5px;">                 Lakeshore Blvd             </td> <td style="width: 10%; text-align: center; padding: 5px;">     </td> <td style="width: 30%; padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">518</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">528</td> </tr> </table> </td> </tr> </table>					<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">6</td> <td style="padding: 2px;">6</td> </tr> <tr> <td style="padding: 2px;">Trucks</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">497</td> <td style="padding: 2px;">507</td> </tr> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Totals</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">503</td> <td style="padding: 2px;">513</td> </tr> </table>	Cyclists	0	0	6	6	Trucks	0	10	497	507	Cars	0	0	0	0	Totals	0	10	503	513	  	Lakeshore Blvd	  	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">518</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">528</td> </tr> </table>	Cars	518	10	0	528																																																																																				
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">6</td> <td style="padding: 2px;">6</td> </tr> <tr> <td style="padding: 2px;">Trucks</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">497</td> <td style="padding: 2px;">507</td> </tr> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Totals</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">503</td> <td style="padding: 2px;">513</td> </tr> </table>	Cyclists	0	0	6	6	Trucks	0	10	497	507	Cars	0	0	0	0	Totals	0	10	503	513	  	Lakeshore Blvd	  	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">518</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">528</td> </tr> </table>	Cars	518	10	0	528																																																																																									
Cyclists	0	0	6	6																																																																																																																		
Trucks	0	10	497	507																																																																																																																		
Cars	0	0	0	0																																																																																																																		
Totals	0	10	503	513																																																																																																																		
Cars	518	10	0	528																																																																																																																		
Peds Cross: 8 West Peds: 9 West Entering: 513 West Leg Total: 1350	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">12</td> </tr> <tr> <td style="padding: 2px;">Trucks</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Totals</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">12</td> </tr> </table>	Cars	0	2	0	10	12	Trucks	0	0	0	0	0	Cyclists	0	0	0	0	0	Totals	0	2	0	10	12		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Cars</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">12</td> </tr> <tr> <td style="padding: 2px;">Trucks</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Cyclists</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Totals</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">12</td> </tr> </table>	Cars	2	0	10	12	Trucks	0	0	0	0	Cyclists	0	0	0	0	Totals	2	0	10	12	Peds Cross: 8 South Peds: 18 South Entering: 12 South Leg Total: 12																																																																						
Cars	0	2	0	10	12																																																																																																																	
Trucks	0	0	0	0	0																																																																																																																	
Cyclists	0	0	0	0	0																																																																																																																	
Totals	0	2	0	10	12																																																																																																																	
Cars	2	0	10	12																																																																																																																		
Trucks	0	0	0	0																																																																																																																		
Cyclists	0	0	0	0																																																																																																																		
Totals	2	0	10	12																																																																																																																		

### Comments

# Ontario Traffic Inc.

## Total Count Diagram

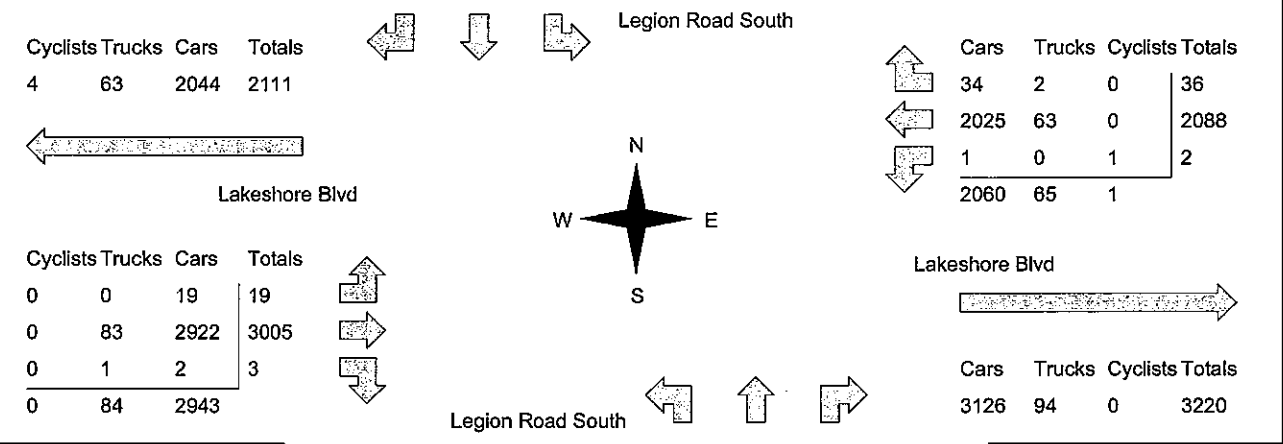
**Municipality:** City of Toronto  
**Site #:** 0901200005  
**Intersection:** Lakeshore Blvd & Legion Road Sou  
**TFR File #:** 6  
**Count date:** 29-Jan-09

**Weather conditions:**  
**Person(s) who counted:**

**\*\* Signalized Intersection \*\***

**Major Road:** Lakeshore Blvd runs W/E

North Leg Total: 108 North Entering: 53 North Peds: 36 Peds Cross: ∞	<table border="1" style="border-collapse: collapse; margin: auto;"> <tr><td>Cyclists</td><td>4</td><td>0</td><td>0</td><td>4</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>10</td><td>10</td></tr> <tr><td>Cars</td><td>4</td><td>0</td><td>35</td><td>39</td></tr> <tr><td>Totals</td><td>8</td><td>0</td><td>45</td><td></td></tr> </table>	Cyclists	4	0	0	4	Trucks	0	0	10	10	Cars	4	0	35	39	Totals	8	0	45			<table border="1" style="border-collapse: collapse; margin: auto;"> <tr><td>Cyclists</td><td>0</td></tr> <tr><td>Trucks</td><td>2</td></tr> <tr><td>Cars</td><td>53</td></tr> <tr><td>Totals</td><td>55</td></tr> </table>	Cyclists	0	Trucks	2	Cars	53	Totals	55	East Leg Total: 5346 East Entering: 2126 East Peds: 51 Peds Cross: ∞
Cyclists	4	0	0	4																												
Trucks	0	0	10	10																												
Cars	4	0	35	39																												
Totals	8	0	45																													
Cyclists	0																															
Trucks	2																															
Cars	53																															
Totals	55																															



Peds Cross: ∞ West Peds: 39 West Entering: 3027 West Leg Total: 5138	<table border="1" style="border-collapse: collapse; margin: auto;"> <tr><td>Cars</td><td>3</td></tr> <tr><td>Trucks</td><td>1</td></tr> <tr><td>Cyclists</td><td>1</td></tr> <tr><td>Totals</td><td>5</td></tr> </table>	Cars	3	Trucks	1	Cyclists	1	Totals	5		<table border="1" style="border-collapse: collapse; margin: auto;"> <tr><td>Cars</td><td>15</td><td>0</td><td>169</td><td>184</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>1</td><td>1</td></tr> <tr><td>Cyclists</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Totals</td><td>15</td><td>0</td><td>170</td><td></td></tr> </table>	Cars	15	0	169	184	Trucks	0	0	1	1	Cyclists	0	0	0	0	Totals	15	0	170		Peds Cross: ∞ South Peds: 38 South Entering: 185 South Leg Total: 190
Cars	3																															
Trucks	1																															
Cyclists	1																															
Totals	5																															
Cars	15	0	169	184																												
Trucks	0	0	1	1																												
Cyclists	0	0	0	0																												
Totals	15	0	170																													

### Comments

# Ontario Traffic Inc. Traffic Count Summary

Intersection: Lakeshore Blvd & Legion Road So    Count Date: 29-Jan-09    Municipality: City of Toronto

North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds		Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	22	0	0	22	11	111	8:00:00	7	0	82	89	4
9:00:00	8	0	4	12	7	78	9:00:00	4	0	62	66	0
17:00:00	0	0	0	0	0	1	17:00:00	0	0	1	1	0
18:00:00	11	0	3	14	13	26	18:00:00	2	0	10	12	18
19:00:00	4	0	1	5	5	22	19:00:00	2	0	15	17	16
<b>Totals:</b>	45	0	8	53	36	238	15	0	170	185	38	

East Approach Totals						East/West Total Approaches	West Approach Totals					
Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds		Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	2	0	2	0	3	7:00:00	0	1	0	1	2
8:00:00	0	261	6	267	7	1155	8:00:00	1	886	1	888	7
9:00:00	0	292	8	300	3	1429	9:00:00	5	1122	2	1129	14
17:00:00	0	2	0	2	0	22	17:00:00	1	19	0	20	1
18:00:00	0	832	10	842	22	1355	18:00:00	6	507	0	513	9
19:00:00	2	693	12	707	18	1177	19:00:00	6	464	0	470	5
<b>Totals:</b>	2	2082	36	2120	50	5141	19	2999	3	3021	38	

### Calculated Values for Traffic Crossing Major Street

Hours Ending:	7:00	8:00	9:00	17:00	18:00	18:00	19:00	19:00
Crossing Values:	2	43	29	1	44	44	29	29



# City of Toronto - Traffic Data Centre & Safety Bureau

## Turning Movement Count Summary Report

LAKE SHORE BLVD AT MARINE PARADE DRIPARK LAWN

Survey Date: 2007-Apr-18 (Wednesday)  
Survey Type: Routine Hours

Time Period	Vehicle Type	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND			Peds	Bike	Other									
		Exits	Left	Thru	Right	Total	Exits	Left	Thru	Right	Total	Exits	Left				Thru	Right	Total						
07:45-08:45	CAR	740	26	170	12	208	1,730	300	1,070	50	1,420	85	648	32	104	784	421	3	281	270	564	N	1	3	0
	TRK	15	3	2	1	6	46	7	22	1	30	6	23	4	4	31	12	1	5	6	12	S	14	3	0
	BUS	11	0	5	0	5	14	5	14	0	19	5	0	5	1	6	10	0	9	1	10	E	0	1	0
	<b>TOTAL:</b>	<b>766</b>	<b>29</b>	<b>177</b>	<b>13</b>	<b>219</b>	<b>1,790</b>	<b>312</b>	<b>1,106</b>	<b>51</b>	<b>1,469</b>	<b>96</b>	<b>671</b>	<b>41</b>	<b>109</b>	<b>821</b>	<b>443</b>	<b>4</b>	<b>305</b>	<b>277</b>	<b>586</b>	<b>W</b>	<b>59</b>	<b>10</b>	<b>0</b>
17:00-18:00	CAR	494	26	69	13	108	1,341	234	665	31	930	96	663	57	284	1,004	1,081	8	771	191	970	N	17	1	0
	TRK	5	0	1	0	1	7	1	2	1	4	2	5	1	2	8	11	0	9	3	12	S	16	18	0
	BUS	4	0	4	0	4	8	0	8	0	8	3	0	3	0	3	7	0	7	0	7	E	2	4	0
	<b>TOTAL:</b>	<b>503</b>	<b>26</b>	<b>74</b>	<b>13</b>	<b>113</b>	<b>1,356</b>	<b>235</b>	<b>675</b>	<b>32</b>	<b>942</b>	<b>101</b>	<b>668</b>	<b>61</b>	<b>286</b>	<b>1,015</b>	<b>1,099</b>	<b>8</b>	<b>787</b>	<b>194</b>	<b>989</b>	<b>W</b>	<b>67</b>	<b>15</b>	<b>0</b>
OFF HR AVG	CAR	389	19	56	13	88	525	178	317	16	511	44	195	23	207	425	513	5	287	155	447	N	7	1	0
	TRK	16	2	1	4	7	29	5	11	1	17	5	14	3	11	28	25	1	12	10	23	S	14	2	0
	BUS	3	0	1	0	1	10	1	9	0	10	2	1	2	1	4	9	0	8	1	9	E	1	1	0
	<b>TOTAL:</b>	<b>408</b>	<b>21</b>	<b>58</b>	<b>17</b>	<b>96</b>	<b>564</b>	<b>184</b>	<b>337</b>	<b>17</b>	<b>538</b>	<b>51</b>	<b>210</b>	<b>28</b>	<b>219</b>	<b>457</b>	<b>547</b>	<b>6</b>	<b>307</b>	<b>166</b>	<b>479</b>	<b>W</b>	<b>33</b>	<b>1</b>	<b>0</b>
07:30-09:30	CAR	1,282	45	277	26	348	3,122	556	1,865	74	2,495	137	1,231	58	248	1,537	849	5	556	449	1,010	N	15	5	0
	TRK	29	3	4	1	8	87	12	42	2	56	8	44	5	18	67	32	1	11	13	25	S	40	5	0
	BUS	16	0	8	0	8	24	6	21	0	27	8	3	8	3	14	20	0	17	2	19	E	3	3	0
	<b>TOTAL:</b>	<b>1,327</b>	<b>48</b>	<b>289</b>	<b>27</b>	<b>364</b>	<b>3,233</b>	<b>574</b>	<b>1,928</b>	<b>76</b>	<b>2,578</b>	<b>153</b>	<b>1,278</b>	<b>71</b>	<b>269</b>	<b>1,618</b>	<b>901</b>	<b>6</b>	<b>584</b>	<b>464</b>	<b>1,054</b>	<b>W</b>	<b>130</b>	<b>19</b>	<b>0</b>
16:00-18:00	CAR	949	54	136	31	221	2,280	438	1,093	63	1,594	203	1,156	120	572	1,848	1,908	20	1,282	375	1,677	N	24	3	0
	TRK	15	0	2	0	2	18	7	9	1	17	2	9	1	6	16	24	0	18	6	24	S	27	28	0
	BUS	9	0	8	0	8	18	0	16	0	16	7	2	7	0	9	15	0	15	1	16	E	2	5	0
	<b>TOTAL:</b>	<b>973</b>	<b>54</b>	<b>146</b>	<b>31</b>	<b>231</b>	<b>2,316</b>	<b>445</b>	<b>1,118</b>	<b>64</b>	<b>1,627</b>	<b>212</b>	<b>1,167</b>	<b>128</b>	<b>578</b>	<b>1,873</b>	<b>1,947</b>	<b>20</b>	<b>1,315</b>	<b>382</b>	<b>1,717</b>	<b>W</b>	<b>110</b>	<b>23</b>	<b>0</b>
07:30-18:00	CAR	3,786	176	637	108	921	7,502	1,706	4,226	200	6,132	516	3,168	270	1,646	5,084	4,806	46	2,984	1,443	4,473	N	67	10	0
	TRK	108	10	10	15	35	218	40	94	6	140	27	109	18	67	194	155	3	78	58	139	S	122	42	0
	BUS	35	0	21	0	21	79	8	71	0	79	21	8	21	7	36	71	0	64	6	70	E	7	11	0
	<b>TOTAL:</b>	<b>3,929</b>	<b>186</b>	<b>668</b>	<b>123</b>	<b>977</b>	<b>7,799</b>	<b>1,754</b>	<b>4,391</b>	<b>206</b>	<b>6,351</b>	<b>554</b>	<b>3,285</b>	<b>309</b>	<b>1,720</b>	<b>5,314</b>	<b>5,032</b>	<b>49</b>	<b>3,126</b>	<b>1,507</b>	<b>4,682</b>	<b>W</b>	<b>370</b>	<b>47</b>	<b>0</b>

Total 8 Hour Vehicle Volume: 17,324  
Comment:

Total 8 Hour Bicycle Volume: 110

Total 8 Hour Intersection Volume: 17,434

# Ontario Traffic Inc.

## Morning Peak Diagram

### Specified Period

From: 7:00:00

To: 9:00:00

### One Hour Peak

From: 7:45:00

To: 8:45:00

**Municipality:** Toronto  
**Site #:** 0919400002  
**Intersection:** Lake Shore Blvd W & Casa Mendoz  
**TFR File #:** 11  
**Count date:** 12-Aug-09

**Weather conditions:**

**Person(s) who counted:**

**\*\* Non-Signalized Intersection \*\***

**Major Road:** Lake Shore Blvd W runs W/E

North Leg Total: 5  
 North Entering: 5  
 North Peds: 0  
 Peds Cross:  $\blacktriangleleft$

Heavys	0	0	0	0
Trucks	1	0	0	1
Cars	3	0	1	4
Totals	4	0	1	



Heavys 0  
 Trucks 0  
 Cars 0  
 Totals 0

East Leg Total: 2119  
 East Entering: 491  
 East Peds: 1  
 Peds Cross:  $\blacktriangleright$

Heavys	0	16	478	494
--------	---	----	-----	-----

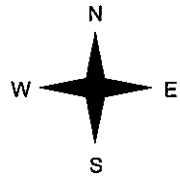


Lake Shore Blvd W



Christie's Bakery West Driveway

Cars	0	0	0	0
Trucks	473	15	0	488
Heavys	3	0	0	3
Totals	476	15	0	



Heavys	0	0	0	0
Trucks	0	51	1575	1626
Cars	0	0	0	0
Totals	0	51	1575	



Casa Mendoza Site Driveway

Lake Shore Blvd W



Cars	1577	51	0	1628
------	------	----	---	------

Peds Cross:  $\blacktriangleright$   
 West Peds: 0  
 West Entering: 1626  
 West Leg Total: 2120

Cars	3			
Trucks	0			
Heavys	0			
Totals	3			



Cars	2	0	1	3
Trucks	0	0	0	0
Heavys	0	0	0	0
Totals	2	0	1	

Peds Cross:  $\blacktriangleleft$   
 South Peds: 27  
 South Entering: 3  
 South Leg Total: 6

### Comments





# Ontario Traffic Inc.

## Total Count Diagram

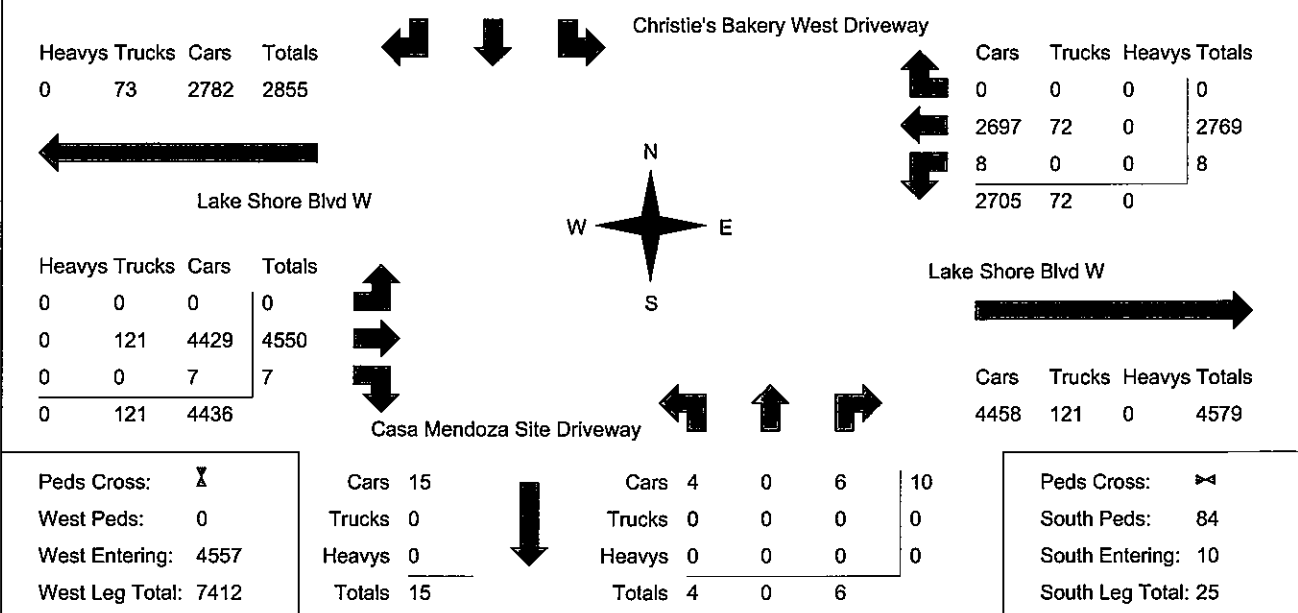
**Municipality:** Toronto  
**Site #:** 0919400002  
**Intersection:** Lake Shore Blvd W & Casa Mendoz  
**TFR File #:** 11  
**Count date:** 12-Aug-09

**Weather conditions:**  
**Person(s) who counted:**

**\*\* Non-Signalized Intersection \*\***

**Major Road:** Lake Shore Blvd W runs W/E

North Leg Total: 105 North Entering: 105 North Peds: 8 Peds Cross: $\nabla$	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Trucks</td><td>1</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>Cars</td><td>81</td><td>0</td><td>23</td><td>104</td></tr> <tr><td>Totals</td><td>82</td><td>0</td><td>23</td><td></td></tr> </table>	Heavys	0	0	0	0	Trucks	1	0	0	1	Cars	81	0	23	104	Totals	82	0	23			<table style="width: 100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>0</td></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Cars</td><td>0</td></tr> <tr><td>Totals</td><td>0</td></tr> </table>	Heavys	0	Trucks	0	Cars	0	Totals	0	East Leg Total: 7356 East Entering: 2777 East Peds: 5 Peds Cross: $\nabla$
Heavys	0	0	0	0																												
Trucks	1	0	0	1																												
Cars	81	0	23	104																												
Totals	82	0	23																													
Heavys	0																															
Trucks	0																															
Cars	0																															
Totals	0																															



### Comments

# Ontario Traffic Inc. Traffic Count Summary

Intersection: Lake Shore Blvd W & Casa Mendocino    Count Date: 12-Aug-09    Municipality: Toronto

North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	3	3	0	3	7:00:00	0	0	0	0	0
8:00:00	10	0	47	57	1	59	8:00:00	1	0	1	2	11
9:00:00	1	0	6	7	0	8	9:00:00	1	0	0	1	32
16:00:00	0	0	0	0	1	0	16:00:00	0	0	0	0	0
17:00:00	6	0	12	18	0	21	17:00:00	1	0	2	3	15
18:00:00	6	0	14	20	4	24	18:00:00	1	0	3	4	24
<b>Totals:</b>	<b>23</b>	<b>0</b>	<b>82</b>	<b>105</b>	<b>6</b>	<b>115</b>		<b>4</b>	<b>0</b>	<b>6</b>	<b>10</b>	<b>82</b>

East Approach Totals						East/West Total Approaches	West Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	10	0	10	0	20	7:00:00	0	10	0	10	0
8:00:00	2	402	0	404	0	1608	8:00:00	0	1204	0	1204	0
9:00:00	2	499	0	501	3	2096	9:00:00	0	1595	0	1595	0
16:00:00	0	14	0	14	0	44	16:00:00	0	30	0	30	0
17:00:00	3	866	0	869	1	1578	17:00:00	0	706	3	709	0
18:00:00	1	948	0	949	1	1908	18:00:00	0	955	4	959	0
<b>Totals:</b>	<b>8</b>	<b>2739</b>	<b>0</b>	<b>2747</b>	<b>5</b>	<b>7254</b>		<b>0</b>	<b>4500</b>	<b>7</b>	<b>4507</b>	<b>0</b>

### Calculated Values for Traffic Crossing Major Street

Hours Ending:	0:00	0:00	7:00	8:00		9:00	16:00	17:00	18:00
Crossing Values:	0	0	0	11		5	0	8	8

# Ontario Traffic Inc.

## Morning Peak Diagram

### Specified Period

From: 7:00:00

To: 9:00:00

### One Hour Peak

From: 8:00:00

To: 9:00:00

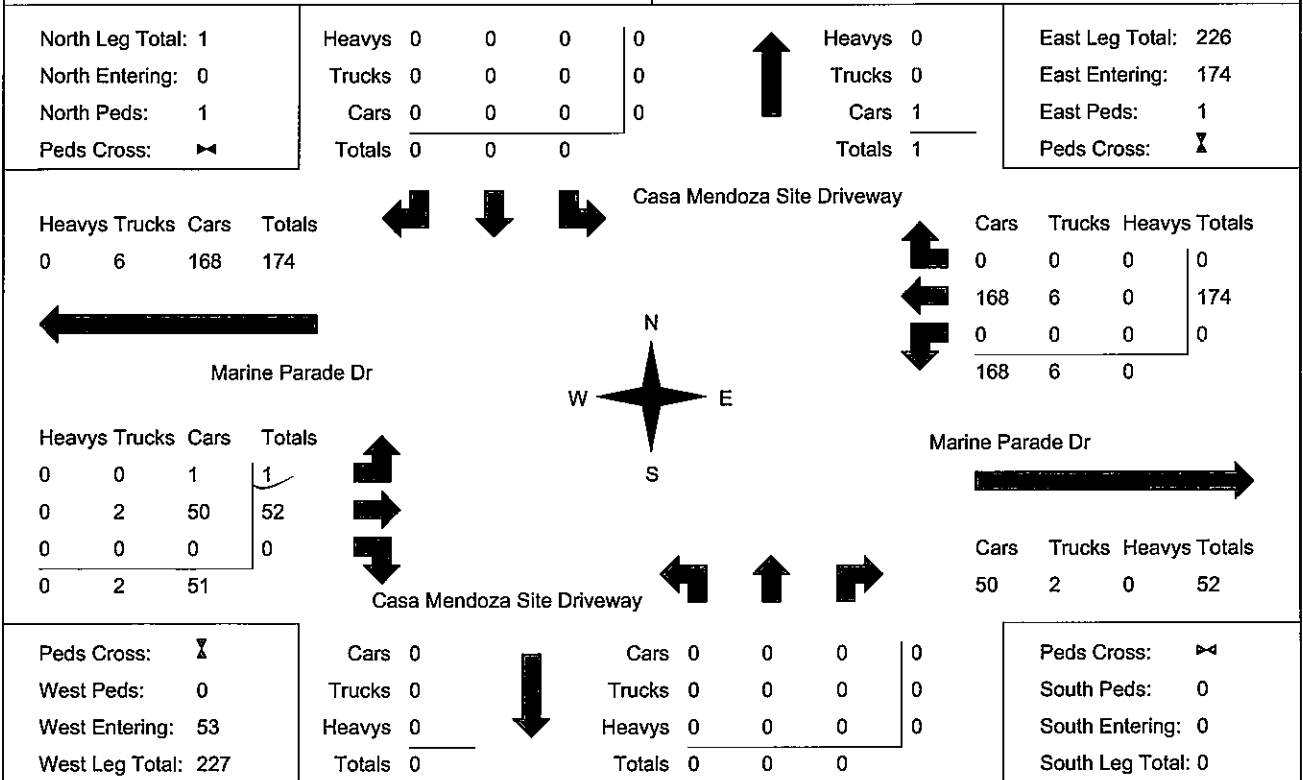
**Municipality:** Toronto  
**Site #:** 0919400001  
**Intersection:** Marine Parade Dr & Casa Mendoza  
**TFR File #:** 1  
**Count date:** 12-Aug-09

**Weather conditions:**

**Person(s) who counted:**

**\*\* Non-Signalized Intersection \*\***

**Major Road:** Marine Parade Dr runs W/E



## Comments

# Ontario Traffic Inc.

## Afternoon Peak Diagram

### Specified Period

From: 16:00:00

To: 18:00:00

### One Hour Peak

From: 17:00:00

To: 18:00:00

**Municipality:** Toronto  
**Site #:** 0919400001  
**Intersection:** Marine Parade Dr & Casa Mendoza  
**TFR File #:** 1  
**Count date:** 12-Aug-09

**Weather conditions:**

**Person(s) who counted:**

**\*\* Non-Signalized Intersection \*\***

**Major Road:** Marine Parade Dr runs W/E

North Leg Total: 5  
 North Entering: 4  
 North Peds: 0  
 Peds Cross:  $\blacktriangleleft$

Heavys	0	0	0	0
Trucks	0	0	0	0
Cars	1	0	3	4
Totals	1	0	3	

↑  
 Heavys 0  
 Trucks 0  
 Cars 1  
 Totals 1

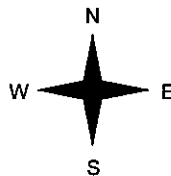
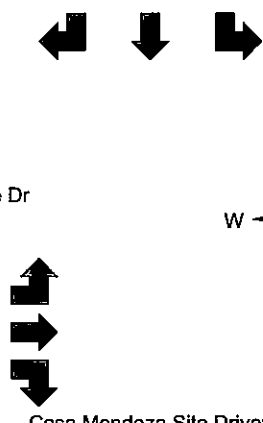
East Leg Total: 236  
 East Entering: 126  
 East Peds: 1  
 Peds Cross:  $\blacktriangleright$

Heavys	0	Trucks	4	Cars	123	Totals	127
--------	---	--------	---	------	-----	--------	-----



Marine Parade Dr

Heavys	0	Trucks	0	Cars	1	Totals	1
Heavys	0	Trucks	0	Cars	107	Totals	107
Heavys	0	Trucks	0	Cars	0	Totals	0
Heavys	0	Trucks	0	Cars	108	Totals	



Casa Mendoza Site Driveway

Cars	0	Trucks	0	Heavys	0	Totals	0
Cars	122	Trucks	4	Heavys	0	Totals	126
Cars	0	Trucks	0	Heavys	0	Totals	0
Cars	122	Trucks	4	Heavys	0	Totals	

Marine Parade Dr

Cars	110	Trucks	0	Heavys	0	Totals	110
------	-----	--------	---	--------	---	--------	-----

Peds Cross:  $\blacktriangleright$   
 West Peds: 4  
 West Entering: 108  
 West Leg Total: 235

Cars	0	Trucks	0	Heavys	0	Totals	0
Cars	0	Trucks	0	Heavys	0	Totals	0
Cars	0	Trucks	0	Heavys	0	Totals	0
Cars	0	Trucks	0	Heavys	0	Totals	0

Peds Cross:  $\blacktriangleleft$   
 South Peds: 0  
 South Entering: 0  
 South Leg Total: 0

### Comments

# Ontario Traffic Inc.

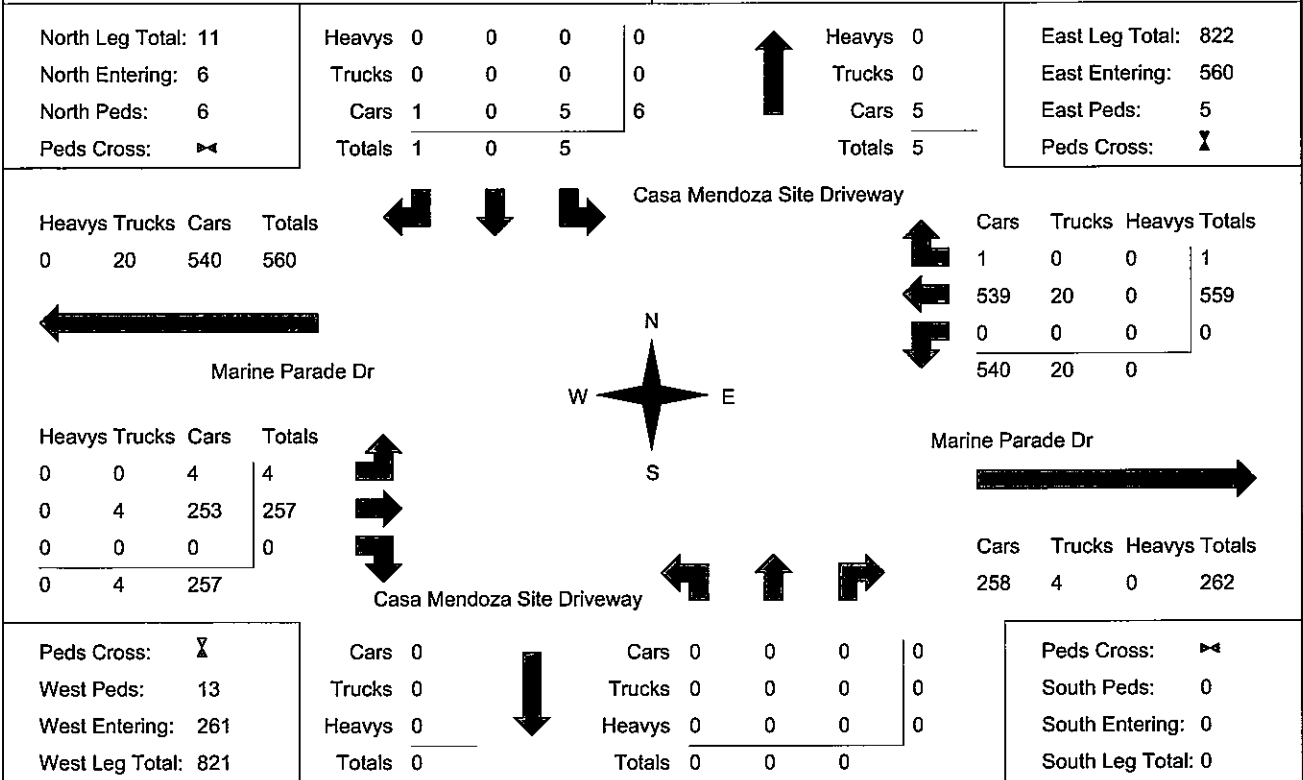
## Total Count Diagram

**Municipality:** Toronto  
**Site #:** 0919400001  
**Intersection:** Marine Parade Dr & Casa Mendoza  
**TFR File #:** 1  
**Count date:** 12-Aug-09

**Weather conditions:**  
**Person(s) who counted:**

**\*\* Non-Signalized Intersection \*\***

**Major Road:** Marine Parade Dr runs W/E



### Comments

# Ontario Traffic Inc. Traffic Count Summary

Intersection: Marine Parade Dr & Casa Mendoz														Count Date: 12-Aug-09		Municipality: Toronto	
North Approach Totals							South Approach Totals										
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds	North/South Total Approaches	Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds					
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total						
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0					
8:00:00	1	0	0	1	1	1	8:00:00	0	0	0	0	0					
9:00:00	0	0	0	0	1	0	9:00:00	0	0	0	0	0					
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0					
17:00:00	1	0	0	1	2	1	17:00:00	0	0	0	0	0					
18:00:00	3	0	1	4	0	4	18:00:00	0	0	0	0	0					
<b>Totals:</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>6</b>	<b>4</b>	<b>6</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>					
East Approach Totals							West Approach Totals										
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds	East/West Total Approaches	Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds					
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total						
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0					
8:00:00	0	121	0	121	2	157	8:00:00	0	36	0	36	1					
9:00:00	0	174	0	174	1	227	9:00:00	1	52	0	53	0					
16:00:00	0	3	0	3	0	3	16:00:00	0	0	0	0	0					
17:00:00	0	131	1	132	1	192	17:00:00	2	58	0	60	8					
18:00:00	0	126	0	126	1	234	18:00:00	1	107	0	108	4					
<b>Totals:</b>	<b>0</b>	<b>555</b>	<b>1</b>	<b>556</b>	<b>5</b>	<b>813</b>		<b>4</b>	<b>253</b>	<b>0</b>	<b>257</b>	<b>13</b>					
<b>Calculated Values for Traffic Crossing Major Street</b>																	
Hours Ending:	0:00	0:00	7:00	8:00			9:00	16:00	17:00	18:00							
Crossing Values:	0	0	0	4			1	0	10	8							

# Ontario Traffic Inc.

## Morning Peak Diagram

### Specified Period

From: 7:00:00

To: 9:00:00

### One Hour Peak

From: 7:45:00

To: 8:45:00

**Municipality:** Toronto  
**Site #:** 0919400003  
**Intersection:** Lake Shore Blvd W & Christie's Bak  
**TFR File #:** 20  
**Count date:** 12-Aug-09

**Weather conditions:**

**Person(s) who counted:**

**\*\* Non-Signalized Intersection \*\***

**Major Road:** Lake Shore Blvd W runs W/E

North Leg Total: 16  
 North Entering: 0  
 North Peds: 0  
 Peds Cross: 0

Heavys	0	0	0
Trucks	0	0	0
Cars	0	0	0
Totals	0	0	0



Heavys 0  
 Trucks 1  
 Cars 15  
 Totals 16

East Leg Total: 2098  
 East Entering: 484  
 East Peds: 0  
 Peds Cross: 0

Heavys	Trucks	Cars	Totals
0	21	460	481



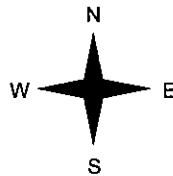
Christie's Bakery East Driveway



Cars	Trucks	Heavys	Totals
3	0	0	3
460	21	0	481
463	21	0	



Lake Shore Blvd W



Heavys	Trucks	Cars	Totals
0	1	12	13
0	58	1556	1614
0	59	1568	



Lake Shore Blvd W



Cars	Trucks	Heavys	Totals
1556	58	0	1614

Peds Cross: 0  
 West Peds: 3  
 West Entering: 1627  
 West Leg Total: 2108

## Comments



# Ontario Traffic Inc.

## Afternoon Peak Diagram

### Specified Period

From: 16:00:00

To: 18:00:00

### One Hour Peak

From: 17:00:00

To: 18:00:00

**Municipality:** Toronto  
**Site #:** 0919400003  
**Intersection:** Lake Shore Blvd W & Christie's Bak  
**TFR File #:** 20  
**Count date:** 12-Aug-09

**Weather conditions:**

**Person(s) who counted:**

**\*\* Non-Signalized Intersection \*\***

**Major Road:** Lake Shore Blvd W runs W/E

North Leg Total: 6  
 North Entering: 0  
 North Peds: 4  
 Peds Cross: 2

Heavys	0	0	0
Trucks	0	0	0
Cars	0	0	0
Totals	0	0	0



Heavys 0  
 Trucks 2  
 Cars 4  
 Totals 6

East Leg Total: 1875  
 East Entering: 934  
 East Peds: 0  
 Peds Cross: 1

Heavys	Trucks	Cars	Totals
0	25	904	929

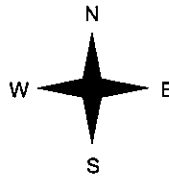


Christie's Bakery East Driveway

Cars	Trucks	Heavys	Totals
1	2	0	3
904	25	0	929
905	29	0	



Lake Shore Blvd W



Heavys	Trucks	Cars	Totals
0	0	3	3
0	19	922	941
0	19	925	



Lake Shore Blvd W



Cars	Trucks	Heavys	Totals
922	19	0	941

Peds Cross: 1  
 West Peds: 5  
 West Entering: 944  
 West Leg Total: 1873

### Comments

# Ontario Traffic Inc.

## Total Count Diagram

**Municipality:** Toronto  
**Site #:** 0919400003  
**Intersection:** Lake Shore Blvd W & Christie's Bak  
**TFR File #:** 20  
**Count date:** 12-Aug-09

**Weather conditions:**  
**Person(s) who counted:**

**\*\* Non-Signalized Intersection \*\***

**Major Road:** Lake Shore Blvd W runs W/E

North Leg Total: 49  
 North Entering: 2  
 North Peds: 5  
 Peds Cross:  $\blacktriangleleft$

Heavys	0	0	0
Trucks	0	0	0
Cars	0	2	2
Totals	0	2	



Heavys 0  
 Trucks 4  
 Cars 43  
 Totals 47

East Leg Total: 7137  
 East Entering: 2713  
 East Peds: 0  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
0	94	2601	2695

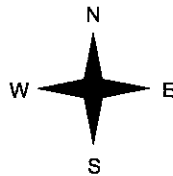


Christie's Bakery East Driveway



Cars	Trucks	Heavys	Totals
13	3	0	16
2601	94	0	2695
2614	99	0	

Lake Shore Blvd W



Heavys	Trucks	Cars	Totals
0	1	30	31
0	145	4277	4422
0	146	4307	



Lake Shore Blvd W



Cars	Trucks	Heavys	Totals
4279	145	0	4424

Peds Cross:  $\times$   
 West Peds: 12  
 West Entering: 4453  
 West Leg Total: 7148

### Comments

# Ontario Traffic Inc. Traffic Count Summary

Intersection: Lake Shore Blvd W & Christie's Ba    Count Date: 12-Aug-09    Municipality: Toronto

North Approach Totals						South Approach Totals						
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds	North/South Total Approaches	Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	0	0	0	0	1	0	8:00:00	0	0	0	0	11
9:00:00	0	0	0	0	0	0	9:00:00	0	0	0	0	27
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	2	0	0	2	0	2	17:00:00	0	0	0	0	13
18:00:00	0	0	0	0	4	0	18:00:00	0	0	0	0	18
<b>Totals:</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>5</b>	<b>2</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>69</b>

East Approach Totals						West Approach Totals						
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds	East/West Total Approaches	Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	0	410	8	418	0	1629	8:00:00	8	1203	0	1211	0
9:00:00	0	484	5	489	0	2087	9:00:00	20	1578	0	1598	3
16:00:00	0	1	0	1	0	1	16:00:00	0	0	0	0	0
17:00:00	0	867	0	867	0	1565	17:00:00	0	698	0	698	4
18:00:00	2	929	3	934	0	1878	18:00:00	3	941	0	944	5
<b>Totals:</b>	<b>2</b>	<b>2691</b>	<b>16</b>	<b>2709</b>	<b>0</b>	<b>7160</b>		<b>31</b>	<b>4420</b>	<b>0</b>	<b>4451</b>	<b>12</b>

### Calculated Values for Traffic Crossing Major Street

Hours Ending:	0:00	0:00	7:00	8:00	9:00	16:00	17:00	18:00
Crossing Values:	0	0	0	0	3	0	6	5

# Ontario Traffic Inc.

## Morning Peak Diagram

### Specified Period

From: 7:00:00  
To: 9:00:00

### One Hour Peak

From: 7:45:00  
To: 8:45:00

**Municipality:** Toronto  
**Site #:** 0919400004  
**Intersection:** Lake Shore Blvd W & Brookers Lane  
**TFR File #:** 2  
**Count date:** 12-Aug-09

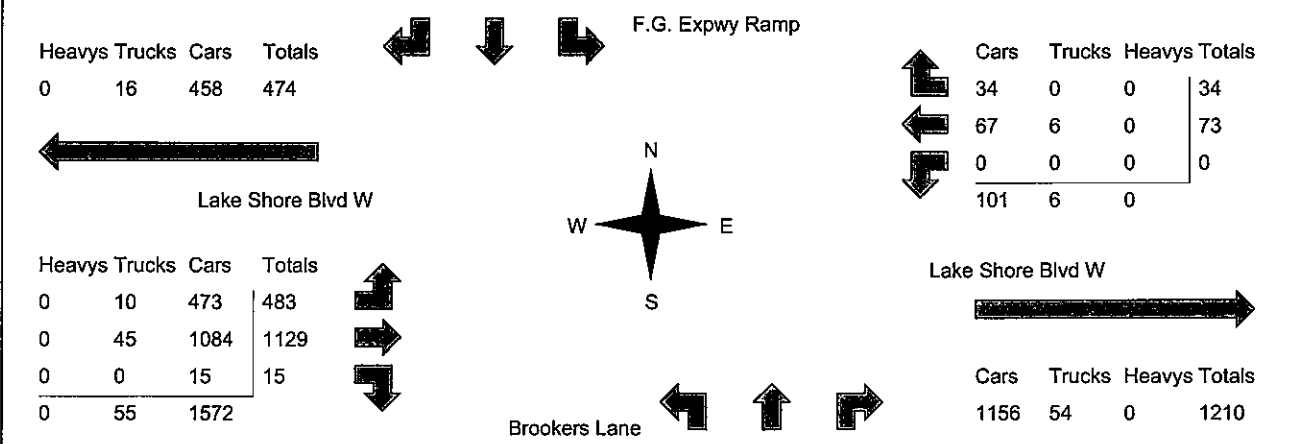
### Weather conditions:

### Person(s) who counted:

### \*\* Signalized Intersection \*\*

**Major Road:** Lake Shore Blvd W runs W/E

North Leg Total: 881 North Entering: 344 North Peds: 0 Peds Cross: X	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Trucks</td><td>10</td><td>0</td><td>9</td><td>19</td></tr> <tr><td>Cars</td><td>283</td><td>10</td><td>32</td><td>325</td></tr> <tr><td>Totals</td><td>293</td><td>10</td><td>41</td><td></td></tr> </table>	Heavys	0	0	0	0	Trucks	10	0	9	19	Cars	283	10	32	325	Totals	293	10	41			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>0</td></tr> <tr><td>Trucks</td><td>10</td></tr> <tr><td>Cars</td><td>527</td></tr> <tr><td>Totals</td><td>537</td></tr> </table>	Heavys	0	Trucks	10	Cars	527	Totals	537	East Leg Total: 1317 East Entering: 107 East Peds: 0 Peds Cross: X
Heavys	0	0	0	0																												
Trucks	10	0	9	19																												
Cars	283	10	32	325																												
Totals	293	10	41																													
Heavys	0																															
Trucks	10																															
Cars	527																															
Totals	537																															



Peds Cross: X West Peds: 0 West Entering: 1627 West Leg Total: 2101	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Cars</td><td>25</td></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Heavys</td><td>0</td></tr> <tr><td>Totals</td><td>25</td></tr> </table>	Cars	25	Trucks	0	Heavys	0	Totals	25		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Cars</td><td>108</td><td>20</td><td>40</td><td>168</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Heavys</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Totals</td><td>108</td><td>20</td><td>40</td><td></td></tr> </table>	Cars	108	20	40	168	Trucks	0	0	0	0	Heavys	0	0	0	0	Totals	108	20	40		Peds Cross: X South Peds: 18 South Entering: 168 South Leg Total: 193
Cars	25																															
Trucks	0																															
Heavys	0																															
Totals	25																															
Cars	108	20	40	168																												
Trucks	0	0	0	0																												
Heavys	0	0	0	0																												
Totals	108	20	40																													

### Comments

# Ontario Traffic Inc.

## Afternoon Peak Diagram

### Specified Period

From: 16:00:00

To: 18:00:00

### One Hour Peak

From: 17:00:00

To: 18:00:00

**Municipality:** Toronto  
**Site #:** 0919400004  
**Intersection:** Lake Shore Blvd W & Brookers Lane  
**TFR File #:** 2  
**Count date:** 12-Aug-09

**Weather conditions:**

**Person(s) who counted:**

**\*\* Signalized Intersection \*\***

**Major Road:** Lake Shore Blvd W runs W/E

North Leg Total: 1180  
 North Entering: 978  
 North Peds: 2  
 Peds Cross: 2

Heavys	0	0	0	0
Trucks	17	0	4	21
Cars	797	43	117	957
<b>Totals</b>	<b>814</b>	<b>43</b>	<b>121</b>	



Heavys 0  
 Trucks 2  
 Cars 200  
 Totals 202

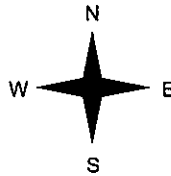
East Leg Total: 902  
 East Entering: 99  
 East Peds: 1  
 Peds Cross: 1

Heavys	0	Trucks	26	Cars	924	Totals	950
--------	---	--------	----	------	-----	--------	-----



Lake Shore Blvd W

Heavys	0	Trucks	2	Cars	182	Totals	184
0	12	651	663				
0	0	96	96				
0	14	929					



F.G. Expwy Ramp



Cars	14	Trucks	0	Heavys	0	Totals	14
74	8	0	82				
2	1	0	3				
90	9	0					

Lake Shore Blvd W



Peds Cross: 1  
 West Peds: 0  
 West Entering: 943  
 West Leg Total: 1893

Cars	141
Trucks	1
Heavys	0
<b>Totals</b>	<b>142</b>



Brookers Lane



Cars	53	4	19	76
Trucks	1	0	0	1
Heavys	0	0	0	0
<b>Totals</b>	<b>54</b>	<b>4</b>	<b>19</b>	

Cars	787	Trucks	16	Heavys	0	Totals	803
------	-----	--------	----	--------	---	--------	-----

Peds Cross: 1  
 South Peds: 13  
 South Entering: 77  
 South Leg Total: 219

### Comments

# Ontario Traffic Inc.

## Total Count Diagram

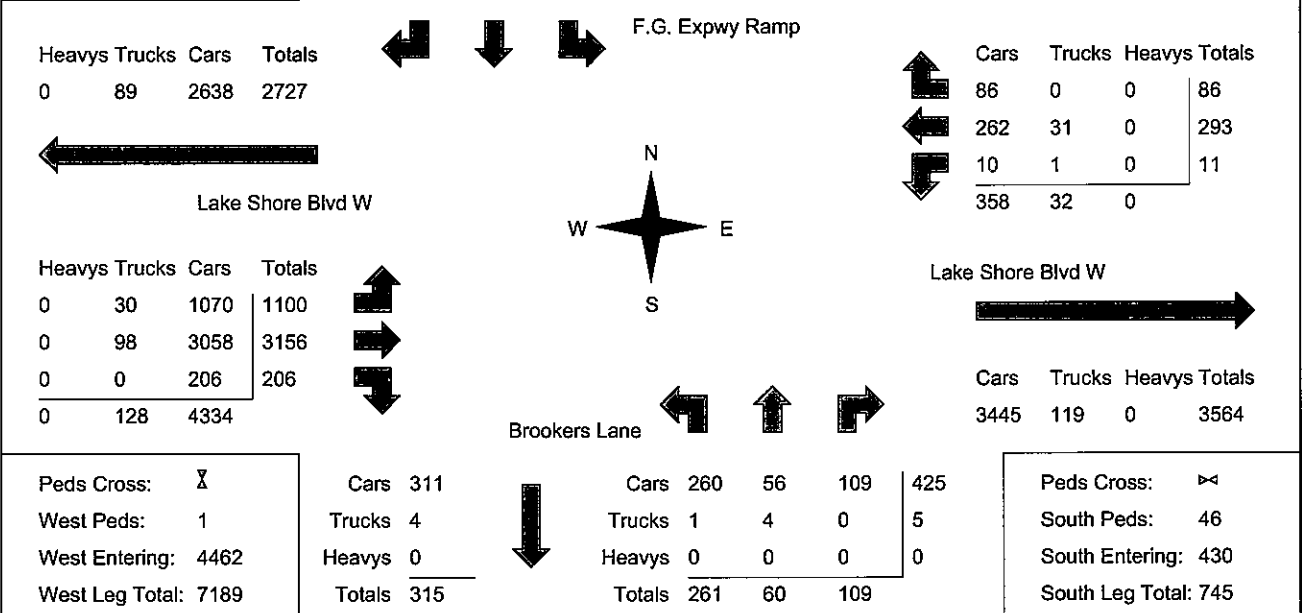
**Municipality:** Toronto  
**Site #:** 0919400004  
**Intersection:** Lake Shore Blvd W & Brookers Lane  
**TFR File #:** 2  
**Count date:** 12-Aug-09

**Weather conditions:**  
**Person(s) who counted:**

**\*\* Signalized Intersection \*\***

**Major Road:** Lake Shore Blvd W runs W/E

North Leg Total: 3816 North Entering: 2570 North Peds: 3 Peds Cross: ▶	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Trucks</td><td>57</td><td>3</td><td>21</td><td>81</td></tr> <tr><td>Cars</td><td>2116</td><td>95</td><td>278</td><td>2489</td></tr> <tr><td>Totals</td><td>2173</td><td>98</td><td>299</td><td></td></tr> </table>	Heavys	0	0	0	0	Trucks	57	3	21	81	Cars	2116	95	278	2489	Totals	2173	98	299			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>0</td></tr> <tr><td>Trucks</td><td>34</td></tr> <tr><td>Cars</td><td>1212</td></tr> <tr><td>Totals</td><td>1246</td></tr> </table>	Heavys	0	Trucks	34	Cars	1212	Totals	1246	East Leg Total: 3954 East Entering: 390 East Peds: 1 Peds Cross: ✕
Heavys	0	0	0	0																												
Trucks	57	3	21	81																												
Cars	2116	95	278	2489																												
Totals	2173	98	299																													
Heavys	0																															
Trucks	34																															
Cars	1212																															
Totals	1246																															



### Comments

# Ontario Traffic Inc. Traffic Count Summary

Ontario Traffic Inc. Traffic Count Summary													
Intersection: Lake Shore Blvd W & Brookers La						Count Date: 12-Aug-09			Municipality: Toronto				
North Approach Totals						North/South Total Approaches	South Approach Totals						
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds	
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total		
7:00:00	0	2	0	2	0	5	7:00:00	0	3	0	3	0	
8:00:00	47	9	265	321	1	459	8:00:00	83	23	32	138	4	
9:00:00	41	10	311	362	0	519	9:00:00	99	16	42	157	19	
16:00:00	1	2	1	4	0	10	16:00:00	0	6	0	6	1	
17:00:00	88	31	781	900	0	948	17:00:00	25	8	15	48	9	
18:00:00	121	43	814	978	2	1055	18:00:00	54	4	19	77	13	
<b>Totals:</b>	298	97	2172	2567	3	2996		261	60	108	429	46	
East Approach Totals						East/West Total Approaches	West Approach Totals						
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds	
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total		
7:00:00	0	3	0	3	0	4	7:00:00	0	1	0	1	0	
8:00:00	0	67	27	94	0	1284	8:00:00	321	861	8	1190	1	
9:00:00	2	74	31	107	0	1697	9:00:00	452	1119	19	1590	0	
16:00:00	1	2	1	4	0	27	16:00:00	6	17	0	23	0	
17:00:00	4	64	12	80	0	777	17:00:00	136	479	82	697	0	
18:00:00	3	82	14	99	1	1042	18:00:00	184	663	96	943	0	
<b>Totals:</b>	10	292	85	387	1	4831		1099	3140	205	4444	1	
<b>Calculated Values for Traffic Crossing Major Street</b>													
Hours Ending:	0:00	0:00	7:00	8:00			9:00	16:00	17:00	18:00			
Crossing Values:	0	0	3	154			156	7	144	219			



# Ontario Traffic Inc.

## Morning Peak Diagram

### Specified Period

From: 7:00:00

To: 9:00:00

### One Hour Peak

From: 7:45:00

To: 8:45:00

**Municipality:** Toronto  
**Site #:** 0919400005  
**Intersection:** Lake Shore Blvd W & Marine Parade  
**TFR File #:** 1  
**Count date:** 12-Aug-09

**Weather conditions:**

**Person(s) who counted:**

**\*\* Non-Signalized Intersection \*\***

**Major Road:** Lake Shore Blvd W runs W/E

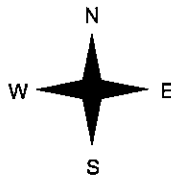
East Leg Total: 1283  
 East Entering: 60  
 East Peds: 0  
 Peds Cross: X

Heavys	Trucks	Cars	Totals
0	2	88	90



Lake Shore Blvd W

Cars	Trucks	Heavys	Totals
58	2	0	60
0	0	0	0
58	2	0	



Heavys	Trucks	Cars	Totals
0	36	1131	1167
0	9	25	34
0	45	1156	



Marine Parade Dr

Lake Shore Blvd W



Cars	Trucks	Heavys	Totals
1184	39	0	1223

Peds Cross: X  
 West Peds: 0  
 West Entering: 1201  
 West Leg Total: 1291

Cars	25
Trucks	9
Heavys	0
<b>Totals</b>	<b>34</b>



Cars	30	53	83
Trucks	0	3	3
Heavys	0	0	0
<b>Totals</b>	<b>30</b>	<b>56</b>	

Peds Cross: X  
 South Peds: 16  
 South Entering: 86  
 South Leg Total: 120

## Comments

# Ontario Traffic Inc.

## Afternoon Peak Diagram

### Specified Period

From: 16:00:00

To: 18:00:00

### One Hour Peak

From: 17:00:00

To: 18:00:00

**Municipality:** Toronto  
**Site #:** 0919400005  
**Intersection:** Lake Shore Blvd W & Marine Parad  
**TFR File #:** 1  
**Count date:** 12-Aug-09

**Weather conditions:**

**Person(s) who counted:**

**\*\* Non-Signalized Intersection \*\***

**Major Road:** Lake Shore Blvd W runs W/E

East Leg Total: 667  
 East Entering: 39  
 East Peds: 0  
 Peds Cross: X

Heavys	Trucks	Cars	Totals
0	1	68	69

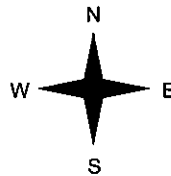


Lake Shore Blvd W

Heavys	Trucks	Cars	Totals
0	4	591	595
0	6	57	63
0	10	649	



Marine Parade Dr



Cars	Trucks	Heavys	Totals
38	0	0	38
1	0	0	1
39	0	0	



Lake Shore Blvd W

Cars	Trucks	Heavys	Totals
624	4	0	628



Peds Cross: X  
 West Peds: 0  
 West Entering: 659  
 West Leg Total: 728

Cars	58
Trucks	6
Heavys	0
<b>Totals</b>	<b>64</b>



Cars	30	33	63
Trucks	1	0	1
Heavys	0	0	0
<b>Totals</b>	<b>31</b>	<b>33</b>	

Peds Cross: X  
 South Peds: 9  
 South Entering: 64  
 South Leg Total: 128

## Comments

# Ontario Traffic Inc.

## Total Count Diagram

**Municipality:** Toronto  
**Site #:** 0919400005  
**Intersection:** Lake Shore Blvd W & Marine Parade  
**TFR File #:** 1  
**Count date:** 12-Aug-09

**Weather conditions:**  
**Person(s) who counted:**

**\*\* Non-Signalized Intersection \*\***

**Major Road:** Lake Shore Blvd W runs W/E

East Leg Total: 3449  
 East Entering: 179  
 East Peds: 0  
 Peds Cross: X

Heavys	Trucks	Cars	Totals
0	4	292	296

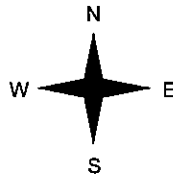


Lake Shore Blvd W

Heavys	Trucks	Cars	Totals
0	64	3042	3106
0	26	177	203
0	90	3220	



Marine Parade Dr



Cars	Trucks	Heavys	Totals
175	2	0	177
2	0	0	2
177	2	0	



Lake Shore Blvd W



Cars	Trucks	Heavys	Totals
3200	70	0	3270

Peds Cross:	X
West Peds:	0
West Entering:	3310
West Leg Total:	3606

Cars	179
Trucks	26
Heavys	0
Totals	205



Cars	117	158	275
Trucks	2	6	8
Heavys	0	0	0
Totals	119	164	

Peds Cross:	X
South Peds:	54
South Entering:	283
South Leg Total:	488

### Comments

# Ontario Traffic Inc. Traffic Count Summary

Intersection: Lake Shore Blvd W & Marine Parade    Count Date: 12-Aug-09    Municipality: Toronto

North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	0	0	0	0	0	78	8:00:00	32	0	46	78	14
9:00:00	0	0	0	0	0	78	9:00:00	27	0	51	78	21
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	0	0	0	0	0	63	17:00:00	29	0	34	63	10
18:00:00	0	0	0	0	0	64	18:00:00	31	0	33	64	9
<b>Totals:</b>	0	0	0	0	0	283		119	0	164	283	54

East Approach Totals						East/West Total Approaches	West Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	0	40	0	40	0	952	8:00:00	0	873	39	912	0
9:00:00	0	64	0	64	0	1249	9:00:00	0	1152	33	1185	0
16:00:00	0	0	0	0	0	1	16:00:00	0	1	0	1	0
17:00:00	1	35	0	36	0	587	17:00:00	0	483	68	551	0
18:00:00	1	38	0	39	0	698	18:00:00	1	595	63	659	0
<b>Totals:</b>	2	177	0	179	0	3487		1	3104	203	3308	0

### Calculated Values for Traffic Crossing Major Street

Hours Ending:	0:00	0:00	7:00	8:00		9:00	16:00	17:00	18:00
Crossing Values:	0	0	0	32		27	0	29	31

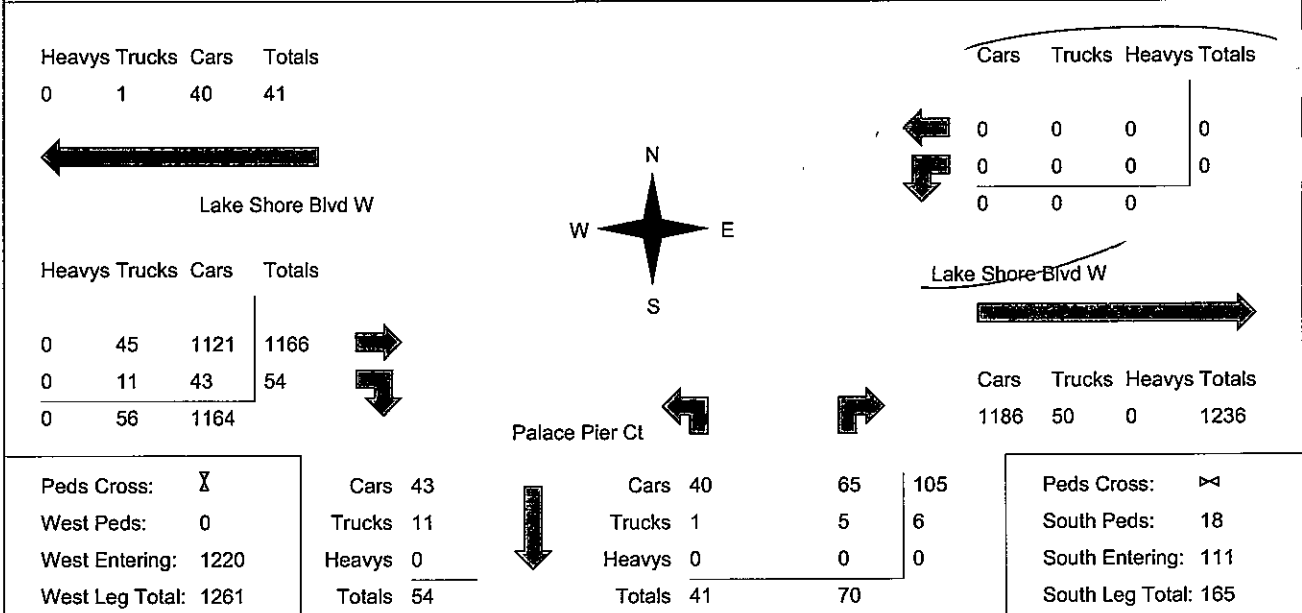
# Ontario Traffic Inc.

<b>Morning Peak Diagram</b>	<b>Specified Period</b> From: 7:00:00 To: 9:00:00	<b>One Hour Peak</b> From: 7:45:00 To: 8:45:00
-----------------------------	---	--

<b>Municipality:</b> Toronto <b>Site #:</b> 0919400006 <b>Intersection:</b> Lake Shore Blvd W & Palace Pier C <b>TFR File #:</b> 1 <b>Count date:</b> 12-Aug-09	<b>Weather conditions:</b>  <b>Person(s) who counted:</b>
---	---

**\*\* Non-Signalized Intersection \*\***      **Major Road:** Lake Shore Blvd W runs W/E

	East Leg Total: 1236 East Entering: 0 East Peds: 0 Peds Cross: X
--	---



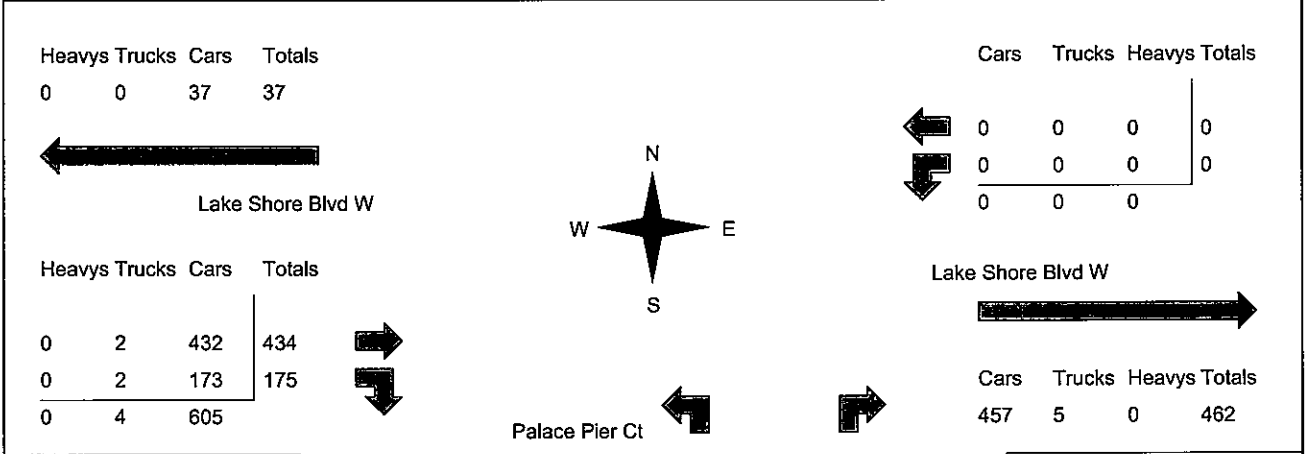
## Comments

# Ontario Traffic Inc.

<b>Afternoon Peak Diagram</b>	<b>Specified Period</b> From: 16:00:00 To: 18:00:00	<b>One Hour Peak</b> From: 17:00:00 To: 18:00:00
<b>Municipality:</b> Toronto <b>Site #:</b> 0919400006 <b>Intersection:</b> Lake Shore Blvd W & Palace Pier C <b>TFR File #:</b> 1 <b>Count date:</b> 12-Aug-09	<b>Weather conditions:</b>  <b>Person(s) who counted:</b>	

**\*\* Non-Signalized Intersection \*\***      **Major Road:** Lake Shore Blvd W runs W/E

	East Leg Total: 462 East Entering: 0 East Peds: 0 Peds Cross: X
--	--



Peds Cross: X West Peds: 0 West Entering: 609 West Leg Total: 646	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cars</td><td>173</td></tr> <tr><td>Trucks</td><td>2</td></tr> <tr><td>Heavys</td><td>0</td></tr> <tr><td><b>Totals</b></td><td><b>175</b></td></tr> </table>	Cars	173	Trucks	2	Heavys	0	<b>Totals</b>	<b>175</b>	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cars</td><td>37</td><td>25</td><td>62</td></tr> <tr><td>Trucks</td><td>0</td><td>3</td><td>3</td></tr> <tr><td>Heavys</td><td>0</td><td>0</td><td>0</td></tr> <tr><td><b>Totals</b></td><td><b>37</b></td><td><b>28</b></td><td></td></tr> </table>	Cars	37	25	62	Trucks	0	3	3	Heavys	0	0	0	<b>Totals</b>	<b>37</b>	<b>28</b>		Peds Cross: X South Peds: 20 South Entering: 65 South Leg Total: 240
Cars	173																										
Trucks	2																										
Heavys	0																										
<b>Totals</b>	<b>175</b>																										
Cars	37	25	62																								
Trucks	0	3	3																								
Heavys	0	0	0																								
<b>Totals</b>	<b>37</b>	<b>28</b>																									

**Comments**

# Ontario Traffic Inc.

## Total Count Diagram

**Municipality:** Toronto  
**Site #:** 0919400006  
**Intersection:** Lake Shore Blvd W & Palace Pier Ct  
**TFR File #:** 1  
**Count date:** 12-Aug-09

**Weather conditions:**  
**Person(s) who counted:**

**\*\* Non-Signalized Intersection \*\***

**Major Road:** Lake Shore Blvd W runs W/E

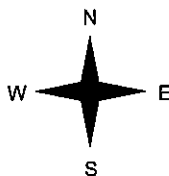
East Leg Total: 3048  
 East Entering: 2  
 East Peds: 1  
 Peds Cross: 1

Heavys	Trucks	Cars	Totals
0	2	148	150



Lake Shore Blvd W

Heavys	Trucks	Cars	Totals
0	81	2779	2860
0	21	416	437
0	102	3195	



Palace Pier Ct



Cars	Trucks	Heavys	Totals
0	0	0	0
2	0	0	2
2	0	0	



Lake Shore Blvd W



Cars	Trucks	Heavys	Totals
2951	95	0	3046

Peds Cross:	1
West Peds:	0
West Entering:	3297
West Leg Total:	3447

Cars	418
Trucks	21
Heavys	0
Totals	439

Cars	148	172	320
Trucks	2	14	16
Heavys	0	0	0
Totals	150	186	

Peds Cross:	64
South Peds:	64
South Entering:	336
South Leg Total:	775

### Comments

# Ontario Traffic Inc. Traffic Count Summary

Intersection: Lake Shore Blvd W & Palace Pier ( Count Date: 12-Aug-09 Municipality: Toronto

North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	9	7:00:00	3	0	6	9	0
8:00:00	0	0	0	0	0	84	8:00:00	30	0	54	84	6
9:00:00	0	0	0	0	0	112	9:00:00	45	0	67	112	21
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	0	0	0	0	0	66	17:00:00	35	0	31	66	17
18:00:00	0	0	0	0	0	65	18:00:00	37	0	28	65	20
<b>Totals:</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>336</b>		<b>150</b>	<b>0</b>	<b>186</b>	<b>336</b>	<b>64</b>

East Approach Totals						East/West Total Approaches	West Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	16	7:00:00	0	13	3	16	0
8:00:00	0	0	0	0	0	944	8:00:00	0	903	41	944	0
9:00:00	0	0	0	0	1	1212	9:00:00	0	1162	50	1212	0
16:00:00	0	0	0	0	0	6	16:00:00	0	4	2	6	0
17:00:00	2	0	0	2	0	504	17:00:00	0	340	162	502	0
18:00:00	0	0	0	0	0	609	18:00:00	0	434	175	609	0
<b>Totals:</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>3291</b>		<b>0</b>	<b>2856</b>	<b>433</b>	<b>3289</b>	<b>0</b>

### Calculated Values for Traffic Crossing Major Street

Hours Ending:	0:00	0:00	7:00	8:00	9:00	16:00	17:00	18:00
Crossing Values:	0	0	3	30	46	0	35	37



# Appendix B

## Level of Service Definitions

## Level of Service (LOS) Definitions

Signalized Intersection:

Level of Service	Control Delay (seconds)
A	0 – 10
B	> 10 – 20
C	> 20 – 35
D	> 35 – 55
E	> 55 – 80
F	> 80

Source: Highway Capacity Manual (HCM) 2000

Unsignalised Intersection:

Level of Service	Avg. Control Delay (seconds)
A	0 – 10
B	> 10 – 15
C	> 15 – 25
D	> 25 – 35
E	> 35 – 50
F	> 50

Source: Highway Capacity Manual (HCM) 2000

# Appendix C

## Intersection Capacity Analysis, Existing Conditions

# Timings

## 3: Lake Shore Blvd W & Park Lawn Road

3/3/2014



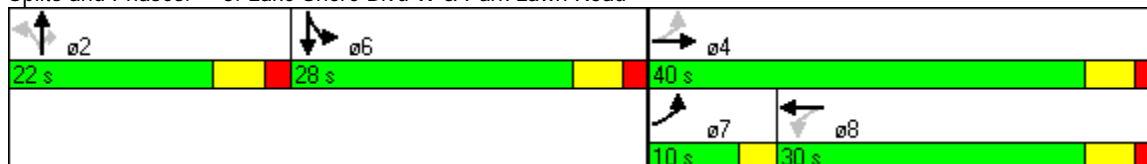
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕↕↕		↕↕		↕↕	↕	↕	↕
Volume (vph)	321	1140	6	305	27	158	15	756	34
Turn Type	pm+pt		Perm		Perm		Perm	Split	
Protected Phases	7	4		8		2		6	6
Permitted Phases	4		8		2		2		
Detector Phase	7	4	8	8	2	2	2	6	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	30.0	30.0	30.0	28.0	28.0	28.0	29.0	29.0
Total Split (s)	10.0	40.0	30.0	30.0	22.0	22.0	22.0	28.0	28.0
Total Split (%)	11.1%	44.4%	33.3%	33.3%	24.4%	24.4%	24.4%	31.1%	31.1%
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)	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	-1.0	0.0	-1.0	0.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	5.0	6.0	5.0	6.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag					
Lead-Lag Optimize?	Yes		Yes	Yes					
Recall Mode	None	Min	Min	Min	Min	Min	Min	Min	Min
Act Effect Green (s)		35.0		35.0		14.5	14.5	23.0	23.0
Actuated g/C Ratio		0.40		0.40		0.17	0.17	0.26	0.26
v/c Ratio		1.27dl		0.44		0.65	0.08	1.11	1.15
Control Delay		97.9		13.2		44.6	16.0	110.5	123.1
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		97.9		13.2		44.6	16.0	110.5	123.1
LOS		F		B		D	B	F	F
Approach Delay		97.9		13.2		42.4			116.8
Approach LOS		F		B		D			F

### Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 87.6	
Natural Cycle: 140	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 85.0	Intersection LOS: F
Intersection Capacity Utilization 93.9%	ICU Level of Service F
Analysis Period (min) 15	

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

### Splits and Phases: 3: Lake Shore Blvd W & Park Lawn Road



# HCM Signalized Intersection Capacity Analysis

## 3: Lake Shore Blvd W & Park Lawn Road

3/3/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔↔			↔↔			↔↔	↔	↔	↔	↔
Volume (vph)	321	1140	52	6	305	242	27	158	15	756	34	112
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		0.91			0.95			0.95	1.00	0.95	0.95	
Frbp, ped/bikes		1.00			0.99			1.00	0.99	1.00	0.98	
Flpb, ped/bikes		1.00			1.00			1.00	1.00	1.00	1.00	
Frt		0.99			0.93			1.00	0.85	1.00	0.96	
Flt Protected		0.99			1.00			0.99	1.00	0.95	0.97	
Satd. Flow (prot)		4956			3206			3263	1180	1649	1528	
Flt Permitted		0.70			0.93			0.56	1.00	0.95	0.97	
Satd. Flow (perm)		3526			2985			1836	1180	1649	1528	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	341	1213	55	6	324	257	29	168	16	804	36	119
RTOR Reduction (vph)	0	4	0	0	130	0	0	0	13	0	13	0
Lane Group Flow (vph)	0	1605	0	0	457	0	0	197	3	482	464	0
Confl. Peds. (#/hr)	1		14	1		1	59					59
Confl. Bikes (#/hr)			14			3			1			10
Heavy Vehicles (%)	3%	3%	0%	27%	6%	2%	12%	9%	35%	4%	28%	11%
Turn Type	pm+pt			Perm			Perm		Perm	Split		
Protected Phases	7	4			8			2		6	6	
Permitted Phases	4			8			2		2			
Actuated Green, G (s)		34.0			34.0			13.5	13.5	22.0	22.0	
Effective Green, g (s)		35.0			35.0			14.5	14.5	23.0	23.0	
Actuated g/C Ratio		0.40			0.40			0.17	0.17	0.26	0.26	
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)		1410			1194			304	196	433	402	
v/s Ratio Prot										0.29	c0.30	
v/s Ratio Perm		c0.46			0.15			c0.11	0.00			
v/c Ratio		1.27dl			0.38			0.65	0.02	1.11	1.15	
Uniform Delay, d1		26.2			18.6			34.1	30.5	32.2	32.2	
Progression Factor		1.00			1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		71.3			0.2			4.7	0.0	77.7	93.9	
Delay (s)		97.6			18.8			38.8	30.6	110.0	126.1	
Level of Service		F			B			D	C	F	F	
Approach Delay (s)		97.6			18.8			38.2			118.0	
Approach LOS		F			B			D			F	

### Intersection Summary

HCM Average Control Delay	85.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	87.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

# Timings

## 5: The Queensway & Park Lawn Rd

3/3/2014

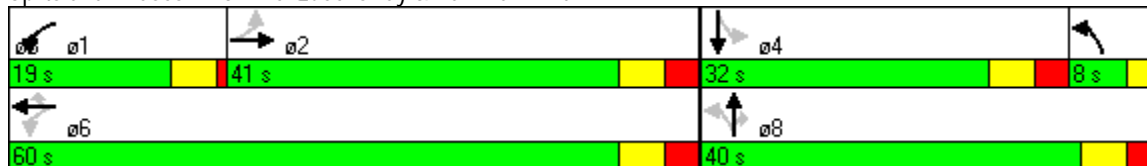


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↕	↖	↕	↖	↖	↕	↖	↖	↕
Volume (vph)	115	880	277	483	35	115	249	499	112	390
Turn Type	Perm		pm+pt		Perm	pm+pt		Perm	Perm	
Protected Phases		2	1	6		3	8			4
Permitted Phases	2		6		6	8	8	8	4	
Detector Phase	2	2	1	6	6	3	8	8	4	4
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	1.0	1.0	4.0	4.0
Minimum Split (s)	32.0	32.0	10.0	32.0	32.0	8.0	29.0	29.0	32.0	32.0
Total Split (s)	41.0	41.0	19.0	60.0	60.0	8.0	40.0	40.0	32.0	32.0
Total Split (%)	41.0%	41.0%	19.0%	60.0%	60.0%	8.0%	40.0%	40.0%	32.0%	32.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	5.0	7.0	7.0	3.0	7.0	7.0	7.0	7.0
Lead/Lag	Lag	Lag	Lead			Lag			Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes			Yes			Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None
Act Effect Green (s)	33.5	33.5	54.3	52.2	52.2	31.5	27.5	27.5	19.5	19.5
Actuated g/C Ratio	0.36	0.36	0.58	0.56	0.56	0.34	0.29	0.29	0.21	0.21
v/c Ratio	0.41	0.93	0.88	0.26	0.05	0.45	0.49	0.78	0.65	0.75
Control Delay	29.1	43.0	51.1	11.7	3.9	33.0	30.8	19.3	52.0	38.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.1	43.0	51.1	11.7	3.9	33.0	30.8	19.3	52.0	38.8
LOS	C	D	D	B	A	C	C	B	D	D
Approach Delay		41.7		25.1			24.5			41.1
Approach LOS		D		C			C			D

### Intersection Summary

Cycle Length: 100	
Actuated Cycle Length: 93.8	
Natural Cycle: 85	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 33.5	Intersection LOS: C
Intersection Capacity Utilization 87.5%	ICU Level of Service E
Analysis Period (min) 15	

### Splits and Phases: 5: The Queensway & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 5: The Queensway & Park Lawn Rd

3/3/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗	↗	↖	↗	
Volume (vph)	115	880	198	277	483	35	115	249	499	112	390	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		5.0	7.0	7.0	3.0	7.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1683	3346		1687	3471	1291	1769	1810	1476	1736	3349	
Flt Permitted	0.47	1.00		0.10	1.00	1.00	0.32	1.00	1.00	0.47	1.00	
Satd. Flow (perm)	828	3346		184	3471	1291	600	1810	1476	862	3349	
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)	120	917	206	289	503	36	120	259	520	117	406	147
RTOR Reduction (vph)	0	19	0	0	0	16	0	0	237	0	39	0
Lane Group Flow (vph)	120	1104	0	289	503	20	120	259	283	117	514	0
Confl. Peds. (#/hr)	4		18	18		4	2					2
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	7%	5%	1%	7%	4%	23%	2%	5%	8%	4%	2%	6%
Turn Type	Perm			pm+pt		Perm	pm+pt		Perm	Perm		
Protected Phases		2		1	6		3	8				4
Permitted Phases	2			6		6	8	8	8	4		
Actuated Green, G (s)	33.5	33.5		52.3	52.3	52.3	31.5	27.5	27.5	19.5	19.5	
Effective Green, g (s)	33.5	33.5		52.3	52.3	52.3	31.5	27.5	27.5	19.5	19.5	
Actuated g/C Ratio	0.36	0.36		0.56	0.56	0.56	0.34	0.29	0.29	0.21	0.21	
Clearance Time (s)	7.0	7.0		5.0	7.0	7.0	3.0	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	3.0	
Lane Grp Cap (vph)	296	1195		324	1935	720	264	531	433	179	696	
v/s Ratio Prot		0.33		c0.13	0.14		c0.02	0.14			0.15	
v/s Ratio Perm	0.14			c0.37		0.02	0.13		c0.19	0.14		
v/c Ratio	0.41	0.92		0.89	0.26	0.03	0.45	0.49	0.65	0.65	0.74	
Uniform Delay, d1	22.7	28.9		25.2	10.7	9.3	30.2	27.3	29.0	34.1	34.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	11.9		25.0	0.1	0.0	1.2	0.7	3.5	8.3	4.1	
Delay (s)	23.6	40.8		50.2	10.8	9.3	31.5	28.0	32.5	42.3	38.9	
Level of Service	C	D		D	B	A	C	C	C	D	D	
Approach Delay (s)		39.1			24.5			31.1			39.5	
Approach LOS		D			C			C			D	

### Intersection Summary

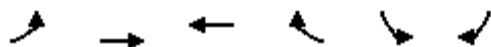
HCM Average Control Delay	33.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	93.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 7: Lake Shore Blvd W & Mr. Christie's West Driveway

3/3/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	
Volume (veh/h)	0	1626	490	0	1	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	1730	521	0	1	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		237	103			
pX, platoon unblocked					0.73	
vC, conflicting volume	521				1386	261
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	521				781	261
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	99
cM capacity (veh/h)	1041				241	738
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	865	865	261	261	5	
Volume Left	0	0	0	0	1	
Volume Right	0	0	0	0	4	
cSH	1700	1700	1700	1700	523	
Volume to Capacity	0.51	0.51	0.15	0.15	0.01	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.2	
Control Delay (s)	0.0	0.0	0.0	0.0	12.0	
Lane LOS					B	
Approach Delay (s)	0.0		0.0		12.0	
Approach LOS					B	
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			54.9%		ICU Level of Service	A
Analysis Period (min)			15			



# Timings

## 8: Gardiner WB On-ramp & Park Lawn Rd

3/3/2014

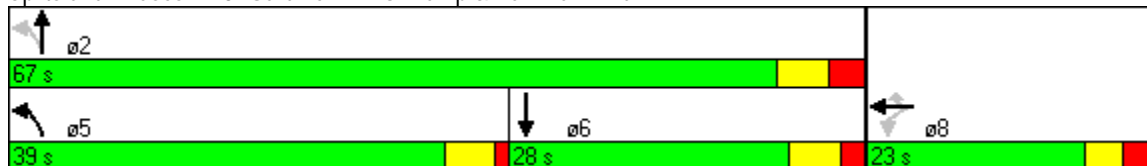


Lane Group	WBT	WBR	NBL	NBT	SBT
Lane Configurations	↖	↗	↘	↑↑	↑↓
Volume (vph)	67	27	529	757	190
Turn Type		Perm	pm+pt		
Protected Phases	8		5	2	6
Permitted Phases		8	2		
Detector Phase	8	8	5	2	6
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.0	23.0	10.0	23.0	23.0
Total Split (s)	23.0	23.0	39.0	67.0	28.0
Total Split (%)	25.6%	25.6%	43.3%	74.4%	31.1%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	1.0	3.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0	7.0	6.0
Lead/Lag			Lead		Lag
Lead-Lag Optimize?			Yes		Yes
Recall Mode	Min	Min	Min	Max	Max
Act Effect Green (s)	10.5	10.5	62.1	60.1	37.3
Actuated g/C Ratio	0.13	0.13	0.74	0.72	0.45
v/c Ratio	0.50	0.16	0.84	0.33	0.46
Control Delay	44.7	14.2	20.8	5.2	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.7	14.2	20.8	5.2	10.3
LOS	D	B	C	A	B
Approach Delay	36.7			11.6	10.3
Approach LOS	D			B	B

### Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 83.6	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 12.4	Intersection LOS: B
Intersection Capacity Utilization 69.1%	ICU Level of Service C
Analysis Period (min) 15	

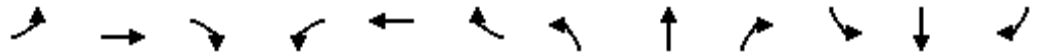
### Splits and Phases: 8: Gardiner WB On-ramp & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 8: Gardiner WB On-ramp & Park Lawn Rd

3/3/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↖	↗	↖	↕			↕	↗	
Volume (vph)	0	0	0	8	67	27	529	757	0	0	190	497	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)					6.0	6.0	5.0	7.0			6.0		
Lane Util. Factor					1.00	1.00	1.00	0.95			0.95		
Frbp, ped/bikes					1.00	1.00	1.00	1.00			0.98		
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00		
Frt					1.00	0.85	1.00	1.00			0.89		
Flt Protected					0.99	1.00	0.95	1.00			1.00		
Satd. Flow (prot)					1268	1214	1768	3343			3034		
Flt Permitted					0.99	1.00	0.27	1.00			1.00		
Satd. Flow (perm)					1268	1214	509	3343			3034		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	0	0	0	8	71	28	557	797	0	0	200	523	
RTOR Reduction (vph)	0	0	0	0	0	24	0	0	0	0	209	0	
Lane Group Flow (vph)	0	0	0	0	79	4	557	797	0	0	514	0	
Confl. Peds. (#/hr)							5					5	
Heavy Vehicles (%)	0%	0%	0%	50%	49%	33%	2%	8%	0%	0%	5%	3%	
Turn Type				Perm		Perm	pm+pt						
Protected Phases					8		5	2				6	
Permitted Phases				8		8	2						
Actuated Green, G (s)					10.5	10.5	60.1	60.1				37.4	
Effective Green, g (s)					10.5	10.5	60.1	60.1				37.4	
Actuated g/C Ratio					0.13	0.13	0.72	0.72				0.45	
Clearance Time (s)					6.0	6.0	5.0	7.0				6.0	
Vehicle Extension (s)					3.0	3.0	3.0	3.0				3.0	
Lane Grp Cap (vph)					159	152	648	2403				1357	
v/s Ratio Prot							c0.19	0.24				0.17	
v/s Ratio Perm					0.06	0.00	c0.43						
v/c Ratio					0.50	0.02	0.86	0.33				0.38	
Uniform Delay, d1					34.1	32.1	9.8	4.3				15.4	
Progression Factor					1.00	1.00	1.00	1.00				1.00	
Incremental Delay, d2					2.4	0.1	11.0	0.4				0.8	
Delay (s)					36.5	32.1	20.8	4.7				16.2	
Level of Service					D	C	C	A				B	
Approach Delay (s)		0.0			35.4			11.3				16.2	
Approach LOS		A			D			B				B	
<b>Intersection Summary</b>													
HCM Average Control Delay			14.1		HCM Level of Service							B	
HCM Volume to Capacity ratio			0.76										
Actuated Cycle Length (s)			83.6		Sum of lost time (s)						11.0		
Intersection Capacity Utilization			69.1%		ICU Level of Service							C	
Analysis Period (min)			15										
c Critical Lane Group													

# Timings

## 10: Gardiner EB Off-ramp & Park Lawn Rd

3/3/2014



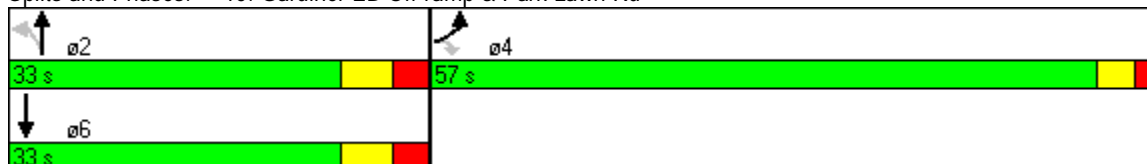
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations	↖↗	↖	↖	↑↑	↑↔
Volume (vph)	601	731	16	681	249
Turn Type		Perm	Perm		
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	19.0	19.0	4.0	4.0	4.0
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0
Total Split (s)	57.0	57.0	33.0	33.0	33.0
Total Split (%)	63.3%	63.3%	36.7%	36.7%	36.7%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	7.0	7.0	7.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	Max	Max	Max
Act Effect Green (s)	52.0	52.0	26.0	26.0	26.0
Actuated g/C Ratio	0.58	0.58	0.29	0.29	0.29
v/c Ratio	0.33	0.76	0.06	0.71	0.28
Control Delay	10.6	14.0	23.9	33.4	25.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	14.0	23.9	33.4	25.1
LOS	B	B	C	C	C
Approach Delay	12.5			33.2	25.1
Approach LOS	B			C	C

### Intersection Summary

Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 4:EBL, Start of Green, Master Intersection  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.76  
 Intersection Signal Delay: 20.2  
 Intersection Capacity Utilization 68.8%  
 Analysis Period (min) 15

Intersection LOS: C  
 ICU Level of Service C

### Splits and Phases: 10: Gardiner EB Off-ramp & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 10: Gardiner EB Off-ramp & Park Lawn Rd

3/3/2014



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	601	731	16	681	249	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	7.0	7.0	7.0	
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	
Frbp, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3303	1539	1680	3505	3430	
Flt Permitted	0.95	1.00	0.58	1.00	1.00	
Satd. Flow (perm)	3303	1539	1024	3505	3430	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	639	778	17	724	265	16
RTOR Reduction (vph)	0	132	0	0	5	0
Lane Group Flow (vph)	639	646	17	724	276	0
Confl. Peds. (#/hr)		2	7			7
Confl. Bikes (#/hr)		9				7
Heavy Vehicles (%)	6%	3%	6%	3%	4%	5%
Turn Type		Perm	Perm			
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	52.0	52.0	26.0	26.0	26.0	
Effective Green, g (s)	52.0	52.0	26.0	26.0	26.0	
Actuated g/C Ratio	0.58	0.58	0.29	0.29	0.29	
Clearance Time (s)	5.0	5.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1908	889	296	1013	991	
v/s Ratio Prot	0.19			c0.21	0.08	
v/s Ratio Perm		c0.42	0.02			
v/c Ratio	0.33	0.73	0.06	0.71	0.28	
Uniform Delay, d1	9.9	13.8	23.1	28.7	24.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	5.2	0.4	4.3	0.7	
Delay (s)	10.4	19.0	23.5	33.0	25.4	
Level of Service	B	B	C	C	C	
Approach Delay (s)	15.1			32.8	25.4	
Approach LOS	B			C	C	

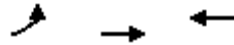
Intersection Summary			
HCM Average Control Delay		21.7	HCM Level of Service C
HCM Volume to Capacity ratio		0.72	
Actuated Cycle Length (s)		90.0	Sum of lost time (s) 12.0
Intersection Capacity Utilization		68.8%	ICU Level of Service C
Analysis Period (min)		15	

c Critical Lane Group

# Timings

## 12: Lake Shore Blvd W & Mr. Christie's East Driveway

3/3/2014

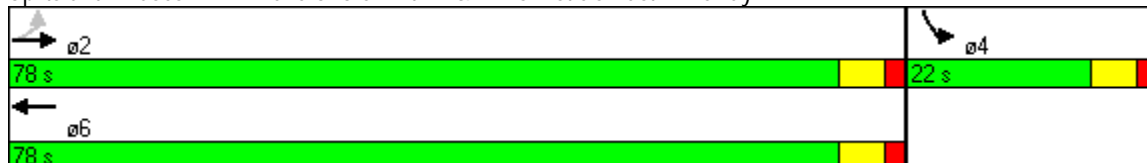


Lane Group	EBL	EBT	WBT	ø4
Lane Configurations		↕↕	↕↕	
Volume (vph)	13	1614	481	
Turn Type	Perm			
Protected Phases		2	6	4
Permitted Phases	2			
Detector Phase	2	2	6	
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0
Total Split (s)	78.0	78.0	78.0	22.0
Total Split (%)	78.0%	78.0%	78.0%	22%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	None
Act Effect Green (s)		120.0	120.0	
Actuated g/C Ratio		1.00	1.00	
v/c Ratio		0.54	0.16	
Control Delay		0.7	0.1	
Queue Delay		0.0	0.0	
Total Delay		0.7	0.1	
LOS		A	A	
Approach Delay		0.7	0.1	
Approach LOS		A	A	

### Intersection Summary

Cycle Length: 100	
Actuated Cycle Length: 120	
Natural Cycle: 65	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 0.5	Intersection LOS: A
Intersection Capacity Utilization 68.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 12: Lake Shore Blvd W & Mr. Christie's East Driveway



# HCM Signalized Intersection Capacity Analysis

## 12: Lake Shore Blvd W & Mr. Christie's East Driveway

3/3/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔↕	↔↕		↔↕	
Volume (vph)	13	1614	481	3	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0			
Lane Util. Factor		0.95	0.95			
Frbp, ped/bikes		1.00	1.00			
Flpb, ped/bikes		1.00	1.00			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		3436	3372			
Flt Permitted		0.95	1.00			
Satd. Flow (perm)		3263	3372			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	1754	523	3	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1768	526	0	0	0
Confl. Peds. (#/hr)						3
Heavy Vehicles (%)	8%	5%	7%	0%	0%	0%
Turn Type	Perm					
Protected Phases		2	6		4	
Permitted Phases	2					
Actuated Green, G (s)		120.0	120.0			
Effective Green, g (s)		120.0	120.0			
Actuated g/C Ratio		1.00	1.00			
Clearance Time (s)		6.0	6.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		3263	3372			
v/s Ratio Prot			0.16			
v/s Ratio Perm		c0.54				
v/c Ratio		0.54	0.16			
Uniform Delay, d1		0.0	0.0			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.7	0.1			
Delay (s)		0.7	0.1			
Level of Service		A	A			
Approach Delay (s)		0.7	0.1		0.0	
Approach LOS		A	A		A	
<b>Intersection Summary</b>						
HCM Average Control Delay			0.5		HCM Level of Service	A
HCM Volume to Capacity ratio			0.54			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	0.0
Intersection Capacity Utilization			68.0%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

# Timings

## 17: Gardiner EB Off-ramp & Legion Rd North

3/3/2014

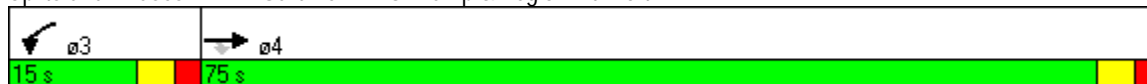


Lane Group	EBT	EBR	WBL	NBR
Lane Configurations	↑↑	↑	↘	↗
Volume (vph)	1178	25	28	203
Turn Type		Perm	Prot	Free
Protected Phases	4		3	
Permitted Phases		4		Free
Detector Phase	4	4	3	
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	
Minimum Split (s)	23.0	23.0	9.0	
Total Split (s)	75.0	75.0	15.0	0.0
Total Split (%)	83.3%	83.3%	16.7%	0.0%
Yellow Time (s)	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	
Recall Mode	None	None	None	
Act Effect Green (s)	23.3	23.3	7.4	25.1
Actuated g/C Ratio	0.93	0.93	0.22	1.00
v/c Ratio	0.40	0.02	0.08	0.14
Control Delay	1.9	1.1	14.5	0.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	1.9	1.1	14.5	0.2
LOS	A	A	B	A
Approach Delay	1.9			
Approach LOS	A			

### Intersection Summary

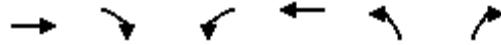
Cycle Length: 90	
Actuated Cycle Length: 25.1	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.40	
Intersection Signal Delay: 1.9	Intersection LOS: A
Intersection Capacity Utilization 35.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 17: Gardiner EB Off-ramp & Legion Rd North



HCM Signalized Intersection Capacity Analysis  
 17: Gardiner EB Off-ramp & Legion Rd North

3/3/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↖			↗
Volume (vph)	1178	25	28	0	0	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.95	1.00	1.00			1.00
Frbp, ped/bikes	1.00	0.98	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			0.86
Flt Protected	1.00	1.00	0.95			1.00
Satd. Flow (prot)	3438	1517	1736			1596
Flt Permitted	1.00	1.00	0.95			1.00
Satd. Flow (perm)	3438	1517	1736			1596
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1280	27	30	0	0	221
RTOR Reduction (vph)	0	9	0	0	0	0
Lane Group Flow (vph)	1280	18	30	0	0	221
Confl. Peds. (#/hr)		4	4			
Heavy Vehicles (%)	5%	4%	4%	0%	0%	3%
Turn Type		Perm	Prot			Free
Protected Phases	4		3			
Permitted Phases		4				Free
Actuated Green, G (s)	17.9	17.9	0.8			28.7
Effective Green, g (s)	18.9	18.9	1.8			28.7
Actuated g/C Ratio	0.66	0.66	0.06			1.00
Clearance Time (s)	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	2264	999	109			1596
v/s Ratio Prot	c0.37		0.02			
v/s Ratio Perm		0.01				c0.14
v/c Ratio	0.57	0.02	0.28			0.14
Uniform Delay, d1	2.7	1.7	12.8			0.0
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.3	0.0	1.4			0.2
Delay (s)	3.0	1.7	14.2			0.2
Level of Service	A	A	B			A
Approach Delay (s)	3.0			14.2	0.2	
Approach LOS	A			B	A	

Intersection Summary			
HCM Average Control Delay	2.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	28.7	Sum of lost time (s)	4.0
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



# Timings

## 30: Lake Shore Blvd W & Legion Rd

3/3/2014

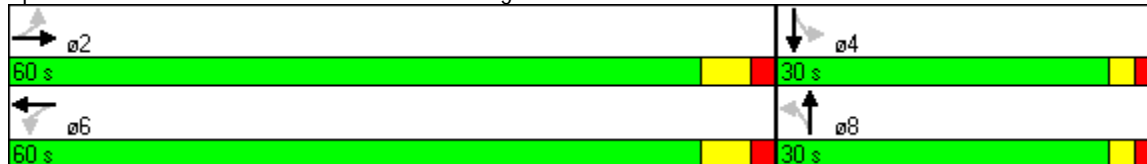


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕↕	↕↕		↕		↕
Volume (vph)	7	1116	470	18	0	96	0
Turn Type	Perm			Perm		Perm	
Protected Phases		2	6		8		4
Permitted Phases	2			8		4	
Detector Phase	2	2	6	8	8	4	4
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.0	23.0	23.0	30.0	30.0	30.0	30.0
Total Split (s)	60.0	60.0	60.0	30.0	30.0	30.0	30.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	2.0	2.0	2.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Max	Max	Min	Min	Min	Min	Min
Act Effct Green (s)		54.2	54.2		12.3		12.3
Actuated g/C Ratio		0.71	0.71		0.16		0.16
v/c Ratio		0.51	0.22		0.33		0.59
Control Delay		6.6	4.6		13.3		40.2
Queue Delay		0.0	0.0		0.0		0.0
Total Delay		6.6	4.6		13.3		40.2
LOS		A	A		B		D
Approach Delay		6.6	4.6		13.3		40.2
Approach LOS		A	A		B		D

### Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 76.5	
Natural Cycle: 60	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 8.4	Intersection LOS: A
Intersection Capacity Utilization 58.5%	ICU Level of Service B
Analysis Period (min) 15	

### Splits and Phases: 30: Lake Shore Blvd W & Legion Rd



HCM Signalized Intersection Capacity Analysis  
 30: Lake Shore Blvd W & Legion Rd

3/3/2014



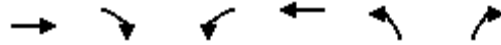
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (vph)	7	1116	1	0	470	16	18	0	80	96	0	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frbp, ped/bikes		1.00			1.00			0.98			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			0.99	
Frt		1.00			1.00			0.89			0.98	
Flt Protected		1.00			1.00			0.99			0.96	
Satd. Flow (prot)		3504			3272			1630			1685	
Flt Permitted		0.95			1.00			0.94			0.67	
Satd. Flow (perm)		3338			3272			1552			1177	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	7	1187	1	0	500	17	19	0	85	102	0	14
RTOR Reduction (vph)	0	0	0	0	2	0	0	65	0	0	7	0
Lane Group Flow (vph)	0	1195	0	0	515	0	0	39	0	0	109	0
Confl. Peds. (#/hr)	7					7	8		10	10		8
Heavy Vehicles (%)	0%	3%	0%	0%	10%	0%	0%	0%	1%	6%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		54.2			54.2			12.3			12.3	
Effective Green, g (s)		54.2			54.2			12.3			12.3	
Actuated g/C Ratio		0.71			0.71			0.16			0.16	
Clearance Time (s)		6.0			6.0			4.0			4.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		2365			2318			250			189	
v/s Ratio Prot					0.16							
v/s Ratio Perm		c0.36						0.02			c0.09	
v/c Ratio		0.51			0.22			0.15			0.58	
Uniform Delay, d1		5.1			3.9			27.6			29.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.8			0.0			0.3			4.2	
Delay (s)		5.8			3.9			27.9			33.9	
Level of Service		A			A			C			C	
Approach Delay (s)		5.8			3.9			27.9			33.9	
Approach LOS		A			A			C			C	

Intersection Summary		
HCM Average Control Delay	8.2	HCM Level of Service A
HCM Volume to Capacity ratio	0.52	
Actuated Cycle Length (s)	76.5	Sum of lost time (s) 10.0
Intersection Capacity Utilization	58.5%	ICU Level of Service B
Analysis Period (min)	15	
c Critical Lane Group		

# HCM Unsignalized Intersection Capacity Analysis

## 32: Lake Shore Blvd W & Existing Driveway

3/3/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	1627	0	3	488	2	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1731	0	3	519	2	1
Pedestrians				1	27	
Lane Width (m)				3.6	3.6	
Walking Speed (m/s)				1.2	1.2	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	264			76		
pX, platoon unblocked			0.73		0.73	0.73
vC, conflicting volume			1758		2024	893
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1298		1662	114
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	100
cM capacity (veh/h)			386		64	659

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1154	577	176	346	3
Volume Left	0	0	3	0	2
Volume Right	0	0	0	0	1
cSH	1700	1700	386	1700	91
Volume to Capacity	0.68	0.34	0.01	0.20	0.04
Queue Length 95th (m)	0.0	0.0	0.2	0.0	0.9
Control Delay (s)	0.0	0.0	0.4	0.0	46.0
Lane LOS			A		E
Approach Delay (s)	0.0		0.1		46.0
Approach LOS					E

Intersection Summary					
Average Delay			0.1		
Intersection Capacity Utilization			55.3%	ICU Level of Service	B
Analysis Period (min)			15		

# Timings

## 34: Lake Shore Blvd W & F Gardiner Expy WB Off-Ramp

3/3/2014

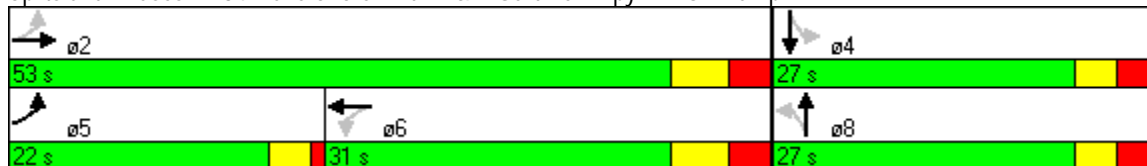


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖	↕	↗	↖	↕		↖	↗
Volume (vph)	483	1129	73	108	20	41	10	293
Turn Type	pm+pt			Perm		Perm		Free
Protected Phases	5	2	6		8		4	
Permitted Phases	2			8		4		Free
Detector Phase	5	2	6	8	8	4	4	
Switch Phase								
Minimum Initial (s)	6.0	24.0	24.0	13.0	13.0	13.0	13.0	
Minimum Split (s)	10.0	31.0	31.0	27.0	27.0	27.0	27.0	
Total Split (s)	22.0	53.0	31.0	27.0	27.0	27.0	27.0	0.0
Total Split (%)	27.5%	66.3%	38.8%	33.8%	33.8%	33.8%	33.8%	0.0%
Yellow Time (s)	3.0	4.0	4.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	6.0	6.0	6.0	6.0	4.0
Lead/Lag	Lead		Lag					
Lead-Lag Optimize?	Yes		Yes					
Recall Mode	Min	Min	Min	Min	Min	Min	Min	
Act Effect Green (s)	48.3	45.3	24.0	13.7	13.7		13.7	72.0
Actuated g/C Ratio	0.67	0.63	0.33	0.19	0.19		0.19	1.00
v/c Ratio	0.58	0.57	0.21	0.44	0.10		0.25	0.20
Control Delay	8.7	9.1	14.8	32.1	12.4		28.2	0.3
Queue Delay	0.5	0.3	0.0	0.0	0.0		0.0	0.0
Total Delay	9.2	9.4	14.8	32.1	12.4		28.2	0.3
LOS	A	A	B	C	B		C	A
Approach Delay		9.4	14.8		25.0		4.4	
Approach LOS		A	B		C		A	

### Intersection Summary

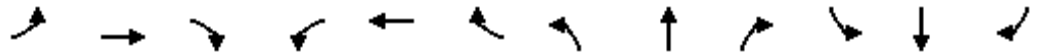
Cycle Length: 80	
Actuated Cycle Length: 72	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 10.0	Intersection LOS: B
Intersection Capacity Utilization 56.9%	ICU Level of Service B
Analysis Period (min) 15	

### Splits and Phases: 34: Lake Shore Blvd W & F Gardiner Expy WB Off-Ramp



HCM Signalized Intersection Capacity Analysis  
 34: Lake Shore Blvd W & F Gardiner Expy WB Off-Ramp

3/3/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗			↖	↗
Volume (vph)	483	1129	15	0	73	34	108	20	40	41	10	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0			7.0		6.0	6.0			6.0	4.0
Lane Util. Factor	1.00	0.95			1.00		1.00	0.95			1.00	1.00
Frbp, ped/bikes	1.00	1.00			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	1.00
Frt	1.00	1.00			0.95		1.00	0.90			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	3431			1564		1805	3252			1554	1568
Flt Permitted	0.59	1.00			1.00		0.72	1.00			0.73	1.00
Satd. Flow (perm)	1090	3431			1564		1370	3252			1174	1568
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)	519	1214	16	0	78	37	116	22	43	44	11	315
RTOR Reduction (vph)	0	1	0	0	20	0	0	35	0	0	0	0
Lane Group Flow (vph)	519	1229	0	0	95	0	116	30	0	0	55	315
Confl. Peds. (#/hr)			18	18								
Heavy Vehicles (%)	2%	5%	0%	0%	23%	0%	0%	0%	0%	22%	0%	3%
Turn Type	pm+pt			Perm			Perm			Perm		Free
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		Free
Actuated Green, G (s)	45.2	45.2			24.0		13.7	13.7			13.7	71.9
Effective Green, g (s)	45.2	45.2			24.0		13.7	13.7			13.7	71.9
Actuated g/C Ratio	0.63	0.63			0.33		0.19	0.19			0.19	1.00
Clearance Time (s)	4.0	7.0			7.0		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)	848	2157			522		261	620			224	1568
v/s Ratio Prot	c0.15	0.36			0.06			0.01				
v/s Ratio Perm	c0.24						c0.08				0.05	0.20
v/c Ratio	0.61	0.57			0.18		0.44	0.05			0.25	0.20
Uniform Delay, d1	7.2	7.7			17.0		25.7	23.8			24.7	0.0
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	1.3	0.3			0.2		1.2	0.0			0.6	0.3
Delay (s)	8.5	8.1			17.2		26.9	23.8			25.3	0.3
Level of Service	A	A			B		C	C			C	A
Approach Delay (s)		8.2			17.2			25.8			4.0	
Approach LOS		A			B			C			A	

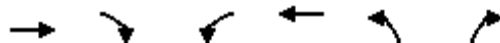
Intersection Summary

HCM Average Control Delay	9.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	71.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Unsignalized Intersection Capacity Analysis

## 37: Lake Shore Blvd W & Marine Parade Dr.

3/3/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	↻
Volume (veh/h)	1167	34	0	60	30	56
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1216	35	0	62	31	58
Pedestrians					16	
Lane Width (m)					3.2	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						5
Median type	None			None		
Median storage veh						
Upstream signal (m)				138		
pX, platoon unblocked						
vC, conflicting volume			1267		1312	1249
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1267		1312	1249
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		82	72
cM capacity (veh/h)			549		175	205

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1251	62	90
Volume Left	0	0	31
Volume Right	35	0	58
cSH	1700	549	316
Volume to Capacity	0.74	0.00	0.28
Queue Length 95th (m)	0.0	0.0	9.1
Control Delay (s)	0.0	0.0	29.6
Lane LOS			D
Approach Delay (s)	0.0	0.0	29.6
Approach LOS			D

Intersection Summary			
Average Delay		1.9	
Intersection Capacity Utilization		73.7%	ICU Level of Service
Analysis Period (min)		15	D

# Timings

## 38: Lake Shore Blvd W & Palace Pier Crt

3/3/2014



Lane Group	EBT	EBR	NBL	NBR
Lane Configurations	↑	↑	↑	↑
Volume (vph)	1166	54	41	70
Turn Type		Perm		Perm
Protected Phases	2		4	
Permitted Phases		2		4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	24.0	24.0	24.0	24.0
Total Split (s)	76.0	76.0	24.0	24.0
Total Split (%)	76.0%	76.0%	24.0%	24.0%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effect Green (s)	70.0	70.0	18.0	18.0
Actuated g/C Ratio	0.70	0.70	0.18	0.18
v/c Ratio	0.95	0.06	0.14	0.23
Control Delay	30.7	4.1	36.0	10.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.7	4.1	36.0	10.6
LOS	C	A	D	B
Approach Delay	29.6		20.0	
Approach LOS	C		C	

### Intersection Summary

Cycle Length: 100	
Actuated Cycle Length: 100	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 28.8	Intersection LOS: C
Intersection Capacity Utilization 75.7%	ICU Level of Service D
Analysis Period (min) 15	

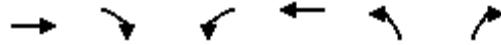
Splits and Phases: 38: Lake Shore Blvd W & Palace Pier Crt



# HCM Signalized Intersection Capacity Analysis

## 38: Lake Shore Blvd W & Palace Pier Crt

3/3/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗			↖	↗
Volume (vph)	1166	54	0	0	41	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.2	3.2
Total Lost time (s)	6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	1.00			1.00	1.00
Frbp, ped/bikes	1.00	0.92			1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00
Frt	1.00	0.85			1.00	0.85
Flt Protected	1.00	1.00			0.95	1.00
Satd. Flow (prot)	1827	1245			1691	1442
Flt Permitted	1.00	1.00			0.95	1.00
Satd. Flow (perm)	1827	1245			1691	1442
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1215	56	0	0	43	73
RTOR Reduction (vph)	0	4	0	0	0	60
Lane Group Flow (vph)	1215	52	0	0	43	13
Confl. Peds. (#/hr)		18	18			
Heavy Vehicles (%)	4%	20%	0%	0%	2%	7%
Turn Type		Perm				Perm
Protected Phases	2				4	
Permitted Phases		2				4
Actuated Green, G (s)	70.0	70.0			18.0	18.0
Effective Green, g (s)	70.0	70.0			18.0	18.0
Actuated g/C Ratio	0.70	0.70			0.18	0.18
Clearance Time (s)	6.0	6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	1279	872			304	260
v/s Ratio Prot	c0.67				c0.03	
v/s Ratio Perm		0.04				0.01
v/c Ratio	0.95	0.06			0.14	0.05
Uniform Delay, d1	13.4	4.7			34.5	33.9
Progression Factor	1.00	1.00			1.00	1.00
Incremental Delay, d2	15.7	0.1			1.0	0.4
Delay (s)	29.2	4.8			35.5	34.3
Level of Service	C	A			D	C
Approach Delay (s)	28.1			0.0	34.7	
Approach LOS	C			A	C	

Intersection Summary			
HCM Average Control Delay	28.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis  
 40: Marine Parade Dr. & Waterfront Drive

3/3/2014

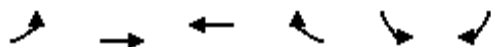


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	0	0	0	52	174	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	57	189	0
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	0	57	189			
Volume Left (vph)	0	0	0			
Volume Right (vph)	0	0	0			
Hadj (s)	0.00	0.03	0.03			
Departure Headway (s)	4.4	4.1	4.0			
Degree Utilization, x	0.00	0.06	0.21			
Capacity (veh/h)	780	858	897			
Control Delay (s)	7.4	7.4	8.0			
Approach Delay (s)	0.0	7.4	8.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.9			
HCM Level of Service			A			
Intersection Capacity Utilization			12.5%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 50: Marine Parade Dr. & Existing Driveway

3/3/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↷	↶↷		↶↷	
Volume (veh/h)	1	52	174	0	0	0
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)	1	56	187	0	0	0
Pedestrians			1		1	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	188				247	95
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	188				247	95
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)	1397				724	949

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	1	56	125	62	0
Volume Left	1	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1397	1700	1700	1700	1700
Volume to Capacity	0.00	0.03	0.07	0.04	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	7.6	0.0	0.0	0.0	0.0
Lane LOS	A				A
Approach Delay (s)	0.1		0.0		0.0
Approach LOS					A

Intersection Summary					
Average Delay			0.0		
Intersection Capacity Utilization			8.4%	ICU Level of Service	A
Analysis Period (min)			15		

Summary of All Intervals

Run Number	1	3	Avg
Start Time	6:50	6:50	6:50
End Time	7:15	7:15	7:15
Total Time (min)	25	25	25
Time Recorded (min)	15	15	15
# of Intervals	2	2	2
# of Recorded Intvl	1	1	1
Vehs Entered	1632	1658	1642
Vehs Exited	1544	1544	1545
Starting Vehs	400	398	391
Ending Vehs	488	512	488
Denied Entry Before	39	28	33
Denied Entry After	216	214	212
Travel Distance (km)	2050	2041	2045
Travel Time (hr)	145.8	142.4	144.1
Total Delay (hr)	105.9	102.6	104.2
Total Stops	4315	4360	4327
Fuel Used (l)	2775.0	2726.1	2750.6

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10
Volumes adjusted by PHF, Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	1	3	Avg
Vehs Entered	1632	1658	1642
Vehs Exited	1544	1544	1545
Starting Vehs	400	398	391
Ending Vehs	488	512	488
Denied Entry Before	39	28	33
Denied Entry After	216	214	212
Travel Distance (km)	2050	2041	2045
Travel Time (hr)	145.8	142.4	144.1
Total Delay (hr)	105.9	102.6	104.2
Total Stops	4315	4360	4327
Fuel Used (l)	2775.0	2726.1	2750.6

Queuing and Blocking Report  
Existing Traffic Conditions, AM Peak Hour

2/7/2014

Intersection: 3: Lake Shore Blvd W & Park Lawn Road

Movement	EB	EB	EB	B20	B20	B20	WB	WB	B14	NB	NB	NB
Directions Served	LT	T	TR	T	T	T	LT	TR	T	LT	T	R
Maximum Queue (m)	139.4	139.8	97.8	158.5	165.4	146.6	46.7	72.7	7.3	37.3	44.8	15.0
Average Queue (m)	139.3	108.1	50.7	153.9	156.2	94.4	33.1	49.6	1.0	19.6	16.9	5.1
95th Queue (m)	139.6	169.7	105.4	158.6	169.5	183.0	48.8	73.2	7.3	41.7	42.7	15.6
Link Distance (m)	117.8	117.8	117.8	149.6	149.6	149.6	52.3	52.3	58.1		298.4	298.4
Upstream Blk Time (%)	88	14		75	47	0	0	9				
Queuing Penalty (veh)	404	63		345	216	1	1	23				
Storage Bay Dist (m)										55.0		
Storage Blk Time (%)										1	0	
Queuing Penalty (veh)										1	0	

Intersection: 3: Lake Shore Blvd W & Park Lawn Road

Movement	SB	SB
Directions Served	L	LTR
Maximum Queue (m)	359.6	370.0
Average Queue (m)	261.9	263.7
95th Queue (m)	393.1	397.1
Link Distance (m)	480.0	480.0
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report  
Existing Traffic Conditions, AM Peak Hour

2/7/2014

Intersection: 5: The Queensway & Park Lawn Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (m)	48.3	130.8	147.3	54.6	363.3	43.5	21.8	38.6	49.5	62.9	38.0	53.3
Average Queue (m)	24.7	88.5	97.6	40.9	19.9	27.3	3.7	20.1	31.7	20.1	22.4	39.2
95th Queue (m)	48.9	138.6	152.6	58.5	40.6	45.1	20.5	36.9	52.6	67.7	41.8	57.6
Link Distance (m)		169.3	169.3		682.9	682.9			271.0	271.0		403.4
Upstream Blk Time (%)			0		0							
Queuing Penalty (veh)			0		0							
Storage Bay Dist (m)	50.0			50.0			20.0	50.0			25.0	
Storage Blk Time (%)	2	33		5		14		0	3		18	23
Queuing Penalty (veh)	7	39		12		5		0	3		36	27

Intersection: 5: The Queensway & Park Lawn Rd

Movement	SB
Directions Served	TR
Maximum Queue (m)	69.6
Average Queue (m)	52.9
95th Queue (m)	76.6
Link Distance (m)	403.4
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Lake Shore Blvd W & Mr. Christie's West Driveway

Movement	EB	EB	B1	B1	B14	B14	B14	WB	SB
Directions Served	T	T	T	T	T	T	T	T	LR
Maximum Queue (m)	94.6	91.8	88.1	79.6	85.3	91.2	62.5	4.6	4.5
Average Queue (m)	92.3	58.0	80.8	54.6	62.2	55.7	15.8	0.7	1.6
95th Queue (m)	94.8	118.6	86.0	99.8	103.6	106.0	57.6	4.6	7.0
Link Distance (m)	70.2	70.2	58.1	58.1	52.3	52.3	52.3	9.2	68.2
Upstream Blk Time (%)	70	9	63	13	26	8	1	0	
Queuing Penalty (veh)	710	89	430	91	179	51	8	0	
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report  
Existing Traffic Conditions, AM Peak Hour

2/7/2014

Intersection: 8: Gardiner WB On-ramp & Park Lawn Rd

Movement	WB	WB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	T	T	T	TR
Maximum Queue (m)	37.5	16.9	70.2	60.3	30.8	50.0	94.9
Average Queue (m)	22.5	6.2	46.0	21.0	19.2	20.6	57.5
95th Queue (m)	41.6	17.4	70.2	55.7	33.3	44.2	118.0
Link Distance (m)	120.0	120.0		176.2	176.2	271.0	271.0
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			50.0				
Storage Blk Time (%)			6				
Queuing Penalty (veh)			23				

Intersection: 10: Gardiner EB Off-ramp & Park Lawn Rd

Movement	EB	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	L	R	L	T	T	T	TR
Maximum Queue (m)	55.0	45.8	34.2	8.9	60.6	33.3	32.0	28.2
Average Queue (m)	39.5	22.1	13.6	2.2	40.6	22.6	24.5	20.5
95th Queue (m)	56.0	44.7	36.2	8.3	66.6	37.8	37.6	34.9
Link Distance (m)	243.8	243.8			480.0	480.0	176.2	176.2
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			35.0	27.0				
Storage Blk Time (%)		1	1		26			
Queuing Penalty (veh)		7	2		4			

Intersection: 12: Lake Shore Blvd W & Mr. Christie's East Driveway

Movement	EB	EB	WB	WB
Directions Served	LT	T	T	TR
Maximum Queue (m)	73.4	83.6	15.9	13.6
Average Queue (m)	67.4	52.9	5.8	3.7
95th Queue (m)	70.6	101.1	24.3	16.2
Link Distance (m)	63.2	63.2	91.4	91.4
Upstream Blk Time (%)	48	12		
Queuing Penalty (veh)	420	106		
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report  
Existing Traffic Conditions, AM Peak Hour

2/7/2014

Intersection: 17: Gardiner EB Off-ramp & Legion Rd North

Movement	EB	EB	WB	NB
Directions Served	T	T	L	R
Maximum Queue (m)	15.8	33.9	11.6	70.6
Average Queue (m)	3.8	10.9	5.0	33.4
95th Queue (m)	11.7	31.8	14.1	77.1
Link Distance (m)	511.7	511.7	243.8	124.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 30: Lake Shore Blvd W & Legion Rd

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LR	LR
Maximum Queue (m)	254.2	251.3	21.4	27.8	40.8	65.0
Average Queue (m)	236.2	234.6	7.9	11.6	18.8	39.6
95th Queue (m)	297.7	300.4	23.0	27.8	48.4	67.2
Link Distance (m)	246.7	246.7	149.6	149.6	126.3	291.8
Upstream Blk Time (%)	71	66				
Queuing Penalty (veh)	0	0				
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 32: Lake Shore Blvd W & Existing Driveway

Movement	EB	EB	WB	NB
Directions Served	T	TR	LT	LR
Maximum Queue (m)	25.7	20.5	4.6	4.6
Average Queue (m)	12.7	9.6	1.3	1.3
95th Queue (m)	23.3	23.3	6.4	6.6
Link Distance (m)	9.2	9.2	63.2	40.5
Upstream Blk Time (%)	52	11		
Queuing Penalty (veh)	451	92		
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report  
Existing Traffic Conditions, AM Peak Hour

2/7/2014

Intersection: 34: Lake Shore Blvd W & F Gardiner Expy WB Off-Ramp

Movement	EB	EB	EB	B2	B2	WB	NB	NB	NB	SB
Directions Served	L	T	TR	T	T	TR	L	T	TR	LT
Maximum Queue (m)	22.2	49.4	12.8	110.6	117.5	24.8	34.4	27.7	17.0	19.9
Average Queue (m)	19.6	47.3	2.4	102.4	60.6	9.1	18.0	5.5	9.0	7.5
95th Queue (m)	26.8	50.3	10.7	110.6	149.3	25.1	35.1	25.4	18.3	19.6
Link Distance (m)		24.6	24.6	91.4	91.4	42.0		82.2	82.2	119.8
Upstream Blk Time (%)	3	34		41	8					
Queuing Penalty (veh)	0	302		362	69					
Storage Bay Dist (m)	20.0						20.0			
Storage Blk Time (%)	7	29					9			
Queuing Penalty (veh)	42	152					1			

Intersection: 37: Lake Shore Blvd W & Marine Parade Dr.

Movement	EB	NB	NB
Directions Served	TR	L	R
Maximum Queue (m)	11.1	11.6	21.0
Average Queue (m)	3.8	4.3	10.4
95th Queue (m)	16.1	12.2	22.3
Link Distance (m)	190.9		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			40.0
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 38: Lake Shore Blvd W & Palace Pier Crt

Movement	EB	EB	NB	NB
Directions Served	T	R	L	R
Maximum Queue (m)	116.9	10.7	14.5	22.3
Average Queue (m)	79.8	3.0	6.5	9.0
95th Queue (m)	138.8	15.4	17.0	19.1
Link Distance (m)	119.4		142.9	
Upstream Blk Time (%)	1			
Queuing Penalty (veh)	17			
Storage Bay Dist (m)		10.0		40.0
Storage Blk Time (%)	23	0		
Queuing Penalty (veh)	13	4		



Queuing and Blocking Report  
Existing Traffic Conditions, AM Peak Hour

2/7/2014

Intersection: 40: Marine Parade Dr. & Waterfront Drive

Movement	NB	SB
Directions Served	LT	TR
Maximum Queue (m)	9.3	18.6
Average Queue (m)	6.6	12.1
95th Queue (m)	13.5	18.8
Link Distance (m)	264.1	165.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 50: Marine Parade Dr. & Existing Driveway

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 4809

# Timings

## 3: Lake Shore Blvd W & Park Lawn Road

2/19/2014



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↔↔↔		↔↔		↔↔	↔	↔	↔
Volume (vph)	210	543	10	867	24	60	13	576	54
Turn Type	pm+pt		Perm		Perm		Perm	Split	
Protected Phases	7	4		8		2		6	6
Permitted Phases	4		8		2		2		
Detector Phase	7	4	8	8	2	2	2	6	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0
Total Split (s)	10.0	40.0	30.0	30.0	22.0	22.0	22.0	28.0	28.0
Total Split (%)	11.1%	44.4%	33.3%	33.3%	24.4%	24.4%	24.4%	31.1%	31.1%
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)	0.0	2.0	2.0	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	-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag					
Lead-Lag Optimize?	Yes		Yes	Yes					
Recall Mode	None	Max	Max	Max	Min	Min	Min	Min	Min
Act Effect Green (s)		35.0		35.0		9.7	9.7	23.0	23.0
Actuated g/C Ratio		0.42		0.42		0.12	0.12	0.28	0.28
v/c Ratio		2.40dl		0.84		0.35	0.07	1.13	0.99
Control Delay		20.3		28.3		37.2	16.8	111.8	63.5
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		20.3		28.3		37.2	16.8	111.8	63.5
LOS		C		C		D	B	F	E
Approach Delay		20.3		28.3		34.5			88.5
Approach LOS		C		C		C			F

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 82.7

Natural Cycle: 135

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.13

Intersection Signal Delay: 46.3

Intersection LOS: D

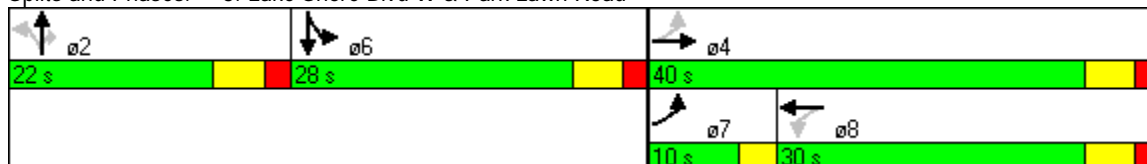
Intersection Capacity Utilization 97.1%

ICU Level of Service F

Analysis Period (min) 15

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

### Splits and Phases: 3: Lake Shore Blvd W & Park Lawn Road



# HCM Signalized Intersection Capacity Analysis

## 3: Lake Shore Blvd W & Park Lawn Road

2/19/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕↕			↕↕			↕↕	↕	↕	↕	↕
Volume (vph)	210	543	21	10	867	188	24	60	13	576	54	327
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		0.91			0.95			0.95	1.00	0.95	0.95	
Frbp, ped/bikes		1.00			0.99			1.00	0.98	1.00	0.93	
Flpb, ped/bikes		1.00			1.00			0.99	1.00	1.00	1.00	
Frt		1.00			0.97			1.00	0.85	1.00	0.89	
Flt Protected		0.99			1.00			0.99	1.00	0.95	0.99	
Satd. Flow (prot)		4982			3368			3361	1589	1698	1469	
Flt Permitted		0.68			0.94			0.65	1.00	0.95	0.99	
Satd. Flow (perm)		3421			3181			2233	1589	1698	1469	
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)	226	584	23	11	932	202	26	65	14	619	58	352
RTOR Reduction (vph)	0	3	0	0	16	0	0	0	12	0	94	0
Lane Group Flow (vph)	0	830	0	0	1129	0	0	91	2	532	403	0
Confl. Peds. (#/hr)	17		16	16		17	67		2	2		67
Confl. Bikes (#/hr)			14			3			1			10
Heavy Vehicles (%)	0%	3%	3%	0%	4%	2%	0%	7%	0%	1%	7%	1%
Turn Type	pm+pt			Perm			Perm		Perm		Split	
Protected Phases	7	4			8			2			6	6
Permitted Phases	4			8			2		2			
Actuated Green, G (s)		34.0			34.0			8.7	8.7	22.0	22.0	
Effective Green, g (s)		35.0			35.0			9.7	9.7	23.0	23.0	
Actuated g/C Ratio		0.42			0.42			0.12	0.12	0.28	0.28	
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)		1448			1346			262	186	472	409	
v/s Ratio Prot										c0.31	0.27	
v/s Ratio Perm		0.24			c0.35			c0.04	0.00			
v/c Ratio		2.40dl			0.84			0.35	0.01	1.13	0.99	
Uniform Delay, d1		18.2			21.3			33.6	32.3	29.9	29.7	
Progression Factor		1.00			1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.6			6.4			0.8	0.0	81.1	40.4	
Delay (s)		18.7			27.7			34.4	32.3	110.9	70.1	
Level of Service		B			C			C	C	F	E	
Approach Delay (s)		18.7			27.7			34.1			91.2	
Approach LOS		B			C			C			F	

### Intersection Summary

HCM Average Control Delay	46.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	82.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	97.1%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

# Timings

## 5: The Queensway & Park Lawn Rd

2/19/2014



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Volume (vph)	211	672	347	859	68	149	348	349	34	254
Turn Type	Perm		pm+pt		Perm	pm+pt		Perm	Perm	
Protected Phases		2	1	6		3	8			4
Permitted Phases	2		6		6	8	8	8	4	
Detector Phase	2	2	1	6	6	3	8	8	4	4
Switch Phase										
Minimum Initial (s)	1.0	1.0	7.0	10.0	10.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	12.0	30.0	30.0	10.0	29.0	29.0	32.0	32.0
Total Split (s)	52.0	52.0	16.0	68.0	68.0	10.0	42.0	42.0	32.0	32.0
Total Split (%)	47.3%	47.3%	14.5%	61.8%	61.8%	9.1%	38.2%	38.2%	29.1%	29.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	1.0	3.0	3.0	1.0	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	-1.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	2.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead			Lag			Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes			Yes			Yes	Yes
Recall Mode	C-Min	C-Min	Min	Min	Min	Min	Min	Min	Min	Min
Act Effect Green (s)	46.1	46.1	71.1	69.1	69.1	32.9	28.9	28.9	18.7	18.7
Actuated g/C Ratio	0.42	0.42	0.65	0.63	0.63	0.30	0.26	0.26	0.17	0.17
v/c Ratio	0.89	0.61	0.79	0.43	0.08	0.58	0.74	0.58	0.55	0.70
Control Delay	65.9	26.1	28.1	11.9	5.4	45.3	46.1	10.9	71.2	35.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.9	26.1	28.1	11.9	5.4	45.3	46.1	10.9	71.2	35.2
LOS	E	C	C	B	A	D	D	B	E	D
Approach Delay		34.1		15.9			31.4			37.8
Approach LOS		C		B			C			D

### Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 27.6

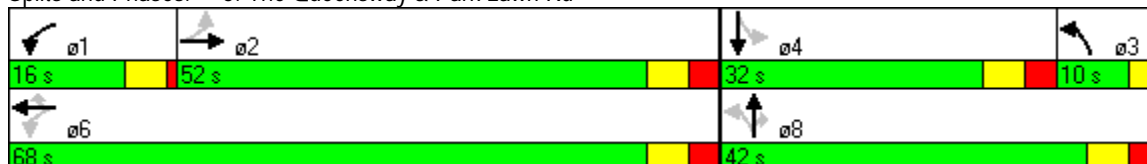
Intersection LOS: C

Intersection Capacity Utilization 88.5%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 5: The Queensway & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 5: The Queensway & Park Lawn Rd

2/19/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗	↗	↖	↗	
Volume (vph)	211	672	168	347	859	68	149	348	349	34	254	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.0	6.0	6.0	2.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1802	3407		1734	3374	1417	1804	1881	1563	1703	3260	
Flt Permitted	0.32	1.00		0.19	1.00	1.00	0.32	1.00	1.00	0.21	1.00	
Satd. Flow (perm)	598	3407		349	3374	1417	601	1881	1563	383	3260	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	222	707	177	365	904	72	157	366	367	36	267	202
RTOR Reduction (vph)	0	20	0	0	0	15	0	0	219	0	115	0
Lane Group Flow (vph)	222	864	0	365	904	57	157	366	148	36	354	0
Confl. Peds. (#/hr)	4		18	18		4	2					2
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	0%	2%	2%	4%	7%	12%	0%	1%	2%	6%	2%	4%
Turn Type	Perm			pm+pt		Perm	pm+pt		Perm	Perm		
Protected Phases		2		1	6		3	8				4
Permitted Phases	2			6		6	8	8	8	4		
Actuated Green, G (s)	45.1	45.1		68.1	68.1	68.1	31.9	27.9	27.9	17.7	17.7	
Effective Green, g (s)	46.1	46.1		69.1	69.1	69.1	32.9	28.9	28.9	18.7	18.7	
Actuated g/C Ratio	0.42	0.42		0.63	0.63	0.63	0.30	0.26	0.26	0.17	0.17	
Clearance Time (s)	7.0	7.0		5.0	7.0	7.0	3.0	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	3.0	
Lane Grp Cap (vph)	251	1428		458	2119	890	269	494	411	65	554	
v/s Ratio Prot		0.25		c0.14	0.27		c0.04	c0.19			0.11	
v/s Ratio Perm	c0.37			0.36		0.04	0.13		0.09	0.09		
v/c Ratio	0.88	0.60		0.80	0.43	0.06	0.58	0.74	0.36	0.55	0.64	
Uniform Delay, d1	29.5	24.9		15.5	10.4	7.9	39.7	37.1	33.0	41.8	42.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	33.4	1.9		9.3	0.1	0.0	3.2	5.9	0.5	9.8	2.4	
Delay (s)	62.9	26.8		24.9	10.5	8.0	42.9	43.0	33.6	51.7	44.9	
Level of Service	E	C		C	B	A	D	D	C	D	D	
Approach Delay (s)		34.0			14.3			39.1			45.4	
Approach LOS		C			B			D			D	

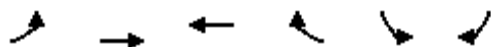
Intersection Summary		
HCM Average Control Delay	29.8	HCM Level of Service C
HCM Volume to Capacity ratio	0.83	
Actuated Cycle Length (s)	110.0	Sum of lost time (s) 16.0
Intersection Capacity Utilization	88.5%	ICU Level of Service E
Analysis Period (min)	15	

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 7: Lake Shore Blvd W & Mr. Christie's West Driveway

2/19/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	
Volume (veh/h)	0	959	949	0	6	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	1020	1010	0	6	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)		237	103			
pX, platoon unblocked					0.96	
vC, conflicting volume	1010				1520	505
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1010				1452	505
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				94	97
cM capacity (veh/h)	682				116	513

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	510	510	505	505	21
Volume Left	0	0	0	0	6
Volume Right	0	0	0	0	15
cSH	1700	1700	1700	1700	253
Volume to Capacity	0.30	0.30	0.30	0.30	0.08
Queue Length 95th (m)	0.0	0.0	0.0	0.0	2.2
Control Delay (s)	0.0	0.0	0.0	0.0	20.5
Lane LOS					C
Approach Delay (s)	0.0		0.0		20.5
Approach LOS					C

Intersection Summary					
Average Delay			0.2		
Intersection Capacity Utilization			36.5%	ICU Level of Service	A
Analysis Period (min)			15		

# Timings

## 8: Gardiner WB On-ramp & Park Lawn Rd

2/19/2014



Lane Group	WBT	WBR	NBL	NBT	SBT
Lane Configurations	↖	↗	↘	↑↑	↑↓
Volume (vph)	16	9	318	837	383
Turn Type		Perm	pm+pt		
Protected Phases	8		5	2	6
Permitted Phases		8	2		
Detector Phase	8	8	5	2	6
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.0	23.0	10.0	23.0	23.0
Total Split (s)	23.0	23.0	29.0	67.0	38.0
Total Split (%)	25.6%	25.6%	32.2%	74.4%	42.2%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	1.0	3.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	4.0	6.0	5.0
Lead/Lag			Lead		Lag
Lead-Lag Optimize?			Yes		Yes
Recall Mode	Min	Min	Min	Max	Max
Act Effect Green (s)	7.6	7.6	63.0	61.0	47.4
Actuated g/C Ratio	0.10	0.10	0.79	0.77	0.60
v/c Ratio	0.13	0.07	0.61	0.33	0.43
Control Delay	35.1	19.0	7.6	3.4	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	35.1	19.0	7.6	3.4	5.8
LOS	D	B	A	A	A
Approach Delay	29.5			4.5	5.8
Approach LOS	C			A	A

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 79.6

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 5.4

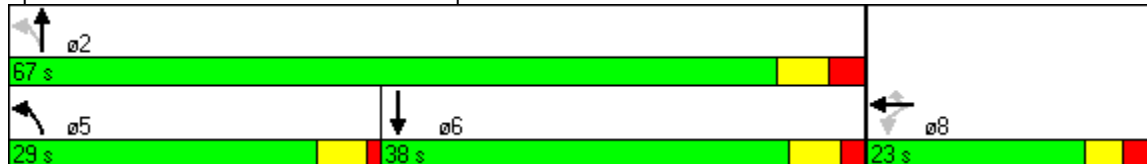
Intersection LOS: A

Intersection Capacity Utilization 58.5%

ICU Level of Service B

Analysis Period (min) 15

### Splits and Phases: 8: Gardiner WB On-ramp & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 8: Gardiner WB On-ramp & Park Lawn Rd

2/19/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↖	↗	↖	↑↑			↑↑	
Volume (vph)	0	0	0	2	16	9	318	837	0	0	383	446
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0	4.0	6.0			5.0	
Lane Util. Factor					1.00	1.00	1.00	0.95			0.95	
Frbp, ped/bikes					1.00	0.99	1.00	1.00			0.97	
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.92	
Flt Protected					0.99	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1480	1435	1767	3505			3169	
Flt Permitted					0.99	1.00	0.26	1.00			1.00	
Satd. Flow (perm)					1480	1435	479	3505			3169	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	2	17	10	338	890	0	0	407	474
RTOR Reduction (vph)	0	0	0	0	0	9	0	0	0	0	150	0
Lane Group Flow (vph)	0	0	0	0	19	1	338	890	0	0	731	0
Confl. Peds. (#/hr)	1					1	11		3	3		11
Heavy Vehicles (%)	0%	0%	0%	0%	31%	11%	2%	3%	0%	0%	1%	3%
Turn Type				Perm		Perm	pm+pt					
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					
Actuated Green, G (s)					6.6	6.6	60.0	60.0			46.4	
Effective Green, g (s)					7.6	7.6	61.0	61.0			47.4	
Actuated g/C Ratio					0.10	0.10	0.77	0.77			0.60	
Clearance Time (s)					6.0	6.0	5.0	7.0			6.0	
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)					141	137	539	2686			1887	
v/s Ratio Prot							c0.08	0.25			0.23	
v/s Ratio Perm					0.01	0.00	c0.40					
v/c Ratio					0.13	0.01	0.63	0.33			0.39	
Uniform Delay, d1					33.0	32.6	4.2	2.9			8.5	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					0.4	0.0	2.3	0.3			0.6	
Delay (s)					33.4	32.6	6.5	3.2			9.1	
Level of Service					C	C	A	A			A	
Approach Delay (s)		0.0			33.1			4.1			9.1	
Approach LOS		A			C			A			A	
<b>Intersection Summary</b>												
HCM Average Control Delay			6.6		HCM Level of Service						A	
HCM Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			79.6		Sum of lost time (s)						9.0	
Intersection Capacity Utilization			58.5%		ICU Level of Service						B	
Analysis Period (min)			15									
c Critical Lane Group												



# Timings

## 10: Gardiner EB Off-ramp & Park Lawn Rd

2/19/2014

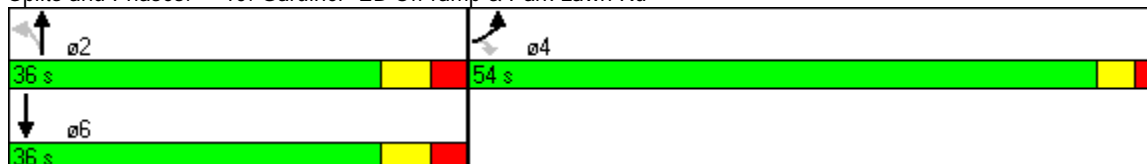


Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations	↖↗	↖	↖	↑↑	↑↔
Volume (vph)	525	532	51	635	397
Turn Type		Perm	Perm		
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	19.0	19.0	4.0	4.0	4.0
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0
Total Split (s)	54.0	54.0	36.0	36.0	36.0
Total Split (%)	60.0%	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	7.0	7.0	7.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	Max	Max	Max
Act Effect Green (s)	49.0	49.0	29.0	29.0	29.0
Actuated g/C Ratio	0.54	0.54	0.32	0.32	0.32
v/c Ratio	0.29	0.58	0.20	0.56	0.42
Control Delay	11.6	12.0	24.7	27.6	24.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	12.0	24.7	27.6	24.2
LOS	B	B	C	C	C
Approach Delay	11.8			27.3	24.2
Approach LOS	B			C	C

### Intersection Summary

Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 4:EBL, Start of Green, Master Intersection  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.58  
 Intersection Signal Delay: 19.2  
 Intersection Capacity Utilization 57.9%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service B

### Splits and Phases: 10: Gardiner EB Off-ramp & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 10: Gardiner EB Off-ramp & Park Lawn Rd

2/19/2014



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	525	532	51	635	397	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	7.0	7.0	7.0	
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	
Frbp, ped/bikes	1.00	0.98	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	1574	1746	3574	3436	
Flt Permitted	0.95	1.00	0.44	1.00	1.00	
Satd. Flow (perm)	3433	1574	810	3574	3436	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	536	543	52	648	405	61
RTOR Reduction (vph)	0	77	0	0	14	0
Lane Group Flow (vph)	536	466	52	648	452	0
Confl. Peds. (#/hr)			27			27
Confl. Bikes (#/hr)		9				7
Heavy Vehicles (%)	2%	1%	0%	1%	2%	0%
Turn Type		Perm	Perm			
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	49.0	49.0	29.0	29.0	29.0	
Effective Green, g (s)	49.0	49.0	29.0	29.0	29.0	
Actuated g/C Ratio	0.54	0.54	0.32	0.32	0.32	
Clearance Time (s)	5.0	5.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1869	857	261	1152	1107	
v/s Ratio Prot	0.16			c0.18	0.13	
v/s Ratio Perm		c0.30	0.06			
v/c Ratio	0.29	0.54	0.20	0.56	0.41	
Uniform Delay, d1	11.1	13.3	22.1	25.2	23.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	2.5	1.7	2.0	1.1	
Delay (s)	11.5	15.8	23.8	27.2	24.9	
Level of Service	B	B	C	C	C	
Approach Delay (s)	13.6			27.0	24.9	
Approach LOS	B			C	C	

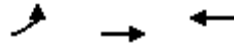
Intersection Summary			
HCM Average Control Delay	20.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 12: Lake Shore Blvd W & Mr. Christie's East Driveway

2/19/2014

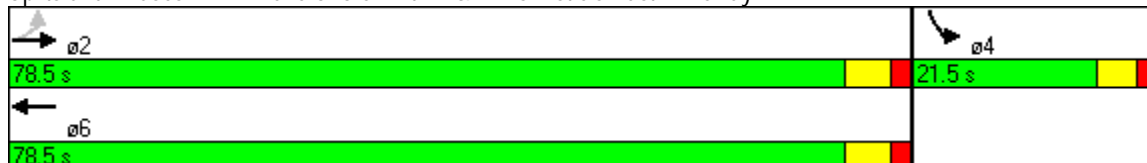


Lane Group	EBL	EBT	WBT	ø4
Lane Configurations		↕↕	↕↕	
Volume (vph)	3	941	929	
Turn Type	Perm			
Protected Phases		2	6	4
Permitted Phases	2			
Detector Phase	2	2	6	
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	21.5
Total Split (s)	78.5	78.5	78.5	21.5
Total Split (%)	78.5%	78.5%	78.5%	22%
Yellow Time (s)	4.0	4.0	4.0	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	
Total Lost Time (s)	5.0	5.0	5.0	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	None
Act Effect Green (s)		120.0	120.0	
Actuated g/C Ratio		1.00	1.00	
v/c Ratio		0.31	0.29	
Control Delay		0.2	0.2	
Queue Delay		0.0	0.0	
Total Delay		0.2	0.2	
LOS		A	A	
Approach Delay		0.2	0.2	
Approach LOS		A	A	

### Intersection Summary

Cycle Length: 100	
Actuated Cycle Length: 120	
Natural Cycle: 45	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.31	
Intersection Signal Delay: 0.2	Intersection LOS: A
Intersection Capacity Utilization 40.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 12: Lake Shore Blvd W & Mr. Christie's East Driveway



# HCM Signalized Intersection Capacity Analysis

## 12: Lake Shore Blvd W & Mr. Christie's East Driveway

2/19/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔↕	↔↕		↔↕	
Volume (vph)	3	941	929	3	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0			
Lane Util. Factor		0.95	0.95			
Frbp, ped/bikes		1.00	1.00			
Flpb, ped/bikes		1.00	1.00			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		3437	3437			
Flt Permitted		0.95	1.00			
Satd. Flow (perm)		3277	3437			
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	3	1012	999	3	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1015	1002	0	0	0
Confl. Peds. (#/hr)	4			4		5
Heavy Vehicles (%)	8%	5%	5%	0%	0%	0%
Turn Type	Perm					
Protected Phases		2	6		4	
Permitted Phases	2					
Actuated Green, G (s)		120.0	120.0			
Effective Green, g (s)		120.0	120.0			
Actuated g/C Ratio		1.00	1.00			
Clearance Time (s)		6.0	6.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		3277	3437			
v/s Ratio Prot			0.29			
v/s Ratio Perm		c0.31				
v/c Ratio		0.31	0.29			
Uniform Delay, d1		0.0	0.0			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.2	0.2			
Delay (s)		0.2	0.2			
Level of Service		A	A			
Approach Delay (s)		0.2	0.2		0.0	
Approach LOS		A	A		A	
<b>Intersection Summary</b>						
HCM Average Control Delay			0.2		HCM Level of Service	A
HCM Volume to Capacity ratio			0.31			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	0.0
Intersection Capacity Utilization			40.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

# Timings

## 17: FGG EB Off-ramp & Legion Rd North

2/19/2014



Lane Group	EBT	EBR	WBL	NBR
Lane Configurations	↑↑	↑	↑	↑
Volume (vph)	936	143	109	99
Turn Type		Perm	Prot	Free
Protected Phases	4		3	
Permitted Phases		4		Free
Detector Phase	4	4	3	
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	
Minimum Split (s)	23.0	23.0	9.0	
Total Split (s)	64.0	64.0	26.0	0.0
Total Split (%)	71.1%	71.1%	28.9%	0.0%
Yellow Time (s)	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	3.0
Lead/Lag	Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	
Recall Mode	None	None	None	
Act Effect Green (s)	21.3	21.3	8.9	29.6
Actuated g/C Ratio	0.72	0.72	0.26	1.00
v/c Ratio	0.38	0.13	0.24	0.06
Control Delay	4.9	1.5	13.1	0.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.9	1.5	13.1	0.1
LOS	A	A	B	A
Approach Delay	4.4			
Approach LOS	A			

### Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 29.6	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.38	
Intersection Signal Delay: 4.8	Intersection LOS: A
Intersection Capacity Utilization 38.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 17: FGG EB Off-ramp & Legion Rd North



HCM Signalized Intersection Capacity Analysis  
 17: FGG EB Off-ramp & Legion Rd North

2/19/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↖			↗
Volume (vph)	936	143	109	0	0	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			3.0
Lane Util. Factor	0.95	1.00	1.00			1.00
Frbp, ped/bikes	1.00	0.97	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			0.86
Flt Protected	1.00	1.00	0.95			1.00
Satd. Flow (prot)	3539	1558	1805			1611
Flt Permitted	1.00	1.00	0.95			1.00
Satd. Flow (perm)	3539	1558	1805			1611
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	975	149	114	0	0	103
RTOR Reduction (vph)	0	63	0	0	0	0
Lane Group Flow (vph)	975	86	114	0	0	103
Confl. Peds. (#/hr)		7	7			
Heavy Vehicles (%)	2%	1%	0%	0%	0%	2%
Turn Type		Perm	Prot			Free
Protected Phases	4		3			
Permitted Phases		4				Free
Actuated Green, G (s)	17.0	17.0	4.1			31.1
Effective Green, g (s)	18.0	18.0	5.1			31.1
Actuated g/C Ratio	0.58	0.58	0.16			1.00
Clearance Time (s)	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	2048	902	296			1611
v/s Ratio Prot	c0.28		c0.06			
v/s Ratio Perm		0.06				0.06
v/c Ratio	0.48	0.10	0.39			0.06
Uniform Delay, d1	3.8	2.9	11.6			0.0
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.2	0.0	0.8			0.1
Delay (s)	4.0	3.0	12.4			0.1
Level of Service	A	A	B			A
Approach Delay (s)	3.8			12.4	0.1	
Approach LOS	A			B	A	

Intersection Summary			
HCM Average Control Delay		4.3	HCM Level of Service A
HCM Volume to Capacity ratio		0.46	
Actuated Cycle Length (s)		31.1	Sum of lost time (s) 8.0
Intersection Capacity Utilization		38.6%	ICU Level of Service A
Analysis Period (min)		15	
c Critical Lane Group			

# Timings

## 30: Lake Shore Blvd W & Legion Rd

2/19/2014

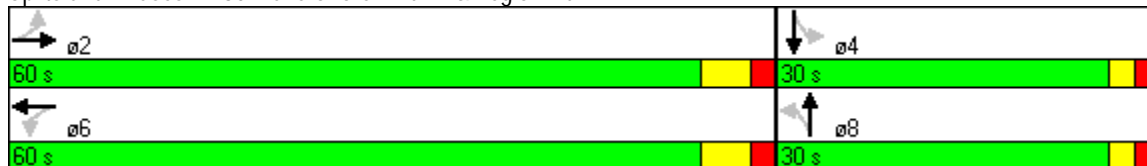


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕↕	↕↕		↕		↕
Volume (vph)	30	577	1165	5	0	31	0
Turn Type	Perm			Perm		Perm	
Protected Phases		2	6		8		4
Permitted Phases	2			8		4	
Detector Phase	2	2	6	8	8	4	4
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.0	23.0	23.0	30.0	30.0	30.0	30.0
Total Split (s)	60.0	60.0	60.0	30.0	30.0	30.0	30.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	2.0	2.0	2.0	2.0
All-Red Time (s)	2.0	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	-1.0
Total Lost Time (s)	5.0	5.0	5.0	3.0	3.0	3.0	3.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Max	Max	Max	Min	Min	Min	Min
Act Effect Green (s)		55.0	55.0		8.3		8.3
Actuated g/C Ratio		0.77	0.77		0.12		0.12
v/c Ratio		0.28	0.48		0.13		0.27
Control Delay		2.9	3.8		16.5		25.3
Queue Delay		0.0	0.0		0.0		0.0
Total Delay		2.9	3.8		16.5		25.3
LOS		A	A		B		C
Approach Delay		2.9	3.8		16.5		25.3
Approach LOS		A	A		B		C

### Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 71.3	
Natural Cycle: 60	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 4.2	Intersection LOS: A
Intersection Capacity Utilization 57.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 30: Lake Shore Blvd W & Legion Rd



HCM Signalized Intersection Capacity Analysis  
30: Lake Shore Blvd W & Legion Rd

2/19/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (vph)	30	577	0	0	1165	61	5	0	19	31	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frbp, ped/bikes		1.00			1.00			0.97			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			0.99	
Frt		1.00			0.99			0.89			0.96	
Flt Protected		1.00			1.00			0.99			0.97	
Satd. Flow (prot)		3437			3444			1633			1722	
Flt Permitted		0.85			1.00			0.95			0.80	
Satd. Flow (perm)		2938			3444			1562			1430	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	607	0	0	1226	64	5	0	20	33	0	16
RTOR Reduction (vph)	0	0	0	0	3	0	0	18	0	0	14	0
Lane Group Flow (vph)	0	639	0	0	1287	0	0	7	0	0	35	0
Confl. Peds. (#/hr)	13		18	18		13	9		22	22		9
Heavy Vehicles (%)	0%	5%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		54.0			54.0			7.3			7.3	
Effective Green, g (s)		55.0			55.0			8.3			8.3	
Actuated g/C Ratio		0.77			0.77			0.12			0.12	
Clearance Time (s)		6.0			6.0			4.0			4.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		2266			2657			182			166	
v/s Ratio Prot					c0.37							
v/s Ratio Perm		0.22						0.00			c0.02	
v/c Ratio		0.28			0.48			0.04			0.21	
Uniform Delay, d1		2.4			3.0			28.0			28.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.3			0.6			0.1			0.6	
Delay (s)		2.7			3.6			28.1			29.2	
Level of Service		A			A			C			C	
Approach Delay (s)		2.7			3.6			28.1			29.2	
Approach LOS		A			A			C			C	

Intersection Summary

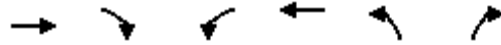
HCM Average Control Delay	4.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	71.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Unsignalized Intersection Capacity Analysis

## 32: Lake Shore Blvd W & Existing Driveway

2/19/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	961	4	1	948	1	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1022	4	1	1009	1	3
Pedestrians				1	24	
Lane Width (m)				3.6	3.6	
Walking Speed (m/s)				1.2	1.2	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	264			76		
pX, platoon unblocked			0.97		0.97	0.97
vC, conflicting volume			1051		1555	538
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			987		1508	458
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		99	99
cM capacity (veh/h)			672		108	527

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	682	345	337	672	4
Volume Left	0	0	1	0	1
Volume Right	0	4	0	0	3
cSH	1700	1700	672	1700	267
Volume to Capacity	0.40	0.20	0.00	0.40	0.02
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.4
Control Delay (s)	0.0	0.0	0.1	0.0	18.7
Lane LOS			A		C
Approach Delay (s)	0.0		0.0		18.7
Approach LOS					C

Intersection Summary					
Average Delay			0.0		
Intersection Capacity Utilization			37.2%	ICU Level of Service	A
Analysis Period (min)			15		

# Timings

## 34: Lake Shore Blvd W & Gardner Expwy EB ON-Off ramp

2/19/2014



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖	↕	↖	↕	↖	↕		↕	↗
Volume (vph)	184	663	3	82	54	4	121	43	814
Turn Type	pm+pt		Perm		Perm		Perm		Perm
Protected Phases	5	2		6		8		4	
Permitted Phases	2		6		8		4		4
Detector Phase	5	2	6	6	8	8	4	4	4
Switch Phase									
Minimum Initial (s)	6.0	24.0	24.0	24.0	13.0	13.0	13.0	13.0	13.0
Minimum Split (s)	10.0	31.0	31.0	31.0	27.0	27.0	27.0	27.0	27.0
Total Split (s)	22.0	53.0	31.0	31.0	27.0	27.0	27.0	27.0	27.0
Total Split (%)	27.5%	66.3%	38.8%	38.8%	33.8%	33.8%	33.8%	33.8%	33.8%
Yellow Time (s)	3.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0
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	-1.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag					
Lead-Lag Optimize?	Yes		Yes	Yes					
Recall Mode	Min	Min	Min	Min	Min	Min	Min	Min	Min
Act Effect Green (s)	43.0	40.0	25.2	25.2	17.6	17.6		17.6	17.6
Actuated g/C Ratio	0.63	0.58	0.37	0.37	0.26	0.26		0.26	0.26
v/c Ratio	0.24	0.42	0.01	0.18	0.20	0.03		0.56	0.83
Control Delay	6.7	8.7	17.3	16.4	22.4	0.0		30.2	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	6.7	8.7	17.3	16.4	22.4	0.0		30.2	10.5
LOS	A	A	B	B	C	A		C	B
Approach Delay		8.3		16.4		15.7		13.8	
Approach LOS		A		B		B		B	

### Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 68.7

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 11.5

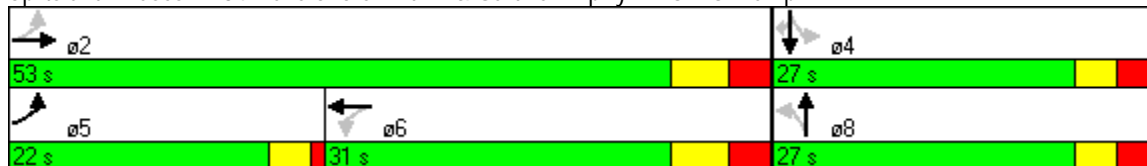
Intersection LOS: B

Intersection Capacity Utilization 94.8%

ICU Level of Service F

Analysis Period (min) 15

### Splits and Phases: 34: Lake Shore Blvd W & Gardner Expwy EB ON-Off ramp



# HCM Signalized Intersection Capacity Analysis

## 34: Lake Shore Blvd W & Gardner Expwy EB ON-Off ramp

2/19/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↗		↖	↖↗			↖↗	↖
Volume (vph)	184	663	96	3	82	14	54	4	19	121	43	814
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		6.0	6.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	0.95			1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99			1.00	1.00
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	0.87			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1768	3349		1794	1573		1805	3121			1576	1568
Flt Permitted	0.62	1.00		0.34	1.00		0.62	1.00			0.77	1.00
Satd. Flow (perm)	1147	3349		644	1573		1180	3121			1251	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	200	721	104	3	89	15	59	4	21	132	47	885
RTOR Reduction (vph)	0	14	0	0	7	0	0	19	0	0	0	658
Lane Group Flow (vph)	200	811	0	3	97	0	59	6	0	0	179	227
Confl. Peds. (#/hr)	2		13	13		2			1	1		
Heavy Vehicles (%)	2%	6%	0%	0%	21%	0%	0%	0%	0%	22%	0%	3%
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	39.0	39.0		24.2	24.2		16.6	16.6			16.6	16.6
Effective Green, g (s)	40.0	40.0		25.2	25.2		17.6	17.6			17.6	17.6
Actuated g/C Ratio	0.58	0.58		0.37	0.37		0.26	0.26			0.26	0.26
Clearance Time (s)	4.0	7.0		7.0	7.0		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	3.0
Lane Grp Cap (vph)	776	1953		237	578		303	801			321	402
v/s Ratio Prot	0.04	c0.24			0.06			0.00				
v/s Ratio Perm	0.11			0.00			0.05				0.14	c0.14
v/c Ratio	0.26	0.42		0.01	0.17		0.19	0.01			0.56	0.56
Uniform Delay, d1	6.8	7.9		13.8	14.6		20.0	19.0			22.1	22.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.2	0.1		0.0	0.1		0.3	0.0			2.1	1.8
Delay (s)	7.0	8.0		13.8	14.8		20.3	19.0			24.2	24.0
Level of Service	A	A		B	B		C	B			C	C
Approach Delay (s)		7.8			14.7			19.9			24.0	
Approach LOS		A			B			B			C	

### Intersection Summary

HCM Average Control Delay	16.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	68.6	Sum of lost time (s)	11.0
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Unsignalized Intersection Capacity Analysis

## 37: Lake Shore Blvd W & Marine Parade Dr.

2/19/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	↻
Volume (veh/h)	595	63	1	38	31	33
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)	640	68	1	41	33	35
Pedestrians					9	
Lane Width (m)					3.2	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						5
Median type	None			None		
Median storage veh						
Upstream signal (m)				138		
pX, platoon unblocked						
vC, conflicting volume			717		726	683
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			717		726	683
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		91	92
cM capacity (veh/h)			888		387	450

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	708	42	69
Volume Left	0	1	33
Volume Right	68	0	35
cSH	1700	888	799
Volume to Capacity	0.42	0.00	0.09
Queue Length 95th (m)	0.0	0.0	2.3
Control Delay (s)	0.0	0.2	14.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	14.4
Approach LOS			B

Intersection Summary			
Average Delay		1.2	
Intersection Capacity Utilization		45.2%	ICU Level of Service A
Analysis Period (min)		15	

# Timings

## 38: Lake Shore Blvd W & Palace Pier Crt

2/19/2014



Lane Group	EBT	EBR	NBL	NBR
Lane Configurations	↑	↑	↑	↑
Volume (vph)	434	175	37	28
Turn Type		Perm		Perm
Protected Phases	2		4	
Permitted Phases		2		4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0
Total Split (s)	73.0	73.0	27.0	27.0
Total Split (%)	73.0%	73.0%	27.0%	27.0%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effect Green (s)	68.0	68.0	22.0	22.0
Actuated g/C Ratio	0.68	0.68	0.22	0.22
v/c Ratio	0.37	0.18	0.11	0.09
Control Delay	7.8	1.2	32.2	12.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	7.8	1.2	32.2	12.0
LOS	A	A	C	B
Approach Delay	5.9		23.5	
Approach LOS	A		C	

### Intersection Summary

Cycle Length: 100	
Actuated Cycle Length: 100	
Natural Cycle: 45	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.37	
Intersection Signal Delay: 7.6	Intersection LOS: A
Intersection Capacity Utilization 34.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 38: Lake Shore Blvd W & Palace Pier Crt



HCM Signalized Intersection Capacity Analysis  
 38: Lake Shore Blvd W & Palace Pier Crt

2/19/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗			↖	↗
Volume (vph)	434	175	0	0	37	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.2	3.2
Total Lost time (s)	5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	1.00			1.00	1.00
Frbp, ped/bikes	1.00	0.92			1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00
Frt	1.00	0.85			1.00	0.85
Flt Protected	1.00	1.00			0.95	1.00
Satd. Flow (prot)	1900	1469			1725	1390
Flt Permitted	1.00	1.00			0.95	1.00
Satd. Flow (perm)	1900	1469			1725	1390
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	477	192	0	0	41	31
RTOR Reduction (vph)	0	61	0	0	0	24
Lane Group Flow (vph)	477	131	0	0	41	7
Confl. Peds. (#/hr)		20	20			
Heavy Vehicles (%)	0%	1%	0%	0%	0%	11%
Turn Type		Perm				Perm
Protected Phases	2				4	
Permitted Phases		2				4
Actuated Green, G (s)	67.0	67.0			21.0	21.0
Effective Green, g (s)	68.0	68.0			22.0	22.0
Actuated g/C Ratio	0.68	0.68			0.22	0.22
Clearance Time (s)	6.0	6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	1292	999			380	306
v/s Ratio Prot	c0.25				c0.02	
v/s Ratio Perm		0.09				0.00
v/c Ratio	0.37	0.13			0.11	0.02
Uniform Delay, d1	6.8	5.6			31.2	30.6
Progression Factor	1.00	1.00			1.00	1.00
Incremental Delay, d2	0.8	0.3			0.6	0.1
Delay (s)	7.6	5.9			31.7	30.7
Level of Service	A	A			C	C
Approach Delay (s)	7.1			0.0	31.3	
Approach LOS	A			A	C	

Intersection Summary

HCM Average Control Delay	9.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	34.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis  
 40: Marine Parade Dr. & Waterfront Drive

2/19/2014

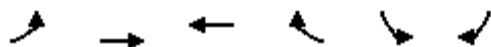


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	0	0	0	110	126	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	120	137	0
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	0	120	137			
Volume Left (vph)	0	0	0			
Volume Right (vph)	0	0	0			
Hadj (s)	0.00	0.03	0.03			
Departure Headway (s)	4.4	4.1	4.0			
Degree Utilization, x	0.00	0.13	0.15			
Capacity (veh/h)	774	871	882			
Control Delay (s)	7.4	7.7	7.8			
Approach Delay (s)	0.0	7.7	7.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
HCM Level of Service			A			
Intersection Capacity Utilization			10.0%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 50: Marine Parade Dr. & Existing Driveway

2/19/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	1	107	126	0	3	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	119	140	0	3	1
Pedestrians		4	1			
Lane Width (m)		3.6	3.6			
Walking Speed (m/s)		1.2	1.2			
Percent Blockage		0	0			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	140				262	74
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	140				262	74
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)	1456				709	976
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	1	119	93	47	4	
Volume Left	1	0	0	0	3	
Volume Right	0	0	0	0	1	
cSH	1456	1700	1700	1700	761	
Volume to Capacity	0.00	0.07	0.05	0.03	0.01	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.1	
Control Delay (s)	7.5	0.0	0.0	0.0	9.8	
Lane LOS	A				A	
Approach Delay (s)	0.1		0.0		9.8	
Approach LOS					A	
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			16.9%		ICU Level of Service	A
Analysis Period (min)			15			



Summary of All Intervals

Run Number	3	5	Avg
Start Time	6:50	6:50	6:50
End Time	7:15	7:15	7:15
Total Time (min)	25	25	25
Time Recorded (min)	15	15	15
# of Intervals	2	2	2
# of Recorded Intvl	1	1	1
Vehs Entered	1819	1700	1756
Vehs Exited	1618	1583	1602
Starting Vehs	269	333	292
Ending Vehs	470	450	455
Denied Entry Before	24	29	26
Denied Entry After	72	100	85
Travel Distance (km)	2044	2048	2046
Travel Time (hr)	99.9	110.1	105.0
Total Delay (hr)	59.8	70.1	64.9
Total Stops	2845	3202	3023
Fuel Used (l)	2411.9	2490.2	2451.0

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10
Volumes adjusted by PHF, Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	3	5	Avg
Vehs Entered	1819	1700	1756
Vehs Exited	1618	1583	1602
Starting Vehs	269	333	292
Ending Vehs	470	450	455
Denied Entry Before	24	29	26
Denied Entry After	72	100	85
Travel Distance (km)	2044	2048	2046
Travel Time (hr)	99.9	110.1	105.0
Total Delay (hr)	59.8	70.1	64.9
Total Stops	2845	3202	3023
Fuel Used (l)	2411.9	2490.2	2451.0

Queuing and Blocking Report  
Existing Traffic Conditions, PM Peak Hour

2/7/2014

Intersection: 3: Lake Shore Blvd W & Park Lawn Road

Movement	EB	EB	EB	B20	B20	B20	WB	WB	B14	B14	NB	NB
Directions Served	LT	T	TR	T	T	T	LT	TR	T	T	LT	T
Maximum Queue (m)	139.2	138.9	29.0	158.2	156.8	123.8	73.4	73.8	19.3	26.0	16.8	12.8
Average Queue (m)	139.2	47.3	6.2	120.7	102.0	20.6	57.4	63.0	3.4	8.6	10.6	6.0
95th Queue (m)	140.0	124.8	24.8	180.9	195.4	71.9	80.7	85.9	15.2	26.7	19.3	14.6
Link Distance (m)	117.7	117.7	117.7	149.8	149.8	149.8	52.3	52.3	58.1	58.1		298.6
Upstream Blk Time (%)	96	1		22	14	0	11	20				
Queuing Penalty (veh)	211	2		48	31	0	55	103				
Storage Bay Dist (m)												55.0
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 3: Lake Shore Blvd W & Park Lawn Road

Movement	NB	SB	SB
Directions Served	R	L	LTR
Maximum Queue (m)	5.0	261.5	288.5
Average Queue (m)	1.4	211.9	222.4
95th Queue (m)	4.9	404.3	411.5
Link Distance (m)	298.6	482.4	482.4
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: The Queensway & Park Lawn Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	L	T	TR
Maximum Queue (m)	147.6	169.0	123.4	130.0	687.5	574.6	22.3	32.3	74.8	16.5	66.7	85.5
Average Queue (m)	118.9	100.1	84.4	127.3	293.1	224.2	13.4	22.1	45.5	10.0	38.0	54.3
95th Queue (m)	171.2	186.0	162.3	141.5	629.9	517.2	40.5	36.0	72.5	17.7	66.6	85.5
Link Distance (m)		164.4	164.4		682.9	682.9			271.0		401.9	401.9
Upstream Blk Time (%)		19	1		1	0						
Queuing Penalty (veh)		0	0		0	0						
Storage Bay Dist (m)	50.0			50.0			20.0	50.0		25.0		
Storage Blk Time (%)	88	13		83	5	30	0		8	0	16	
Queuing Penalty (veh)	310	29		374	19	21	0		12	0	6	

Queuing and Blocking Report  
Existing Traffic Conditions, PM Peak Hour

2/7/2014

Intersection: 7: Lake Shore Blvd W & Mr. Christie's West Driveway

Movement	SB
Directions Served	LR
Maximum Queue (m)	15.5
Average Queue (m)	6.9
95th Queue (m)	15.4
Link Distance (m)	58.4
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Gardiner WB On-ramp & Park Lawn Rd

Movement	WB	WB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	T	T	T	TR
Maximum Queue (m)	17.8	8.2	47.2	18.6	21.4	36.9	70.2
Average Queue (m)	3.1	2.8	25.1	11.3	12.6	14.9	33.0
95th Queue (m)	14.9	9.2	40.6	19.7	27.9	37.6	81.2
Link Distance (m)	120.0	120.0		176.2	176.2	271.0	271.0
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			50.0				
Storage Blk Time (%)			0				
Queuing Penalty (veh)			2				

Intersection: 10: Gardiner EB Off-ramp & Park Lawn Rd

Movement	EB	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	L	R	L	T	T	T	TR
Maximum Queue (m)	53.3	34.0	30.3	35.0	72.0	56.0	47.2	43.8
Average Queue (m)	34.9	16.7	11.6	14.9	39.3	24.5	30.2	28.5
95th Queue (m)	54.5	34.8	28.3	33.3	57.1	44.9	47.0	47.4
Link Distance (m)	243.8	243.8			482.4	482.4	176.2	176.2
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			35.0	27.0				
Storage Blk Time (%)		0	0	0	22			
Queuing Penalty (veh)		1	1	0	12			

Queuing and Blocking Report  
Existing Traffic Conditions, PM Peak Hour

2/7/2014

Intersection: 12: Lake Shore Blvd W & Mr. Christie's East Driveway

Movement	EB	EB	WB	WB
Directions Served	LT	T	T	TR
Maximum Queue (m)	14.0	4.6	11.9	17.3
Average Queue (m)	6.7	0.7	4.3	6.1
95th Queue (m)	24.7	4.6	18.2	25.8
Link Distance (m)	62.9	62.9	91.9	91.9
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 17: FGG EB Off-ramp & Legion Rd North

Movement	EB	EB	WB	NB
Directions Served	T	T	L	R
Maximum Queue (m)	516.3	273.8	18.6	8.1
Average Queue (m)	84.6	53.8	12.0	2.3
95th Queue (m)	375.6	265.4	21.7	11.6
Link Distance (m)	511.7	511.7	243.8	124.0
Upstream Blk Time (%)	0	0		
Queuing Penalty (veh)	0	0		
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 30: Lake Shore Blvd W & Legion Rd

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LR	LR
Maximum Queue (m)	78.6	77.7	73.1	82.4	14.6	16.6
Average Queue (m)	32.4	30.5	34.5	43.7	4.9	5.9
95th Queue (m)	80.5	77.7	75.3	81.8	15.6	13.8
Link Distance (m)	246.7	246.7	149.8	149.8	126.3	291.7
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Queuing and Blocking Report  
Existing Traffic Conditions, PM Peak Hour

2/7/2014

Intersection: 32: Lake Shore Blvd W & Existing Driveway

Movement	NB
Directions Served	LR
Maximum Queue (m)	9.2
Average Queue (m)	1.3
95th Queue (m)	6.6
Link Distance (m)	52.1
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 34: Lake Shore Blvd W & Gardner Expwy EB ON-Off ramp

Movement	EB	EB	EB	B1	WB	NB	NB	SB
Directions Served	L	T	TR	T	TR	L	TR	LT
Maximum Queue (m)	22.3	49.1	16.4	86.1	28.0	14.9	7.4	57.1
Average Queue (m)	14.0	42.1	7.1	38.1	16.4	7.1	3.5	28.8
95th Queue (m)	26.7	56.6	15.8	96.4	29.7	15.3	9.4	54.9
Link Distance (m)		24.6	24.6	91.9	41.5		82.2	119.3
Upstream Blk Time (%)	1	16		1				
Queuing Penalty (veh)	0	81		4				
Storage Bay Dist (m)	20.0					20.0		
Storage Blk Time (%)	4	15				0		
Queuing Penalty (veh)	15	31				0		

Intersection: 37: Lake Shore Blvd W & Marine Parade Dr.

Movement	NB	NB
Directions Served	L	R
Maximum Queue (m)	7.8	6.8
Average Queue (m)	4.3	4.3
95th Queue (m)	10.5	9.6
Link Distance (m)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		40.0
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report  
Existing Traffic Conditions, PM Peak Hour

2/7/2014

Intersection: 38: Lake Shore Blvd W & Palace Pier Crt

Movement	EB	EB	NB	NB
Directions Served	T	R	L	R
Maximum Queue (m)	49.9	30.8	14.1	6.6
Average Queue (m)	25.9	9.6	4.3	2.4
95th Queue (m)	52.4	30.2	13.6	7.3
Link Distance (m)	119.4		142.9	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)		45.0		40.0
Storage Blk Time (%)	1	0		
Queuing Penalty (veh)	2	0		

Intersection: 40: Marine Parade Dr. & Waterfront Drive

Movement	NB	SB
Directions Served	LT	TR
Maximum Queue (m)	16.3	15.9
Average Queue (m)	11.0	10.5
95th Queue (m)	18.3	14.8
Link Distance (m)	267.8	165.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 50: Marine Parade Dr. & Existing Driveway

Movement	SB
Directions Served	LR
Maximum Queue (m)	3.9
Average Queue (m)	0.6
95th Queue (m)	3.9
Link Distance (m)	64.0
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 1369

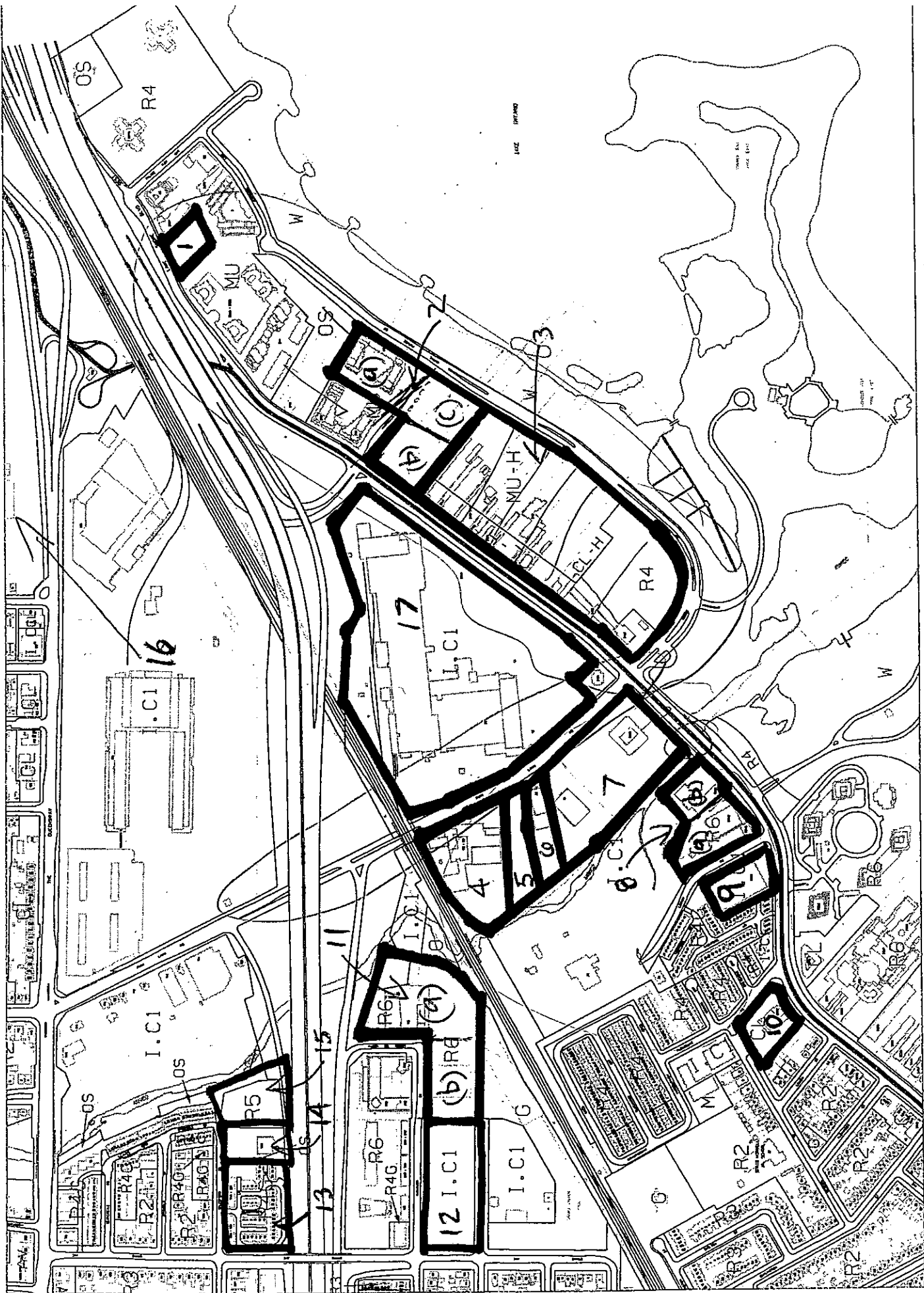
# Appendix D

## List of Future Background Developments and Locations

Block	Project/Location	Current Status	Development Assumptions - Lea/MMM Traffic Reports (August 2005)						Development Assumptions - City Planning (July 2008)						Change in Development Assumptions (2005 to 2008)					
			Condominiums (units)	Townhouses (units)	Office (m2)	Retail (m2)	Industrial (m2)	Other (m2)	Condominiums (units)	Townhouses (units)	Office (m2)	Retail (m2)	Industrial (m2)	Other (m2)	Condominiums (units)	Townhouses (units)	Office (m2)	Retail (m2)	Industrial (m2)	Other (m2)
1	2077 Lake Shore Blvd. W.	Under Construction	127		818	715	2,082	145		676	725	1,863	18		-142	10	0		-169	
2	Monarch - Totals		947			3,070		947			3,435		-267				365			
2 a	Monarch - Explorer	Occupied						267			842									
2 b	Monarch - Nautilus	Approved						377			2,496									
2 c	Monarch - Residual	Pending						303			97									
3	Motel Strip Residual	Potential	1,028		14,932	7,466		2,542		15,893	15,893	15,893	1,514		961	8,427			15,893	
4	Amexon	Approved	588		3,725	1,570		588		3,725	1,570									
5	42 Park Lawn Road	Approved	217			592		217			1,128						536			
6	36 Park Lawn Road	Approved	189			550		189			1,128						578			
7	2200 Lake Shore Blvd. W. (Menkes)	Approved	1,200		18,473	1,700		1,200		18,500	1,700				27					
8	Empire (formerly Fogh) - Totals		362		8,606	930		830		347	1,330		468		-8,259	400				
8 a	Beyond The Sea	Approved	362			930		489			980									
8 b (Note)	2230 Lake Shore Blvd. W.	Proposed			8,606			341		347	350									
9	2256 Lake Shore Blvd. W.	Development Potential			12,762					12,762										
10	Polish Alliance	Approved	200					200												
11	Mystic Point - Totals		793					975					-124							
11 a	Mystic Point - Tides	Occupied						306												
11 a	Mystic Point - iLofts	Under Construction						243												
11 a	Mystic Point - California	Approved						274												
11 b	Mystic Point - Residual	Pending						152												
12	Former Metro Lands	No Development Potential	331					0					-331							
13	95-101 Grand Avenue	Occupied		53											-53					
14	255 Dalesford	Occupied		22											-22					
15	245 Dalesford	Occupied		134											-134					
16	125 The Queensway	Occupied				10,684											-10,684			
17	Kraft	Development Potential			9,450					5,000	15,000				-4,450		15,000			
													1,278	-209	-11,863	-368	15,000	15,724		

Note: 2230 Lake Shore Blvd. W. was not part of the Fogh proposal in 2005. It was a separate parcel with development potential defined by the former Park Lawn/Lake Shore Secondary Plan





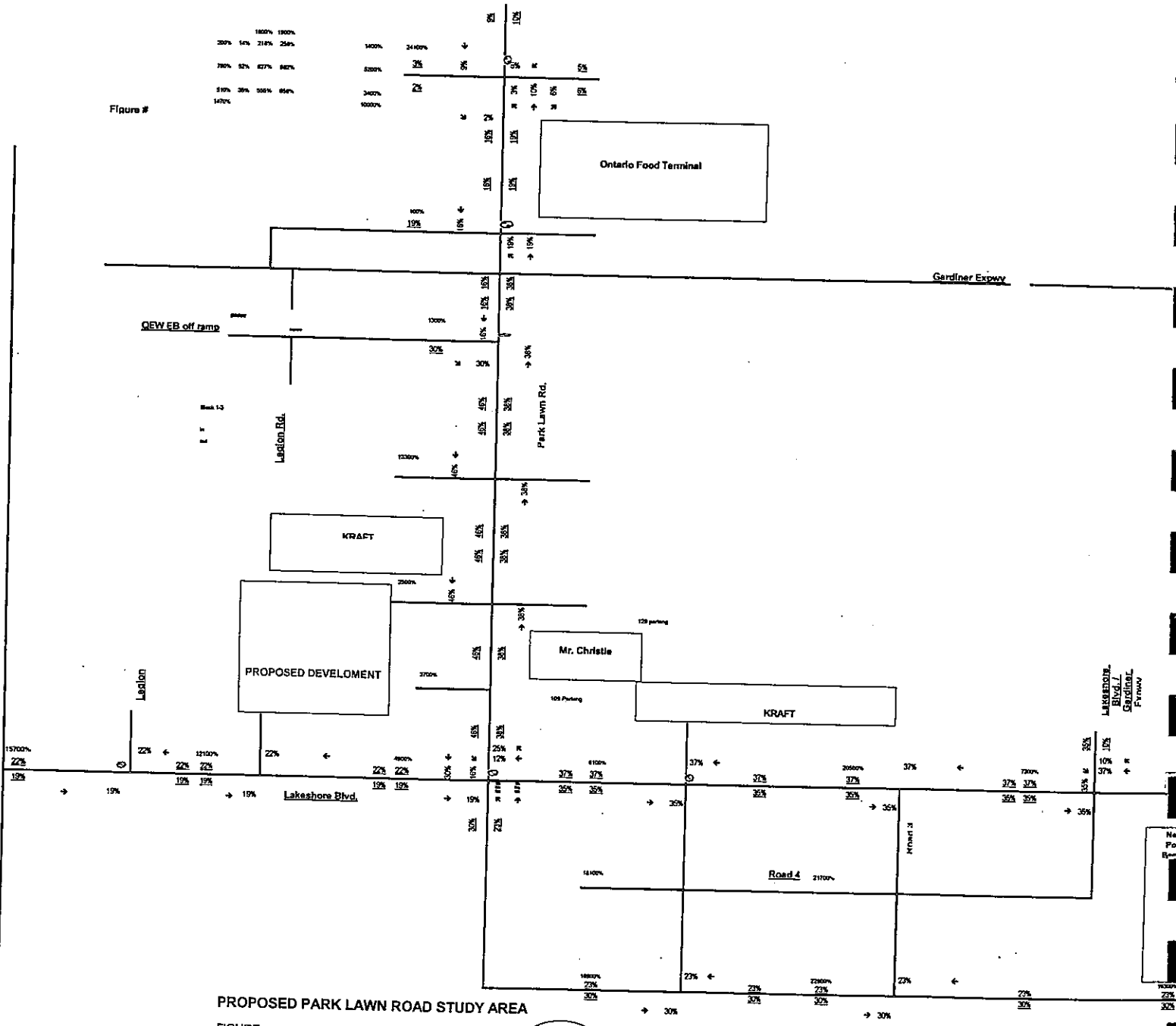
# Appendix E

## Trip Distribution Sheets



1

Figure #



PROPOSED PARK LAWN ROAD STUDY AREA

FIGURE  
BG SITE Trips - Grenadier Landing  
Weekday PM



Maring Parade Drive



1

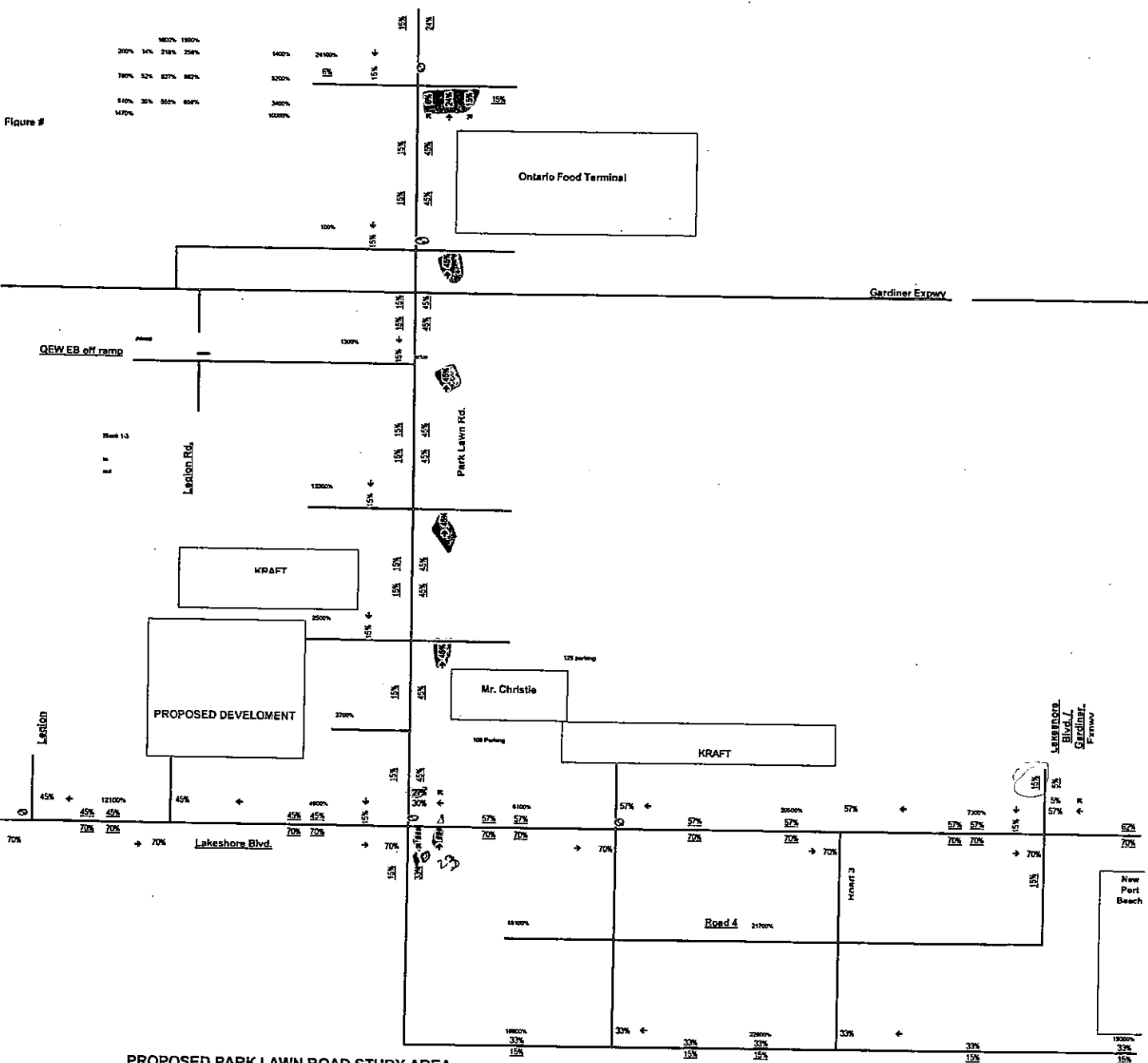


Figure #

PROPOSED PARK LAWN ROAD STUDY AREA

FIGURE  
BG SITE Trips - Grenadier Landing (commercial)  
Weekday AM  
Per:



Marine Parade Drive



1

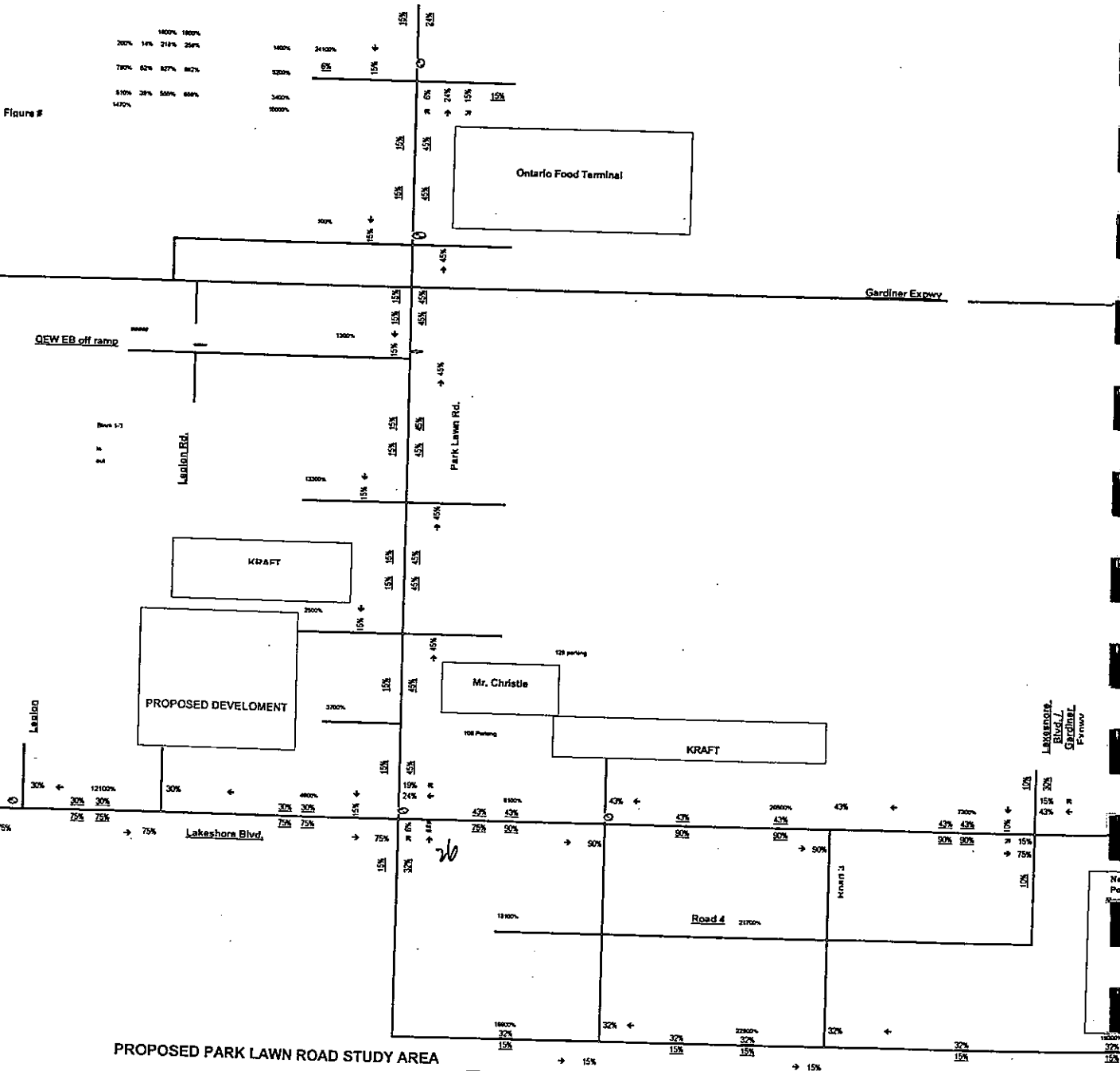


Figure #

1400%	1800%		
200%	14%	218%	254%
78%	62%	827%	802%
810%	38%	555%	684%
1470%			

PROPOSED PARK LAWN ROAD STUDY AREA

FIGURE BG SITE Trips - Grenadier Landing (commercial) Weekday PM



Marine Parade Drive

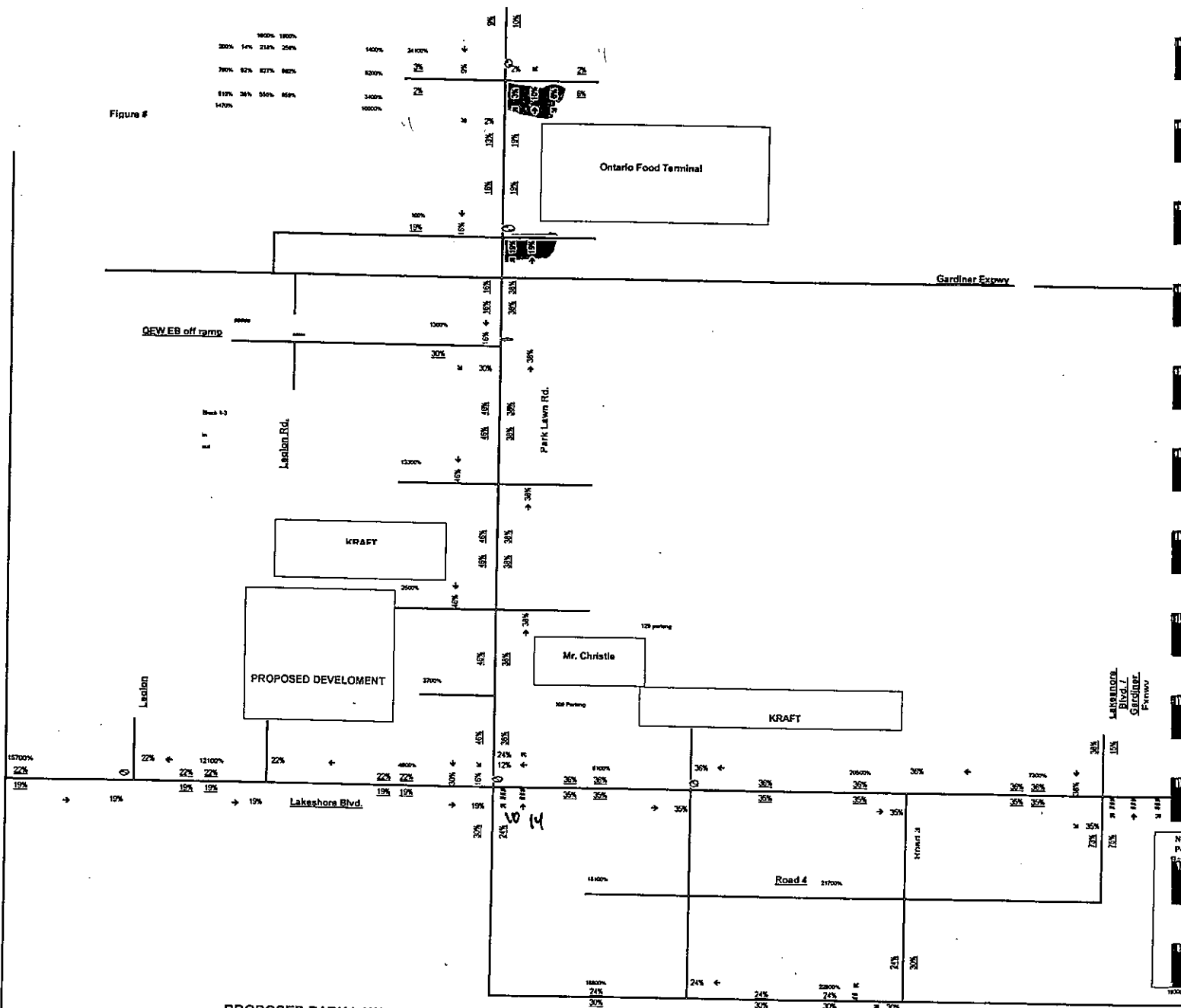


2005-06-16-09:11 pm... 3654375%



2

Figure #



PROPOSED PARK LAWN ROAD STUDY AREA

FIGURE  
BG SITE Trips - Waterview Place (Monarch-Condo)  
Weekday PM



Marine Parade Drive





(2)

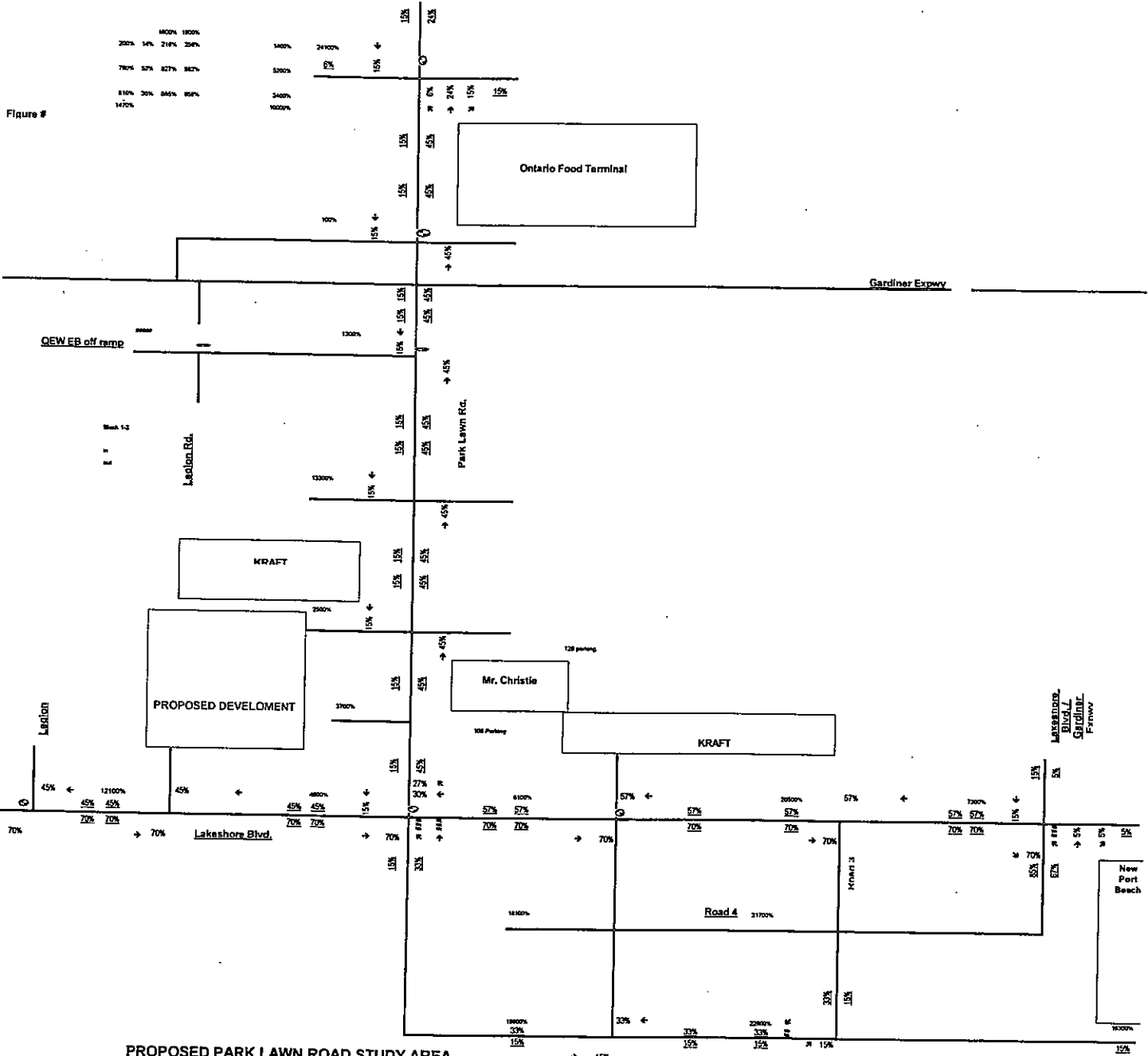


Figure #

200%	1%	180%	140%	2400%
70%	5%	21%	520%	15%
810%	20%	86%	340%	15%
1470%			1000%	

PROPOSED PARK LAWN ROAD STUDY AREA

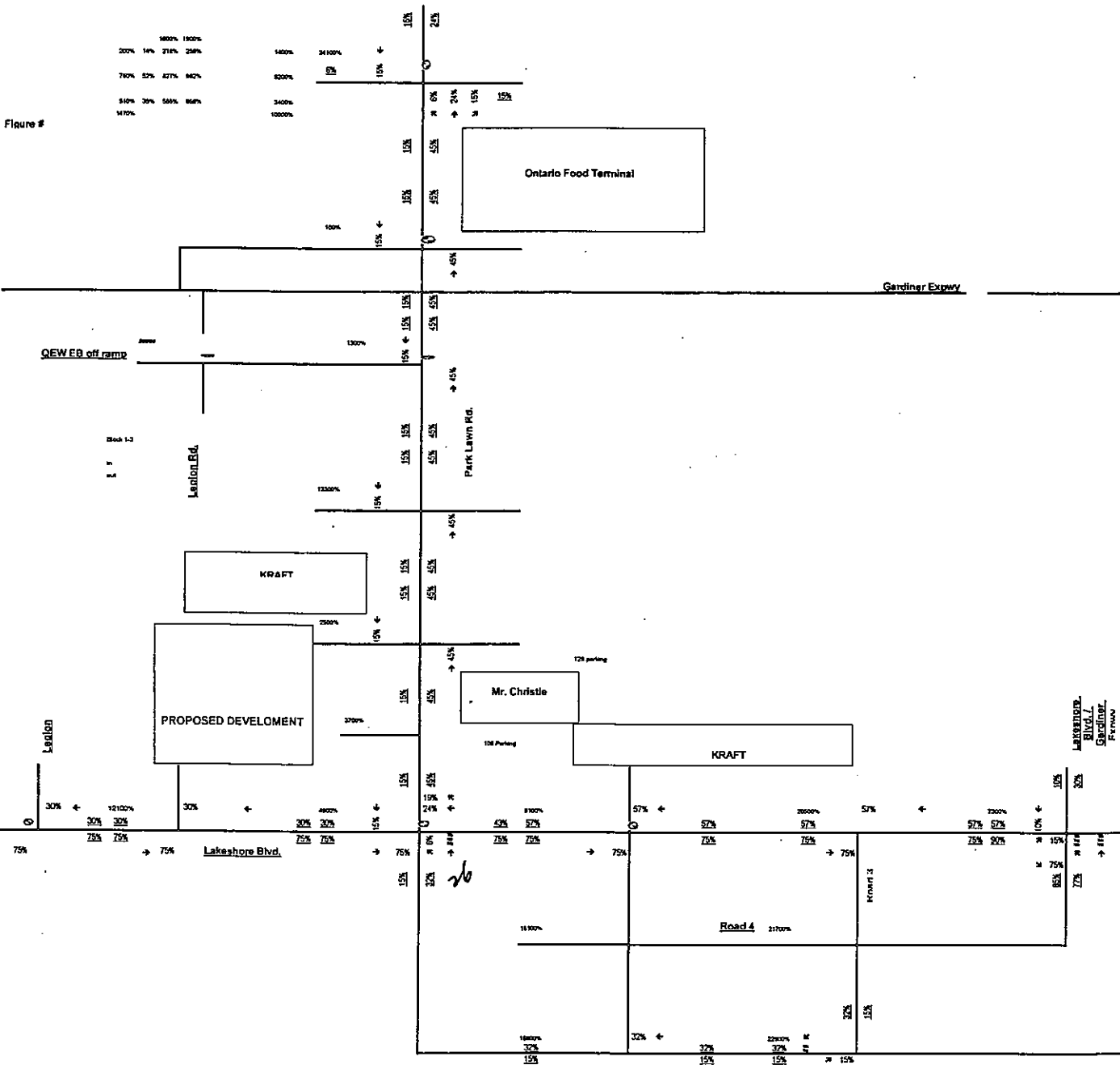
FIGURE  
BG SITE Trips - Waterview Place (Monarch-Commercial)  
Weekday AM



Marine Parade Drive



2



PROPOSED PARK LAWN ROAD STUDY AREA

FIGURE  
BG SITE Trips - Waterview Place (Monarch-Commercial)  
Weekday PM  
PWC

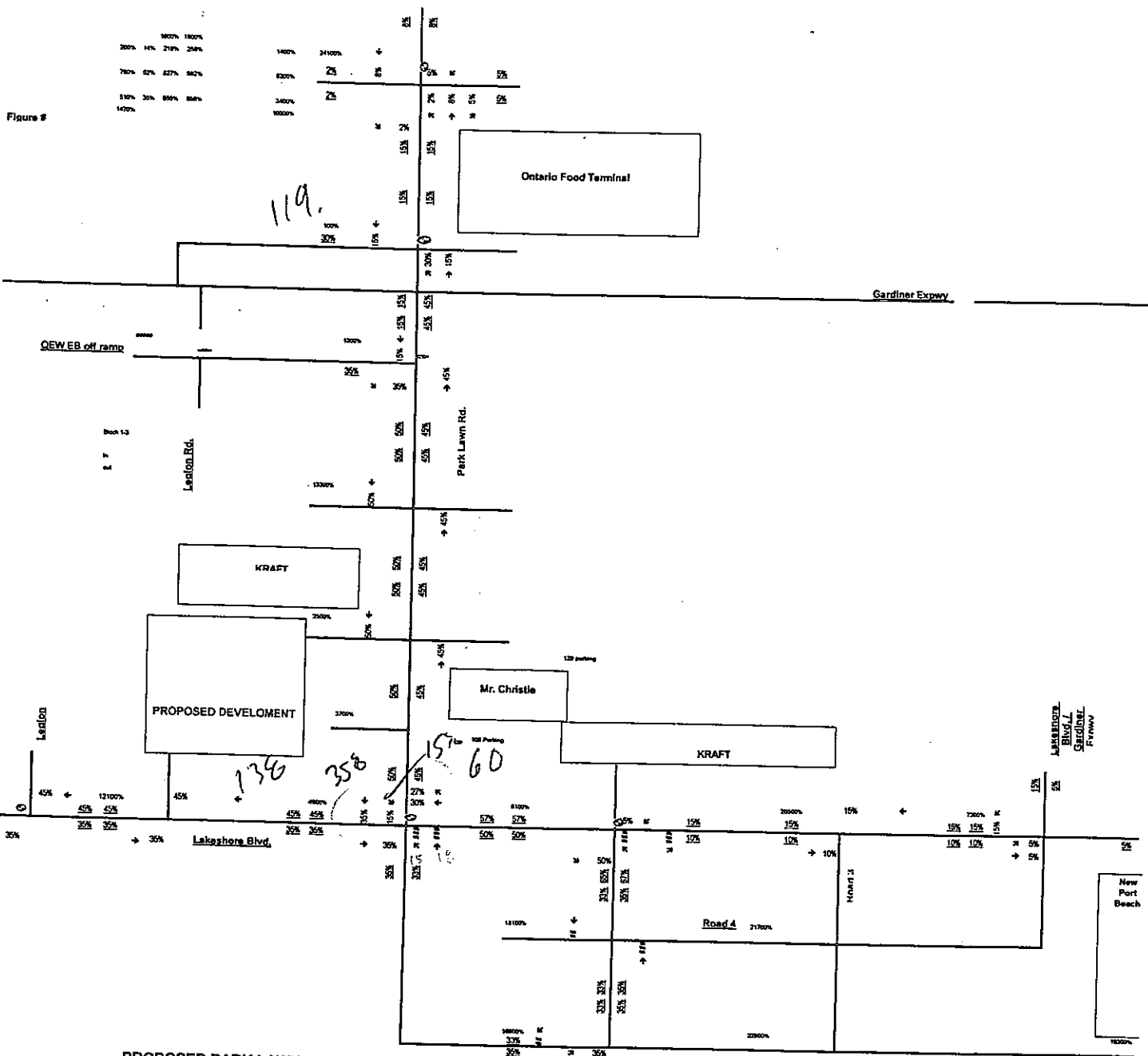


Marine Parade Drive



3

Figure #



PROPOSED PARK LAWN ROAD STUDY AREA

FIGURE  
BG SITE Trips - Commerical Residential  
Weekday AM

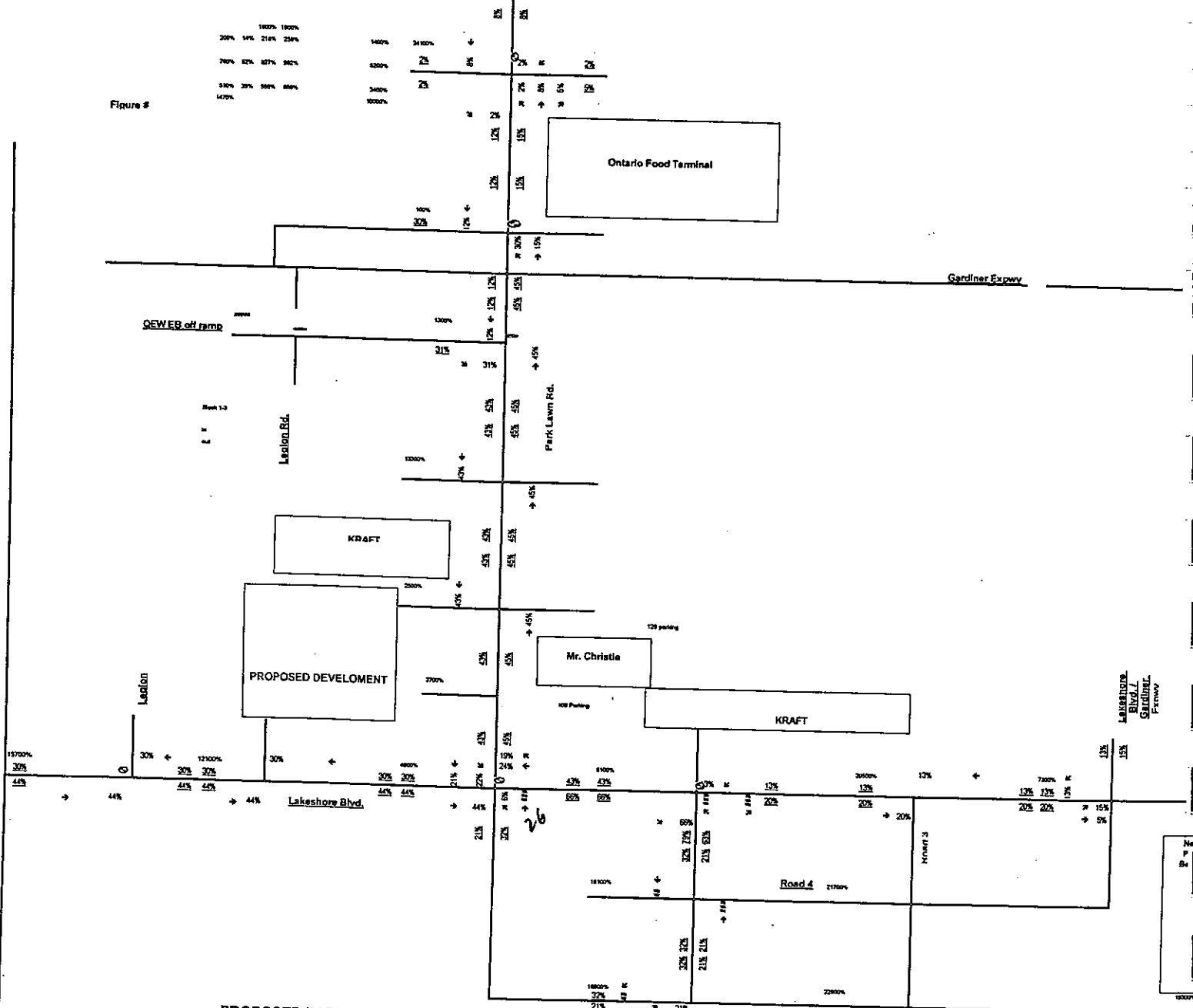


Marine Parade Drive



3

Figure #



PROPOSED PARK LAWN ROAD STUDY AREA

FIGURE  
BG SITE Trips - Commercial Residual  
Weekday PM  
6:07



Marina Parade Drive



3

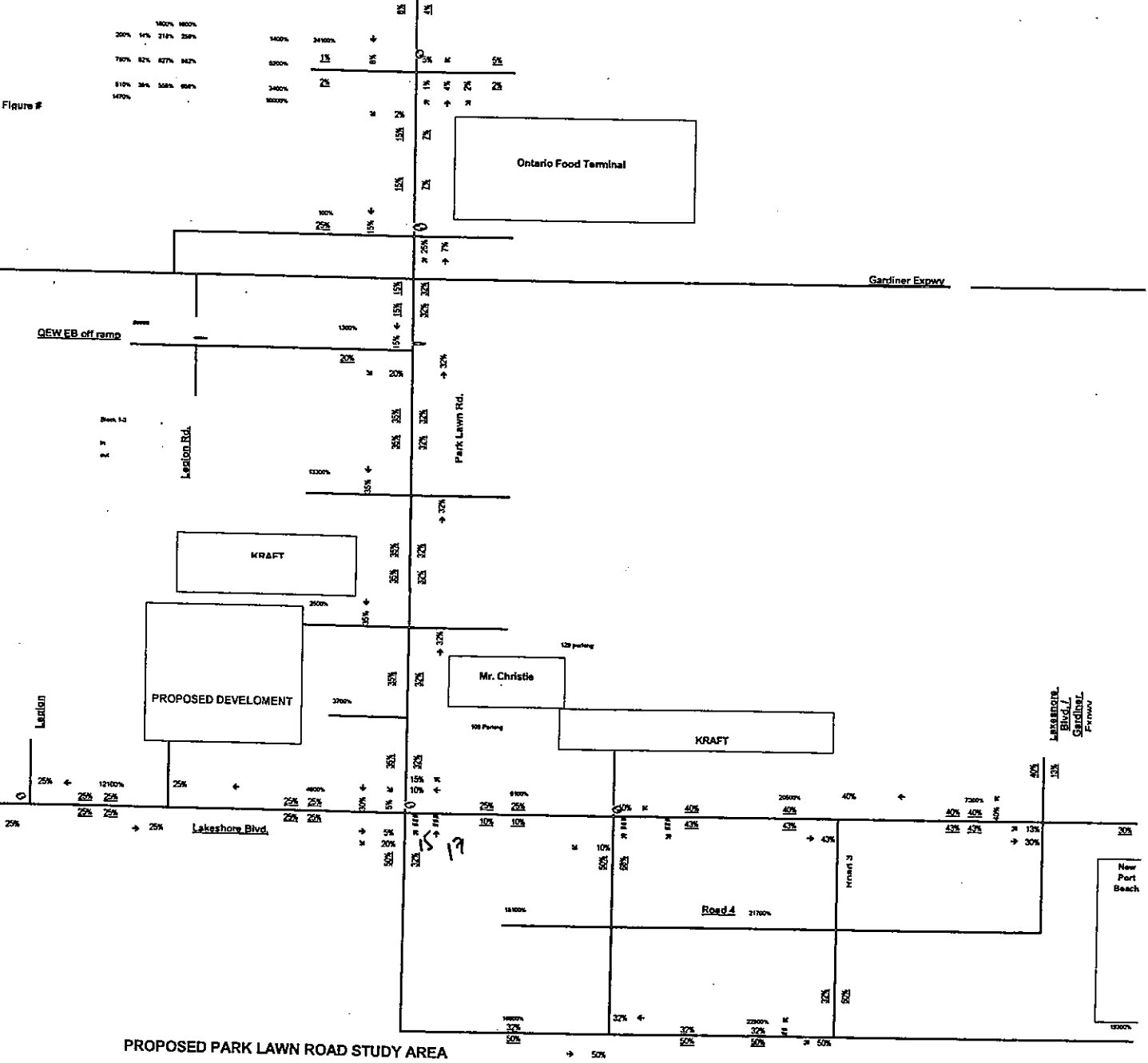


Figure #

### PROPOSED PARK LAWN ROAD STUDY AREA

FIGURE  
 BG SITE Trips - Residential Residual  
 Weekday AM  
 2021



Marine Parade Drive



2389818-021 Proj: Residential Development - Road 4 in Leaside - 11-20-20-21-01

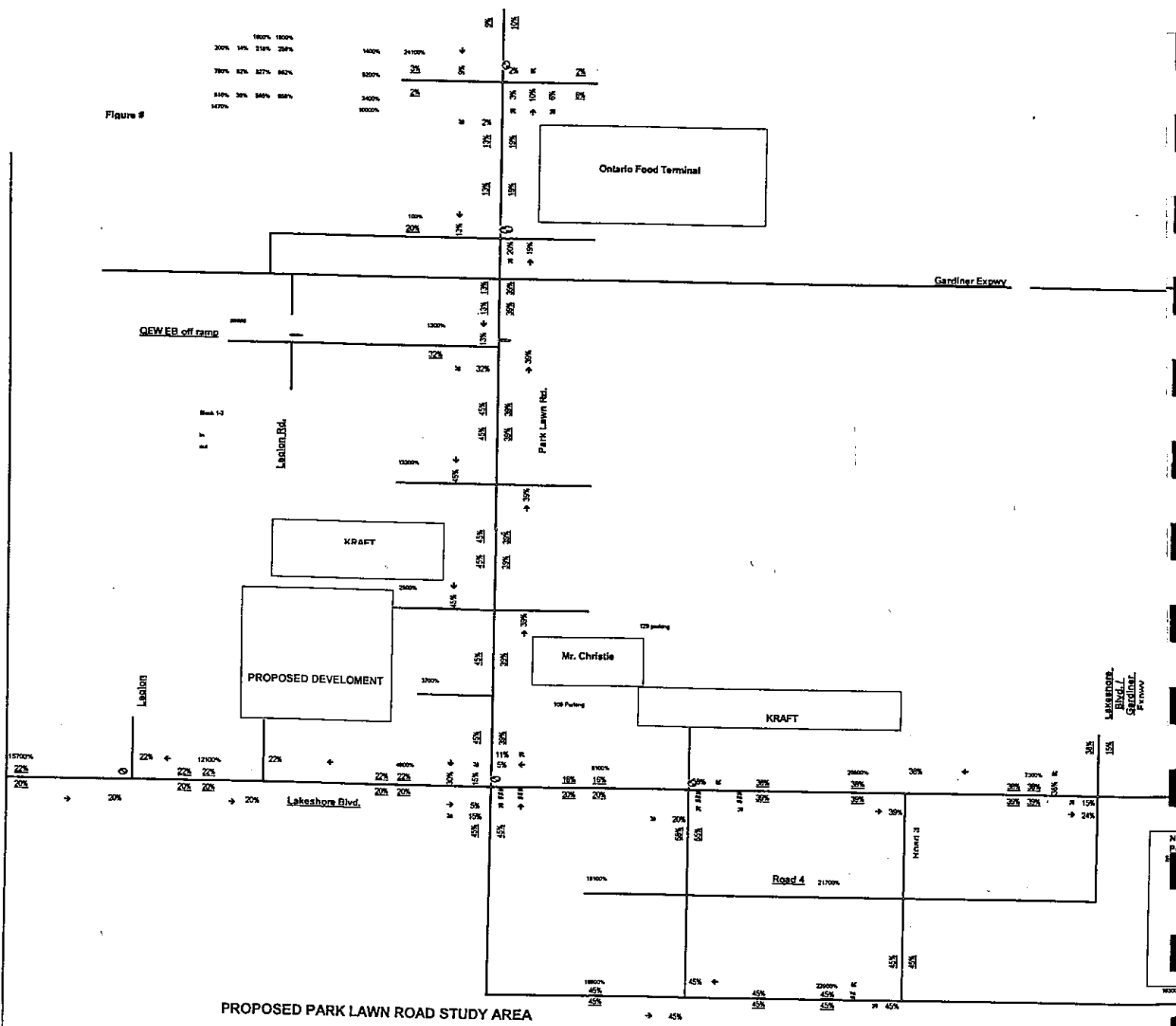
3654779%

3654779%

Column 12

3

Figure #



PROPOSED PARK LAWN ROAD STUDY AREA

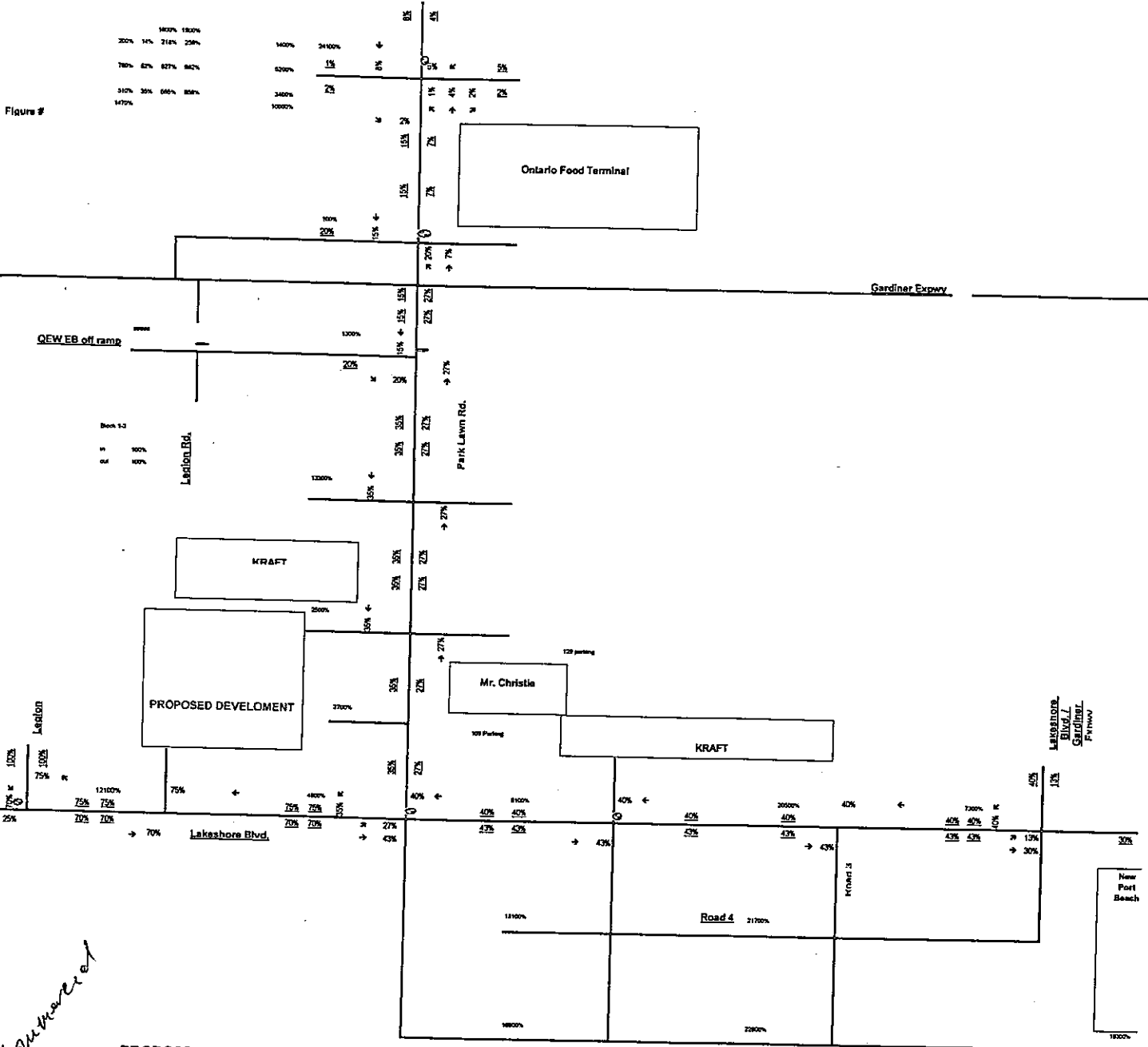
FIGURE  
BG SITE Trips - Residential Residential  
Weekday PM  
6/07



Marine Parade Drive



8



**PROPOSED PARK LAWN ROAD STUDY AREA**

FIGURE  
BG SITE Trips - FoghSail



Marine Parade Drive

FIGURE







8

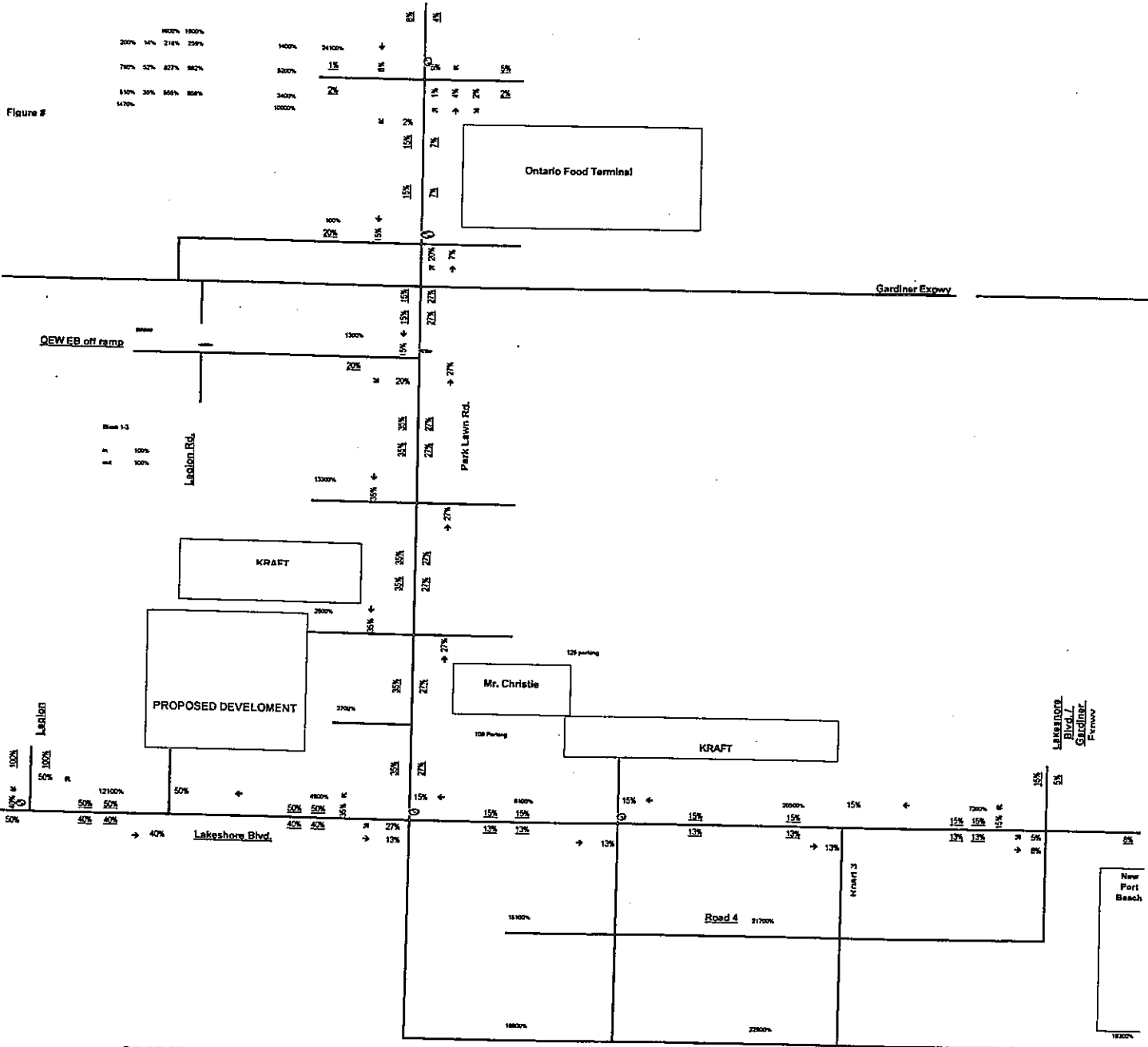


Figure #

PROPOSED PARK LAWN ROAD STUDY AREA

FIGURE  
BG SITE Trips - FeghSail  
Weekday AM

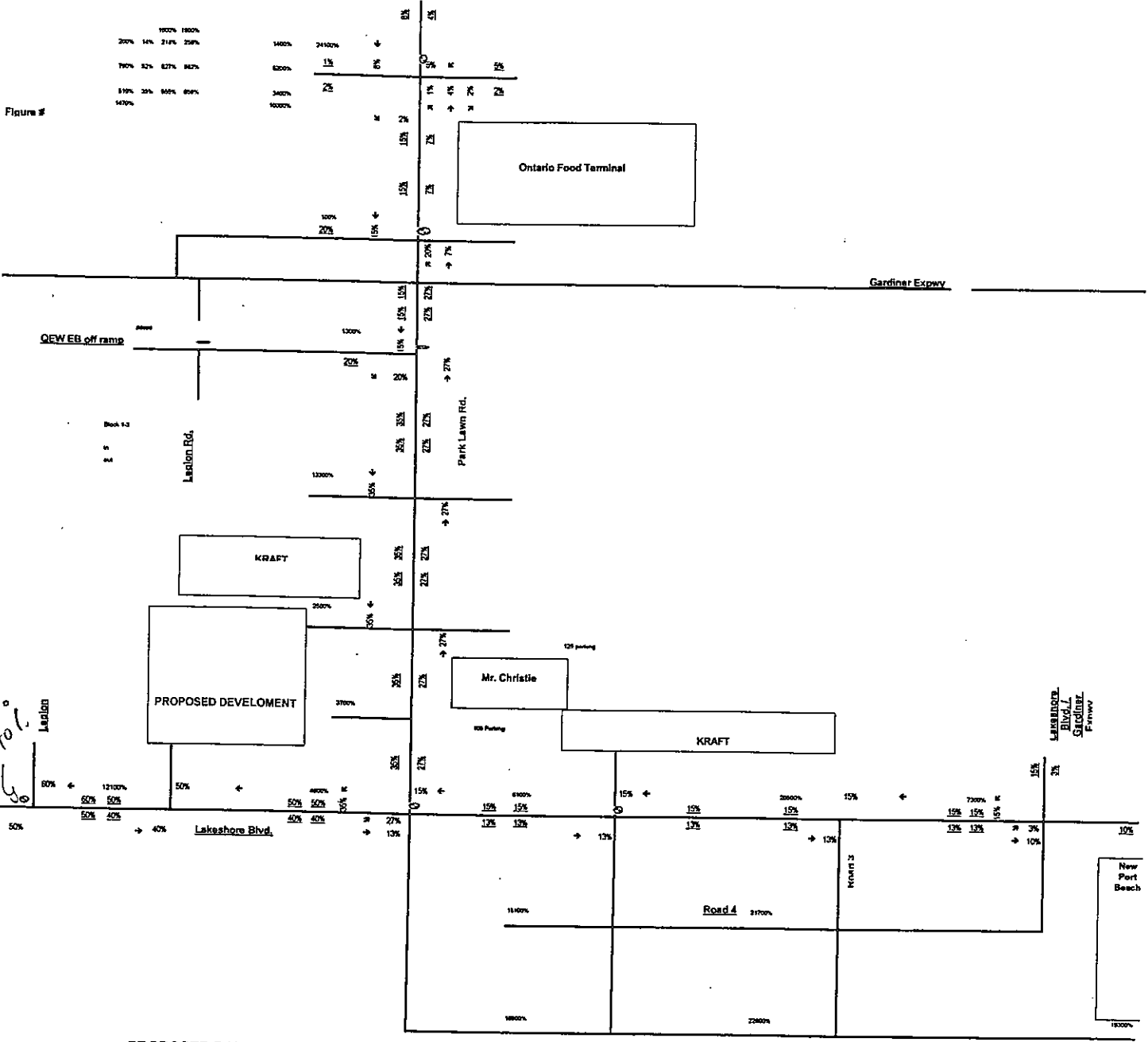


Marine Parade Drive





22



60%  
40%

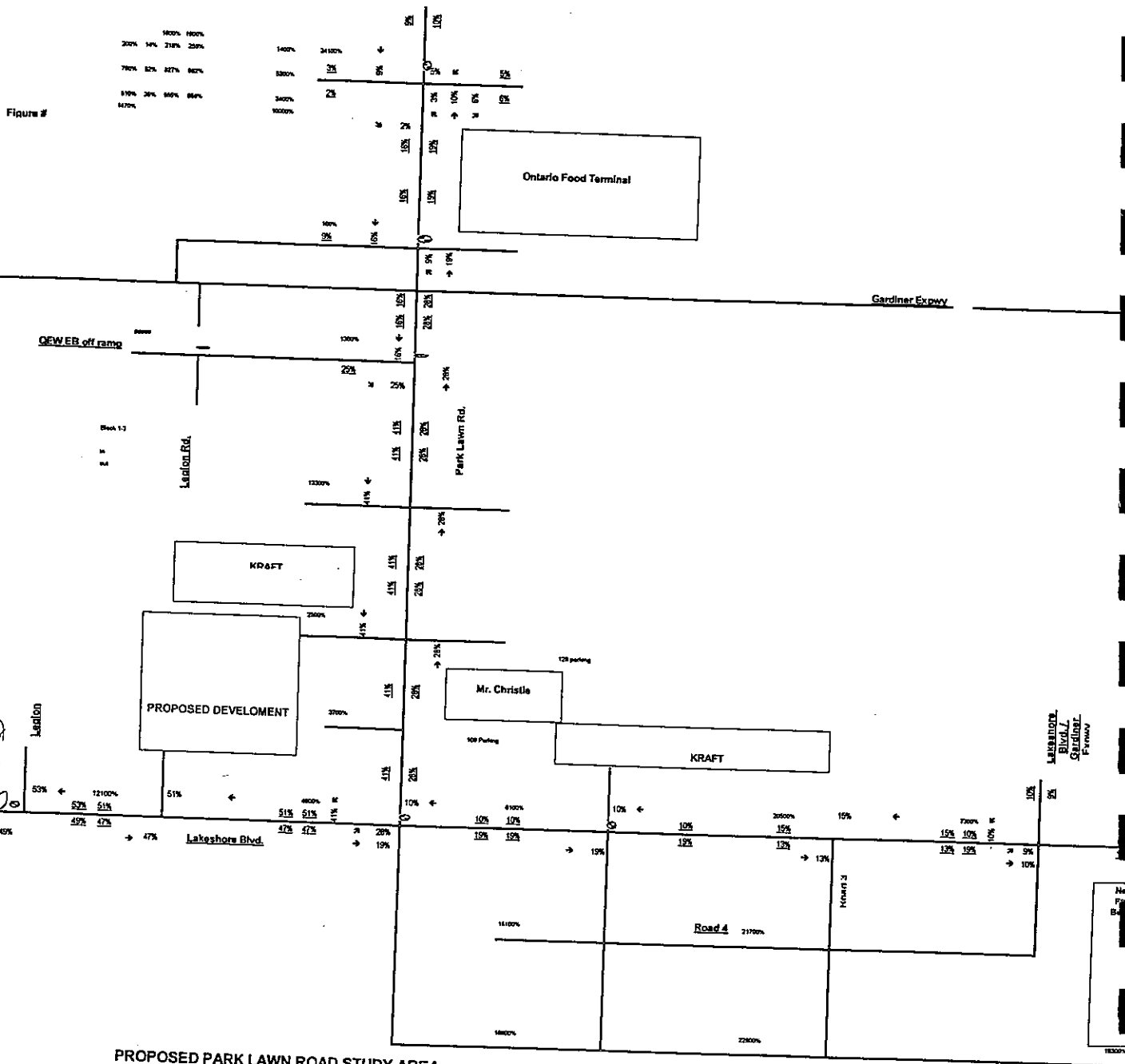
PROPOSED PARK LAWN ROAD STUDY AREA

FIGURE  
BG SITE Trips - 2230 Lakeshore Office  
Weekday AM



Marine Parade Drive





**PROPOSED PARK LAWN ROAD STUDY AREA**

FIGURE  
 BG SITE Trips - 2230 Lakeshore Office  
 Weekday PM



Marine Parade Drive



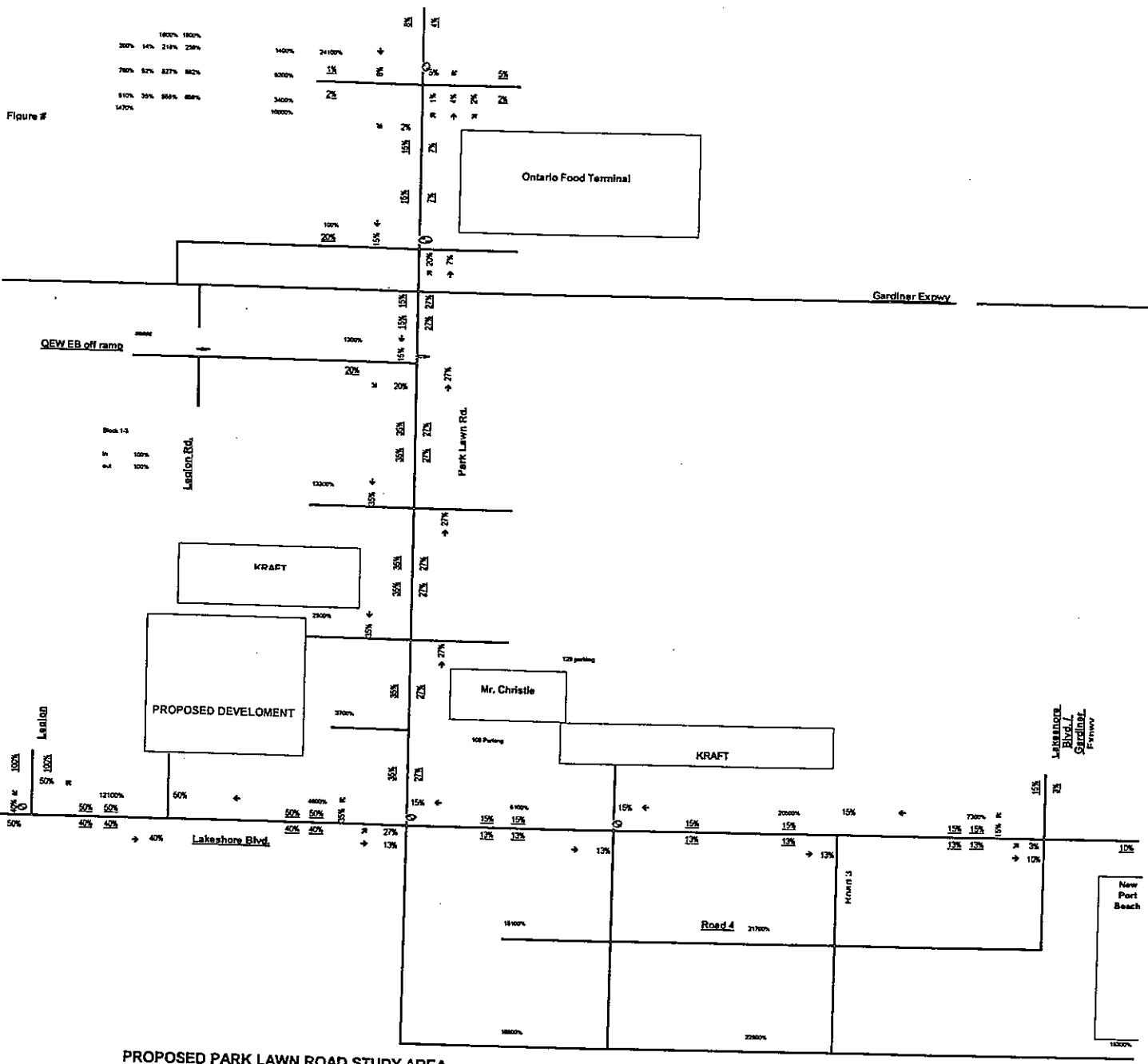


Figure #

PROPOSED PARK LAWN ROAD STUDY AREA

FIGURE  
BG SITE Trips - 2256 Lakeshore Office

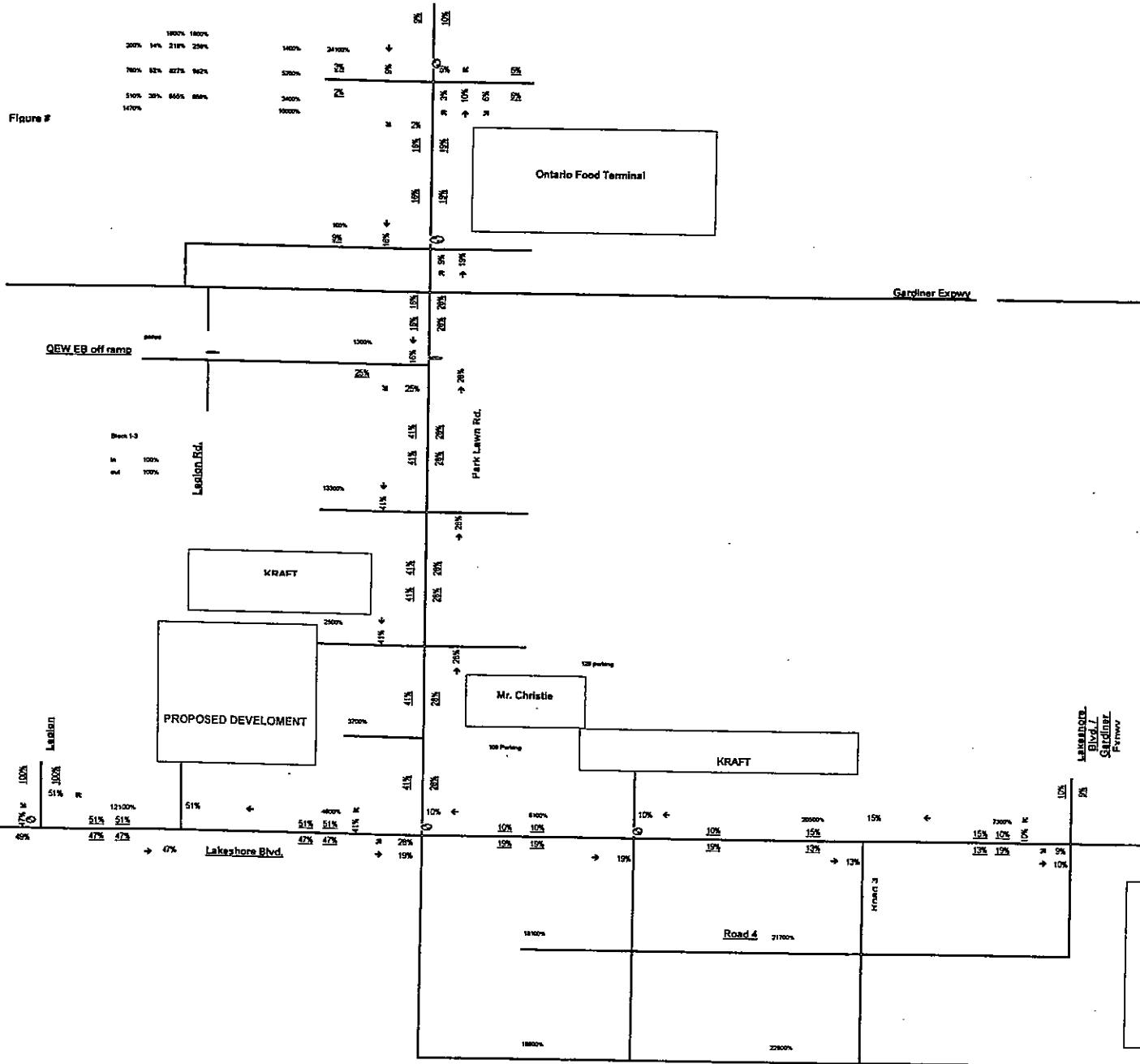


Marine Parade Drive

REV:

FOR: 11-2011 (Log 20000000 Management, Ltd. & 20000000 Limited) 2011/11/20





**PROPOSED PARK LAWN ROAD STUDY AREA**

FIGURE  
BG SITE Trips - 2256 Lakeshore Office



Marine Parade Drive

ENC

3054777P

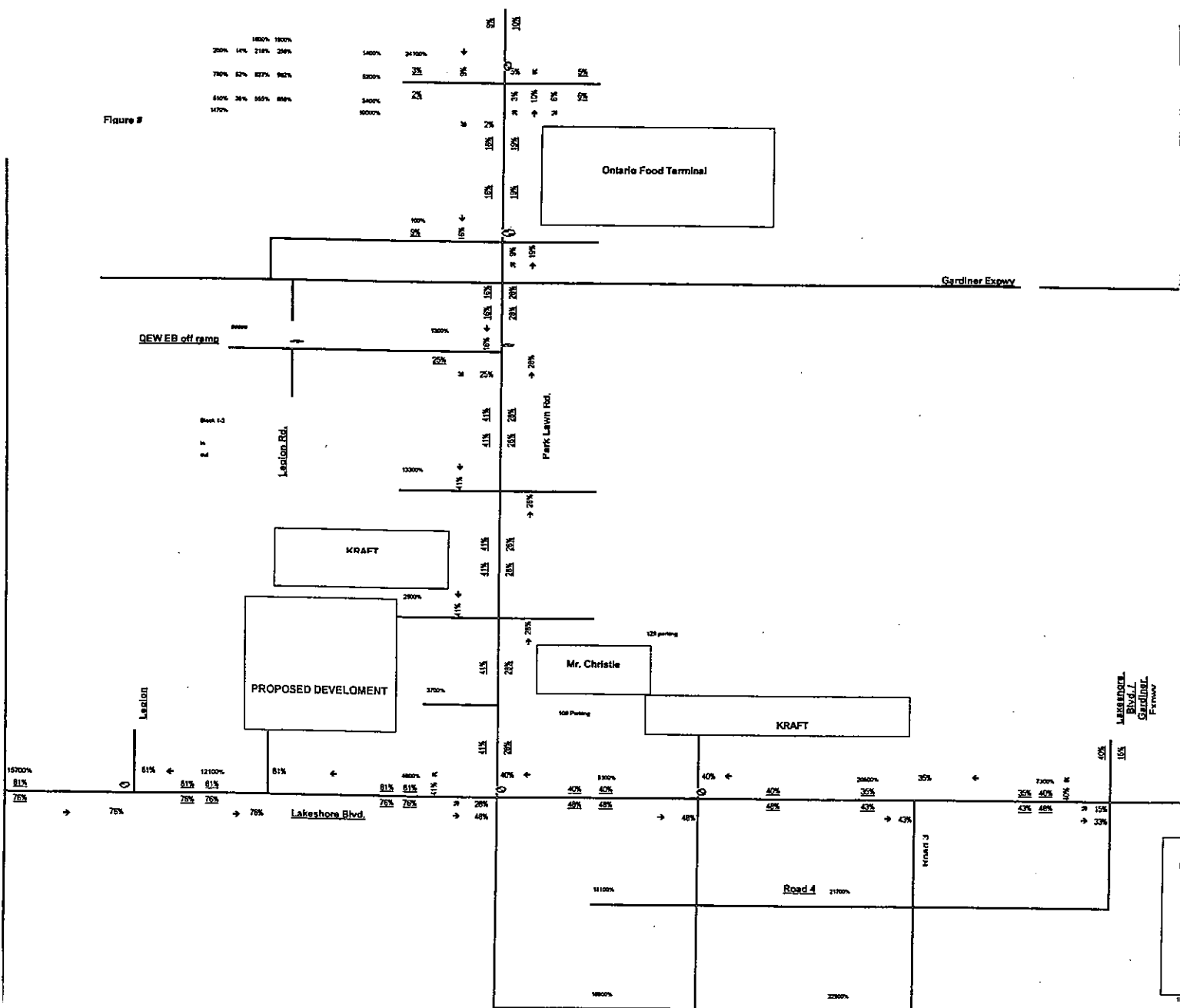
3054777P

3054777P





Figure #



PROPOSED PARK LAWN ROAD STUDY AREA

FIGURE  
BG SITE Trips - Polish Alliance



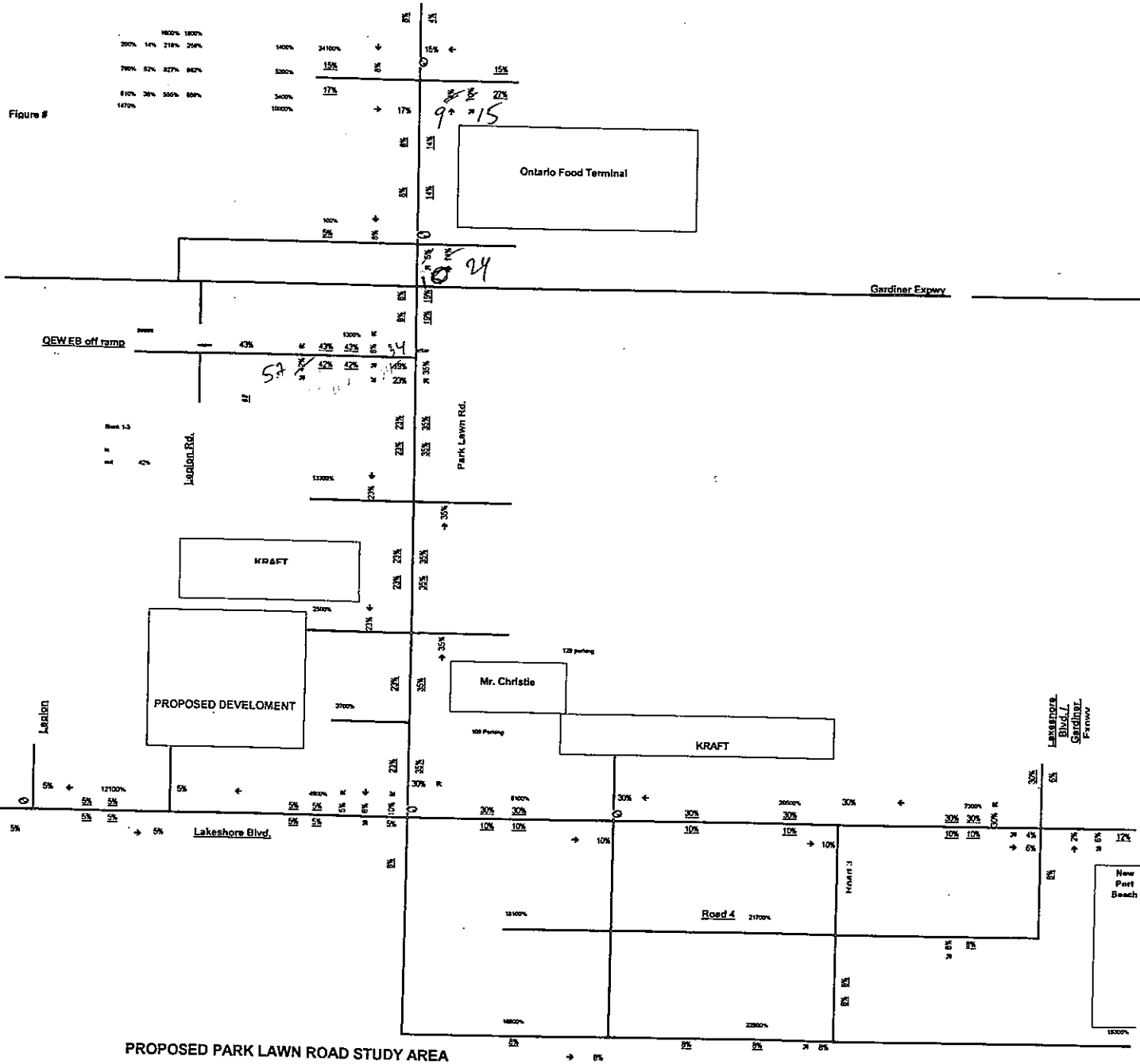
Marine Parade Drive





11, 13, 14, 15

Figure #



PROPOSED PARK LAWN ROAD STUDY AREA

FIGURE  
BG SITE Trips - Mystic Point, Grand Ave, Dalesford  
Weekday AM  
9947

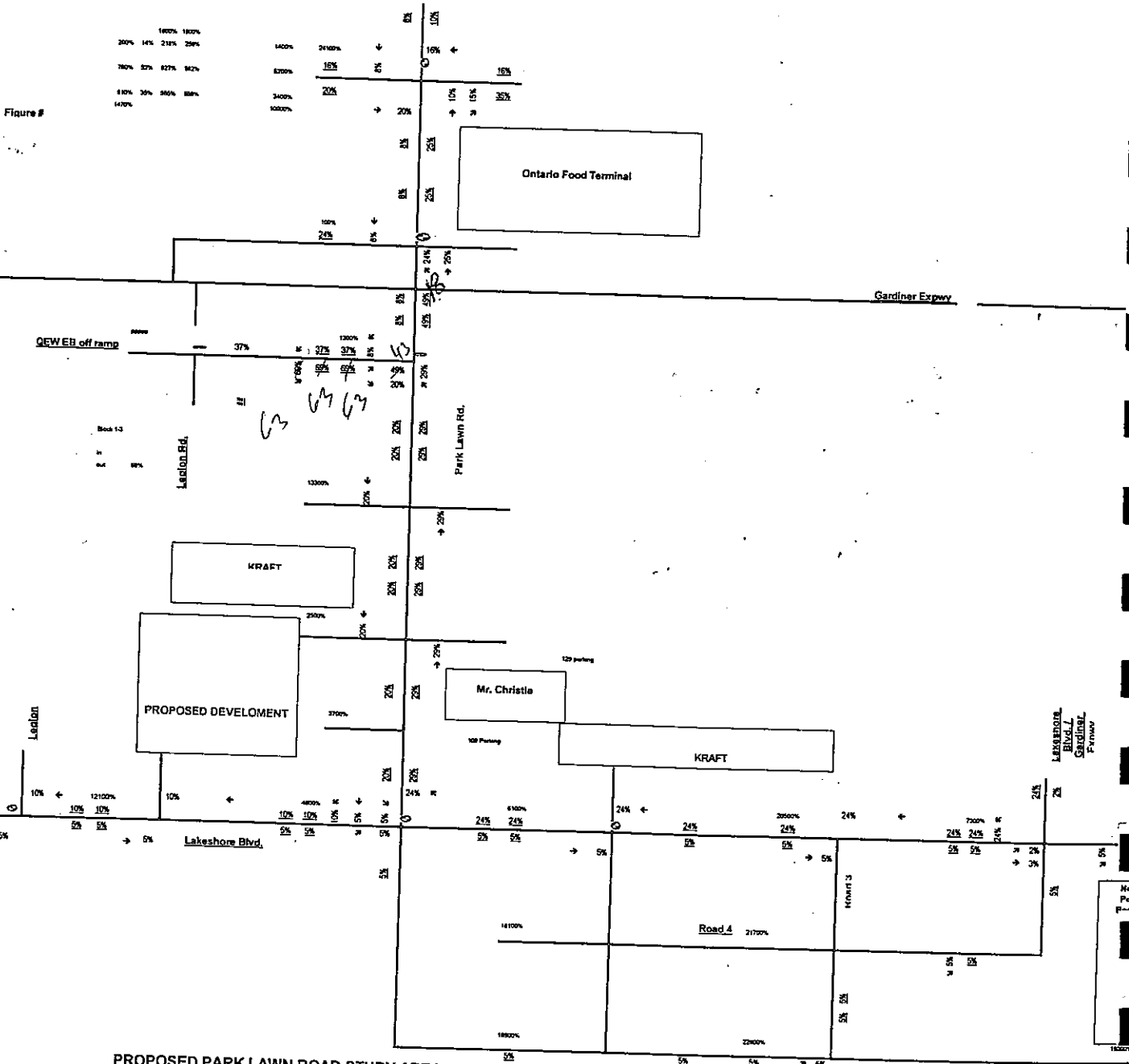


Marine Parade Drive



322822-14-01 (see www.mysticpoint.com for more information) 30567754

11, 13, 14, 15



PROPOSED PARK LAWN ROAD STUDY AREA

FIGURE  
BG SITE Trips - Mystic Point, Grand Ave, Dalesford  
Weekday PM

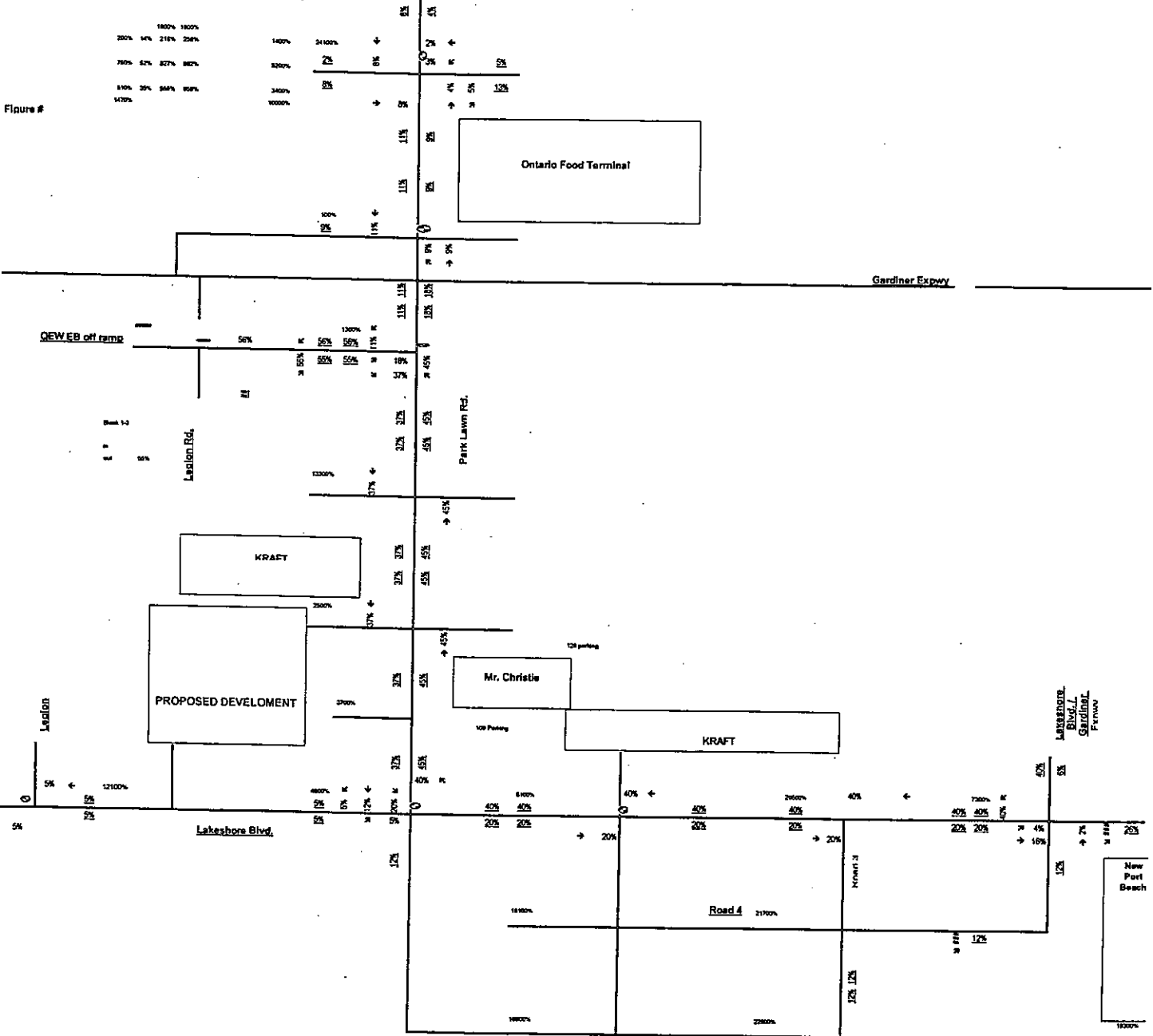


Marine Parade Drive



Figure #

1800%	1800%
250%	14%
216%	256%
760%	67%
827%	867%
810%	35%
848%	858%
1470%	



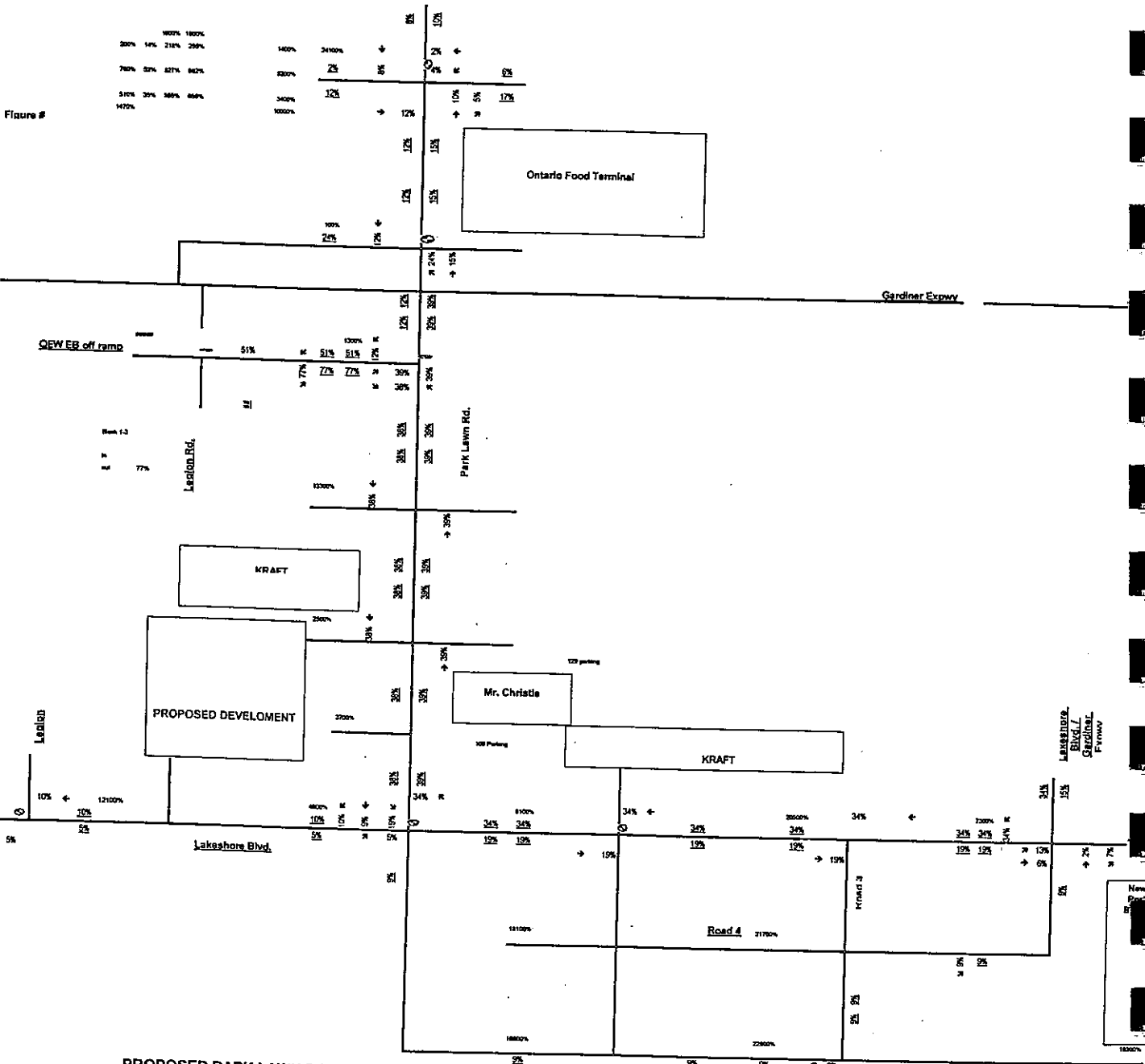
PROPOSED PARK LAWN ROAD STUDY AREA

FIGURE BG SITE Trips - Former Metro Lands



Marine Parade Drive





PROPOSED PARK LAWN ROAD STUDY AREA

FIGURE BG SITE Trips - Former Metro Lands

PAC

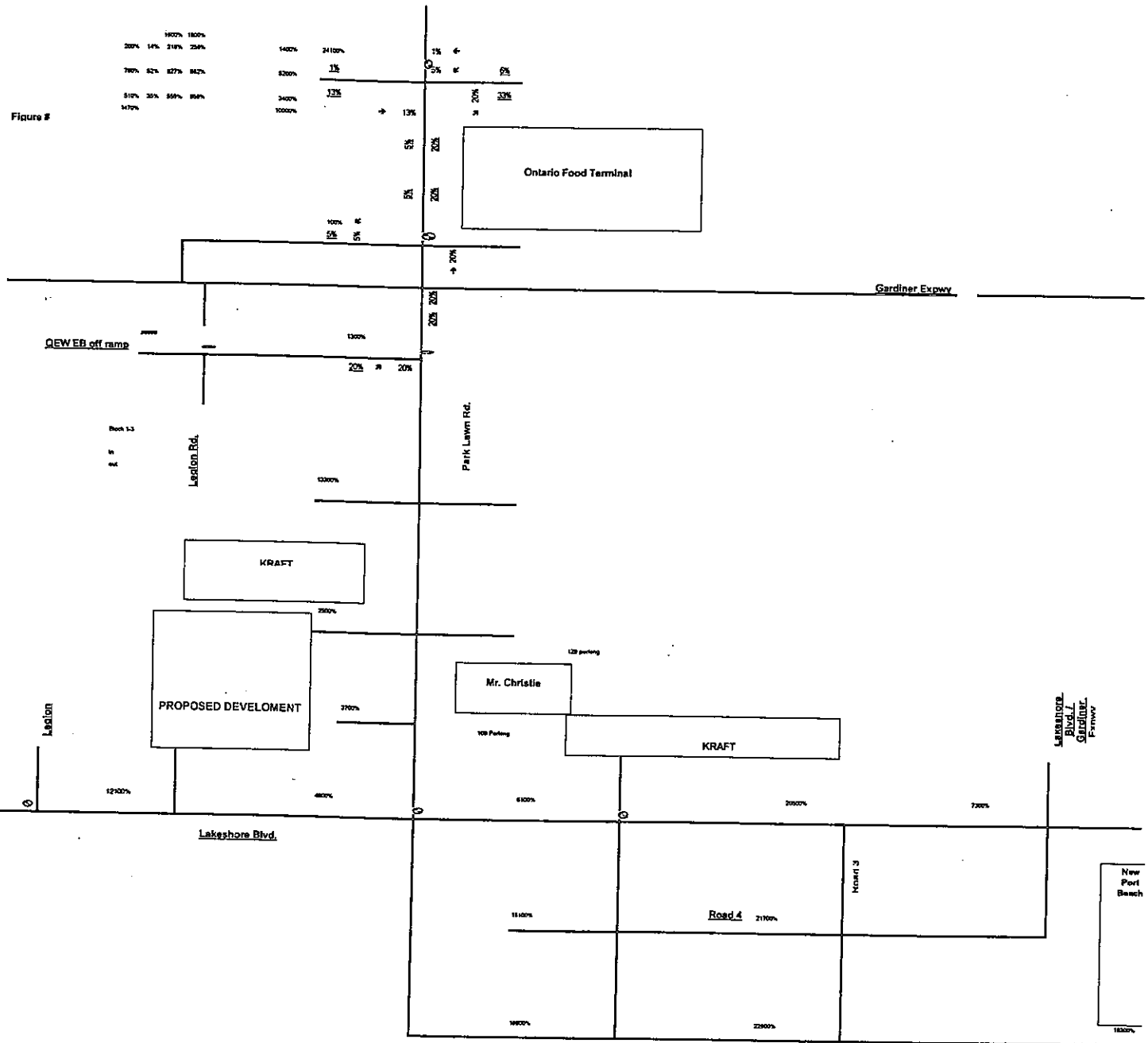
2012-04-11 12:01:12

306217%

C:\p\17



Figure #



PROPOSED PARK LAWN ROAD STUDY AREA

FIGURE  
BG SITE Trips - 125 The Queensway



Marine Parade Drive

ENR

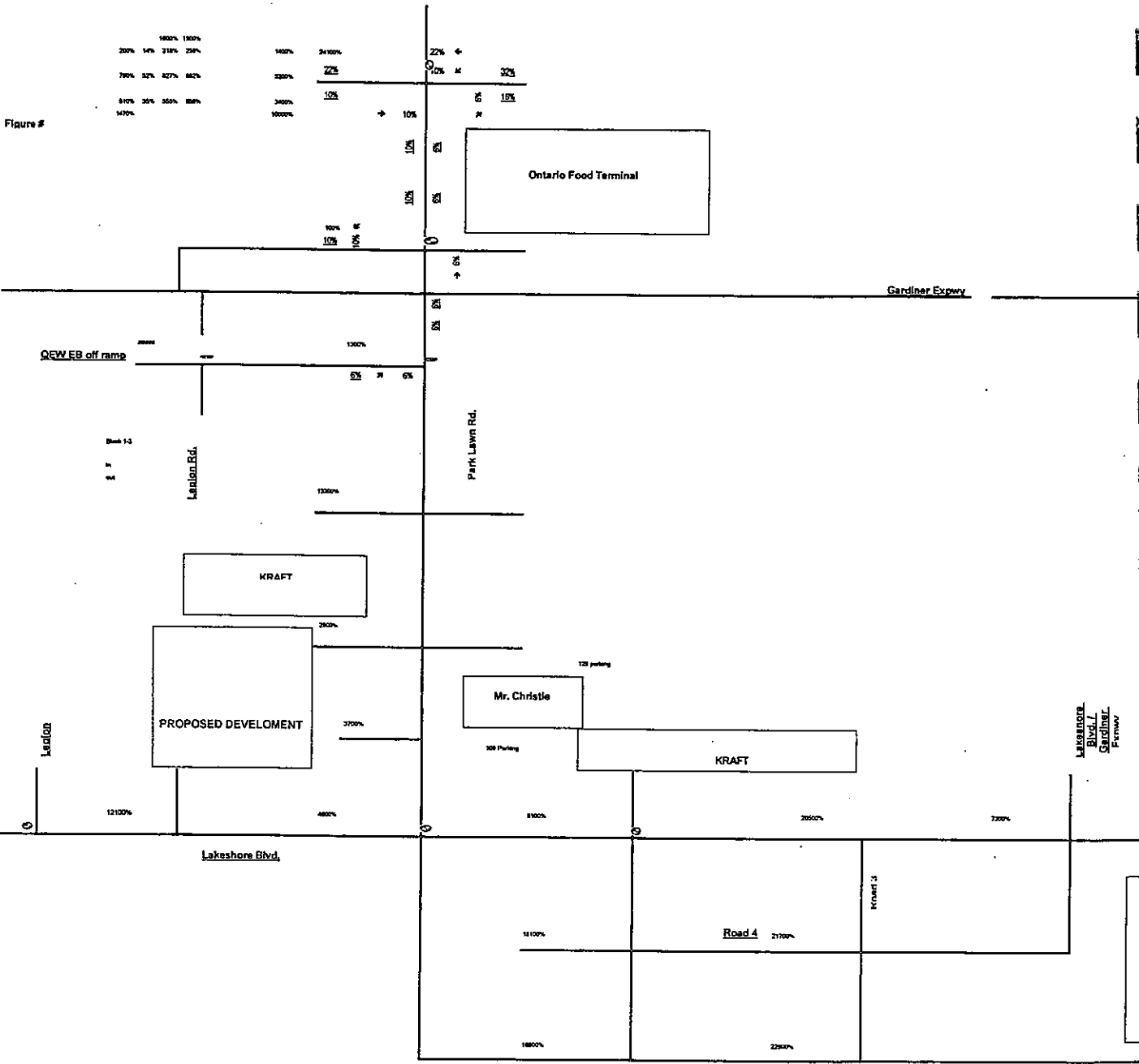
2018/08/14 09:14 AM 125 The Queensway - BG SITE Trips - 125 The Queensway - 125 The Queensway - 125 The Queensway

388277%



02/04/18

(16)



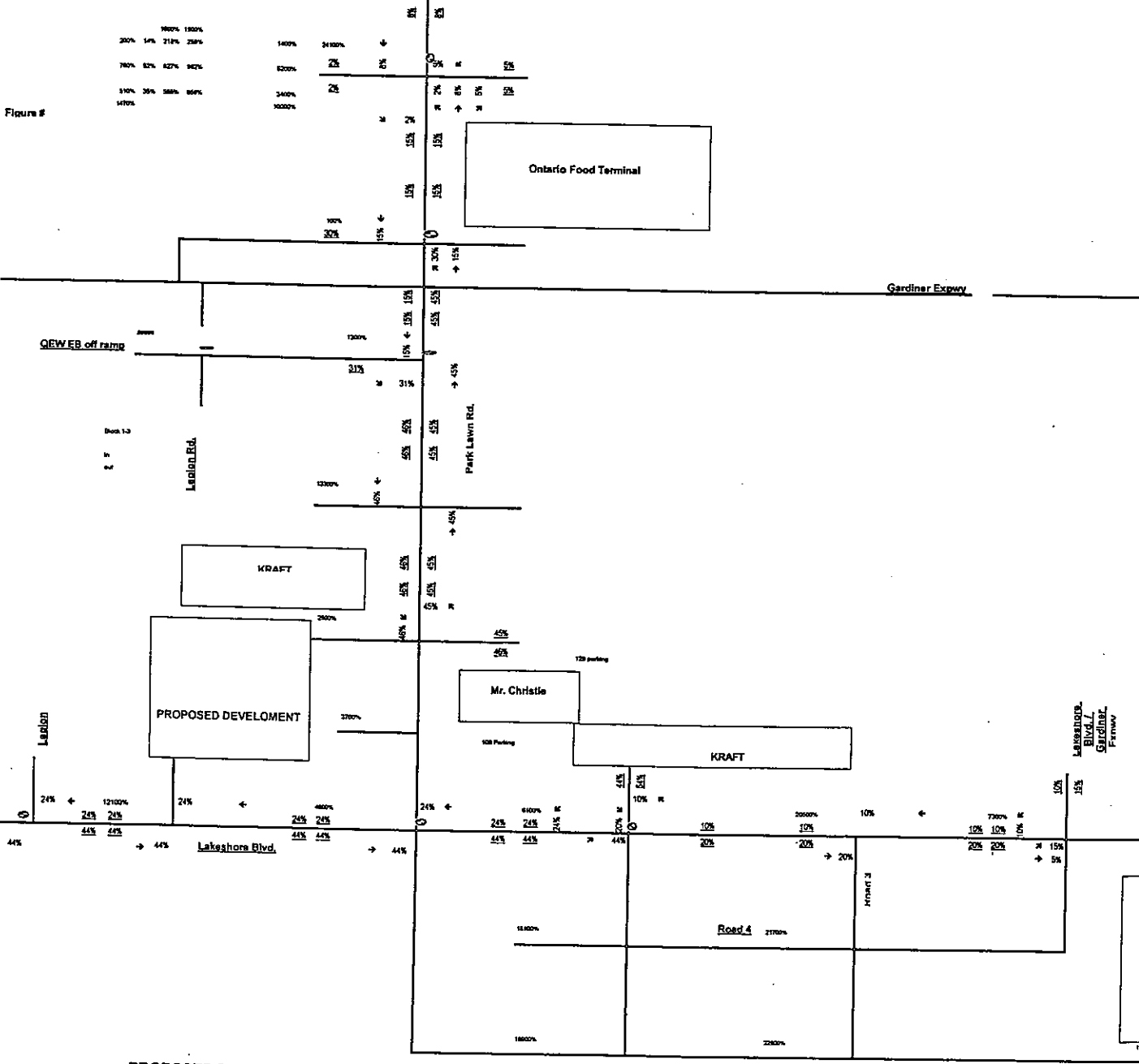
PROPOSED PARK LAWN ROAD STUDY AREA  
FIGURE  
BG SITE Trips - 125 The Queensway



Marine Parade Drive









### Annexon, 42-36 Park Lawn Road and 2200 Lakeshore Blvd W (Menkes)

Blocks 4.5, 5.7



The Observatory

E.A. Eganey WB Driveway



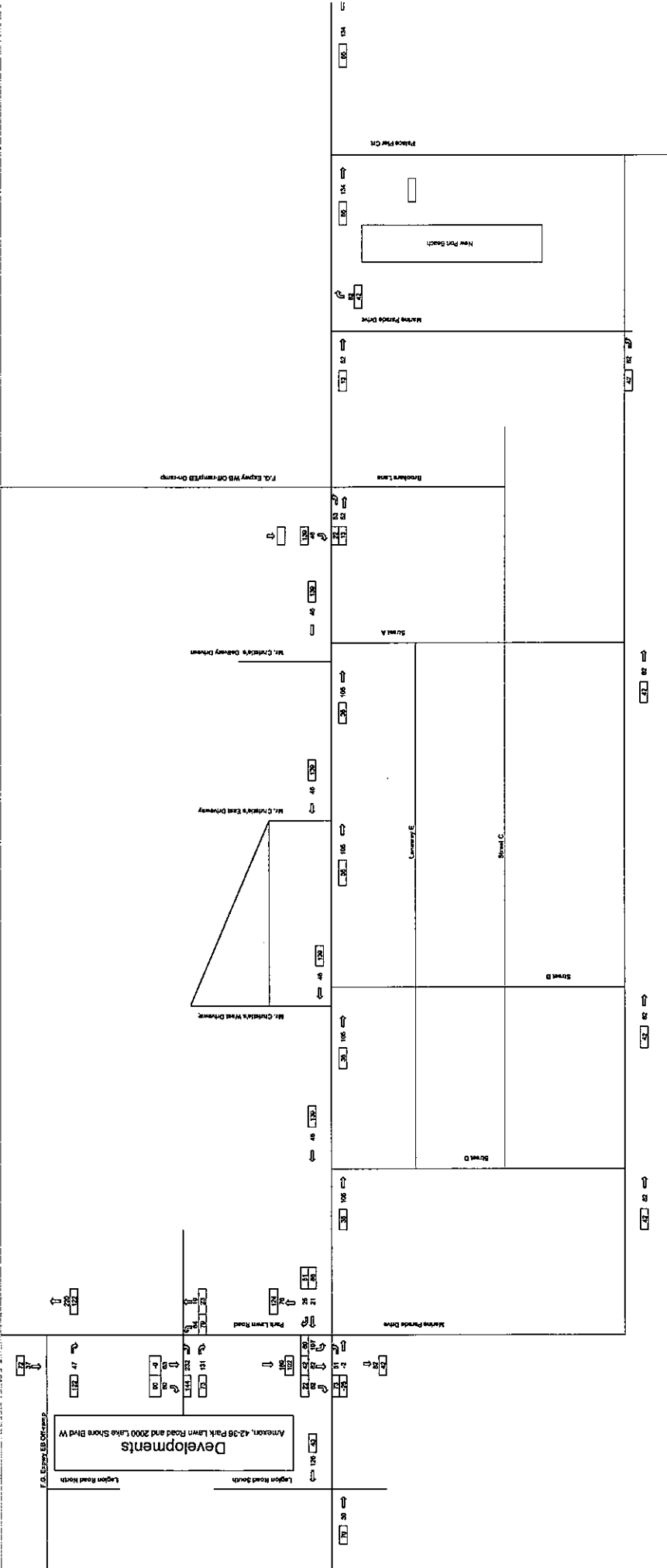
Food Terminal Driveway



### F.G. Expressway

### F.G. Expressway

### F.G. Expressway



Developments  
Annexon, 42-36 Park Lawn Road and 2000 Lakeshore Blvd W

Lakeshore Blvd W

Park Lawn Road

M. Chindler's West Driveway

M. Chindler's East Driveway

M. Chindler's Driveway Driveway

Brookers Lane

Marnie Prings Drive

New Run Road

# Appendix F

Intersection Capacity and  
Queuing Analysis, Future  
Background Total Traffic  
Interim Scenario

# Timings

## 3: Lake Shore Blvd W & Park Lawn Rd

2/20/2014

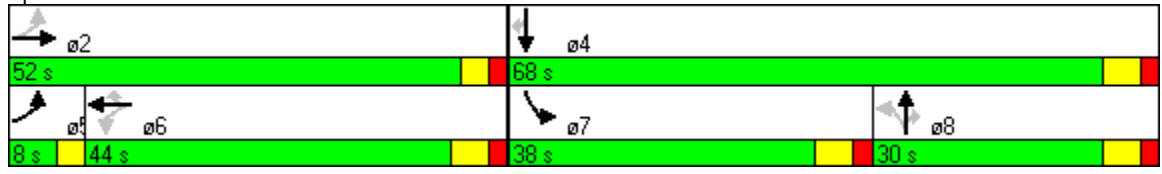


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔↔		↔↔	↔	↔	↑	↔	↔↔	↑	↔
Volume (vph)	424	1261	6	376	337	40	172	15	1087	46	528
Turn Type	pm+pt		Perm		Perm	Perm		Perm	Prot		Perm
Protected Phases	5	2		6			8		7	4	
Permitted Phases	2		6		6	8		8			4
Detector Phase	5	2	6	6	6	8	8	8	7	4	4
Switch Phase											
Minimum Initial (s)	4.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	8.0	28.0	28.0	28.0	28.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (s)	8.0	52.0	44.0	44.0	44.0	30.0	30.0	30.0	38.0	68.0	68.0
Total Split (%)	6.7%	43.3%	36.7%	36.7%	36.7%	25.0%	25.0%	25.0%	31.7%	56.7%	56.7%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?											
Recall Mode	None	C-Min	Min	Min	Min	Min	Min	Min	Min	Min	Min
Act Effct Green (s)		53.8		52.8	52.8	17.2	17.2	17.2	32.0	55.2	55.2
Actuated g/C Ratio		0.45		0.44	0.44	0.14	0.14	0.14	0.27	0.46	0.46
v/c Ratio		1.13dl		0.30	0.41	0.26	0.70	0.07	1.27	0.07	0.70
Control Delay		88.0		19.1	2.7	46.4	61.3	30.9	160.4	7.5	11.8
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay		88.0		19.1	2.7	46.4	61.3	30.9	160.4	7.5	12.1
LOS		F		B	A	D	E	C	F	A	B
Approach Delay		88.0		11.4			56.6			109.0	
Approach LOS		F		B			E			F	

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 35 (29%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.27  
 Intersection Signal Delay: 81.7  
 Intersection Capacity Utilization 104.2%  
 Analysis Period (min) 15  
 Intersection LOS: F  
 ICU Level of Service G  
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

### Splits and Phases: 3: Lake Shore Blvd W & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 3: Lake Shore Blvd W & Park Lawn Rd

2/20/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↕↔			↕↕	↕↕	↕↕	↕	↕↕	↕↕	↕	↕↕
Volume (vph)	424	1261	52	6	376	337	40	172	15	1087	46	528
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			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	1.00	1.00	1.00	0.97	1.00	1.00
Frbp, ped/bikes		1.00			1.00	0.98	1.00	1.00	0.99	1.00	1.00	0.90
Flpb, ped/bikes		1.00			1.00	1.00	0.92	1.00	1.00	1.00	1.00	1.00
Frt		1.00			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4936			3422	1544	1505	1827	1475	3400	1557	1380
Flt Permitted		0.74			0.91	1.00	0.73	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3700			3106	1544	1149	1827	1475	3400	1557	1380
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	451	1341	55	6	400	359	43	183	16	1156	49	562
RTOR Reduction (vph)	0	2	0	0	0	201	0	0	5	0	0	167
Lane Group Flow (vph)	0	1845	0	0	406	158	43	183	11	1156	49	395
Confl. Peds. (#/hr)	1		14	14		1	59					59
Confl. Bikes (#/hr)			14			3			1			10
Heavy Vehicles (%)	4%	3%	2%	33%	5%	3%	10%	4%	8%	3%	22%	5%
Bus Blockages (#/hr)	16	0	0	10	0	0	0	0	0	0	0	0
Turn Type	pm+pt			Perm		Perm	Perm		Perm	Prot		Perm
Protected Phases	5	2			6			8		7	4	
Permitted Phases	2			6		6	8		8			4
Actuated Green, G (s)		53.8			52.8	52.8	17.2	17.2	17.2	32.0	55.2	55.2
Effective Green, g (s)		53.8			52.8	52.8	17.2	17.2	17.2	32.0	55.2	55.2
Actuated g/C Ratio		0.45			0.44	0.44	0.14	0.14	0.14	0.27	0.46	0.46
Clearance Time (s)		5.0			6.0	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	3.0	3.0
Lane Grp Cap (vph)		1659			1367	679	165	262	211	907	716	635
v/s Ratio Prot								0.10		c0.34	0.03	
v/s Ratio Perm		c0.50			0.13	0.10	0.04		0.01			c0.29
v/c Ratio		1.13dl			0.30	0.23	0.26	0.70	0.05	1.27	0.07	0.62
Uniform Delay, d1		33.1			21.6	21.0	45.7	48.9	44.4	44.0	18.1	24.5
Progression Factor		0.95			0.82	0.51	0.97	0.98	0.96	0.74	0.44	0.77
Incremental Delay, d2		57.3			0.1	0.2	0.8	7.9	0.1	130.2	0.0	1.4
Delay (s)		88.6			17.8	10.8	45.1	55.6	42.6	162.7	8.0	20.2
Level of Service		F			B	B	D	E	D	F	A	C
Approach Delay (s)		88.6			14.5			52.9			113.1	
Approach LOS		F			B			D			F	

### Intersection Summary

HCM Average Control Delay	83.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	104.2%	ICU Level of Service	G
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

# Timings

## 5: The Queensway & Park Lawn Rd

2/20/2014



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↕	↖	↕	↗	↖	↕	↗	↖	↕
Volume (vph)	115	880	298	483	35	119	265	508	112	424
Turn Type	pm+pt		pm+pt		Perm	pm+pt		pm+ov	pm+pt	
Protected Phases	5	2	1	6		3	8	1	7	4
Permitted Phases	2		6		6	8	8	8	4	
Detector Phase	5	2	1	6	6	3	8	1	7	4
Switch Phase										
Minimum Initial (s)	7.0	10.0	7.0	10.0	10.0	7.0	10.0	7.0	7.0	10.0
Minimum Split (s)	11.0	30.0	12.0	30.0	30.0	10.0	29.0	12.0	11.0	32.0
Total Split (s)	11.0	50.0	28.0	67.0	67.0	10.0	31.0	28.0	11.0	32.0
Total Split (%)	9.2%	41.7%	23.3%	55.8%	55.8%	8.3%	25.8%	23.3%	9.2%	26.7%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	2.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	3.0	1.0	3.0	3.0	1.0	3.0	1.0	1.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	5.0	7.0	7.0	3.0	7.0	5.0	4.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?										
Recall Mode	Min	C-Min	Min	Min	Min	Min	Min	Min	Min	Min
Act Effect Green (s)	56.8	46.6	74.2	61.0	61.0	33.8	22.5	45.2	33.7	23.5
Actuated g/C Ratio	0.47	0.39	0.62	0.51	0.51	0.28	0.19	0.38	0.28	0.20
v/c Ratio	0.27	0.86	0.87	0.28	0.05	0.65	0.81	0.87	0.52	0.86
Control Delay	13.0	41.9	54.7	17.7	6.8	47.1	59.0	31.7	40.1	57.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	41.9	54.7	17.7	6.8	47.1	59.0	31.7	40.1	57.3
LOS	B	D	D	B	A	D	E	C	D	E
Approach Delay		39.2		30.8			41.9			54.5
Approach LOS		D		C			D			D

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 57 (48%), Referenced to phase 2:EBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 40.8

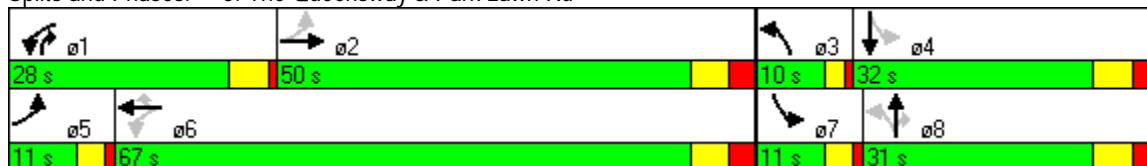
Intersection LOS: D

Intersection Capacity Utilization 90.1%

ICU Level of Service E

Analysis Period (min) 15

### Splits and Phases: 5: The Queensway & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 5: The Queensway & Park Lawn Rd

2/20/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗	↗	↖	↗	
Volume (vph)	115	880	206	298	483	35	119	265	508	112	424	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		5.0	7.0	7.0	3.0	7.0	5.0	4.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1685	3339		1687	3471	1289	1769	1810	1486	1736	3360	
Flt Permitted	0.47	1.00		0.08	1.00	1.00	0.20	1.00	1.00	0.30	1.00	
Satd. Flow (perm)	829	3339		149	3471	1289	371	1810	1486	543	3360	
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)	120	917	215	310	503	36	124	276	529	117	442	147
RTOR Reduction (vph)	0	16	0	0	0	14	0	0	47	0	27	0
Lane Group Flow (vph)	120	1116	0	310	503	22	124	276	482	117	562	0
Confl. Peds. (#/hr)	4		18	18		4	2					2
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	7%	5%	1%	7%	4%	23%	2%	5%	8%	4%	2%	6%
Turn Type	pm+pt			pm+pt		Perm	pm+pt		pm+ov		pm+pt	
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases	2			6		6	8	8	8	4		
Actuated Green, G (s)	53.8	46.6		72.2	61.0	61.0	29.8	22.5	43.1	30.8	23.5	
Effective Green, g (s)	53.8	46.6		72.2	61.0	61.0	29.8	22.5	43.1	30.8	23.5	
Actuated g/C Ratio	0.45	0.39		0.60	0.51	0.51	0.25	0.19	0.36	0.26	0.20	
Clearance Time (s)	4.0	7.0		5.0	7.0	7.0	3.0	7.0	5.0	4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	423	1297		354	1764	655	177	339	534	212	658	
v/s Ratio Prot	0.02	0.33		0.15	0.14		c0.04	0.15	c0.15	0.03	0.17	
v/s Ratio Perm	0.11			c0.38		0.02	0.13		0.17	0.11		
v/c Ratio	0.28	0.86		0.88	0.29	0.03	0.70	0.81	0.90	0.55	0.85	
Uniform Delay, d1	19.7	33.7		34.7	17.0	14.8	37.2	46.7	36.4	36.2	46.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.97	0.86	0.58	1.00	1.00	
Incremental Delay, d2	0.4	7.6		20.7	0.1	0.0	11.5	13.6	18.0	3.1	10.5	
Delay (s)	20.0	41.3		55.4	17.1	14.8	47.8	53.9	39.0	39.3	57.0	
Level of Service	C	D		E	B	B	D	D	D	D	E	
Approach Delay (s)		39.3			31.0			44.6			54.1	
Approach LOS		D			C			D			D	

### Intersection Summary

HCM Average Control Delay	41.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 8: Gardiner Exwy WB On-ramp & Park Lawn Rd

2/20/2014

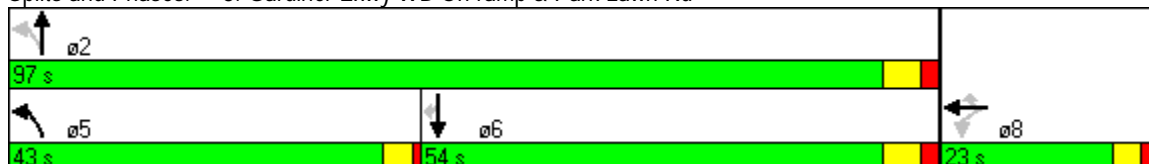


Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations	↕	↗	↖	↑↑	↑↑	↗
Volume (vph)	67	27	612	786	253	497
Turn Type		Perm	pm+pt			Perm
Protected Phases	8		5	2	6	
Permitted Phases		8	2			6
Detector Phase	8	8	5	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.0	23.0	10.0	23.0	23.0	23.0
Total Split (s)	23.0	23.0	43.0	97.0	54.0	54.0
Total Split (%)	19.2%	19.2%	35.8%	80.8%	45.0%	45.0%
Yellow Time (s)	3.0	3.0	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	6.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?						
Recall Mode	Min	Min	Max	C-Max	C-Min	C-Min
Act Effect Green (s)	12.7	12.7	98.3	96.3	48.0	48.0
Actuated g/C Ratio	0.11	0.11	0.82	0.80	0.40	0.40
v/c Ratio	0.59	0.18	0.58	0.31	0.19	0.64
Control Delay	67.8	18.4	4.9	2.0	15.5	5.2
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	67.8	18.4	5.0	2.0	15.5	5.2
LOS	E	B	A	A	B	A
Approach Delay	54.9			3.3	8.7	
Approach LOS	D			A	A	

### Intersection Summary

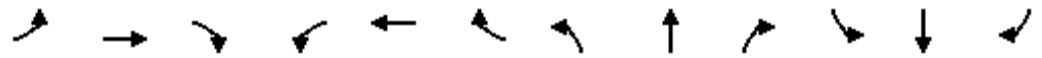
Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 20 (17%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.64  
 Intersection Signal Delay: 7.4  
 Intersection LOS: A  
 Intersection Capacity Utilization 81.7%  
 ICU Level of Service D  
 Analysis Period (min) 15

### Splits and Phases: 8: Gardiner Exwy WB On-ramp & Park Lawn Rd



HCM Signalized Intersection Capacity Analysis  
 8: Gardiner Exwy WB On-ramp & Park Lawn Rd

2/20/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↖	↑↑			↑↑	↗
Volume (vph)	0	0	0	8	67	27	612	786	0	0	253	497
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0	4.0	6.0			6.0	6.0
Lane Util. Factor					1.00	1.00	1.00	0.95			0.95	1.00
Frbp, ped/bikes					1.00	1.00	1.00	1.00			1.00	0.96
Flpb, ped/bikes					1.00	1.00	0.99	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					1268	1214	1759	3343			3438	1508
Flt Permitted					0.99	1.00	0.54	1.00			1.00	1.00
Satd. Flow (perm)					1268	1214	1003	3343			3438	1508
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	8	71	28	644	827	0	0	266	523
RTOR Reduction (vph)	0	0	0	0	0	25	0	0	0	0	0	218
Lane Group Flow (vph)	0	0	0	0	79	3	644	827	0	0	266	305
Confl. Peds. (#/hr)							5					5
Heavy Vehicles (%)	0%	0%	0%	50%	49%	33%	2%	8%	0%	0%	5%	3%
Turn Type				Perm		Perm	pm+pt					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Actuated Green, G (s)					12.7	12.7	96.3	96.3			48.0	48.0
Effective Green, g (s)					12.7	12.7	96.3	96.3			48.0	48.0
Actuated g/C Ratio					0.11	0.11	0.80	0.80			0.40	0.40
Clearance Time (s)					5.0	5.0	4.0	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)					134	128	1084	2683			1375	603
v/s Ratio Prot							c0.22	0.25			0.08	
v/s Ratio Perm					0.06	0.00	c0.26					0.20
v/c Ratio					0.59	0.02	0.59	0.31			0.19	0.51
Uniform Delay, d1					51.2	48.1	3.9	3.1			23.4	27.1
Progression Factor					1.00	1.00	0.82	0.49			0.65	0.37
Incremental Delay, d2					6.5	0.1	2.1	0.3			0.2	1.7
Delay (s)					57.7	48.2	5.3	1.8			15.4	11.6
Level of Service					E	D	A	A			B	B
Approach Delay (s)		0.0			55.2			3.3			12.9	
Approach LOS		A			E			A			B	

Intersection Summary			
HCM Average Control Delay	8.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



# Timings

## 10: Gardiner EB Off-ramp & Park Lawn Rd

2/20/2014



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations	↖↗	↖	↖	↑↑	↑↔
Volume (vph)	610	933	33	867	337
Turn Type		Free	Perm		
Protected Phases	4			2	6
Permitted Phases		Free	2		
Detector Phase	4		2	2	6
Switch Phase					
Minimum Initial (s)	19.0		4.0	4.0	4.0
Minimum Split (s)	30.0		30.0	30.0	30.0
Total Split (s)	53.0	0.0	67.0	67.0	67.0
Total Split (%)	44.2%	0.0%	55.8%	55.8%	55.8%
Yellow Time (s)	3.0		4.0	4.0	4.0
All-Red Time (s)	2.0		3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	7.0	7.0	7.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max		Max	Max	Max
Act Effect Green (s)	48.0	120.0	60.0	60.0	60.0
Actuated g/C Ratio	0.40	1.00	0.50	0.50	0.50
v/c Ratio	0.49	0.64	0.08	0.53	0.22
Control Delay	28.5	2.1	9.4	8.5	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	28.5	2.1	9.4	8.5	14.3
LOS	C	A	A	A	B
Approach Delay	12.5			8.5	14.3
Approach LOS	B			A	B

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 4:EBL, Start of Green, Master Intersection  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.64  
 Intersection Signal Delay: 11.5  
 Intersection LOS: B  
 Intersection Capacity Utilization 51.7%  
 ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 10: Gardiner EB Off-ramp & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 10: Gardiner EB Off-ramp & Park Lawn Rd

2/20/2014



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	610	933	33	867	337	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0	7.0	7.0	7.0	
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	
Frbp, ped/bikes	1.00	0.99	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3303	1545	1680	3505	3430	
Flt Permitted	0.95	1.00	0.52	1.00	1.00	
Satd. Flow (perm)	3303	1545	924	3505	3430	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	649	993	35	922	359	20
RTOR Reduction (vph)	0	0	0	0	4	0
Lane Group Flow (vph)	649	993	35	922	376	0
Confl. Peds. (#/hr)		2	7			7
Confl. Bikes (#/hr)		9				7
Heavy Vehicles (%)	6%	3%	6%	3%	4%	7%
Turn Type		Free	Perm			
Protected Phases	4			2	6	
Permitted Phases		Free	2			
Actuated Green, G (s)	48.0	120.0	60.0	60.0	60.0	
Effective Green, g (s)	48.0	120.0	60.0	60.0	60.0	
Actuated g/C Ratio	0.40	1.00	0.50	0.50	0.50	
Clearance Time (s)	5.0		7.0	7.0	7.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1321	1545	462	1753	1715	
v/s Ratio Prot	0.20			0.26	0.11	
v/s Ratio Perm		c0.64	0.04			
v/c Ratio	0.49	0.64	0.08	0.53	0.22	
Uniform Delay, d1	26.9	0.0	15.6	20.4	16.8	
Progression Factor	1.00	1.00	0.57	0.36	0.84	
Incremental Delay, d2	1.3	2.1	0.3	1.0	0.3	
Delay (s)	28.2	2.1	9.1	8.4	14.4	
Level of Service	C	A	A	A	B	
Approach Delay (s)	12.4			8.4	14.4	
Approach LOS	B			A	B	

### Intersection Summary

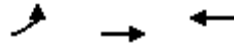
HCM Average Control Delay	11.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 12: Lake Shore Blvd W & Mr. Christie's East Driveway

2/20/2014

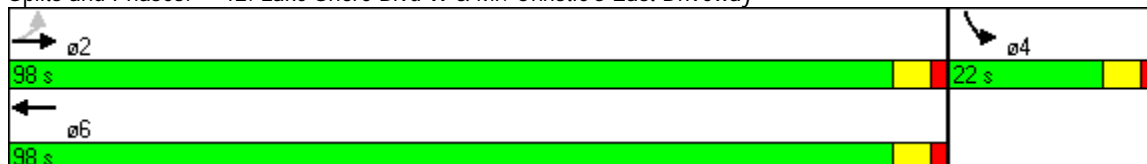


Lane Group	EBL	EBT	WBT	ø4
Lane Configurations		↕↕	↕↕	
Volume (vph)	13	2017	656	
Turn Type	Perm			
Protected Phases		2	6	4
Permitted Phases	2			
Detector Phase	2	2	6	
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0
Total Split (s)	98.0	98.0	98.0	22.0
Total Split (%)	81.7%	81.7%	81.7%	18%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)		120.0	120.0	
Actuated g/C Ratio		1.00	1.00	
v/c Ratio		0.67	0.21	
Control Delay		1.4	0.1	
Queue Delay		0.0	0.0	
Total Delay		1.4	0.1	
LOS		A	A	
Approach Delay		1.4	0.1	
Approach LOS		A	A	

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.67  
 Intersection Signal Delay: 1.1  
 Intersection Capacity Utilization 79.1%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service D

### Splits and Phases: 12: Lake Shore Blvd W & Mr. Christie's East Driveway



# HCM Signalized Intersection Capacity Analysis

## 12: Lake Shore Blvd W & Mr. Christie's East Driveway

2/20/2014

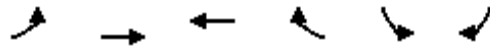


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔↗	↔↘		↔↗	
Volume (vph)	13	2017	656	3	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0			
Lane Util. Factor		0.95	0.95			
Frbp, ped/bikes		1.00	1.00			
Flpb, ped/bikes		1.00	1.00			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		3469	3470			
Flt Permitted		0.95	1.00			
Satd. Flow (perm)		3292	3470			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	2192	713	3	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	2206	716	0	0	0
Confl. Peds. (#/hr)						3
Heavy Vehicles (%)	8%	4%	4%	0%	0%	0%
Turn Type	Perm					
Protected Phases		2	6		4	
Permitted Phases	2					
Actuated Green, G (s)		120.0	120.0			
Effective Green, g (s)		120.0	120.0			
Actuated g/C Ratio		1.00	1.00			
Clearance Time (s)		6.0	6.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		3292	3470			
v/s Ratio Prot			0.21			
v/s Ratio Perm		c0.67				
v/c Ratio		0.67	0.21			
Uniform Delay, d1		0.0	0.0			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.1	0.1			
Delay (s)		0.1	0.1			
Level of Service		A	A			
Approach Delay (s)		0.1	0.1		0.0	
Approach LOS		A	A		A	
<b>Intersection Summary</b>						
HCM Average Control Delay			0.1		HCM Level of Service	A
HCM Volume to Capacity ratio			0.67			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	0.0
Intersection Capacity Utilization			79.1%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Unsignalized Intersection Capacity Analysis

## 14: Lake Shore Blvd W & Mr. Christie's West Driveway

2/20/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↔		↔↔	
Volume (veh/h)	54	2024	642	23	6	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	57	2153	683	24	6	19
Pedestrians			1			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.2			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)		237	103			
pX, platoon unblocked					0.68	
vC, conflicting volume	707				1888	354
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	707				1358	354
tC, single (s)	4.1				6.8	7.4
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.5
p0 queue free %	94				93	97
cM capacity (veh/h)	887				90	581
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	775	1435	455	252	26	
Volume Left	57	0	0	0	6	
Volume Right	0	0	0	24	19	
cSH	887	1700	1700	1700	246	
Volume to Capacity	0.06	0.84	0.27	0.15	0.10	
Queue Length 95th (m)	1.7	0.0	0.0	0.0	2.7	
Control Delay (s)	1.7	0.0	0.0	0.0	21.3	
Lane LOS	A				C	
Approach Delay (s)	0.6		0.0		21.3	
Approach LOS					C	
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			89.3%		ICU Level of Service	E
Analysis Period (min)			15			

# Timings

## 19: Gardiner EB Off-ramp &

2/20/2014



Lane Group	EBT	EBR	WBL	NBR
Lane Configurations	↑↑	↑	↘	↗
Volume (vph)	1291	25	49	300
Turn Type		Perm	Prot	Free
Protected Phases	4		3	
Permitted Phases		4		Free
Detector Phase	4	4	3	
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	
Minimum Split (s)	23.0	23.0	9.0	
Total Split (s)	75.0	75.0	15.0	0.0
Total Split (%)	83.3%	83.3%	16.7%	0.0%
Yellow Time (s)	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	
Recall Mode	None	None	None	
Act Effect Green (s)	29.3	29.3	8.1	33.8
Actuated g/C Ratio	0.87	0.87	0.20	1.00
v/c Ratio	0.47	0.02	0.15	0.20
Control Delay	3.3	1.4	18.3	0.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.3	1.4	18.3	0.3
LOS	A	A	B	A
Approach Delay	3.2			
Approach LOS	A			

### Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 33.8	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 3.1	Intersection LOS: A
Intersection Capacity Utilization 44.1%	ICU Level of Service A
Analysis Period (min) 15	

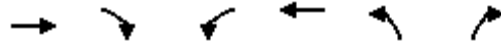
Splits and Phases: 19: Gardiner EB Off-ramp &



# HCM Signalized Intersection Capacity Analysis

## 19: Gardiner EB Off-ramp &

2/20/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↖			↗
Volume (vph)	1291	25	49	0	0	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.95	1.00	1.00			1.00
Frbp, ped/bikes	1.00	0.98	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			0.86
Flt Protected	1.00	1.00	0.95			1.00
Satd. Flow (prot)	3438	1517	1736			1596
Flt Permitted	1.00	1.00	0.95			1.00
Satd. Flow (perm)	3438	1517	1736			1596
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1403	27	53	0	0	326
RTOR Reduction (vph)	0	8	0	0	0	0
Lane Group Flow (vph)	1403	19	53	0	0	326
Confl. Peds. (#/hr)		4	4			
Heavy Vehicles (%)	5%	4%	4%	2%	2%	3%
Turn Type		Perm	Prot			Free
Protected Phases	4		3			
Permitted Phases		4				Free
Actuated Green, G (s)	24.2	24.2	2.1			36.3
Effective Green, g (s)	25.2	25.2	3.1			36.3
Actuated g/C Ratio	0.69	0.69	0.09			1.00
Clearance Time (s)	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	2387	1053	148			1596
v/s Ratio Prot	c0.41		0.03			
v/s Ratio Perm		0.01				c0.20
v/c Ratio	0.59	0.02	0.36			0.20
Uniform Delay, d1	2.9	1.7	15.7			0.0
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.4	0.0	1.5			0.3
Delay (s)	3.2	1.7	17.1			0.3
Level of Service	A	A	B			A
Approach Delay (s)	3.2			17.1	0.3	
Approach LOS	A			B	A	

### Intersection Summary

HCM Average Control Delay	3.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	36.3	Sum of lost time (s)	4.0
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

# Timings

## 21: Menkes- Kraft Driveway & Park Lawn Rd

2/20/2014

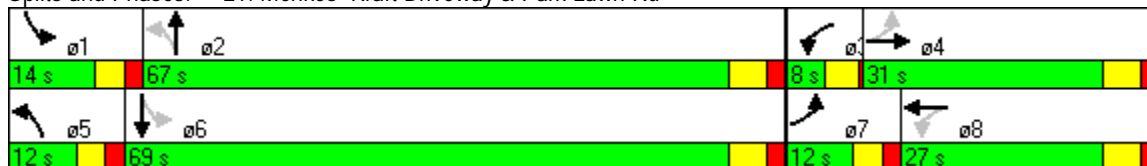


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	ø3
Lane Configurations	↖	↗	↔	↖	↗		↖↗	
Volume (vph)	9	0	0	17	916	77	1642	
Turn Type	pm+pt			pm+pt		pm+pt		
Protected Phases	7	4	8	5	2	1	6	3
Permitted Phases	4			2		6		
Detector Phase	7	4	8	5	2	1	6	
Switch Phase								
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	10.0	4.0
Minimum Split (s)	12.0	27.0	27.0	12.0	30.0	12.0	30.0	8.0
Total Split (s)	12.0	31.0	27.0	12.0	67.0	14.0	69.0	8.0
Total Split (%)	10.0%	25.8%	22.5%	10.0%	55.8%	11.7%	57.5%	7%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.0	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	5.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?								
Recall Mode	Min	Min	Min	Min	C-Min	Min	C-Min	None
Act Effect Green (s)	23.1	22.1	10.0	81.9	73.9		79.9	
Actuated g/C Ratio	0.19	0.18	0.08	0.68	0.62		0.67	
v/c Ratio	0.04	0.29	0.06	0.08	0.45		0.67	
Control Delay	39.9	15.6	0.3	6.3	17.4		10.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	
Total Delay	39.9	15.6	0.3	6.3	17.4		10.0	
LOS	D	B	A	A	B		A	
Approach Delay		17.8	0.3		17.2		10.0	
Approach LOS		B	A		B		A	

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 92 (77%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 85  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.67  
 Intersection Signal Delay: 12.6  
 Intersection LOS: B  
 Intersection Capacity Utilization 82.0%  
 ICU Level of Service E  
 Analysis Period (min) 15

### Splits and Phases: 21: Menkes- Kraft Driveway & Park Lawn Rd

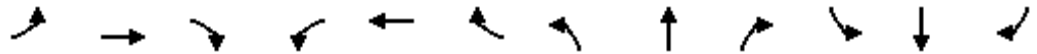




# HCM Signalized Intersection Capacity Analysis

## 21: Menkes- Kraft Driveway & Park Lawn Rd

2/20/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	0	96	0	0	21	17	916	0	77	1642	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0			6.0		5.0	6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95			0.91	
Frt	1.00	0.85			0.86		1.00	1.00			1.00	
Flt Protected	0.95	1.00			1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1583			1611		1770	3539			5072	
Flt Permitted	0.50	1.00			1.00		0.11	1.00			0.79	
Satd. Flow (perm)	923	1583			1611		196	3539			4031	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	10	0	102	0	0	22	18	974	0	82	1747	4
RTOR Reduction (vph)	0	65	0	0	20	0	0	0	0	0	0	0
Lane Group Flow (vph)	10	37	0	0	2	0	18	974	0	0	1833	0
Heavy Vehicles (%)	2%	0%	2%	0%	0%	2%	2%	2%	0%	2%	2%	2%
Turn Type	pm+pt		pm+pt			pm+pt			pm+pt			
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.1	22.1			10.0		80.9	73.9			80.9	
Effective Green, g (s)	22.1	22.1			10.0		80.9	73.9			80.9	
Actuated g/C Ratio	0.18	0.18			0.08		0.67	0.62			0.67	
Clearance Time (s)	5.0	6.0			6.0		5.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	220	292			134		224	2179			2778	
v/s Ratio Prot	0.00	c0.02			0.00		0.00	0.28			c0.04	
v/s Ratio Perm	0.01						0.05				c0.41	
v/c Ratio	0.05	0.13			0.01		0.08	0.45			0.66	
Uniform Delay, d1	40.3	40.9			50.5		6.6	12.2			11.5	
Progression Factor	1.00	1.00			1.00		1.21	1.37			0.81	
Incremental Delay, d2	0.1	0.2			0.0		0.1	0.4			0.5	
Delay (s)	40.4	41.1			50.5		8.1	17.2			9.8	
Level of Service	D	D			D		A	B			A	
Approach Delay (s)		41.0			50.5			17.0			9.8	
Approach LOS		D			D			B			A	

### Intersection Summary

HCM Average Control Delay	13.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 30: Lake Shore Blvd W & Legion Rd South

2/20/2014

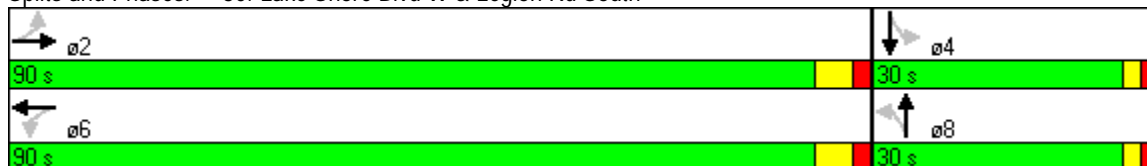


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕↕	↕↕		↕↕	↕	↕
Volume (vph)	107	1286	865	18	0	150	0
Turn Type	Perm			Perm		Perm	
Protected Phases		2	6		8		4
Permitted Phases	2			8		4	
Detector Phase	2	2	6	8	8	4	4
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.0	23.0	23.0	30.0	30.0	30.0	30.0
Total Split (s)	90.0	90.0	90.0	30.0	30.0	30.0	30.0
Total Split (%)	75.0%	75.0%	75.0%	25.0%	25.0%	25.0%	25.0%
Yellow Time (s)	4.0	4.0	4.0	2.0	2.0	2.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	C-Min	Min	Min	Min	Min
Act Effct Green (s)		88.8	88.8		21.2	21.2	21.2
Actuated g/C Ratio		0.74	0.74		0.18	0.18	0.18
v/c Ratio		0.82	0.43		0.30	0.80	0.12
Control Delay		16.5	5.9		15.1	75.1	0.5
Queue Delay		0.0	0.0		0.0	0.0	0.0
Total Delay		16.5	5.9		15.1	75.1	0.5
LOS		B	A		B	E	A
Approach Delay		16.5	5.9		15.1		57.1
Approach LOS		B	A		B		E

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 15 (13%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.82  
 Intersection Signal Delay: 15.6  
 Intersection LOS: B  
 Intersection Capacity Utilization 95.8%  
 ICU Level of Service F  
 Analysis Period (min) 15

### Splits and Phases: 30: Lake Shore Blvd W & Legion Rd South



HCM Signalized Intersection Capacity Analysis  
 30: Lake Shore Blvd W & Legion Rd South

2/20/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕		↕	↕	
Volume (vph)	107	1286	1	0	865	121	18	0	80	150	0	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95			1.00		1.00	1.00	
Frbp, ped/bikes		1.00			0.99			0.98		1.00	0.98	
Flpb, ped/bikes		1.00			1.00			1.00		0.99	1.00	
Frt		1.00			0.98			0.89		1.00	0.85	
Flt Protected		1.00			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		3498			3320			1621		1784	1576	
Flt Permitted		0.70			1.00			0.95		0.60	1.00	
Satd. Flow (perm)		2443			3320			1553		1124	1576	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	114	1368	1	0	920	129	19	0	85	160	0	51
RTOR Reduction (vph)	0	0	0	0	8	0	0	67	0	0	42	0
Lane Group Flow (vph)	0	1483	0	0	1041	0	0	37	0	160	9	0
Confl. Peds. (#/hr)	7					7	8		10	10		8
Heavy Vehicles (%)	0%	3%	0%	0%	7%	0%	0%	0%	1%	0%	0%	0%
Bus Blockages (#/hr)	16	0	0	10	0	0	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		88.8			88.8			21.2		21.2	21.2	
Effective Green, g (s)		88.8			88.8			21.2		21.2	21.2	
Actuated g/C Ratio		0.74			0.74			0.18		0.18	0.18	
Clearance Time (s)		6.0			6.0			4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		1808			2457			274		199	278	
v/s Ratio Prot					0.31						0.01	
v/s Ratio Perm		c0.61						0.02		c0.14		
v/c Ratio		0.82			0.42			0.14		0.80	0.03	
Uniform Delay, d1		10.3			5.9			41.7		47.4	40.9	
Progression Factor		1.00			0.86			1.00		1.00	1.00	
Incremental Delay, d2		4.3			0.5			0.2		20.5	0.0	
Delay (s)		14.6			5.5			41.9		67.9	41.0	
Level of Service		B			A			D		E	D	
Approach Delay (s)		14.6			5.5			41.9			61.4	
Approach LOS		B			A			D			E	

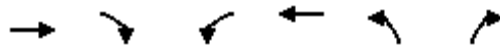
Intersection Summary		
HCM Average Control Delay	15.7	HCM Level of Service B
HCM Volume to Capacity ratio	0.82	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 10.0
Intersection Capacity Utilization	95.8%	ICU Level of Service F
Analysis Period (min)	15	

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 32: Lake Shore Blvd W & Street B

2/20/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	↗
Volume (veh/h)	2030	0	3	663	2	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	2160	0	3	705	2	1
Pedestrians				1	27	
Lane Width (m)				3.6	3.6	
Walking Speed (m/s)				1.2	1.2	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	264			76		
pX, platoon unblocked				0.68	0.68	0.68
vC, conflicting volume	2187			2546	1108	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1811			2336	235	
tC, single (s)	4.1			6.8	6.9	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	99			90	100	
cM capacity (veh/h)	230			21	517	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	1440	720	238	470	2	1
Volume Left	0	0	3	0	2	0
Volume Right	0	0	0	0	0	1
cSH	1700	1700	230	1700	21	517
Volume to Capacity	0.85	0.42	0.01	0.28	0.10	0.00
Queue Length 95th (m)	0.0	0.0	0.3	0.0	2.4	0.0
Control Delay (s)	0.0	0.0	0.6	0.0	196.6	12.0
Lane LOS	A			F	B	
Approach Delay (s)	0.0		0.2	135.0		
Approach LOS	F					

### Intersection Summary

Average Delay	0.2					
Intersection Capacity Utilization	66.4%		ICU Level of Service		C	
Analysis Period (min)	15					

Timings

34: Lake Shore Blvd. W & Gardiner Expwy Off/On-Ramp

2/20/2014

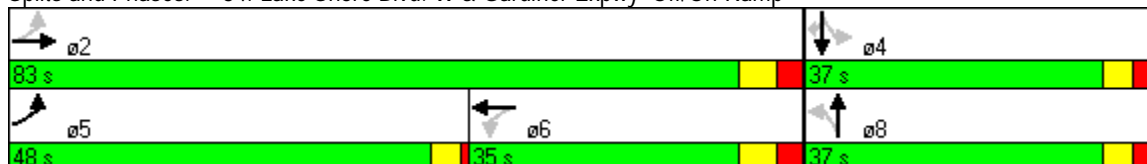


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖	↕	↗	↖	↕		↖	↗
Volume (vph)	599	1405	91	149	34	48	22	409
Turn Type	pm+pt			Perm		Perm		Perm
Protected Phases	5	2	6		8		4	
Permitted Phases	2			8		4		4
Detector Phase	5	2	6	8	8	4	4	4
Switch Phase								
Minimum Initial (s)	6.0	24.0	24.0	13.0	13.0	13.0	13.0	13.0
Minimum Split (s)	10.0	31.0	31.0	27.0	27.0	27.0	27.0	27.0
Total Split (s)	48.0	83.0	35.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	40.0%	69.2%	29.2%	30.8%	30.8%	30.8%	30.8%	30.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag					
Lead-Lag Optimize?								
Recall Mode	Min	C-Min	C-Min	Min	Min	Min	Min	Min
Act Effct Green (s)	90.2	87.2	56.9	19.8	19.8		19.8	19.8
Actuated g/C Ratio	0.75	0.73	0.47	0.16	0.16		0.16	0.16
v/c Ratio	0.68	0.61	0.17	0.72	0.20		0.39	0.70
Control Delay	5.9	5.4	15.5	64.9	26.8		48.8	10.4
Queue Delay	0.2	0.5	0.0	0.0	0.0		0.0	0.0
Total Delay	6.1	5.9	15.5	64.9	26.8		48.8	10.4
LOS	A	A	B	E	C		D	B
Approach Delay		6.0	15.5		49.0		16.0	
Approach LOS		A	B		D		B	

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 7 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 11.9  
 Intersection Capacity Utilization 91.3%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service F

Splits and Phases: 34: Lake Shore Blvd. W & Gardiner Expwy Off/On-Ramp



HCM Signalized Intersection Capacity Analysis  
 34: Lake Shore Blvd. W & Gardiner Expwy Off/On-Ramp

2/20/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗			↖	↗
Volume (vph)	599	1405	25	0	91	39	149	34	72	48	22	409
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0			7.0		6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	0.95			1.00		1.00	0.95			1.00	1.00
Frbp, ped/bikes	1.00	1.00			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	1.00
Frt	1.00	1.00			0.95		1.00	0.90			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1656	3460			1718		1805	3244			1597	1568
Flt Permitted	0.62	1.00			1.00		0.71	1.00			0.72	1.00
Satd. Flow (perm)	1088	3460			1718		1344	3244			1193	1568
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)	644	1511	27	0	98	42	160	37	77	52	24	440
RTOR Reduction (vph)	0	1	0	0	9	0	0	34	0	0	0	367
Lane Group Flow (vph)	644	1537	0	0	131	0	160	80	0	0	76	73
Confl. Peds. (#/hr)			18	18								
Heavy Vehicles (%)	2%	4%	0%	0%	8%	0%	0%	0%	0%	22%	0%	3%
Bus Blockages (#/hr)	16	0	0	10	0	0	0	0	0	0	0	0
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	87.2	87.2			56.9		19.8	19.8			19.8	19.8
Effective Green, g (s)	87.2	87.2			56.9		19.8	19.8			19.8	19.8
Actuated g/C Ratio	0.73	0.73			0.47		0.17	0.17			0.17	0.17
Clearance Time (s)	4.0	7.0			7.0		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)	915	2514			815		222	535			197	259
v/s Ratio Prot	c0.15	0.44			0.08			0.02				
v/s Ratio Perm	c0.36						c0.12				0.06	0.05
v/c Ratio	0.70	0.61			0.16		0.72	0.15			0.39	0.28
Uniform Delay, d1	7.5	8.1			18.0		47.5	42.9			44.7	43.9
Progression Factor	0.41	0.51			0.73		1.00	1.00			1.00	1.00
Incremental Delay, d2	1.8	0.8			0.4		10.9	0.1			1.3	0.6
Delay (s)	4.9	4.9			13.5		58.4	43.0			45.9	44.5
Level of Service	A	A			B		E	D			D	D
Approach Delay (s)		4.9			13.5			52.0			44.7	
Approach LOS		A			B			D			D	

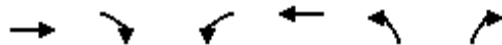
Intersection Summary		
HCM Average Control Delay	16.1	HCM Level of Service B
HCM Volume to Capacity ratio	0.68	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 10.0
Intersection Capacity Utilization	91.3%	ICU Level of Service F
Analysis Period (min)	15	

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 37: Lake Shore Blvd W & Marine Parade Dr.

2/20/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↘	↙
Volume (veh/h)	1483	34	6	84	30	61
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1545	35	6	88	31	64
Pedestrians					16	
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)	398			136		
pX, platoon unblocked			0.27		0.27	0.27
vC, conflicting volume			1596		1678	1578
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1854		2156	1789
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		0	0
cM capacity (veh/h)			89		13	27

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	1580	94	31	64
Volume Left	0	6	31	0
Volume Right	35	0	0	64
cSH	1700	89	13	27
Volume to Capacity	0.93	0.07	2.35	2.39
Queue Length 95th (m)	0.0	1.8	37.8	61.7
Control Delay (s)	0.0	6.6	1197.2	948.0
Lane LOS		A	F	F
Approach Delay (s)	0.0	6.6	1030.2	
Approach LOS			F	

Intersection Summary			
Average Delay		55.6	
Intersection Capacity Utilization		90.6%	ICU Level of Service E
Analysis Period (min)		15	

# Timings

## 38: Lake Shore Blvd W & Palace Pier Crt

2/20/2014

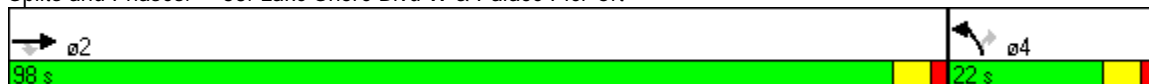


Lane Group	EBT	EBR	NBL	NBR
Lane Configurations	↑	↑	↑	↑
Volume (vph)	1478	54	41	70
Turn Type		Perm		Perm
Protected Phases	2		4	
Permitted Phases		2		4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0
Total Split (s)	98.0	98.0	22.0	22.0
Total Split (%)	81.7%	81.7%	18.3%	18.3%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effect Green (s)	92.0	92.0	16.0	16.0
Actuated g/C Ratio	0.77	0.77	0.13	0.13
v/c Ratio	1.10	0.06	0.18	0.28
Control Delay	66.7	0.7	43.0	11.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	66.7	0.7	43.0	11.9
LOS	E	A	D	B
Approach Delay	64.4		23.5	
Approach LOS	E		C	

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 101 (84%), Referenced to phase 2:EBT and 6:, Start of Green  
 Natural Cycle: 150  
 Control Type: Pretimed  
 Maximum v/c Ratio: 1.10  
 Intersection Signal Delay: 61.6  
 Intersection LOS: E  
 Intersection Capacity Utilization 92.1%  
 ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 38: Lake Shore Blvd W & Palace Pier Crt

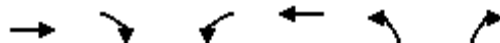




# HCM Signalized Intersection Capacity Analysis

## 38: Lake Shore Blvd W & Palace Pier Crt

2/20/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗			↖	↗
Volume (vph)	1478	54	0	0	41	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	1.00			1.00	1.00
Frbp, ped/bikes	1.00	0.91			1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00
Frt	1.00	0.85			1.00	0.85
Flt Protected	1.00	1.00			0.95	1.00
Satd. Flow (prot)	1827	1230			1770	1509
Flt Permitted	1.00	1.00			0.95	1.00
Satd. Flow (perm)	1827	1230			1770	1509
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1540	56	0	0	43	73
RTOR Reduction (vph)	0	5	0	0	0	61
Lane Group Flow (vph)	1540	51	0	0	43	12
Confl. Peds. (#/hr)		18	18			
Heavy Vehicles (%)	4%	20%	0%	0%	2%	7%
Turn Type		Perm				Perm
Protected Phases	2				4	
Permitted Phases		2				4
Actuated Green, G (s)	92.0	92.0			16.0	16.0
Effective Green, g (s)	92.0	92.0			16.0	16.0
Actuated g/C Ratio	0.77	0.77			0.13	0.13
Clearance Time (s)	6.0	6.0			6.0	6.0
Lane Grp Cap (vph)	1401	943			236	201
v/s Ratio Prot	c0.84				c0.02	
v/s Ratio Perm		0.04				0.01
v/c Ratio	1.10	0.05			0.18	0.06
Uniform Delay, d1	14.0	3.4			46.2	45.4
Progression Factor	0.58	0.27			0.89	0.78
Incremental Delay, d2	54.5	0.1			1.6	0.6
Delay (s)	62.6	1.0			42.5	35.9
Level of Service	E	A			D	D
Approach Delay (s)	60.5			0.0	38.4	
Approach LOS	E			A	D	

### Intersection Summary

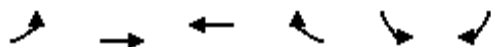
HCM Average Control Delay	59.0	HCM Level of Service	E
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 40: Marine parade Dr. & Marine Parade Dr.

2/20/2014

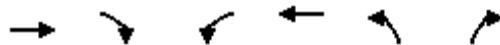


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	5	52	174	0	0	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	57	189	0	0	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)			342			
pX, platoon unblocked						
vC, conflicting volume	189				257	189
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	189				257	189
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1385				729	853
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	62	189	7			
Volume Left	5	0	0			
Volume Right	0	0	7			
cSH	1385	1700	853			
Volume to Capacity	0.00	0.11	0.01			
Queue Length 95th (m)	0.1	0.0	0.2			
Control Delay (s)	0.7	0.0	9.3			
Lane LOS	A		A			
Approach Delay (s)	0.7	0.0	9.3			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.4			
Intersection Capacity Utilization			19.2%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 48: Lake Shore Blvd W & Street A

2/20/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	2017	0	0	659	0	0
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)	2169	0	0	709	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)	80			77		
pX, platoon unblocked			0.03		0.03	0.03
vC, conflicting volume			2169		2523	1084
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)			54		34	36

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1446	723	236	472	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	54	1700	1700
Volume to Capacity	0.85	0.43	0.00	0.28	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					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary					
Average Delay			0.0		
Intersection Capacity Utilization			59.1%	ICU Level of Service	B
Analysis Period (min)			15		

# HCM Unsignalized Intersection Capacity Analysis

## 50: Marine Parade Dr. & Street B

2/20/2014

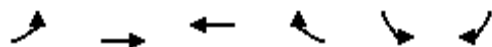


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	1	64	201	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	1	69	216	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	216				287	108
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	216				287	108
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)	1351				679	925
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	1	69	144	72	0	
Volume Left	1	0	0	0	0	
Volume Right	0	0	0	0	0	
cSH	1351	1700	1700	1700	1700	
Volume to Capacity	0.00	0.04	0.08	0.04	0.00	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	
Control Delay (s)	7.7	0.0	0.0	0.0	0.0	
Lane LOS	A				A	
Approach Delay (s)	0.1		0.0		0.0	
Approach LOS					A	
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			8.9%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 52: Marine Parade Dr. & Street A

2/20/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↑	↶↷		↶	
Volume (veh/h)	7	57	180	0	0	20
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)	8	61	194	0	0	22
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	194				270	97
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	194				270	97
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1377				693	941

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	8	61	129	65	22
Volume Left	8	0	0	0	0
Volume Right	0	0	0	0	22
cSH	1377	1700	1700	1700	941
Volume to Capacity	0.01	0.04	0.08	0.04	0.02
Queue Length 95th (m)	0.1	0.0	0.0	0.0	0.6
Control Delay (s)	7.6	0.0	0.0	0.0	8.9
Lane LOS	A				A
Approach Delay (s)	0.8		0.0		8.9
Approach LOS					A

Intersection Summary					
Average Delay			0.9		
Intersection Capacity Utilization		15.8%		ICU Level of Service	A
Analysis Period (min)		15			

Summary of All Intervals

Run Number	1	3	5	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	7:15	7:15	7:15	7:15
Total Time (min)	25	25	25	25
Time Recorded (min)	15	15	15	15
# of Intervals	2	2	2	2
# of Recorded Intvls	1	1	1	1
Vehs Entered	1729	1820	1826	1797
Vehs Exited	1697	1811	1734	1748
Starting Vehs	514	554	517	528
Ending Vehs	546	563	609	568
Denied Entry Before	49	64	102	70
Denied Entry After	502	474	566	515
Travel Distance (km)	2052	2172	2145	2123
Travel Time (hr)	202.0	197.3	221.7	207.0
Total Delay (hr)	159.8	152.3	177.4	163.2
Total Stops	4870	4901	5232	4998
Fuel Used (l)	3225.3	3292.1	3465.9	3327.8

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10
Volumes adjusted by PHF, Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	1	3	5	Avg
Vehs Entered	1729	1820	1826	1797
Vehs Exited	1697	1811	1734	1748
Starting Vehs	514	554	517	528
Ending Vehs	546	563	609	568
Denied Entry Before	49	64	102	70
Denied Entry After	502	474	566	515
Travel Distance (km)	2052	2172	2145	2123
Travel Time (hr)	202.0	197.3	221.7	207.0
Total Delay (hr)	159.8	152.3	177.4	163.2
Total Stops	4870	4901	5232	4998
Fuel Used (l)	3225.3	3292.1	3465.9	3327.8

Queuing and Blocking Report  
 Future Backg. Traffic AM Peak Hour, Interim Scenario

2/20/2014

Intersection: 3: Lake Shore Blvd W & Park Lawn Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	T	TR	LT	T	R	L	T	R	L	L	T
Maximum Queue (m)	294.2	300.5	283.4	44.6	44.5	29.4	32.0	61.4	12.3	129.9	199.5	198.4
Average Queue (m)	289.1	289.4	172.4	29.5	29.1	16.1	14.5	39.4	4.3	129.2	194.5	82.3
95th Queue (m)	294.3	296.6	366.0	46.6	47.2	28.0	38.9	68.8	12.4	131.2	200.3	236.9
Link Distance (m)	283.8	283.8	283.8	115.3	115.3			279.0	279.0		187.8	187.8
Upstream Blk Time (%)	59	40	1								23	2
Queuing Penalty (veh)	316	215	5								139	13
Storage Bay Dist (m)						45.0	55.0			100.0		
Storage Blk Time (%)					1	0	0	5		66	45	
Queuing Penalty (veh)					3	0	0	2		379	262	

Intersection: 3: Lake Shore Blvd W & Park Lawn Rd

Movement	SB
Directions Served	R
Maximum Queue (m)	96.6
Average Queue (m)	32.3
95th Queue (m)	97.3
Link Distance (m)	187.8
Upstream Blk Time (%)	1
Queuing Penalty (veh)	4
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report  
 Future Backg. Traffic AM Peak Hour, Interim Scenario

2/20/2014

Intersection: 5: The Queensway & Park Lawn Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (m)	82.1	163.5	157.3	115.2	88.9	52.3	17.6	52.4	78.4	46.6	54.5	168.4
Average Queue (m)	24.1	126.7	132.2	75.6	29.8	30.7	4.0	22.9	42.6	6.7	37.9	80.1
95th Queue (m)	75.5	198.5	195.4	132.9	80.5	46.7	17.2	51.2	88.8	35.4	69.5	170.0
Link Distance (m)		164.4	164.4		682.9	682.9			271.0	271.0		401.9
Upstream Blk Time (%)		8	17									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (m)	50.0			50.0			20.0	50.0			25.0	
Storage Blk Time (%)	1	42		40	1	23			7		44	31
Queuing Penalty (veh)	3	51		101	3	8			9		97	36

Intersection: 5: The Queensway & Park Lawn Rd

Movement	SB
Directions Served	TR
Maximum Queue (m)	200.4
Average Queue (m)	151.0
95th Queue (m)	204.6
Link Distance (m)	401.9
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Gardiner Exwy WB On-ramp & Park Lawn Rd

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	T	T	T	T	R
Maximum Queue (m)	56.2	13.2	119.3	35.7	46.6	17.7	16.0	57.6
Average Queue (m)	28.5	5.2	63.3	20.8	24.2	8.8	7.9	31.8
95th Queue (m)	57.8	14.1	121.2	40.1	45.8	20.7	16.3	57.4
Link Distance (m)	120.0	120.0		176.2	176.2	271.0	271.0	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			199.5				220.0	
Storage Blk Time (%)								
Queuing Penalty (veh)								



Queuing and Blocking Report  
 Future Backg. Traffic AM Peak Hour, Interim Scenario

2/20/2014

Intersection: 10: Gardiner EB Off-ramp & Park Lawn Rd

Movement	EB	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	L	R	L	T	T	T	TR
Maximum Queue (m)	262.6	264.7	35.0	35.8	85.9	55.1	59.7	49.3
Average Queue (m)	180.7	202.0	33.5	9.4	52.5	36.2	42.5	28.8
95th Queue (m)	337.9	359.2	43.3	32.6	76.3	57.1	65.3	53.5
Link Distance (m)	243.4	243.4			104.2	104.2	176.2	176.2
Upstream Blk Time (%)	21	60						
Queuing Penalty (veh)	181	523						
Storage Bay Dist (m)			35.0	27.0				
Storage Blk Time (%)		41	44	0	29			
Queuing Penalty (veh)		410	142	0	10			

Intersection: 12: Lake Shore Blvd W & Mr. Christie's East Driveway

Movement	EB	EB
Directions Served	LT	T
Maximum Queue (m)	67.8	77.1
Average Queue (m)	60.7	48.1
95th Queue (m)	71.6	91.8
Link Distance (m)	59.4	59.4
Upstream Blk Time (%)	29	6
Queuing Penalty (veh)	311	62
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 14: Lake Shore Blvd W & Mr. Christie's West Driveway

Movement	EB	EB	B42	B42	WB	SB
Directions Served	LT	T	T	T	TR	LR
Maximum Queue (m)	102.4	94.9	118.1	74.2	2.5	48.4
Average Queue (m)	85.5	61.2	77.6	34.8	0.4	28.6
95th Queue (m)	142.9	127.6	156.7	113.7	2.9	70.9
Link Distance (m)	80.9	80.9	115.3	115.3	5.6	83.1
Upstream Blk Time (%)	37	9	14	1	0	0
Queuing Penalty (veh)	466	107	119	5	0	0
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Queuing and Blocking Report  
 Future Backg. Traffic AM Peak Hour, Interim Scenario

2/20/2014

Intersection: 19: Gardiner EB Off-ramp &

Movement	EB	EB	EB	WB	NB
Directions Served	T	T	R	L	R
Maximum Queue (m)	264.0	264.0	33.2	24.0	229.3
Average Queue (m)	107.9	142.6	4.7	12.1	136.3
95th Queue (m)	281.1	323.9	39.7	24.0	255.5
Link Distance (m)	259.4	259.4		243.4	224.7
Upstream Blk Time (%)	3	27			26
Queuing Penalty (veh)	0	0			0
Storage Bay Dist (m)			50.0		
Storage Blk Time (%)		44			
Queuing Penalty (veh)		12			

Intersection: 21: Menkes- Kraft Driveway & Park Lawn Rd

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	B18	B18
Directions Served	L	TR	LR	L	T	TR	LT	T	TR	T	T
Maximum Queue (m)	5.6	31.6	8.1	8.1	60.6	40.8	167.6	162.3	121.8	117.2	130.7
Average Queue (m)	0.4	15.8	3.6	0.8	30.0	23.0	164.2	137.5	58.5	93.0	100.0
95th Queue (m)	3.2	31.5	9.5	4.1	55.8	39.2	167.0	183.7	139.9	141.7	172.8
Link Distance (m)	90.7	90.7	92.5		187.8	187.8	142.2	142.2	142.2	104.2	104.2
Upstream Blk Time (%)							78	13	0	26	32
Queuing Penalty (veh)							353	57	0	173	215
Storage Bay Dist (m)				30.0							
Storage Blk Time (%)					5						
Queuing Penalty (veh)					1						

Intersection: 30: Lake Shore Blvd W & Legion Rd South

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	TR	LT	TR	LR	L	TR
Maximum Queue (m)	257.7	255.8	23.2	30.1	38.0	73.4	11.7
Average Queue (m)	250.9	249.5	11.6	16.4	19.6	55.5	7.2
95th Queue (m)	256.5	260.4	23.3	28.4	45.7	98.2	14.6
Link Distance (m)	245.0	245.0	283.8	283.8	126.6		291.5
Upstream Blk Time (%)	86	56					
Queuing Penalty (veh)	0	0					
Storage Bay Dist (m)						50.0	
Storage Blk Time (%)						30	
Queuing Penalty (veh)						16	

Queuing and Blocking Report  
 Future Backg. Traffic AM Peak Hour, Interim Scenario

2/20/2014

Intersection: 32: Lake Shore Blvd W & Street B

Movement	EB	EB	WB	NB	NB
Directions Served	T	TR	LT	L	R
Maximum Queue (m)	21.6	21.8	7.2	5.6	5.2
Average Queue (m)	11.4	7.9	1.0	0.8	0.7
95th Queue (m)	19.6	22.7	8.6	4.8	4.5
Link Distance (m)	5.6	5.6	59.4		89.0
Upstream Blk Time (%)	32	6			
Queuing Penalty (veh)	343	64			
Storage Bay Dist (m)				50.0	
Storage Blk Time (%)					
Queuing Penalty (veh)					

# Timings

## 3: Lake Shore Blvd W & Park Lawn Rd

2/20/2014

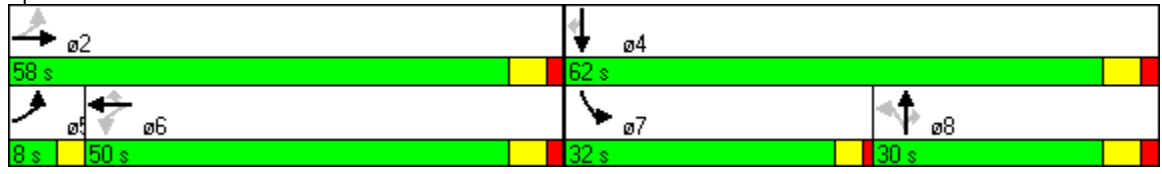


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔↔		↔↔	↔	↔	↑	↔	↔↔	↑	↔
Volume (vph)	526	650	10	941	407	32	73	13	687	85	478
Turn Type	pm+pt		Perm		Perm	Perm		Perm	Prot		Perm
Protected Phases	5	2		6			8		7	4	
Permitted Phases	2		6		6	8		8			4
Detector Phase	5	2	6	6	6	8	8	8	7	4	4
Switch Phase											
Minimum Initial (s)	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0
Minimum Split (s)	8.0	28.0	28.0	28.0	28.0	30.0	30.0	30.0	8.5	30.0	30.0
Total Split (s)	8.0	58.0	50.0	50.0	50.0	30.0	30.0	30.0	32.0	62.0	62.0
Total Split (%)	6.7%	48.3%	41.7%	41.7%	41.7%	25.0%	25.0%	25.0%	26.7%	51.7%	51.7%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?											
Recall Mode	None	C-Min	Min	Min	Min	Min	Min	Min	None	Min	Min
Act Effect Green (s)		62.0		62.0	62.0	13.3	13.3	13.3	28.7	46.0	46.0
Actuated g/C Ratio		0.52		0.52	0.52	0.11	0.11	0.11	0.24	0.38	0.38
v/c Ratio		3.23dl		0.60	0.48	0.25	0.40	0.07	0.89	0.13	0.82
Control Delay		23.7		26.4	12.9	62.9	67.0	30.4	55.5	23.5	33.7
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		23.7		26.4	12.9	62.9	67.0	30.4	55.5	23.5	33.7
LOS		C		C	B	E	E	C	E	C	C
Approach Delay		23.7		22.3			61.8			45.0	
Approach LOS		C		C			E			D	

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 116 (97%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 31.2  
 Intersection LOS: C  
 Intersection Capacity Utilization 96.7%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

### Splits and Phases: 3: Lake Shore Blvd W & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 3: Lake Shore Blvd W & Park Lawn Rd

2/20/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↕↔			↔↕	↔↕	↔↕	↕	↔↕	↔↕↔	↕	↔↕
Volume (vph)	526	650	21	10	941	407	32	73	13	687	85	478
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	4.0	6.0	6.0
Lane Util. Factor		0.91			0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frbp, ped/bikes		1.00			1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.88
Flpb, ped/bikes		1.00			1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00
Frt		1.00			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4809			3532	1519	1645	1776	1588	3467	1776	1415
Flt Permitted		0.66			0.93	1.00	0.70	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3250			3292	1519	1209	1776	1588	3467	1776	1415
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)	566	699	23	11	1012	438	34	78	14	739	91	514
RTOR Reduction (vph)	0	1	0	0	0	123	0	0	12	0	0	81
Lane Group Flow (vph)	0	1287	0	0	1023	315	34	78	2	739	91	433
Confl. Peds. (#/hr)	17		16	16		17	67		2	2		67
Confl. Bikes (#/hr)			14			3			1			10
Heavy Vehicles (%)	10%	1%	3%	16%	2%	2%	0%	7%	0%	1%	7%	1%
Bus Blockages (#/hr)	10	0	0	16	0	0	0	0	0	0	0	0
Turn Type	pm+pt			Perm		Perm	Perm		Perm	Prot		Perm
Protected Phases	5	2			6			8		7		4
Permitted Phases	2			6		6	8		8			4
Actuated Green, G (s)		62.0			62.0	62.0	13.3	13.3	13.3	28.7		46.0
Effective Green, g (s)		62.0			62.0	62.0	13.3	13.3	13.3	28.7		46.0
Actuated g/C Ratio		0.52			0.52	0.52	0.11	0.11	0.11	0.24		0.38
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0	6.0	4.0		6.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)		1679			1701	785	134	197	176	829		542
v/s Ratio Prot								0.04		c0.21		0.05
v/s Ratio Perm		c0.40			0.31	0.21	0.03		0.00			c0.31
v/c Ratio		3.23dl			0.60	0.40	0.25	0.40	0.01	0.89		0.80
Uniform Delay, d1		23.2			20.3	17.7	48.8	49.6	47.5	44.1		32.9
Progression Factor		0.82			1.13	1.33	1.28	1.29	1.60	0.95		0.95
Incremental Delay, d2		2.0			0.6	0.3	1.0	1.3	0.0	11.4		7.7
Delay (s)		20.9			23.6	23.9	63.4	65.3	76.1	53.2		38.8
Level of Service		C			C	C	E	E	E	D		D
Approach Delay (s)		20.9			23.7			66.0				45.8
Approach LOS		C			C			E				D

### Intersection Summary

HCM Average Control Delay	31.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

# Timings

## 5: The Queensway & Park Lawn Rd

2/20/2014

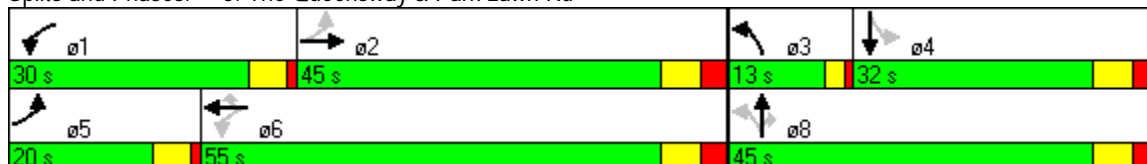


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↗	↖	↑	↗	↖	↗
Volume (vph)	211	672	359	859	68	161	389	374	34	283
Turn Type	pm+pt		pm+pt		Perm	pm+pt		Perm	Perm	
Protected Phases	5	2	1	6		3	8			4
Permitted Phases	2		6		6	8	8	8	4	
Detector Phase	5	2	1	6	6	3	8	8	4	4
Switch Phase										
Minimum Initial (s)	4.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	30.0	9.0	30.0	30.0	8.0	29.0	29.0	32.0	32.0
Total Split (s)	20.0	45.0	30.0	55.0	55.0	13.0	45.0	45.0	32.0	32.0
Total Split (%)	16.7%	37.5%	25.0%	45.8%	45.8%	10.8%	37.5%	37.5%	26.7%	26.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	5.0	7.0	7.0	3.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead			Lag	Lag
Lead-Lag Optimize?										
Recall Mode	Min	C-Min	Max	Min	Min	Max	Min	Min	Min	Min
Act Effect Green (s)	49.0	35.1	72.5	53.6	53.6	39.5	35.5	35.5	19.5	19.5
Actuated g/C Ratio	0.41	0.29	0.60	0.45	0.45	0.33	0.30	0.30	0.16	0.16
v/c Ratio	0.61	0.88	0.75	0.60	0.11	0.61	0.74	0.53	0.26	0.78
Control Delay	21.7	49.7	38.9	27.8	14.6	39.4	45.6	6.8	47.1	44.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	49.7	38.9	27.8	14.6	39.4	45.6	6.8	47.1	44.7
LOS	C	D	D	C	B	D	D	A	D	D
Approach Delay		44.1		30.2			28.8			44.9
Approach LOS		D		C			C			D

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 106 (88%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.88  
 Intersection Signal Delay: 35.7  
 Intersection LOS: D  
 Intersection Capacity Utilization 90.7%  
 ICU Level of Service E  
 Analysis Period (min) 15
























### Splits and Phases: 5: The Queensway & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 5: The Queensway & Park Lawn Rd

2/20/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	211	672	174	359	859	68	161	389	374	34	283	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0		5.0	7.0	7.0	3.0	7.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1804	3402		1736	3374	1416	1805	1881	1563	1703	3277	
Flt Permitted	0.32	1.00		0.10	1.00	1.00	0.20	1.00	1.00	0.47	1.00	
Satd. Flow (perm)	599	3402		183	3374	1416	371	1881	1563	843	3277	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	222	707	183	378	904	72	169	409	394	36	298	202
RTOR Reduction (vph)	0	20	0	0	0	14	0	0	277	0	105	0
Lane Group Flow (vph)	222	870	0	378	904	58	169	409	117	36	395	0
Confl. Peds. (#/hr)	4		18	18		4	2					2
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	0%	2%	2%	4%	7%	12%	0%	1%	2%	6%	2%	4%
Turn Type	pm+pt			pm+pt		Perm	pm+pt		Perm	Perm		
Protected Phases	5	2		1	6		3	8				4
Permitted Phases	2			6		6	8	8	8	4		
Actuated Green, G (s)	47.0	35.0		70.5	53.5	53.5	35.5	35.5	35.5	19.6	19.6	
Effective Green, g (s)	47.0	35.0		70.5	53.5	53.5	35.5	35.5	35.5	19.6	19.6	
Actuated g/C Ratio	0.39	0.29		0.59	0.45	0.45	0.30	0.30	0.30	0.16	0.16	
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	3.0	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	3.0	
Lane Grp Cap (vph)	355	992		502	1504	631	264	556	462	138	535	
v/s Ratio Prot	0.06	c0.26		c0.19	0.27		0.07	c0.22			0.12	
v/s Ratio Perm	0.18			0.25		0.04	0.12		0.07	0.04		
v/c Ratio	0.63	0.88		0.75	0.60	0.09	0.64	0.74	0.25	0.26	0.74	
Uniform Delay, d1	25.3	40.5		30.1	25.2	19.2	33.7	38.0	32.2	43.9	47.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.97	0.97	1.32	1.00	1.00	
Incremental Delay, d2	3.4	10.8		6.3	0.7	0.1	5.0	4.8	0.3	1.0	5.3	
Delay (s)	28.7	51.3		36.4	25.9	19.3	37.8	41.8	42.7	44.9	53.1	
Level of Service	C	D		D	C	B	D	D	D	D	D	
Approach Delay (s)		46.8			28.5			41.5			52.5	
Approach LOS		D			C			D			D	

### Intersection Summary

HCM Average Control Delay	40.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 8: Gardiner WB On-ramp & Park Lawn Rd

2/20/2014

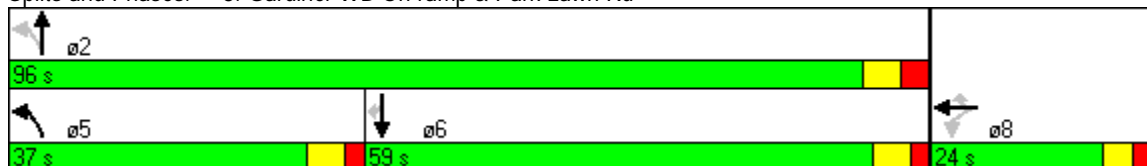


Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↘	↑↑	↑↑	↗
Volume (vph)	16	9	386	914	430	446
Turn Type		Perm	pm+pt			Perm
Protected Phases	8		5	2	6	
Permitted Phases		8	2			6
Detector Phase	8	8	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	4.0	5.0	5.0	5.0
Minimum Split (s)	22.0	22.0	10.0	23.0	22.0	22.0
Total Split (s)	24.0	24.0	37.0	96.0	59.0	59.0
Total Split (%)	20.0%	20.0%	30.8%	80.0%	49.2%	49.2%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	2.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	7.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?						
Recall Mode	Min	Min	Min	C-Min	C-Min	C-Min
Act Effect Green (s)	7.2	7.2	100.8	99.8	83.3	83.3
Actuated g/C Ratio	0.06	0.06	0.84	0.83	0.69	0.69
v/c Ratio	0.22	0.11	0.52	0.35	0.20	0.41
Control Delay	58.7	28.2	4.4	1.2	7.3	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	28.2	4.4	1.2	7.3	2.4
LOS	E	C	A	A	A	A
Approach Delay	48.2			2.2	4.8	
Approach LOS	D			A	A	

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 92 (77%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.52  
 Intersection Signal Delay: 3.8  
 Intersection LOS: A  
 Intersection Capacity Utilization 69.6%  
 ICU Level of Service C  
 Analysis Period (min) 15

### Splits and Phases: 8: Gardiner WB On-ramp & Park Lawn Rd





# HCM Signalized Intersection Capacity Analysis

## 8: Gardiner WB On-ramp & Park Lawn Rd

2/20/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↖	↗	↖	↑↑			↑↑	↗
Volume (vph)	0	0	0	2	16	9	386	914	0	0	430	446
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	7.0			6.0	6.0
Lane Util. Factor					1.00	1.00	1.00	0.95			0.95	1.00
Frbp, ped/bikes					1.00	0.99	1.00	1.00			1.00	0.94
Flpb, ped/bikes					1.00	1.00	0.99	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					1480	1434	1756	3343			3374	1473
Flt Permitted					0.99	1.00	0.46	1.00			1.00	1.00
Satd. Flow (perm)					1480	1434	842	3343			3374	1473
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	2	17	10	411	972	0	0	457	474
RTOR Reduction (vph)	0	0	0	0	0	9	0	0	0	0	0	145
Lane Group Flow (vph)	0	0	0	0	19	1	411	972	0	0	457	329
Confl. Peds. (#/hr)	1					1	11		3	3		11
Heavy Vehicles (%)	0%	0%	0%	0%	31%	11%	2%	8%	0%	0%	7%	3%
Turn Type				Perm		Perm	pm+pt					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Actuated Green, G (s)					7.2	7.2	99.8	99.8			83.3	83.3
Effective Green, g (s)					7.2	7.2	99.8	99.8			83.3	83.3
Actuated g/C Ratio					0.06	0.06	0.83	0.83			0.69	0.69
Clearance Time (s)					6.0	6.0	6.0	7.0			6.0	6.0
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					89	86	788	2780			2342	1023
v/s Ratio Prot							c0.05	0.29			0.14	
v/s Ratio Perm					0.01	0.00	c0.38					0.22
v/c Ratio					0.21	0.01	0.52	0.35			0.20	0.32
Uniform Delay, d1					53.7	53.0	2.5	2.4			6.5	7.2
Progression Factor					1.00	1.00	1.02	0.36			1.03	2.15
Incremental Delay, d2					1.2	0.0	0.6	0.3			0.1	0.6
Delay (s)					54.9	53.1	3.1	1.2			6.8	16.1
Level of Service					D	D	A	A			A	B
Approach Delay (s)		0.0			54.3			1.8			11.5	
Approach LOS		A			D			A			B	

Intersection Summary			
HCM Average Control Delay	6.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# Timings

## 10: Gardiner Expwy EB Off-ramp & Park Lawn Rd

2/20/2014



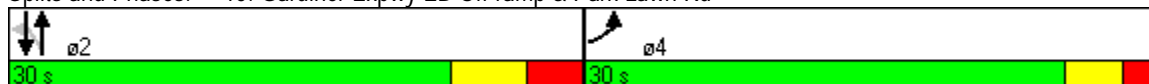
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations	↖↖	↗	↖	↑↑	↑↗
Volume (vph)	531	635	100	830	529
Turn Type		Free	Perm		
Protected Phases	4			2	2
Permitted Phases		Free	2		
Detector Phase	4		2	2	2
Switch Phase					
Minimum Initial (s)	19.0		4.0	4.0	4.0
Minimum Split (s)	30.0		30.0	30.0	30.0
Total Split (s)	30.0	0.0	30.0	30.0	30.0
Total Split (%)	50.0%	0.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.0		4.0	4.0	4.0
All-Red Time (s)	2.0		3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	7.0	7.0	7.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Min		Max	Max	Max
Act Effect Green (s)	19.0	60.0	29.0	29.0	29.0
Actuated g/C Ratio	0.32	1.00	0.48	0.48	0.48
v/c Ratio	0.50	0.41	0.27	0.49	0.36
Control Delay	18.6	0.8	7.0	8.3	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.6	0.8	7.0	8.3	6.6
LOS	B	A	A	A	A
Approach Delay	8.9			8.1	6.6
Approach LOS	A			A	A

### Intersection Summary

Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 4:EBL, Start of Green, Master Intersection  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.50  
 Intersection Signal Delay: 8.1  
 Intersection Capacity Utilization 54.4%  
 Analysis Period (min) 15

Intersection LOS: A  
 ICU Level of Service A

Splits and Phases: 10: Gardiner Expwy EB Off-ramp & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 10: Gardiner Expwy EB Off-ramp & Park Lawn Rd

2/20/2014



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	531	635	100	830	529	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0	7.0	7.0	7.0	
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	
Frbp, ped/bikes	1.00	0.99	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	1577	1770	3574	3455	
Flt Permitted	0.95	1.00	0.42	1.00	1.00	
Satd. Flow (perm)	3433	1577	782	3574	3455	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	542	648	102	847	540	73
RTOR Reduction (vph)	0	0	0	0	14	0
Lane Group Flow (vph)	542	648	102	847	599	0
Confl. Peds. (#/hr)			27			27
Confl. Bikes (#/hr)		9				7
Heavy Vehicles (%)	2%	1%	0%	1%	2%	0%
Turn Type		Free	Perm			
Protected Phases	4			2	2	
Permitted Phases		Free	2			
Actuated Green, G (s)	19.0	60.0	29.0	29.0	29.0	
Effective Green, g (s)	19.0	60.0	29.0	29.0	29.0	
Actuated g/C Ratio	0.32	1.00	0.48	0.48	0.48	
Clearance Time (s)	5.0		7.0	7.0	7.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1087	1577	378	1727	1670	
v/s Ratio Prot	0.16			0.24	0.17	
v/s Ratio Perm		c0.41	0.13			
v/c Ratio	0.50	0.41	0.27	0.49	0.36	
Uniform Delay, d1	16.6	0.0	9.2	10.5	9.7	
Progression Factor	1.00	1.00	0.56	0.69	0.64	
Incremental Delay, d2	1.6	0.8	1.7	0.9	0.6	
Delay (s)	18.3	0.8	6.8	8.2	6.8	
Level of Service	B	A	A	A	A	
Approach Delay (s)	8.8			8.0	6.8	
Approach LOS	A			A	A	

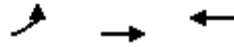
Intersection Summary			
HCM Average Control Delay	8.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 12: Lake Shore Blvd W & Mr. Christie's East Driveway

2/20/2014



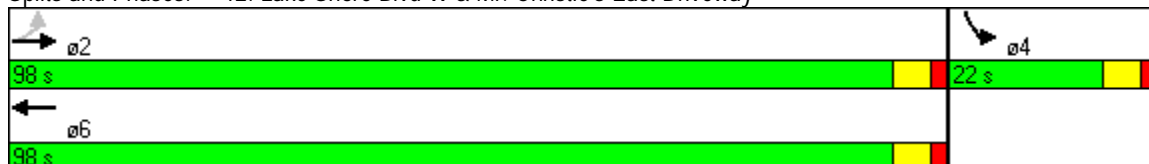
Lane Group	EBL	EBT	WBT	ø4
Lane Configurations		↕↕	↕↕	
Volume (vph)	3	1151	1200	
Turn Type	Perm			
Protected Phases		2	6	4
Permitted Phases	2			
Detector Phase	2	2	6	
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0
Total Split (s)	98.0	98.0	98.0	22.0
Total Split (%)	81.7%	81.7%	81.7%	18%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)		120.0	120.0	
Actuated g/C Ratio		1.00	1.00	
v/c Ratio		0.37	0.37	
Control Delay		0.2	0.2	
Queue Delay		0.0	0.0	
Total Delay		0.2	0.2	
LOS		A	A	
Approach Delay		0.2	0.2	
Approach LOS		A	A	

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.37  
 Intersection Signal Delay: 0.2  
 Intersection Capacity Utilization 48.8%  
 Analysis Period (min) 15

Intersection LOS: A  
 ICU Level of Service A

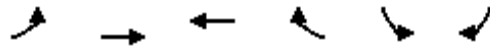
### Splits and Phases: 12: Lake Shore Blvd W & Mr. Christie's East Driveway



# HCM Signalized Intersection Capacity Analysis

## 12: Lake Shore Blvd W & Mr. Christie's East Driveway

2/20/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕		↕↕	
Volume (vph)	3	1151	1200	3	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0			
Lane Util. Factor		0.95	0.95			
Frbp, ped/bikes		1.00	1.00			
Flpb, ped/bikes		1.00	1.00			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		3539	3498			
Flt Permitted		0.95	1.00			
Satd. Flow (perm)		3372	3498			
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	3	1238	1290	3	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1241	1293	0	0	0
Confl. Peds. (#/hr)	1			1		5
Heavy Vehicles (%)	0%	2%	3%	67%	0%	0%
Turn Type	Perm					
Protected Phases		2	6		4	
Permitted Phases	2					
Actuated Green, G (s)		120.0	120.0			
Effective Green, g (s)		120.0	120.0			
Actuated g/C Ratio		1.00	1.00			
Clearance Time (s)		6.0	6.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		3372	3498			
v/s Ratio Prot			c0.37			
v/s Ratio Perm		0.37				
v/c Ratio		0.37	0.37			
Uniform Delay, d1		0.0	0.0			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.2	0.1			
Delay (s)		0.2	0.1			
Level of Service		A	A			
Approach Delay (s)		0.2	0.1		0.0	
Approach LOS		A	A		A	
<b>Intersection Summary</b>						
HCM Average Control Delay			0.2		HCM Level of Service	A
HCM Volume to Capacity ratio			0.37			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	0.0
Intersection Capacity Utilization			48.8%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Unsignalized Intersection Capacity Analysis

## 14: Lake Shore Blvd W & Mr. Christie's West Driveway

2/20/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↔		↔↔	
Volume (veh/h)	33	1144	1213	8	31	44
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	35	1217	1290	9	33	47
Pedestrians			1			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.2			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)		237	103			
pX, platoon unblocked					0.93	
vC, conflicting volume	1299				1974	649
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1299				1897	649
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				39	89
cM capacity (veh/h)	529				54	417

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	441	811	860	439	80
Volume Left	35	0	0	0	33
Volume Right	0	0	0	9	47
cSH	529	1700	1700	1700	111
Volume to Capacity	0.07	0.48	0.51	0.26	0.72
Queue Length 95th (m)	1.7	0.0	0.0	0.0	30.9
Control Delay (s)	2.0	0.0	0.0	0.0	94.7
Lane LOS	A				F
Approach Delay (s)	0.7		0.0		94.7
Approach LOS					F

Intersection Summary					
Average Delay			3.2		
Intersection Capacity Utilization			66.5%	ICU Level of Service	C
Analysis Period (min)			15		

# Timings

## 19: Gardiner Expwy EB Off-ramp &

2/20/2014

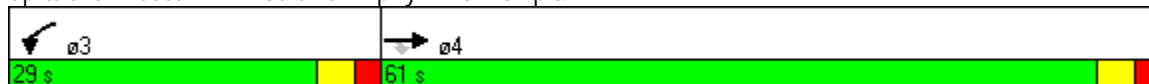


Lane Group	EBT	EBR	WBL	NBR
Lane Configurations	↑↑	↑	↵	↵
Volume (vph)	1026	143	170	118
Turn Type		Perm	Prot	Free
Protected Phases	4		3	
Permitted Phases		4		Free
Detector Phase	4	4	3	
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	
Minimum Split (s)	23.0	23.0	9.0	
Total Split (s)	61.0	61.0	29.0	0.0
Total Split (%)	67.8%	67.8%	32.2%	0.0%
Yellow Time (s)	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	3.0
Lead/Lag	Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	
Recall Mode	None	None	None	
Act Effect Green (s)	24.8	24.8	10.9	38.9
Actuated g/C Ratio	0.64	0.64	0.26	1.00
v/c Ratio	0.47	0.14	0.37	0.08
Control Delay	6.7	1.6	16.5	0.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.7	1.6	16.5	0.1
LOS	A	A	B	A
Approach Delay	6.1			
Approach LOS	A			

### Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 38.9	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 6.8	Intersection LOS: A
Intersection Capacity Utilization 44.4%	ICU Level of Service A
Analysis Period (min) 15	

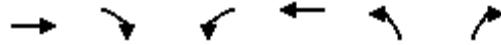
Splits and Phases: 19: Gardiner Expwy EB Off-ramp &



# HCM Signalized Intersection Capacity Analysis

## 19: Gardiner Expwy EB Off-ramp &

2/20/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↖			↗
Volume (vph)	1026	143	170	0	0	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			3.0
Lane Util. Factor	0.95	1.00	1.00			1.00
Frbp, ped/bikes	1.00	0.97	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			0.86
Flt Protected	1.00	1.00	0.95			1.00
Satd. Flow (prot)	3539	1558	1805			1611
Flt Permitted	1.00	1.00	0.95			1.00
Satd. Flow (perm)	3539	1558	1805			1611
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1069	149	177	0	0	123
RTOR Reduction (vph)	0	62	0	0	0	0
Lane Group Flow (vph)	1069	87	177	0	0	123
Confl. Peds. (#/hr)		7	7			
Heavy Vehicles (%)	2%	1%	0%	2%	2%	2%
Turn Type		Perm	Prot			Free
Protected Phases	4		3			
Permitted Phases		4				Free
Actuated Green, G (s)	22.0	22.0	7.6			39.6
Effective Green, g (s)	23.0	23.0	8.6			39.6
Actuated g/C Ratio	0.58	0.58	0.22			1.00
Clearance Time (s)	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	2055	905	392			1611
v/s Ratio Prot	c0.30		c0.10			
v/s Ratio Perm		0.06				0.08
v/c Ratio	0.52	0.10	0.45			0.08
Uniform Delay, d1	5.0	3.7	13.5			0.0
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.2	0.0	0.8			0.1
Delay (s)	5.2	3.7	14.3			0.1
Level of Service	A	A	B			A
Approach Delay (s)	5.0			14.3	0.1	
Approach LOS	A			B	A	

### Intersection Summary

HCM Average Control Delay	5.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	39.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



# Timings

## 21: Menkes- Kraft Driveway & Park Lawn Rd

2/20/2014

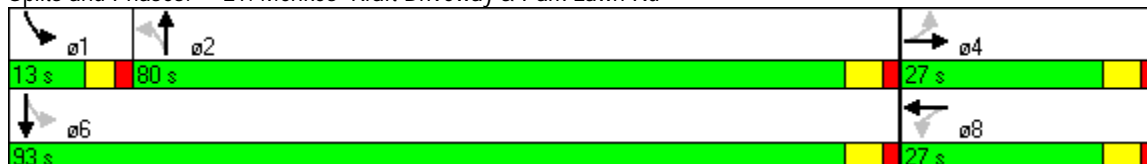


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↔	↖	↕		↕↗↖
Volume (vph)	8	0	0	59	947	35	1197
Turn Type	Perm			Perm		pm+pt	
Protected Phases		4	8		2	1	6
Permitted Phases	4			2		6	
Detector Phase	4	4	8	2	2	1	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0
Minimum Split (s)	24.0	24.0	24.0	29.0	29.0	9.0	29.0
Total Split (s)	27.0	27.0	27.0	80.0	80.0	13.0	93.0
Total Split (%)	22.5%	22.5%	22.5%	66.7%	66.7%	10.8%	77.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	5.0	6.0
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?							
Recall Mode	Min	Min	Min	C-Min	C-Min	Min	C-Min
Act Effect Green (s)	6.5	6.5	6.5	91.0	91.0		101.5
Actuated g/C Ratio	0.05	0.05	0.05	0.76	0.76		0.85
v/c Ratio	0.12	0.15	0.20	0.23	0.38		0.35
Control Delay	57.2	1.8	1.6	7.7	5.7		2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	57.2	1.8	1.6	7.7	5.7		2.7
LOS	E	A	A	A	A		A
Approach Delay		15.3	1.6		5.8		2.7
Approach LOS		B	A		A		A

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 12 (10%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.38  
 Intersection Signal Delay: 4.2  
 Intersection Capacity Utilization 65.7%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service C

### Splits and Phases: 21: Menkes- Kraft Driveway & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 21: Menkes- Kraft Driveway & Park Lawn Rd

2/20/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↔		↖	↗			↖↗↔	
Volume (vph)	8	0	26	0	0	56	59	947	0	35	1197	13
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	1.00	1.00			1.00		1.00	0.95			0.91	
Frt	1.00	0.85			0.86		1.00	1.00			1.00	
Flt Protected	0.95	1.00			1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1583			1611		1770	3539			5070	
Flt Permitted	0.72	1.00			1.00		0.19	1.00			0.87	
Satd. Flow (perm)	1337	1583			1611		358	3539			4434	
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)	9	0	28	0	0	60	63	1018	0	38	1287	14
RTOR Reduction (vph)	0	26	0	0	57	0	0	0	0	0	0	0
Lane Group Flow (vph)	9	2	0	0	3	0	63	1018	0	0	1339	0
Heavy Vehicles (%)	2%	0%	2%	0%	0%	2%	2%	2%	0%	2%	2%	2%
Turn Type	Perm		Perm		Perm		pm+pt					
Protected Phases		4			8			2			1	6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	6.5	6.5			6.5		91.0	91.0			101.5	
Effective Green, g (s)	6.5	6.5			6.5		91.0	91.0			101.5	
Actuated g/C Ratio	0.05	0.05			0.05		0.76	0.76			0.85	
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)	72	86			87		271	2684			3780	
v/s Ratio Prot		0.00			0.00			c0.29			c0.02	
v/s Ratio Perm	c0.01						0.18				0.28	
v/c Ratio	0.12	0.02			0.04		0.23	0.38			0.35	
Uniform Delay, d1	54.0	53.7			53.8		4.3	4.9			2.0	
Progression Factor	1.00	1.00			1.00		1.25	1.07			1.21	
Incremental Delay, d2	0.8	0.1			0.2		1.6	0.3			0.1	
Delay (s)	54.8	53.8			54.0		6.9	5.6			2.5	
Level of Service	D	D			D		A	A			A	
Approach Delay (s)		54.1			54.0			5.7			2.5	
Approach LOS		D			D			A			A	

### Intersection Summary

HCM Average Control Delay	5.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 30: Lake Shore Blvd W & Legion Rd South

2/20/2014

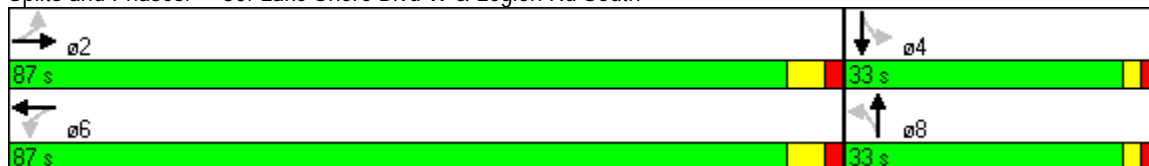


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔↔	↔↔		↔	↔	↔
Volume (vph)	58	908	1346	5	0	122	0
Turn Type	Perm			Perm		Perm	
Protected Phases		2	6		8		4
Permitted Phases	2			8		4	
Detector Phase	2	2	6	8	8	4	4
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.0	23.0	23.0	30.0	30.0	30.0	30.0
Total Split (s)	87.0	87.0	87.0	33.0	33.0	33.0	33.0
Total Split (%)	72.5%	72.5%	72.5%	27.5%	27.5%	27.5%	27.5%
Yellow Time (s)	4.0	4.0	4.0	2.0	2.0	2.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)		93.4	93.4		16.6	16.6	16.6
Actuated g/C Ratio		0.78	0.78		0.14	0.14	0.14
v/c Ratio		0.51	0.56		0.11	0.68	0.44
Control Delay		6.5	4.8		20.4	66.4	27.5
Queue Delay		0.0	0.0		0.0	0.0	0.0
Total Delay		6.5	4.8		20.4	66.4	27.5
LOS		A	A		C	E	C
Approach Delay		6.5	4.8		20.4		47.7
Approach LOS		A	A		C		D

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 117 (98%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.68  
 Intersection Signal Delay: 9.3  
 Intersection Capacity Utilization 92.0%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service F

### Splits and Phases: 30: Lake Shore Blvd W & Legion Rd South



# HCM Signalized Intersection Capacity Analysis

## 30: Lake Shore Blvd W & Legion Rd South

2/20/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕		↕	↕	
Volume (vph)	58	908	0	0	1346	113	5	0	19	122	0	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95			1.00		1.00	1.00	
Frbp, ped/bikes		1.00			0.99			0.96		1.00	0.97	
Flpb, ped/bikes		1.00			1.00			1.00		0.97	1.00	
Frt		1.00			0.99			0.89		1.00	0.85	
Flt Protected		1.00			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		3565			3517			1613		1745	1573	
Flt Permitted		0.71			1.00			0.95		0.74	1.00	
Satd. Flow (perm)		2555			3517			1550		1361	1573	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	956	0	0	1417	119	5	0	20	128	0	119
RTOR Reduction (vph)	0	0	0	0	4	0	0	17	0	0	54	0
Lane Group Flow (vph)	0	1017	0	0	1532	0	0	8	0	128	65	0
Confl. Peds. (#/hr)	13		18	18		13	9		22	22		9
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	10	0	0	16	0	0	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		93.4			93.4			16.6		16.6	16.6	
Effective Green, g (s)		93.4			93.4			16.6		16.6	16.6	
Actuated g/C Ratio		0.78			0.78			0.14		0.14	0.14	
Clearance Time (s)		6.0			6.0			4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		1989			2737			214		188	218	
v/s Ratio Prot					c0.44						0.04	
v/s Ratio Perm		0.40						0.01		c0.09		
v/c Ratio		0.51			0.56			0.04		0.68	0.30	
Uniform Delay, d1		4.9			5.2			44.8		49.2	46.5	
Progression Factor		1.00			0.72			1.00		1.00	1.00	
Incremental Delay, d2		0.9			0.7			0.1		9.7	0.8	
Delay (s)		5.8			4.4			44.8		58.9	47.2	
Level of Service		A			A			D		E	D	
Approach Delay (s)		5.8			4.4			44.8			53.3	
Approach LOS		A			A			D			D	

### Intersection Summary

HCM Average Control Delay	9.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 32: Lake Shore Blvd W & Street B

2/20/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↗	↗
Volume (veh/h)	1171	4	1	1220	1	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1246	4	1	1298	1	3
Pedestrians				1	24	
Lane Width (m)				3.6	3.6	
Walking Speed (m/s)				1.2	1.2	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	264			76		
pX, platoon unblocked				0.96	0.96	0.96
vC, conflicting volume				1274	1923	650
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				1199	1876	548
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	98	99
cM capacity (veh/h)				553	61	455

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	830	420	434	865	1	3
Volume Left	0	0	1	0	1	0
Volume Right	0	4	0	0	0	3
cSH	1700	1700	553	1700	61	455
Volume to Capacity	0.49	0.25	0.00	0.51	0.02	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.4	0.2
Control Delay (s)	0.0	0.0	0.1	0.0	65.5	13.0
Lane LOS	A			F B		
Approach Delay (s)	0.0		0.0		26.1	
Approach LOS					D	

Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			44.7%		ICU Level of Service A	
Analysis Period (min)	15					

# Timings

## 34: Lake Shore Blvd W & Gardiner Expy WB Off-Ramp

2/20/2014

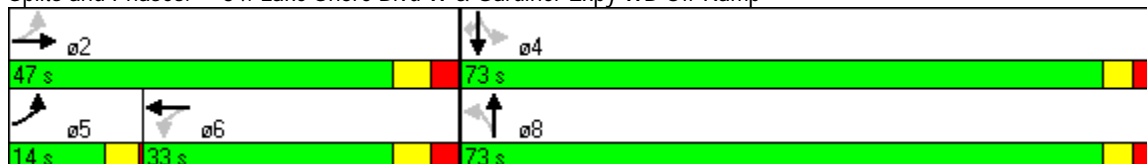


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖	↕	↖	↕	↖	↕		↕	↗
Volume (vph)	241	791	3	96	71	11	132	68	1054
Turn Type	pm+pt		Perm		Perm		Perm		Perm
Protected Phases	5	2		6		8		4	
Permitted Phases	2		6		8		4		4
Detector Phase	5	2	6	6	8	8	4	4	4
Switch Phase									
Minimum Initial (s)	4.0	24.0	24.0	24.0	13.0	13.0	13.0	13.0	13.0
Minimum Split (s)	8.0	31.0	31.0	31.0	27.0	27.0	27.0	27.0	27.0
Total Split (s)	14.0	47.0	33.0	33.0	73.0	73.0	73.0	73.0	73.0
Total Split (%)	11.7%	39.2%	27.5%	27.5%	60.8%	60.8%	60.8%	60.8%	60.8%
Yellow Time (s)	3.5	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag					
Lead-Lag Optimize?									
Recall Mode	None	C-Min	Min	Min	Min	Min	Max	Max	Max
Act Effect Green (s)	42.2	39.2	25.2	25.2	67.8	67.8		67.8	67.8
Actuated g/C Ratio	0.35	0.33	0.21	0.21	0.56	0.56		0.56	0.56
v/c Ratio	0.62	0.87	0.07	0.34	0.12	0.03		0.27	0.95
Control Delay	25.0	34.6	45.7	43.3	13.1	6.0		14.6	26.3
Queue Delay	0.0	2.3	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	25.0	36.9	45.7	43.3	13.1	6.0		14.6	26.3
LOS	C	D	D	D	B	A		B	C
Approach Delay		34.5		43.3		10.4		24.4	
Approach LOS		C		D		B		C	

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 72 (60%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.95  
 Intersection Signal Delay: 29.1  
 Intersection LOS: C  
 Intersection Capacity Utilization 112.1%  
 ICU Level of Service H  
 Analysis Period (min) 15

### Splits and Phases: 34: Lake Shore Blvd W & Gardiner Expy WB Off-Ramp



# HCM Signalized Intersection Capacity Analysis

## 34: Lake Shore Blvd W & Gardiner Expy WB Off-Ramp

2/20/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↗		↖	↖↗			↖↗	↖
Volume (vph)	241	791	121	3	96	18	71	11	31	132	68	1054
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		7.0	7.0		6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	0.95			1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99			1.00	1.00
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1713	3454		1262	1706		1770	3177			1802	1583
Flt Permitted	0.58	1.00		0.16	1.00		0.61	1.00			0.77	1.00
Satd. Flow (perm)	1054	3454		211	1706		1140	3177			1442	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	262	860	132	3	104	20	77	12	34	143	74	1146
RTOR Reduction (vph)	0	10	0	0	6	0	0	13	0	0	0	313
Lane Group Flow (vph)	262	982	0	3	118	0	77	33	0	0	217	833
Confl. Peds. (#/hr)	2		13	13		2			1	1		
Heavy Vehicles (%)	1%	2%	0%	33%	10%	0%	2%	0%	0%	3%	0%	2%
Bus Blockages (#/hr)	10	0	0	16	0	0	0	0	0	0	0	0
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8				4
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	39.2	39.2		25.2	25.2		67.8	67.8			67.8	67.8
Effective Green, g (s)	39.2	39.2		25.2	25.2		67.8	67.8			67.8	67.8
Actuated g/C Ratio	0.33	0.33		0.21	0.21		0.56	0.56			0.56	0.56
Clearance Time (s)	4.0	7.0		7.0	7.0		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	3.0
Lane Grp Cap (vph)	399	1128		44	358		644	1795			815	894
v/s Ratio Prot	0.05	c0.28			0.07			0.01				
v/s Ratio Perm	0.16			0.01			0.07				0.15	c0.53
v/c Ratio	0.66	0.87		0.07	0.33		0.12	0.02			0.27	0.93
Uniform Delay, d1	33.5	38.0		38.0	40.2		12.2	11.5			13.4	24.0
Progression Factor	0.61	0.68		1.09	1.06		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.7	8.8		0.7	0.5		0.1	0.0			0.8	17.5
Delay (s)	24.0	34.6		42.3	43.4		12.3	11.5			14.2	41.5
Level of Service	C	C		D	D		B	B			B	D
Approach Delay (s)		32.4			43.4			12.0			37.2	
Approach LOS		C			D			B			D	

### Intersection Summary

HCM Average Control Delay	34.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	112.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 37: Lake Shore Blvd W & Marine Parade Dr.

2/20/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	→
Volume (veh/h)	746	63	10	56	31	43
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)	802	68	11	60	33	46
Pedestrians					9	
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)	398			136		
pX, platoon unblocked			0.68		0.68	0.68
vC, conflicting volume			879		927	845
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			581		652	531
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		88	88
cM capacity (veh/h)			673		285	370

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	870	71	33	46
Volume Left	0	11	33	0
Volume Right	68	0	0	46
cSH	1700	673	285	370
Volume to Capacity	0.51	0.02	0.12	0.12
Queue Length 95th (m)	0.0	0.4	3.1	3.4
Control Delay (s)	0.0	1.7	19.3	16.1
Lane LOS		A	C	C
Approach Delay (s)	0.0	1.7	17.4	
Approach LOS			C	

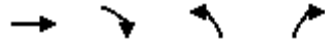
Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization		53.2%	ICU Level of Service A
Analysis Period (min)		15	



# Timings

## 38: Lake Shore Blvd W & Palace Pier Crt

2/20/2014



Lane Group	EBT	EBR	NBL	NBR
Lane Configurations	↑	↑	↑	↑
Volume (vph)	562	175	37	28
Turn Type		Perm		Perm
Protected Phases	2		4	
Permitted Phases		2		4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0
Total Split (s)	38.0	38.0	22.0	22.0
Total Split (%)	63.3%	63.3%	36.7%	36.7%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effect Green (s)	32.0	32.0	16.0	16.0
Actuated g/C Ratio	0.53	0.53	0.27	0.27
v/c Ratio	0.61	0.22	0.09	0.08
Control Delay	7.5	1.5	17.5	7.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	7.5	1.5	17.5	7.7
LOS	A	A	B	A
Approach Delay	6.1		13.3	
Approach LOS	A		B	

### Intersection Summary

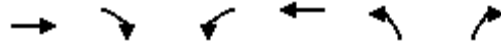
Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 50 (83%), Referenced to phase 2:EBT and 6:, Start of Green  
 Natural Cycle: 50  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.61  
 Intersection Signal Delay: 6.7  
 Intersection LOS: A  
 Intersection Capacity Utilization 42.9%  
 ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 38: Lake Shore Blvd W & Palace Pier Crt



HCM Signalized Intersection Capacity Analysis  
 38: Lake Shore Blvd W & Palace Pier Crt

2/20/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗			↖	↗
Volume (vph)	562	175	0	0	37	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	1.00			1.00	1.00
Frbp, ped/bikes	1.00	0.94			1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00
Frt	1.00	0.85			1.00	0.85
Flt Protected	1.00	1.00			0.95	1.00
Satd. Flow (prot)	1900	1508			1805	1455
Flt Permitted	1.00	1.00			0.95	1.00
Satd. Flow (perm)	1900	1508			1805	1455
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	618	192	0	0	41	31
RTOR Reduction (vph)	0	89	0	0	0	23
Lane Group Flow (vph)	618	103	0	0	41	8
Confl. Peds. (#/hr)		20	20			
Heavy Vehicles (%)	0%	1%	0%	0%	0%	11%
Turn Type		Perm				Perm
Protected Phases	2				4	
Permitted Phases		2				4
Actuated Green, G (s)	32.0	32.0			16.0	16.0
Effective Green, g (s)	32.0	32.0			16.0	16.0
Actuated g/C Ratio	0.53	0.53			0.27	0.27
Clearance Time (s)	6.0	6.0			6.0	6.0
Lane Grp Cap (vph)	1013	804			481	388
v/s Ratio Prot	c0.33				c0.02	
v/s Ratio Perm		0.07				0.01
v/c Ratio	0.61	0.13			0.09	0.02
Uniform Delay, d1	9.7	7.0			16.5	16.2
Progression Factor	0.57	1.05			1.03	1.32
Incremental Delay, d2	1.9	0.2			0.3	0.1
Delay (s)	7.4	7.6			17.3	21.5
Level of Service	A	A			B	C
Approach Delay (s)	7.5			0.0	19.1	
Approach LOS	A			A	B	

Intersection Summary

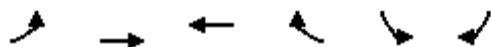
HCM Average Control Delay	8.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 40: Marine parade Dr. & Marine Parade Dr.

2/20/2014

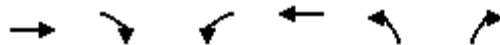


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	10	110	126	0	0	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	120	137	0	0	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			342			
pX, platoon unblocked						
vC, conflicting volume	137				278	137
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	137				278	137
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	99
cM capacity (veh/h)	1447				706	912
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	130	137	10			
Volume Left	11	0	0			
Volume Right	0	0	10			
cSH	1447	1700	912			
Volume to Capacity	0.01	0.08	0.01			
Queue Length 95th (m)	0.2	0.0	0.3			
Control Delay (s)	0.7	0.0	9.0			
Lane LOS	A		A			
Approach Delay (s)	0.7	0.0	9.0			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.6			
Intersection Capacity Utilization		24.1%		ICU Level of Service		A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 48: Lake Shore Blvd W & Street A

2/20/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	1151	0	0	1203	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)	1251	0	0	1308	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)	80			77		
pX, platoon unblocked						
vC, conflicting volume			1251		1905	626
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1251		1905	626
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)			563		60	427

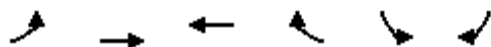
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	834	417	436	872	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	563	1700	1700
Volume to Capacity	0.49	0.25	0.00	0.51	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary					
Average Delay			0.0		
Intersection Capacity Utilization			36.6%	ICU Level of Service	A
Analysis Period (min)			15		

# HCM Unsignalized Intersection Capacity Analysis

## 50: Marine Parade Dr. & Street B

2/20/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	1	138	147	0	3	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	153	163	0	3	1
Pedestrians		4	1			
Lane Width (m)		3.6	3.6			
Walking Speed (m/s)		1.2	1.2			
Percent Blockage		0	0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	163				320	86
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	163				320	86
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				99	100
cM capacity (veh/h)	1413				653	953

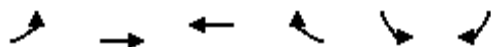
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	1	153	109	54	4
Volume Left	1	0	0	0	3
Volume Right	0	0	0	0	1
cSH	1413	1700	1700	1700	709
Volume to Capacity	0.00	0.09	0.06	0.03	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.2
Control Delay (s)	7.6	0.0	0.0	0.0	10.1
Lane LOS	A				B
Approach Delay (s)	0.1		0.0		10.1
Approach LOS					B

Intersection Summary					
Average Delay			0.2		
Intersection Capacity Utilization		18.5%		ICU Level of Service	A
Analysis Period (min)		15			

# HCM Unsignalized Intersection Capacity Analysis

## 52: Marine Parade Dr. & Street A

2/20/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	21	120	135	0	0	12
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)	23	130	147	0	0	13
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	147				323	73
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	147				323	73
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	99
cM capacity (veh/h)	1433				636	974

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	23	130	98	49	13
Volume Left	23	0	0	0	0
Volume Right	0	0	0	0	13
cSH	1433	1700	1700	1700	974
Volume to Capacity	0.02	0.08	0.06	0.03	0.01
Queue Length 95th (m)	0.4	0.0	0.0	0.0	0.3
Control Delay (s)	7.6	0.0	0.0	0.0	8.7
Lane LOS	A				A
Approach Delay (s)	1.1		0.0		8.7
Approach LOS					A

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		20.4%	ICU Level of Service A
Analysis Period (min)		15	

SimTraffic Simulation Summary  
 Future Backg. Traffic PM Peak Hour, Interim Scenario

2/20/2014

Summary of All Intervals

Run Number	PM Peak Hour	Interim Scenario	Avg
Start Time	6:50	6:50	
End Time	7:15	7:15	
Total Time (min)	25	25	
Time Recorded (min)	15	15	
# of Intervals	2	2	
# of Recorded Intvl	1	1	
Vehs Entered	1822	1822	
Vehs Exited	1787	1787	
Starting Vehs	515	515	
Ending Vehs	550	550	
Denied Entry Before	4	4	
Denied Entry After	306	306	
Travel Distance (km)	2090	2090	
Travel Time (hr)	169.7	169.7	
Total Delay (hr)	126.6	126.6	
Total Stops	3310	3310	
Fuel Used (l)	3037.4	3037.4	

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10
Volumes adjusted by PHF, Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	PM Peak Hour	Interim Scenario	Avg
Vehs Entered	1822	1822	
Vehs Exited	1787	1787	
Starting Vehs	515	515	
Ending Vehs	550	550	
Denied Entry Before	4	4	
Denied Entry After	306	306	
Travel Distance (km)	2090	2090	
Travel Time (hr)	169.7	169.7	
Total Delay (hr)	126.6	126.6	
Total Stops	3310	3310	
Fuel Used (l)	3037.4	3037.4	

Queuing and Blocking Report  
 Future Backg. Traffic PM Peak Hour, Interim Scenario

2/20/2014

Intersection: 3: Lake Shore Blvd W & Park Lawn Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB	SB
Directions Served	LT	T	TR	LT	T	R	L	T	L	L	T	R
Maximum Queue (m)	287.2	282.6	184.6	80.0	84.2	16.6	14.0	32.1	129.9	199.1	201.1	151.6
Average Queue (m)	283.8	263.1	3.6	66.9	65.7	12.1	3.0	14.8	129.3	174.5	59.9	86.3
95th Queue (m)	286.9	315.7	13.7	82.6	91.7	18.1	11.5	28.2	130.4	212.7	196.5	150.0
Link Distance (m)	282.6	282.6	282.6	115.3	115.3			287.2		188.4	188.4	188.4
Upstream Blk Time (%)	100	65								17	0	
Queuing Penalty (veh)	366	238								76	0	
Storage Bay Dist (m)						45.0	55.0		100.0			
Storage Blk Time (%)					18				79	52		
Queuing Penalty (veh)					77				293	192		

Intersection: 5: The Queensway & Park Lawn Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	L	T	TR
Maximum Queue (m)	86.4	143.7	169.0	84.3	687.5	106.4	16.5	32.1	98.1	27.6	70.9	115.6
Average Queue (m)	53.8	99.3	101.7	61.6	151.2	69.5	1.3	20.3	52.2	16.9	36.5	75.0
95th Queue (m)	91.4	135.5	146.3	96.5	513.4	103.1	4.6	32.1	89.8	28.5	70.6	98.6
Link Distance (m)		164.4	164.4		682.9	682.9			271.0		401.9	401.9
Upstream Blk Time (%)			3		0							
Queuing Penalty (veh)			0		0							
Storage Bay Dist (m)	50.0			50.0			20.0	50.0		25.0		
Storage Blk Time (%)	29	28		29	14	40	0		8	1	15	
Queuing Penalty (veh)	104	62		132	55	28	1		14	2	5	

Intersection: 8: Gardiner WB On-ramp & Park Lawn Rd

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	T	T	T	T	R
Maximum Queue (m)	14.8	13.9	71.6	27.5	27.0	34.7	26.1	31.2
Average Queue (m)	4.6	4.3	42.9	12.5	16.4	18.0	12.6	23.8
95th Queue (m)	13.9	13.1	78.3	28.3	30.7	36.4	27.9	32.2
Link Distance (m)	120.0	120.0		176.2	176.2	271.0	271.0	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			199.5				220.0	
Storage Blk Time (%)								
Queuing Penalty (veh)								



Queuing and Blocking Report  
 Future Backg. Traffic PM Peak Hour, Interim Scenario

2/20/2014

Intersection: 10: Gardiner Expwy EB Off-ramp & Park Lawn Rd

Movement	EB	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	L	R	L	T	T	T	TR
Maximum Queue (m)	43.6	261.1	31.7	22.6	47.3	28.7	47.2	35.1
Average Queue (m)	26.5	51.2	14.9	11.5	24.7	15.4	32.3	21.9
95th Queue (m)	42.0	194.4	32.0	22.5	45.7	28.9	46.7	38.8
Link Distance (m)	243.2	243.2			104.2	104.2	176.2	176.2
Upstream Blk Time (%)		0						
Queuing Penalty (veh)		1						
Storage Bay Dist (m)			35.0	27.0				
Storage Blk Time (%)			0	0	9			
Queuing Penalty (veh)			0	0	9			

Intersection: 12: Lake Shore Blvd W & Mr. Christie's East Driveway

Movement	EB	EB	WB	WB
Directions Served	LT	T	T	TR
Maximum Queue (m)	64.0	79.6	59.2	69.5
Average Queue (m)	61.6	62.5	18.6	24.6
95th Queue (m)	63.5	82.5	56.3	73.6
Link Distance (m)	59.9	59.9	59.2	59.2
Upstream Blk Time (%)	54	11	0	2
Queuing Penalty (veh)	338	69	0	10
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: Lake Shore Blvd W & Mr. Christie's West Driveway

Movement	EB	EB	B42	B42	SB
Directions Served	LT	T	T	T	LR
Maximum Queue (m)	108.6	88.9	123.2	140.5	79.1
Average Queue (m)	104.1	44.5	101.4	61.8	70.8
95th Queue (m)	107.9	97.0	145.9	151.2	80.9
Link Distance (m)	81.3	81.3	115.3	115.3	76.1
Upstream Blk Time (%)	71	4	24	4	45
Queuing Penalty (veh)	516	26	116	18	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Queuing and Blocking Report  
 Future Backg. Traffic PM Peak Hour, Interim Scenario

2/20/2014

Intersection: 19: Gardiner Expwy EB Off-ramp &

Movement	EB	EB	WB	NB
Directions Served	T	T	L	R
Maximum Queue (m)	285.9	285.0	28.4	16.7
Average Queue (m)	55.7	62.6	15.7	2.4
95th Queue (m)	211.5	213.3	28.4	12.1
Link Distance (m)	282.0	282.0	243.2	195.7
Upstream Blk Time (%)	0	0		
Queuing Penalty (veh)	0	0		
Storage Bay Dist (m)				
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 21: Menkes- Kraft Driveway & Park Lawn Rd

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LR	L	T	TR	LT	T	TR
Maximum Queue (m)	13.4	13.4	13.6	12.1	34.3	19.8	73.4	69.3	34.4
Average Queue (m)	3.0	6.5	6.9	5.5	17.5	11.9	34.5	19.9	18.2
95th Queue (m)	11.2	12.0	12.9	12.1	35.0	22.0	66.4	55.9	34.6
Link Distance (m)	91.7	91.7	98.4		188.4	188.4	140.7	140.7	140.7
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)				30.0					
Storage Blk Time (%)					1				
Queuing Penalty (veh)					1				

Intersection: 30: Lake Shore Blvd W & Legion Rd South

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	TR	LT	TR	LR	L	TR
Maximum Queue (m)	249.3	249.6	52.8	72.4	59.8	99.8	296.1
Average Queue (m)	247.9	241.8	43.1	58.2	38.8	96.4	217.4
95th Queue (m)	248.9	247.0	54.7	71.0	64.7	105.3	381.4
Link Distance (m)	245.0	245.0	282.6	282.6	126.6		291.5
Upstream Blk Time (%)	99	99					43
Queuing Penalty (veh)	0	0					0
Storage Bay Dist (m)						50.0	
Storage Blk Time (%)						100	
Queuing Penalty (veh)						119	

**Intersection: 32: Lake Shore Blvd W & Street B**

Movement	EB	EB	NB
Directions Served	T	TR	R
Maximum Queue (m)	15.1	21.5	8.2
Average Queue (m)	9.9	11.4	3.4
95th Queue (m)	13.4	25.7	8.8
Link Distance (m)	4.8	4.8	89.0
Upstream Blk Time (%)	56	15	
Queuing Penalty (veh)	349	91	
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 34: Lake Shore Blvd W & Gardiner Expy WB Off-Ramp**

Movement	EB	EB	EB	B2	B2	WB	NB	NB	SB	SB
Directions Served	L	T	TR	T	T	TR	L	TR	LT	R
Maximum Queue (m)	22.1	52.1	16.5	38.0	16.9	38.1	27.2	15.0	21.3	123.4
Average Queue (m)	18.7	46.9	6.0	37.9	2.4	22.5	13.2	7.6	17.4	26.2
95th Queue (m)	23.6	50.4	15.7	38.2	12.1	45.2	27.6	16.1	24.0	96.2
Link Distance (m)		24.6	24.6	16.8	16.8	58.1		81.2	118.8	118.8
Upstream Blk Time (%)	8	63		61	0					3
Queuing Penalty (veh)	0	397		383	1					0
Storage Bay Dist (m)	70.0						30.0			
Storage Blk Time (%)	8	63					0			
Queuing Penalty (veh)	35	166					0			

**Intersection: 37: Lake Shore Blvd W & Marine Parade Dr.**

Movement	NB	NB
Directions Served	L	R
Maximum Queue (m)	11.9	11.0
Average Queue (m)	5.2	4.7
95th Queue (m)	11.5	9.5
Link Distance (m)		129.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)	15.0	
Storage Blk Time (%)	0	0
Queuing Penalty (veh)	0	0

Queuing and Blocking Report  
 Future Backg. Traffic PM Peak Hour, Interim Scenario

2/20/2014

Intersection: 38: Lake Shore Blvd W & Palace Pier Crt

Movement	EB	EB	NB	NB
Directions Served	T	R	L	R
Maximum Queue (m)	41.2	9.3	21.7	7.0
Average Queue (m)	25.6	7.8	7.3	3.8
95th Queue (m)	45.0	13.0	19.9	9.3
Link Distance (m)	117.2			134.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)		30.0	15.0	
Storage Blk Time (%)	5		4	
Queuing Penalty (veh)	10		1	

Intersection: 40: Marine parade Dr. & Marine Parade Dr.

Movement	SB
Directions Served	LR
Maximum Queue (m)	6.4
Average Queue (m)	1.8
95th Queue (m)	6.6
Link Distance (m)	129.1
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 48: Lake Shore Blvd W & Street A

Movement	EB	EB	WB	B2	B2	B2
Directions Served	T	TR	T	T	T	
Maximum Queue (m)	86.0	74.4	38.5	18.8	17.6	52.4
Average Queue (m)	72.6	47.6	5.5	2.7	6.6	16.3
95th Queue (m)	87.6	87.5	27.8	13.6	19.3	52.0
Link Distance (m)	59.2	59.2	16.8	24.6	24.6	24.6
Upstream Blk Time (%)	59	14	2	0		3
Queuing Penalty (veh)	363	85	12	0		15
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 50: Marine Parade Dr. & Street B

Movement	EB
Directions Served	T
Maximum Queue (m)	9.2
Average Queue (m)	1.3
95th Queue (m)	6.6
Link Distance (m)	119.0
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 52: Marine Parade Dr. & Street A

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (m)	8.6	9.2
Average Queue (m)	1.2	2.6
95th Queue (m)	6.2	9.5
Link Distance (m)		49.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)	50.0	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 4780
------------------------------------

# Appendix G

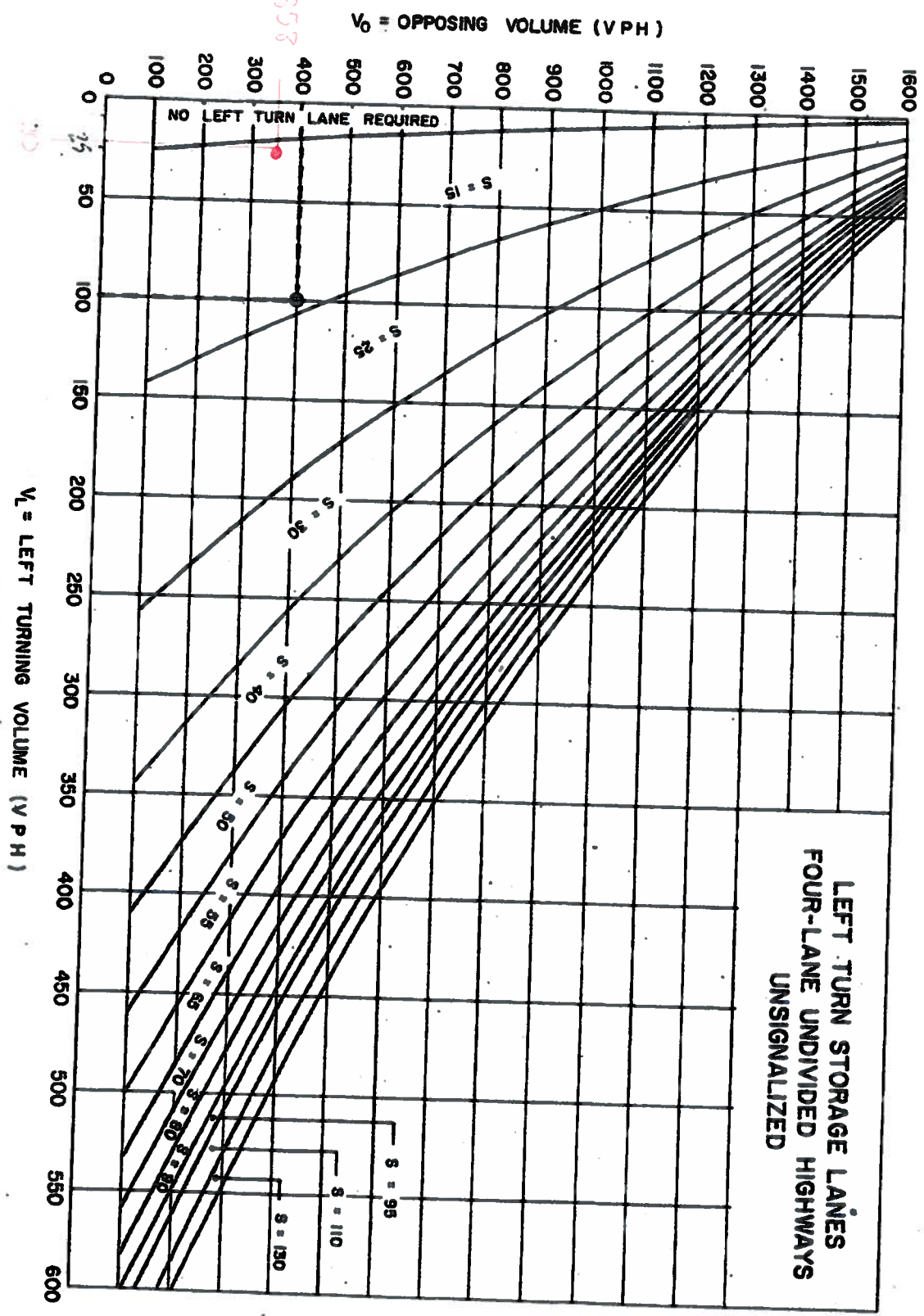
Left Turn Lane Warrant Analysis,  
Interim Scenario

Interim - AM Peak - Marine Parade Drive / Street B

9406

EB-2

Figure EB-1



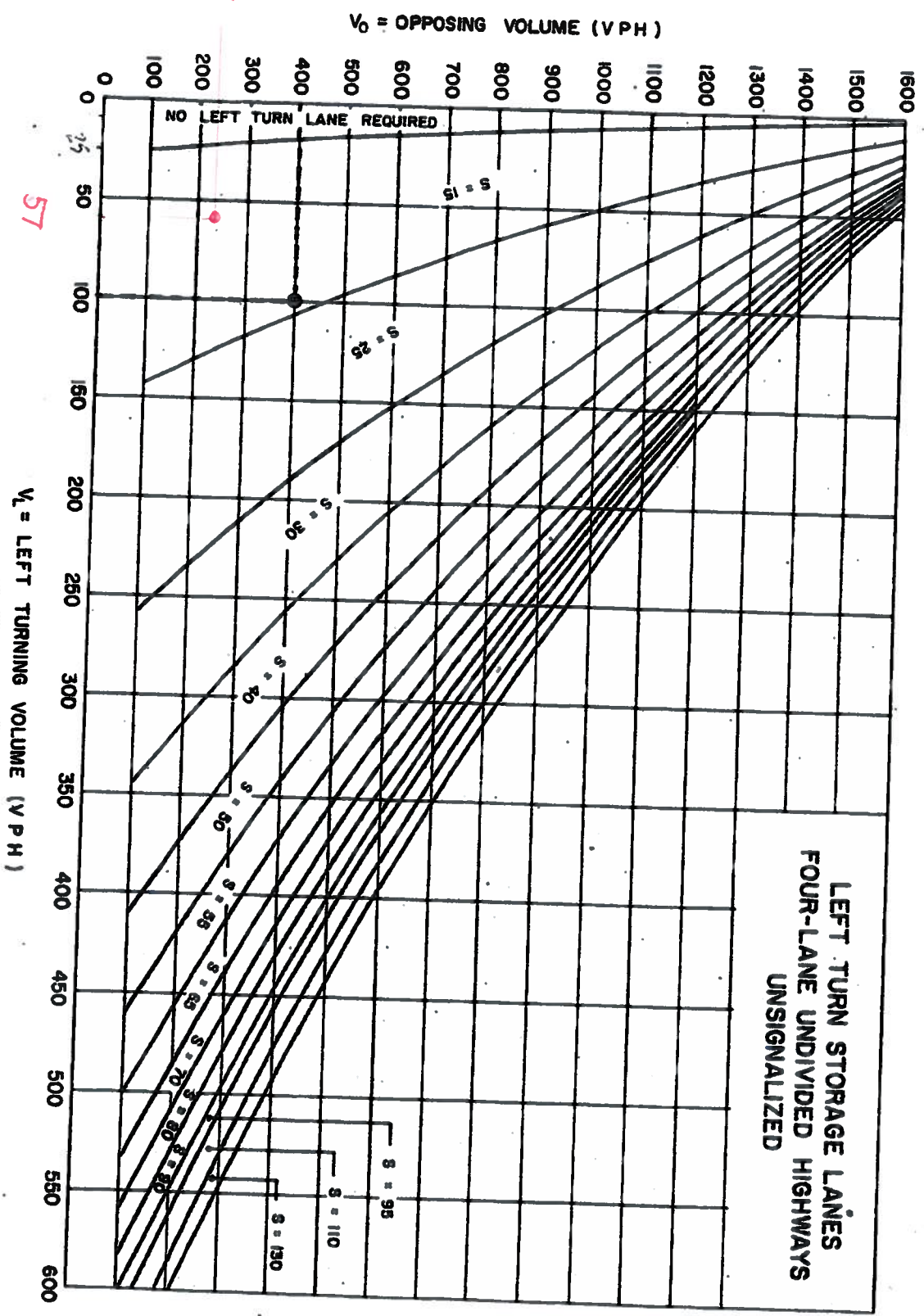
Interim - PM Peak - Marine Parade Drive / Street B

94-06

EB-2

Figure EB-1

227



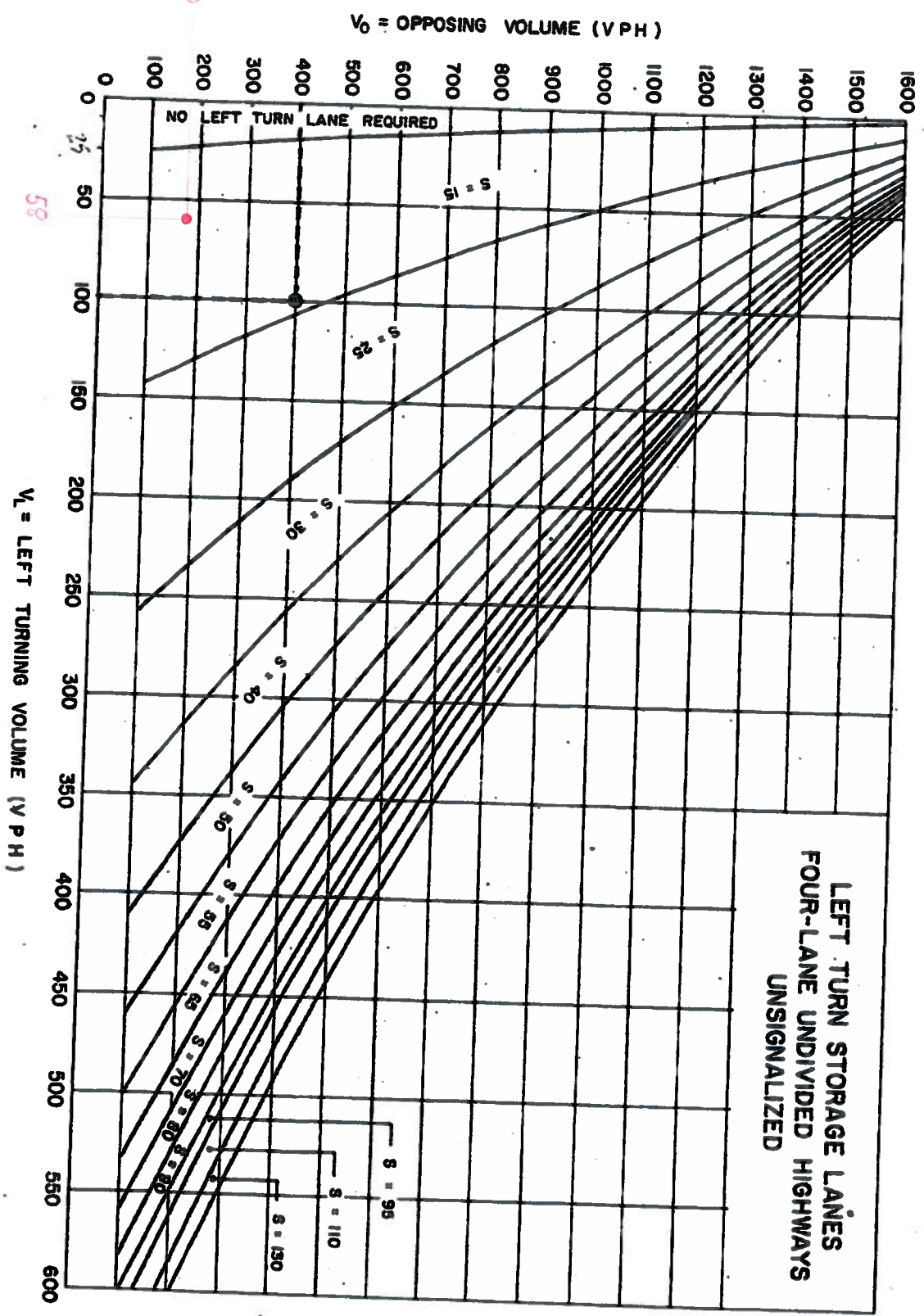


Interim - AM Peak - Marine Parade Drive / Street A

94-06

EB-2

Figure EB-1



130

58

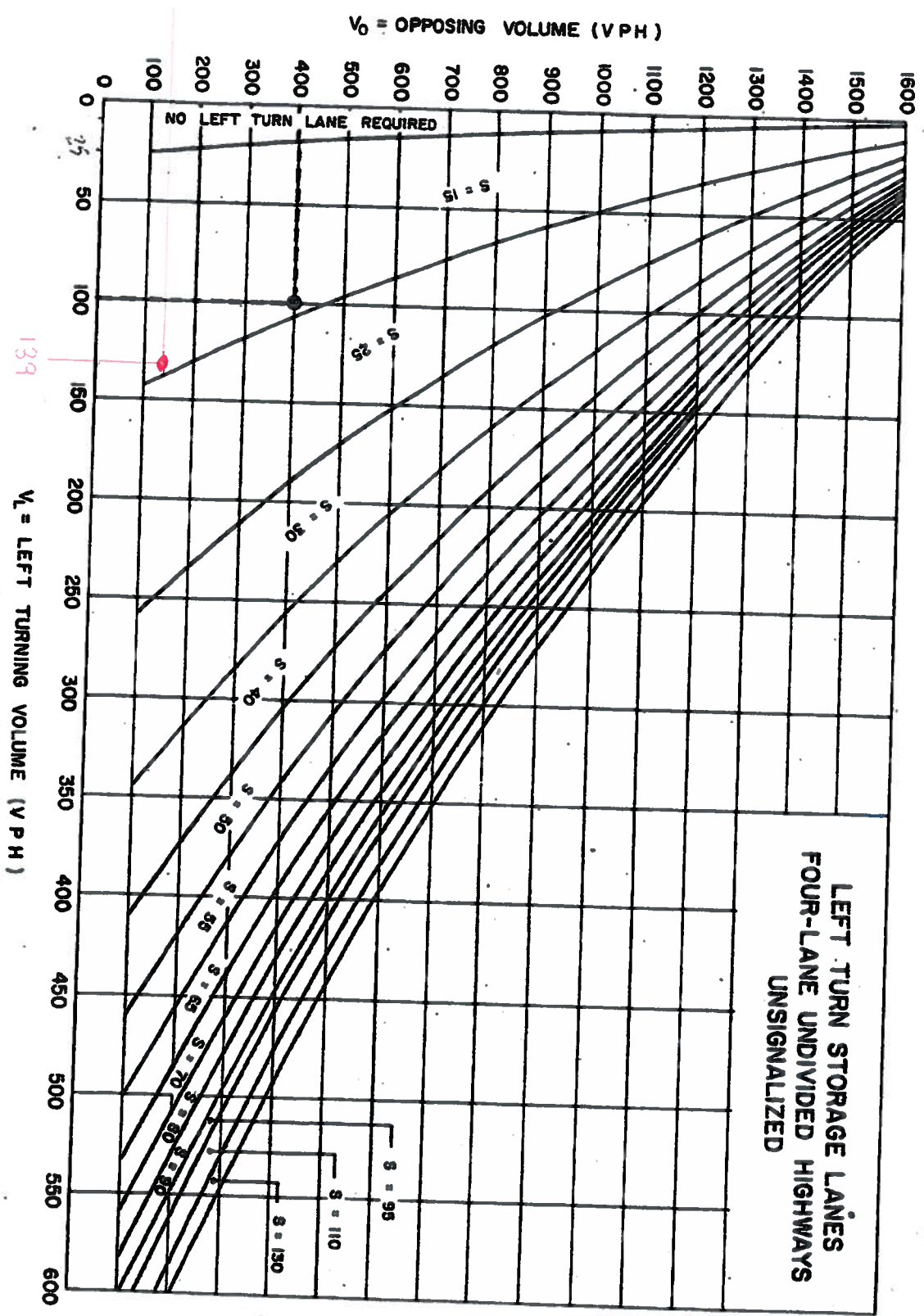
Interim - PM Peak - Marine Parade Drive / Street A

84-08

EB-2

Figure EB-1

135



# Appendix H

Intersection Capacity and  
Queuing Analysis, Future Total  
Traffic Interim Scenario

# Timings

## 3: Lake Shore Blvd W & Park Lawn Rd

3/24/2014

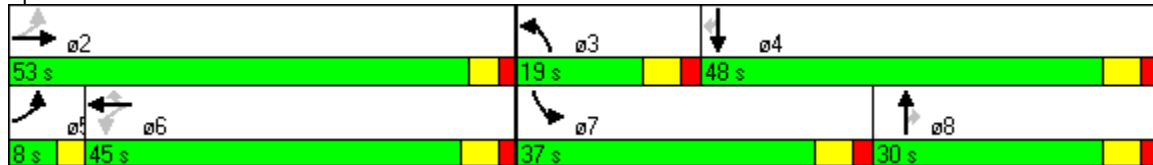


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔↔		↔↔	↔	↔	↑	↔	↔↔	↑	↔
Volume (vph)	424	1295	6	450	414	123	300	15	1109	90	528
Turn Type	pm+pt		Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		6		3	8		7	4	
Permitted Phases	2		6		6			8			4
Detector Phase	5	2	6	6	6	3	8	8	7	4	4
Switch Phase											
Minimum Initial (s)	4.0	10.0	10.0	10.0	10.0	4.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	8.0	28.0	28.0	28.0	28.0	10.0	30.0	30.0	30.0	30.0	30.0
Total Split (s)	8.0	53.0	45.0	45.0	45.0	19.0	30.0	30.0	37.0	48.0	48.0
Total Split (%)	6.7%	44.2%	37.5%	37.5%	37.5%	15.8%	25.0%	25.0%	30.8%	40.0%	40.0%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes					
Recall Mode	None	C-Min	Min	Min	Min	None	Min	Min	Min	Min	Min
Act Effct Green (s)		48.8		47.8	47.8	12.3	23.2	23.2	31.0	41.8	41.8
Actuated g/C Ratio		0.41		0.40	0.40	0.10	0.19	0.19	0.26	0.35	0.35
v/c Ratio		1.44dl		0.42	0.50	0.78	0.91	0.06	1.34	0.18	0.87
Control Delay		170.3		30.8	7.2	82.5	76.4	29.4	190.4	31.9	43.6
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		170.3		30.8	7.2	82.5	76.4	29.4	190.4	31.9	43.6
LOS		F		C	A	F	E	C	F	C	D
Approach Delay		170.3		19.6			76.5			137.2	
Approach LOS		F		B			E			F	

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 35 (29%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.34  
 Intersection Signal Delay: 122.7  
 Intersection LOS: F  
 Intersection Capacity Utilization 114.5%  
 ICU Level of Service H  
 Analysis Period (min) 15  
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

### Splits and Phases: 3: Lake Shore Blvd W & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 3: Lake Shore Blvd W & Park Lawn Rd

3/24/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↕↔			↔↕	↔↕	↔↕	↕	↔↕	↔↕↔	↕	↔↕
Volume (vph)	424	1295	66	6	450	414	123	300	15	1109	90	528
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			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	1.00	1.00	1.00	0.97	1.00	1.00
Frbp, ped/bikes		1.00			1.00	0.98	1.00	1.00	0.99	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	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4931			3425	1544	1641	1827	1476	3400	1557	1378
Flt Permitted		0.72			0.84	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3575			2865	1544	1641	1827	1476	3400	1557	1378
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	451	1378	70	6	479	440	131	319	16	1180	96	562
RTOR Reduction (vph)	0	4	0	0	0	265	0	0	5	0	0	165
Lane Group Flow (vph)	0	1895	0	0	485	175	131	319	11	1180	96	397
Confl. Peds. (#/hr)	1		14	14		1	59					59
Confl. Bikes (#/hr)			14			3			1			10
Heavy Vehicles (%)	4%	3%	2%	33%	5%	3%	10%	4%	8%	3%	22%	5%
Bus Blockages (#/hr)	16	0	0	10	0	0	0	0	0	0	0	0
Turn Type	pm+pt			Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2			6		3	8		7		4
Permitted Phases	2			6		6			8			4
Actuated Green, G (s)		48.8			47.8	47.8	12.3	23.2	23.2	31.0	41.9	41.9
Effective Green, g (s)		48.8			47.8	47.8	12.3	23.2	23.2	31.0	41.9	41.9
Actuated g/C Ratio		0.41			0.40	0.40	0.10	0.19	0.19	0.26	0.35	0.35
Clearance Time (s)		5.0			6.0	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	3.0	3.0
Lane Grp Cap (vph)		1454			1141	615	168	353	285	878	544	481
v/s Ratio Prot							0.08	0.17		c0.35		0.06
v/s Ratio Perm		c0.53			0.17	0.11			0.01			c0.29
v/c Ratio		1.44dl			0.43	0.28	0.78	0.90	0.04	1.34	0.18	0.82
Uniform Delay, d1		35.6			26.1	24.5	52.5	47.3	39.3	44.5	27.1	35.7
Progression Factor		0.95			1.11	2.21	1.02	0.99	0.98	0.76	1.14	1.66
Incremental Delay, d2		140.0			0.3	0.3	20.1	25.4	0.1	160.2	0.1	7.9
Delay (s)		173.6			29.4	54.3	73.8	72.2	38.4	194.2	31.0	67.1
Level of Service		F			C	D	E	E	D	F	C	E
Approach Delay (s)		173.6			41.2			71.5			146.8	
Approach LOS		F			D			E			F	

### Intersection Summary

HCM Average Control Delay	130.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	114.5%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

# Timings

## 5: The Queensway & Park Lawn Rd

3/24/2014

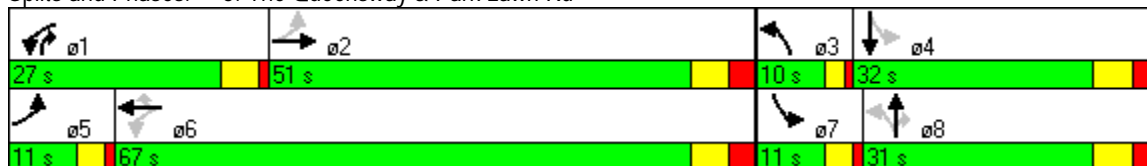


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↕	↖	↕	↗	↖	↕	↗	↖	↕
Volume (vph)	115	880	305	483	35	125	293	522	112	437
Turn Type	pm+pt		pm+pt		Perm	pm+pt		pm+ov	pm+pt	
Protected Phases	5	2	1	6		3	8	1	7	4
Permitted Phases	2		6		6	8	8	8	4	
Detector Phase	5	2	1	6	6	3	8	1	7	4
Switch Phase										
Minimum Initial (s)	7.0	10.0	7.0	10.0	10.0	7.0	10.0	7.0	7.0	10.0
Minimum Split (s)	11.0	30.0	12.0	30.0	30.0	10.0	29.0	12.0	11.0	32.0
Total Split (s)	11.0	51.0	27.0	67.0	67.0	10.0	31.0	27.0	11.0	32.0
Total Split (%)	9.2%	42.5%	22.5%	55.8%	55.8%	8.3%	25.8%	22.5%	9.2%	26.7%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	2.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	3.0	1.0	3.0	3.0	1.0	3.0	1.0	1.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	5.0	7.0	7.0	3.0	7.0	5.0	4.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?										
Recall Mode	Min	C-Min	Min	Min	Min	Min	Min	Min	Min	Min
Act Effect Green (s)	56.2	46.0	73.8	60.6	60.6	34.4	23.0	45.7	34.1	23.8
Actuated g/C Ratio	0.47	0.38	0.62	0.50	0.50	0.29	0.19	0.38	0.28	0.20
v/c Ratio	0.27	0.88	0.90	0.29	0.05	0.69	0.88	0.89	0.57	0.87
Control Delay	13.0	43.0	60.2	17.9	6.8	47.6	66.5	36.3	42.8	57.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	43.0	60.2	17.9	6.8	47.6	66.5	36.3	42.8	57.7
LOS	B	D	E	B	A	D	E	D	D	E
Approach Delay		40.1		33.1			47.2			55.3
Approach LOS		D		C			D			E

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 54 (45%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 95  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 43.2  
 Intersection LOS: D  
 Intersection Capacity Utilization 91.2%  
 ICU Level of Service F  
 Analysis Period (min) 15

### Splits and Phases: 5: The Queensway & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 5: The Queensway & Park Lawn Rd

3/24/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗	↗	↖	↗	
Volume (vph)	115	880	209	305	483	35	125	293	522	112	437	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		5.0	7.0	7.0	3.0	7.0	5.0	4.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1685	3338		1687	3471	1289	1769	1810	1485	1736	3364	
Flt Permitted	0.47	1.00		0.08	1.00	1.00	0.19	1.00	1.00	0.25	1.00	
Satd. Flow (perm)	829	3338		142	3471	1289	356	1810	1485	448	3364	
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)	120	917	218	318	503	36	130	305	544	117	455	147
RTOR Reduction (vph)	0	17	0	0	0	14	0	0	45	0	26	0
Lane Group Flow (vph)	120	1118	0	318	503	22	130	305	499	117	576	0
Confl. Peds. (#/hr)	4		18	18		4	2					2
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	7%	5%	1%	7%	4%	23%	2%	5%	8%	4%	2%	6%
Turn Type	pm+pt			pm+pt		Perm	pm+pt		pm+ov		pm+pt	
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases	2			6		6	8	8	8	4		
Actuated Green, G (s)	53.1	46.0		71.7	60.6	60.6	30.4	23.0	43.7	31.2	23.9	
Effective Green, g (s)	53.1	46.0		71.7	60.6	60.6	30.4	23.0	43.7	31.2	23.9	
Actuated g/C Ratio	0.44	0.38		0.60	0.51	0.51	0.25	0.19	0.36	0.26	0.20	
Clearance Time (s)	4.0	7.0		5.0	7.0	7.0	3.0	7.0	5.0	4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	417	1280		351	1753	651	177	347	541	195	670	
v/s Ratio Prot	0.02	0.34		0.16	0.14		c0.05	0.17	c0.16	0.04	0.17	
v/s Ratio Perm	0.11			c0.39		0.02	0.14		0.18	0.12		
v/c Ratio	0.29	0.87		0.91	0.29	0.03	0.73	0.88	0.92	0.60	0.86	
Uniform Delay, d1	20.1	34.3		36.1	17.2	15.0	36.9	47.1	36.5	36.1	46.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.90	0.86	0.65	1.00	1.00	
Incremental Delay, d2	0.4	8.5		25.8	0.1	0.0	14.2	20.9	21.0	4.9	10.7	
Delay (s)	20.5	42.8		61.9	17.3	15.0	47.6	61.5	44.9	41.0	57.1	
Level of Service	C	D		E	B	B	D	E	D	D	E	
Approach Delay (s)		40.6			33.7			50.4			54.5	
Approach LOS		D			C			D			D	

### Intersection Summary

HCM Average Control Delay	44.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 8: Gardiner Exwy WB On-ramp & Park Lawn Rd

3/24/2014

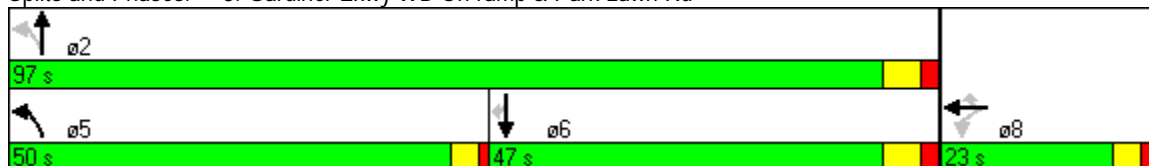


Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↑↑	↑↑	↗
Volume (vph)	67	27	769	835	276	497
Turn Type		Perm	pm+pt			Perm
Protected Phases	8		5	2	6	
Permitted Phases		8	2			6
Detector Phase	8	8	5	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.0	23.0	10.0	23.0	23.0	23.0
Total Split (s)	23.0	23.0	50.0	97.0	47.0	47.0
Total Split (%)	19.2%	19.2%	41.7%	80.8%	39.2%	39.2%
Yellow Time (s)	3.0	3.0	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	6.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?						
Recall Mode	Min	Min	Max	C-Max	C-Min	C-Min
Act Effect Green (s)	12.7	12.7	98.3	96.3	41.0	41.0
Actuated g/C Ratio	0.11	0.11	0.82	0.80	0.34	0.34
v/c Ratio	0.59	0.18	0.72	0.33	0.25	0.74
Control Delay	67.8	18.4	11.9	5.1	19.9	10.7
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0
Total Delay	67.8	18.4	12.3	5.1	19.9	10.7
LOS	E	B	B	A	B	B
Approach Delay	54.9			8.5	14.0	
Approach LOS	D			A	B	

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 22 (18%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.74  
 Intersection Signal Delay: 12.1  
 Intersection LOS: B  
 Intersection Capacity Utilization 90.4%  
 ICU Level of Service E  
 Analysis Period (min) 15

### Splits and Phases: 8: Gardiner Exwy WB On-ramp & Park Lawn Rd





# HCM Signalized Intersection Capacity Analysis

## 8: Gardiner Exwy WB On-ramp & Park Lawn Rd

3/24/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↖	↗	↖	↗			↖	↗
Volume (vph)	0	0	0	8	67	27	769	835	0	0	276	497
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0	4.0	6.0			6.0	6.0
Lane Util. Factor					1.00	1.00	1.00	0.95			0.95	1.00
Frbp, ped/bikes					1.00	1.00	1.00	1.00			1.00	0.96
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					1268	1214	1761	3343			3438	1508
Flt Permitted					0.99	1.00	0.51	1.00			1.00	1.00
Satd. Flow (perm)					1268	1214	937	3343			3438	1508
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	8	71	28	809	879	0	0	291	523
RTOR Reduction (vph)	0	0	0	0	0	25	0	0	0	0	0	196
Lane Group Flow (vph)	0	0	0	0	79	3	809	879	0	0	291	327
Confl. Peds. (#/hr)							5					5
Heavy Vehicles (%)	0%	0%	0%	50%	49%	33%	2%	8%	0%	0%	5%	3%
Turn Type				Perm		Perm	pm+pt					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Actuated Green, G (s)					12.7	12.7	96.3	96.3			41.0	41.0
Effective Green, g (s)					12.7	12.7	96.3	96.3			41.0	41.0
Actuated g/C Ratio					0.11	0.11	0.80	0.80			0.34	0.34
Clearance Time (s)					5.0	5.0	4.0	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)					134	128	1104	2683			1175	515
v/s Ratio Prot							c0.31	0.26			0.08	
v/s Ratio Perm					0.06	0.00	c0.27					0.22
v/c Ratio					0.59	0.02	0.73	0.33			0.25	0.64
Uniform Delay, d1					51.2	48.1	4.8	3.2			28.4	33.2
Progression Factor					1.00	1.00	1.75	1.37			0.69	0.49
Incremental Delay, d2					6.5	0.1	3.6	0.3			0.3	3.0
Delay (s)					57.7	48.2	12.0	4.6			19.7	19.3
Level of Service					E	D	B	A			B	B
Approach Delay (s)		0.0			55.2			8.2			19.5	
Approach LOS		A			E			A			B	

Intersection Summary			
HCM Average Control Delay	13.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# Timings

## 10: Gardiner EB Off-ramp & Park Lawn Rd

3/24/2014



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations	↖↗	↗	↖	↑↑	↑↓
Volume (vph)	610	976	33	1072	361
Turn Type		Free	Perm		
Protected Phases	4			2	6
Permitted Phases		Free	2		
Detector Phase	4		2	2	6
Switch Phase					
Minimum Initial (s)	19.0		4.0	4.0	4.0
Minimum Split (s)	30.0		30.0	30.0	30.0
Total Split (s)	48.0	0.0	72.0	72.0	72.0
Total Split (%)	40.0%	0.0%	60.0%	60.0%	60.0%
Yellow Time (s)	3.0		4.0	4.0	4.0
All-Red Time (s)	2.0		3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	7.0	7.0	7.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max		Max	Max	Max
Act Effect Green (s)	43.0	120.0	65.0	65.0	65.0
Actuated g/C Ratio	0.36	1.00	0.54	0.54	0.54
v/c Ratio	0.55	0.67	0.07	0.60	0.22
Control Delay	32.9	2.3	2.7	4.1	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	2.3	2.7	4.1	10.5
LOS	C	A	A	A	B
Approach Delay	14.1			4.1	10.5
Approach LOS	B			A	B

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 4:EBL, Start of Green, Master Intersection  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.67  
 Intersection Signal Delay: 10.0  
 Intersection LOS: B  
 Intersection Capacity Utilization 57.1%  
 ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 10: Gardiner EB Off-ramp & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 10: Gardiner EB Off-ramp & Park Lawn Rd

3/24/2014



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	610	976	33	1072	361	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0	7.0	7.0	7.0	
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	
Frbp, ped/bikes	1.00	0.99	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3303	1545	1680	3505	3432	
Flt Permitted	0.95	1.00	0.51	1.00	1.00	
Satd. Flow (perm)	3303	1545	905	3505	3432	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	649	1038	35	1140	384	20
RTOR Reduction (vph)	0	0	0	0	3	0
Lane Group Flow (vph)	649	1038	35	1140	401	0
Confl. Peds. (#/hr)		2	7			7
Confl. Bikes (#/hr)		9				7
Heavy Vehicles (%)	6%	3%	6%	3%	4%	7%
Turn Type		Free	Perm			
Protected Phases	4			2	6	
Permitted Phases		Free	2			
Actuated Green, G (s)	43.0	120.0	65.0	65.0	65.0	
Effective Green, g (s)	43.0	120.0	65.0	65.0	65.0	
Actuated g/C Ratio	0.36	1.00	0.54	0.54	0.54	
Clearance Time (s)	5.0		7.0	7.0	7.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1184	1545	490	1899	1859	
v/s Ratio Prot	0.20			0.33	0.12	
v/s Ratio Perm		c0.67	0.04			
v/c Ratio	0.55	0.67	0.07	0.60	0.22	
Uniform Delay, d1	30.7	0.0	13.1	18.7	14.3	
Progression Factor	1.00	1.00	0.18	0.15	0.73	
Incremental Delay, d2	1.8	2.3	0.2	1.2	0.3	
Delay (s)	32.6	2.3	2.6	4.1	10.6	
Level of Service	C	A	A	A	B	
Approach Delay (s)	14.0			4.0	10.6	
Approach LOS	B			A	B	

### Intersection Summary

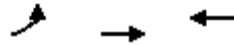
HCM Average Control Delay	10.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 12: Lake Shore Blvd W & Mr. Christie's East Driveway

3/24/2014

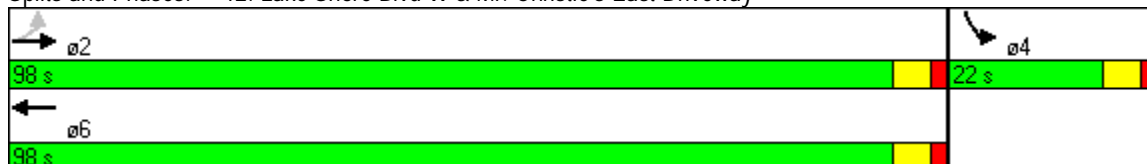


Lane Group	EBL	EBT	WBT	ø4
Lane Configurations		↕↕	↕↕	
Volume (vph)	13	2122	713	
Turn Type	Perm			
Protected Phases		2	6	4
Permitted Phases	2			
Detector Phase	2	2	6	
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0
Total Split (s)	98.0	98.0	98.0	22.0
Total Split (%)	81.7%	81.7%	81.7%	18%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)		120.0	120.0	
Actuated g/C Ratio		1.00	1.00	
v/c Ratio		0.71	0.22	
Control Delay		1.7	0.1	
Queue Delay		0.0	0.0	
Total Delay		1.7	0.1	
LOS		A	A	
Approach Delay		1.7	0.1	
Approach LOS		A	A	

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.71  
 Intersection Signal Delay: 1.3  
 Intersection Capacity Utilization 82.0%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service E

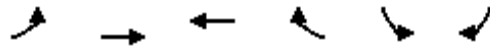
### Splits and Phases: 12: Lake Shore Blvd W & Mr. Christie's East Driveway



# HCM Signalized Intersection Capacity Analysis

## 12: Lake Shore Blvd W & Mr. Christie's East Driveway

3/24/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↔		↔↔	
Volume (vph)	13	2122	713	3	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0			
Lane Util. Factor		0.95	0.95			
Frbp, ped/bikes		1.00	1.00			
Flpb, ped/bikes		1.00	1.00			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		3469	3470			
Flt Permitted		0.95	1.00			
Satd. Flow (perm)		3291	3470			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	2307	775	3	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	2321	778	0	0	0
Confl. Peds. (#/hr)						3
Heavy Vehicles (%)	8%	4%	4%	0%	0%	0%
Turn Type	Perm					
Protected Phases		2	6		4	
Permitted Phases	2					
Actuated Green, G (s)		120.0	120.0			
Effective Green, g (s)		120.0	120.0			
Actuated g/C Ratio		1.00	1.00			
Clearance Time (s)		6.0	6.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		3291	3470			
v/s Ratio Prot			0.22			
v/s Ratio Perm		c0.71				
v/c Ratio		0.71	0.22			
Uniform Delay, d1		0.0	0.0			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.1	0.1			
Delay (s)		0.1	0.1			
Level of Service		A	A			
Approach Delay (s)		0.1	0.1		0.0	
Approach LOS		A	A		A	
<b>Intersection Summary</b>						
HCM Average Control Delay			0.1		HCM Level of Service	A
HCM Volume to Capacity ratio			0.71			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	0.0
Intersection Capacity Utilization			82.0%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis  
 14: Lake Shore Blvd W & Mr. Christie's West Driveway

3/24/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	
Volume (veh/h)	54	2108	738	23	6	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	57	2243	785	24	6	19
Pedestrians			1			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.2			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)		237	103			
pX, platoon unblocked					0.65	
vC, conflicting volume	810				2035	405
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	810				1516	405
tC, single (s)	4.1				6.8	7.4
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.5
p0 queue free %	93				91	96
cM capacity (veh/h)	812				68	535

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	805	1495	523	286	26
Volume Left	57	0	0	0	6
Volume Right	0	0	0	24	19
cSH	812	1700	1700	1700	197
Volume to Capacity	0.07	0.88	0.31	0.17	0.13
Queue Length 95th (m)	1.8	0.0	0.0	0.0	3.5
Control Delay (s)	1.8	0.0	0.0	0.0	26.0
Lane LOS	A				D
Approach Delay (s)	0.6		0.0		26.0
Approach LOS					D

Intersection Summary					
Average Delay			0.7		
Intersection Capacity Utilization			94.3%	ICU Level of Service	F
Analysis Period (min)			15		

# Timings

## 19: Gardiner EB Off-ramp &

3/24/2014



Lane Group	EBT	EBR	WBL	NBR
Lane Configurations	↑↑	↗	↘	↗
Volume (vph)	1334	25	49	300
Turn Type		Perm	Prot	Free
Protected Phases	4		3	
Permitted Phases		4		Free
Detector Phase	4	4	3	
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	
Minimum Split (s)	23.0	23.0	9.0	
Total Split (s)	75.0	75.0	15.0	0.0
Total Split (%)	83.3%	83.3%	16.7%	0.0%
Yellow Time (s)	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	
Recall Mode	None	None	None	
Act Effect Green (s)	30.7	30.7	8.2	35.3
Actuated g/C Ratio	0.87	0.87	0.20	1.00
v/c Ratio	0.48	0.02	0.16	0.20
Control Delay	3.3	1.4	19.2	0.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.3	1.4	19.2	0.3
LOS	A	A	B	A
Approach Delay	3.3			
Approach LOS	A			

### Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 35.3	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 3.2	Intersection LOS: A
Intersection Capacity Utilization 44.1%	ICU Level of Service A
Analysis Period (min) 15	

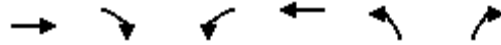
Splits and Phases: 19: Gardiner EB Off-ramp &



# HCM Signalized Intersection Capacity Analysis

## 19: Gardiner EB Off-ramp &

3/24/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↖			↗
Volume (vph)	1334	25	49	0	0	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.95	1.00	1.00			1.00
Frbp, ped/bikes	1.00	0.98	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			0.86
Flt Protected	1.00	1.00	0.95			1.00
Satd. Flow (prot)	3438	1518	1736			1596
Flt Permitted	1.00	1.00	0.95			1.00
Satd. Flow (perm)	3438	1518	1736			1596
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1450	27	53	0	0	326
RTOR Reduction (vph)	0	8	0	0	0	0
Lane Group Flow (vph)	1450	19	53	0	0	326
Confl. Peds. (#/hr)		4	4			
Heavy Vehicles (%)	5%	4%	4%	2%	2%	3%
Turn Type		Perm	Prot			Free
Protected Phases	4		3			
Permitted Phases		4				Free
Actuated Green, G (s)	25.6	25.6	2.2			37.8
Effective Green, g (s)	26.6	26.6	3.2			37.8
Actuated g/C Ratio	0.70	0.70	0.08			1.00
Clearance Time (s)	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	2419	1068	147			1596
v/s Ratio Prot	c0.42		0.03			
v/s Ratio Perm		0.01				c0.20
v/c Ratio	0.60	0.02	0.36			0.20
Uniform Delay, d1	2.9	1.7	16.3			0.0
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.4	0.0	1.5			0.3
Delay (s)	3.3	1.7	17.8			0.3
Level of Service	A	A	B			A
Approach Delay (s)	3.2			17.8	0.3	
Approach LOS	A			B	A	

### Intersection Summary

HCM Average Control Delay	3.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	37.8	Sum of lost time (s)	4.0
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



# Timings

## 21: Menkes- Kraft Driveway & Park Lawn Rd

3/24/2014

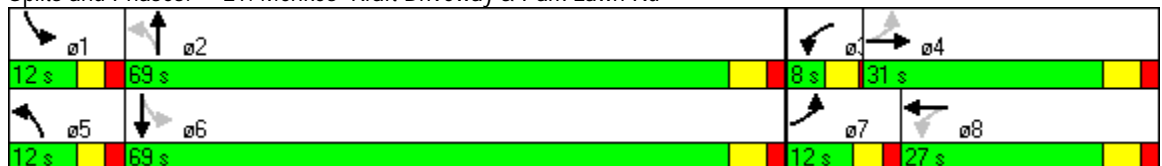


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	ø3
Lane Configurations	↖	↗	↔	↖	↕		↕	
Volume (vph)	9	0	0	17	1121	77	1709	
Turn Type	pm+pt			pm+pt		pm+pt		
Protected Phases	7	4	8	5	2	1	6	3
Permitted Phases	4			2		6		
Detector Phase	7	4	8	5	2	1	6	
Switch Phase								
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	10.0	4.0
Minimum Split (s)	12.0	27.0	27.0	12.0	30.0	12.0	30.0	8.0
Total Split (s)	12.0	31.0	27.0	12.0	69.0	12.0	69.0	8.0
Total Split (%)	10.0%	25.8%	22.5%	10.0%	57.5%	10.0%	57.5%	7%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.0	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	5.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?								
Recall Mode	Min	Min	Min	Min	C-Min	Min	C-Min	None
Act Effect Green (s)	23.0	22.0	10.0	82.0	74.0		80.0	
Actuated g/C Ratio	0.19	0.18	0.08	0.68	0.62		0.67	
v/c Ratio	0.04	0.29	0.07	0.08	0.55		0.73	
Control Delay	40.1	17.6	0.4	3.4	10.9		10.4	
Queue Delay	0.0	0.0	0.0	0.0	0.5		0.0	
Total Delay	40.1	17.6	0.4	3.4	11.4		10.4	
LOS	D	B	A	A	B		B	
Approach Delay		19.6	0.4		11.3		10.4	
Approach LOS		B	A		B		B	

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 62 (52%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 95  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 11.0  
 Intersection LOS: B  
 Intersection Capacity Utilization 89.0%  
 ICU Level of Service E  
 Analysis Period (min) 15

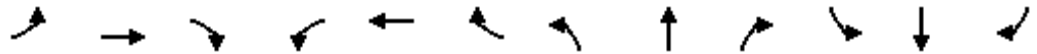
### Splits and Phases: 21: Menkes- Kraft Driveway & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 21: Menkes- Kraft Driveway & Park Lawn Rd

3/24/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↔		↖	↗			↖↗↔	
Volume (vph)	9	0	96	0	0	21	17	1121	0	77	1709	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0			6.0		5.0	6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95			0.91	
Frt	1.00	0.85			0.86		1.00	1.00			1.00	
Flt Protected	0.95	1.00			1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1583			1611		1770	3539			5073	
Flt Permitted	0.50	1.00			1.00		0.10	1.00			0.75	
Satd. Flow (perm)	923	1583			1611		178	3539			3825	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	10	0	102	0	0	22	18	1193	0	82	1818	4
RTOR Reduction (vph)	0	60	0	0	20	0	0	0	0	0	0	0
Lane Group Flow (vph)	10	42	0	0	2	0	18	1193	0	0	1904	0
Heavy Vehicles (%)	2%	0%	2%	0%	0%	2%	2%	2%	0%	2%	2%	2%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.0	22.0			10.0		81.0	74.0			81.0	
Effective Green, g (s)	22.0	22.0			10.0		81.0	74.0			81.0	
Actuated g/C Ratio	0.18	0.18			0.08		0.68	0.62			0.68	
Clearance Time (s)	5.0	6.0			6.0		5.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	219	290			134		213	2182			2655	
v/s Ratio Prot	0.00	c0.03			0.00		0.00	0.34			c0.04	
v/s Ratio Perm	0.01						0.05				c0.44	
v/c Ratio	0.05	0.15			0.01		0.08	0.55			0.72	
Uniform Delay, d1	40.3	41.1			50.5		6.6	13.3			12.3	
Progression Factor	1.00	1.00			1.00		0.63	0.78			0.75	
Incremental Delay, d2	0.1	0.2			0.0		0.1	0.4			0.9	
Delay (s)	40.4	41.4			50.5		4.3	10.8			10.1	
Level of Service	D	D			D		A	B			B	
Approach Delay (s)		41.3			50.5			10.7			10.1	
Approach LOS		D			D			B			B	

### Intersection Summary

HCM Average Control Delay	11.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 30: Lake Shore Blvd W & Legion Rd South

3/24/2014

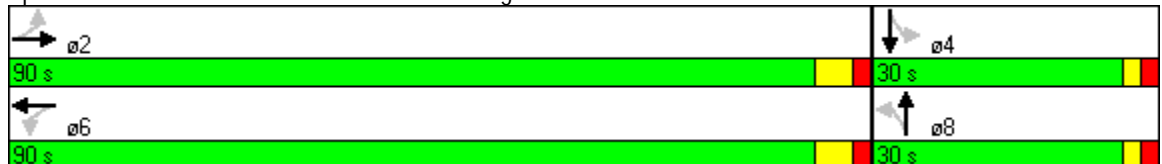


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕↕	↕↕		↕	↕	↕
Volume (vph)	107	1334	1022	18	0	150	0
Turn Type	Perm			Perm		Perm	
Protected Phases		2	6		8		4
Permitted Phases	2			8		4	
Detector Phase	2	2	6	8	8	4	4
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.0	23.0	23.0	30.0	30.0	30.0	30.0
Total Split (s)	90.0	90.0	90.0	30.0	30.0	30.0	30.0
Total Split (%)	75.0%	75.0%	75.0%	25.0%	25.0%	25.0%	25.0%
Yellow Time (s)	4.0	4.0	4.0	2.0	2.0	2.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	C-Min	Min	Min	Min	Min
Act Effct Green (s)		88.8	88.8		21.2	21.2	21.2
Actuated g/C Ratio		0.74	0.74		0.18	0.18	0.18
v/c Ratio		0.90	0.49		0.31	0.80	0.13
Control Delay		22.8	5.3		17.2	75.1	0.7
Queue Delay		0.0	0.0		0.0	0.0	0.0
Total Delay		22.8	5.3		17.2	75.1	0.7
LOS		C	A		B	E	A
Approach Delay		22.8	5.3		17.2		57.1
Approach LOS		C	A		B		E

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 110 (92%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 18.0  
 Intersection Capacity Utilization 101.5%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service G

### Splits and Phases: 30: Lake Shore Blvd W & Legion Rd South



HCM Signalized Intersection Capacity Analysis  
 30: Lake Shore Blvd W & Legion Rd South

3/24/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕		↕	↕	
Volume (vph)	107	1334	1	0	1022	121	18	0	80	150	0	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95			1.00		1.00	1.00	
Frbp, ped/bikes		1.00			1.00			0.98		1.00	0.98	
Flpb, ped/bikes		1.00			1.00			1.00		0.99	1.00	
Frt		1.00			0.98			0.89		1.00	0.85	
Flt Protected		1.00			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		3498			3327			1621		1784	1576	
Flt Permitted		0.65			1.00			0.95		0.60	1.00	
Satd. Flow (perm)		2297			3327			1553		1124	1576	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	114	1419	1	0	1087	129	19	0	85	160	0	51
RTOR Reduction (vph)	0	0	0	0	7	0	0	60	0	0	42	0
Lane Group Flow (vph)	0	1534	0	0	1210	0	0	44	0	160	9	0
Confl. Peds. (#/hr)	7					7	8		10	10		8
Heavy Vehicles (%)	0%	3%	0%	0%	7%	0%	0%	0%	1%	0%	0%	0%
Bus Blockages (#/hr)	16	0	0	10	0	0	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		88.8			88.8			21.2		21.2	21.2	
Effective Green, g (s)		88.8			88.8			21.2		21.2	21.2	
Actuated g/C Ratio		0.74			0.74			0.18		0.18	0.18	
Clearance Time (s)		6.0			6.0			4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		1700			2462			274		199	278	
v/s Ratio Prot					0.36						0.01	
v/s Ratio Perm		c0.67						0.03		c0.14		
v/c Ratio		0.90			0.49			0.16		0.80	0.03	
Uniform Delay, d1		12.2			6.4			41.9		47.4	40.9	
Progression Factor		1.00			0.69			1.00		1.00	1.00	
Incremental Delay, d2		8.2			0.5			0.3		20.5	0.0	
Delay (s)		20.4			4.9			42.1		67.9	41.0	
Level of Service		C			A			D		E	D	
Approach Delay (s)		20.4			4.9			42.1			61.4	
Approach LOS		C			A			D			E	

Intersection Summary

HCM Average Control Delay	17.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	101.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 32: Lake Shore Blvd W & Street B

3/24/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	↗
Volume (veh/h)	2102	12	10	713	48	33
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	2236	13	11	759	51	35
Pedestrians				1	27	
Lane Width (m)				3.6	3.6	
Walking Speed (m/s)				1.2	1.2	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	264			76		
pX, platoon unblocked				0.66	0.66	0.66
vC, conflicting volume	2276			2670	1152	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1902			2500	197	
tC, single (s)	4.1			6.8	6.9	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	95			0	93	
cM capacity (veh/h)	204			15	526	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	1491	758	263	506	51	35
Volume Left	0	0	11	0	51	0
Volume Right	0	13	0	0	0	35
cSH	1700	1700	204	1700	15	526
Volume to Capacity	0.88	0.45	0.05	0.30	3.43	0.07
Queue Length 95th (m)	0.0	0.0	1.3	0.0	Err	1.7
Control Delay (s)	0.0	0.0	2.3	0.0	Err	12.3
Lane LOS	A				F	B
Approach Delay (s)	0.0		0.8		5930.4	
Approach LOS						F

### Intersection Summary

Average Delay	164.8	
Intersection Capacity Utilization	68.8%	ICU Level of Service C
Analysis Period (min)	15	

# Timings

## 34: Lake Shore Blvd. W & Gardiner Expwy Off/On-Ramp

3/24/2014

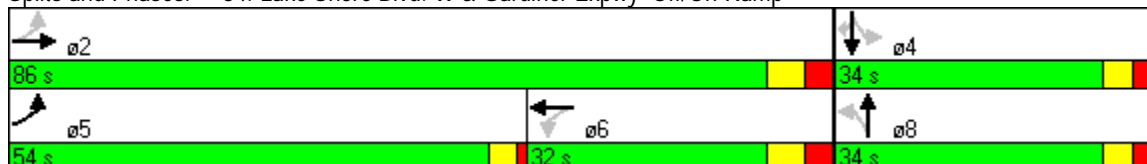


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖	↕	↗	↖	↕		↖	↗
Volume (vph)	673	1445	91	149	72	48	42	431
Turn Type	pm+pt			Perm		Perm		Perm
Protected Phases	5	2	6		8		4	
Permitted Phases	2			8		4		4
Detector Phase	5	2	6	8	8	4	4	4
Switch Phase								
Minimum Initial (s)	6.0	24.0	24.0	13.0	13.0	13.0	13.0	13.0
Minimum Split (s)	10.0	31.0	31.0	27.0	27.0	27.0	27.0	27.0
Total Split (s)	54.0	86.0	32.0	34.0	34.0	34.0	34.0	34.0
Total Split (%)	45.0%	71.7%	26.7%	28.3%	28.3%	28.3%	28.3%	28.3%
Yellow Time (s)	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag					
Lead-Lag Optimize?								
Recall Mode	Min	C-Min	C-Min	Min	Min	Min	Min	Min
Act Effect Green (s)	90.0	87.0	51.9	20.0	20.0		20.0	20.0
Actuated g/C Ratio	0.75	0.72	0.43	0.17	0.17		0.17	0.17
v/c Ratio	0.75	0.63	0.19	0.73	0.38		0.50	0.72
Control Delay	6.3	3.8	19.6	65.5	36.4		53.2	10.4
Queue Delay	0.2	0.7	0.0	0.0	0.0		0.0	0.0
Total Delay	6.6	4.5	19.6	65.5	36.4		53.2	10.4
LOS	A	A	B	E	D		D	B
Approach Delay		5.1	19.6		48.7		17.8	
Approach LOS		A	B		D		B	

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 17 (14%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.75  
 Intersection Signal Delay: 12.7  
 Intersection LOS: B  
 Intersection Capacity Utilization 104.1%  
 ICU Level of Service G  
 Analysis Period (min) 15

### Splits and Phases: 34: Lake Shore Blvd. W & Gardiner Expwy Off/On-Ramp



# HCM Signalized Intersection Capacity Analysis

## 34: Lake Shore Blvd. W & Gardiner Expwy Off/On-Ramp

3/24/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗			↖	↗
Volume (vph)	673	1445	25	0	91	39	149	72	131	48	42	431
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0			7.0		6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	0.95			1.00		1.00	0.95			1.00	1.00
Frbp, ped/bikes	1.00	1.00			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	1.00
Frt	1.00	1.00			0.95		1.00	0.90			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1656	3461			1718		1805	3260			1655	1568
Flt Permitted	0.62	1.00			1.00		0.69	1.00			0.68	1.00
Satd. Flow (perm)	1081	3461			1718		1319	3260			1163	1568
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)	724	1554	27	0	98	42	160	77	141	52	45	463
RTOR Reduction (vph)	0	1	0	0	9	0	0	35	0	0	0	386
Lane Group Flow (vph)	724	1580	0	0	131	0	160	183	0	0	97	77
Confl. Peds. (#/hr)			18	18								
Heavy Vehicles (%)	2%	4%	0%	0%	8%	0%	0%	0%	0%	22%	0%	3%
Bus Blockages (#/hr)	16	0	0	10	0	0	0	0	0	0	0	0
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	87.0	87.0			51.9		20.0	20.0			20.0	20.0
Effective Green, g (s)	87.0	87.0			51.9		20.0	20.0			20.0	20.0
Actuated g/C Ratio	0.72	0.72			0.43		0.17	0.17			0.17	0.17
Clearance Time (s)	4.0	7.0			7.0		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)	933	2509			743		220	543			194	261
v/s Ratio Prot	c0.20	0.46			0.08			0.06				
v/s Ratio Perm	c0.36						c0.12				0.08	0.05
v/c Ratio	0.78	0.63			0.18		0.73	0.34			0.50	0.30
Uniform Delay, d1	8.2	8.4			20.9		47.4	44.1			45.5	43.8
Progression Factor	0.30	0.32			0.77		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.0	0.9			0.5		11.3	0.4			2.0	0.6
Delay (s)	5.4	3.5			16.6		58.8	44.5			47.5	44.5
Level of Service	A	A			B		E	D			D	D
Approach Delay (s)		4.1			16.6			50.5			45.0	
Approach LOS		A			B			D			D	

### Intersection Summary

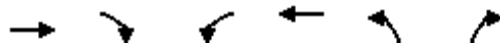
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	104.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 37: Lake Shore Blvd W & Marine Parade Dr.

3/24/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	↻
Volume (veh/h)	1581	34	6	84	30	82
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1647	35	6	88	31	85
Pedestrians					16	
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)	398			136		
pX, platoon unblocked			0.27		0.27	0.27
vC, conflicting volume			1698		1781	1681
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2231		2534	2166
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			90		0	0
cM capacity (veh/h)			63		7	16

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	1682	94	31	85
Volume Left	0	6	31	0
Volume Right	35	0	0	85
cSH	1700	63	7	16
Volume to Capacity	0.99	0.10	4.23	5.48
Queue Length 95th (m)	0.0	2.5	Err	Err
Control Delay (s)	0.0	11.2	Err	Err
Lane LOS		B	F	F
Approach Delay (s)	0.0	11.2	Err	
Approach LOS			F	

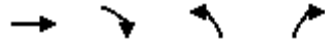
Intersection Summary			
Average Delay		616.9	
Intersection Capacity Utilization		97.0%	ICU Level of Service F
Analysis Period (min)		15	



# Timings

## 38: Lake Shore Blvd W & Palace Pier Crt

3/24/2014



Lane Group	EBT	EBR	NBL	NBR
Lane Configurations	↑	↑	↑	↑
Volume (vph)	1597	54	41	70
Turn Type		Perm		Perm
Protected Phases	2		4	
Permitted Phases		2		4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0
Total Split (s)	98.0	98.0	22.0	22.0
Total Split (%)	81.7%	81.7%	18.3%	18.3%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effect Green (s)	92.0	92.0	16.0	16.0
Actuated g/C Ratio	0.77	0.77	0.13	0.13
v/c Ratio	1.19	0.06	0.18	0.29
Control Delay	103.6	1.1	42.2	16.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	103.6	1.1	42.2	16.3
LOS	F	A	D	B
Approach Delay	100.3		25.9	
Approach LOS	F		C	

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 107 (89%), Referenced to phase 2:EBT and 6:, Start of Green  
 Natural Cycle: 150  
 Control Type: Pretimed  
 Maximum v/c Ratio: 1.19  
 Intersection Signal Delay: 95.6  
 Intersection LOS: F  
 Intersection Capacity Utilization 98.4%  
 ICU Level of Service F  
 Analysis Period (min) 15

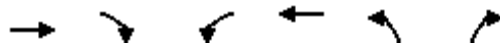
Splits and Phases: 38: Lake Shore Blvd W & Palace Pier Crt



# HCM Signalized Intersection Capacity Analysis

## 38: Lake Shore Blvd W & Palace Pier Crt

3/24/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗			↖	↗
Volume (vph)	1597	54	0	0	41	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	1.00			1.00	1.00
Frbp, ped/bikes	1.00	0.91			1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00
Frt	1.00	0.85			1.00	0.85
Flt Protected	1.00	1.00			0.95	1.00
Satd. Flow (prot)	1827	1230			1770	1509
Flt Permitted	1.00	1.00			0.95	1.00
Satd. Flow (perm)	1827	1230			1770	1509
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1664	56	0	0	43	73
RTOR Reduction (vph)	0	5	0	0	0	49
Lane Group Flow (vph)	1664	51	0	0	43	24
Confl. Peds. (#/hr)		18	18			
Heavy Vehicles (%)	4%	20%	0%	0%	2%	7%
Turn Type		Perm				Perm
Protected Phases	2				4	
Permitted Phases		2				4
Actuated Green, G (s)	92.0	92.0			16.0	16.0
Effective Green, g (s)	92.0	92.0			16.0	16.0
Actuated g/C Ratio	0.77	0.77			0.13	0.13
Clearance Time (s)	6.0	6.0			6.0	6.0
Lane Grp Cap (vph)	1401	943			236	201
v/s Ratio Prot	c0.91				c0.02	
v/s Ratio Perm		0.04				0.02
v/c Ratio	1.19	0.05			0.18	0.12
Uniform Delay, d1	14.0	3.4			46.2	45.8
Progression Factor	0.48	0.40			0.87	0.77
Incremental Delay, d2	90.8	0.1			1.7	1.2
Delay (s)	97.6	1.5			41.7	36.3
Level of Service	F	A			D	D
Approach Delay (s)	94.4			0.0	38.3	
Approach LOS	F			A	D	

### Intersection Summary

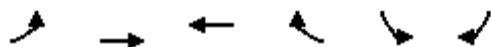
HCM Average Control Delay	90.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	98.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 40: Marine parade Dr. & Marine Parade Dr.

3/24/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	26	52	174	0	0	6
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)	28	57	189	0	0	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)			342			
pX, platoon unblocked						
vC, conflicting volume	189				302	189
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	189				302	189
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				100	99
cM capacity (veh/h)	1385				675	853
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	85	189	7			
Volume Left	28	0	0			
Volume Right	0	0	7			
cSH	1385	1700	853			
Volume to Capacity	0.02	0.11	0.01			
Queue Length 95th (m)	0.5	0.0	0.2			
Control Delay (s)	2.7	0.0	9.3			
Lane LOS	A		A			
Approach Delay (s)	2.7	0.0	9.3			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			1.0			
Intersection Capacity Utilization			26.7%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 42: Lake Shore Blvd W & Interim Phantom Driveway

3/24/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	2121	15	6	750	51	42
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2121	15	6	750	51	42
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	141			199		
pX, platoon unblocked				0.64	0.64	0.64
vC, conflicting volume	2136			2516	1068	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1650			2243	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 %	98			0	94	
cM capacity (veh/h)	248			22	694	

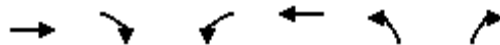
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1414	722	256	500	93
Volume Left	0	0	6	0	51
Volume Right	0	15	0	0	42
cSH	1700	1700	248	1700	39
Volume to Capacity	0.83	0.42	0.02	0.29	2.35
Queue Length 95th (m)	0.0	0.0	0.6	0.0	81.0
Control Delay (s)	0.0	0.0	1.0	0.0	836.2
Lane LOS	A			F	
Approach Delay (s)	0.0		0.3		836.2
Approach LOS				F	

Intersection Summary					
Average Delay			26.1		
Intersection Capacity Utilization	71.2%		ICU Level of Service	C	
Analysis Period (min)	15				

# HCM Unsignalized Intersection Capacity Analysis

## 48: Lake Shore Blvd W & Street A

3/24/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	2091	31	9	672	44	39
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)	2248	33	10	723	47	42
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	80			77		
pX, platoon unblocked			0.02		0.02	0.02
vC, conflicting volume			2282		2646	1141
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 %			75		0	0
cM capacity (veh/h)			39		19	26

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1499	783	251	482	89
Volume Left	0	0	10	0	47
Volume Right	0	33	0	0	42
cSH	1700	1700	39	1700	22
Volume to Capacity	0.88	0.46	0.25	0.28	4.13
Queue Length 95th (m)	0.0	0.0	6.4	0.0	Err
Control Delay (s)	0.0	0.0	39.2	0.0	Err
Lane LOS			E		F
Approach Delay (s)	0.0		13.4		Err
Approach LOS					F

Intersection Summary					
Average Delay			290.7		
Intersection Capacity Utilization			70.3%	ICU Level of Service	C
Analysis Period (min)			15		

# HCM Unsignalized Intersection Capacity Analysis

## 50: Marine Parade Dr. & Street B

3/24/2014

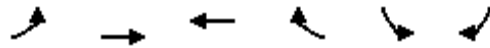


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	20	103	353	5	33	59
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	22	111	380	5	35	63
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	385				536	192
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	385				536	192
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				92	92
cM capacity (veh/h)	1170				466	817
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	22	111	253	132	99	
Volume Left	22	0	0	0	35	
Volume Right	0	0	0	5	63	
cSH	1170	1700	1700	1700	643	
Volume to Capacity	0.02	0.07	0.15	0.08	0.15	
Queue Length 95th (m)	0.4	0.0	0.0	0.0	4.3	
Control Delay (s)	8.1	0.0	0.0	0.0	11.6	
Lane LOS	A				B	
Approach Delay (s)	1.3		0.0		11.6	
Approach LOS					B	
Intersection Summary						
Average Delay			2.1			
Intersection Capacity Utilization			28.7%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 52: Marine Parade Dr. & Street A

3/24/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	58	78	180	0	0	177
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)	62	84	194	0	0	190
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	194				402	97
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	194				402	97
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	80
cM capacity (veh/h)	1377				550	941
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	62	84	129	65	190	
Volume Left	62	0	0	0	0	
Volume Right	0	0	0	0	190	
cSH	1377	1700	1700	1700	941	
Volume to Capacity	0.05	0.05	0.08	0.04	0.20	
Queue Length 95th (m)	1.1	0.0	0.0	0.0	6.0	
Control Delay (s)	7.7	0.0	0.0	0.0	9.8	
Lane LOS	A				A	
Approach Delay (s)	3.3		0.0		9.8	
Approach LOS					A	
Intersection Summary						
Average Delay			4.4			
Intersection Capacity Utilization			29.3%		ICU Level of Service	A
Analysis Period (min)			15			

Summary of All Intervals

Run Number	2	Avg
Start Time	6:50	6:50
End Time	7:15	7:15
Total Time (min)	25	25
Time Recorded (min)	15	15
# of Intervals	2	2
# of Recorded Intvl	1	1
Vehs Entered	2051	2051
Vehs Exited	1773	1773
Starting Vehs	583	583
Ending Vehs	861	861
Denied Entry Before	82	82
Denied Entry After	587	587
Travel Distance (km)	2155	2155
Travel Time (hr)	253.9	253.9
Total Delay (hr)	208.9	208.9
Total Stops	5705	5705
Fuel Used (l)	3777.6	3777.6

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10
Volumes adjusted by PHF, Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	2	Avg
Vehs Entered	2051	2051
Vehs Exited	1773	1773
Starting Vehs	583	583
Ending Vehs	861	861
Denied Entry Before	82	82
Denied Entry After	587	587
Travel Distance (km)	2155	2155
Travel Time (hr)	253.9	253.9
Total Delay (hr)	208.9	208.9
Total Stops	5705	5705
Fuel Used (l)	3777.6	3777.6



Queuing and Blocking Report  
 Future Backg. Traffic AM Peak Hour, Interim Scenario

3/24/2014

Intersection: 3: Lake Shore Blvd W & Park Lawn Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	B45	B45	SB
Directions Served	LT	T	TR	LT	T	R	L	T	R	T	T	L
Maximum Queue (m)	295.8	310.3	275.9	52.6	63.3	46.4	54.8	298.2	300.2	46.3	25.8	129.8
Average Queue (m)	290.0	290.8	247.4	25.3	28.4	19.0	34.7	226.8	70.8	3.9	0.0	122.9
95th Queue (m)	295.6	310.5	299.9	45.4	47.4	43.9	74.3	334.6	252.7	19.8	0.0	140.3
Link Distance (m)	283.8	283.8	283.8	48.9	48.9			279.0	279.0	118.2	118.2	
Upstream Blk Time (%)	77	46		1	1	1		25	8			
Queuing Penalty (veh)	428	253		3	6	0		56	17			
Storage Bay Dist (m)						45.0	55.0					100.0
Storage Blk Time (%)					2	1	6	76				43
Queuing Penalty (veh)					8	2	21	100				255

Intersection: 3: Lake Shore Blvd W & Park Lawn Rd

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (m)	197.2	204.5	21.1
Average Queue (m)	157.6	82.5	13.1
95th Queue (m)	250.6	208.3	24.2
Link Distance (m)	187.8	187.8	187.8
Upstream Blk Time (%)	18	0	
Queuing Penalty (veh)	116	0	
Storage Bay Dist (m)			
Storage Blk Time (%)	20		
Queuing Penalty (veh)	119		

Intersection: 5: The Queensway & Park Lawn Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	L	T	TR
Maximum Queue (m)	25.6	169.0	157.0	77.7	33.0	37.2	37.4	31.8	58.8	74.8	293.7	302.5
Average Queue (m)	14.2	138.0	133.9	58.6	22.2	24.2	8.9	19.4	40.1	37.5	129.1	186.3
95th Queue (m)	23.6	166.1	166.3	89.4	32.2	38.0	29.9	33.0	62.4	70.2	293.5	284.8
Link Distance (m)		164.4	164.4		682.9	682.9			271.0		401.9	401.9
Upstream Blk Time (%)		0										
Queuing Penalty (veh)		0										
Storage Bay Dist (m)	50.0			50.0			20.0	50.0		25.0		
Storage Blk Time (%)		42		20		16	0		3	46	40	
Queuing Penalty (veh)		51		50		6	0		3	104	46	

Queuing and Blocking Report  
 Future Backg. Traffic AM Peak Hour, Interim Scenario

3/24/2014

Intersection: 8: Gardiner Exwy WB On-ramp & Park Lawn Rd

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	T	T	T	T	R
Maximum Queue (m)	53.6	13.9	162.1	15.0	26.6	20.5	19.7	71.4
Average Queue (m)	34.8	5.5	86.4	6.9	11.5	15.7	10.0	48.6
95th Queue (m)	52.7	13.9	164.9	15.1	27.1	23.5	21.7	71.6
Link Distance (m)	120.0	120.0		176.2	176.2	271.0	271.0	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			199.5					220.0
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 10: Gardiner EB Off-ramp & Park Lawn Rd

Movement	EB	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	L	R	L	T	T	T	TR
Maximum Queue (m)	261.2	261.2	35.0	15.0	72.9	33.6	79.2	84.2
Average Queue (m)	195.5	241.0	34.9	5.4	31.0	14.5	47.2	31.3
95th Queue (m)	291.7	312.7	35.1	14.3	67.5	33.6	74.0	61.9
Link Distance (m)	243.4	243.4			104.2	104.2	176.2	176.2
Upstream Blk Time (%)	17	68						
Queuing Penalty (veh)	154	601						
Storage Bay Dist (m)			35.0	27.0				
Storage Blk Time (%)		37	45		15			
Queuing Penalty (veh)		386	144		5			

Intersection: 12: Lake Shore Blvd W & Mr. Christie's East Driveway

Movement	EB	EB
Directions Served	LT	T
Maximum Queue (m)	65.5	84.8
Average Queue (m)	61.9	64.3
95th Queue (m)	64.8	79.8
Link Distance (m)	59.4	59.4
Upstream Blk Time (%)	37	11
Queuing Penalty (veh)	425	123
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report  
 Future Backg. Traffic AM Peak Hour, Interim Scenario

3/24/2014

Intersection: 14: Lake Shore Blvd W & Mr. Christie's West Driveway

Movement	EB	EB	SB
Directions Served	LT	T	LR
Maximum Queue (m)	95.9	104.1	91.2
Average Queue (m)	89.2	79.3	55.2
95th Queue (m)	94.5	112.6	92.7
Link Distance (m)	82.7	82.7	83.1
Upstream Blk Time (%)	49	16	7
Queuing Penalty (veh)	528	177	0
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 19: Gardiner EB Off-ramp &

Movement	EB	EB	EB	WB	NB
Directions Served	T	T	R	L	R
Maximum Queue (m)	185.4	264.0	100.0	21.6	191.3
Average Queue (m)	61.6	91.8	14.3	12.4	98.8
95th Queue (m)	168.9	236.2	72.0	23.6	168.3
Link Distance (m)	259.4	259.4		243.4	224.7
Upstream Blk Time (%)		6			
Queuing Penalty (veh)		0			
Storage Bay Dist (m)			50.0		
Storage Blk Time (%)		28			
Queuing Penalty (veh)		7			

Intersection: 21: Menkes- Kraft Driveway & Park Lawn Rd

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	B18	B18
Directions Served	L	TR	LR	L	T	TR	LT	T	TR	T	T
Maximum Queue (m)	8.8	15.0	6.4	6.0	91.5	59.3	168.5	165.8	139.6	107.7	133.1
Average Queue (m)	4.4	9.1	1.6	2.6	40.8	28.8	163.7	134.8	78.2	101.3	123.7
95th Queue (m)	11.1	16.8	5.7	6.9	89.4	57.1	167.7	196.4	161.0	113.7	133.7
Link Distance (m)	90.7	90.7	92.5		187.8	187.8	142.2	142.2	142.2	104.2	104.2
Upstream Blk Time (%)							77	21	0	23	29
Queuing Penalty (veh)							367	102	1	164	204
Storage Bay Dist (m)				30.0							
Storage Blk Time (%)					10						
Queuing Penalty (veh)					2						

Queuing and Blocking Report  
 Future Backg. Traffic AM Peak Hour, Interim Scenario

3/24/2014

Intersection: 30: Lake Shore Blvd W & Legion Rd South

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	TR	LT	TR	LR	L	TR
Maximum Queue (m)	249.6	255.4	66.9	84.4	130.6	99.6	296.1
Average Queue (m)	249.6	250.8	32.2	37.3	83.9	97.1	262.6
95th Queue (m)	249.6	254.3	71.6	81.2	138.5	98.8	332.3
Link Distance (m)	245.0	245.0	283.8	283.8	126.6		291.5
Upstream Blk Time (%)	80	75			10		50
Queuing Penalty (veh)	0	0			0		0
Storage Bay Dist (m)						50.0	
Storage Blk Time (%)						100	
Queuing Penalty (veh)						51	

Intersection: 32: Lake Shore Blvd W & Street B

Movement	EB	EB	WB	NB	NB
Directions Served	T	TR	LT	L	R
Maximum Queue (m)	22.3	26.6	14.9	30.4	14.2
Average Queue (m)	11.1	9.8	2.1	13.6	6.8
95th Queue (m)	18.7	20.1	10.8	29.5	14.5
Link Distance (m)	5.6	5.6	59.4		89.0
Upstream Blk Time (%)	43	11			
Queuing Penalty (veh)	483	125			
Storage Bay Dist (m)				50.0	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 34: Lake Shore Blvd. W & Gardiner Expwy Off/On-Ramp

Movement	EB	EB	EB	B1	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	T	TR	L	T	TR	LT	R
Maximum Queue (m)	22.0	46.2	24.2	38.0	78.8	37.4	85.8	46.3	98.3	118.6
Average Queue (m)	17.6	46.0	7.2	37.9	33.0	33.4	57.7	16.8	37.4	50.3
95th Queue (m)	30.2	46.4	20.4	38.0	71.0	42.9	110.3	46.2	72.7	146.0
Link Distance (m)		24.5	24.5	16.8	58.1		81.2	81.2	114.0	114.0
Upstream Blk Time (%)	5	29	0	30	20		54			18
Queuing Penalty (veh)	0	335	3	347	24		0			0
Storage Bay Dist (m)	70.0					30.0				
Storage Blk Time (%)	5	29			28	64				
Queuing Penalty (veh)	35	212			0	24				

Queuing and Blocking Report  
 Future Backg. Traffic AM Peak Hour, Interim Scenario

3/24/2014

Intersection: 37: Lake Shore Blvd W & Marine Parade Dr.

Movement	NB	NB
Directions Served	L	R
Maximum Queue (m)	12.9	17.4
Average Queue (m)	5.4	10.3
95th Queue (m)	14.2	19.8
Link Distance (m)	129.1	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)	15.0	
Storage Blk Time (%)	0	7
Queuing Penalty (veh)	0	2

Intersection: 38: Lake Shore Blvd W & Palace Pier Crt

Movement	EB	EB	NB	NB
Directions Served	T	R	L	R
Maximum Queue (m)	59.6	9.1	14.3	19.4
Average Queue (m)	33.8	1.3	4.2	10.3
95th Queue (m)	57.1	6.5	13.0	22.8
Link Distance (m)	117.2		134.7	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	30.0		15.0	
Storage Blk Time (%)	7		1	9
Queuing Penalty (veh)	4		1	4

Intersection: 40: Marine parade Dr. & Marine Parade Dr.

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	15.6	6.6
Average Queue (m)	3.5	0.9
95th Queue (m)	13.2	4.7
Link Distance (m)	266.3	129.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report  
 Future Backg. Traffic AM Peak Hour, Interim Scenario

3/24/2014

Intersection: 42: Lake Shore Blvd W & Interim Phantom Driveway

Movement	EB	EB	B43	B43	NB
Directions Served	T	TR	T	T	LR
Maximum Queue (m)	69.3	69.4	78.8	81.8	92.5
Average Queue (m)	69.3	43.8	65.6	30.9	85.8
95th Queue (m)	69.4	91.5	86.0	82.3	99.3
Link Distance (m)	47.8	47.8	48.9	48.9	87.9
Upstream Blk Time (%)	55	14	35	7	78
Queuing Penalty (veh)	709	176	299	60	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 48: Lake Shore Blvd W & Street A

Movement	EB	EB	WB	WB	B1	B1	B1	NB
Directions Served	T	TR	LT	T	T	T		LR
Maximum Queue (m)	82.0	59.9	38.6	38.5	45.6	14.6	47.2	75.0
Average Queue (m)	77.0	17.5	36.0	15.7	30.8	9.8	24.8	75.0
95th Queue (m)	87.1	57.3	41.7	45.8	50.4	20.2	61.1	75.0
Link Distance (m)	59.9	59.9	16.8	16.8	24.5	24.5	24.5	78.1
Upstream Blk Time (%)	38	0	82		66		28	100
Queuing Penalty (veh)	439	1	297		158		66	0
Storage Bay Dist (m)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 50: Marine Parade Dr. & Street B

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (m)	8.7	22.2
Average Queue (m)	1.2	12.4
95th Queue (m)	6.2	17.7
Link Distance (m)		58.0
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)	60.0	
Storage Blk Time (%)		
Queuing Penalty (veh)		

---

Intersection: 52: Marine Parade Dr. & Street A

---

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (m)	9.2	17.5
Average Queue (m)	1.3	12.5
95th Queue (m)	6.7	18.6
Link Distance (m)		51.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)	50.0	
Storage Blk Time (%)		
Queuing Penalty (veh)		

---

Network Summary

---

Network wide Queuing Penalty: 8890

# Timings

## 3: Lake Shore Blvd W & Park Lawn Rd

3/24/2014

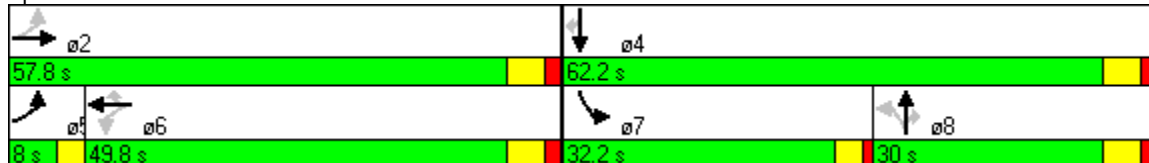


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔↔		↔↔	↔	↔	↑	↔	↔↔	↑	↔
Volume (vph)	526	736	10	989	457	60	135	13	763	212	478
Turn Type	pm+pt		Perm		Perm	Perm		Perm	Prot		Perm
Protected Phases	5	2		6			8		7	4	
Permitted Phases	2		6		6	8		8			4
Detector Phase	5	2	6	6	6	8	8	8	7	4	4
Switch Phase											
Minimum Initial (s)	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0
Minimum Split (s)	8.0	28.0	28.0	28.0	28.0	30.0	30.0	30.0	8.5	30.0	30.0
Total Split (s)	8.0	57.8	49.8	49.8	49.8	30.0	30.0	30.0	32.2	62.2	62.2
Total Split (%)	6.7%	48.2%	41.5%	41.5%	41.5%	25.0%	25.0%	25.0%	26.8%	51.8%	51.8%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?											
Recall Mode	None	C-Min	Min	Min	Min	Min	Min	Min	None	Min	Min
Act Effect Green (s)		60.0		60.0	60.0	15.7	15.7	15.7	28.3	48.0	48.0
Actuated g/C Ratio		0.50		0.50	0.50	0.13	0.13	0.13	0.24	0.40	0.40
v/c Ratio		3.72dl		0.65	0.55	0.46	0.62	0.06	1.00	0.32	0.80
Control Delay		30.5		28.4	14.6	68.1	71.7	28.3	78.5	24.5	30.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		30.5		28.4	14.6	68.1	71.7	28.3	78.5	24.5	30.0
LOS		C		C	B	E	E	C	E	C	C
Approach Delay		30.5		24.1			68.0			54.6	
Approach LOS		C		C			E			D	

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 104 (87%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 38.0  
 Intersection LOS: D  
 Intersection Capacity Utilization 104.8%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

### Splits and Phases: 3: Lake Shore Blvd W & Park Lawn Rd





# HCM Signalized Intersection Capacity Analysis

## 3: Lake Shore Blvd W & Park Lawn Rd

3/24/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↕↔			↔↕	↔↕	↔↕	↔↕	↔↕	↔↕	↔↕	↔↕
Volume (vph)	526	736	64	10	989	457	60	135	13	763	212	478
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	4.0	6.0	6.0
Lane Util. Factor		0.91			0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frbp, ped/bikes		1.00			1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.88
Flpb, ped/bikes		1.00			1.00	1.00	0.93	1.00	1.00	1.00	1.00	1.00
Frt		0.99			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4808			3532	1519	1673	1776	1588	3467	1776	1415
Flt Permitted		0.66			0.93	1.00	0.62	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3245			3281	1519	1085	1776	1588	3467	1776	1415
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)	566	791	69	11	1063	491	65	145	14	820	228	514
RTOR Reduction (vph)	0	4	0	0	0	136	0	0	12	0	0	77
Lane Group Flow (vph)	0	1422	0	0	1074	355	65	145	2	820	228	437
Confl. Peds. (#/hr)	17		16	16		17	67		2	2		67
Confl. Bikes (#/hr)			14			3			1			10
Heavy Vehicles (%)	10%	1%	3%	16%	2%	2%	0%	7%	0%	1%	7%	1%
Bus Blockages (#/hr)	10	0	0	16	0	0	0	0	0	0	0	0
Turn Type	pm+pt			Perm		Perm	Perm		Perm	Prot		Perm
Protected Phases	5	2			6			8		7		4
Permitted Phases	2			6		6	8		8			4
Actuated Green, G (s)		60.0			60.0	60.0	15.7	15.7	15.7	28.3	48.0	48.0
Effective Green, g (s)		60.0			60.0	60.0	15.7	15.7	15.7	28.3	48.0	48.0
Actuated g/C Ratio		0.50			0.50	0.50	0.13	0.13	0.13	0.24	0.40	0.40
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0
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)		1623			1641	760	142	232	208	818	710	566
v/s Ratio Prot								0.08		c0.24		0.13
v/s Ratio Perm		c0.44			0.33	0.23	0.06		0.00			c0.31
v/c Ratio		3.72dl			0.65	0.47	0.46	0.62	0.01	1.00	0.32	0.77
Uniform Delay, d1		26.7			22.3	19.6	48.2	49.4	45.4	45.9	24.8	31.3
Progression Factor		0.86			1.12	1.29	1.24	1.24	1.52	1.03	0.97	0.89
Incremental Delay, d2		5.1			0.9	0.4	2.3	5.2	0.0	31.0	0.2	6.1
Delay (s)		28.0			25.9	25.7	62.2	66.4	68.8	78.0	24.3	33.9
Level of Service		C			C	C	E	E	E	E	C	C
Approach Delay (s)		28.0			25.9			65.3			55.6	
Approach LOS		C			C			E			E	

### Intersection Summary

HCM Average Control Delay	38.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	104.8%	ICU Level of Service	G
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

# Timings

## 5: The Queensway & Park Lawn Rd

3/24/2014



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↕	↖	↕	↗	↖	↕	↗	↖	↕
Volume (vph)	211	672	368	859	68	171	414	389	34	322
Turn Type	pm+pt		pm+pt		Perm	pm+pt		Perm	Perm	
Protected Phases	5	2	1	6		3	8			4
Permitted Phases	2		6		6	8	8	8	4	
Detector Phase	5	2	1	6	6	3	8	8	4	4
Switch Phase										
Minimum Initial (s)	4.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	30.0	9.0	30.0	30.0	8.0	29.0	29.0	32.0	32.0
Total Split (s)	14.0	30.0	20.0	36.0	36.0	8.0	40.0	40.0	32.0	32.0
Total Split (%)	15.6%	33.3%	22.2%	40.0%	40.0%	8.9%	44.4%	44.4%	35.6%	35.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	5.0	7.0	7.0	3.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead			Lag	Lag
Lead-Lag Optimize?										
Recall Mode	Min	C-Min	Max	Min	Min	Max	Min	Min	Min	Min
Act Effect Green (s)	34.6	23.0	51.2	34.6	34.6	30.8	26.8	26.8	18.8	18.8
Actuated g/C Ratio	0.38	0.26	0.57	0.38	0.38	0.34	0.30	0.30	0.21	0.21
v/c Ratio	0.64	1.00	0.78	0.70	0.13	0.75	0.78	0.58	0.26	0.68
Control Delay	22.4	64.6	33.4	28.3	14.1	42.2	38.7	8.0	32.6	28.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	64.6	33.4	28.3	14.1	42.2	38.7	8.0	32.6	28.3
LOS	C	E	C	C	B	D	D	A	C	C
Approach Delay		56.2		29.0			27.1			28.5
Approach LOS		E		C			C			C

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 35.9

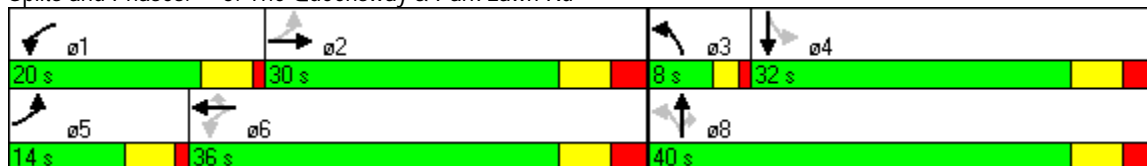
Intersection LOS: D

Intersection Capacity Utilization 92.8%

ICU Level of Service F

Analysis Period (min) 15

### Splits and Phases: 5: The Queensway & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 5: The Queensway & Park Lawn Rd

3/24/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗	↗	↖	↗	
Volume (vph)	211	672	184	368	859	68	171	414	389	34	322	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0		5.0	7.0	7.0	3.0	7.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1804	3401		1735	3374	1418	1805	1881	1563	1703	3298	
Flt Permitted	0.30	1.00		0.14	1.00	1.00	0.26	1.00	1.00	0.37	1.00	
Satd. Flow (perm)	565	3401		261	3374	1418	487	1881	1563	660	3298	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	222	707	194	387	904	72	180	436	409	36	339	202
RTOR Reduction (vph)	0	28	0	0	0	19	0	0	242	0	107	0
Lane Group Flow (vph)	222	873	0	387	904	53	180	436	167	36	434	0
Confl. Peds. (#/hr)	4		18	18		4	2					2
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	0%	2%	2%	4%	7%	12%	0%	1%	2%	6%	2%	4%
Turn Type	pm+pt			pm+pt		Perm	pm+pt		Perm	Perm		
Protected Phases	5	2		1	6		3	8				4
Permitted Phases	2			6		6	8	8	8	4		
Actuated Green, G (s)	32.6	23.0		49.2	34.6	34.6	26.8	26.8	26.8	18.8	18.8	
Effective Green, g (s)	32.6	23.0		49.2	34.6	34.6	26.8	26.8	26.8	18.8	18.8	
Actuated g/C Ratio	0.36	0.26		0.55	0.38	0.38	0.30	0.30	0.30	0.21	0.21	
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	3.0	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	3.0	
Lane Grp Cap (vph)	337	869		490	1297	545	218	560	465	138	689	
v/s Ratio Prot	0.07	c0.26		c0.19	0.27		0.05	c0.23			0.13	
v/s Ratio Perm	0.17			0.25		0.04	c0.20		0.11	0.05		
v/c Ratio	0.66	1.01		0.79	0.70	0.10	0.83	0.78	0.36	0.26	0.63	
Uniform Delay, d1	20.9	33.5		21.1	23.3	17.7	27.9	28.9	24.8	29.8	32.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.6	31.8		8.3	1.7	0.1	21.8	6.8	0.5	1.0	1.9	
Delay (s)	25.5	65.3		29.4	24.9	17.8	49.7	35.6	25.3	30.8	34.3	
Level of Service	C	E		C	C	B	D	D	C	C	C	
Approach Delay (s)		57.4			25.8			34.0			34.1	
Approach LOS		E			C			C			C	

### Intersection Summary

HCM Average Control Delay	37.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	92.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 8: Gardiner WB On-ramp & Park Lawn Rd

3/24/2014

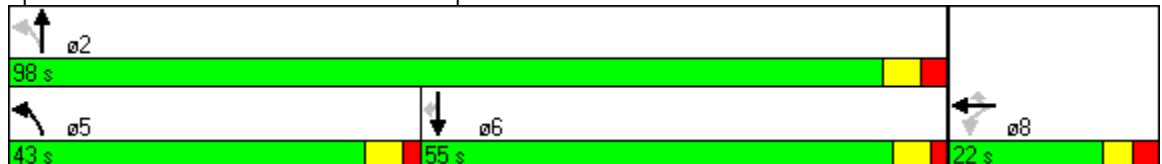


Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↘	↑↑	↑↑	↗
Volume (vph)	16	9	449	964	488	446
Turn Type		Perm	pm+pt			Perm
Protected Phases	8		5	2	6	
Permitted Phases		8	2			6
Detector Phase	8	8	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	4.0	5.0	5.0	5.0
Minimum Split (s)	22.0	22.0	10.0	23.0	22.0	22.0
Total Split (s)	22.0	22.0	43.0	98.0	55.0	55.0
Total Split (%)	18.3%	18.3%	35.8%	81.7%	45.8%	45.8%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	2.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	7.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?						
Recall Mode	Min	Min	Min	C-Min	C-Min	C-Min
Act Effect Green (s)	7.2	7.2	100.8	99.8	82.0	82.0
Actuated g/C Ratio	0.06	0.06	0.84	0.83	0.68	0.68
v/c Ratio	0.22	0.11	0.63	0.37	0.23	0.41
Control Delay	58.7	28.2	8.6	2.7	7.9	1.9
Queue Delay	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	58.7	28.2	8.7	2.7	7.9	1.9
LOS	E	C	A	A	A	A
Approach Delay	48.2			4.6	5.0	
Approach LOS	D			A	A	

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 88 (73%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.63  
 Intersection Signal Delay: 5.3  
 Intersection LOS: A  
 Intersection Capacity Utilization 73.1%  
 ICU Level of Service D  
 Analysis Period (min) 15

### Splits and Phases: 8: Gardiner WB On-ramp & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 8: Gardiner WB On-ramp & Park Lawn Rd

3/24/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↘	↑↑			↑↑	↗
Volume (vph)	0	0	0	2	16	9	449	964	0	0	488	446
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	7.0			6.0	6.0
Lane Util. Factor					1.00	1.00	1.00	0.95			0.95	1.00
Frbp, ped/bikes					1.00	0.99	1.00	1.00			1.00	0.94
Flpb, ped/bikes					1.00	1.00	0.99	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					1480	1434	1759	3343			3374	1473
Flt Permitted					0.99	1.00	0.42	1.00			1.00	1.00
Satd. Flow (perm)					1480	1434	785	3343			3374	1473
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	2	17	10	478	1026	0	0	519	474
RTOR Reduction (vph)	0	0	0	0	0	9	0	0	0	0	0	150
Lane Group Flow (vph)	0	0	0	0	19	1	478	1026	0	0	519	324
Confl. Peds. (#/hr)	1					1	11		3	3		11
Heavy Vehicles (%)	0%	0%	0%	0%	31%	11%	2%	8%	0%	0%	7%	3%
Turn Type				Perm		Perm	pm+pt					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Actuated Green, G (s)					7.2	7.2	99.8	99.8			81.9	81.9
Effective Green, g (s)					7.2	7.2	99.8	99.8			81.9	81.9
Actuated g/C Ratio					0.06	0.06	0.83	0.83			0.68	0.68
Clearance Time (s)					6.0	6.0	6.0	7.0			6.0	6.0
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					89	86	758	2780			2303	1005
v/s Ratio Prot							c0.07	0.31			0.15	
v/s Ratio Perm					0.01	0.00	c0.46					0.22
v/c Ratio					0.21	0.01	0.63	0.37			0.23	0.32
Uniform Delay, d1					53.7	53.0	2.8	2.5			7.1	7.8
Progression Factor					1.00	1.00	2.28	0.94			1.00	1.00
Incremental Delay, d2					1.2	0.0	1.5	0.3			0.2	0.8
Delay (s)					54.9	53.1	7.8	2.6			7.4	8.6
Level of Service					D	D	A	A			A	A
Approach Delay (s)		0.0			54.3			4.3			8.0	
Approach LOS		A			D			A			A	

### Intersection Summary

HCM Average Control Delay	6.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# Timings

## 10: Gardiner Expwy EB Off-ramp & Park Lawn Rd

3/24/2014



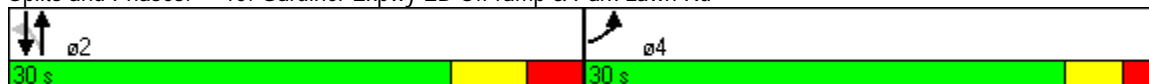
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	531	781	100	944	586
Turn Type		Free	Perm		
Protected Phases	4			2	2
Permitted Phases		Free	2		
Detector Phase	4		2	2	2
Switch Phase					
Minimum Initial (s)	19.0		4.0	4.0	4.0
Minimum Split (s)	30.0		30.0	30.0	30.0
Total Split (s)	30.0	0.0	30.0	30.0	30.0
Total Split (%)	50.0%	0.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.0		4.0	4.0	4.0
All-Red Time (s)	2.0		3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	7.0	7.0	7.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Min		Max	Max	Max
Act Effect Green (s)	19.0	60.0	29.0	29.0	29.0
Actuated g/C Ratio	0.32	1.00	0.48	0.48	0.48
v/c Ratio	0.50	0.51	0.29	0.56	0.40
Control Delay	18.6	1.2	9.4	11.8	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.6	1.2	9.4	11.8	7.7
LOS	B	A	A	B	A
Approach Delay	8.2			11.5	7.7
Approach LOS	A			B	A

### Intersection Summary

Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 4:EBL, Start of Green, Master Intersection  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.56  
 Intersection Signal Delay: 9.3  
 Intersection Capacity Utilization 56.0%  
 Analysis Period (min) 15

Intersection LOS: A  
 ICU Level of Service B

Splits and Phases: 10: Gardiner Expwy EB Off-ramp & Park Lawn Rd



HCM Signalized Intersection Capacity Analysis  
 10: Gardiner Expwy EB Off-ramp & Park Lawn Rd

3/24/2014



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	531	781	100	944	586	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0	7.0	7.0	7.0	
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	
Frbp, ped/bikes	1.00	0.99	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	1577	1774	3574	3463	
Flt Permitted	0.95	1.00	0.39	1.00	1.00	
Satd. Flow (perm)	3433	1577	726	3574	3463	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	542	797	102	963	598	73
RTOR Reduction (vph)	0	0	0	0	13	0
Lane Group Flow (vph)	542	797	102	963	658	0
Confl. Peds. (#/hr)			27			27
Confl. Bikes (#/hr)		9				7
Heavy Vehicles (%)	2%	1%	0%	1%	2%	0%
Turn Type		Free	Perm			
Protected Phases	4			2	2	
Permitted Phases		Free	2			
Actuated Green, G (s)	19.0	60.0	29.0	29.0	29.0	
Effective Green, g (s)	19.0	60.0	29.0	29.0	29.0	
Actuated g/C Ratio	0.32	1.00	0.48	0.48	0.48	
Clearance Time (s)	5.0		7.0	7.0	7.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1087	1577	351	1727	1674	
v/s Ratio Prot	0.16			0.27	0.19	
v/s Ratio Perm		c0.51	0.14			
v/c Ratio	0.50	0.51	0.29	0.56	0.39	
Uniform Delay, d1	16.6	0.0	9.3	11.0	9.9	
Progression Factor	1.00	1.00	0.76	0.95	0.73	
Incremental Delay, d2	1.6	1.2	1.9	1.2	0.7	
Delay (s)	18.3	1.2	9.1	11.6	8.0	
Level of Service	B	A	A	B	A	
Approach Delay (s)	8.1			11.4	8.0	
Approach LOS	A			B	A	

**Intersection Summary**

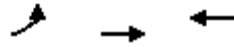
HCM Average Control Delay	9.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 12: Lake Shore Blvd W & Mr. Christie's East Driveway

3/24/2014



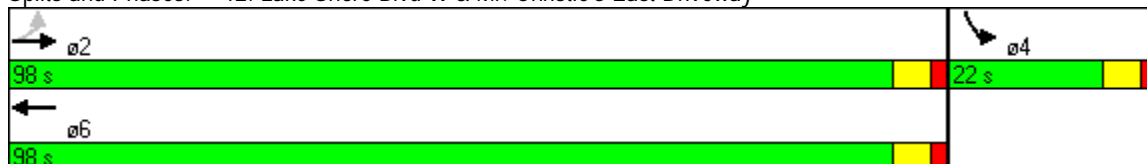
Lane Group	EBL	EBT	WBT	ø4
Lane Configurations		↕↕	↕↕	
Volume (vph)	3	1260	1292	
Turn Type	Perm			
Protected Phases		2	6	4
Permitted Phases	2			
Detector Phase	2	2	6	
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0
Total Split (s)	98.0	98.0	98.0	22.0
Total Split (%)	81.7%	81.7%	81.7%	18%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)		120.0	120.0	
Actuated g/C Ratio		1.00	1.00	
v/c Ratio		0.40	0.40	
Control Delay		0.2	0.2	
Queue Delay		0.0	0.0	
Total Delay		0.2	0.2	
LOS		A	A	
Approach Delay		0.2	0.2	
Approach LOS		A	A	

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.40  
 Intersection Signal Delay: 0.2  
 Intersection Capacity Utilization 51.8%  
 Analysis Period (min) 15

Intersection LOS: A  
 ICU Level of Service A

### Splits and Phases: 12: Lake Shore Blvd W & Mr. Christie's East Driveway





# HCM Signalized Intersection Capacity Analysis

## 12: Lake Shore Blvd W & Mr. Christie's East Driveway

3/24/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕		↕↕	
Volume (vph)	3	1260	1292	3	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0			
Lane Util. Factor		0.95	0.95			
Frbp, ped/bikes		1.00	1.00			
Flpb, ped/bikes		1.00	1.00			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		3539	3499			
Flt Permitted		0.95	1.00			
Satd. Flow (perm)		3372	3499			
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	3	1355	1389	3	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1358	1392	0	0	0
Confl. Peds. (#/hr)	1			1		5
Heavy Vehicles (%)	0%	2%	3%	67%	0%	0%
Turn Type	Perm					
Protected Phases		2	6		4	
Permitted Phases	2					
Actuated Green, G (s)		120.0	120.0			
Effective Green, g (s)		120.0	120.0			
Actuated g/C Ratio		1.00	1.00			
Clearance Time (s)		6.0	6.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		3372	3499			
v/s Ratio Prot			0.40			
v/s Ratio Perm		c0.40				
v/c Ratio		0.40	0.40			
Uniform Delay, d1		0.0	0.0			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.2	0.2			
Delay (s)		0.2	0.2			
Level of Service		A	A			
Approach Delay (s)		0.2	0.2		0.0	
Approach LOS		A	A		A	
<b>Intersection Summary</b>						
HCM Average Control Delay			0.2		HCM Level of Service	A
HCM Volume to Capacity ratio			0.40			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	0.0
Intersection Capacity Utilization			51.8%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Unsignalized Intersection Capacity Analysis

## 14: Lake Shore Blvd W & Mr. Christie's West Driveway

3/24/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↔		↔↔	
Volume (veh/h)	33	1270	1312	8	31	44
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	35	1351	1396	9	33	47
Pedestrians			1			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.2			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)		237	103			
pX, platoon unblocked					0.94	
vC, conflicting volume	1404				2147	702
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1404				2088	702
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				18	88
cM capacity (veh/h)	482				40	385
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	485	901	930	474	80	
Volume Left	35	0	0	0	33	
Volume Right	0	0	0	9	47	
cSH	482	1700	1700	1700	85	
Volume to Capacity	0.07	0.53	0.55	0.28	0.94	
Queue Length 95th (m)	1.9	0.0	0.0	0.0	41.2	
Control Delay (s)	2.1	0.0	0.0	0.0	168.0	
Lane LOS	A				F	
Approach Delay (s)	0.8		0.0		168.0	
Approach LOS					F	
Intersection Summary						
Average Delay			5.0			
Intersection Capacity Utilization			69.9%		ICU Level of Service	C
Analysis Period (min)			15			

# Timings

## 19: Gardiner Expwy EB Off-ramp &

3/24/2014

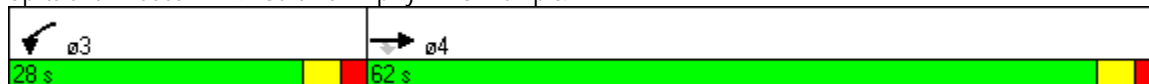


Lane Group	EBT	EBR	WBL	NBR
Lane Configurations	↑↑	↑	↓	↑
Volume (vph)	1172	143	170	118
Turn Type		Perm	Prot	Free
Protected Phases	4		3	
Permitted Phases		4		Free
Detector Phase	4	4	3	
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	
Minimum Split (s)	23.0	23.0	9.0	
Total Split (s)	62.0	62.0	28.0	0.0
Total Split (%)	68.9%	68.9%	31.1%	0.0%
Yellow Time (s)	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	3.0
Lead/Lag	Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	
Recall Mode	None	None	None	
Act Effect Green (s)	28.5	28.5	11.4	43.0
Actuated g/C Ratio	0.66	0.66	0.25	1.00
v/c Ratio	0.52	0.14	0.39	0.08
Control Delay	6.9	1.5	19.0	0.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.9	1.5	19.0	0.1
LOS	A	A	B	A
Approach Delay	6.3			
Approach LOS	A			

### Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 43	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 7.2	Intersection LOS: A
Intersection Capacity Utilization 48.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 19: Gardiner Expwy EB Off-ramp &



# HCM Signalized Intersection Capacity Analysis

## 19: Gardiner Expwy EB Off-ramp &

3/24/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑			↑
Volume (vph)	1172	143	170	0	0	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			3.0
Lane Util. Factor	0.95	1.00	1.00			1.00
Frbp, ped/bikes	1.00	0.97	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			0.86
Flt Protected	1.00	1.00	0.95			1.00
Satd. Flow (prot)	3539	1558	1805			1611
Flt Permitted	1.00	1.00	0.95			1.00
Satd. Flow (perm)	3539	1558	1805			1611
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1221	149	177	0	0	123
RTOR Reduction (vph)	0	58	0	0	0	0
Lane Group Flow (vph)	1221	91	177	0	0	123
Confl. Peds. (#/hr)		7	7			
Heavy Vehicles (%)	2%	1%	0%	2%	2%	2%
Turn Type		Perm	Prot			Free
Protected Phases	4		3			
Permitted Phases		4				Free
Actuated Green, G (s)	25.6	25.6	8.0			43.6
Effective Green, g (s)	26.6	26.6	9.0			43.6
Actuated g/C Ratio	0.61	0.61	0.21			1.00
Clearance Time (s)	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	2159	951	373			1611
v/s Ratio Prot	c0.34		c0.10			
v/s Ratio Perm		0.06				0.08
v/c Ratio	0.57	0.10	0.47			0.08
Uniform Delay, d1	5.1	3.5	15.2			0.0
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.3	0.0	1.0			0.1
Delay (s)	5.4	3.6	16.2			0.1
Level of Service	A	A	B			A
Approach Delay (s)	5.2			16.2	0.1	
Approach LOS	A			B	A	

### Intersection Summary

HCM Average Control Delay	6.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	43.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

# Timings

## 21: Menkes- Kraft Driveway & Park Lawn Rd

3/24/2014

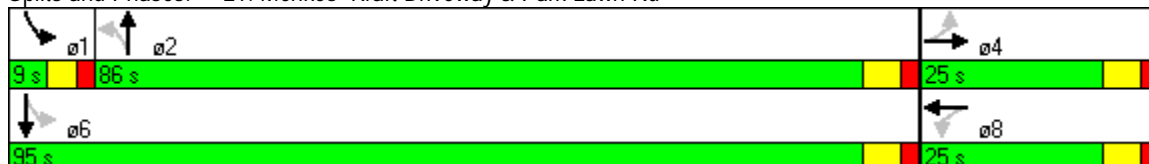


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↔	↖	↗		↖↗↔
Volume (vph)	8	0	0	59	1060	35	1400
Turn Type	Perm			Perm		pm+pt	
Protected Phases		4	8		2	1	6
Permitted Phases	4			2		6	
Detector Phase	4	4	8	2	2	1	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0
Minimum Split (s)	24.0	24.0	24.0	29.0	29.0	9.0	29.0
Total Split (s)	25.0	25.0	25.0	86.0	86.0	9.0	95.0
Total Split (%)	20.8%	20.8%	20.8%	71.7%	71.7%	7.5%	79.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	5.0	6.0
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?							
Recall Mode	Min	Min	Min	C-Min	C-Min	Min	C-Min
Act Effect Green (s)	6.5	6.5	6.5	91.0	91.0		101.5
Actuated g/C Ratio	0.05	0.05	0.05	0.76	0.76		0.85
v/c Ratio	0.12	0.18	0.25	0.29	0.42		0.41
Control Delay	57.2	2.6	2.5	7.6	5.2		1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	57.2	2.6	2.5	7.6	5.2		1.8
LOS	E	A	A	A	A		A
Approach Delay		15.9	2.5		5.3		1.8
Approach LOS		B	A		A		A

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.42  
 Intersection Signal Delay: 3.5  
 Intersection Capacity Utilization 69.1%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service C

### Splits and Phases: 21: Menkes- Kraft Driveway & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 21: Menkes- Kraft Driveway & Park Lawn Rd

3/24/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↔		↖	↗			↖↗↘	
Volume (vph)	8	0	26	0	0	56	59	1060	0	35	1400	13
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	1.00	1.00			1.00		1.00	0.95			0.91	
Frt	1.00	0.85			0.86		1.00	1.00			1.00	
Flt Protected	0.95	1.00			1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1583			1611		1770	3539			5072	
Flt Permitted	0.72	1.00			1.00		0.15	1.00			0.87	
Satd. Flow (perm)	1337	1583			1611		284	3539			4426	
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)	9	0	28	0	0	60	63	1140	0	38	1505	14
RTOR Reduction (vph)	0	26	0	0	57	0	0	0	0	0	0	0
Lane Group Flow (vph)	9	2	0	0	3	0	63	1140	0	0	1557	0
Heavy Vehicles (%)	2%	0%	2%	0%	0%	2%	2%	2%	0%	2%	2%	2%
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		4			8			2			1	6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	6.5	6.5			6.5		91.0	91.0			101.5	
Effective Green, g (s)	6.5	6.5			6.5		91.0	91.0			101.5	
Actuated g/C Ratio	0.05	0.05			0.05		0.76	0.76			0.85	
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)	72	86			87		215	2684			3773	
v/s Ratio Prot		0.00			0.00			c0.32			c0.02	
v/s Ratio Perm	c0.01						0.22				0.33	
v/c Ratio	0.12	0.02			0.04		0.29	0.42			0.41	
Uniform Delay, d1	54.0	53.7			53.8		4.5	5.2			2.2	
Progression Factor	1.00	1.00			1.00		0.95	0.92			0.72	
Incremental Delay, d2	0.8	0.1			0.2		2.5	0.4			0.1	
Delay (s)	54.8	53.8			54.0		6.8	5.1			1.6	
Level of Service	D	D			D		A	A			A	
Approach Delay (s)		54.1			54.0			5.2			1.6	
Approach LOS		D			D			A			A	

### Intersection Summary

HCM Average Control Delay	4.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 30: Lake Shore Blvd W & Legion Rd South

3/24/2014

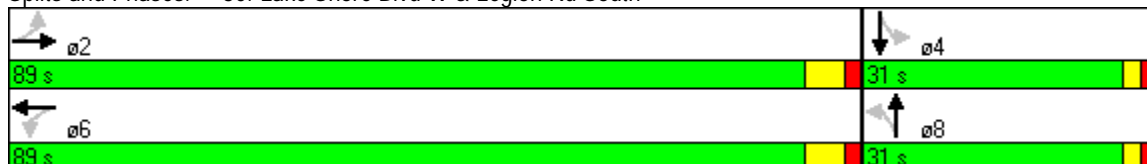


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔↔	↔↔		↔	↔	↔
Volume (vph)	58	1038	1421	5	0	122	0
Turn Type	Perm			Perm		Perm	
Protected Phases		2	6		8		4
Permitted Phases	2			8		4	
Detector Phase	2	2	6	8	8	4	4
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.0	23.0	23.0	30.0	30.0	30.0	30.0
Total Split (s)	89.0	89.0	89.0	31.0	31.0	31.0	31.0
Total Split (%)	74.2%	74.2%	74.2%	25.8%	25.8%	25.8%	25.8%
Yellow Time (s)	4.0	4.0	4.0	2.0	2.0	2.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)		93.4	93.4		16.6	16.6	16.6
Actuated g/C Ratio		0.78	0.78		0.14	0.14	0.14
v/c Ratio		0.58	0.59		0.11	0.68	0.45
Control Delay		7.5	3.4		20.4	66.5	29.7
Queue Delay		0.0	0.0		0.0	0.0	0.0
Total Delay		7.5	3.4		20.4	66.5	29.7
LOS		A	A		C	E	C
Approach Delay		7.5	3.4		20.4		48.8
Approach LOS		A	A		C		D

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 91 (76%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.68  
 Intersection Signal Delay: 8.8  
 Intersection LOS: A  
 Intersection Capacity Utilization 95.2%  
 ICU Level of Service F  
 Analysis Period (min) 15

### Splits and Phases: 30: Lake Shore Blvd W & Legion Rd South



HCM Signalized Intersection Capacity Analysis  
 30: Lake Shore Blvd W & Legion Rd South

3/24/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕		↕	↕	
Volume (vph)	58	1038	0	0	1421	113	5	0	19	122	0	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95			1.00		1.00	1.00	
Frbp, ped/bikes		1.00			1.00			0.96		1.00	0.97	
Flpb, ped/bikes		1.00			1.00			1.00		0.97	1.00	
Frt		1.00			0.99			0.89		1.00	0.85	
Flt Protected		1.00			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		3567			3520			1613		1745	1573	
Flt Permitted		0.71			1.00			0.95		0.74	1.00	
Satd. Flow (perm)		2541			3520			1550		1361	1573	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	1093	0	0	1496	119	5	0	20	128	0	119
RTOR Reduction (vph)	0	0	0	0	4	0	0	17	0	0	49	0
Lane Group Flow (vph)	0	1154	0	0	1611	0	0	8	0	128	70	0
Confl. Peds. (#/hr)	13		18	18		13	9		22	22		9
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	10	0	0	16	0	0	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		93.4			93.4			16.6		16.6	16.6	
Effective Green, g (s)		93.4			93.4			16.6		16.6	16.6	
Actuated g/C Ratio		0.78			0.78			0.14		0.14	0.14	
Clearance Time (s)		6.0			6.0			4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		1978			2740			214		188	218	
v/s Ratio Prot					c0.46					c0.09		0.04
v/s Ratio Perm		0.45						0.01				
v/c Ratio		0.58			0.59			0.04		0.68	0.32	
Uniform Delay, d1		5.4			5.4			44.8		49.2	46.6	
Progression Factor		1.00			0.45			1.00		1.00	1.00	
Incremental Delay, d2		1.3			0.7			0.1		9.7	0.9	
Delay (s)		6.7			3.1			44.8		58.9	47.5	
Level of Service		A			A			D		E	D	
Approach Delay (s)		6.7			3.1			44.8			53.4	
Approach LOS		A			A			D			D	

Intersection Summary		
HCM Average Control Delay	8.9	HCM Level of Service
HCM Volume to Capacity ratio	0.60	A
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	95.2%	10.0
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group



# HCM Unsignalized Intersection Capacity Analysis

## 32: Lake Shore Blvd W & Street B

3/24/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	↗
Volume (veh/h)	1254	47	28	1286	34	29
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1334	50	30	1368	36	31
Pedestrians				1	24	
Lane Width (m)				3.6	3.6	
Walking Speed (m/s)				1.2	1.2	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	264			76		
pX, platoon unblocked				0.99	0.99	0.99
vC, conflicting volume	1408			2127		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1386			2115		
tC, single (s)	4.1			6.8		
tC, 2 stage (s)						
tF (s)	2.2			3.5		
p0 queue free %	94			11		
cM capacity (veh/h)	484			41		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	889	495	486	912	36	31
Volume Left	0	0	30	0	36	0
Volume Right	0	50	0	0	0	31
cSH	1700	1700	484	1700	41	381
Volume to Capacity	0.52	0.29	0.06	0.54	0.89	0.08
Queue Length 95th (m)	0.0	0.0	1.6	0.0	27.4	2.1
Control Delay (s)	0.0	0.0	1.8	0.0	260.2	15.3
Lane LOS			A			C
Approach Delay (s)	0.0		0.6		147.4	
Approach LOS					F	

Intersection Summary						
Average Delay			3.8			
Intersection Capacity Utilization			65.9%		ICU Level of Service	C
Analysis Period (min)			15			

# Timings

## 34: Lake Shore Blvd W & Gardiner Expy WB Off-Ramp

3/24/2014

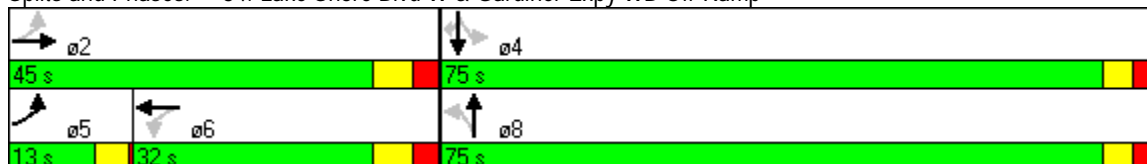


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖	↕	↖	↗	↖	↕		↕	↗
Volume (vph)	275	804	3	96	71	29	132	144	1117
Turn Type	pm+pt		Perm		Perm		Perm		Perm
Protected Phases	5	2		6		8		4	
Permitted Phases	2		6		8		4		4
Detector Phase	5	2	6	6	8	8	4	4	4
Switch Phase									
Minimum Initial (s)	4.0	24.0	24.0	24.0	13.0	13.0	13.0	13.0	13.0
Minimum Split (s)	8.0	31.0	31.0	31.0	27.0	27.0	27.0	27.0	27.0
Total Split (s)	13.0	45.0	32.0	32.0	75.0	75.0	75.0	75.0	75.0
Total Split (%)	10.8%	37.5%	26.7%	26.7%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag					
Lead-Lag Optimize?									
Recall Mode	None	C-Min	Min	Min	Min	Min	Max	Max	Max
Act Effect Green (s)	40.8	37.8	24.8	24.8	69.2	69.2		69.2	69.2
Actuated g/C Ratio	0.34	0.32	0.21	0.21	0.58	0.58		0.58	0.58
v/c Ratio	0.74	0.92	0.07	0.35	0.13	0.04		0.34	1.00
Control Delay	31.3	36.3	45.0	43.1	12.5	8.0		14.8	38.7
Queue Delay	0.0	4.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	31.3	40.3	45.0	43.1	12.5	8.0		14.8	38.7
LOS	C	D	D	D	B	A		B	D
Approach Delay		38.3		43.2		10.3		34.0	
Approach LOS		D		D		B		C	

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 68 (57%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 35.0  
 Intersection LOS: D  
 Intersection Capacity Utilization 116.0%  
 ICU Level of Service H  
 Analysis Period (min) 15

### Splits and Phases: 34: Lake Shore Blvd W & Gardiner Expy WB Off-Ramp



HCM Signalized Intersection Capacity Analysis  
 34: Lake Shore Blvd W & Gardiner Expy WB Off-Ramp

3/24/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗			↖	↗
Volume (vph)	275	804	121	3	96	18	71	29	40	132	144	1117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		7.0	7.0		6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	0.95			1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99			1.00	1.00
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	0.91			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1713	3455		1263	1706		1770	3274			1828	1583
Flt Permitted	0.58	1.00		0.16	1.00		0.54	1.00			0.81	1.00
Satd. Flow (perm)	1050	3455		214	1706		1010	3274			1519	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	299	874	132	3	104	20	77	32	43	143	157	1214
RTOR Reduction (vph)	0	10	0	0	6	0	0	10	0	0	0	297
Lane Group Flow (vph)	299	996	0	3	118	0	77	65	0	0	300	917
Confl. Peds. (#/hr)	2		13	13		2			1	1		
Heavy Vehicles (%)	1%	2%	0%	33%	10%	0%	2%	0%	0%	3%	0%	2%
Bus Blockages (#/hr)	10	0	0	16	0	0	0	0	0	0	0	0
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8				4
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	37.8	37.8		24.8	24.8		69.2	69.2			69.2	69.2
Effective Green, g (s)	37.8	37.8		24.8	24.8		69.2	69.2			69.2	69.2
Actuated g/C Ratio	0.31	0.31		0.21	0.21		0.58	0.58			0.58	0.58
Clearance Time (s)	4.0	7.0		7.0	7.0		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	3.0
Lane Grp Cap (vph)	380	1088		44	353		582	1888			876	913
v/s Ratio Prot	0.06	c0.29			0.07			0.02				
v/s Ratio Perm	0.19			0.01			0.08				0.20	c0.58
v/c Ratio	0.79	0.92		0.07	0.34		0.13	0.03			0.34	1.00
Uniform Delay, d1	36.7	39.6		38.3	40.6		11.6	11.0			13.4	25.4
Progression Factor	0.60	0.59		1.06	1.04		1.00	1.00			1.00	1.00
Incremental Delay, d2	9.7	12.6		0.7	0.6		0.1	0.0			1.1	30.9
Delay (s)	31.9	35.8		41.3	42.9		11.7	11.0			14.5	56.3
Level of Service	C	D		D	D		B	B			B	E
Approach Delay (s)		34.9			42.9			11.4			48.0	
Approach LOS		C			D			B			D	

Intersection Summary		
HCM Average Control Delay	40.5	HCM Level of Service D
HCM Volume to Capacity ratio	0.97	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 13.0
Intersection Capacity Utilization	116.0%	ICU Level of Service H
Analysis Period (min)	15	

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 37: Lake Shore Blvd W & Marine Parade Dr.

3/24/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	↩
Volume (veh/h)	767	63	10	56	31	46
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)	825	68	11	60	33	49
Pedestrians					9	
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)	398			136		
pX, platoon unblocked			0.67		0.67	0.67
vC, conflicting volume			901		949	868
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			611		682	560
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		88	86
cM capacity (veh/h)			653		272	355

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	892	71	33	49
Volume Left	0	11	33	0
Volume Right	68	0	0	49
cSH	1700	653	272	355
Volume to Capacity	0.52	0.02	0.12	0.14
Queue Length 95th (m)	0.0	0.4	3.3	3.8
Control Delay (s)	0.0	1.8	20.1	16.8
Lane LOS		A	C	C
Approach Delay (s)	0.0	1.8	18.1	
Approach LOS			C	

Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization		54.3%	ICU Level of Service A
Analysis Period (min)		15	

# Timings

## 38: Lake Shore Blvd W & Palace Pier Crt

3/24/2014



Lane Group	EBT	EBR	NBL	NBR
Lane Configurations	↑	↑	↑	↑
Volume (vph)	586	175	37	28
Turn Type		Perm		Perm
Protected Phases	2		4	
Permitted Phases		2		4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0
Total Split (s)	38.0	38.0	22.0	22.0
Total Split (%)	63.3%	63.3%	36.7%	36.7%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effect Green (s)	32.0	32.0	16.0	16.0
Actuated g/C Ratio	0.53	0.53	0.27	0.27
v/c Ratio	0.64	0.22	0.09	0.08
Control Delay	8.5	1.6	14.9	5.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	8.5	1.6	14.9	5.2
LOS	A	A	B	A
Approach Delay	6.9		10.7	
Approach LOS	A		B	

### Intersection Summary

Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 45 (75%), Referenced to phase 2:EBT and 6:, Start of Green  
 Natural Cycle: 55  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.64  
 Intersection Signal Delay: 7.2  
 Intersection Capacity Utilization 44.2%  
 Analysis Period (min) 15

Intersection LOS: A  
 ICU Level of Service A

Splits and Phases: 38: Lake Shore Blvd W & Palace Pier Crt



HCM Signalized Intersection Capacity Analysis  
 38: Lake Shore Blvd W & Palace Pier Crt

3/24/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗			↖	↗
Volume (vph)	586	175	0	0	37	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	1.00			1.00	1.00
Frbp, ped/bikes	1.00	0.94			1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00
Frt	1.00	0.85			1.00	0.85
Flt Protected	1.00	1.00			0.95	1.00
Satd. Flow (prot)	1900	1508			1805	1455
Flt Permitted	1.00	1.00			0.95	1.00
Satd. Flow (perm)	1900	1508			1805	1455
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	644	192	0	0	41	31
RTOR Reduction (vph)	0	85	0	0	0	23
Lane Group Flow (vph)	644	107	0	0	41	8
Confl. Peds. (#/hr)		20	20			
Heavy Vehicles (%)	0%	1%	0%	0%	0%	11%
Turn Type		Perm				Perm
Protected Phases	2				4	
Permitted Phases		2				4
Actuated Green, G (s)	32.0	32.0			16.0	16.0
Effective Green, g (s)	32.0	32.0			16.0	16.0
Actuated g/C Ratio	0.53	0.53			0.27	0.27
Clearance Time (s)	6.0	6.0			6.0	6.0
Lane Grp Cap (vph)	1013	804			481	388
v/s Ratio Prot	c0.34				c0.02	
v/s Ratio Perm		0.07				0.01
v/c Ratio	0.64	0.13			0.09	0.02
Uniform Delay, d1	9.9	7.0			16.5	16.2
Progression Factor	0.64	1.06			0.87	0.88
Incremental Delay, d2	1.9	0.2			0.3	0.1
Delay (s)	8.3	7.7			14.7	14.3
Level of Service	A	A			B	B
Approach Delay (s)	8.2			0.0	14.5	
Approach LOS	A			A	B	

Intersection Summary

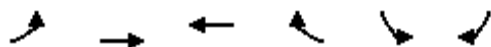
HCM Average Control Delay	8.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 40: Marine parade Dr. & Marine Parade Dr.

3/24/2014

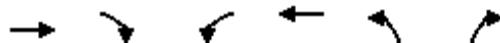


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	13	110	126	0	0	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	120	137	0	0	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)			342			
pX, platoon unblocked						
vC, conflicting volume	137				285	137
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	137				285	137
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	99
cM capacity (veh/h)	1447				699	912
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	134	137	10			
Volume Left	14	0	0			
Volume Right	0	0	10			
cSH	1447	1700	912			
Volume to Capacity	0.01	0.08	0.01			
Queue Length 95th (m)	0.2	0.0	0.3			
Control Delay (s)	0.9	0.0	9.0			
Lane LOS	A		A			
Approach Delay (s)	0.9	0.0	9.0			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.7			
Intersection Capacity Utilization		26.5%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis

## 42: Lake Shore Blvd W & Interim Phantom Driveway

3/24/2014



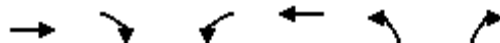
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	1288	56	26	1328	26	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1288	56	26	1328	26	13
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	141			199		
pX, platoon unblocked				0.86	0.86	0.86
vC, conflicting volume	1344			2032	672	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1077			1876	297	
tC, single (s)	4.1			6.8	6.9	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	95			50	98	
cM capacity (veh/h)	554			52	602	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	859	485	469	885	39	
Volume Left	0	0	26	0	26	
Volume Right	0	56	0	0	13	
cSH	1700	1700	554	1700	75	
Volume to Capacity	0.51	0.29	0.05	0.52	0.52	
Queue Length 95th (m)	0.0	0.0	1.2	0.0	17.6	
Control Delay (s)	0.0	0.0	1.4	0.0	97.1	
Lane LOS	A			F		
Approach Delay (s)	0.0		0.5		97.1	
Approach LOS				F		
Intersection Summary						
Average Delay	1.6					
Intersection Capacity Utilization	65.2%			ICU Level of Service	C	
Analysis Period (min)	15					



# HCM Unsignalized Intersection Capacity Analysis

## 48: Lake Shore Blvd W & Street A

3/24/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Volume (veh/h)	1152	108	39	1227	68	45
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)	1252	117	42	1334	74	49
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)	80		77			
pX, platoon unblocked						
vC, conflicting volume			1370		2062	685
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1370		2062	685
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		0	87
cM capacity (veh/h)			508		43	391
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	835	535	487	889	123	
Volume Left	0	0	42	0	74	
Volume Right	0	117	0	0	49	
cSH	1700	1700	508	1700	67	
Volume to Capacity	0.49	0.31	0.08	0.52	1.83	
Queue Length 95th (m)	0.0	0.0	2.2	0.0	88.9	
Control Delay (s)	0.0	0.0	2.4	0.0	527.3	
Lane LOS			A		F	
Approach Delay (s)	0.0		0.9		527.3	
Approach LOS					F	
Intersection Summary						
Average Delay			23.0			
Intersection Capacity Utilization			75.3%		ICU Level of Service	D
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 50: Marine Parade Dr. & Street B

3/24/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	57	257	208	19	10	32
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	63	286	231	21	11	36
Pedestrians		4	1			
Lane Width (m)		3.6	3.6			
Walking Speed (m/s)		1.2	1.2			
Percent Blockage		0	0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	252				655	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	252				655	130
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				97	96
cM capacity (veh/h)	1310				384	892

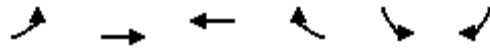
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	63	286	154	98	47
Volume Left	63	0	0	0	11
Volume Right	0	0	0	21	36
cSH	1310	1700	1700	1700	678
Volume to Capacity	0.05	0.17	0.09	0.06	0.07
Queue Length 95th (m)	1.2	0.0	0.0	0.0	1.8
Control Delay (s)	7.9	0.0	0.0	0.0	10.7
Lane LOS	A				B
Approach Delay (s)	1.4		0.0		10.7
Approach LOS					B

Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization		24.8%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

## 52: Marine Parade Dr. & Street A

3/24/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	139	121	135	0	2	93
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)	151	132	147	0	2	101
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	147				580	73
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	147				580	73
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				99	90
cM capacity (veh/h)	1433				398	974

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	151	132	98	49	103
Volume Left	151	0	0	0	2
Volume Right	0	0	0	0	101
cSH	1433	1700	1700	1700	945
Volume to Capacity	0.11	0.08	0.06	0.03	0.11
Queue Length 95th (m)	2.8	0.0	0.0	0.0	2.9
Control Delay (s)	7.8	0.0	0.0	0.0	9.3
Lane LOS	A				A
Approach Delay (s)	4.2		0.0		9.3
Approach LOS					A

Intersection Summary			
Average Delay		4.0	
Intersection Capacity Utilization	27.3%		ICU Level of Service A
Analysis Period (min)	15		

Summary of All Intervals

Run Number	2	3	5	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	7:15	7:15	7:15	7:15
Total Time (min)	25	25	25	25
Time Recorded (min)	15	15	15	15
# of Intervals	2	2	2	2
# of Recorded Intvl	1	1	1	1
Vehs Entered	1838	1824	1798	1815
Vehs Exited	1678	1755	1699	1709
Starting Vehs	510	510	498	503
Ending Vehs	670	579	597	611
Denied Entry Before	61	11	28	32
Denied Entry After	625	578	566	587
Travel Distance (km)	2012	2074	2021	2036
Travel Time (hr)	213.6	198.1	199.7	203.8
Total Delay (hr)	171.8	155.3	157.7	161.6
Total Stops	4251	4262	4327	4276
Fuel Used (l)	3323.8	3237.5	3206.4	3255.9

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10
Volumes adjusted by PHF, Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	2	3	5	Avg
Vehs Entered	1838	1824	1798	1815
Vehs Exited	1678	1755	1699	1709
Starting Vehs	510	510	498	503
Ending Vehs	670	579	597	611
Denied Entry Before	61	11	28	32
Denied Entry After	625	578	566	587
Travel Distance (km)	2012	2074	2021	2036
Travel Time (hr)	213.6	198.1	199.7	203.8
Total Delay (hr)	171.8	155.3	157.7	161.6
Total Stops	4251	4262	4327	4276
Fuel Used (l)	3323.8	3237.5	3206.4	3255.9

Queuing and Blocking Report  
 Future Backg. Traffic PM Peak Hour, Interim Scenario

3/24/2014

Intersection: 3: Lake Shore Blvd W & Park Lawn Rd

Movement	EB	EB	EB	WB	WB	WB	B25	B25	NB	NB	NB	SB
Directions Served	LT	T	TR	LT	T	R	T	T	L	T	R	L
Maximum Queue (m)	289.9	300.1	279.8	58.6	60.3	38.4	14.4	34.4	22.4	92.3	62.3	129.8
Average Queue (m)	285.1	285.2	172.7	24.4	25.8	15.8	4.3	11.9	10.1	34.5	1.4	115.6
95th Queue (m)	289.7	309.9	358.0	60.0	66.5	38.5	19.5	47.2	23.6	87.2	5.7	142.5
Link Distance (m)	282.6	282.6	282.6	48.9	48.9		47.8	47.8		287.2	287.2	
Upstream Blk Time (%)	69	44	0	4	4	0		1				
Queuing Penalty (veh)	286	184	1	27	25	0		6				
Storage Bay Dist (m)							45.0		55.0			100.0
Storage Blk Time (%)					4	0				11		38
Queuing Penalty (veh)					19	1				7		156

Intersection: 3: Lake Shore Blvd W & Park Lawn Rd

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (m)	200.0	210.7	105.5
Average Queue (m)	146.6	86.0	39.4
95th Queue (m)	225.4	205.0	114.0
Link Distance (m)	188.4	188.4	188.4
Upstream Blk Time (%)	18	4	0
Queuing Penalty (veh)	92	22	1
Storage Bay Dist (m)			
Storage Blk Time (%)	37		
Queuing Penalty (veh)	153		

Intersection: 5: The Queensway & Park Lawn Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	L	T	TR
Maximum Queue (m)	120.7	152.1	157.2	124.7	162.0	155.8	38.4	38.6	74.2	15.9	52.6	76.2
Average Queue (m)	56.5	120.1	126.0	118.2	132.5	116.4	7.8	20.0	43.2	6.8	26.9	51.6
95th Queue (m)	133.6	189.6	192.2	154.0	223.4	189.1	28.6	38.5	71.8	16.8	52.1	75.7
Link Distance (m)		164.4	164.4		682.9	682.9			271.0		401.9	401.9
Upstream Blk Time (%)		4	7									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (m)	50.0			50.0			20.0	50.0		25.0		
Storage Blk Time (%)	5	59		72	20	50	0	0	5	0	8	
Queuing Penalty (veh)	17	131		327	77	36	0	0	9	0	3	

Queuing and Blocking Report  
 Future Backg. Traffic PM Peak Hour, Interim Scenario

3/24/2014

Intersection: 8: Gardiner WB On-ramp & Park Lawn Rd

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	T	T	T	T	R
Maximum Queue (m)	12.7	5.0	54.5	21.8	19.8	30.3	41.8	44.7
Average Queue (m)	3.6	0.7	37.5	12.4	11.0	18.9	23.9	18.6
95th Queue (m)	12.5	4.4	66.6	24.9	26.3	38.5	46.5	39.0
Link Distance (m)	120.0	120.0		176.2	176.2	271.0	271.0	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			199.5					220.0
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 10: Gardiner Expwy EB Off-ramp & Park Lawn Rd

Movement	EB	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	L	R	L	T	T	T	TR
Maximum Queue (m)	52.5	62.5	35.0	17.3	55.1	34.2	50.1	48.9
Average Queue (m)	34.5	34.0	25.2	11.0	29.9	17.8	26.9	25.1
95th Queue (m)	57.0	64.9	43.5	19.6	54.7	36.0	51.5	54.9
Link Distance (m)	243.2	243.2			104.2	104.2	176.2	176.2
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			35.0	27.0				
Storage Blk Time (%)		1	3		9			
Queuing Penalty (veh)		11	7		10			

Intersection: 12: Lake Shore Blvd W & Mr. Christie's East Driveway

Movement	EB	EB	WB	WB
Directions Served	LT	T	T	TR
Maximum Queue (m)	65.6	64.0	18.4	19.7
Average Queue (m)	61.5	52.4	4.0	4.8
95th Queue (m)	63.8	78.5	25.3	29.4
Link Distance (m)	59.9	59.9	59.2	59.2
Upstream Blk Time (%)	68	27	0	0
Queuing Penalty (veh)	461	186	0	1
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report  
 Future Backg. Traffic PM Peak Hour, Interim Scenario

3/24/2014

Intersection: 14: Lake Shore Blvd W & Mr. Christie's West Driveway

Movement	EB	EB	SB
Directions Served	LT	T	LR
Maximum Queue (m)	90.9	86.1	77.4
Average Queue (m)	87.1	59.3	47.8
95th Queue (m)	90.9	109.7	89.5
Link Distance (m)	83.1	83.1	76.1
Upstream Blk Time (%)	62	18	25
Queuing Penalty (veh)	404	116	0
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 19: Gardiner Expwy EB Off-ramp &

Movement	EB	EB	WB	NB
Directions Served	T	T	L	R
Maximum Queue (m)	122.1	53.7	26.3	20.9
Average Queue (m)	32.4	31.9	15.8	4.5
95th Queue (m)	128.2	57.4	27.1	18.4
Link Distance (m)	282.0	282.0	243.2	195.7
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (m)				
Storage Blk Time (%)		1		
Queuing Penalty (veh)		1		

Intersection: 21: Menkes- Kraft Driveway & Park Lawn Rd

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	B18
Directions Served	L	TR	LR	L	T	TR	LT	T	TR	T
Maximum Queue (m)	7.6	11.8	9.1	12.5	35.5	25.5	133.0	126.4	121.1	3.8
Average Queue (m)	1.5	6.0	5.9	5.2	13.5	11.8	50.8	31.0	20.7	0.0
95th Queue (m)	7.7	14.1	11.1	16.4	33.2	27.1	119.0	96.3	67.3	0.0
Link Distance (m)	91.7	91.7	98.4		188.4	188.4	140.7	140.7	140.7	104.2
Upstream Blk Time (%)							2	0	0	
Queuing Penalty (veh)							8	2	0	
Storage Bay Dist (m)				30.0						
Storage Blk Time (%)				0	1					
Queuing Penalty (veh)				0	1					

Queuing and Blocking Report  
 Future Backg. Traffic PM Peak Hour, Interim Scenario

3/24/2014

Intersection: 30: Lake Shore Blvd W & Legion Rd South

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	TR	LT	TR	LR	L	TR
Maximum Queue (m)	255.2	249.6	33.1	43.0	10.9	92.6	111.3
Average Queue (m)	249.9	246.6	16.3	25.5	4.1	63.9	47.2
95th Queue (m)	255.1	257.2	34.9	45.5	10.8	111.9	151.1
Link Distance (m)	245.0	245.0	282.6	282.6	126.6		291.5
Upstream Blk Time (%)	85	48					
Queuing Penalty (veh)	0	0					
Storage Bay Dist (m)						50.0	
Storage Blk Time (%)						50	0
Queuing Penalty (veh)						60	0

Intersection: 32: Lake Shore Blvd W & Street B

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	TR	LT	T	L	R
Maximum Queue (m)	16.0	17.0	23.2	10.3	24.1	24.7
Average Queue (m)	9.9	9.0	3.3	1.5	9.0	12.3
95th Queue (m)	13.4	19.8	20.5	12.3	22.8	28.7
Link Distance (m)	4.8	4.8	59.9	59.9		89.0
Upstream Blk Time (%)	69	30				
Queuing Penalty (veh)	480	209				
Storage Bay Dist (m)					50.0	
Storage Blk Time (%)						
Queuing Penalty (veh)						



Queuing and Blocking Report  
 Future Backg. Traffic PM Peak Hour, Interim Scenario

3/24/2014

Intersection: 34: Lake Shore Blvd W & Gardiner Expy WB Off-Ramp

Movement	EB	EB	EB	B2	B2	WB	WB	B23	NB	NB	NB	SB
Directions Served	L	T	TR	T	T	L	TR	T	L	T	TR	LT
Maximum Queue (m)	33.6	61.6	57.4	28.8	23.2	4.3	67.9	39.5	37.2	63.6	15.7	36.5
Average Queue (m)	20.6	56.3	41.4	26.5	9.7	0.0	37.4	6.0	21.9	9.5	5.7	11.9
95th Queue (m)	35.8	64.7	72.0	31.6	23.8	0.0	77.5	32.3	45.1	44.7	16.9	44.5
Link Distance (m)		36.3	36.3	5.8	5.8		58.1	292.7		81.1	81.1	118.7
Upstream Blk Time (%)	0	55	7	57	16		26					
Queuing Penalty (veh)	0	358	47	373	102		24					
Storage Bay Dist (m)	70.0					50.0			30.0			
Storage Blk Time (%)	0	55					26		35			
Queuing Penalty (veh)	1	164					1		6			

Intersection: 34: Lake Shore Blvd W & Gardiner Expy WB Off-Ramp

Movement	SB
Directions Served	R
Maximum Queue (m)	125.4
Average Queue (m)	119.9
95th Queue (m)	125.4
Link Distance (m)	118.7
Upstream Blk Time (%)	85
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 37: Lake Shore Blvd W & Marine Parade Dr.

Movement	WB	NB	NB
Directions Served	LT	L	R
Maximum Queue (m)	8.9	10.5	12.1
Average Queue (m)	1.5	4.7	6.3
95th Queue (m)	6.8	11.0	13.1
Link Distance (m)	117.2		129.1
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)		15.0	
Storage Blk Time (%)		0	0
Queuing Penalty (veh)		0	0

Queuing and Blocking Report  
 Future Backg. Traffic PM Peak Hour, Interim Scenario

3/24/2014

Intersection: 38: Lake Shore Blvd W & Palace Pier Crt

Movement	EB	EB	NB	NB
Directions Served	T	R	L	R
Maximum Queue (m)	45.4	42.8	16.0	9.2
Average Queue (m)	28.1	14.9	5.4	3.8
95th Queue (m)	49.7	41.2	17.1	10.3
Link Distance (m)	117.2			134.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)		30.0	15.0	
Storage Blk Time (%)	7		3	0
Queuing Penalty (veh)	13		1	0

Intersection: 40: Marine parade Dr. & Marine Parade Dr.

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	3.0	6.4
Average Queue (m)	0.4	1.5
95th Queue (m)	3.6	6.1
Link Distance (m)	256.1	129.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 42: Lake Shore Blvd W & Interim Phantom Driveway

Movement	EB	EB	B25	B25	WB	NB
Directions Served	T	TR	T	T	LT	LR
Maximum Queue (m)	71.2	68.9	76.1	89.1	15.0	13.3
Average Queue (m)	61.1	40.6	42.8	34.1	2.6	6.0
95th Queue (m)	88.3	86.1	92.6	94.1	15.6	14.4
Link Distance (m)	47.8	47.8	48.9	48.9	83.1	87.9
Upstream Blk Time (%)	54	14	27	13		
Queuing Penalty (veh)	442	113	145	73		
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Queuing and Blocking Report  
 Future Backg. Traffic PM Peak Hour, Interim Scenario

3/24/2014

Intersection: 48: Lake Shore Blvd W & Street A

Movement	EB	EB	WB	WB	B2	B2	B2	NB
Directions Served	T	TR	LT	T	T	T		LR
Maximum Queue (m)	79.2	80.3	28.8	11.2	45.0	40.0	57.7	74.0
Average Queue (m)	67.7	68.7	24.9	8.6	39.0	30.3	38.7	70.4
95th Queue (m)	79.7	97.4	28.4	31.1	47.0	44.7	79.2	77.3
Link Distance (m)	59.2	59.2	5.8	5.8	36.3	36.3	36.3	69.5
Upstream Blk Time (%)	70	45	93	0	71	28	59	94
Queuing Penalty (veh)	473	306	649	2	332	129	276	0
Storage Bay Dist (m)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 50: Marine Parade Dr. & Street B

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (m)	6.1	11.0
Average Queue (m)	2.2	7.5
95th Queue (m)	8.7	13.9
Link Distance (m)		53.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)	60.0	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 52: Marine Parade Dr. & Street A

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (m)	11.8	14.2
Average Queue (m)	3.0	9.9
95th Queue (m)	12.6	13.4
Link Distance (m)		49.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)	50.0	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 7568

# Appendix I

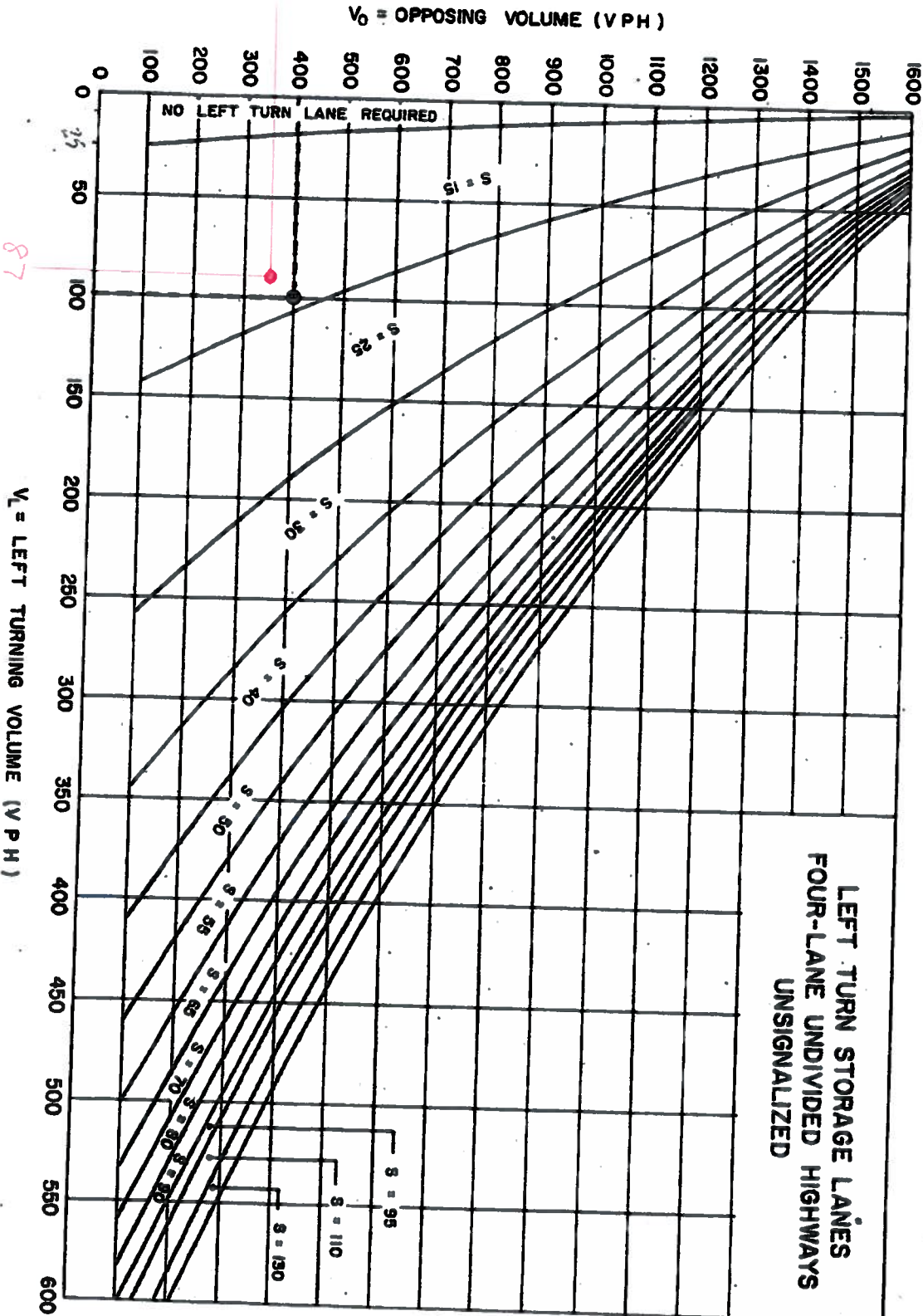
Left Turn Lane Warrant Analysis,  
Ultimate Traffic Scenario

Ultimate - AM Peak - Marine Parade Drive / Street B

94-08

EB-2

Figure EB-1



AT-GRADE INTERSECTIONS

APPENDIX B

87

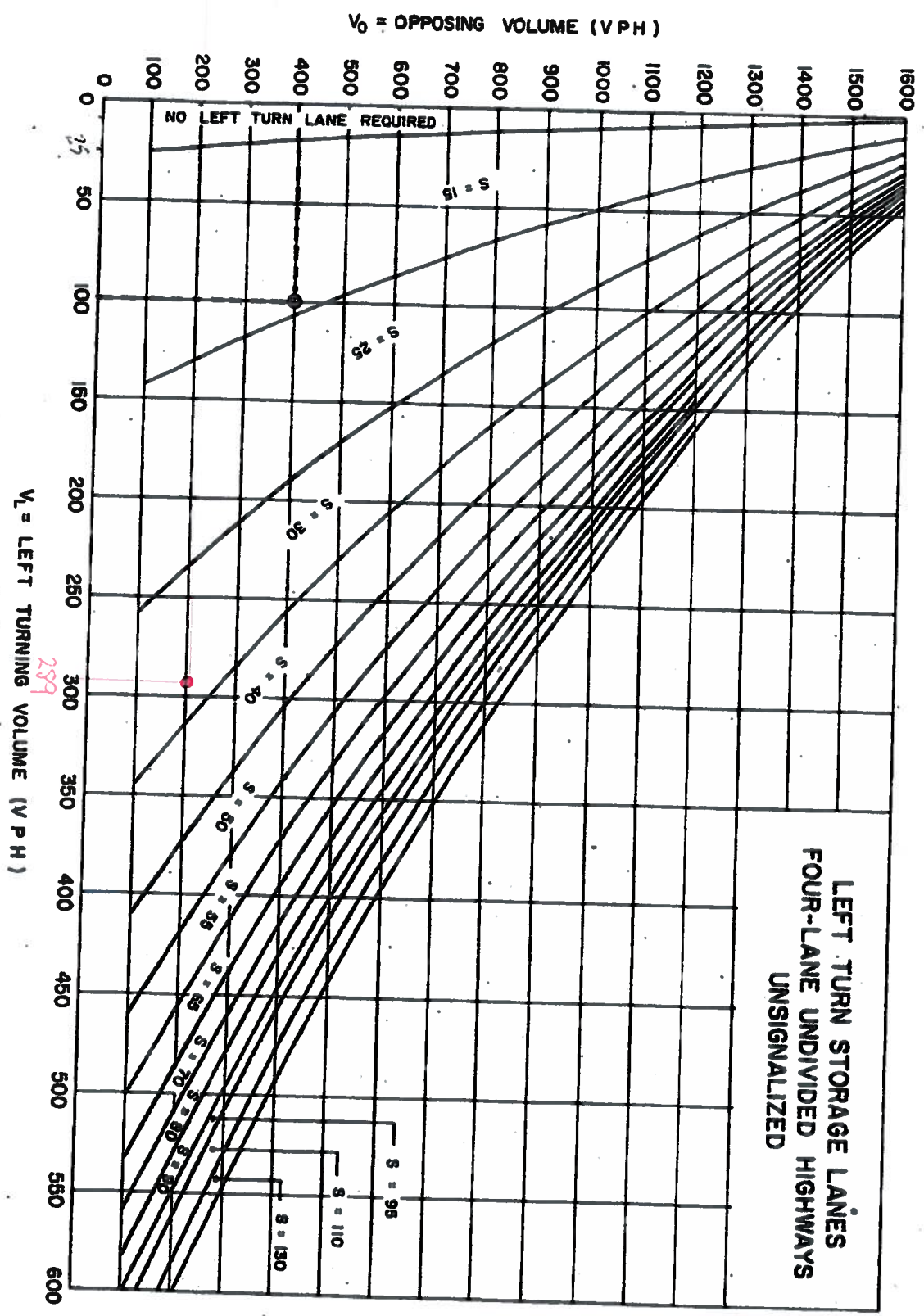
341

Ultimate - PM Peak - Marine Parade Drive / Street B

94-08

EB-2

Figure EB-1



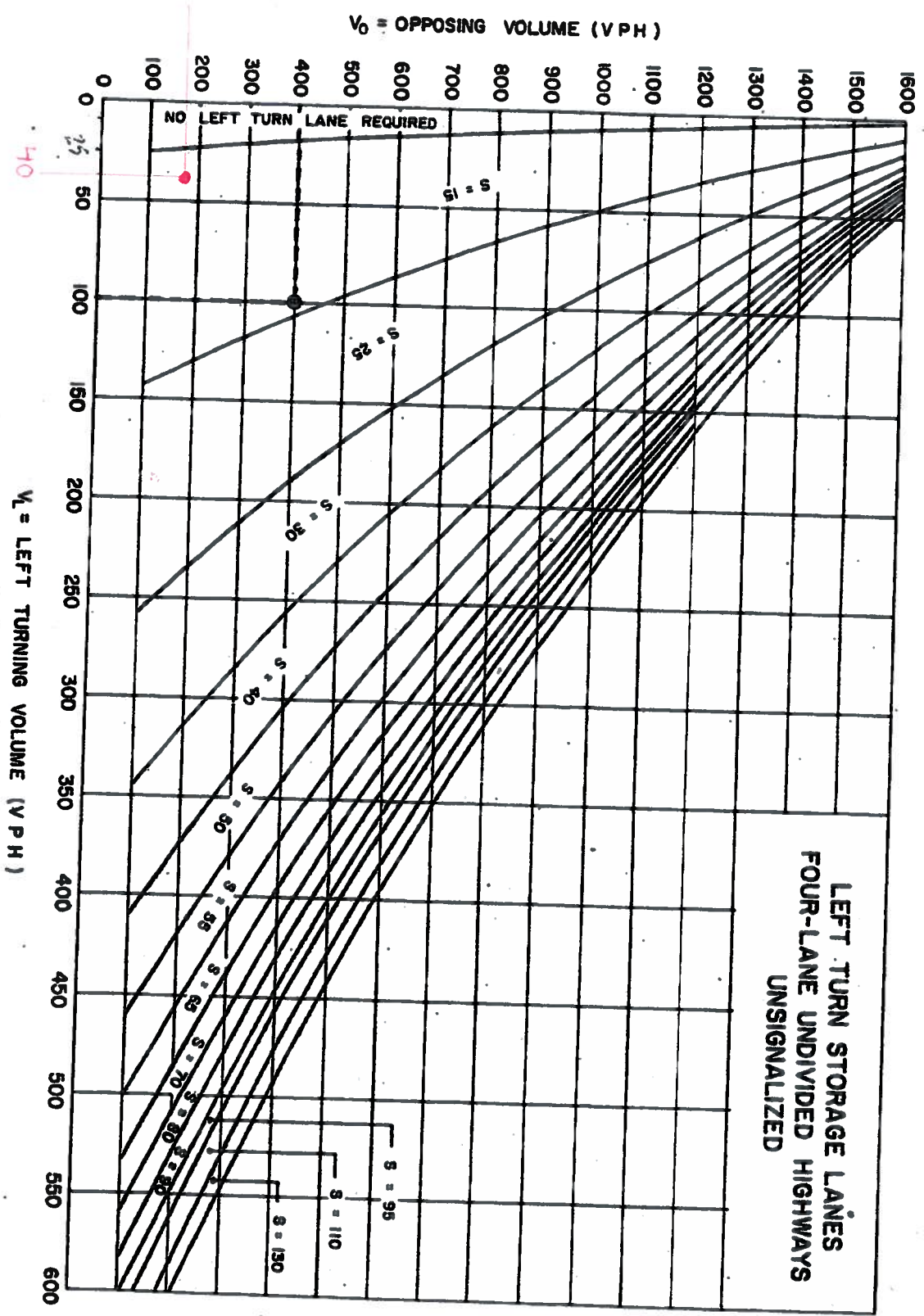
LEFT TURN STORAGE LANES  
FOUR-LANE UNDIVIDED HIGHWAYS  
UNSIGNALIZED

Ultimate - AM Peak - Marine Parade Drive / Street A

94-06

EB-2

Figure EB-1



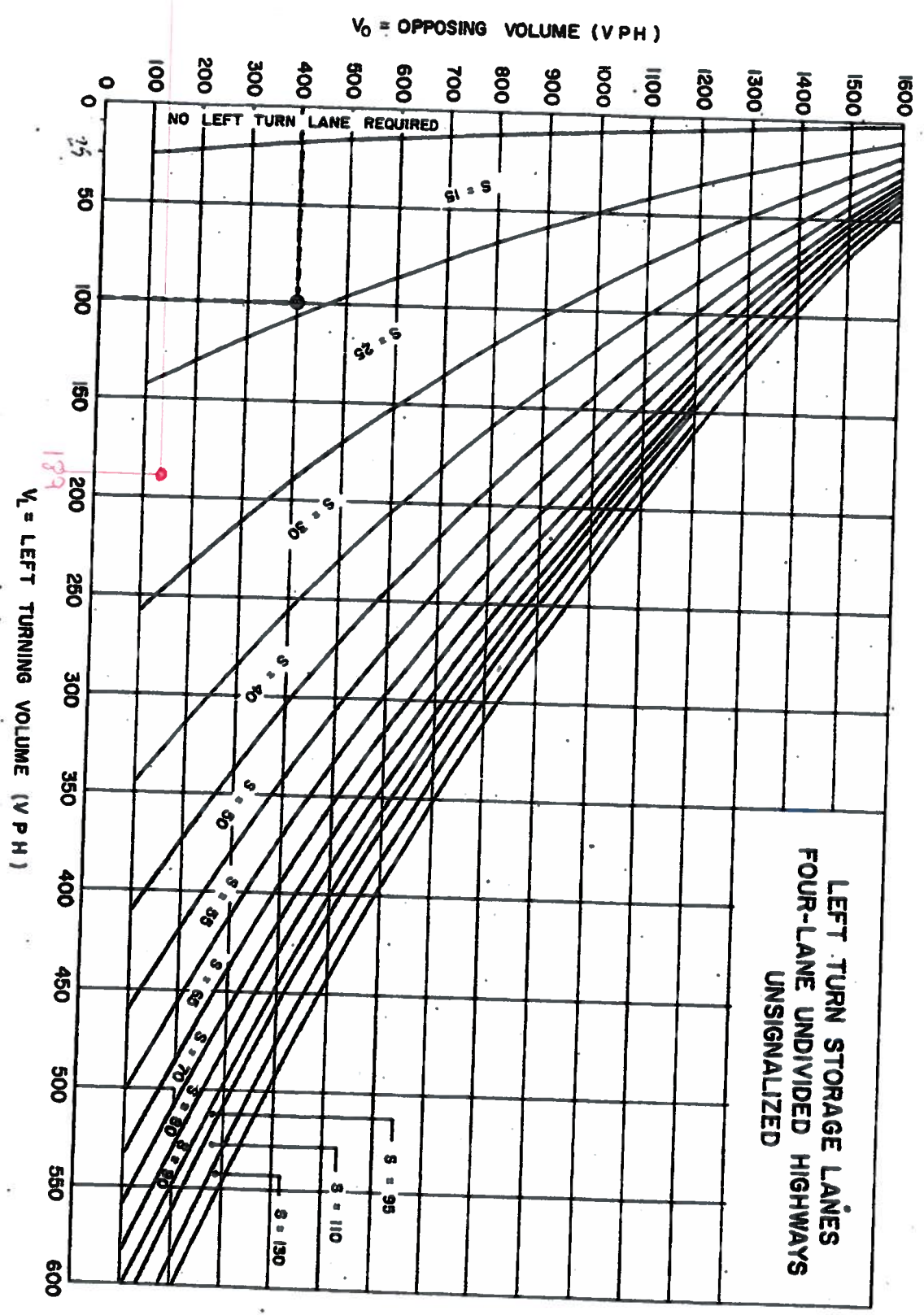


Ultimate - PM Peak - Marine Parade Drive / Street A

94-06

EB-2

Figure EB-1





# Appendix J

Intersection Capacity and  
Queuing Analysis, Future Total  
Traffic Ultimate Scenario

# Timings

## 3: Lake Shore Blvd W & Park Lawn Rd

2/26/2014

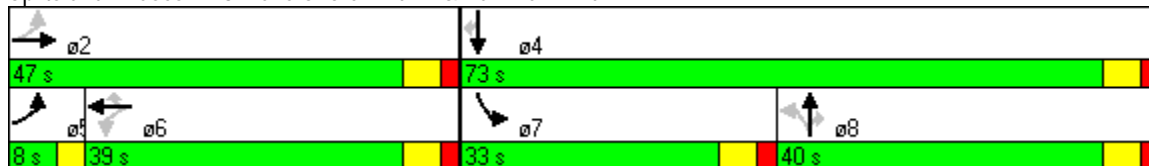


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕	↖	↕	↖	↖	↕	↖	↖↗	↕	↖
Volume (vph)	403	1267	6	587	344	117	485	15	1044	128	446
Turn Type	pm+pt		Perm		Perm	Perm		Perm	Prot		Perm
Protected Phases	5	2		6			8		7	4	
Permitted Phases	2		6		6	8		8			4
Detector Phase	5	2	6	6	6	8	8	8	7	4	4
Switch Phase											
Minimum Initial (s)	4.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	8.0	34.0	39.0	39.0	39.0	40.0	40.0	40.0	33.0	33.0	33.0
Total Split (s)	8.0	47.0	39.0	39.0	39.0	40.0	40.0	40.0	33.0	73.0	73.0
Total Split (%)	6.7%	39.2%	32.5%	32.5%	32.5%	33.3%	33.3%	33.3%	27.5%	60.8%	60.8%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	-1.0	0.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	5.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min
Act Effect Green (s)	44.0	42.0	33.0	34.0	34.0	35.0	35.0	35.0	28.0	68.0	68.0
Actuated g/C Ratio	0.37	0.35	0.28	0.28	0.28	0.29	0.29	0.29	0.23	0.57	0.57
v/c Ratio	2.16	1.20	0.12	0.65	0.58	0.39	0.97	0.04	1.40	0.15	0.54
Control Delay	558.4	133.0	40.3	41.6	10.7	38.4	74.4	27.0	223.7	12.9	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	558.4	133.0	40.3	41.6	10.7	38.4	74.4	27.0	223.7	12.9	12.3
LOS	F	F	D	D	B	D	E	C	F	B	B
Approach Delay		230.6		30.3			66.4			148.9	
Approach LOS		F		C			E			F	

### Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 2.16	
Intersection Signal Delay: 145.2	Intersection LOS: F
Intersection Capacity Utilization 121.9%	ICU Level of Service H
Analysis Period (min) 15	

### Splits and Phases: 3: Lake Shore Blvd W & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 3: Lake Shore Blvd W & Park Lawn Rd

2/26/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	403	1267	87	6	587	344	117	485	15	1044	128	446
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.93	1.00	1.00	0.88	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.94	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1730	3423		1357	3374	1462	1550	1827	1321	3400	1557	1414
Flt Permitted	0.22	1.00		0.12	1.00	1.00	0.67	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	395	3423		173	3374	1462	1094	1827	1321	3400	1557	1414
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	429	1348	93	6	624	366	124	516	16	1111	136	474
RTOR Reduction (vph)	0	4	0	0	0	221	0	0	2	0	0	75
Lane Group Flow (vph)	429	1437	0	6	624	145	124	516	14	1111	136	399
Confl. Peds. (#/hr)	50		50	50		50	50		100	100		50
Confl. Bikes (#/hr)			14			3			1			10
Heavy Vehicles (%)	4%	4%	2%	33%	7%	3%	10%	4%	8%	3%	22%	5%
Turn Type	pm+pt			Perm		Perm	Perm		Perm	Prot		Perm
Protected Phases	5	2			6			8		7		4
Permitted Phases	2			6		6	8		8			4
Actuated Green, G (s)	41.0	41.0		33.0	33.0	33.0	34.0	34.0	34.0	27.0	67.0	67.0
Effective Green, g (s)	41.0	42.0		33.0	34.0	34.0	35.0	35.0	35.0	28.0	68.0	68.0
Actuated g/C Ratio	0.34	0.35		0.28	0.28	0.28	0.29	0.29	0.29	0.23	0.57	0.57
Clearance Time (s)	3.0	6.0		6.0	6.0	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	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	191	1198		48	956	414	319	533	385	793	882	801
v/s Ratio Prot	c0.09	0.42			0.18			c0.28		c0.33	0.09	
v/s Ratio Perm	c0.68			0.03		0.10	0.11		0.01			0.28
v/c Ratio	2.25	1.20		0.12	0.65	0.35	0.39	0.97	0.04	1.40	0.15	0.50
Uniform Delay, d1	39.6	39.0		32.7	37.8	34.2	34.0	41.9	30.4	46.0	12.3	15.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	577.2	98.1		1.2	1.6	0.5	0.8	30.6	0.0	188.1	0.1	0.5
Delay (s)	616.9	137.1		33.8	39.4	34.7	34.7	72.6	30.5	234.1	12.4	16.2
Level of Service	F	F		C	D	C	C	E	C	F	B	B
Approach Delay (s)		247.1			37.7			64.4			156.5	
Approach LOS		F			D			E			F	

### Intersection Summary

HCM Average Control Delay	154.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	121.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 5: The Queensway & Park Lawn Rd

2/26/2014

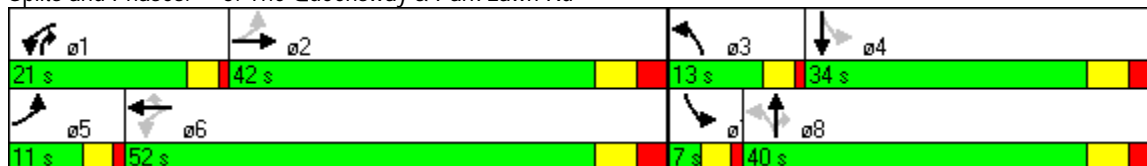


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↕	↖	↕	↗	↖	↕	↗	↖	↕
Volume (vph)	115	880	305	483	35	128	304	530	112	433
Turn Type	pm+pt		pm+pt		Perm	pm+pt		pm+ov	pm+pt	
Protected Phases	5	2	1	6		3	8	1	7	4
Permitted Phases	2		6		6	8	8	8	4	
Detector Phase	5	2	1	6	6	3	8	1	7	4
Switch Phase										
Minimum Initial (s)	7.0	10.0	7.0	10.0	10.0	7.0	10.0	7.0	1.0	10.0
Minimum Split (s)	11.0	30.0	12.0	30.0	30.0	11.0	40.0	12.0	5.0	32.0
Total Split (s)	11.0	42.0	21.0	52.0	52.0	13.0	40.0	21.0	7.0	34.0
Total Split (%)	10.0%	38.2%	19.1%	47.3%	47.3%	11.8%	36.4%	19.1%	6.4%	30.9%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0
All-Red Time (s)	1.0	3.0	1.0	3.0	3.0	1.0	3.0	1.0	1.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?										
Recall Mode	Min	C-Min	Min	Min	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	47.7	36.9	63.1	48.3	48.3	38.9	28.9	51.1	29.1	23.1
Actuated g/C Ratio	0.43	0.34	0.57	0.44	0.44	0.35	0.26	0.46	0.26	0.21
v/c Ratio	0.29	1.00	0.87	0.33	0.06	0.57	0.67	0.77	0.48	0.81
Control Delay	14.7	62.9	52.4	21.7	9.9	35.0	44.4	48.6	35.3	47.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	62.9	52.4	21.7	9.9	35.0	44.4	48.6	35.3	47.8
LOS	B	E	D	C	A	C	D	D	D	D
Approach Delay		58.3		32.6			45.5			45.7
Approach LOS		E		C			D			D

### Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 46.8  
 Intersection LOS: D  
 Intersection Capacity Utilization 90.4%  
 ICU Level of Service E  
 Analysis Period (min) 15

### Splits and Phases: 5: The Queensway & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 5: The Queensway & Park Lawn Rd

2/26/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗	↗	↖	↗	
Volume (vph)	115	880	208	305	483	35	128	304	530	112	433	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1685	3340		1687	3471	1290	1769	1810	1484	1736	3363	
Flt Permitted	0.47	1.00		0.10	1.00	1.00	0.18	1.00	1.00	0.45	1.00	
Satd. Flow (perm)	829	3340		174	3471	1290	344	1810	1484	831	3363	
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)	120	917	217	318	503	36	133	317	552	117	451	147
RTOR Reduction (vph)	0	18	0	0	0	15	0	0	28	0	30	0
Lane Group Flow (vph)	120	1116	0	318	503	21	133	317	524	117	568	0
Confl. Peds. (#/hr)	4		18	18		4	2					2
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	7%	5%	1%	7%	4%	23%	2%	5%	8%	4%	2%	6%
Turn Type	pm+pt			pm+pt		Perm	pm+pt		pm+ov		pm+pt	
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases	2			6		6	8	8	8	4		
Actuated Green, G (s)	44.6	36.8		60.1	48.3	48.3	35.9	28.9	48.2	26.2	23.2	
Effective Green, g (s)	44.6	36.8		60.1	48.3	48.3	35.9	28.9	48.2	26.2	23.2	
Actuated g/C Ratio	0.41	0.33		0.55	0.44	0.44	0.33	0.26	0.44	0.24	0.21	
Clearance Time (s)	4.0	7.0		4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	397	1117		361	1524	566	225	476	650	223	709	
v/s Ratio Prot	0.02	c0.33		c0.15	0.14		c0.05	0.18	c0.14	0.01	0.17	
v/s Ratio Perm	0.10			0.33		0.02	0.15		0.21	0.11		
v/c Ratio	0.30	1.00		0.88	0.33	0.04	0.59	0.67	0.81	0.52	0.80	
Uniform Delay, d1	20.9	36.6		31.4	20.2	17.6	28.3	36.2	26.8	36.8	41.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.07	1.04	2.07	1.00	1.00	
Incremental Delay, d2	0.4	26.7		21.3	0.1	0.0	4.0	3.4	7.0	2.2	6.5	
Delay (s)	21.4	63.3		52.8	20.4	17.6	34.1	41.1	62.4	39.0	47.7	
Level of Service	C	E		D	C	B	C	D	E	D	D	
Approach Delay (s)		59.3			32.3			51.9			46.3	
Approach LOS		E			C			D			D	

### Intersection Summary

HCM Average Control Delay	48.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 8: Gardiner Expwy WB On-ramp & Park Lawn Rd

2/26/2014

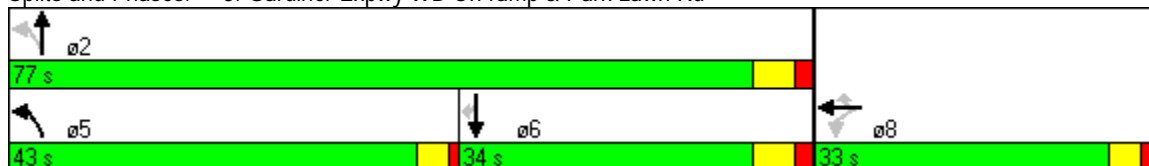


Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↘	↕	↕	↘
Volume (vph)	67	27	861	855	270	497
Turn Type		Perm	pm+pt			Perm
Protected Phases	8		5	2	6	
Permitted Phases		8	2			6
Detector Phase	8	8	5	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	33.0	33.0	10.0	26.0	28.0	28.0
Total Split (s)	33.0	33.0	43.0	77.0	34.0	34.0
Total Split (%)	30.0%	30.0%	39.1%	70.0%	30.9%	30.9%
Yellow Time (s)	3.0	3.0	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	6.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?						
Recall Mode	Min	Min	Max	C-Max	C-Min	C-Min
Act Effect Green (s)	12.2	12.2	88.8	86.8	28.0	28.0
Actuated g/C Ratio	0.11	0.11	0.81	0.79	0.25	0.25
v/c Ratio	0.56	0.17	0.78	0.34	0.32	0.78
Control Delay	60.5	17.1	14.3	4.8	37.7	28.0
Queue Delay	0.0	0.0	1.0	0.0	0.0	0.0
Total Delay	60.5	17.1	15.3	4.8	37.7	28.0
LOS	E	B	B	A	D	C
Approach Delay	49.2			10.1	31.4	
Approach LOS	D			B	C	

### Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 34 (31%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 17.9  
 Intersection LOS: B  
 Intersection Capacity Utilization 95.5%  
 ICU Level of Service F  
 Analysis Period (min) 15

### Splits and Phases: 8: Gardiner Expwy WB On-ramp & Park Lawn Rd



HCM Signalized Intersection Capacity Analysis  
 8: Gardiner Expwy WB On-ramp & Park Lawn Rd

2/26/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↖	↗	↖	↕			↕	↗
Volume (vph)	0	0	0	8	67	27	861	855	0	0	270	497
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0	4.0	6.0			6.0	6.0
Lane Util. Factor					1.00	1.00	1.00	0.95			0.95	1.00
Frbp, ped/bikes					1.00	1.00	1.00	1.00			1.00	0.97
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					1268	1214	1764	3343			3438	1517
Flt Permitted					0.99	1.00	0.48	1.00			1.00	1.00
Satd. Flow (perm)					1268	1214	890	3343			3438	1517
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	8	71	28	906	900	0	0	284	523
RTOR Reduction (vph)	0	0	0	0	0	25	0	0	0	0	0	283
Lane Group Flow (vph)	0	0	0	0	79	3	906	900	0	0	284	240
Confl. Peds. (#/hr)							5					5
Heavy Vehicles (%)	0%	0%	0%	50%	49%	33%	2%	8%	0%	0%	5%	3%
Turn Type				Perm		Perm	pm+pt					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Actuated Green, G (s)					12.2	12.2	86.8	86.8			28.0	28.0
Effective Green, g (s)					12.2	12.2	86.8	86.8			28.0	28.0
Actuated g/C Ratio					0.11	0.11	0.79	0.79			0.25	0.25
Clearance Time (s)					5.0	5.0	4.0	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)					141	135	1138	2638			875	386
v/s Ratio Prot							c0.40	0.27			0.08	
v/s Ratio Perm					0.06	0.00	c0.23					0.16
v/c Ratio					0.56	0.02	0.80	0.34			0.32	0.62
Uniform Delay, d1					46.4	43.6	6.1	3.3			33.3	36.3
Progression Factor					1.00	1.00	1.56	1.23			1.11	2.17
Incremental Delay, d2					5.0	0.1	3.6	0.2			0.5	4.1
Delay (s)					51.4	43.7	13.1	4.3			37.4	82.7
Level of Service					D	D	B	A			D	F
Approach Delay (s)		0.0			49.4			8.8			66.7	
Approach LOS		A			D			A			E	
<b>Intersection Summary</b>												
HCM Average Control Delay			27.6		HCM Level of Service						C	
HCM Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			110.0		Sum of lost time (s)						9.0	
Intersection Capacity Utilization			95.5%		ICU Level of Service						F	
Analysis Period (min)			15									
c Critical Lane Group												

# Timings

## 10: Gardiner Expwy EB Off-ramp & Park Lawn Rd

2/26/2014



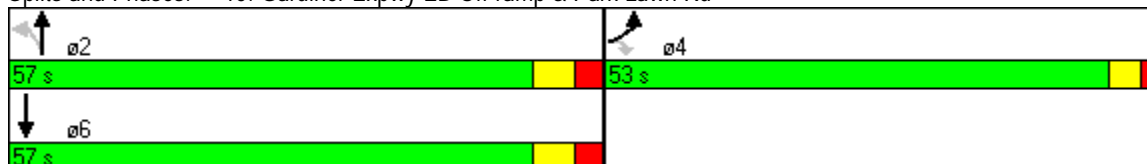
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	608	953	30	1173	351
Turn Type		Perm	Perm		
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	19.0	19.0	4.0	4.0	4.0
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0
Total Split (s)	53.0	53.0	57.0	57.0	57.0
Total Split (%)	48.2%	48.2%	51.8%	51.8%	51.8%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	7.0	7.0	7.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	Max	Max	Max
Act Effect Green (s)	48.0	48.0	50.0	50.0	50.0
Actuated g/C Ratio	0.44	0.44	0.45	0.45	0.45
v/c Ratio	0.75	0.65	0.08	0.78	0.25
Control Delay	22.4	9.6	14.5	17.9	8.6
Queue Delay	0.2	0.0	0.0	0.1	0.0
Total Delay	22.7	9.6	14.5	18.0	8.6
LOS	C	A	B	B	A
Approach Delay	18.5			17.9	8.6
Approach LOS	B			B	A

### Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 0 (0%), Referenced to phase 4:EBL, Start of Green, Master Intersection  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 17.1  
 Intersection Capacity Utilization 69.8%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service C

### Splits and Phases: 10: Gardiner Expwy EB Off-ramp & Park Lawn Rd





# HCM Signalized Intersection Capacity Analysis

## 10: Gardiner Expwy EB Off-ramp & Park Lawn Rd

2/26/2014



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	608	953	30	1173	351	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	7.0	7.0	7.0	
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	
Frbp, ped/bikes	0.99	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	
Frt	0.94	0.85	1.00	1.00	0.99	
Flt Protected	0.97	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3158	1400	1685	3505	3434	
Flt Permitted	0.97	1.00	0.51	1.00	1.00	
Satd. Flow (perm)	3158	1400	909	3505	3434	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	647	1014	32	1248	373	19
RTOR Reduction (vph)	123	205	0	0	3	0
Lane Group Flow (vph)	1011	322	32	1248	389	0
Confl. Peds. (#/hr)		2	7			7
Confl. Bikes (#/hr)		9				7
Heavy Vehicles (%)	6%	3%	6%	3%	4%	7%
Turn Type		Perm	Perm			
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	48.0	48.0	50.0	50.0	50.0	
Effective Green, g (s)	48.0	48.0	50.0	50.0	50.0	
Actuated g/C Ratio	0.44	0.44	0.45	0.45	0.45	
Clearance Time (s)	5.0	5.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1378	611	413	1593	1561	
v/s Ratio Prot	c0.32			c0.36	0.11	
v/s Ratio Perm		0.23	0.04			
v/c Ratio	0.73	0.53	0.08	0.78	0.25	
Uniform Delay, d1	25.7	22.7	17.0	25.4	18.5	
Progression Factor	0.92	0.83	0.82	0.57	0.45	
Incremental Delay, d2	3.2	3.0	0.3	3.1	0.4	
Delay (s)	26.7	21.8	14.2	17.7	8.7	
Level of Service	C	C	B	B	A	
Approach Delay (s)	25.2			17.6	8.7	
Approach LOS	C			B	A	

### Intersection Summary

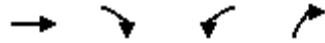
HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 17: FGG EB Off-ramp & Legion Rd North

2/26/2014

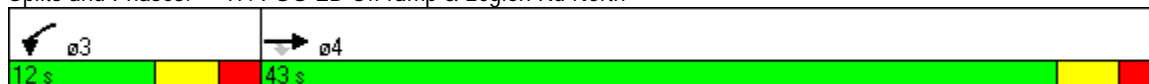


Lane Group	EBT	EBR	WBL	NBR
Lane Configurations	↑↑	↑	↵	↵
Volume (vph)	1332	25	45	278
Turn Type		Perm	Prot	Free
Protected Phases	4		3	
Permitted Phases		4		Free
Detector Phase	4	4	3	
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	
Minimum Split (s)	23.0	23.0	9.0	
Total Split (s)	43.0	43.0	12.0	0.0
Total Split (%)	78.2%	78.2%	21.8%	0.0%
Yellow Time (s)	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag	Lead	
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	
Act Effect Green (s)	48.2	48.2	6.5	55.0
Actuated g/C Ratio	0.88	0.88	0.12	1.00
v/c Ratio	0.48	0.02	0.24	0.19
Control Delay	3.1	1.3	26.3	0.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.1	1.3	26.3	0.3
LOS	A	A	C	A
Approach Delay	3.1			
Approach LOS	A			

### Intersection Summary

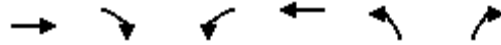
Cycle Length: 55  
 Actuated Cycle Length: 55  
 Offset: 8 (15%), Referenced to phase 4:EBT, Start of Green  
 Natural Cycle: 40  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.48  
 Intersection Signal Delay: 3.2  
 Intersection LOS: A  
 Intersection Capacity Utilization 41.0%  
 ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 17: FGG EB Off-ramp & Legion Rd North



HCM Signalized Intersection Capacity Analysis  
 17: FGG EB Off-ramp & Legion Rd North

2/26/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↖			↗
Volume (vph)	1332	25	45	0	0	278
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			4.0
Lane Util. Factor	0.95	1.00	1.00			1.00
Frbp, ped/bikes	1.00	0.98	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			0.86
Flt Protected	1.00	1.00	0.95			1.00
Satd. Flow (prot)	3438	1518	1736			1596
Flt Permitted	1.00	1.00	0.95			1.00
Satd. Flow (perm)	3438	1518	1736			1596
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1448	27	49	0	0	302
RTOR Reduction (vph)	0	6	0	0	0	0
Lane Group Flow (vph)	1448	21	49	0	0	302
Confl. Peds. (#/hr)		4	4			
Heavy Vehicles (%)	5%	4%	4%	0%	0%	3%
Turn Type		Perm	Prot			Free
Protected Phases	4		3			
Permitted Phases		4				Free
Actuated Green, G (s)	42.2	42.2	2.8			55.0
Effective Green, g (s)	42.2	42.2	2.8			55.0
Actuated g/C Ratio	0.77	0.77	0.05			1.00
Clearance Time (s)	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	2638	1165	88			1596
v/s Ratio Prot	c0.42		c0.03			
v/s Ratio Perm		0.01				0.19
v/c Ratio	0.55	0.02	0.56			0.19
Uniform Delay, d1	2.6	1.5	25.5			0.0
Progression Factor	1.00	1.00	1.07			1.00
Incremental Delay, d2	0.8	0.0	7.4			0.3
Delay (s)	3.4	1.5	34.8			0.3
Level of Service	A	A	C			A
Approach Delay (s)	3.4			34.8	0.3	
Approach LOS	A			C	A	

Intersection Summary				
HCM Average Control Delay		3.7	HCM Level of Service	A
HCM Volume to Capacity ratio		0.55		
Actuated Cycle Length (s)		55.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization		41.0%	ICU Level of Service	A
Analysis Period (min)		15		
c Critical Lane Group				

# Timings

## 21: Menkes- Kraft Driveway & Park Lawn Rd

2/26/2014

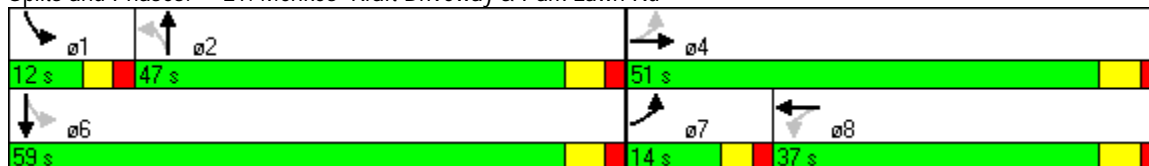


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↔	↖	↕	↖	↕
Volume (vph)	7	0	0	14	1218	59	1617
Turn Type	pm+pt			Perm		pm+pt	
Protected Phases	7	4	8		2	1	6
Permitted Phases	4			2		6	
Detector Phase	7	4	8	2	2	1	6
Switch Phase							
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0	7.0	10.0
Minimum Split (s)	12.0	34.0	37.0	30.0	30.0	12.0	30.0
Total Split (s)	14.0	51.0	37.0	47.0	47.0	12.0	59.0
Total Split (%)	12.7%	46.4%	33.6%	42.7%	42.7%	10.9%	53.6%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	6.0	6.0	5.0	6.0
Lead/Lag	Lead		Lag	Lag	Lag	Lead	
Lead-Lag Optimize?							
Recall Mode	Min	Min	Min	C-Min	C-Min	Min	C-Min
Act Effect Green (s)	23.0	22.0	10.0	63.8	63.8	77.0	76.0
Actuated g/C Ratio	0.21	0.20	0.09	0.58	0.58	0.70	0.69
v/c Ratio	0.03	0.26	0.04	0.11	0.63	0.24	0.49
Control Delay	35.0	36.1	0.2	13.0	17.1	6.1	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	36.1	0.2	13.0	17.1	6.1	7.7
LOS	C	D	A	B	B	A	A
Approach Delay		36.1	0.2		17.1		7.7
Approach LOS		D	A		B		A

### Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 73 (66%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 95  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.63  
 Intersection Signal Delay: 12.3  
 Intersection LOS: B  
 Intersection Capacity Utilization 63.0%  
 ICU Level of Service B  
 Analysis Period (min) 15

### Splits and Phases: 21: Menkes- Kraft Driveway & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 21: Menkes- Kraft Driveway & Park Lawn Rd

2/26/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↔		↖	↗		↖	↗	↘
Volume (vph)	7	0	80	0	0	17	14	1218	0	59	1617	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0			6.0		6.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.91	
Frt	1.00	0.85			0.86		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1611		1770	3539		1770	5084	
Flt Permitted	0.50	1.00			1.00		0.13	1.00		0.13	1.00	
Satd. Flow (perm)	926	1583			1611		237	3539		240	5084	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	7	0	85	0	0	18	15	1296	0	63	1720	3
RTOR Reduction (vph)	0	6	0	0	16	0	0	0	0	0	0	0
Lane Group Flow (vph)	7	79	0	0	2	0	15	1296	0	63	1723	0
Heavy Vehicles (%)	2%	0%	2%	0%	0%	2%	2%	2%	0%	2%	2%	2%
Turn Type	pm+pt			Perm			Perm			pm+pt		
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.0	22.0			10.0		63.8	63.8		76.0	76.0	
Effective Green, g (s)	22.0	22.0			10.0		63.8	63.8		76.0	76.0	
Actuated g/C Ratio	0.20	0.20			0.09		0.58	0.58		0.69	0.69	
Clearance Time (s)	5.0	6.0			6.0		6.0	6.0		5.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	239	317			146		137	2053		266	3513	
v/s Ratio Prot	0.00	c0.05			0.00			c0.37		0.02	c0.34	
v/s Ratio Perm	0.00						0.06			0.15		
v/c Ratio	0.03	0.25			0.01		0.11	0.63		0.24	0.49	
Uniform Delay, d1	35.5	37.0			45.5		10.4	15.3		9.4	7.9	
Progression Factor	1.00	1.00			1.00		1.00	1.00		0.82	0.91	
Incremental Delay, d2	0.0	0.4			0.0		1.6	1.5		0.4	0.4	
Delay (s)	35.5	37.4			45.5		12.0	16.8		8.1	7.7	
Level of Service	D	D			D		B	B		A	A	
Approach Delay (s)		37.3			45.5			16.7			7.7	
Approach LOS		D			D			B			A	

### Intersection Summary

HCM Average Control Delay	12.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 30: Lake Shore Blvd W & Legion Rd South

2/26/2014

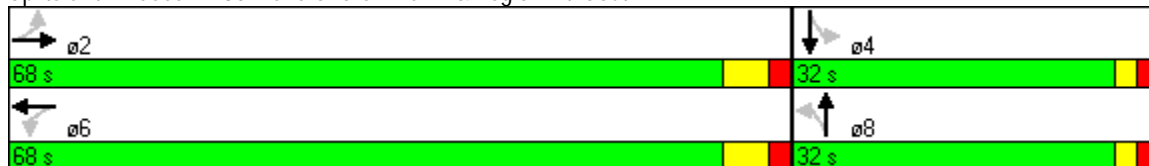


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕↕	↕↕		↕↕	↕	↕
Volume (vph)	77	1319	1103	18	0	138	0
Turn Type	Perm			Perm		Perm	
Protected Phases		2	6		8		4
Permitted Phases	2			8		4	
Detector Phase	2	2	6	8	8	4	4
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.0	23.0	25.0	32.0	32.0	30.0	30.0
Total Split (s)	68.0	68.0	68.0	32.0	32.0	32.0	32.0
Total Split (%)	68.0%	68.0%	68.0%	32.0%	32.0%	32.0%	32.0%
Yellow Time (s)	4.0	4.0	4.0	2.0	2.0	2.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Min	Min	Min	Min	Min	Min	Min
Act Effect Green (s)		46.6	46.6		14.4	14.4	14.4
Actuated g/C Ratio		0.65	0.65		0.20	0.20	0.20
v/c Ratio		0.86	0.59		0.29	0.55	0.11
Control Delay		16.7	8.4		18.2	37.7	1.3
Queue Delay		0.0	0.0		0.0	0.0	0.0
Total Delay		16.7	8.4		18.2	37.7	1.3
LOS		B	A		B	D	A
Approach Delay		16.7	8.4		18.2		29.7
Approach LOS		B	A		B		C

### Intersection Summary

Cycle Length: 100	
Actuated Cycle Length: 71.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 14.1	Intersection LOS: B
Intersection Capacity Utilization 101.2%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 30: Lake Shore Blvd W & Legion Rd South



# HCM Signalized Intersection Capacity Analysis

## 30: Lake Shore Blvd W & Legion Rd South

2/26/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔		↔	↔	
Volume (vph)	77	1319	1	0	1103	89	18	0	80	138	0	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95			1.00		1.00	1.00	
Frbp, ped/bikes		1.00			1.00			0.98		1.00	0.98	
Flpb, ped/bikes		1.00			1.00			1.00		0.99	1.00	
Frt		1.00			0.99			0.89		1.00	0.85	
Flt Protected		1.00			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		3468			3315			1632		1793	1584	
Flt Permitted		0.76			1.00			0.95		0.70	1.00	
Satd. Flow (perm)		2659			3315			1568		1327	1584	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	82	1403	1	0	1173	95	19	0	85	147	0	41
RTOR Reduction (vph)	0	0	0	0	5	0	0	42	0	0	33	0
Lane Group Flow (vph)	0	1486	0	0	1263	0	0	62	0	147	8	0
Confl. Peds. (#/hr)	7					7	8		10	10		8
Heavy Vehicles (%)	0%	4%	0%	0%	8%	0%	0%	0%	1%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		46.6			46.6			14.4		14.4	14.4	
Effective Green, g (s)		46.6			46.6			14.4		14.4	14.4	
Actuated g/C Ratio		0.66			0.66			0.20		0.20	0.20	
Clearance Time (s)		6.0			6.0			4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		1745			2176			318		269	321	
v/s Ratio Prot					0.38						0.01	
v/s Ratio Perm		c0.56						0.04		c0.11		
v/c Ratio		0.85			0.58			0.19		0.55	0.03	
Uniform Delay, d1		9.5			6.8			23.5		25.4	22.7	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		4.2			0.4			0.3		2.3	0.0	
Delay (s)		13.7			7.2			23.8		27.6	22.7	
Level of Service		B			A			C		C	C	
Approach Delay (s)		13.7			7.2			23.8			26.6	
Approach LOS		B			A			C			C	

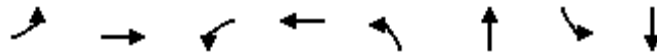
### Intersection Summary

HCM Average Control Delay	12.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	71.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	101.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

# Timings

## 32: Lake Shore Blvd W & Mr. Christie's West Driveway

2/26/2014

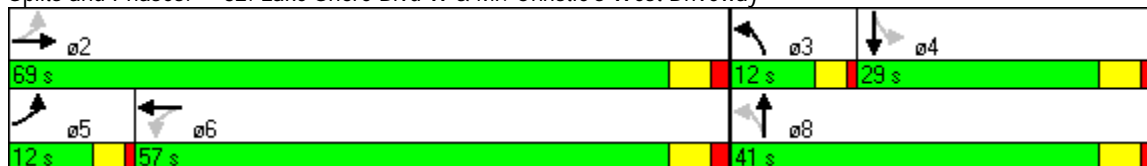


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↶	↷	↶	↷	↶	↷	↶	↷
Volume (vph)	42	2008	32	602	260	0	5	0
Turn Type	pm+pt		Perm		pm+pt		Perm	
Protected Phases	5	2		6	3	8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	6	6	3	8	4	4
Switch Phase								
Minimum Initial (s)	7.0	10.0	10.0	10.0	7.0	10.0	10.0	10.0
Minimum Split (s)	12.0	30.0	30.0	30.0	12.0	29.0	29.0	29.0
Total Split (s)	12.0	69.0	57.0	57.0	12.0	41.0	29.0	29.0
Total Split (%)	10.9%	62.7%	51.8%	51.8%	10.9%	37.3%	26.4%	26.4%
Yellow Time (s)	3.0	4.0	4.0	4.0	3.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	2.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	6.0	4.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag	Lead		Lag	Lag
Lead-Lag Optimize?								
Recall Mode	Min	C-Min	C-Min	C-Min	Min	Min	Min	Min
Act Effect Green (s)	78.0	76.0	65.0	65.0	24.0	22.0	10.0	10.0
Actuated g/C Ratio	0.71	0.69	0.59	0.59	0.22	0.20	0.09	0.09
v/c Ratio	0.08	0.90	0.49	0.33	0.99	0.30	0.04	0.04
Control Delay	5.1	20.3	41.6	11.9	94.8	38.4	46.6	0.2
Queue Delay	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.1	22.7	41.6	11.9	94.8	38.4	46.6	0.2
LOS	A	C	D	B	F	D	D	A
Approach Delay		22.3		13.3		80.3		10.8
Approach LOS		C		B		F		B

### Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 115  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 27.0  
 Intersection LOS: C  
 Intersection Capacity Utilization 86.9%  
 ICU Level of Service E  
 Analysis Period (min) 15

### Splits and Phases: 32: Lake Shore Blvd W & Mr. Christie's West Driveway

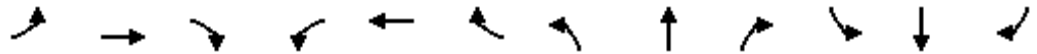




# HCM Signalized Intersection Capacity Analysis

## 32: Lake Shore Blvd W & Mr. Christie's West Driveway

2/26/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↘		↗	↗↘		↗	↘		↗	↘	
Volume (vph)	42	2008	9	32	602	18	260	0	90	5	0	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3467		1805	3428		1805	1593		1803	1292	
Flt Permitted	0.35	1.00		0.06	1.00		0.53	1.00		0.69	1.00	
Satd. Flow (perm)	666	3467		117	3428		1013	1593		1319	1292	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	45	2136	10	34	640	19	277	0	96	5	0	17
RTOR Reduction (vph)	0	0	0	0	2	0	0	4	0	0	15	0
Lane Group Flow (vph)	45	2146	0	34	657	0	277	92	0	5	2	0
Confl. Peds. (#/hr)			27	27					1	1		
Heavy Vehicles (%)	0%	4%	0%	0%	5%	0%	0%	0%	0%	0%	0%	25%
Turn Type	pm+pt			Perm			pm+pt			Perm		
Protected Phases	5	2			6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	76.0	76.0		65.0	65.0		22.0	22.0		10.0	10.0	
Effective Green, g (s)	76.0	76.0		65.0	65.0		22.0	22.0		10.0	10.0	
Actuated g/C Ratio	0.69	0.69		0.59	0.59		0.20	0.20		0.09	0.09	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	533	2395		69	2026		260	319		120	117	
v/s Ratio Prot	0.01	c0.62			0.19		c0.08	0.06			0.00	
v/s Ratio Perm	0.05			0.29			c0.14			0.00		
v/c Ratio	0.08	0.90		0.49	0.32		1.07	0.29		0.04	0.01	
Uniform Delay, d1	5.8	13.8		13.0	11.4		43.4	37.4		45.6	45.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	5.8		23.0	0.4		74.2	0.5		0.1	0.0	
Delay (s)	5.8	19.6		36.0	11.8		117.6	37.9		45.8	45.6	
Level of Service	A	B		D	B		F	D		D	D	
Approach Delay (s)		19.3			13.0			97.1			45.6	
Approach LOS		B			B			F			D	

### Intersection Summary

HCM Average Control Delay	27.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# Timings

## 34: Lake Shore Blvd W & Gardiner Expy ON- Off Ramp

2/26/2014

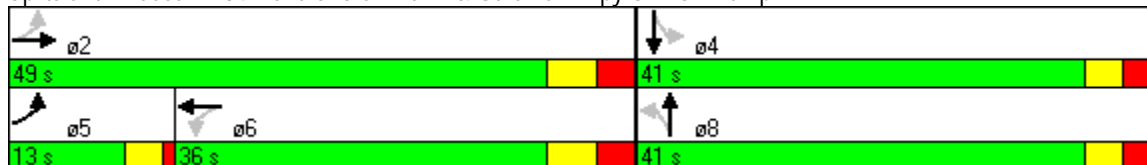


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖	↕	↗	↖	↕		↖	↗
Volume (vph)	688	1397	87	139	146	46	65	409
Turn Type	pm+pt			Perm		Perm		Free
Protected Phases	5	2	6		8		4	
Permitted Phases	2			8		4		Free
Detector Phase	5	2	6	8	8	4	4	
Switch Phase								
Minimum Initial (s)	6.0	24.0	24.0	13.0	13.0	13.0	13.0	
Minimum Split (s)	10.0	32.0	36.0	41.0	41.0	35.0	35.0	
Total Split (s)	13.0	49.0	36.0	41.0	41.0	41.0	41.0	0.0
Total Split (%)	14.4%	54.4%	40.0%	45.6%	45.6%	45.6%	45.6%	0.0%
Yellow Time (s)	3.0	4.0	4.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	6.0	6.0	6.0	6.0	4.0
Lead/Lag	Lead		Lag					
Lead-Lag Optimize?								
Recall Mode	Min	C-Min	C-Min	Min	Min	Min	Min	
Act Effct Green (s)	61.5	58.5	26.4	18.5	18.5		18.5	90.0
Actuated g/C Ratio	0.68	0.65	0.29	0.21	0.21		0.21	1.00
v/c Ratio	0.77	0.68	0.28	0.56	0.86dr		0.62	0.28
Control Delay	17.2	12.8	20.7	39.6	36.5		45.7	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	17.2	12.8	20.7	39.6	36.5		45.7	0.4
LOS	B	B	C	D	D		D	A
Approach Delay		14.2	20.7		37.2		10.1	
Approach LOS		B	C		D		B	

### Intersection Summary

Cycle Length: 90  
 Actuated Cycle Length: 90  
 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: 0.77  
 Intersection Signal Delay: 17.7  
 Intersection LOS: B  
 Intersection Capacity Utilization 104.7%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

### Splits and Phases: 34: Lake Shore Blvd W & Gardiner Expy ON- Off Ramp



HCM Signalized Intersection Capacity Analysis  
 34: Lake Shore Blvd W & Gardiner Expy ON- Off Ramp

2/26/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↗		↖	↖↗			↖↗	↖
Volume (vph)	688	1397	22	0	87	38	139	146	273	46	65	409
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0			7.0		6.0	6.0			6.0	4.0
Lane Util. Factor	1.00	0.95			1.00		1.00	0.95			1.00	1.00
Frbp, ped/bikes	1.00	1.00			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	1.00
Frt	1.00	1.00			0.95		1.00	0.90			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1770	3430			1592		1805	3257			1707	1568
Flt Permitted	0.58	1.00			1.00		0.68	1.00			0.54	1.00
Satd. Flow (perm)	1085	3430			1592		1293	3257			940	1568
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)	740	1502	24	0	94	41	149	157	294	49	70	440
RTOR Reduction (vph)	0	1	0	0	18	0	0	10	0	0	0	0
Lane Group Flow (vph)	740	1525	0	0	117	0	149	441	0	0	119	440
Confl. Peds. (#/hr)			18	18								
Heavy Vehicles (%)	2%	5%	0%	0%	20%	0%	0%	0%	0%	22%	0%	3%
Turn Type	pm+pt			Perm			Perm			Perm		Free
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		Free
Actuated Green, G (s)	58.5	58.5			26.4		18.5	18.5			18.5	90.0
Effective Green, g (s)	58.5	58.5			26.4		18.5	18.5			18.5	90.0
Actuated g/C Ratio	0.65	0.65			0.29		0.21	0.21			0.21	1.00
Clearance Time (s)	4.0	7.0			7.0		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)	919	2230			467		266	669			193	1568
v/s Ratio Prot	c0.25	0.44			0.07			c0.14				
v/s Ratio Perm	c0.27						0.12				0.13	0.28
v/c Ratio	0.81	0.68			0.25		0.56	0.86dr			0.62	0.28
Uniform Delay, d1	9.7	9.9			24.2		32.1	32.9			32.5	0.0
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	5.2	1.7			1.3		2.7	2.4			5.7	0.4
Delay (s)	14.9	11.7			25.5		34.8	35.2			38.3	0.4
Level of Service	B	B			C		C	D			D	A
Approach Delay (s)		12.7			25.5			35.1			8.5	
Approach LOS		B			C			D			A	

Intersection Summary			
HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	104.7%	ICU Level of Service	G
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.  
 c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 37: Lake Shore Blvd W & Marine Parade Dr.

2/26/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	↻
Volume (veh/h)	1673	34	5	78	30	59
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1743	35	5	81	31	61
Pedestrians					16	
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)	398			136		
pX, platoon unblocked			0.34		0.34	0.34
vC, conflicting volume			1794		1868	1776
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2354		2569	2303
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		0	0
cM capacity (veh/h)			72		9	16

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	1778	86	31	61
Volume Left	0	5	31	0
Volume Right	35	0	0	61
cSH	1700	72	9	16
Volume to Capacity	1.05	0.07	3.41	3.78
Queue Length 95th (m)	0.0	1.8	Err	Err
Control Delay (s)	0.0	7.8	Err	Err
Lane LOS		A	F	F
Approach Delay (s)	0.0	7.8	9999.0	
Approach LOS			F	

Intersection Summary			
Average Delay		474.0	
Intersection Capacity Utilization		100.5%	ICU Level of Service G
Analysis Period (min)		15	

# Timings

## 38: Lake Shore Blvd W & Palace Pier Crt

2/26/2014

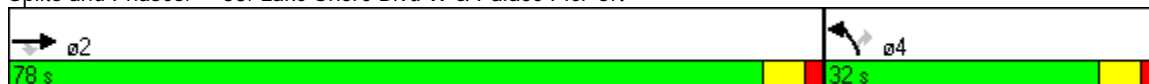


Lane Group	EBT	EBR	NBL	NBR
Lane Configurations	↑	↑	↑	↑
Volume (vph)	1670	54	41	70
Turn Type		Perm		Perm
Protected Phases	2		4	
Permitted Phases		2		4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	29.5	29.5	32.0	32.0
Total Split (s)	78.0	78.0	32.0	32.0
Total Split (%)	70.9%	70.9%	29.1%	29.1%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effect Green (s)	72.0	72.0	26.0	26.0
Actuated g/C Ratio	0.65	0.65	0.24	0.24
v/c Ratio	1.45	0.07	0.10	0.19
Control Delay	231.3	5.7	33.8	23.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	231.3	5.7	33.8	23.7
LOS	F	A	C	C
Approach Delay	224.2		27.4	
Approach LOS	F		C	

### Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:, Start of Green  
 Natural Cycle: 150  
 Control Type: Pretimed  
 Maximum v/c Ratio: 1.45  
 Intersection Signal Delay: 212.3  
 Intersection LOS: F  
 Intersection Capacity Utilization 102.2%  
 ICU Level of Service G  
 Analysis Period (min) 15

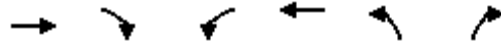
Splits and Phases: 38: Lake Shore Blvd W & Palace Pier Crt



# HCM Signalized Intersection Capacity Analysis

## 38: Lake Shore Blvd W & Palace Pier Crt

2/26/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗			↖	↗
Volume (vph)	1670	54	0	0	41	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	1.00			1.00	1.00
Frbp, ped/bikes	1.00	0.94			1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00
Frt	1.00	0.85			1.00	0.85
Flt Protected	1.00	1.00			0.95	1.00
Satd. Flow (prot)	1827	1263			1770	1509
Flt Permitted	1.00	1.00			0.95	1.00
Satd. Flow (perm)	1827	1263			1770	1509
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1740	56	0	0	43	73
RTOR Reduction (vph)	0	5	0	0	0	21
Lane Group Flow (vph)	1740	51	0	0	43	52
Confl. Peds. (#/hr)		18	18			
Heavy Vehicles (%)	4%	20%	0%	0%	2%	7%
Turn Type		Perm				Perm
Protected Phases	2				4	
Permitted Phases		2				4
Actuated Green, G (s)	72.0	72.0			26.0	26.0
Effective Green, g (s)	72.0	72.0			26.0	26.0
Actuated g/C Ratio	0.65	0.65			0.24	0.24
Clearance Time (s)	6.0	6.0			6.0	6.0
Lane Grp Cap (vph)	1196	827			418	357
v/s Ratio Prot	c0.95				0.02	
v/s Ratio Perm		0.04				c0.03
v/c Ratio	1.45	0.06			0.10	0.14
Uniform Delay, d1	19.0	6.8			32.9	33.2
Progression Factor	1.00	1.00			1.00	1.00
Incremental Delay, d2	209.4	0.1			0.5	0.9
Delay (s)	228.4	7.0			33.4	34.1
Level of Service	F	A			C	C
Approach Delay (s)	221.5			0.0	33.8	
Approach LOS	F			A	C	

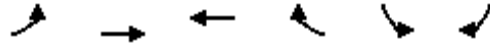
### Intersection Summary

HCM Average Control Delay	210.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	102.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis  
 40: Marine parade Dr. & Marine Parade Dr.

2/26/2014

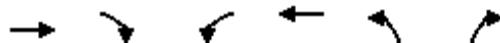


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Sign Control		Stop	Stop		Stop	
Volume (vph)	3	52	174	0	0	5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	3	52	174	0	0	5
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	55	174	5			
Volume Left (vph)	3	0	0			
Volume Right (vph)	0	0	5			
Hadj (s)	0.04	0.03	-0.57			
Departure Headway (s)	4.1	4.0	3.8			
Degree Utilization, x	0.06	0.19	0.01			
Capacity (veh/h)	861	894	881			
Control Delay (s)	7.4	7.9	6.8			
Approach Delay (s)	7.4	7.9	6.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.8			
HCM Level of Service			A			
Intersection Capacity Utilization			19.2%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 42: Lake Shore Blvd W & Street D

2/26/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↗
Volume (veh/h)	2038	3	0	877	0	21
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	2168	3	0	933	0	22
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	141			123		
pX, platoon unblocked			0.66		0.71	0.66
vC, conflicting volume			2171		2636	1086
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1748		1923	108
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	96
cM capacity (veh/h)			235		42	612

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1445	726	466	466	22
Volume Left	0	0	0	0	0
Volume Right	0	3	0	0	22
cSH	1700	1700	1700	1700	612
Volume to Capacity	0.85	0.43	0.27	0.27	0.04
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.9
Control Delay (s)	0.0	0.0	0.0	0.0	11.1
Lane LOS					B
Approach Delay (s)	0.0		0.0		11.1
Approach LOS					B

Intersection Summary					
Average Delay			0.1		
Intersection Capacity Utilization			66.4%	ICU Level of Service	C
Analysis Period (min)			15		



HCM Unsignalized Intersection Capacity Analysis  
 45: Marine Parade Dr. & Street D

2/26/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Volume (veh/h)	0	182	483	0	0	108
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)	0	196	519	0	0	116
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)		321				
pX, platoon unblocked						
vC, conflicting volume	519				617	260
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	519				617	260
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	84
cM capacity (veh/h)	1043				422	739

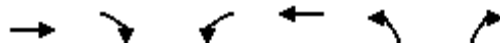
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	98	98	346	173	116
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	116
cSH	1700	1700	1700	1700	739
Volume to Capacity	0.06	0.06	0.20	0.10	0.16
Queue Length 95th (m)	0.0	0.0	0.0	0.0	4.4
Control Delay (s)	0.0	0.0	0.0	0.0	10.8
Lane LOS					B
Approach Delay (s)	0.0		0.0		10.8
Approach LOS					B

Intersection Summary					
Average Delay			1.5		
Intersection Capacity Utilization			26.7%	ICU Level of Service	A
Analysis Period (min)			15		

# HCM Unsignalized Intersection Capacity Analysis

## 48: Lake Shore Blvd W & Street A

2/26/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↗
Volume (veh/h)	2053	36	0	645	0	42
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)	2208	39	0	694	0	45
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	156			77		
pX, platoon unblocked				0.34	0.34	0.34
vC, conflicting volume	2246			2574	1123	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	782			1745	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	88	
cM capacity (veh/h)	283			26	369	

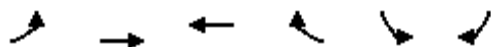
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1472	775	347	347	45
Volume Left	0	0	0	0	0
Volume Right	0	39	0	0	45
cSH	1700	1700	1700	1700	369
Volume to Capacity	0.87	0.46	0.20	0.20	0.12
Queue Length 95th (m)	0.0	0.0	0.0	0.0	3.3
Control Delay (s)	0.0	0.0	0.0	0.0	16.1
Lane LOS	C				
Approach Delay (s)	0.0		0.0		16.1
Approach LOS	C				

Intersection Summary					
Average Delay			0.2		
Intersection Capacity Utilization			67.9%	ICU Level of Service	C
Analysis Period (min)			15		
Description:					

# HCM Unsignalized Intersection Capacity Analysis

## 50: Marine Parade Dr. & Street B

2/26/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	87	95	341	0	0	143
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)	94	102	367	0	0	154
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	367				656	183
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	367				656	183
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				100	81
cM capacity (veh/h)	1188				367	828

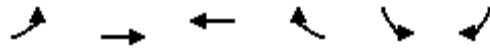
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	94	102	244	122	154
Volume Left	94	0	0	0	0
Volume Right	0	0	0	0	154
cSH	1188	1700	1700	1700	828
Volume to Capacity	0.08	0.06	0.14	0.07	0.19
Queue Length 95th (m)	2.0	0.0	0.0	0.0	5.4
Control Delay (s)	8.3	0.0	0.0	0.0	10.3
Lane LOS	A				B
Approach Delay (s)	4.0		0.0		10.3
Approach LOS					B

Intersection Summary			
Average Delay		3.3	
Intersection Capacity Utilization		33.1%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

## 52: Marine Parade Dr. & Street A

2/26/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	40	55	179	0	0	162
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)	43	59	192	0	0	174
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	192				338	96
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	192				338	96
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				100	81
cM capacity (veh/h)	1378				612	941
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	43	59	128	64	174	
Volume Left	43	0	0	0	0	
Volume Right	0	0	0	0	174	
cSH	1378	1700	1700	1700	941	
Volume to Capacity	0.03	0.03	0.08	0.04	0.19	
Queue Length 95th (m)	0.8	0.0	0.0	0.0	5.4	
Control Delay (s)	7.7	0.0	0.0	0.0	9.7	
Lane LOS	A				A	
Approach Delay (s)	3.2		0.0		9.7	
Approach LOS					A	
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			28.3%		ICU Level of Service	A
Analysis Period (min)			15			

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:50	6:50	6:50	6:50	6:50	6:50
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	25	25	25	25	25	25
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intvl	1	1	1	1	1	1
Vehs Entered	2048	2054	2105	2149	2089	2087
Vehs Exited	1782	1702	1816	1718	1801	1765
Starting Vehs	660	678	705	653	719	678
Ending Vehs	926	1030	994	1084	1007	1005
Denied Entry Before	49	45	30	48	19	34
Denied Entry After	520	663	507	464	407	510
Travel Distance (km)	2193	2122	2197	2123	2186	2164
Travel Time (hr)	266.2	300.6	268.2	263.8	266.1	273.0
Total Delay (hr)	217.9	253.8	220.1	217.2	218.1	225.4
Total Stops	6529	6592	6292	6646	7176	6649
Fuel Used (l)	3822.8	4080.5	3843.2	3742.6	3807.4	3859.3

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10
Volumes adjusted by PHF, Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	2048	2054	2105	2149	2089	2087
Vehs Exited	1782	1702	1816	1718	1801	1765
Starting Vehs	660	678	705	653	719	678
Ending Vehs	926	1030	994	1084	1007	1005
Denied Entry Before	49	45	30	48	19	34
Denied Entry After	520	663	507	464	407	510
Travel Distance (km)	2193	2122	2197	2123	2186	2164
Travel Time (hr)	266.2	300.6	268.2	263.8	266.1	273.0
Total Delay (hr)	217.9	253.8	220.1	217.2	218.1	225.4
Total Stops	6529	6592	6292	6646	7176	6649
Fuel Used (l)	3822.8	4080.5	3843.2	3742.6	3807.4	3859.3

Queuing and Blocking Report  
 Future Total Traffic AM Peak Hour, Ultimate Scenario Rev 3R

2/26/2014

Intersection: 3: Lake Shore Blvd W & Park Lawn Rd

Movement	EB	EB	EB	WB	WB	WB	WB	B43	B43	NB	NB	NB
Directions Served	L	T	TR	L	T	T	R	T	T	L	T	R
Maximum Queue (m)	291.2	297.0	290.7	2.8	75.0	77.5	58.0	11.3	20.7	45.4	301.6	299.9
Average Queue (m)	285.7	286.1	260.1	0.6	56.5	60.4	38.8	2.2	7.4	14.1	266.4	191.4
95th Queue (m)	298.8	310.4	354.7	3.4	91.9	95.4	72.0	10.8	24.4	46.3	374.9	407.1
Link Distance (m)	282.4	282.4	282.4		60.3	60.3		38.7	38.7		297.3	297.3
Upstream Blk Time (%)	65	42	18		7	6	1		0		55	29
Queuing Penalty (veh)	354	232	99		32	30	0		0		176	92
Storage Bay Dist (m)				40.0			45.0			55.0		
Storage Blk Time (%)					22	16	1			0	84	
Queuing Penalty (veh)					1	60	2			1	104	

Intersection: 3: Lake Shore Blvd W & Park Lawn Rd

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (m)	129.8	198.8	202.3	118.0
Average Queue (m)	126.8	192.7	157.8	44.1
95th Queue (m)	133.3	198.9	262.2	147.9
Link Distance (m)		188.5	188.5	188.5
Upstream Blk Time (%)		71	23	1
Queuing Penalty (veh)		425	139	6
Storage Bay Dist (m)	100.0			
Storage Blk Time (%)	88	74		
Queuing Penalty (veh)	490	412		

Queuing and Blocking Report

Future Total Traffic AM Peak Hour, Ultimate Scenario Rev 3R

2/26/2014

Intersection: 5: The Queensway & Park Lawn Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (m)	149.7	297.8	291.9	122.9	287.2	253.6	38.5	43.6	69.2	54.3	55.2	89.7
Average Queue (m)	59.3	257.3	253.1	114.4	155.6	80.6	7.8	15.0	43.3	17.3	32.8	54.9
95th Queue (m)	160.9	330.5	326.4	154.0	409.8	275.6	27.0	40.5	73.6	64.8	65.4	96.2
Link Distance (m)		290.9	290.9		682.9	682.9			271.0	271.0		402.1
Upstream Blk Time (%)		17	17		0	0						
Queuing Penalty (veh)		0	0		0	0						
Storage Bay Dist (m)	50.0			50.0			20.0	50.0			25.0	
Storage Blk Time (%)	1	65		72	0	26	0	0	7		19	26
Queuing Penalty (veh)	4	78		180	0	9	0	0	10		42	30

Intersection: 5: The Queensway & Park Lawn Rd

Movement	SB
Directions Served	TR
Maximum Queue (m)	117.7
Average Queue (m)	96.5
95th Queue (m)	132.6
Link Distance (m)	402.1
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Gardiner Expwy WB On-ramp & Park Lawn Rd

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	T	T	T	T	R
Maximum Queue (m)	48.3	19.4	122.7	30.8	40.1	85.7	98.7	173.8
Average Queue (m)	26.3	10.3	57.8	16.3	19.1	34.4	41.1	131.8
95th Queue (m)	48.0	21.0	124.4	32.4	38.2	84.5	109.1	208.3
Link Distance (m)	120.0	120.0		176.2	176.2	271.0	271.0	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			199.5				220.0	
Storage Blk Time (%)								
Queuing Penalty (veh)								

Queuing and Blocking Report

Future Total Traffic AM Peak Hour, Ultimate Scenario Rev 3R

2/26/2014

Intersection: 10: Gardiner Expwy EB Off-ramp & Park Lawn Rd

Movement	EB	EB	EB	NB	NB	NB	B28	SB	SB
Directions Served	L	LR	R	L	T	T	T	T	TR
Maximum Queue (m)	257.3	264.8	35.0	18.2	100.3	64.7	3.7	137.8	132.2
Average Queue (m)	217.7	228.0	27.5	4.9	67.5	38.4	0.5	72.3	64.0
95th Queue (m)	324.0	335.4	48.9	20.1	112.6	71.5	5.6	156.5	152.0
Link Distance (m)	243.9	243.9			100.7	100.7	142.3	176.2	176.2
Upstream Blk Time (%)	49	67			2			2	2
Queuing Penalty (veh)	426	582			15			3	3
Storage Bay Dist (m)			35.0	27.0					
Storage Blk Time (%)		70	3		37				
Queuing Penalty (veh)		354	21		12				

Intersection: 17: FGG EB Off-ramp & Legion Rd North

Movement	EB	EB	EB	WB	NB
Directions Served	T	T	R	L	R
Maximum Queue (m)	517.3	515.7	39.8	14.4	132.1
Average Queue (m)	287.4	241.4	2.8	5.7	102.6
95th Queue (m)	630.9	576.7	30.1	15.3	165.6
Link Distance (m)	511.7	511.7		243.9	124.0
Upstream Blk Time (%)	17	17			58
Queuing Penalty (veh)	0	0			0
Storage Bay Dist (m)			50.0		
Storage Blk Time (%)		55			
Queuing Penalty (veh)		15			

Intersection: 21: Menkes- Kraft Driveway & Park Lawn Rd

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB	B28	B28
Directions Served	L	TR	LR	L	T	TR	L	T	T	TR	T	T
Maximum Queue (m)	7.8	68.9	7.5	6.8	85.3	72.3	73.6	165.0	163.8	158.7	111.2	112.4
Average Queue (m)	2.0	30.7	3.1	1.6	48.9	38.3	12.4	163.2	155.1	98.2	96.9	88.8
95th Queue (m)	7.7	71.3	9.1	7.5	90.8	76.5	59.0	167.0	169.9	198.1	131.8	142.1
Link Distance (m)	90.8	90.8	93.9		188.5	188.5		142.3	142.3	142.3	100.7	100.7
Upstream Blk Time (%)		1						89	56	6	62	43
Queuing Penalty (veh)		0						412	257	26	433	301
Storage Bay Dist (m)				30.0			60.0					
Storage Blk Time (%)					18			91				
Queuing Penalty (veh)					3			57				



# Queuing and Blocking Report

## Future Total Traffic AM Peak Hour, Ultimate Scenario Rev 3R

2/26/2014

### Intersection: 30: Lake Shore Blvd W & Legion Rd South

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	TR	LT	TR	LR	L	TR
Maximum Queue (m)	255.6	251.8	107.1	105.5	49.6	87.6	118.0
Average Queue (m)	235.7	236.2	48.2	53.4	29.2	68.9	62.7
95th Queue (m)	307.2	309.5	109.4	114.3	56.5	120.5	198.6
Link Distance (m)	245.0	245.0	282.4	282.4	126.7		291.3
Upstream Blk Time (%)	61	65					
Queuing Penalty (veh)	0	0					
Storage Bay Dist (m)						50.0	
Storage Blk Time (%)						57	
Queuing Penalty (veh)						23	

### Intersection: 32: Lake Shore Blvd W & Mr. Christie's West Driveway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	66.3	111.5	107.4	21.0	45.2	54.7	85.4	46.3	8.8	11.0
Average Queue (m)	15.1	107.7	80.3	10.5	23.6	32.2	78.5	25.8	1.9	3.1
95th Queue (m)	57.9	112.4	128.3	26.0	47.5	60.9	98.6	54.5	7.2	10.9
Link Distance (m)		104.2	104.2		57.1	57.1		80.8		67.3
Upstream Blk Time (%)		62	8		0	1	52			
Queuing Penalty (veh)		674	90		0	3	0			
Storage Bay Dist (m)	60.0			30.0			80.0		50.0	
Storage Blk Time (%)		70		2	5		53			
Queuing Penalty (veh)		32		8	2		51			

### Intersection: 34: Lake Shore Blvd W & Gardiner Expy ON- Off Ramp

Movement	EB	EB	EB	B1	B1	WB	B13	NB	NB	NB	SB	SB
Directions Served	L	T	TR	T	T	TR	T	L	T	TR	LT	R
Maximum Queue (m)	35.3	64.4	56.4	24.1	19.4	42.0	18.8	37.3	69.7	73.0	41.3	23.5
Average Queue (m)	27.4	60.4	19.7	22.7	5.9	22.9	3.9	27.0	28.0	40.3	20.0	14.2
95th Queue (m)	44.6	64.7	57.6	26.5	19.6	58.7	30.5	41.6	70.0	70.7	41.6	74.6
Link Distance (m)		37.8	37.8	1.8	1.8	55.9	294.8		81.2	81.2	114.0	114.0
Upstream Blk Time (%)	6	40	1	23	1	10			5	1		11
Queuing Penalty (veh)	0	450	11	260	9	11			0	0		0
Storage Bay Dist (m)	70.0							30.0				
Storage Blk Time (%)	6	40				10		15	1			
Queuing Penalty (veh)	48	295				0		12	2			

## Queuing and Blocking Report

Future Total Traffic AM Peak Hour, Ultimate Scenario Rev 3R

2/26/2014

### Intersection: 37: Lake Shore Blvd W & Marine Parade Dr.

Movement	EB	B13	WB	NB	NB
Directions Served	TR	T	LT	L	R
Maximum Queue (m)	175.3	70.3	8.4	19.3	31.8
Average Queue (m)	97.7	12.5	1.5	6.4	21.3
95th Queue (m)	226.8	63.1	7.6	17.8	55.2
Link Distance (m)	294.8	55.9	117.2		129.1
Upstream Blk Time (%)	0	0			
Queuing Penalty (veh)	4	2			
Storage Bay Dist (m)				15.0	
Storage Blk Time (%)				0	34
Queuing Penalty (veh)				0	11

### Intersection: 38: Lake Shore Blvd W & Palace Pier Crt

Movement	EB	EB	NB	NB
Directions Served	T	R	L	R
Maximum Queue (m)	120.7	23.2	15.8	25.5
Average Queue (m)	116.3	6.7	6.9	12.1
95th Queue (m)	130.5	29.4	16.6	26.0
Link Distance (m)	117.2			134.7
Upstream Blk Time (%)	15			
Queuing Penalty (veh)	267			
Storage Bay Dist (m)		30.0	15.0	
Storage Blk Time (%)	27		6	11
Queuing Penalty (veh)	15		4	5

### Intersection: 40: Marine parade Dr. & Marine Parade Dr.

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (m)	16.7	16.4	2.6
Average Queue (m)	6.6	11.0	1.0
95th Queue (m)	17.9	16.0	4.8
Link Distance (m)	266.3	160.9	129.1
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

## Queuing and Blocking Report

Future Total Traffic AM Peak Hour, Ultimate Scenario Rev 3R

2/26/2014

### Intersection: 42: Lake Shore Blvd W & Street D

Movement	EB	EB	B43	B43	NB
Directions Served	T	TR	T	T	R
Maximum Queue (m)	61.4	60.2	99.5	97.6	20.3
Average Queue (m)	60.4	30.9	88.2	54.5	10.1
95th Queue (m)	62.1	74.8	107.7	115.2	29.7
Link Distance (m)	38.7	38.7	60.3	60.3	86.0
Upstream Blk Time (%)	71	10	57	13	
Queuing Penalty (veh)	875	123	466	106	
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

### Intersection: 45: Marine Parade Dr. & Street D

Movement	WB	WB	B33	B33	SB
Directions Served	T	TR	T	T	R
Maximum Queue (m)	58.0	34.8	68.8	45.9	52.2
Average Queue (m)	36.0	11.3	30.0	15.8	28.9
95th Queue (m)	77.8	36.7	79.7	57.1	59.4
Link Distance (m)	35.4	35.4	53.3	53.3	51.7
Upstream Blk Time (%)	52	12	38	15	30
Queuing Penalty (veh)	136	31	100	40	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

### Intersection: 48: Lake Shore Blvd W & Street A

Movement	EB	EB	B12	B12	WB	WB	B1	B1	B1	NB
Directions Served	T	TR	T	T	T	T	T	T		R
Maximum Queue (m)	91.1	86.5	82.6	85.8	4.4	3.3	9.1	17.0	5.6	79.1
Average Queue (m)	86.1	75.5	76.9	68.8	0.8	0.6	5.9	5.2	0.8	59.8
95th Queue (m)	90.5	109.9	90.5	104.3	3.9	3.5	29.6	21.2	8.4	88.9
Link Distance (m)	63.3	63.3	57.1	57.1	1.8	1.8	37.8	37.8	37.8	77.9
Upstream Blk Time (%)	57	19	49	19	0	0	12			30
Queuing Penalty (veh)	641	209	552	210	0	0	26			0
Storage Bay Dist (m)										
Storage Blk Time (%)										
Queuing Penalty (veh)										

## Queuing and Blocking Report

Future Total Traffic AM Peak Hour, Ultimate Scenario Rev 3R

2/26/2014

### Intersection: 50: Marine Parade Dr. & Street B

Movement	EB	WB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (m)	18.3	73.3	55.2	51.4
Average Queue (m)	5.2	20.0	12.2	25.7
95th Queue (m)	17.2	69.2	46.2	58.3
Link Distance (m)		147.4	147.4	58.2
Upstream Blk Time (%)				18
Queuing Penalty (veh)				0
Storage Bay Dist (m)	60.0			
Storage Blk Time (%)				
Queuing Penalty (veh)				

### Intersection: 52: Marine Parade Dr. & Street A

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (m)	3.6	16.0
Average Queue (m)	0.5	12.1
95th Queue (m)	4.0	18.5
Link Distance (m)		51.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)	50.0	
Storage Blk Time (%)		
Queuing Penalty (veh)		

### Network Summary

Network wide Queuing Penalty: 11733

# Timings

## 3: Lake Shore Blvd W & Park Lawn Rd

3/24/2014

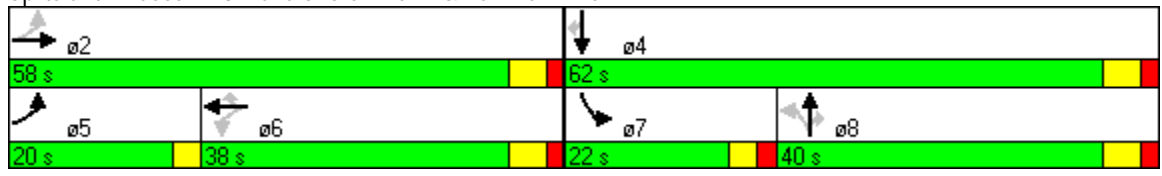


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕	↖	↕	↖	↖	↕	↖	↖↗	↕	↖
Volume (vph)	474	734	10	1001	435	88	220	13	746	425	465
Turn Type	pm+pt		Perm		Perm	Perm		Perm	Prot		Perm
Protected Phases	5	2		6			8		7	4	
Permitted Phases	2		6		6	8		8			4
Detector Phase	5	2	6	6	6	8	8	8	7	4	4
Switch Phase											
Minimum Initial (s)	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0
Minimum Split (s)	8.5	39.0	34.0	34.0	34.0	40.0	40.0	40.0	9.0	33.0	33.0
Total Split (s)	20.0	58.0	38.0	38.0	38.0	40.0	40.0	40.0	22.0	62.0	62.0
Total Split (%)	16.7%	48.3%	31.7%	31.7%	31.7%	33.3%	33.3%	33.3%	18.3%	51.7%	51.7%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	-1.0	0.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	5.0	6.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	Min	Min	Min	Min	Min	None	Min	Min
Act Effect Green (s)	55.1	53.1	32.1	33.1	33.1	20.1	20.1	20.1	18.0	42.2	42.2
Actuated g/C Ratio	0.52	0.50	0.30	0.31	0.31	0.19	0.19	0.19	0.17	0.40	0.40
v/c Ratio	1.38	0.54	0.06	0.99	0.76	0.54	0.70	0.05	1.35	0.64	0.61
Control Delay	212.4	19.3	29.7	61.4	26.3	50.1	50.9	15.6	204.2	30.1	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	212.4	19.3	29.7	61.4	26.3	50.1	50.9	15.6	204.2	30.1	9.2
LOS	F	B	C	E	C	D	D	B	F	C	A
Approach Delay		87.8		50.6			49.3			103.5	
Approach LOS		F		D			D			F	

### Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 105.3	
Natural Cycle: 145	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.38	
Intersection Signal Delay: 79.3	Intersection LOS: E
Intersection Capacity Utilization 117.9%	ICU Level of Service H
Analysis Period (min) 15	

### Splits and Phases: 3: Lake Shore Blvd W & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 3: Lake Shore Blvd W & Park Lawn Rd

3/24/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗	↗	↗	↗	↗
Volume (vph)	474	734	130	10	1001	435	88	220	13	746	425	465
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		6.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.93	1.00	1.00	0.90	1.00	1.00	0.93
Flpb, ped/bikes	1.00	1.00		0.99	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3420		1781	3471	1474	1749	1776	1447	3467	1776	1480
Flt Permitted	0.11	1.00		0.31	1.00	1.00	0.50	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	217	3420		577	3471	1474	920	1776	1447	3467	1776	1480
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)	510	789	140	11	1076	468	95	237	14	802	457	500
RTOR Reduction (vph)	0	11	0	0	0	156	0	0	11	0	0	228
Lane Group Flow (vph)	510	918	0	11	1076	312	95	237	3	802	457	272
Confl. Peds. (#/hr)	50		50	50		50	50		100	100		50
Confl. Bikes (#/hr)			14			3			1			10
Heavy Vehicles (%)	0%	2%	3%	0%	4%	2%	0%	7%	0%	1%	7%	1%
Turn Type	pm+pt			Perm		Perm	Perm		Perm	Prot		Perm
Protected Phases	5	2			6			8		7		4
Permitted Phases	2			6		6	8		8			4
Actuated Green, G (s)	52.1	52.1		32.1	32.1	32.1	19.2	19.2	19.2	17.0	41.2	41.2
Effective Green, g (s)	52.1	53.1		32.1	33.1	33.1	20.2	20.2	20.2	18.0	42.2	42.2
Actuated g/C Ratio	0.49	0.50		0.30	0.31	0.31	0.19	0.19	0.19	0.17	0.40	0.40
Clearance Time (s)	3.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	364	1725		176	1091	463	176	341	278	593	712	593
v/s Ratio Prot	c0.23	0.27			0.31			0.13		c0.23	c0.26	
v/s Ratio Perm	c0.47			0.02		0.21	0.10		0.00			0.18
v/c Ratio	1.40	0.53		0.06	0.99	0.67	0.54	0.70	0.01	1.35	0.64	0.46
Uniform Delay, d1	31.5	17.7		25.9	35.9	31.4	38.4	39.7	34.5	43.6	25.5	23.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	196.4	0.3		0.1	23.7	3.9	3.2	6.0	0.0	169.5	2.0	0.6
Delay (s)	227.9	18.0		26.1	59.6	35.3	41.5	45.7	34.5	213.1	27.4	23.7
Level of Service	F	B		C	E	D	D	D	C	F	C	C
Approach Delay (s)		92.4			52.0			44.1			111.1	
Approach LOS		F			D			D			F	

### Intersection Summary

HCM Average Control Delay	83.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	105.3	Sum of lost time (s)	7.0
Intersection Capacity Utilization	117.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 5: The Queensway & Park Lawn Rd

3/24/2014



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↕	↖	↕	↖	↖	↕	↖	↖	↕
Volume (vph)	211	672	375	859	68	178	425	396	34	359
Turn Type	pm+pt		pm+pt		Perm	pm+pt		Perm	Perm	
Protected Phases	5	2	1	6		3	8			4
Permitted Phases	2		6		6	8	8	8	4	
Detector Phase	5	2	1	6	6	3	8	8	4	4
Switch Phase										
Minimum Initial (s)	4.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	30.0	9.0	30.0	30.0	8.0	35.0	35.0	32.0	32.0
Total Split (s)	13.0	31.0	19.0	37.0	37.0	8.0	40.0	40.0	32.0	32.0
Total Split (%)	14.4%	34.4%	21.1%	41.1%	41.1%	8.9%	44.4%	44.4%	35.6%	35.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	5.0	7.0	7.0	3.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead			Lag	Lag
Lead-Lag Optimize?										
Recall Mode	Min	C-Min	Max	Min	Min	Max	Min	Min	Min	Min
Act Effect Green (s)	36.5	24.0	50.6	33.1	33.1	31.4	27.4	27.4	19.4	19.4
Actuated g/C Ratio	0.41	0.27	0.56	0.37	0.37	0.35	0.30	0.30	0.22	0.22
v/c Ratio	0.63	0.97	0.85	0.73	0.13	0.82	0.78	0.60	0.26	0.72
Control Delay	23.2	55.9	41.0	29.7	13.9	42.7	28.9	6.6	32.4	31.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	55.9	41.0	29.7	13.9	42.7	28.9	6.6	32.4	31.5
LOS	C	E	D	C	B	D	C	A	C	C
Approach Delay		49.5		32.1			22.5			31.6
Approach LOS		D		C			C			C

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 56 (62%), Referenced to phase 2:EBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 34.3

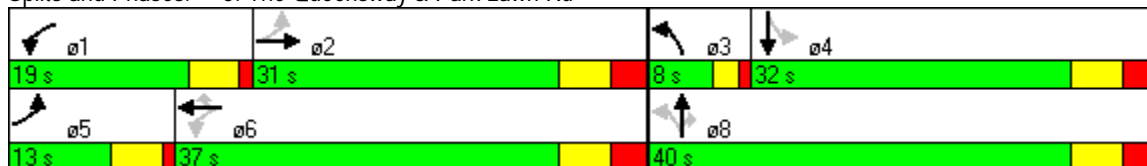
Intersection LOS: C

Intersection Capacity Utilization 94.1%

ICU Level of Service F

Analysis Period (min) 15

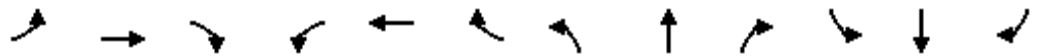
### Splits and Phases: 5: The Queensway & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 5: The Queensway & Park Lawn Rd

3/24/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗	↗	↖	↗	
Volume (vph)	211	672	192	375	859	68	178	425	396	34	359	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0		5.0	7.0	7.0	3.0	7.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3396		1735	3374	1418	1805	1881	1563	1703	3314	
Flt Permitted	0.26	1.00		0.14	1.00	1.00	0.23	1.00	1.00	0.36	1.00	
Satd. Flow (perm)	490	3396		252	3374	1418	441	1881	1563	639	3314	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	222	707	202	395	904	72	187	447	417	36	378	202
RTOR Reduction (vph)	0	29	0	0	0	20	0	0	220	0	86	0
Lane Group Flow (vph)	222	880	0	395	904	52	187	447	197	36	494	0
Confl. Peds. (#/hr)	4		18	18		4	2					2
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	0%	2%	2%	4%	7%	12%	0%	1%	2%	6%	2%	4%
Turn Type	pm+pt			pm+pt		Perm	pm+pt		Perm	Perm		
Protected Phases	5	2		1	6		3	8				4
Permitted Phases	2			6		6	8	8	8	4		
Actuated Green, G (s)	34.5	24.0		48.6	33.1	33.1	27.4	27.4	27.4	19.4	19.4	
Effective Green, g (s)	34.5	24.0		48.6	33.1	33.1	27.4	27.4	27.4	19.4	19.4	
Actuated g/C Ratio	0.38	0.27		0.54	0.37	0.37	0.30	0.30	0.30	0.22	0.22	
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	3.0	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	3.0	
Lane Grp Cap (vph)	341	906		459	1241	522	210	573	476	138	714	
v/s Ratio Prot	0.08	c0.26		c0.19	0.27		c0.05	0.24			0.15	
v/s Ratio Perm	0.17			0.28		0.04	c0.22		0.13	0.06		
v/c Ratio	0.65	0.97		0.86	0.73	0.10	0.89	0.78	0.41	0.26	0.69	
Uniform Delay, d1	19.7	32.7		22.7	24.6	18.7	28.3	28.6	24.9	29.3	32.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.71	0.69	0.48	1.00	1.00	
Incremental Delay, d2	4.4	23.6		15.1	2.2	0.1	32.4	6.4	0.5	1.0	2.9	
Delay (s)	24.1	56.3		37.8	26.7	18.8	52.6	26.0	12.5	30.4	35.5	
Level of Service	C	E		D	C	B	D	C	B	C	D	
Approach Delay (s)		50.0			29.5			25.4			35.2	
Approach LOS		D			C			C			D	

### Intersection Summary

HCM Average Control Delay	34.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



# Timings

## 8: Gardiner Expwy WB On-ramp & Park Lawn Rd

3/24/2014



Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↘	↑↑	↑↑	↗
Volume (vph)	16	9	492	984	538	446
Turn Type		Perm	pm+pt			Perm
Protected Phases	8		5	2	6	
Permitted Phases		8	2			6
Detector Phase	8	8	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	4.0	5.0	5.0	5.0
Minimum Split (s)	34.0	34.0	10.0	27.0	28.0	28.0
Total Split (s)	34.0	34.0	28.0	56.0	28.0	28.0
Total Split (%)	37.8%	37.8%	31.1%	62.2%	31.1%	31.1%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	2.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	7.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?						
Recall Mode	Min	Min	Min	C-Min	C-Min	C-Min
Act Effect Green (s)	6.8	6.8	71.2	70.2	50.8	50.8
Actuated g/C Ratio	0.08	0.08	0.79	0.78	0.56	0.56
v/c Ratio	0.17	0.09	0.73	0.40	0.30	0.45
Control Delay	41.8	21.9	7.6	3.1	10.4	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.8	21.9	7.6	3.1	10.4	4.4
LOS	D	C	A	A	B	A
Approach Delay	34.9			4.6	7.7	
Approach LOS	C			A	A	

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 24 (27%), Referenced to phase 2:NBTL and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 6.2

Intersection LOS: A

Intersection Capacity Utilization 75.8%

ICU Level of Service D

Analysis Period (min) 15

### Splits and Phases: 8: Gardiner Expwy WB On-ramp & Park Lawn Rd



HCM Signalized Intersection Capacity Analysis  
 8: Gardiner Expwy WB On-ramp & Park Lawn Rd

3/24/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↖	↑↑			↑↑	↗
Volume (vph)	0	0	0	2	16	9	492	984	0	0	538	446
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	7.0			6.0	6.0
Lane Util. Factor					1.00	1.00	1.00	0.95			0.95	1.00
Frbp, ped/bikes					1.00	0.99	1.00	1.00			1.00	0.96
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					1480	1436	1765	3343			3374	1502
Flt Permitted					0.99	1.00	0.38	1.00			1.00	1.00
Satd. Flow (perm)					1480	1436	697	3343			3374	1502
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	2	17	10	523	1047	0	0	572	474
RTOR Reduction (vph)	0	0	0	0	0	9	0	0	0	0	0	206
Lane Group Flow (vph)	0	0	0	0	19	1	523	1047	0	0	572	268
Confl. Peds. (#/hr)	1					1	11		3	3		11
Heavy Vehicles (%)	0%	0%	0%	0%	31%	11%	2%	8%	0%	0%	7%	3%
Turn Type				Perm		Perm	pm+pt					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Actuated Green, G (s)					6.8	6.8	70.2	70.2			50.8	50.8
Effective Green, g (s)					6.8	6.8	70.2	70.2			50.8	50.8
Actuated g/C Ratio					0.08	0.08	0.78	0.78			0.56	0.56
Clearance Time (s)					6.0	6.0	6.0	7.0			6.0	6.0
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					112	108	715	2608			1904	848
v/s Ratio Prot							c0.12	0.31			0.17	
v/s Ratio Perm					0.01	0.00	c0.45					0.18
v/c Ratio					0.17	0.01	0.73	0.40			0.30	0.32
Uniform Delay, d1					39.0	38.5	4.1	3.2			10.3	10.4
Progression Factor					1.00	1.00	0.80	0.82			0.91	2.55
Incremental Delay, d2					0.7	0.0	3.1	0.4			0.3	0.7
Delay (s)					39.7	38.5	6.4	3.0			9.6	27.1
Level of Service					D	D	A	A			A	C
Approach Delay (s)		0.0			39.3			4.1			17.6	
Approach LOS		A			D			A			B	

Intersection Summary			
HCM Average Control Delay	9.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# Timings

## 10: Gardiner Expwy EB Off-ramp & Park Lawn Rd

3/24/2014

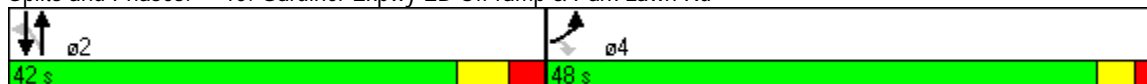


Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	531	911	93	1005	627
Turn Type		Perm	Perm		
Protected Phases	4			2	2
Permitted Phases		4	2		
Detector Phase	4	4	2	2	2
Switch Phase					
Minimum Initial (s)	19.0	19.0	4.0	4.0	4.0
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0
Total Split (s)	48.0	48.0	42.0	42.0	42.0
Total Split (%)	53.3%	53.3%	46.7%	46.7%	46.7%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	7.0	7.0	7.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Min	C-Min	Max	Max	Max
Act Effect Green (s)	34.2	34.2	43.8	43.8	43.8
Actuated g/C Ratio	0.38	0.38	0.49	0.49	0.49
v/c Ratio	0.77	0.78	0.31	0.59	0.42
Control Delay	20.2	21.8	12.8	12.5	24.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	21.8	12.8	12.5	24.7
LOS	C	C	B	B	C
Approach Delay	20.7			12.6	24.7
Approach LOS	C			B	C

### Intersection Summary

Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 4:EBL, Start of Green, Master Intersection  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 18.8  
 Intersection LOS: B  
 Intersection Capacity Utilization 67.4%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 10: Gardiner Expwy EB Off-ramp & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 10: Gardiner Expwy EB Off-ramp & Park Lawn Rd

3/24/2014



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	531	911	93	1005	627	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	7.0	7.0	7.0	
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	
Frbp, ped/bikes	0.99	0.98	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	
Frt	0.93	0.85	1.00	1.00	0.99	
Flt Protected	0.97	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3249	1430	1771	3574	3465	
Flt Permitted	0.97	1.00	0.34	1.00	1.00	
Satd. Flow (perm)	3249	1430	628	3574	3465	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	542	930	95	1026	640	71
RTOR Reduction (vph)	64	64	0	0	8	0
Lane Group Flow (vph)	934	410	95	1026	703	0
Confl. Peds. (#/hr)			27			27
Confl. Bikes (#/hr)		9				7
Heavy Vehicles (%)	2%	1%	0%	1%	2%	0%
Turn Type		Perm	Perm			
Protected Phases	4			2	2	
Permitted Phases		4	2			
Actuated Green, G (s)	34.2	34.2	43.8	43.8	43.8	
Effective Green, g (s)	34.2	34.2	43.8	43.8	43.8	
Actuated g/C Ratio	0.38	0.38	0.49	0.49	0.49	
Clearance Time (s)	5.0	5.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1235	543	306	1739	1686	
v/s Ratio Prot	c0.29			c0.29	0.20	
v/s Ratio Perm		0.29	0.15			
v/c Ratio	0.76	0.76	0.31	0.59	0.42	
Uniform Delay, d1	24.3	24.3	14.0	16.6	14.9	
Progression Factor	0.78	0.75	0.59	0.61	1.49	
Incremental Delay, d2	3.7	8.2	2.4	1.3	0.7	
Delay (s)	22.7	26.2	10.6	11.5	23.0	
Level of Service	C	C	B	B	C	
Approach Delay (s)	23.8			11.4	23.0	
Approach LOS	C			B	C	

### Intersection Summary

HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# Timings

## 17: Gardiner Expwy EB Off-ramp & Legion Rd North

3/24/2014

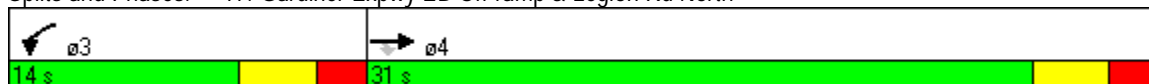


Lane Group	EBT	EBR	WBL	NBR
Lane Configurations	↑↑	↑	↑	↑
Volume (vph)	1303	143	161	118
Turn Type		Perm	Prot	Free
Protected Phases	4		3	
Permitted Phases		4		Free
Detector Phase	4	4	3	
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	
Minimum Split (s)	23.0	23.0	9.0	
Total Split (s)	31.0	31.0	14.0	0.0
Total Split (%)	68.9%	68.9%	31.1%	0.0%
Yellow Time (s)	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag	Lead	
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	
Act Effect Green (s)	30.0	30.0	8.2	45.0
Actuated g/C Ratio	0.67	0.67	0.18	1.00
v/c Ratio	0.57	0.14	0.51	0.08
Control Delay	7.0	1.4	18.7	0.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	7.0	1.4	18.7	0.1
LOS	A	A	B	A
Approach Delay	6.4			
Approach LOS	A			

### Intersection Summary

Cycle Length: 45  
 Actuated Cycle Length: 45  
 Offset: 42 (93%), Referenced to phase 4:EBT, Start of Green  
 Natural Cycle: 40  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.57  
 Intersection Signal Delay: 7.1  
 Intersection Capacity Utilization 52.4%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service A

Splits and Phases: 17: Gardiner Expwy EB Off-ramp & Legion Rd North



HCM Signalized Intersection Capacity Analysis  
 17: Gardiner Expwy EB Off-ramp & Legion Rd North

3/24/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↖			↗
Volume (vph)	1303	143	161	0	0	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			4.0
Lane Util. Factor	0.95	1.00	1.00			1.00
Frbp, ped/bikes	1.00	0.97	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			0.86
Flt Protected	1.00	1.00	0.95			1.00
Satd. Flow (prot)	3539	1558	1805			1611
Flt Permitted	1.00	1.00	0.95			1.00
Satd. Flow (perm)	3539	1558	1805			1611
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1357	149	168	0	0	123
RTOR Reduction (vph)	0	56	0	0	0	0
Lane Group Flow (vph)	1357	93	168	0	0	123
Confl. Peds. (#/hr)		7	7			
Heavy Vehicles (%)	2%	1%	0%	0%	0%	2%
Turn Type		Perm	Prot			Free
Protected Phases	4		3			
Permitted Phases		4				Free
Actuated Green, G (s)	28.0	28.0	7.0			45.0
Effective Green, g (s)	28.0	28.0	7.0			45.0
Actuated g/C Ratio	0.62	0.62	0.16			1.00
Clearance Time (s)	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	2202	969	281			1611
v/s Ratio Prot	c0.38		c0.09			
v/s Ratio Perm		0.06				0.08
v/c Ratio	0.62	0.10	0.60			0.08
Uniform Delay, d1	5.2	3.4	17.7			0.0
Progression Factor	1.00	1.00	0.81			1.00
Incremental Delay, d2	1.3	0.2	3.2			0.1
Delay (s)	6.5	3.6	17.5			0.1
Level of Service	A	A	B			A
Approach Delay (s)	6.2			17.5	0.1	
Approach LOS	A			B	A	

Intersection Summary			
HCM Average Control Delay	6.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

# Timings

## 21: Menkes- Kraft Driveway & Park Lawn Rd

3/24/2014

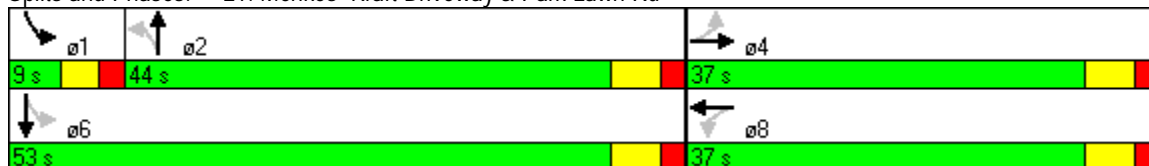


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↶	↷	↻	↶	↷	↶	↷
Volume (vph)	8	0	0	51	1077	28	1583
Turn Type	Perm			Perm		pm+pt	
Protected Phases		4	8		2	1	6
Permitted Phases	4			2		6	
Detector Phase	4	4	8	2	2	1	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0
Minimum Split (s)	34.0	34.0	37.0	29.0	29.0	9.0	29.0
Total Split (s)	37.0	37.0	37.0	44.0	44.0	9.0	53.0
Total Split (%)	41.1%	41.1%	41.1%	48.9%	48.9%	10.0%	58.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	5.0	6.0
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?							
Recall Mode	Min	Min	Min	C-Min	C-Min	Min	C-Min
Act Effect Green (s)	6.6	6.6	6.6	60.6	60.6	72.4	71.4
Actuated g/C Ratio	0.07	0.07	0.07	0.67	0.67	0.80	0.79
v/c Ratio	0.09	0.21	0.19	0.34	0.49	0.08	0.43
Control Delay	40.0	29.6	1.8	14.0	8.2	0.8	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	29.6	1.8	14.0	8.2	0.8	0.9
LOS	D	C	A	B	A	A	A
Approach Delay		32.2	1.8		8.4		0.9
Approach LOS		C	A		A		A

### Intersection Summary

Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 53 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.49  
 Intersection Signal Delay: 4.3  
 Intersection LOS: A  
 Intersection Capacity Utilization 56.6%  
 ICU Level of Service B  
 Analysis Period (min) 15

### Splits and Phases: 21: Menkes- Kraft Driveway & Park Lawn Rd



# HCM Signalized Intersection Capacity Analysis

## 21: Menkes- Kraft Driveway & Park Lawn Rd

3/24/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷			↔		↶	↷		↶	↷	↷
Volume (vph)	8	0	25	0	0	43	51	1077	0	28	1583	11
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		5.0	6.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.91	
Frt	1.00	0.85			0.86		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1611		1770	3539		1770	5080	
Flt Permitted	0.73	1.00			1.00		0.13	1.00		0.19	1.00	
Satd. Flow (perm)	1354	1583			1611		240	3539		358	5080	
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)	9	0	27	0	0	46	55	1158	0	30	1702	12
RTOR Reduction (vph)	0	12	0	0	43	0	0	0	0	0	0	0
Lane Group Flow (vph)	9	15	0	0	3	0	55	1158	0	30	1714	0
Heavy Vehicles (%)	2%	0%	2%	0%	0%	2%	2%	2%	0%	2%	2%	2%
Turn Type	Perm		Perm			Perm			pm+pt			
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	6.6	6.6			6.6		60.6	60.6		71.4	71.4	
Effective Green, g (s)	6.6	6.6			6.6		60.6	60.6		71.4	71.4	
Actuated g/C Ratio	0.07	0.07			0.07		0.67	0.67		0.79	0.79	
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0		5.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	99	116			118		162	2383		375	4030	
v/s Ratio Prot		c0.01			0.00			c0.33		0.01	c0.34	
v/s Ratio Perm	0.01						0.23			0.06		
v/c Ratio	0.09	0.13			0.03		0.34	0.49		0.08	0.43	
Uniform Delay, d1	38.9	39.0			38.7		6.2	7.1		3.1	2.9	
Progression Factor	1.00	1.00			1.00		1.00	1.00		0.23	0.20	
Incremental Delay, d2	0.4	0.5			0.1		5.6	0.7		0.1	0.3	
Delay (s)	39.3	39.5			38.8		11.8	7.8		0.8	0.9	
Level of Service	D	D			D		B	A		A	A	
Approach Delay (s)		39.5			38.8			8.0			0.9	
Approach LOS		D			D			A			A	

### Intersection Summary

HCM Average Control Delay	4.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



# Timings

## 30: Lake Shore Blvd W & Legion Rd South

3/24/2014

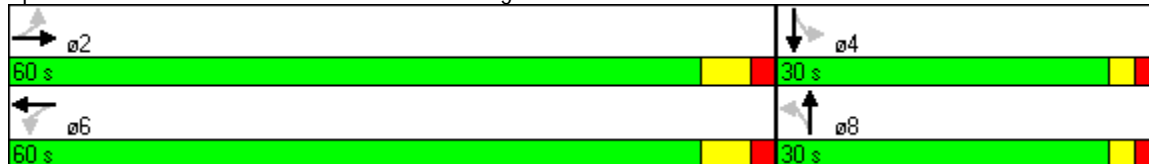


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕↕	↕↕		↕↕	↕	↕
Volume (vph)	51	1076	1462	5	0	97	0
Turn Type	Perm			Perm		Perm	
Protected Phases		2	6		8		4
Permitted Phases	2			8		4	
Detector Phase	2	2	6	8	8	4	4
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.0	23.0	25.0	30.0	30.0	30.0	30.0
Total Split (s)	60.0	60.0	60.0	30.0	30.0	30.0	30.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	2.0	2.0	2.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Max	Max	Max	None	None	None	None
Act Effect Green (s)		64.2	64.2		11.8	11.8	11.8
Actuated g/C Ratio		0.74	0.74		0.14	0.14	0.14
v/c Ratio		0.59	0.63		0.11	0.54	0.36
Control Delay		6.9	7.1		15.2	40.4	23.2
Queue Delay		0.0	0.0		0.0	0.0	0.0
Total Delay		6.9	7.1		15.2	40.4	23.2
LOS		A	A		B	D	C
Approach Delay		6.9	7.1		15.2		32.4
Approach LOS		A	A		B		C

### Intersection Summary

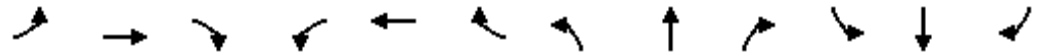
Cycle Length: 90	
Actuated Cycle Length: 86.3	
Natural Cycle: 80	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 8.6	Intersection LOS: A
Intersection Capacity Utilization 90.7%	ICU Level of Service E
Analysis Period (min) 15	

### Splits and Phases: 30: Lake Shore Blvd W & Legion Rd South



HCM Signalized Intersection Capacity Analysis  
 30: Lake Shore Blvd W & Legion Rd South

3/24/2014



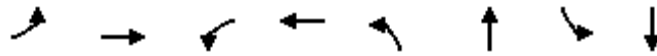
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕		↕	↕	
Volume (vph)	51	1076	0	0	1462	101	5	0	19	97	0	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95			1.00		1.00	1.00	
Frbp, ped/bikes		1.00			1.00			0.97		1.00	0.98	
Flpb, ped/bikes		1.00			1.00			1.00		0.98	1.00	
Frt		1.00			0.99			0.89		1.00	0.85	
Flt Protected		1.00			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		3534			3498			1630		1767	1580	
Flt Permitted		0.77			1.00			0.95		0.74	1.00	
Satd. Flow (perm)		2723			3498			1564		1378	1580	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	54	1133	0	0	1539	106	5	0	20	102	0	89
RTOR Reduction (vph)	0	0	0	0	4	0	0	17	0	0	28	0
Lane Group Flow (vph)	0	1187	0	0	1641	0	0	8	0	102	61	0
Confl. Peds. (#/hr)	13		18	18		13	9		22	22		9
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		64.2			64.2			11.8		11.8	11.8	
Effective Green, g (s)		64.2			64.2			11.8		11.8	11.8	
Actuated g/C Ratio		0.75			0.75			0.14		0.14	0.14	
Clearance Time (s)		6.0			6.0			4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		2033			2611			215		189	217	
v/s Ratio Prot					c0.47						0.04	
v/s Ratio Perm		0.44						0.00		c0.07		
v/c Ratio		0.58			0.63			0.04		0.54	0.28	
Uniform Delay, d1		4.9			5.2			32.2		34.6	33.3	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		1.2			1.2			0.1		3.0	0.7	
Delay (s)		6.1			6.4			32.2		37.5	34.0	
Level of Service		A			A			C		D	C	
Approach Delay (s)		6.1			6.4			32.2			35.9	
Approach LOS		A			A			C			D	

Intersection Summary		
HCM Average Control Delay	8.3	HCM Level of Service
HCM Volume to Capacity ratio	0.61	A
Actuated Cycle Length (s)	86.0	Sum of lost time (s)
Intersection Capacity Utilization	90.7%	10.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		E

# Timings

## 32: Lake Shore Blvd W & Mr. Christie's West Driveway

3/24/2014



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↗	↖	↗
Volume (vph)	27	1193	125	1143	164	0	25	0
Turn Type	pm+pt		pm+pt		pm+pt		Perm	
Protected Phases	5	2	1	6	3	8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	4	4
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	10.0	10.0	10.0
Minimum Split (s)	12.0	30.0	12.0	30.0	12.0	29.0	29.0	29.0
Total Split (s)	12.0	37.0	12.0	37.0	12.0	41.0	29.0	29.0
Total Split (%)	13.3%	41.1%	13.3%	41.1%	13.3%	45.6%	32.2%	32.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead		Lag	Lag
Lead-Lag Optimize?								
Recall Mode	Min	C-Max	Min	C-Min	Min	Min	Min	Min
Act Effect Green (s)	52.5	43.5	55.4	45.0	24.0	22.0	10.0	10.0
Actuated g/C Ratio	0.58	0.48	0.62	0.50	0.27	0.24	0.11	0.11
v/c Ratio	0.11	0.79	0.51	0.70	0.52	0.14	0.18	0.09
Control Delay	7.0	24.2	15.0	20.4	33.1	0.5	39.6	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	24.2	15.0	20.4	33.1	0.5	39.6	0.4
LOS	A	C	B	C	C	A	D	A
Approach Delay		23.9		19.9		22.9		16.5
Approach LOS		C		B		C		B

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 80 (89%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 21.9

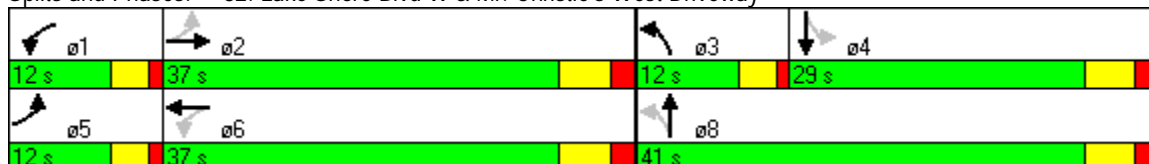
Intersection LOS: C

Intersection Capacity Utilization 71.2%

ICU Level of Service C

Analysis Period (min) 15

### Splits and Phases: 32: Lake Shore Blvd W & Mr. Christie's West Driveway



HCM Signalized Intersection Capacity Analysis  
 32: Lake Shore Blvd W & Mr. Christie's West Driveway

3/24/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	1193	61	125	1143	6	164	0	74	25	0	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3467		1805	3502		1805	1594		1803	1615	
Flt Permitted	0.14	1.00		0.09	1.00		0.52	1.00		0.71	1.00	
Satd. Flow (perm)	261	3467		171	3502		993	1594		1339	1615	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	29	1269	65	133	1216	6	174	0	79	27	0	39
RTOR Reduction (vph)	0	3	0	0	1	0	0	60	0	0	35	0
Lane Group Flow (vph)	29	1331	0	133	1222	0	174	19	0	27	4	0
Confl. Peds. (#/hr)	4		24	24		4			1	1		
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt			pm+pt			pm+pt			Perm		
Protected Phases	5	2		1	6		3	8				4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	50.5	43.5		53.5	45.0		22.0	22.0		10.0	10.0	
Effective Green, g (s)	50.5	43.5		53.5	45.0		22.0	22.0		10.0	10.0	
Actuated g/C Ratio	0.56	0.48		0.59	0.50		0.24	0.24		0.11	0.11	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	267	1676		256	1751		315	390		149	179	
v/s Ratio Prot	0.01	c0.38		c0.05	0.35		c0.05	0.01			0.00	
v/s Ratio Perm	0.05			0.26			c0.09			0.02		
v/c Ratio	0.11	0.79		0.52	0.70		0.55	0.05		0.18	0.02	
Uniform Delay, d1	10.6	19.5		13.4	17.3		28.5	26.0		36.3	35.7	
Progression Factor	1.00	1.00		1.05	1.07		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	4.0		1.2	1.6		2.1	0.1		0.6	0.1	
Delay (s)	10.8	23.5		15.3	20.1		30.6	26.1		36.9	35.7	
Level of Service	B	C		B	C		C	C		D	D	
Approach Delay (s)		23.2			19.6			29.2			36.2	
Approach LOS		C			B			C			D	

Intersection Summary

HCM Average Control Delay	22.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# Timings

## 34: Lake Shore Blvd W & Gardiner Expwy On-Off Ramp

3/24/2014



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗		↖	↗
Volume (vph)	292	803	3	92	69	50	129	255	1115
Turn Type	pm+pt		Perm		Perm		pm+pt		Free
Protected Phases	5	2		6		8	7	4	
Permitted Phases	2		6		8		4		Free
Detector Phase	5	2	6	6	8	8	7	4	
Switch Phase									
Minimum Initial (s)	4.0	24.0	24.0	24.0	13.0	13.0	4.0	13.0	
Minimum Split (s)	8.0	32.0	36.0	36.0	36.0	36.0	8.0	31.0	
Total Split (s)	10.0	46.0	36.0	36.0	36.0	36.0	8.0	44.0	0.0
Total Split (%)	11.1%	51.1%	40.0%	40.0%	40.0%	40.0%	8.9%	48.9%	0.0%
Yellow Time (s)	3.5	4.0	4.0	4.0	3.0	3.0	3.5	3.0	
All-Red Time (s)	0.5	3.0	3.0	3.0	3.0	3.0	0.5	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	7.0	6.0	6.0	4.0	6.0	4.0
Lead/Lag	Lead		Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?									
Recall Mode	None	C-Max	None	None	None	None	None	None	
Act Effect Green (s)	50.7	47.7	33.5	33.5	29.3	29.3		29.3	90.0
Actuated g/C Ratio	0.56	0.53	0.37	0.37	0.33	0.33		0.33	1.00
v/c Ratio	0.44	0.55	0.02	0.21	0.41	0.11		0.81	0.77
Control Delay	2.9	2.4	21.7	20.7	28.7	9.3		40.0	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	2.9	2.4	21.7	20.7	28.7	9.3		40.0	3.6
LOS	A	A	C	C	C	A		D	A
Approach Delay		2.5		20.7		16.8		12.9	
Approach LOS		A		C		B		B	

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 9.2

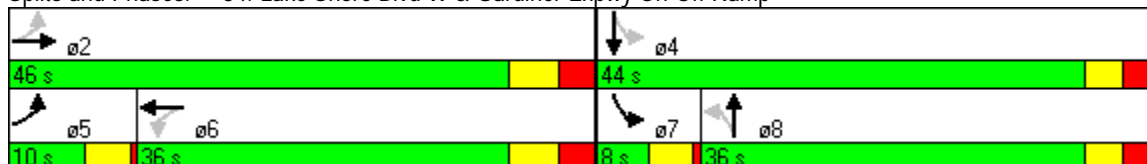
Intersection LOS: A

Intersection Capacity Utilization 73.9%

ICU Level of Service D

Analysis Period (min) 15

### Splits and Phases: 34: Lake Shore Blvd W & Gardiner Expwy On-Off Ramp



HCM Signalized Intersection Capacity Analysis  
 34: Lake Shore Blvd W & Gardiner Expwy On-Off Ramp

3/24/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗			↖	↗
Volume (vph)	292	803	121	3	92	17	69	50	61	129	255	1115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		7.0	7.0		6.0	6.0			6.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	0.95			1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99			1.00	1.00
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	0.92			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1786	3430		1349	1508		1770	3289			1850	1583
Flt Permitted	0.61	1.00		0.29	1.00		0.30	1.00			0.84	1.00
Satd. Flow (perm)	1144	3430		405	1508		560	3289			1577	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	317	873	132	3	100	18	75	54	66	140	277	1212
RTOR Reduction (vph)	0	11	0	0	7	0	0	45	0	0	0	0
Lane Group Flow (vph)	317	994	0	3	111	0	75	75	0	0	417	1212
Confl. Peds. (#/hr)	2		13	13		2			1	1		
Heavy Vehicles (%)	1%	3%	0%	33%	27%	0%	2%	0%	0%	3%	0%	2%
Turn Type	pm+pt			Perm			Perm			pm+pt		Free
Protected Phases	5	2			6			8		7	4	
Permitted Phases	2			6			8			4		Free
Actuated Green, G (s)	47.7	47.7		33.5	33.5		29.3	29.3			29.3	90.0
Effective Green, g (s)	47.7	47.7		33.5	33.5		29.3	29.3			29.3	90.0
Actuated g/C Ratio	0.53	0.53		0.37	0.37		0.33	0.33			0.33	1.00
Clearance Time (s)	4.0	7.0		7.0	7.0		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)	679	1818		151	561		182	1071			513	1583
v/s Ratio Prot	0.05	0.29			0.07			0.02				
v/s Ratio Perm	0.19			0.01			0.13				0.26	c0.77
v/c Ratio	0.47	0.55		0.02	0.20		0.41	0.07			0.81	0.77
Uniform Delay, d1	12.2	14.0		17.9	19.1		23.6	21.0			27.8	0.0
Progression Factor	0.12	0.10		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.3	0.8		0.1	0.2		1.5	0.0			9.5	3.6
Delay (s)	1.9	2.3		17.9	19.3		25.2	21.0			37.4	3.6
Level of Service	A	A		B	B		C	C			D	A
Approach Delay (s)		2.2			19.3			22.6			12.2	
Approach LOS		A			B			C			B	

Intersection Summary		
HCM Average Control Delay	9.0	HCM Level of Service
HCM Volume to Capacity ratio	0.77	A
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	73.9%	ICU Level of Service
Analysis Period (min)	15	D
c Critical Lane Group		

HCM Unsignalized Intersection Capacity Analysis  
 37: Lake Shore Blvd W & Marine Parade Dr.

3/24/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	↻
Volume (veh/h)	786	63	8	51	31	41
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)	845	68	9	55	33	44
Pedestrians					9	
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)	398			136		
pX, platoon unblocked			0.68		0.68	0.68
vC, conflicting volume			922		960	888
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			644		700	594
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		88	87
cM capacity (veh/h)			637		267	341

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	913	63	33	44
Volume Left	0	9	33	0
Volume Right	68	0	0	44
cSH	1700	637	267	341
Volume to Capacity	0.54	0.01	0.12	0.13
Queue Length 95th (m)	0.0	0.3	3.4	3.5
Control Delay (s)	0.0	1.6	20.4	17.1
Lane LOS		A	C	C
Approach Delay (s)	0.0	1.6	18.5	
Approach LOS			C	

Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization		55.3%	ICU Level of Service B
Analysis Period (min)		15	

# Timings

## 38: Lake Shore Blvd W & Palace Pier Crt

3/24/2014

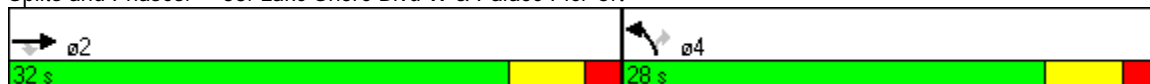


Lane Group	EBT	EBR	NBL	NBR
Lane Configurations	↑	↑	↑	↑
Volume (vph)	607	175	37	28
Turn Type		Perm		Perm
Protected Phases	2		4	
Permitted Phases		2		4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	25.5	25.5	28.0	28.0
Total Split (s)	32.0	32.0	28.0	28.0
Total Split (%)	53.3%	53.3%	46.7%	46.7%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effect Green (s)	26.0	26.0	22.0	22.0
Actuated g/C Ratio	0.43	0.43	0.37	0.37
v/c Ratio	0.81	0.26	0.06	0.06
Control Delay	25.0	4.6	12.7	5.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.0	4.6	12.7	5.6
LOS	C	A	B	A
Approach Delay	20.5		9.7	
Approach LOS	C		A	

### Intersection Summary

Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:, Start of Green  
 Natural Cycle: 60  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.81  
 Intersection Signal Delay: 19.6  
 Intersection Capacity Utilization 45.3%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service A

Splits and Phases: 38: Lake Shore Blvd W & Palace Pier Crt





# HCM Signalized Intersection Capacity Analysis

## 38: Lake Shore Blvd W & Palace Pier Crt

3/24/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗			↖	↗
Volume (vph)	607	175	0	0	37	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	1.00			1.00	1.00
Frbp, ped/bikes	1.00	0.95			1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00
Frt	1.00	0.85			1.00	0.85
Flt Protected	1.00	1.00			0.95	1.00
Satd. Flow (prot)	1900	1519			1805	1455
Flt Permitted	1.00	1.00			0.95	1.00
Satd. Flow (perm)	1900	1519			1805	1455
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	667	192	0	0	41	31
RTOR Reduction (vph)	0	82	0	0	0	20
Lane Group Flow (vph)	667	110	0	0	41	11
Confl. Peds. (#/hr)		20	20			
Heavy Vehicles (%)	0%	1%	0%	0%	0%	11%
Turn Type		Perm				Perm
Protected Phases	2				4	
Permitted Phases		2				4
Actuated Green, G (s)	26.0	26.0			22.0	22.0
Effective Green, g (s)	26.0	26.0			22.0	22.0
Actuated g/C Ratio	0.43	0.43			0.37	0.37
Clearance Time (s)	6.0	6.0			6.0	6.0
Lane Grp Cap (vph)	823	658			662	534
v/s Ratio Prot	c0.35				c0.02	
v/s Ratio Perm		0.07				0.01
v/c Ratio	0.81	0.17			0.06	0.02
Uniform Delay, d1	14.8	10.4			12.3	12.1
Progression Factor	1.00	1.00			1.00	1.00
Incremental Delay, d2	8.5	0.5			0.2	0.1
Delay (s)	23.4	10.9			12.5	12.2
Level of Service	C	B			B	B
Approach Delay (s)	20.6			0.0	12.4	
Approach LOS	C			A	B	

### Intersection Summary

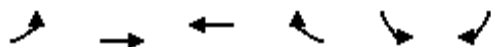
HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 40: Marine Parade Dr. & Waterfront Drive

3/24/2014

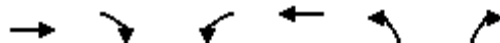


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	8	110	126	0	0	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	8	110	126	0	0	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)			342			
pX, platoon unblocked						
vC, conflicting volume	126				252	126
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	126				252	126
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	99
cM capacity (veh/h)	1460				733	924
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	118	126	7			
Volume Left	8	0	0			
Volume Right	0	0	7			
cSH	1460	1700	924			
Volume to Capacity	0.01	0.07	0.01			
Queue Length 95th (m)	0.1	0.0	0.2			
Control Delay (s)	0.5	0.0	8.9			
Lane LOS	A		A			
Approach Delay (s)	0.5	0.0	8.9			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization			22.4%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 42: Lake Shore Blvd W & Street D

3/24/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↗
Volume (veh/h)	1267	54	0	1344	0	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1348	57	0	1430	0	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	142			122		
pX, platoon unblocked				0.86	0.79	0.86
vC, conflicting volume				1405	2091	703
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				1145	1062	328
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	97
cM capacity (veh/h)				531	174	574

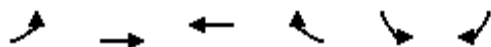
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	899	507	715	715	15
Volume Left	0	0	0	0	0
Volume Right	0	57	0	0	15
cSH	1700	1700	1700	1700	574
Volume to Capacity	0.53	0.30	0.42	0.42	0.03
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.6
Control Delay (s)	0.0	0.0	0.0	0.0	11.4
Lane LOS					B
Approach Delay (s)	0.0		0.0		11.4
Approach LOS					B

Intersection Summary					
Average Delay			0.1		
Intersection Capacity Utilization			46.7%	ICU Level of Service	A
Analysis Period (min)			15		

# HCM Unsignalized Intersection Capacity Analysis

## 45: Marine Parade Dr. & Street D

3/24/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↗
Volume (veh/h)	0	589	301	0	0	50
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	654	334	0	0	56
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		313				
pX, platoon unblocked						
vC, conflicting volume	334				662	167
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	334				662	167
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	93
cM capacity (veh/h)	1236				400	848
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	327	327	223	111	56	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	0	56	
cSH	1700	1700	1700	1700	848	
Volume to Capacity	0.19	0.19	0.13	0.07	0.07	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.7	
Control Delay (s)	0.0	0.0	0.0	0.0	9.5	
Lane LOS					A	
Approach Delay (s)	0.0		0.0		9.5	
Approach LOS					A	
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			19.6%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 48: Lake Shore Blvd W & Street A

3/24/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↗
Volume (veh/h)	1175	93	0	1258	0	38
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)	1277	101	0	1367	0	41
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	156			77		
pX, platoon unblocked				0.67	0.67	0.67
vC, conflicting volume	1378			2011	689	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	590			1531	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	94	
cM capacity (veh/h)	670			72	730	

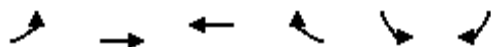
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	851	527	684	684	41
Volume Left	0	0	0	0	0
Volume Right	0	101	0	0	41
cSH	1700	1700	1700	1700	730
Volume to Capacity	0.50	0.31	0.40	0.40	0.06
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.4
Control Delay (s)	0.0	0.0	0.0	0.0	10.2
Lane LOS	B				
Approach Delay (s)	0.0		0.0		10.2
Approach LOS	B				

Intersection Summary					
Average Delay	0.2				
Intersection Capacity Utilization	45.4%		ICU Level of Service		A
Analysis Period (min)	15				

# HCM Unsignalized Intersection Capacity Analysis

## 50: Marine Parade Dr. & Street B

3/24/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	289	300	203	0	3	96
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	321	333	226	0	3	107
Pedestrians		4	1			
Lane Width (m)		3.6	3.6			
Walking Speed (m/s)		1.2	1.2			
Percent Blockage		0	0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	226				1202	117
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	226				1202	117
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	76				98	88
cM capacity (veh/h)	1340				137	910

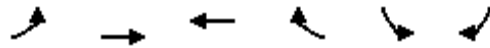
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	321	333	150	75	110
Volume Left	321	0	0	0	3
Volume Right	0	0	0	0	107
cSH	1340	1700	1700	1700	777
Volume to Capacity	0.24	0.20	0.09	0.04	0.14
Queue Length 95th (m)	7.5	0.0	0.0	0.0	3.9
Control Delay (s)	8.5	0.0	0.0	0.0	10.4
Lane LOS	A				B
Approach Delay (s)	4.2		0.0		10.4
Approach LOS					B

Intersection Summary					
Average Delay			3.9		
Intersection Capacity Utilization			39.0%	ICU Level of Service	A
Analysis Period (min)			15		

# HCM Unsignalized Intersection Capacity Analysis

## 52: Marine Parade Dr. & Street A

3/24/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	189	114	129	3	3	74
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)	205	124	140	3	3	80
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	143				677	72
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	143				677	72
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	86				99	92
cM capacity (veh/h)	1437				331	976
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	205	124	93	50	84	
Volume Left	205	0	0	0	3	
Volume Right	0	0	0	3	80	
cSH	1437	1700	1700	1700	907	
Volume to Capacity	0.14	0.07	0.05	0.03	0.09	
Queue Length 95th (m)	4.0	0.0	0.0	0.0	2.4	
Control Delay (s)	7.9	0.0	0.0	0.0	9.4	
Lane LOS	A				A	
Approach Delay (s)	4.9		0.0		9.4	
Approach LOS					A	
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			28.9%		ICU Level of Service	A
Analysis Period (min)			15			

Summary of All Intervals

Run Number	1	2	3	5	Avg
Start Time	6:50	6:50	6:50	6:50	6:50
End Time	7:15	7:15	7:15	7:15	7:15
Total Time (min)	25	25	25	25	25
Time Recorded (min)	15	15	15	15	15
# of Intervals	2	2	2	2	2
# of Recorded Intvl	1	1	1	1	1
Vehs Entered	2240	2307	2272	2225	2260
Vehs Exited	1955	1995	1966	2005	1980
Starting Vehs	564	546	551	594	559
Ending Vehs	849	858	857	814	834
Denied Entry Before	18	5	8	27	12
Denied Entry After	281	213	156	306	236
Travel Distance (km)	2409	2425	2356	2396	2396
Travel Time (hr)	207.2	194.5	195.9	210.9	202.1
Total Delay (hr)	153.9	141.0	143.8	157.7	149.1
Total Stops	7252	6845	6942	6608	6906
Fuel Used (l)	3473.4	3367.9	3344.0	3500.0	3421.3

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10
Volumes adjusted by PHF, Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	1	2	3	5	Avg
Vehs Entered	2240	2307	2272	2225	2260
Vehs Exited	1955	1995	1966	2005	1980
Starting Vehs	564	546	551	594	559
Ending Vehs	849	858	857	814	834
Denied Entry Before	18	5	8	27	12
Denied Entry After	281	213	156	306	236
Travel Distance (km)	2409	2425	2356	2396	2396
Travel Time (hr)	207.2	194.5	195.9	210.9	202.1
Total Delay (hr)	153.9	141.0	143.8	157.7	149.1
Total Stops	7252	6845	6942	6608	6906
Fuel Used (l)	3473.4	3367.9	3344.0	3500.0	3421.3



Queuing and Blocking Report

Future Total Traffic PM Peak Hour, Ultimate Scenario Rev 3R

3/24/2014

Intersection: 3: Lake Shore Blvd W & Park Lawn Rd

Movement	EB	EB	EB	WB	WB	WB	WB	B18	B18	NB	NB	NB
Directions Served	L	T	TR	L	T	T	R	T	T	L	T	R
Maximum Queue (m)	290.9	296.9	279.9	29.6	82.8	81.8	58.2	63.2	61.2	38.0	74.4	8.3
Average Queue (m)	279.2	275.7	199.7	5.2	82.0	81.3	45.0	60.8	60.9	21.6	49.6	2.9
95th Queue (m)	312.7	327.1	360.3	29.6	83.0	84.6	71.5	64.2	61.5	45.6	78.6	9.3
Link Distance (m)	282.4	282.4	282.4		60.6	60.6		38.4	38.4		290.4	290.4
Upstream Blk Time (%)	39	21	0	0	70	55	2	68	62			
Queuing Penalty (veh)	161	88	0	0	502	394	0	487	445			
Storage Bay Dist (m)				40.0			45.0			55.0		
Storage Blk Time (%)					71	68	3			0	6	
Queuing Penalty (veh)					8	318	14			0	5	

Intersection: 3: Lake Shore Blvd W & Park Lawn Rd

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (m)	149.8	200.0	205.4	202.4
Average Queue (m)	148.8	195.7	193.5	116.4
95th Queue (m)	151.2	200.9	213.4	253.4
Link Distance (m)		190.8	190.8	190.8
Upstream Blk Time (%)		71	32	7
Queuing Penalty (veh)		408	186	39
Storage Bay Dist (m)	100.0			
Storage Blk Time (%)	86	88		
Queuing Penalty (veh)	343	355		

Queuing and Blocking Report

Future Total Traffic PM Peak Hour, Ultimate Scenario Rev 3R

3/24/2014

Intersection: 5: The Queensway & Park Lawn Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (m)	134.0	154.6	157.2	129.9	567.3	499.4	38.3	54.8	63.7	9.6	13.5	62.0
Average Queue (m)	85.4	129.2	131.8	129.0	328.4	264.7	12.3	38.8	38.0	1.4	5.6	34.8
95th Queue (m)	172.1	200.7	197.0	135.8	643.7	527.9	35.3	69.6	64.4	13.1	14.2	65.1
Link Distance (m)		164.4	164.4		682.9	682.9			271.0	271.0		401.9
Upstream Blk Time (%)		16	22		0	0						
Queuing Penalty (veh)		0	0		0	0						
Storage Bay Dist (m)	50.0			50.0			20.0	50.0			25.0	
Storage Blk Time (%)	28	56		83	16	48		14	2		0	14
Queuing Penalty (veh)	98	124		375	61	34		62	3		0	5

Intersection: 5: The Queensway & Park Lawn Rd

Movement	SB
Directions Served	TR
Maximum Queue (m)	102.0
Average Queue (m)	68.8
95th Queue (m)	105.5
Link Distance (m)	401.9
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Gardiner Expwy WB On-ramp & Park Lawn Rd

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	T	T	T	T	R
Maximum Queue (m)	22.3	11.9	82.3	56.0	25.1	65.1	69.0	53.4
Average Queue (m)	5.5	3.5	50.9	17.6	8.9	31.9	32.9	30.3
95th Queue (m)	19.6	12.3	93.6	55.1	25.5	72.2	76.5	64.0
Link Distance (m)	120.0	120.0		176.2	176.2	271.0	271.0	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			199.5				220.0	
Storage Blk Time (%)								
Queuing Penalty (veh)								

Queuing and Blocking Report

Future Total Traffic PM Peak Hour, Ultimate Scenario Rev 3R

3/24/2014

Intersection: 10: Gardiner Expwy EB Off-ramp & Park Lawn Rd

Movement	EB	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	LR	R	L	T	T	T	TR
Maximum Queue (m)	260.4	259.6	35.0	29.0	73.0	61.2	179.8	179.8
Average Queue (m)	161.0	174.7	30.7	15.5	48.2	32.9	106.8	105.1
95th Queue (m)	309.5	325.8	43.3	33.4	78.4	60.9	198.1	196.1
Link Distance (m)	243.9	243.9			100.2	100.2	176.2	176.2
Upstream Blk Time (%)	19	32					12	13
Queuing Penalty (veh)	141	240					36	39
Storage Bay Dist (m)			35.0	27.0				
Storage Blk Time (%)		50	5	2	28			
Queuing Penalty (veh)		231	34	9	27			

Intersection: 17: Gardiner Expwy EB Off-ramp & Legion Rd North

Movement	EB	EB	EB	WB	NB
Directions Served	T	T	R	L	R
Maximum Queue (m)	498.6	400.2	74.9	47.2	79.4
Average Queue (m)	152.2	125.6	17.7	28.3	26.5
95th Queue (m)	447.0	370.2	80.2	49.5	81.5
Link Distance (m)	511.7	511.7		243.9	124.0
Upstream Blk Time (%)	1	0			
Queuing Penalty (veh)	0	0			
Storage Bay Dist (m)			50.0		
Storage Blk Time (%)		31			
Queuing Penalty (veh)		47			

Intersection: 21: Menkes- Kraft Driveway & Park Lawn Rd

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB	B19	B19
Directions Served	L	TR	LR	L	T	TR	L	T	T	TR	T	T
Maximum Queue (m)	9.8	14.2	10.0	24.9	68.9	54.6	89.7	163.8	162.3	152.6	108.0	109.2
Average Queue (m)	3.0	7.5	5.4	9.7	34.7	25.5	23.6	157.2	151.5	112.3	89.1	87.8
95th Queue (m)	10.1	18.1	12.4	23.9	63.9	51.4	86.4	193.1	196.3	191.2	143.3	145.4
Link Distance (m)	91.7	91.7	100.3		190.8	190.8		140.7	140.7	140.7	100.2	100.2
Upstream Blk Time (%)								77	42	6	43	41
Queuing Penalty (veh)								405	222	32	340	319
Storage Bay Dist (m)				30.0			60.0					
Storage Blk Time (%)				0	8			85				
Queuing Penalty (veh)				0	4			25				

# Queuing and Blocking Report

Future Total Traffic PM Peak Hour, Ultimate Scenario Rev 3R

3/24/2014

## Intersection: 30: Lake Shore Blvd W & Legion Rd South

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	TR	LT	TR	LR	L	TR
Maximum Queue (m)	221.1	221.3	97.0	112.0	8.7	40.4	21.7
Average Queue (m)	152.3	155.4	59.7	69.9	5.2	23.9	11.1
95th Queue (m)	282.8	286.8	110.4	123.7	11.8	43.8	21.7
Link Distance (m)	245.0	245.0	282.4	282.4	126.7		291.3
Upstream Blk Time (%)	21	20					
Queuing Penalty (veh)	0	0					
Storage Bay Dist (m)						50.0	
Storage Blk Time (%)						0	
Queuing Penalty (veh)						0	

## Intersection: 32: Lake Shore Blvd W & Mr. Christie's West Driveway

Movement	EB	EB	EB	WB	WB	WB	B12	B12	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	T	T	L	TR	L	TR
Maximum Queue (m)	25.5	108.3	88.7	49.7	80.2	78.5	77.4	84.6	69.2	17.2	12.0	18.8
Average Queue (m)	7.9	70.2	49.3	27.6	77.2	78.2	63.9	79.5	43.2	9.1	4.3	11.4
95th Queue (m)	36.2	112.0	90.9	57.3	84.0	78.9	88.3	101.7	74.9	20.3	12.5	20.4
Link Distance (m)		104.0	104.0		57.1	57.1	63.2	63.2		82.6		67.3
Upstream Blk Time (%)		3	0	0	48	68	14	42	1			
Queuing Penalty (veh)		23	0	0	328	466	96	289	0			
Storage Bay Dist (m)	60.0			30.0					80.0		50.0	
Storage Blk Time (%)		14		2	63				1			
Queuing Penalty (veh)		4		10	84				1			

## Intersection: 34: Lake Shore Blvd W & Gardiner Expwy On-Off Ramp

Movement	EB	EB	EB	B2	B2	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	T	T	L	TR	L	T	TR	LT	R
Maximum Queue (m)	35.4	57.7	32.4	23.3	16.8	3.3	29.2	20.9	11.7	22.9	94.3	127.4
Average Queue (m)	23.5	38.8	8.3	10.5	6.5	0.6	16.4	13.1	3.1	13.5	56.6	106.1
95th Queue (m)	42.4	71.8	33.1	29.3	19.7	3.5	30.7	25.0	12.0	26.6	98.7	170.8
Link Distance (m)		38.0	38.0	1.8	1.8		55.8		81.2	81.2	118.2	118.2
Upstream Blk Time (%)	0	18	0	8	0							36
Queuing Penalty (veh)	0	118	1	55	1							0
Storage Bay Dist (m)	30.0					60.0		50.0				
Storage Blk Time (%)	1	21										
Queuing Penalty (veh)	4	65										

## Queuing and Blocking Report

Future Total Traffic PM Peak Hour, Ultimate Scenario Rev 3R

3/24/2014

### Intersection: 37: Lake Shore Blvd W & Marine Parade Dr.

Movement	EB	WB	NB	NB
Directions Served	TR	LT	L	R
Maximum Queue (m)	2.3	6.9	8.0	9.4
Average Queue (m)	0.3	1.3	4.4	4.2
95th Queue (m)	3.2	6.6	9.6	9.7
Link Distance (m)	294.8	117.2		129.1
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			15.0	
Storage Blk Time (%)			0	0
Queuing Penalty (veh)			0	0

### Intersection: 38: Lake Shore Blvd W & Palace Pier Crt

Movement	EB	EB	NB	NB
Directions Served	T	R	L	R
Maximum Queue (m)	73.5	45.0	11.1	11.7
Average Queue (m)	51.1	25.9	4.2	3.4
95th Queue (m)	86.4	54.4	11.8	11.2
Link Distance (m)	117.2			134.7
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	2			
Storage Bay Dist (m)		30.0	15.0	
Storage Blk Time (%)	14		1	1
Queuing Penalty (veh)	27		0	0

### Intersection: 40: Marine Parade Dr. & Waterfront Drive

Movement	SB
Directions Served	LR
Maximum Queue (m)	3.4
Average Queue (m)	0.5
95th Queue (m)	3.4
Link Distance (m)	129.1
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

## Queuing and Blocking Report

Future Total Traffic PM Peak Hour, Ultimate Scenario Rev 3R

3/24/2014

### Intersection: 42: Lake Shore Blvd W & Street D

Movement	EB	EB	B18	B18	WB	WB	NB
Directions Served	T	TR	T	T	T	T	R
Maximum Queue (m)	40.1	15.4	1.9	1.8	109.6	108.4	8.6
Average Queue (m)	6.6	2.2	0.3	0.3	106.3	105.6	1.8
95th Queue (m)	31.3	15.5	2.7	2.4	109.7	109.0	7.6
Link Distance (m)	38.4	38.4	60.6	60.6	104.0	104.0	66.5
Upstream Blk Time (%)	1	0			27	36	
Queuing Penalty (veh)	8	0			191	258	
Storage Bay Dist (m)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

### Intersection: 45: Marine Parade Dr. & Street D

Movement	SB
Directions Served	R
Maximum Queue (m)	12.4
Average Queue (m)	8.1
95th Queue (m)	14.7
Link Distance (m)	87.7
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

### Intersection: 48: Lake Shore Blvd W & Street A

Movement	EB	EB	B12	B12	WB	WB	B2	B2	B2	NB
Directions Served	T	TR	T	T	T	T	T	T		R
Maximum Queue (m)	60.6	33.9	15.0	1.4	19.1	24.2	26.7	35.8	55.4	10.8
Average Queue (m)	27.3	10.7	7.2	0.2	3.6	21.9	6.4	24.0	41.5	5.9
95th Queue (m)	85.5	49.7	36.0	1.9	16.3	30.7	25.9	41.9	81.1	12.7
Link Distance (m)	63.2	63.2	57.1	57.1	1.8	1.8	38.0	38.0	38.0	69.2
Upstream Blk Time (%)	4	0	1		4	27	2	1	28	
Queuing Penalty (veh)	25	2	4		25	186	7	3	131	
Storage Bay Dist (m)										
Storage Blk Time (%)										
Queuing Penalty (veh)										

**Intersection: 50: Marine Parade Dr. & Street B**

Movement	EB	EB	WB	SB
Directions Served	L	T	T	LR
Maximum Queue (m)	19.3	2.3	2.3	13.7
Average Queue (m)	9.5	0.3	0.3	9.3
95th Queue (m)	20.7	3.2	3.2	13.0
Link Distance (m)		56.0	145.2	64.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	60.0			
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 52: Marine Parade Dr. & Street A**

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (m)	12.5	14.6
Average Queue (m)	4.1	10.1
95th Queue (m)	12.8	15.4
Link Distance (m)		49.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)	50.0	
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Network Summary**

Network wide Queuing Penalty: 9082
------------------------------------

# Appendix K



















Intersection Capacity Analysis  
Internal Site, Future Total  
Traffic Ultimate Scenario



# HCM Unsignalized Intersection Capacity Analysis

## 7: Street B & Street C

















5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	169	241	71	71	76	146	22	25	40	5	0	27
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	169	241	71	71	76	146	22	25	40	5	0	27
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	296	132	14	304	126	45	27			65		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	296	132	14	304	126	45	27			65		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	67	68	93	84	90	86	99			100		
cM capacity (veh/h)	512	745	1067	448	751	1025	1587			1537		
<b>Direction, Lane #</b>												
	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	169	312	71	222	87	32						
Volume Left	169	0	71	0	22	5						
Volume Right	0	71	0	146	40	27						
cSH	512	800	448	911	1587	1537						
Volume to Capacity	0.33	0.39	0.16	0.24	0.01	0.00						
Queue Length 95th (m)	10.9	14.1	4.2	7.3	0.3	0.1						
Control Delay (s)	15.5	12.3	14.5	10.2	1.9	1.2						
Lane LOS	C	B	B	B	A	A						
Approach Delay (s)	13.4		11.3		1.9	1.2						
Approach LOS	B		B									
<b>Intersection Summary</b>												
Average Delay			11.2									
Intersection Capacity Utilization			40.4%		ICU Level of Service		A					
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 8: Street A & Street C

5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	28	350	82	5	103	0	5	29	6	10	75	19
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	28	350	82	5	103	0	5	29	6	10	75	19
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	198	150	84	404	156	32	94			35		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	198	150	84	404	156	32	94			35		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	52	92	98	86	100	100			99		
cM capacity (veh/h)	673	735	975	318	729	1042	1500			1576		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	460	108	40	104								
Volume Left	28	5	5	10								
Volume Right	82	0	6	19								
cSH	764	688	1500	1576								
Volume to Capacity	0.60	0.16	0.00	0.01								
Queue Length 95th (m)	31.1	4.2	0.1	0.1								
Control Delay (s)	16.6	11.2	0.9	0.7								
Lane LOS	C	B	A	A								
Approach Delay (s)	16.6	11.2	0.9	0.7								
Approach LOS	C	B										
<b>Intersection Summary</b>												
Average Delay			12.6									
Intersection Capacity Utilization			45.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 10: Street D & Empire Comm. Access No. 2/Street C

5/12/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	0	208	28	46	53	16	0	0	0	61	34	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	208	28	46	53	16	0	0	0	61	34	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	198	156	34	288	156	0	34			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	198	156	34	288	156	0	34			0		
tC, single (s)	*6.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	71	97	91	93	99	100			96		
cM capacity (veh/h)	726	708	1039	486	708	1085	1578			1623		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	236	115	0	95
Volume Left	0	46	0	61
Volume Right	28	16	0	0
cSH	736	624	1700	1623
Volume to Capacity	0.32	0.18	0.00	0.04
Queue Length 95th (m)	10.5	5.1	0.0	0.9
Control Delay (s)	12.2	12.1	0.0	4.8
Lane LOS	B	B		A
Approach Delay (s)	12.2	12.1	0.0	4.8
Approach LOS	B	B		

Intersection Summary			
Average Delay		10.6	
Intersection Capacity Utilization	34.1%		ICU Level of Service A
Analysis Period (min)		15	

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

## 11: Street B & Laneway

5/12/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	5	1	0	0	1	5	0	340	0	5	32	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	1	0	0	1	5	0	340	0	5	32	5
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	390	384	34	385	387	340	37			340		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	390	384	34	385	387	340	37			340		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	99	100			100		
cM capacity (veh/h)	562	547	1039	571	545	702	1574			1219		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	6	6	340	42
Volume Left	5	0	0	5
Volume Right	0	5	0	5
cSH	560	670	1574	1219
Volume to Capacity	0.01	0.01	0.00	0.00
Queue Length 95th (m)	0.2	0.2	0.0	0.1
Control Delay (s)	11.5	10.4	0.0	1.0
Lane LOS	B	B		A
Approach Delay (s)	11.5	10.4	0.0	1.0
Approach LOS	B	B		

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization	28.9%		ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

## 12: Street D & Empire Comm. Access No. 1/Laneway

5/12/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	16	0	20	0	0	0	0	5	0	0	1	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	16	0	20	0	0	0	0	5	0	0	1	2
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	7	7	2	27	8	5	3			5		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	7	7	2	27	8	5	3			5		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	*5.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	98	100	100	100	100			100		
cM capacity (veh/h)	1013	888	1082	965	887	1080	1619			1616		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	36	0	5	3
Volume Left	16	0	0	0
Volume Right	20	0	0	2
cSH	1050	1700	1619	1616
Volume to Capacity	0.03	0.00	0.00	0.00
Queue Length 95th (m)	0.8	0.0	0.0	0.0
Control Delay (s)	8.5	0.0	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	8.5	0.0	0.0	0.0
Approach LOS	A	A		

Intersection Summary			
Average Delay		7.0	
Intersection Capacity Utilization	13.3%		ICU Level of Service
Analysis Period (min)		15	A

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

## 14: Street A & Laneway

5/12/2014






















Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	0	0	41	35	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	0	0	41	35	1
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	76	36	36			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	76	36	36			
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)	927	1037	1575			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	1	41	36			
Volume Left	1	0	0			
Volume Right	0	0	1			
cSH	927	1575	1700			
Volume to Capacity	0.00	0.00	0.02			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	8.9	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.9	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 7: Street B & Street C

5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	54	92	60	32	258	67	80	22	172	17	3	120
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	54	92	60	32	258	67	80	22	172	17	3	120
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	561	451	63	471	425	108	123			194		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	561	451	63	471	425	108	123			194		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	76	80	94	92	47	93	95			99		
cM capacity (veh/h)	226	470	1002	382	487	946	1464			1379		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	54	152	32	325	274	140						
Volume Left	54	0	32	0	80	17						
Volume Right	0	60	0	67	172	120						
cSH	226	595	382	541	1464	1379						
Volume to Capacity	0.24	0.26	0.08	0.60	0.05	0.01						
Queue Length 95th (m)	6.9	7.7	2.1	30.0	1.3	0.3						
Control Delay (s)	25.9	13.1	15.3	21.2	2.6	1.0						
Lane LOS	D	B	C	C	A	A						
Approach Delay (s)	16.5		20.7		2.6	1.0						
Approach LOS	C		C									
Intersection Summary												
Average Delay			11.9									
Intersection Capacity Utilization			59.0%		ICU Level of Service		B					
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 8: Street A & Street C

5/12/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	12	170	10	15	379	1	15	146	31	13	62	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	12	170	10	15	379	1	15	146	31	13	62	30
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	485	310	77	390	310	162	92			177		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	485	310	77	390	310	162	92			177		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	71	99	97	36	100	99			99		
cM capacity (veh/h)	237	593	984	433	593	883	1503			1399		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	192	395	192	105
Volume Left	12	15	15	13
Volume Right	10	1	31	30
cSH	553	586	1503	1399
Volume to Capacity	0.35	0.67	0.01	0.01
Queue Length 95th (m)	11.7	38.9	0.2	0.2
Control Delay (s)	14.9	22.9	0.7	1.0
Lane LOS	B	C	A	A
Approach Delay (s)	14.9	22.9	0.7	1.0
Approach LOS	B	C		

Intersection Summary			
Average Delay		13.8	
Intersection Capacity Utilization	43.5%		ICU Level of Service A
Analysis Period (min)		15	



HCM Unsignalized Intersection Capacity Analysis  
 10: Street D & Empire Comm. Access No. 2/Street C

5/12/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	0	89	12	25	191	57	0	0	0	23	13	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	89	12	25	191	57	0	0	0	23	13	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	212	59	13	116	59	0	13			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	212	59	13	116	59	0	13			0		
tC, single (s)	*6.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	89	99	97	77	95	100			99		
cM capacity (veh/h)	609	820	1067	772	820	1085	1606			1623		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	101	273	0	36
Volume Left	0	25	0	23
Volume Right	12	57	0	0
cSH	843	859	1700	1623
Volume to Capacity	0.12	0.32	0.00	0.01
Queue Length 95th (m)	3.1	10.4	0.0	0.3
Control Delay (s)	9.8	11.1	0.0	4.7
Lane LOS	A	B		A
Approach Delay (s)	9.8	11.1	0.0	4.7
Approach LOS	A	B		

Intersection Summary			
Average Delay		10.2	
Intersection Capacity Utilization		31.6%	ICU Level of Service A
Analysis Period (min)		15	

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

## 11: Street B & Laneway

5/12/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	10	2	1	2	2	10	0	143	0	10	137	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	2	1	2	2	10	0	143	0	10	137	10
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	316	305	142	307	310	143	147			143		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	316	305	142	307	310	143	147			143		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	100	100	99	100			99		
cM capacity (veh/h)	625	604	906	640	600	905	1435			1440		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	14	143	157
Volume Left	10	2	0	10
Volume Right	1	10	0	10
cSH	637	799	1435	1440
Volume to Capacity	0.02	0.02	0.00	0.01
Queue Length 95th (m)	0.5	0.4	0.0	0.2
Control Delay (s)	10.8	9.6	0.0	0.5
Lane LOS	B	A		A
Approach Delay (s)	10.8	9.6	0.0	0.5
Approach LOS	B	A		

Intersection Summary			
Average Delay		1.1	
Intersection Capacity Utilization	26.1%		ICU Level of Service A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis  
 12: Street D & Empire Comm. Access No. 1/Laneway

5/12/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	10	0	5	0	0	0	0	4	0	1	8	24
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	0	5	0	0	0	0	4	0	1	8	24
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	26	26	20	31	38	4	32			4		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	26	26	20	31	38	4	32			4		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	*5.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	100	100			100		
cM capacity (veh/h)	984	867	1058	972	854	1081	1580			1618		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	0	4	33
Volume Left	10	0	0	1
Volume Right	5	0	0	24
cSH	1007	1700	1580	1618
Volume to Capacity	0.01	0.00	0.00	0.00
Queue Length 95th (m)	0.3	0.0	0.0	0.0
Control Delay (s)	8.6	0.0	0.0	0.2
Lane LOS	A	A		A
Approach Delay (s)	8.6	0.0	0.0	0.2
Approach LOS	A	A		

Intersection Summary			
Average Delay		2.6	
Intersection Capacity Utilization	13.3%		ICU Level of Service
Analysis Period (min)		15	A

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

## 14: Street A & Laneway

5/12/2014



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	2	0	1	32	191	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2	0	1	32	191	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	226	192	193			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	226	192	193			
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)	762	850	1380			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	2	33	193			
Volume Left	2	1	0			
Volume Right	0	0	2			
cSH	762	1380	1700			
Volume to Capacity	0.00	0.00	0.11			
Queue Length 95th (m)	0.1	0.0	0.0			
Control Delay (s)	9.7	0.2	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.7	0.2	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			20.2%	ICU Level of Service	A	
Analysis Period (min)			15			