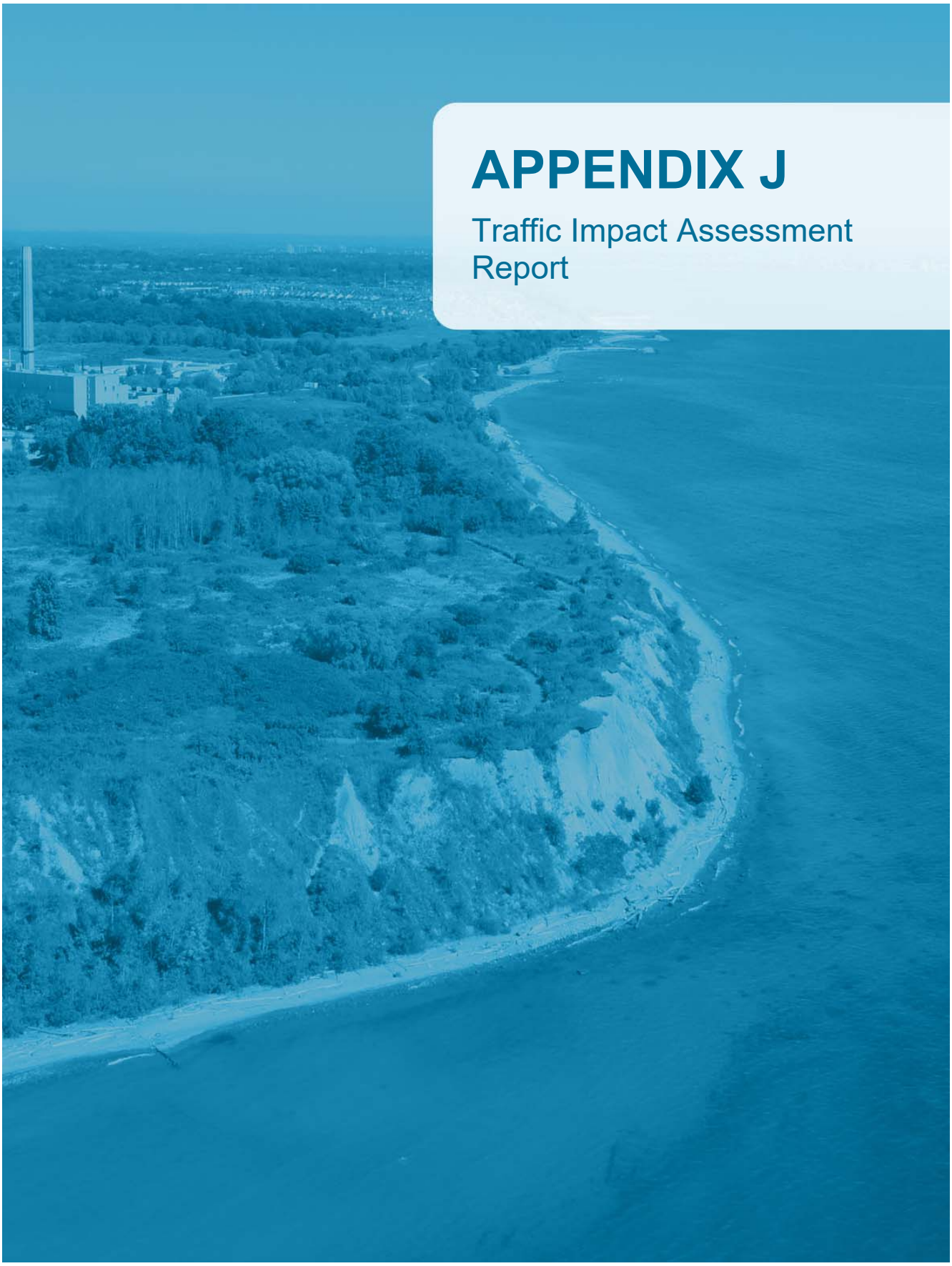


APPENDIX J

Traffic Impact Assessment Report

PROJECT NO. 161-14482

SCARBOROUGH WATERFRONT PROJECT ROAD TRAFFIC IMPACT STUDY ASSESSMENT

FINAL REPORT

JULY 2017

WSP

SCARBOROUGH WATERFRONT PROJECT, ROAD TRAFFIC IMPACT STUDY ASSESSMENT

FINAL

Toronto and Region Conservation Authority - TRCA

Project no: 161-14482
Date: July 2017

WSP Canada Inc.
100 Commerce Valley Drive West
Thornhill, ON L3T 0A1

Phone: 905-882-1100
Fax: 905-882-0055
www.wspgroup.com

161-14482

July 31, 2017

Ms. Alexis Moxley
Toronto and Region Conservation Authority
101 Exchange Avenue
Vaughan, ON L4K 5R5

Subject: Scarborough Waterfront Project Road Traffic Assessment

Dear Ms. Moxley,

Attached please find the Road Traffic Study Assessment Report for the Scarborough Waterfront Project in the City of Toronto.

Should you have any question, please feel free to contact the undersigned.

Very best regards,

WSP Canada Inc.

Mehemed Delibasic, M.Sc., P. Eng.
Manager, Transportation Planning

Juan P. Perez, P. Eng., M.S.C.E.
Senior Transportation Engineer

Racheal Saunders, E.I.T.
Transportation Planning

WSP Canada Inc.
100 Commerce Valley Dirve
Thornhill, ON L3T 0A13

Phone: 905-882-1100
Fax: 905-882-0054
www.wspgroup.com

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1 INTRODUCTION

WSP was retained by Toronto and Region Conservation Authority (TRCA) to complete a Road Traffic Impact Study Assessment for the Scarborough Waterfront Project in the City of Toronto. The Scarborough Waterfront Project is one that seeks to protect the natural and cultural features of the Bluffs to improve the area's aquatic habitat and provide patrons with a safe and enjoyable waterfront experience. The site locations are shown in Figure 1-1.

The project will include shoreline protection such as headlands and beach expansions which involve land creation activities, to provide a safe public access sufficiently set back from the Bluffs. As such, truck traffic will be travelling to and from the site to deliver the necessary construction materials. The construction access is proposed via two access points:

- access via Bluffer's Park
- access via Guildwood Village

This assessment will review access via Bluffer's Park between October and April (during the park-use off-season) and via Guildwood Village year round. The assessment is based on the proposed truck routes and truck schedules supplied by TRCA and will inform the selection of the preferred access route through a detailed analysis of the impacts and mitigation opportunities of each individual route. Visual pavement assessment was completed, however pavement structure assessment is not part of the scope of this study.

The report was prepared based on the terms of reference provided to the City of Toronto on August 9, 2016 and the response from the City dated August 16, 2016.

This report includes:

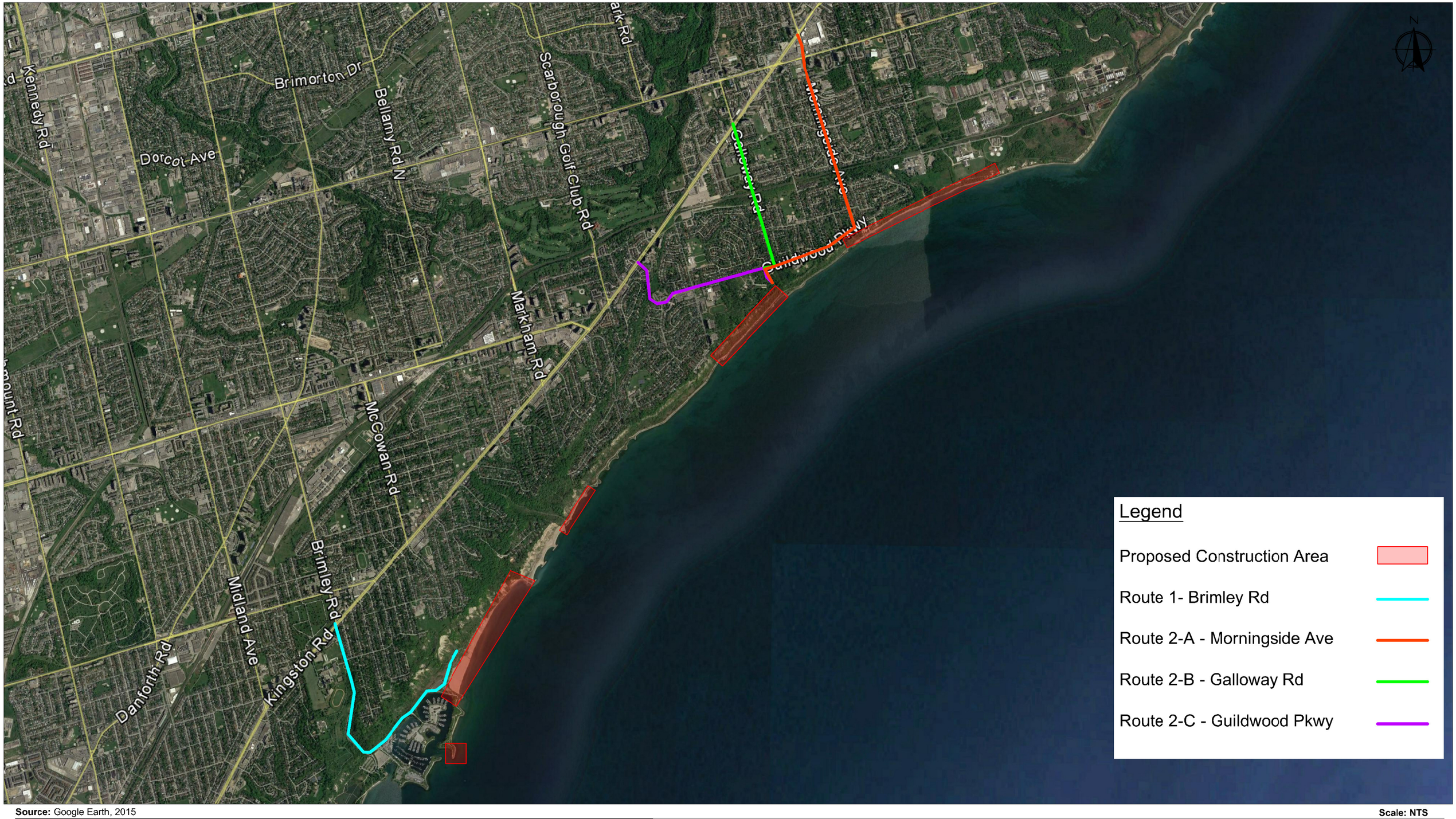
- assessment of the existing traffic operations conditions at the study area intersections
- assessment of the impact of construction-generated traffic at the study area intersections under the future total traffic conditions
- review of the City's By-law regulations as they speak to truck restrictions on specific roadways
- review of Toronto Transit Commission (TTC) ridership and schedules and probable impacts from truck traffic
- review of the active transportation network available within the study area
- examination of schools/ school zones being impacted by potential truck routes during construction

Information used in the assessment includes:

- turning movement counts at boundary roadway intersections commissioned by WSP and completed on August 17, 2016 (summer scenario) and September 28, 2016 (fall scenario)
- City of Toronto intersection signal timing plans for signalized study intersections

→ City of Toronto Road Classification Map, November 2012

Intersection capacity analyses were completed using Synchro/SimTraffic 8.0 software.



Source: Google Earth, 2015

Scale: NTS

Figure 1-1
Study Area
Toronto and Region Conservation Authority Road Traffic Assessment Study

161-10845-00-TRA_Sitelocation-20161109.dwg_StudyArea

Modified: 4/20/2017 5:14 PM By: racheal.saunders Plot Date: 2017/04/20

2 EXISTING TRANSPORTATION CONTEXT

2.1 ROADWAY NETWORK

The selected roadways affected by the proposed routes in the study area are Brimley Road, Morningside Avenue, Galloway Road, Guildwood Parkway, Kingston Road, Cromwell Road, Livingston Road, Ling Road, Danzig Road and Coronation Drive. Below is a description of the existing characteristics of the study roadways based on the City of Toronto Road Classification System Map and data collected from a field visit completed on August 18 and November 29, 2016 by WSP. The existing lane configurations are provided in Figure 2-1.

- **Kingston Road** is a major arterial under the jurisdiction of the City of Toronto. It is a six-lane road running in a north-east/south-west direction. The posted speed limit on the roadway is 60km/h and sidewalks are present on both sides of the street.

- **Morningside Avenue** is a minor arterial under the jurisdiction of the City of Toronto. It is a four-lane roadway running in a north-south direction. The posted speed limit is 50km/h and sidewalks are present on both sides of the roadway. Signed bike route (Route 79) runs from Coronation Drive to Guildwood Parkway.

- **Guildwood Parkway** is a minor arterial under the jurisdiction of the City of Toronto. It is a two-lane roadway running in an east-west direction. It is a four-lane roadway between Livingston Road and Prince Philip Boulevard. The posted speed limit is 50km/h and sidewalks are present on both sides of the roadway. Signed bike route (Route 4) runs from Livingston Road to Morningside Avenue.

- **Galloway Road** is a collector roadway under the jurisdiction of the City of Toronto. It is a two-lane roadway running in a north-south direction. The posted speed limit is 50km/h and sidewalks are present on both sides of the roadway from Kingston Road to Coronation Drive, on the west side from Coronation Drive to Dunera Avenue and in two small segments in front of several houses on the west side of the roadway. Signed bike route (Route 77) from Kingston Road to Guildwood Parkway.

- **Brimley Road** is a collector roadway under the jurisdiction of the City of Toronto within the vicinity of the site. It is a two-lane roadway running in a north-south direction with a posted speed limit of 50km/h. Sidewalks are present on the west side of the roadway from Kingston Road to Barkdene Hills. There is also an off-road path on the east side of Brimley Road, along the lower third of the road which approaches Bluffers Park.

- **Livingston Road** is a collector roadway under the jurisdiction of the City of Toronto. It is a two-lane roadway running in a north-south direction with a posted speed limit of 50km/h. Sidewalks are present on both sides of the roadway. Signed bike route (Route 12) from Westlake Road/Guildwood GO Station to Guildwood Parkway.

- **Coronation Drive** is a collector roadway under the jurisdiction of the City of Toronto. It is a two-lane roadway running in an east-west direction with a posted speed limit of 50km/h. Sidewalks are present on both sides of the roadway.

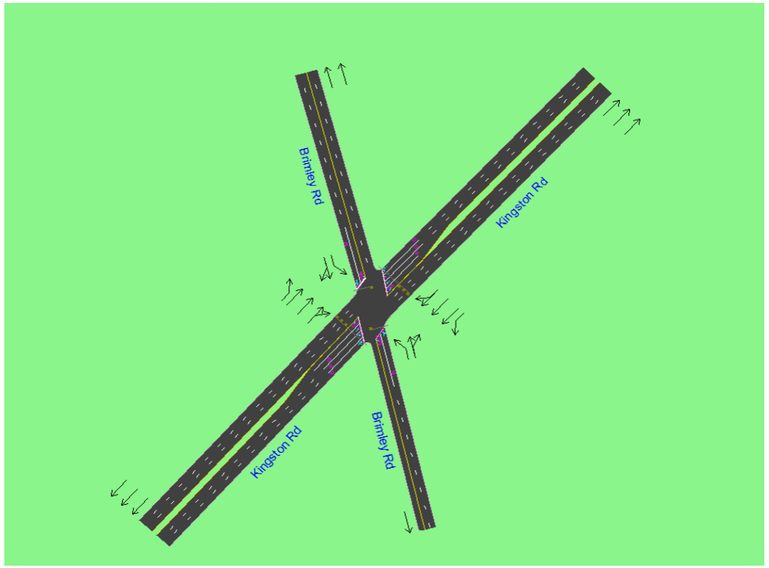
- **Ling Road** is a collector roadway under the jurisdiction of the City of Toronto. It is a two-lane roadway running in an east-west direction with a posted speed limit of 50km/h. Sidewalks are present on both sides of the roadway.

- **Danzig Road** is an east-west local roadway within the study area. It has two lanes and sidewalks on both sides of the roadway.

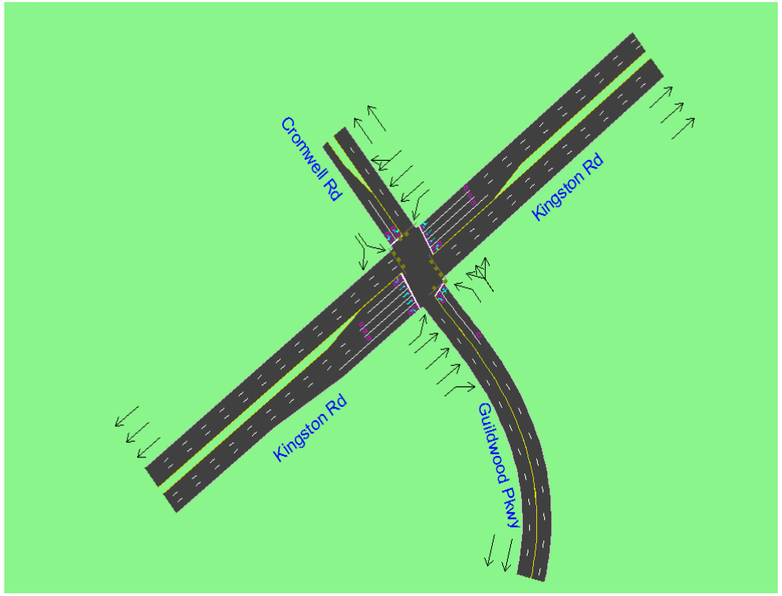
- **Cromwell Road** is a two-lane local roadway under the jurisdiction of the City of Toronto. It runs in a north-south direction and has a posted speed of 40km/h. There are sidewalks present on both sides of the roadway. Trucks are restricted on the Cromwell Road. In addition, north/south through traffic is not allowed between Guildwood Parkway and Cromwell Road at the intersection of Cromwell Road/Guildwood Parkway at Kingston Road.

Figure 2-1 – Existing Lane Configurations

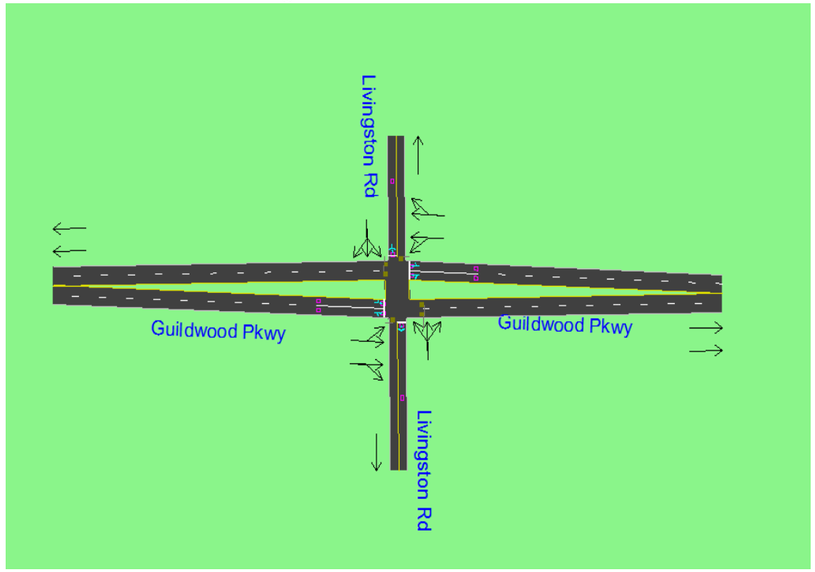
1. Brimley Road and Kingston Road



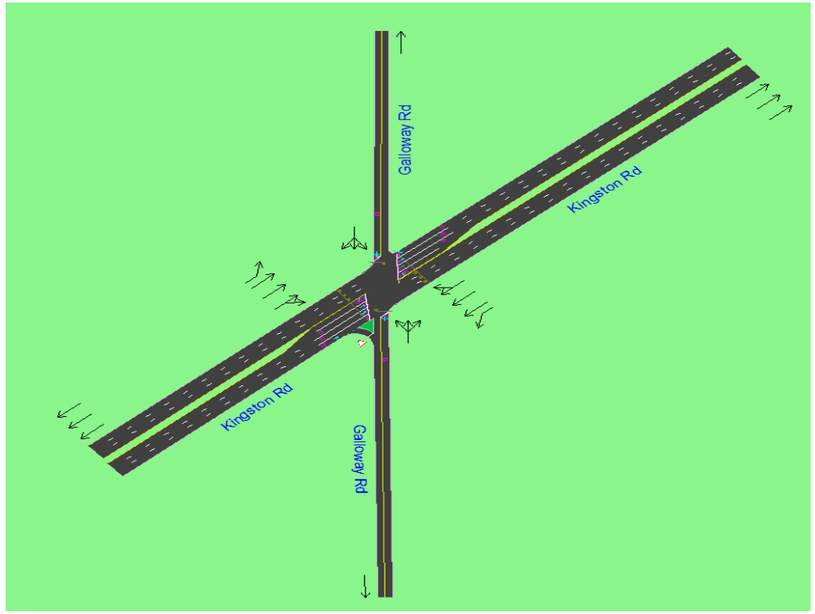
2. Kingston Road and Guildwood Parkway/Cromwell Road



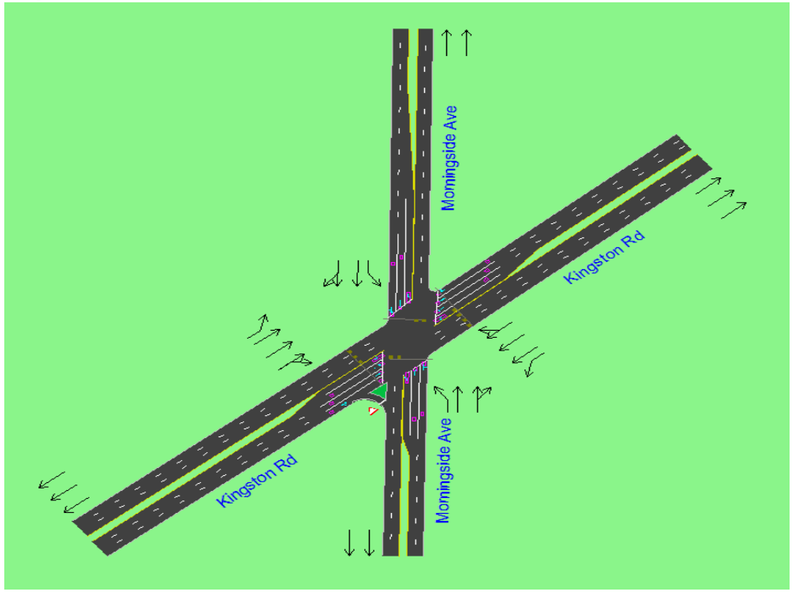
3. Guildwood Parkway and Livingston Road



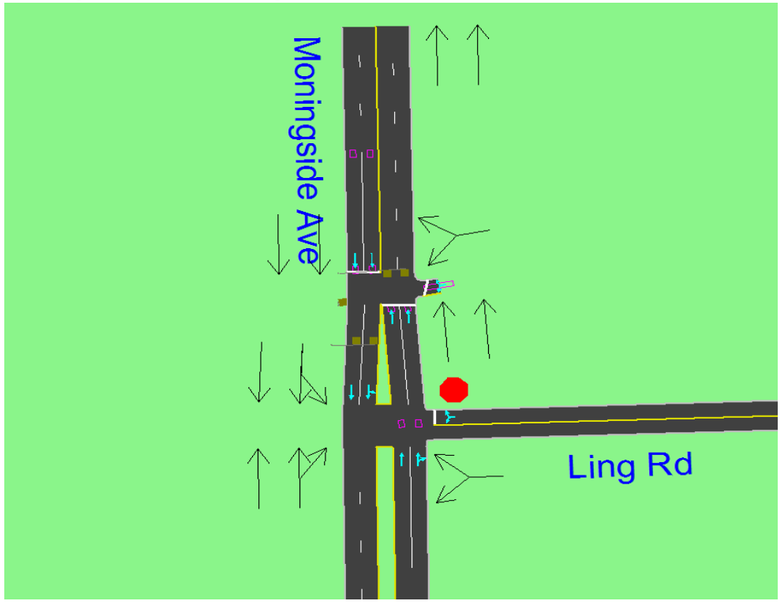
4. Kingston Road and Galloway Road



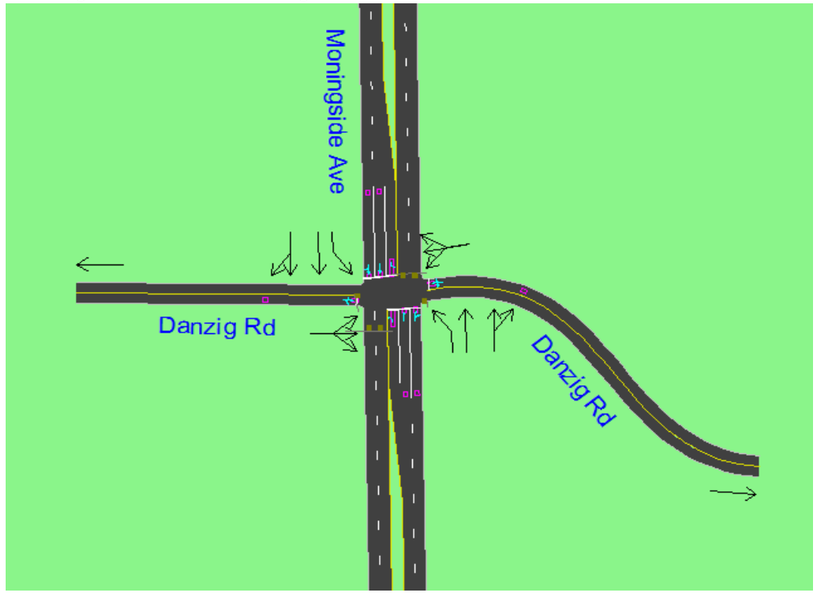
5. Kingston Road and Morningside Avenue



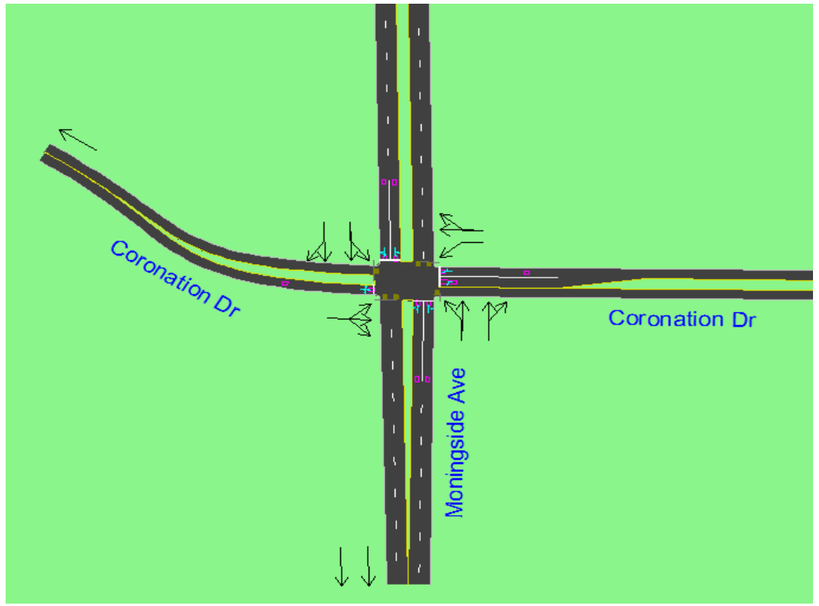
6. Morningside Avenue and Ling Road



7. Morningside Avenue and Danzig Road



8. Morningside Avenue and Coronation Drive



2.2 SITE ACCESS

The site, as mentioned before, has two proposed accesses, which consist of:

→ an access route through Bluffer's Park (accessible October to April or outside of the summer season – off school period - at Bluffer's Park)

→ an access route through Guildwood Village (accessible all year round)

The roadway network used in the assessment, corresponds with those proposed as potential construction truck routes for accessing the construction site. There are four routes in total; one entering from the west access at Bluffers Park and the other three entering from the east access on Guildwood Parkway.

The truck routes are outlined as follows:

1) Bluffer's Park Access

   a. Brimley Road – this route goes through Bluffers Park and enters from the west end of the park and will provide access for both inbound and outbound truck traffic

2) Guildwood Village Access

   a. Morningside Avenue – this route travels down Morningside Avenue through Guildwood Village and then west on Guildwood Parkway to the construction entrance. Trucks are proposed to travel this route inbound and outbound.

   b. Galloway Road – this routes takes Galloway Road through Guildwood Village directly to the construction entrance opposite Navarre Crescent on Guildwood Parkway. Trucks are proposed to use this route for inbound and outbound access.

   c. Guildwood Parkway – this route takes Guildwood Parkway south from Kingston Road and then east through Guildwood Village to the construction entrance. Trucks are proposed to travel this route inbound and outbound.

The routes are shown in Figure 2-2 and Figure 2-3 respectively.

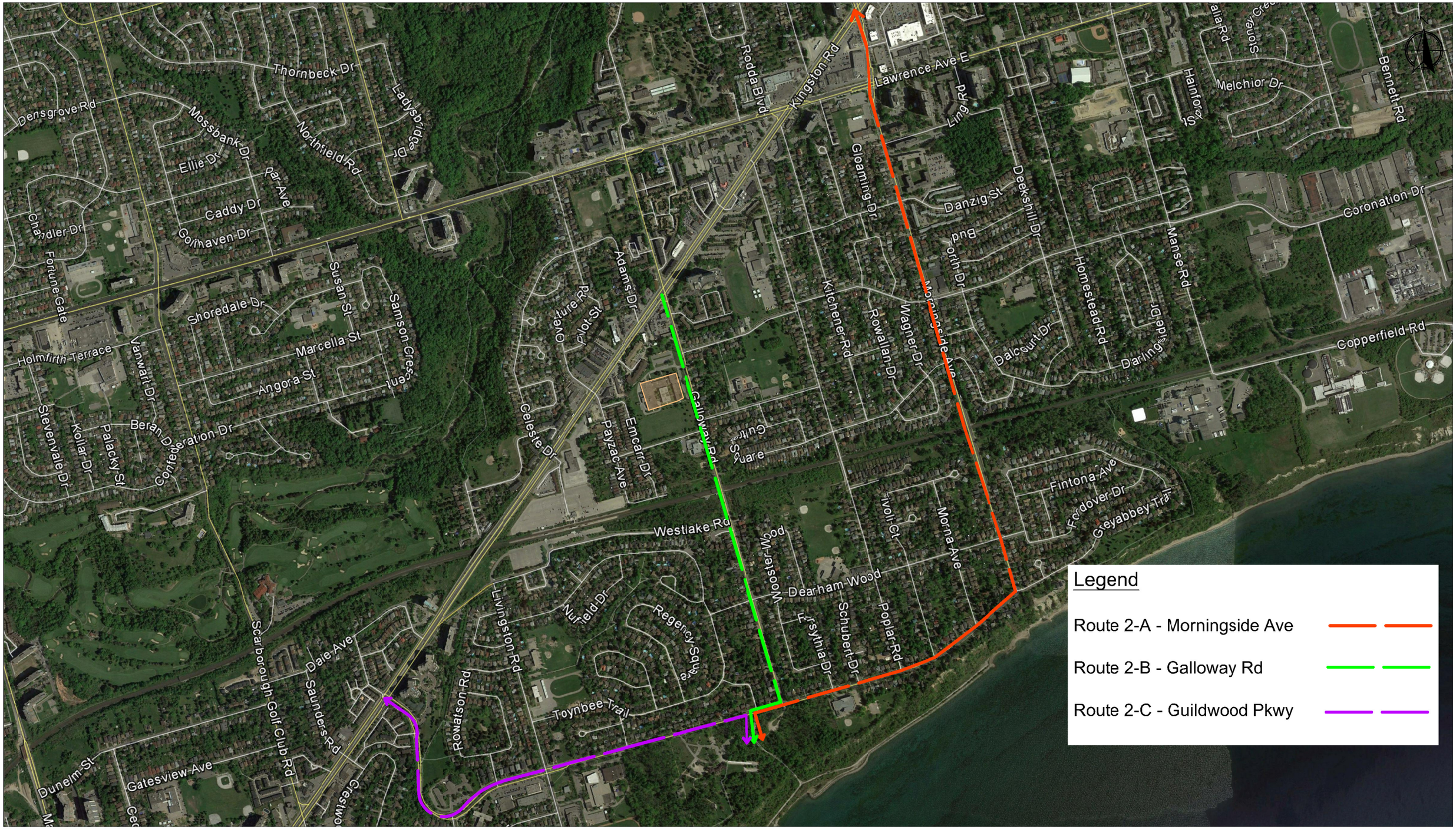
Source: Google Earth, 2015

Scale: NTS

Figure 2-2
West Access - Bluffers Park
Toronto and Region Conservation Authority Road Traffic Assessment Study

161-10845-00-TRA_Sitelocation-20161109.dwg_W-Access

Modified: 4/20/2017 6:28 PM By: rachael.saunders Plot Date: 2017/04/21



Source: Google Earth, 2015

Scale: NTS

Figure 2-3
East Access - Guildwood Village
Toronto and Region Conservation Authority Road Traffic Assessment Study

WSP

161-10845-00-TRA_Sitelocation-20161109.dwg_E-Access

Modified: 4/20/2017 5:14 PM By: racheal.saunders Plot Date: 2017/04/20

2.3 REVIEW OF EXISTING APPLICABLE BY-LAWS AND REGULATIONS

WSP conducted a review of current City of Toronto by-laws in regards to commercial vehicle restrictions relevant to the study area. Toronto Municipal Code Chapter 950, *Traffic and Parking* provides specific provisions and regulations. More specifically, Sections 950-507 and 950-508 provide regulations on restricted vehicle widths and heavy vehicles, respectively.

In particular Section 950-508 – Heavy vehicles indicates:

A. "Except as provided in Subsection B, when official signs to that effect are displayed, no person shall move, drive, park or operate a heavy truck or a heavy vehicle on the highways set out in Schedule XXX in Section 950-1329 between the limits set out in Schedule XXX during the times and/or days set out in the Schedule.

B. Subsection A shall not apply to any vehicle actually engaged in making a delivery to, a collection from, or providing a service to, premises which cannot be reached except by way of a highway or a portion of a highway referred to in said subsection or to prohibit the use of such vehicles for such purpose, provided that in making such delivery, collection or providing the service, said highway or portion of highway is travelled only insofar as is unavoidable in getting to and from such premises."

Delivery vehicles are defined by Chapter 950 of the Toronto Municipal Code as: "*A motor vehicle used for the purpose of delivering goods and/or merchandise at the time it is parked in the delivery vehicle parking zone*". Heavy vehicles or Heavy Trucks are defined as: "*A commercial motor vehicle having a weight when unloaded of three tonnes or more or when loaded of five tonnes or more and includes a school bus longer than eight metres and a road building machine, but does not include a passenger vehicle, an ambulance or any vehicle of a police or fire department*."

As indicated in Section 950-508, Subsection B, trucks making local deliveries that do not have other way to make such deliveries are exempted from the heavy vehicle restriction. Construction trucks that deliver construction material are also considered as trucks engaged in making local deliveries and will be allowed to use the roads/streets listed below:

- Brimley Road, south of Kingston Road – Collector Road
- Morningside Avenue, south of Kingston Road – Minor Arterial Road
- Guildwood Parkway – Minor Arterial Road
- Galloway Road, south of Kingston Road to Guildwood Parkway – Collector Road
- Buffer's Park – Park Road – Private road (not regulated by the City)

Truck operators are required to carry proper documentation about construction activity and deliveries when using the above-mentioned roads in case of by-law enforcement or Police Officer request.

City of Toronto Municipal Code Chapter 594 provides regulation regarding noise control. Operation of construction equipment is permitted only during Monday to Friday 7:00 a.m. to 7:00 p.m. and Saturday 9:00 a.m. to 7:00 p.m. No construction noise is allowed on Sundays and statutory holidays (amended by By-law 505-2006).

2.4 EXISTING TRAFFIC VOLUMES

The following study area intersections are included in this report:

- Brimley Road and Kingston Road
- Kingston Road at Guildwood Parkway/Cromwell Road
- Guildwood Parkway at Livingston Road
- Kingston Road at Galloway Road
- Kingston Road at Morningside Avenue
- Morningside Avenue at Ling Road
- Morningside Avenue at Danzig Road
- Morningside Avenue at Coronation Drive

Study peak hours included weekday AM peak hour and PM peak hour for both fall/winter season (school period) and summer season (off school period). Traffic counts for the study intersections were obtained from traffic counts commissioned by WSP. The intersection turning movement count survey date, time and peak hours are shown in Table 2-1.

Existing traffic volumes for the AM and PM peak hours are provided in Figure 2-4 to Figure 2-7. The intersection turning movement count sheets along with the traffic signal timing plan were obtained from the City of Toronto and are provided in Appendix A.

Table 2-1 – Intersection Turning Movement Count Sources

Intersection	Survey Date and Time		Weekday Peak Hour			
	Summer Season	Fall/Winter Season	Summer Season		Fall/Winter Season	
			AM	PM	AM	PM
Brimley Road and Kingston Road	N/A	Wednesday, September 28, 2016 6:00-9:00AM, 3:00-6:00PM	N/A	N/A	7:45AM-8:45AM	4:00PM-5:00PM
Kingston Road at Guildwood Parkway/Cromwell Road	Wednesday, August 17, 2016 6:00-9:00AM, 3:00-6:00PM	Wednesday, September 28, 2016 6:00-9:00AM, 3:00-6:00PM	7:30AM-8:30AM	5:00PM-6:00PM	8:00AM-9:00AM	4:30PM-5:30PM
Guildwood Parkway at Livingston Road	Wednesday, August 17, 2016 6:00-9:00AM, 3:00-6:00PM	Wednesday, September 28, 2016 6:00-9:00AM, 3:00-6:00PM	8:00AM-9:00AM	5:00PM-6:00PM	8:00AM-9:00AM	3:00PM-4:00PM
Kingston Road at Galloway Road	Wednesday, August 17, 2016 6:00-9:00AM, 3:00-6:00PM	Wednesday, September 28, 2016 6:00-9:00AM, 3:00-6:00PM	7:30AM-8:30AM	4:30PM-5:30PM	8:00AM-9:00AM	5:00PM-6:00PM
Kingston Road at Morningside Avenue	Wednesday, August 17, 2016 6:00-9:00AM, 3:00-6:00PM	Wednesday, September 28, 2016 6:00-9:00AM, 3:00-6:00PM	8:00AM-9:00AM	4:45PM-5:45PM	8:00AM-9:00AM	4:15PM-5:15PM
Morningside Avenue at Ling Road	Wednesday, August 17, 2016 6:00-9:00AM, 3:00-6:00PM	Wednesday, September 28, 2016 6:00-9:00AM, 3:00-6:00PM	7:30AM-8:30AM	5:00PM-6:00PM	8:00AM-9:00AM	5:00PM-6:00PM
Morningside Avenue at Danzig Road	Wednesday, August 17, 2016 6:00-9:00AM, 3:00-6:00PM	Wednesday, September 28, 2016 6:00-9:00AM, 3:00-6:00PM	7:30AM-8:30AM	5:00PM-6:00PM	8:00AM-9:00AM	5:00PM-6:00PM
Morningside Avenue at Coronation Drive	Wednesday, August 17, 2016 6:00-9:00AM, 3:00-6:00PM	Wednesday, September 28, 2016 6:00-9:00AM, 3:00-6:00PM	7:30AM-8:30AM	5:00PM-6:00PM	7:30AM-8:30AM	5:00PM-6:00PM

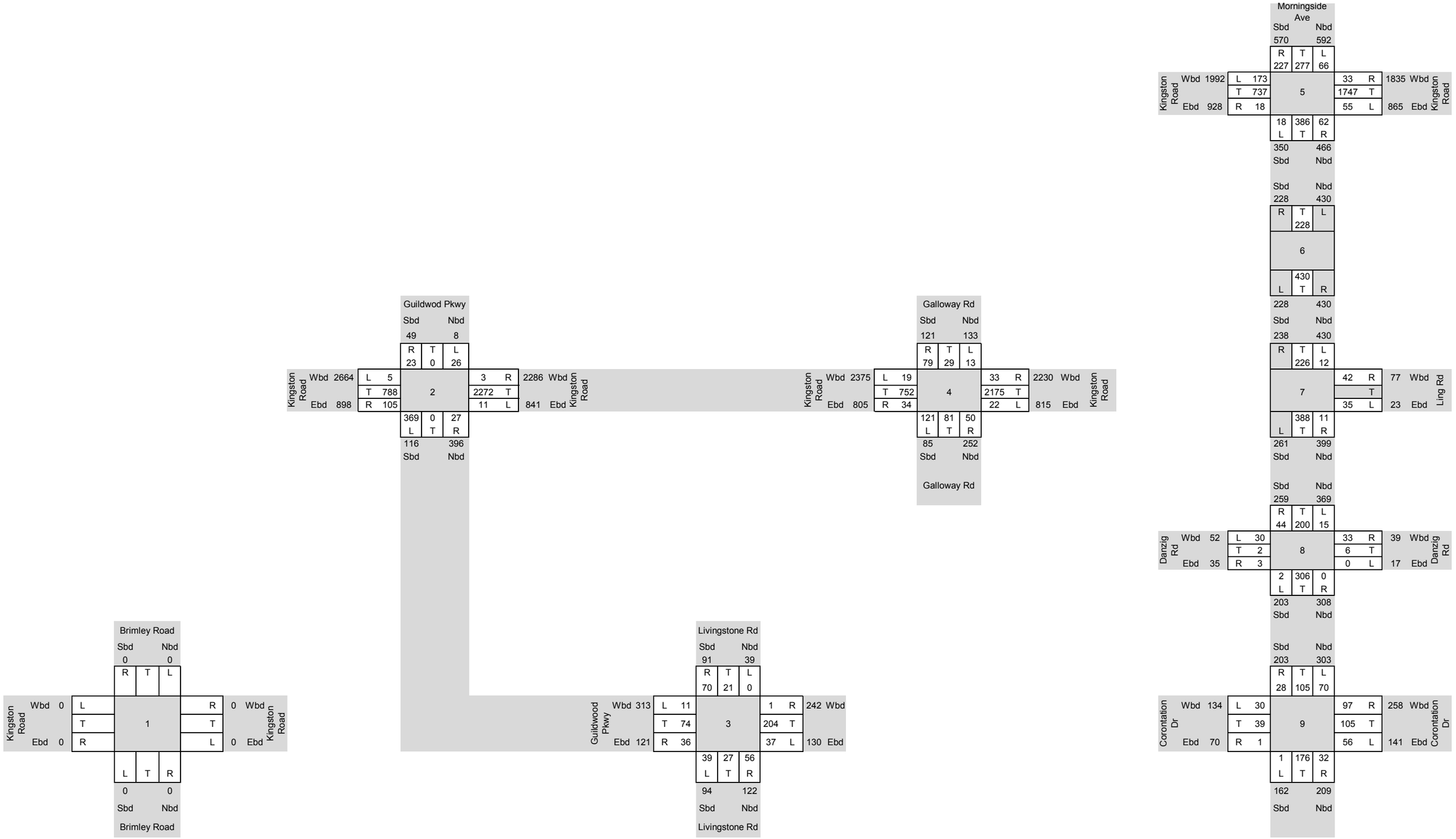


Figure 2-4
Existing AM Peak Hour Traffic Volumes (May to September)
Road Traffic Assessment Scarbrorought Waterfront Project

Legend: Wbd: West bound direction; Ebd: East bound direction; Nbd: North bound direction; Sbd: South bound direction; L: Left turn; T: Through; R: Right turn

161-10845-00_TAB_TrafficModel-May-Sept_20160921_v1-0-Opt1.xlsx

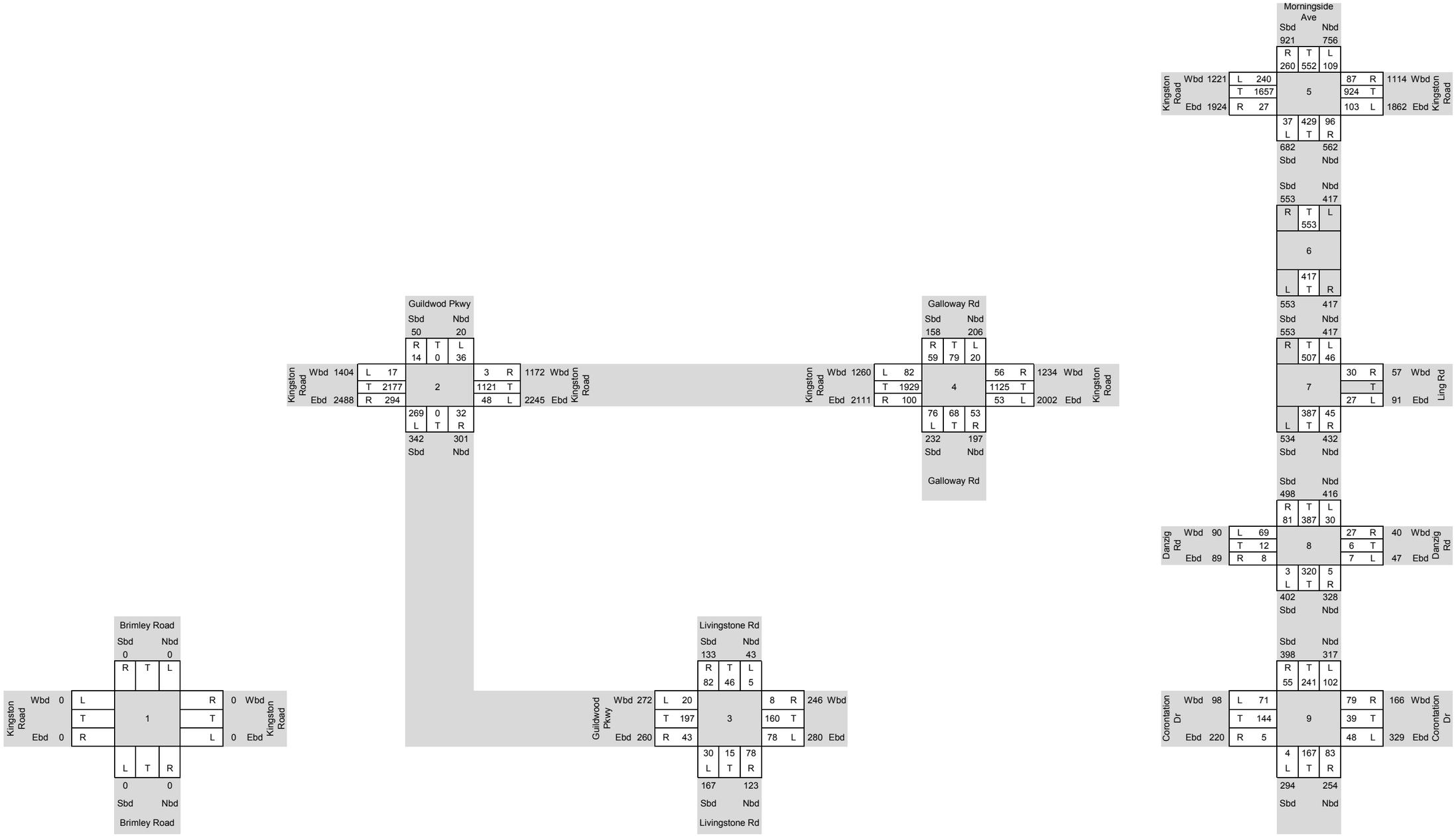


Figure 2-5
Existing PM Peak Hour Traffic Volumes (May to September)
Road Traffic Assessment Scarbrorought Waterfront Project

Legend: Wbd: West bound direction; Ebd: East bound direction; Nbd: North bound direction; Sbd: South bound direction; L: Left turn; T: Through; R: Right turn

161-10845-00_TAB_TrafficModel-May-Sept_20160921_v1-0-Opt1.xlsx

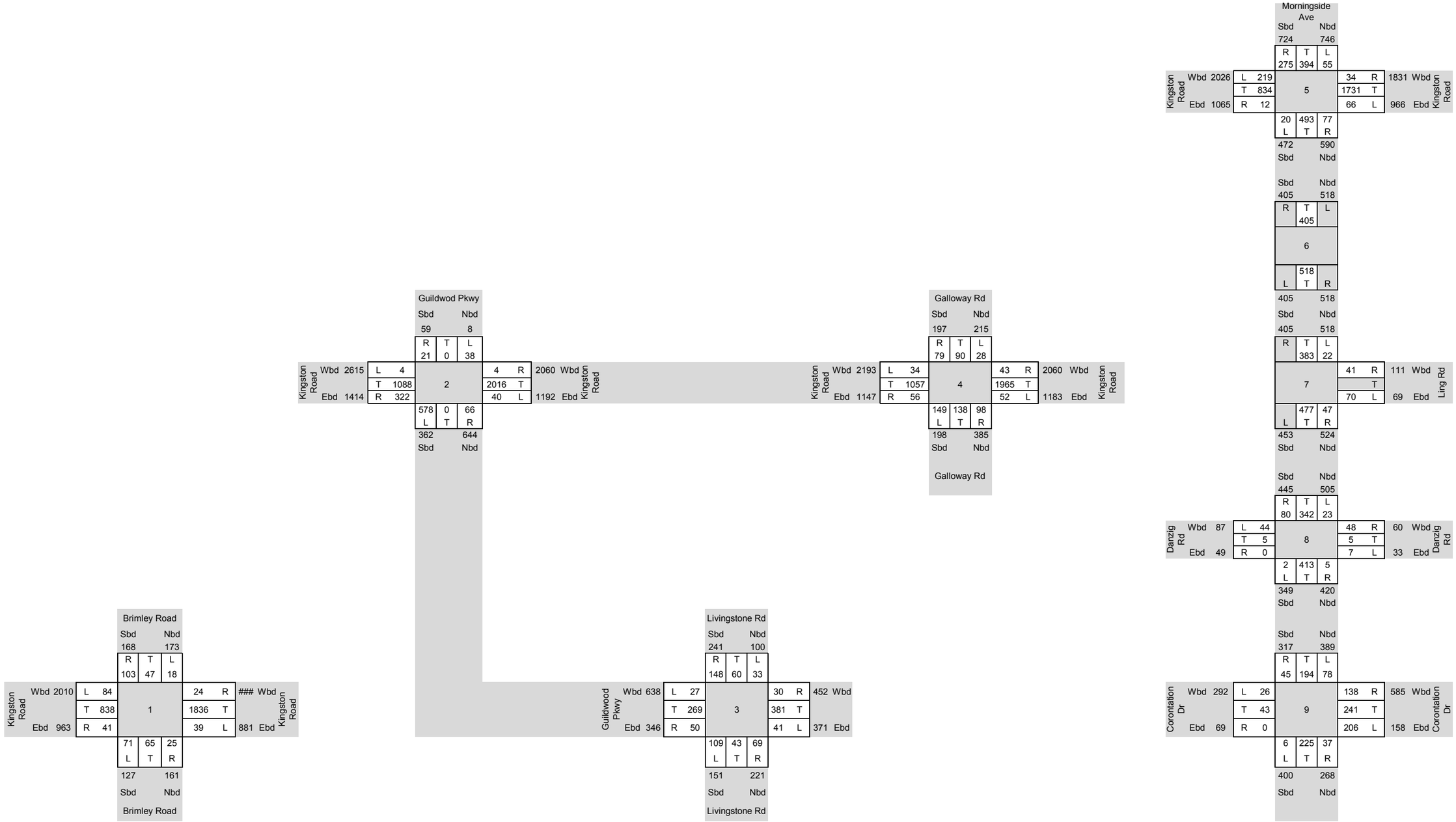


Figure 2-6
Existing AM Peak Hour Traffic Volumes (October to April)
Road Traffic Assessment Scarbrorought Waterfront Project

Legend: Wbd: West bound direction; Ebd: East bound direction; Nbd: North bound direction; Sbd: South bound direction; L: Left turn; T: Through; R: Right turn

161-10845-00_TAB_TrafficModel-Oct-Apr_20161004_v1-0-Opt1.xlsx

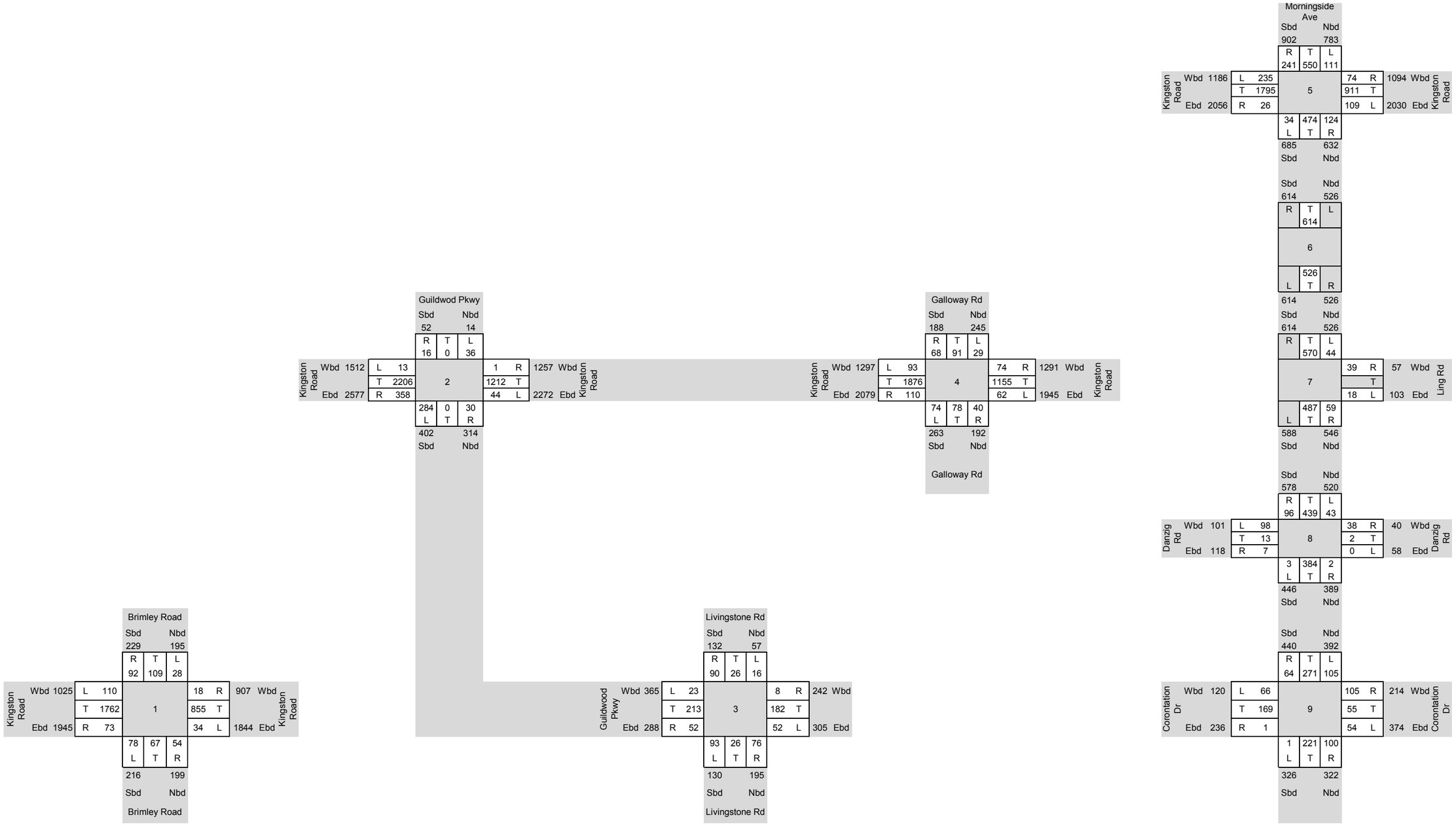


Figure 2-7
Existing PM Peak Hour Traffic Volumes (October to April)
Road Traffic Assessment Scarborought Waterfront Project

Legend: Wbd: West bound direction; Ebd: East bound direction; Nbd: North bound direction; Sbd: South bound direction; L: Left turn; T: Through; R: Right turn

161-10845-00_TAB_TrafficModel-Oct-Apr_20161004_v1-0-Opt1.xlsx

2.5 EXISTING (2016) TRAFFIC ANALYSIS

The operation of study intersections was analyzed using Highway Capacity Manual (HCM) methodology, and Synchro 8.0. Queuing at intersections was analyzed using SimTraffic 8.0 software. The analysis assumes the existing lane configurations, heavy vehicle percentages and peak hour factors (PHF) determined from existing traffic count volumes.

Level of Service (LOS) definitions are provided in Appendix B and intersection capacity and queue analysis reports are provided in Appendix C.

2.5.1 SUMMER SEASON (OFF SCHOOL PERIOD) CONDITIONS

For the summer analysis it is important to note that the Bluffers Park access was not analysed (Brimley Road and Kingston Road intersection). The route to this access has high pedestrian traffic during the summer months and will not have truck traffic during that time taking materials down to the beach.

Table 2-2 provides a summary of intersection level of service (LOS) and volume-to-capacity (V/C) ratios for the signalized intersections analyzed in the study area under existing summer season (off school period) conditions for the AM and PM peak hours.

Table 2-2 – Existing (2016) Summer Season (Off School Period) Traffic Conditions – Signalized Intersections

Intersection	AM Peak Hour			PM Peak Hour		
Movement	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Galloway Road and Kingston Road	**0.69**	**24**	**C**	**0.61**	**23**	**C**
Eastbound Left	0.29	25	C	0.49	27	C
Eastbound Through+Right	0.31	15	B	0.79	24	C
Westbound Left	0.08	13	B	0.79	80	E
Westbound Through+Right	0.86	26	C	0.46	17	B
Northbound Through+Left+Right	0.46	26	C	0.36	25	C
Southbound Through+Left+Right	0.20	23	C	0.23	23	C
Guildwood Parkway/Cromwell Road and Kingston Road	**0.67**	**19**	**B**	**0.59**	**17**	**B**
Eastbound Left	0.07	12	B	0.08	10	B
Eastbound Through	0.29	12	B	0.73	17	B
Eastbound Right	0.08	10	B	0.24	11	B
Westbound Left	0.04	10	B	0.71	63	E
Westbound Through+Right	0.82	21	C	0.38	12	B
Northbound Left	0.38	27	C	0.28	29	C
Northbound Left+Right	0.35	26	C	0.02	27	C
Southbound Left	0.08	24	C	0.07	27	C
Southbound Right	0.02	23	C	0.01	27	C

Intersection	AM Peak Hour			PM Peak Hour		
Movement	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Livingston Road and Guildwood Parkway	**0.19**	**13**	**B**	**0.20**	**13**	**B**
Eastbound Through+Left+Right	0.10	13	B	0.23	14	B
Westbound Through+Left+Right	0.23	14	B	0.28	15	B
Northbound Through+Left+Right	0.15	11	B	0.13	11	B
Southbound Through+Left+Right	0.08	10	B	0.13	11	B
Morningside Avenue and Ling Road	**0.15**	**8**	**A**	**0.19**	**8**	**A**
Northbound Through	0.25	8	A	0.24	8	A
Southbound Through	0.13	8	A	0.31	8	A
Morningside Avenue and Coronation Drive	**0.20**	**12**	**B**	**0.36**	**13**	**B**
Eastbound Through+Left+Right	0.12	14	B	0.40	16	B
Westbound Left	0.12	14	B	0.13	14	B
Westbound Through+Right	0.25	15	B	0.12	14	B
Northbound Through+Left+Right	0.13	10	A	0.16	10	B
Southbound Through+Left+Right	0.16	10	B	0.33	12	B
Morningside Avenue and Danzig Road	**0.14**	**10**	**B**	**0.24**	**11**	**B**
Eastbound Through+Left+Right	0.06	12	B	0.16	12	B
Westbound Through+Left+Right	0.03	12	B	0.04	12	B
Northbound Left		9	A	0.01	9	A
Northbound Through+Right	0.20	10	B	0.22	10	B
Southbound Left	0.03	9	A	0.07	10	A
Southbound Through+Right	0.15	10	A	0.31	11	B
Morningside Avenue and Kingston Road	**0.75**	**28**	**C**	**0.74**	**28**	**C**
Eastbound Left	0.93	75	E	0.83	40	D
Eastbound Through+Right	0.29	13	B	0.82	31	C
Westbound Left	0.21	20	B	0.47	25	C
Westbound Through+Right	0.81	29	C	0.50	23	C
Northbound Left	0.08	26	C	0.25	26	C
Northbound Through+Right	0.41	29	C	0.41	24	C
Southbound Left	0.27	29	C	0.42	28	C
Southbound Through+Right	0.42	29	C	0.64	29	C

All intersections during the summer season (off school period) operate at an acceptable LOS of C or better in both the AM and PM peak hours. During the AM peak hour, the eastbound left movement at Morningside Avenue and Kingston Road operates at an LOS of E and in the PM, the westbound left movements at Galloway Road and Kingston Road and Guildwood Parkway and Kingston Road also have an LOS of E.

Table 2-3 provides a summary of the queue analysis for the intersections analyzed in the study area under existing summer season (off school period) conditions for the AM and PM peak hours. The movements shown only correspond to designated left or right turns.

Table 2-3 – Existing (2016) Summer Season (Off School Period) Queue Analysis

Intersection Movement	Available Storage	AM Peak Hour 95th Percentile Queues (m)	PM Peak Hour 95th Percentile Queues (m)
Galloway Road and Kingston Road			
Eastbound Left	25	14	52
Westbound Left	18	20	49
Guildwood Parkway/Cromwell Road and Kingston Road			
Eastbound Left	22	9	26
Eastbound Right	49	18	33
Westbound Left	36	27	66
Northbound Left	141*	65	60
Northbound Left+Right	141*		9
Southbound Left	23	13	17
Southbound Right	57	11	10
Morningside Avenue and Coronation Drive			
Westbound Left	40	20	21
Morningside Avenue and Danzig Road			
Northbound Left	25	3	4
Southbound Left	30	10	10
Morningside Avenue and Kingston Road			
Eastbound Left	24	46	53
Westbound Left	27	36	48
Northbound Left	28	15	20
Southbound Left	50	20	58

*Note: Link Distance

The 95th percentile queue for the eastbound left-turn movement at Galloway Road and Kingston Road intersection exceeds the available storage during the PM peak hour. Also at the same intersection, the westbound left-turn queues exceeds the available storage in both AM and PM peak hours. At Guildwood Parkway/Cromwell Road and Kingston Road, the 95th percentile queues exceed their storages for both east and westbound left-turn movements. At Morningside Avenue and Kingston Road, the queues exceed the available storage for the eastbound left, westbound left-turn and southbound left-turn movements.

2.5.2 FALL/WINTER SEASON (SCHOOL PERIOD) CONDITIONS

During the fall/winter season (school period), all routes were analysed. Table 2-4 provides a summary of intersection level of service (LOS) and volume-to-capacity (V/C) ratios for the signalized intersections

analyzed in the study area under existing fall/winter season (school period) conditions for the AM and PM peak hours.

Table 2-4 – Existing (2016) Fall/Winter Season (School Period) Traffic Conditions – Signalized Intersections

Intersection	AM Peak Hour			PM Peak Hour		
Movement	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Brimley Road and Kingston Road	**0.63**	**44**	**D**	**0.57**	**26**	**C**
Eastbound Left	0.46	24	C	0.35	14	B
Eastbound Through+Right	0.37	15	B	0.79	27	C
Westbound Left	0.22	24	C	0.23	21	C
Westbound Through+Right	1.04	63	E	0.43	24	C
Northbound Left	0.20	25	C	0.22	25	C
Northbound Through+Right	0.14	24	C	0.16	24	C
Southbound Left	0.05	23	C	0.06	23	C
Southbound Through+Right	0.18	24	C	0.29	25	C
Galloway Road and Kingston Road	**0.79**	**23**	**C**	**0.67**	**23**	**C**
Eastbound Left	0.53	44	D	0.59	33	C
Eastbound Through+Right	0.45	17	B	0.76	23	C
Westbound Left	0.30	19	B	0.91	109	F
Westbound Through+Right	0.79	24	C	0.48	17	B
Northbound Through+Left+Right	0.78	38	D	0.34	25	C
Southbound Through+Left+Right	0.34	25	C	0.28	24	C
Guildwood Parkway/Cromwell Road and Kingston Road	**0.70**	**18**	**B**	**0.59**	**17**	**B**
Eastbound Left	0.05	11	B	0.06	10	A
Eastbound Through	0.40	13	B	0.73	17	B
Eastbound Right	0.22	12	B	0.28	12	B
Westbound Left	0.19	13	B	0.64	52	D
Westbound Through+Right	0.73	18	B	0.41	12	B
Northbound Left	0.63	31	C	0.29	29	C
Northbound Left+Right	`	30	C	0.02	27	C
Southbound Left	0.17	24	C	0.07	27	C
Southbound Right	0.01	23	C	0.01	27	C
Livingston Road and Guildwood Parkway	**0.51**	**15**	**B**	**0.42**	**14**	**B**
Eastbound Through+Left+Right	0.40	16	B	0.37	15	B
Westbound Through+Left+Right	0.52	17	B	0.37	15	B
Northbound Through+Left+Right	0.51	14	B	0.47	13	B
Southbound Through+Left+Right	0.39	13	B	0.28	12	B
Morningside Avenue and Ling Road	**0.19**	**9**	**A**	**0.22**	**8**	**A**
Northbound Through	0.30	9	A	0.30	8	A

Intersection	AM Peak Hour			PM Peak Hour		
Movement	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Southbound Through	0.24	8	A	0.35	9	A
Morningside Avenue and Coronation Drive	**0.40**	**14**	**B**	**0.39**	**13**	**B**
Eastbound Through+Left+Right	0.14	14	B	0.38	16	B
Westbound Left	0.47	17	B	0.13	14	B
Westbound Through+Right	0.59	18	B	0.15	14	B
Northbound Through+Left+Right	0.18	10	B	0.18	10	B
Southbound Through+Left+Right	0.25	11	B	0.39	12	B
Morningside Avenue and Danzig Road	**0.20**	**11**	**B**	**0.29**	**11**	**B**
Eastbound Through+Left+Right	0.09	12	B	0.23	13	B
Westbound Through+Left+Right	0.05	12	B	0.03	12	B
Northbound Left		9	A	0.01	9	A
Northbound Through+Right	0.29	11	B	0.26	11	B
Southbound Left	0.06	10	A	0.11	10	B
Southbound Through+Right	0.28	11	B	0.35	11	B
Morningside Avenue and Kingston Road	**0.93**	**31**	**C**	**0.80**	**32**	**C**
Eastbound Left	1.13	132	F	0.86	44	D
Eastbound Through+Right	0.30	13	B	0.93	37	D
Westbound Left	0.25	21	C	0.52	29	C
Westbound Through+Right	0.77	28	C	0.51	24	C
Northbound Left	0.12	27	C	0.25	26	C
Northbound Through+Right	0.50	31	C	0.49	26	C
Southbound Left	0.28	30	C	0.55	35	C
Southbound Through+Right	0.56	32	C	0.65	29	C

All intersections operate at an acceptable LOS of D or better during the fall/winter season (school period) for both the AM and PM peak hours. The westbound through/right-turn movement at Brimley Road and Kingston Road experiences a LOS of E in the AM. Both the westbound left-turn movement at Galloway Road and Kingston Road and the eastbound left-turn movement at Morningside Avenue and Kingston Road have a LOS of F.

Table 2-5 provides a summary of the queue analysis for the intersections analyzed in the study area under existing fall/winter season (school period) conditions for the AM and PM peak hours. The movements shown only correspond to designated left-turn or right-turn movements.

Table 2-5 – Existing (2016) Fall/Winter Season (School Period) Queue Analysis

Intersection Movement	Available Storage	AM Peak Hour 95th Percentile Queues (m)	PM Peak Hour 95th Percentile Queues (m)
Brimley Road and Kingston Road			
Eastbound Left	35	30	74
Northbound Left	127	23	27
Southbound Left	136	3	7
Galloway Road and Kingston Road			
Eastbound Left	25	37	58
Westbound Left	18	36	54
Guildwood Parkway/Cromwell Road and Kingston Road			
Eastbound Left	22	4	24
Eastbound Right	49	35	37
Westbound Left	36	41	46
Northbound Left	141*	93	62
Northbound Left+Right	141*		8
Southbound Left	23	16	18
Southbound Right	57	12	12
Morningside Avenue and Coronation Drive			
Westbound Left	40	50	20
Morningside Avenue and Danzig Road			
Northbound Left	25	3	5
Southbound Left	30	11	13
Morningside Avenue and Kingston Road			
Eastbound Left	24	53	48
Westbound Left	27	38	52
Northbound Left	28	24	26
Southbound Left	50	29	98

*Note: Link Distance

For the fall/winter season (school period), every intersection experiences 95th percentile queueing beyond the available storage except at Morningside Avenue and Coronation Drive. They occur in both the AM and PM peak periods with the majority taking place on Kingston Road.

All these existing conditions were taken into consideration when assigning the future construction truck volumes.

2.6 ACTIVE TRANSPORTATION

Currently, there is no formal pedestrian access to the park along Brimley Road. There is a sidewalk on the west side of Brimley Road from Kingston Road to the entrance to Blessed Cardinal Newman Catholic School but it is not connected with the park's trail network.

The existing active transportation network within the Brimley Road area is shown in Figure 2-8.

Figure 2-8 – Brimley Road and Bluffers Park Area – Existing Active Transportation Facilities

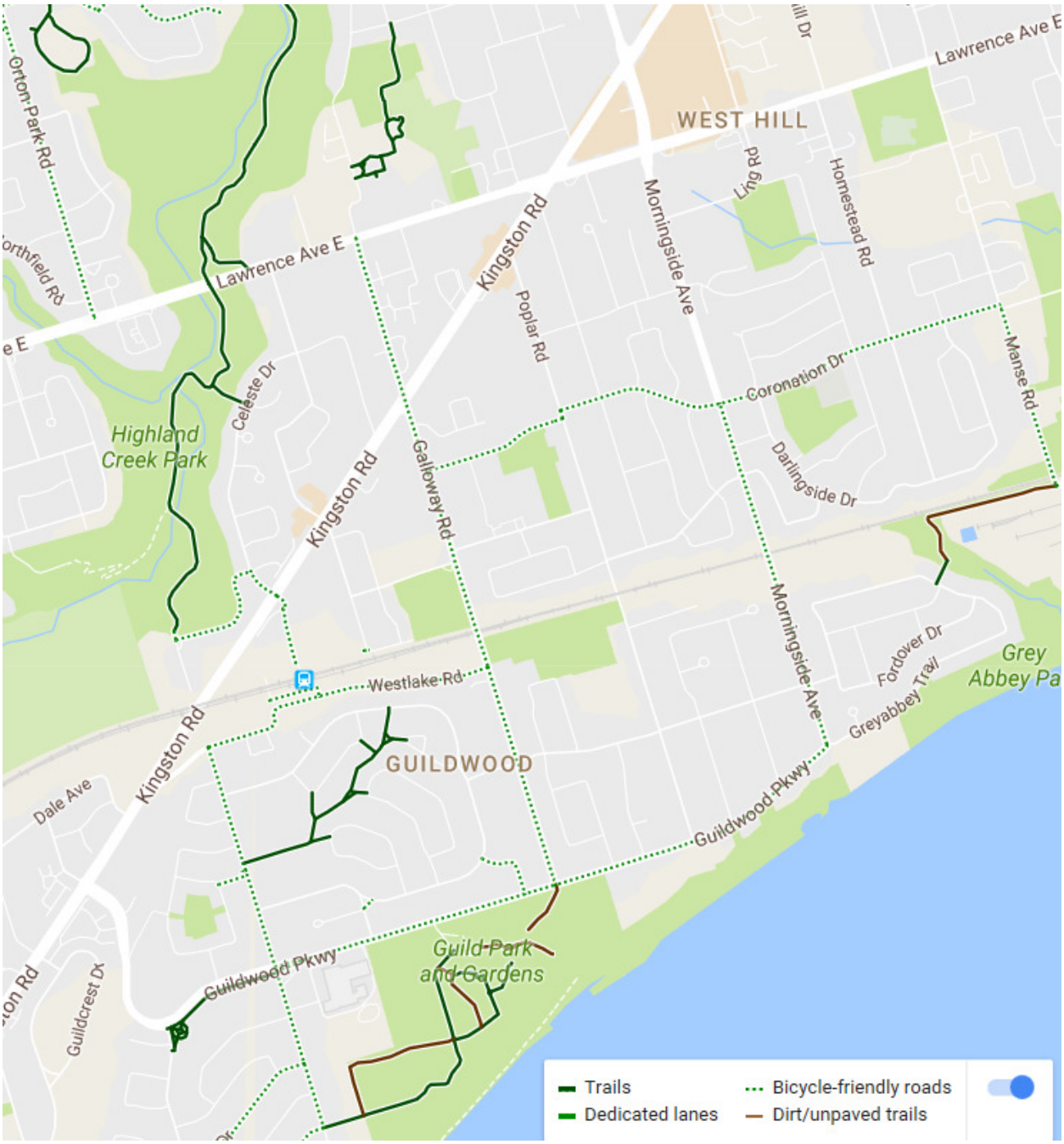
Source: Google Maps

Currently, there is a solid network of roadways with shared bike lanes within the Guildwood Village area, which includes designated bike routes on the following roads:

- Morningside Avenue from Coronation Drive to Guildwood Parkway (Route 79)
- Galloway Road from Kingston Road to Guildwood Parkway (Route 77)
- Guildwood Parkway from Livingston Road to Morningside Avenue (Route 4)
- Livingston Road from Westlake Road/ Guildwood GO Station to Guildwood Parkway (Route 12)

The existing active transportation network within the Guildwood area is shown in Figure 2-9.

Figure 2-9 – Guildwood Area – Existing Active Transportation Network



Source: Google Maps

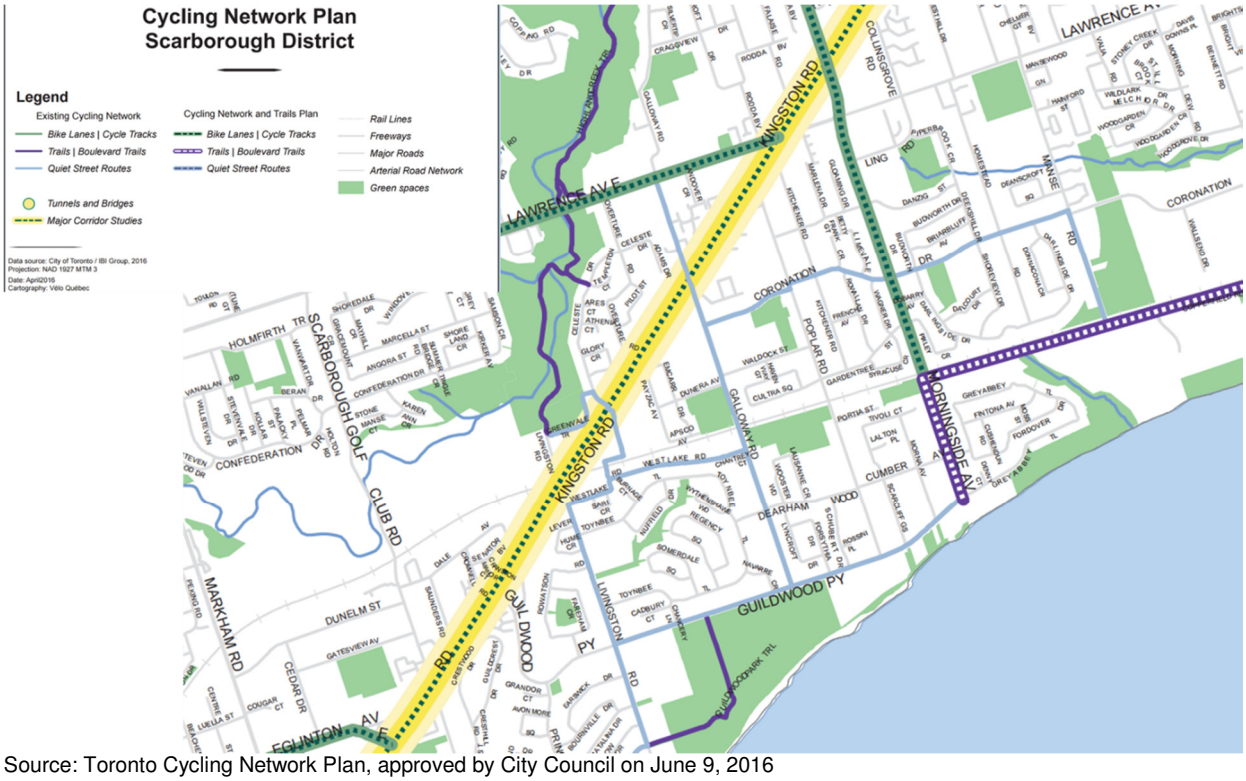
The City of Toronto approved a Cycling Network Plan to Connect, Grow and Renew infrastructure for the City's cycling routes over the next ten years (approved by City Council on June 9, 2016). The plan outlines the planned investments from 2016 to 2025. The plan identifies the following cycling network and trail facility projects:

→ bike lane/cycle track on Morningside Avenue from Kingston Road to rail grade crossing

- trail/boulevard trail adjacent/parallel to rail tracks east of Morningside Avenue and on Morningside Avenue from the rail grade crossing to Guildwood Parkway
- major corridor study to be performed for Kingston Road

Figure 2-10 further illustrates those projects as identified in the Cycling Network Plan.

Figure 2-10 –Toronto Cycling Network Plan - Projects



Source: Toronto Cycling Network Plan, approved by City Council on June 9, 2016

2.7 TRANSIT OPERATIONS AND RIDERSHIP

The Toronto Transit Commission (TTC) provides local bus service in the study areas. The following describes existing transit service around the area for the proposed truck routes:

- Route 12 (Kingston Road) – operates on Kingston Road, Brimley Road and Eglinton Avenue between Kennedy Station and Victoria Park Station, both stations on subway Line 2 - Bloor - Danforth. Three branches/services are operated:
  - 12A Branch Victoria Park Station – Kennedy Station via Variety Village and Brimley Road operates at all times, seven days a week. Route 12A provides 14 to 16-minute service during peak hours and approximately 20-minute service in the off-peak hours.
  - 12B Branch Victoria Park Station – Kennedy Station via Brimley Road operates during the daytime and early evenings on weekends and holidays. Route 12B provides 34 to 36-minute service.

- 12C Branch Victoria Park Station – St. Clair operates until approximately 9:50 pm on weekdays. This branch includes a loop to the south of Kingston Road from Brimley Road to Barkdene Hills and Brooklawn Avenue. Route 12C has stops on Brimley Avenue intersections with Kingston Road (south side) and with Barkdene Hills.

→ Route 116 (Morningside) – operates on Eglinton Avenue East, Guildwood Parkway and Morningside Avenue between Kennedy Station and the area of Morningside Avenue and Old Finch Avenue. Three branches/services are operated:

- 116A branch – Kennedy Station - Conlins Road via Ellesmere Road operates during the peak periods, midday and early weekday evenings. Route 116A provides 22-minute service during the peak periods and 30-minute service during off-peak.

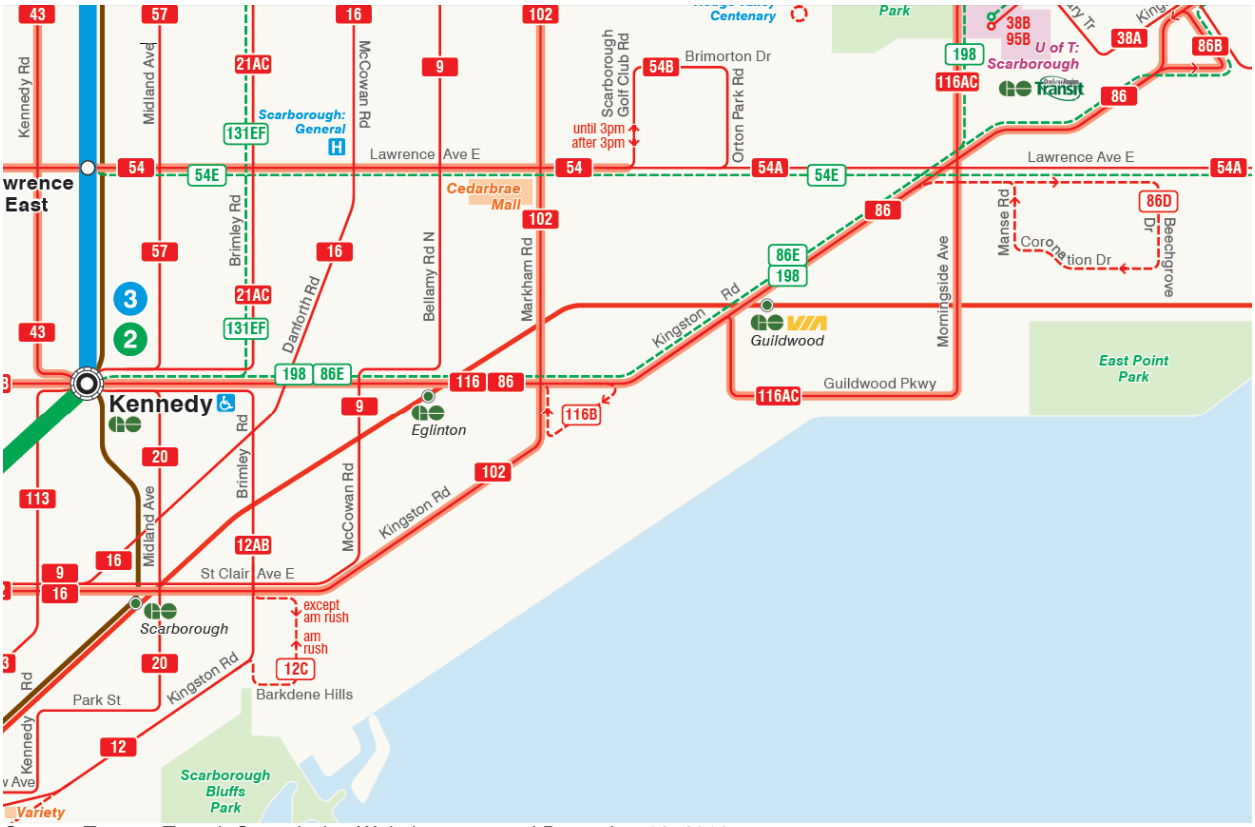
- 116B branch – Kennedy Station – Kingston Road and Eglinton Avenue operates during the peak periods on weekday only.

- 116C branch – Kennedy Station, Finch and Morningside Heights operates at all times seven days a week. Route 116C provides 6-minute service during the peak periods and 10-minute service during off-peak.

Bus stops being served by Route 116 on Guildwood Parkway are located at the south of Kingston Road, at Prince Philip Boulevard, Rowatson Road, Livingston Road, Sir Wilfrid Laurier Collegiate Institute, Guild Inn, Galloway Road, Forsythia Drive, Schubert Drive, Scarcliff Gardens and Morningside Avenue.

Figure 2-11 describes TTC transit routes serving the study areas. Further details of TTC routes are provided in Appendix D.

Figure 2-11 – Transit Routes



Source: Toronto Transit Commission Website, accessed December 12, 2016

GO Transit also provides commuter rail service at the Guildwood train station which is part of the Lakeshore East Line, with service between Oshawa and Union Station. Guildwood station is located approximately 500 metres west of Galloway Road and has direct access from Kingston Road on the north and Westlake Road on the south.

Metrolinx's Regional Express rail improvement program has plans to do grade separation at the Lake Shore East Corridor with Morningside Avenue and Galloway Road. Although timeline for construction of these grade separations is yet unknown, it is expected that the crossing at Galloway Road will be carried out first.

All active transportation components on the proposed routes are provided in Figure 2-12 and Figure 2-13.

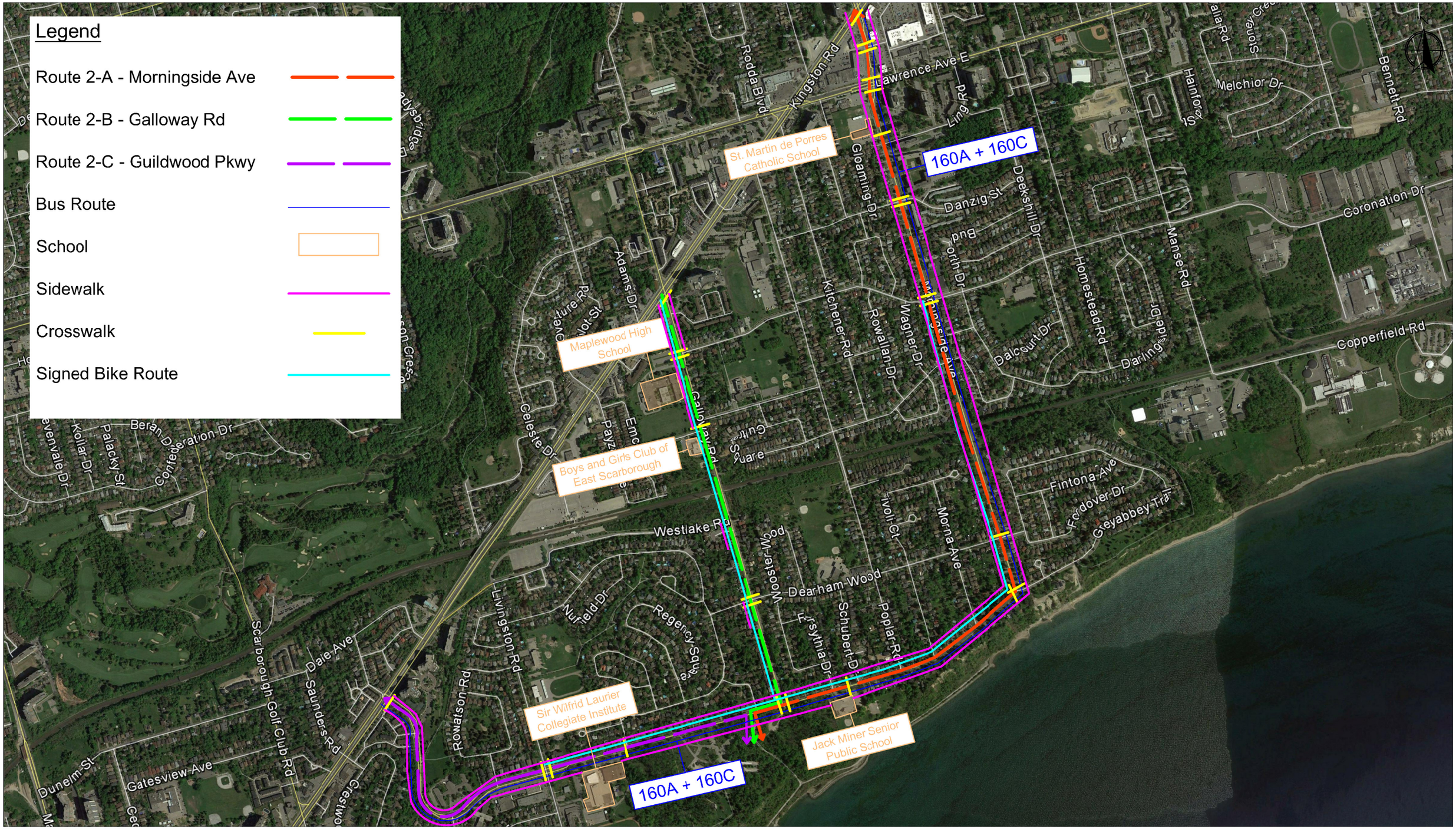
Source: Google Earth, 2015

Scale: NTS

Figure 2-12
Bluffers Park Access - Active Network
Toronto and Region Conservation Authority Road Traffic Assessment Study

161-10845-00-TRA_Sitelocation-20161109.dwg_W-Access

Modified: 12/1/2016 5:38 PM By: Racheal.Saunders Plot Date: 2016/12/15



Source: Google Earth, 2015

Scale: NTS

Figure 2-13
Guildwood Village Access - Active Network
Toronto and Region Conservation Authority Road Traffic Assessment Study

WSP

161-10845-00-TRA_Sitelocation-20161109.dwg_E-Access

Modified: 4/20/2017 6:28 PM By: racheal.saunders Plot Date: 2017/04/21

2.8 EXISTING ROAD CONDITION

Three site visits were conducted and visual investigations were completed to analyze the proposed construction truck routes.

2.8.1 PAVEMENT CONDITION SURVEY

Visual pavement condition survey was conducted on December 7, 2016, along the following road sections and the observed distresses as presented under each road:

- Brimley Road South, south of Kingston Road;
- Morningside Avenue, south of Kingston Road;
- Galloway Road, south of Kingston Road; and
- Guildwood Parkway, south of Kingston Road

2.8.1.1 BRIMLEY ROAD AND BLUFFER'S PARK ROAD

The observed pavement conditions are as follows:

1. Brimley Road: from Kingston Road to approximately 220 m long section south
   - generally in fair condition
   - frequent slight to moderate pavement edge cracking with severe alligatoring in front of driveways
   - extensive, moderate to severe distortion along North Bound (NB) paved shoulder
2. Brimley Road : from 220 m south of Kingston Road to approximately 450 m south section
   - in poor to very poor condition
   - frequent severe distortions with numerous patches
   - extensive slight to moderate transverse cracks, with occasional severe cracks
   - extensive severe pavement edge cracks with intermittent moderate alligator cracks
   - extensive slight to moderate map cracking
   - intermittent slight to moderate mid-lane cracks
   - intermittent moderate to severe ravelling with occasional potholes

It should be noted that Brimley Road south of Kingston Road to approximately 700 m south is built on landfill, is in poor condition, and may require road maintenance on a frequent interval. However, based on the City of Toronto staff confirmation, Brimley Road south of Kingston Road is planned for road resurfacing from Kingston Road to Barkdene Hills, in 2020.

3. Brimley Road: from approximately 670m south of Kingston Road to 580m south section
   - → recently overlaid with probably 50mm of hotmix over old and distressed pavement and is relatively in fair to good condition on the surface with few to intermittent slight distortions (noticeable wavy white line)
4. Brimley Road: from approximately 1,250m south of Kingston Road to Bluffers Park access (200m long section)
   - → in poor to very poor condition
   - → extensive moderate alligator transverse cracks
   - → extensive moderate to severe pavement edge cracks with alligatoring
   - → extensive moderate to severe centreline and wheel-track alligator cracks
   - → patched areas over previous very severe distortions adjacent to swale
5. Bluffers Park Road: from beginning to east end (east parking lot) (approximately 810m long section)
   - → in fair to good condition with portable concrete curbs on both sides of road
   - → recent patch from just east of last intersection to west of east parking lot

Southbound Brimley Road, south of Kingston Road (Source: WSP, November 29, 2016)

2.8.1.2 MORNINGSIDE AVENUE

Morningside Avenue is a four-lane urban section with observed pavement conditions as follows:

1. Morningside Avenue: from Kingston Road to approximately 110m south section
   - → in poor to very poor condition
   - → frequent moderate to severe distortions with numerous patches
   - → extensive slight to moderate alligator cracks
2. Morningside Avenue: from approximately 110m south of Kingston Road to Guildwood Parkway (1825m long section)
   - → generally in fair condition
   - → extensive sealed transverse cracks
   - → frequent sealed mid-lane and wheel-track longitudinal cracks

Southbound Morningside Avenue, south of Ling Road (Source: WSP, November 29, 2016)

2.8.1.3 GUILDWOOD PARKWAY

Guildwood Parkway is a four-lane divided urban section between Kingston Road and just east of Livingston Road, and two-lane undivided urban section easterly, with observed pavement conditions as follows:

1. Guildwood Parkway: from Kingston Rd to Livingston Road (about 845 m long section)
   - → generally in good condition with no significant distresses

2. Guildwood Parkway: from Livingston Road to Navarre Crescent (south limit) (735 m long section)
   - generally in fair to poor condition
   - extensive moderate transverse cracks
   - extensive slight to moderate mid-lane and wheel-track longitudinal cracks
   - frequent slight to moderate pavement edge cracks
3. Guildwood Parkway: from Morningside Avenue to Galloway Road (excluding intersection) (880 m long section)
   - recently resurfaced and generally in good condition with no major distresses on the surface

The intersection of Guildwood Pkwy and Galloway Rd is in poor condition with moderate to severe map cracking, slight to moderate transverse and longitudinal cracks, minor settlements around manholes.

4. Guildwood Parkway: from Galloway Road to Navarre Crescent (south limit) (120 m long section)
   - generally in fair to poor condition
   - extensive moderate transverse cracks
   - extensive slight to moderate mid-lane and wheel-track longitudinal cracks
   - frequent slight to moderate pavement edge crack

Eastbound Guildwood Parkway, at Chancery Lane (Source: WSP, November 29, 2016)

2.8.1.4 GALLOWAY ROAD

Galloway Road is a 2-lane urban section in residential areas with observed pavement conditions as follows:

1. Galloway Road: from Kingston Road to south at approximately 15m north of northernmost railway crossing (650m long section)
   - generally in good condition with no observed distresses
2. Galloway Road: from northernmost railway crossing to 55m southerly, at around the rail tracks area (55m long section)
   - in poor condition
   - severe distortion
   - slight to moderate map cracking
   - alligator and settled patched at south side of the tracks
3. Galloway Road: from 33m south of the southernmost rail to Guildwood Parkway (excluding intersection) (705m long section)
   - generally in fair to poor condition
   - frequent moderate transverse cracks
   - throughout moderate mid-lane and wheel-track longitudinal construction joints/cracks
   - extensive slight to moderate pavement edge cracks
   - intermittent distortions/cracks around manholes
   - few to intermittent slight to moderate map cracks

The intersection of Guildwood Pkwy and Galloway Road is in poor condition with moderate to severe map cracking, slight to moderate transverse and longitudinal cracks, minor settlements around manholes.

Northbound Galloway Road, at Maplewood High School (Source: WSP, November 29, 2016)

3 CONSTRUCTION TRANSPORTATION CONDITIONS

3.1 CONSTRUCTION TIMELINE

There are two scenarios regarding length of construction. There is a full build-out option, which is addressed as the **preferred alternative** with a longer duration of truck activity and more fill volume. The second build-out option, addressed as the **refined preferred alternative**, will require less fill volume and less time to complete but will not change the maximum volume of trucks per day. The analysis carried out was done based on the preferred alternative construction times. This alternative also takes into consideration the larger volume of truck traffic and represents a worst-case scenario.

Based on the information obtained from TRCA project team and the schedule of truck deliveries for the preferred alternative, the project is scheduled to begin in 2018 (earliest possible start) and end in 2030 with and an approximate duration of 12 years. The construction is anticipated to progress from the west to the east of the coastline in three segments:

- West Segment – 2018 to 2025 (7 years)
- Central Segment – 2020 to 2030 (10 years)
- East Segment –2024 to 2030 (6 years)

3.2 CONSTRUCTION TRUCK IMPACT CRITERIA

The proposed routes for construction access were analyzed based on the following criteria to assess the level of impact construction truck traffic would have on each:

- **Level of Service -** Study intersections on each route were analyzed under existing construction conditions to detect problem areas in order to prevent adding more truck traffic to worsen an intersection's capacity
- **Transit Impact –** TTC bus routes service the same routes proposed for the truck routes. Bus service routes were reviewed.
- **Pedestrian Activity Impact –** Some of the proposed truck routes have roadways that are shared by both pedestrians and vehicular traffic alike. The presence of pedestrian facilities was reviewed.
- **Cyclist Activity –** Some of the proposed truck routes have roadways that are shared by both cyclists and vehicular traffic alike. The presence of biking facilities was reviewed.
- **Type of Roadway –** The classification of each roadway was reviewed as well as the condition of the existing surface. Factors such as number of lanes and speed limit were reviewed to capture the capacity of the roadway to handle construction truck traffic.
- **Residential Frontage –** Roadways were reviewed for the presence of residential driveways that directly access proposed truck routes.

→ **Restrictions –** Some routes have restricted access to trucks during specific time periods. By-laws were reviewed to see which routes are completely available to the construction truck traffic

3.3 LEVEL OF SERVICE ANALYSIS

In order to determine the level of service for all possible route combinations the following assumptions and analysis were carried out at the study intersections.

The TRCA recognizes and acknowledges the impact of having heavy trucks going through the proposed truck route areas. The first access at Bluffers Park has been scheduled for the months of October to April or outside of summer season.

The second access has all proposed routes going through the Guildwood Village neighbourhood which is predominantly residential. Some roadways have signed bicycle routes and some restrict heavy trucks for specific time frames or any time of day. This neighbourhood has also been subject to high heavy truck volumes due to prior construction in previous years.

3.3.1 TRUCK VOLUME DATA ANALYSIS AND DISTRIBUTION ASSUMPTIONS

In order to estimate the impact of construction truck traffic on the study area traffic network, the potential truck deliveries with an estimated average of trucks per day and durations were reviewed. This was used to determine the maximum amount of expected trucks associated with this project, which will utilize the roadways during the summer season (off school period) and during the fall/winter season (school period).

The different seasons would have trucks access the site at different locations as follows:

A. October to April – Bluffers Park Access and Guildwood Village Access

B. May to September – Guildwood Village Access

The typical amount of trucks expected on the roadways was also extracted from the potential schedule of truck deliveries to gain a sense of what typical truck traffic would look like during construction. The following findings are shown in the Table 3-1 below.

Table 3-1 – Maximum and Typical Daily Truck Volumes

TIME OF YEAR	ACCESS	MAXIMUM TRUCK VOLUME DATA	TYPICAL TRUCK VOLUME DATA
October to April	Bluffers Park & Guildwood Village	260/day (220 at Bluffers and 40 at Guildwood Village)	60-80/day
May to September	Guildwood Village	200/day	60-80/day

For our analysis of the October to April time period, the highest amount of trucks estimated to access the site will be 260 trucks per day. Of these 260 trucks, 220 will be taking material for West Segment construction and 40 will be taking material for Central Segment Construction.

The West Segment will have trucks coming from the Bluffers Park Access and the Central Segment will have trucks accessing the site from the Guildwood Village Access

For our analysis of the May to September time period, trucks will only be carrying material for construction of the Central and East Segment. The maximum amount of trucks estimated to access the site will be 200 trucks per day and they will enter from the preferred route.

Based on the main locations of aggregate resources (sites) in the Greater Toronto Area (GTA), WSP identified potential corridors for trucks' delivery of material to and from the construction sites.

3.3.1.1 MAY – SEPTEMBER TRAFFIC IMPACT ANALYSIS

The analysis started with determining which routes should be selected for inbound and outbound access solely at the Guildwood Village access as the Brimley Access would not be in use. All three routes were put through a sensitivity test in order to determine this.

No growth was applied in this analysis. The construction truck traffic was added to the existing traffic volumes to investigate the impact.

At the study intersections, 200 trucks per day were split up over a ten hour work day to get a peak hour volume of 20 trucks. These trucks were then assigned based on WSP's assumed distribution, to analyze the intersections on Guildwood Parkway, Galloway Road and Morningside Avenue. Construction working time and truck operations are anticipated to be Monday to Friday between 07:00 AM and 05:00 PM.

The sensitivity test looked at the following truck route combinations and distributions:

1. 100 percent of trucks access via Morningside Avenue (20 percent right hand turns, 50 percent left hand turns, 30 percent straight at Kingston Road) and 100 percent truck egress via Morningside Avenue (50 percent right hand turns, 20 percent left hand turns, 30 percent straight at Kingston Road).

2. 100 percent of trucks access via Morningside Avenue (20 percent right hand turns, 50 percent left hand turns, 30 percent straight at Kingston Road) and 100 percent truck egress via Galloway Road (80 percent right hand turns, 20 percent left hand turns at Kingston Road).

3. 100 percent of trucks access via Morningside Avenue (20 percent right hand turns, 50 percent left hand turns, 30 percent straight at Kingston Road) and 100 percent truck egress via Guildwood Parkway (80 percent right hand turns, 20 percent left hand turns at Kingston Road).

4. 100 percent of trucks access via Galloway Road (20 percent right hand turns, 80 percent left hand turns at Kingston Road) and 100 percent truck egress via Galloway Road (80 percent right hand turns, 20 percent left hand turns at Kingston Road).

5. 100 percent of trucks access via Galloway Road (20 percent right hand turns, 80 percent left hand turns at Kingston Road) and 100 percent truck egress via Morningside Avenue (50 percent right hand turns, 20 percent left hand turns, 30 percent straight at Kingston Road).

6. 100 percent of trucks access via Galloway Road (20 percent right hand turns, 80 percent left hand turns at Kingston Road) and 100 percent truck egress via Guildwood Parkway (80 percent right hand turns, 20 percent left hand turns at Kingston Road).

7. 100 percent of trucks access via Guildwood Parkway (20 percent right hand turns, 80 percent left hand turns at Kingston Road) and 100 percent truck egress via Guildwood Parkway (80 percent right hand turns, 20 percent left hand turns at Kingston Road).

8. 100 percent of trucks access via Guildwood Parkway (20 percent right hand turns, 80 percent left hand turns at Kingston Road) and 100 percent truck egress via Morningside Avenue (50 percent right hand turns, 20 percent left hand turns, 30 percent straight at Kingston Road).

9. 100 percent of trucks access via Guildwood Parkway (20 percent right hand turns, 80 percent left hand turns at Kingston Road) and 100 percent truck egress via Galloway Road (80 percent right hand turns, 20 percent left hand turns at Kingston Road).

The intersection capacity for the intersections corresponding to each of the scenarios listed above were reviewed and an inbound and outbound route were selected as the best fit based on the traffic analysis.

Table 3-2, Table 3-3 and Table 3-4 outline the sensitivity test results.

Table 3-2– Morningside Route – All Inbound

Morningside Inbound Scenarios

Scenario 1 - Morningside Avenue Inbound, Morningside Avenue Outbound

Inbound Intersections - Morningside Ave and Kingston Rd, Morningside Ave and Ling Rd, Morningside Ave and Danzig Rd, Morningside Ave and Coronation Dr

Outbound Intersections - Morningside Ave and Coronation Dr, Morningside Ave and Danzig Rd, Morningside Ave and Ling Rd, Morningside Ave and Kingston Rd

AM Peak Hour (May - September)				PM Peak Hour (May - September)			
Intersection	Delay (s)	LOS	v/c ratio	Intersection	Delay (s)	LOS	v/c ratio
Morningside Ave and Kingston Rd	28	C	0.76	Morningside Ave and Kingston Rd	29	C	0.75
Morningside Ave and Ling Rd	8	A	0.16	Morningside Ave and Ling Rd	8	A	0.21
Morningside Ave and Danzig Rd	10	B	0.15	Morningside Ave and Danzig Rd	11	B	0.26
Morningside Ave and Coronation	12	B	0.22	Morningside Ave and Coronation	13	B	0.38

Scenario 2 - Morningside Avenue Inbound, Galloway Road Outbound

Inbound Intersections - Morningside Ave and Kingston Rd, Morningside Ave and Ling Rd, Morningside Ave and Danzig Rd, Morningside Ave and Coronation Dr

Outbound Intersections - Galloway Rd and Kingston Rd

AM Peak Hour (May - September)				PM Peak Hour (May - September)			
Intersection	Delay (s)	LOS	v/c ratio	Intersection	Delay (s)	LOS	v/c ratio
Morningside Ave and Kingston Rd	29	C	0.79	Morningside Ave and Kingston Rd	29	C	0.77
Morningside Ave and Ling Rd	8	A	0.15	Morningside Ave and Ling Rd	8	A	0.21
Morningside Ave and Danzig Rd	10	B	0.14	Morningside Ave and Danzig Rd	11	B	0.25
Morningside Ave and Coronation Dr	12	B	0.22	Morningside Ave and Coronation Dr	13	B	0.38
Galloway Rd and Kingston Rd	24	C	0.69	Galloway Rd and Kingston Rd	23	C	0.64

Scenario 3 - Morningside Avenue Inbound, Guildwood Parkway Outbound

Inbound Intersections - Morningside Ave and Kingston Rd, Morningside Ave and Ling Rd, Morningside Ave and Danzig Rd, Morningside Ave and Coronation Dr

Outbound Intersections - Guildwood Pkwy and Livingstone Rd, Guildwood Pkwy and Kingston Rd

AM Peak Hour (May - September)				PM Peak Hour (May - September)			
Intersection	Delay (s)	LOS	v/c ratio	Intersection	Delay (s)	LOS	v/c ratio
Morningside Ave and Kingston Rd	29	C	0.79	Morningside Ave and Kingston Rd	29	C	0.77
Morningside Ave and Ling Rd	8	A	0.15	Morningside Ave and Ling Rd	8	A	0.21
Morningside Ave and Danzig Rd	10	B	0.14	Morningside Ave and Danzig Rd	11	B	0.25
Morningside Ave and Coronation Dr	12	B	0.22	Morningside Ave and Coronation Dr	13	B	0.38
Guildwood Pkway and Livingstone Rd	13	B	0.2	Guildwood Pkway and Livingstone Rd	13	B	0.22
Guildwood Pkwy and Kingston Rd	19	B	0.67	Guildwood Pkwy and Kingston Rd	17	B	0.59

Table 3-3 – Galloway Route – All Inbound

Galloway Inbound Scenarios							
Scenario 1 - Galloway Road Inbound, Galloway Road Outbound							
Inbound Intersections - Galloway Rd and Kingston Rd							
Outbound Intersections - Galloway Rd and Kingston Rd							
AM Peak Hour (May - September)				PM Peak Hour (May - September)			
Intersection	Delay (s)	LOS	v/c ratio	Intersection	Delay (s)	LOS	v/c ratio
Galloway Rd and Kingston Rd	24	C	0.72	Galloway Rd and Kingston Rd	26	C	0.91
Scenario 2 - Galloway Road Inbound, Morningside Avenue Outbound							
Inbound Intersections - Galloway Rd and Kingston Rd							
Outbound Intersections - Morningside Ave and Coronation Dr, Morningside Ave and Danzig Rd, Morningside Ave and Ling Rd, Morningside Ave and Kingston Rd							
AM Peak Hour (May - September)				PM Peak Hour (May - September)			
Intersection	Delay (s)	LOS	v/c ratio	Intersection	Delay (s)	LOS	v/c ratio
Galloway Rd and Kingston Rd	24	C	0.7	Galloway Rd and Kingston Rd	26	C	0.88
Morningside Ave and Kingston Rd	28	C	0.76	Morningside Ave and Kingston Rd	28	C	0.75
Morningside Ave and Ling Rd	8	A	0.16	Morningside Ave and Ling Rd	8	A	0.19
Morningside Ave and Danzig Rd	10	B	0.15	Morningside Ave and Danzig Rd	11	B	0.24
Morningside Ave and Coronation Dr	12	B	0.2	Morningside Ave and Coronation Dr	13	B	0.36
Scenario 3 - Galloway Road Inbound, Guildwood Parkway Outbound							
Inbound Intersections - Galloway Rd and Kingston Rd							
Outbound Intersections - Guildwood Pkwy and Livingstone Rd, Guildwood Pkwy and Kingston Rd, Galloway Rd and Kingston Rd							
AM Peak Hour (May - September)				PM Peak Hour (May - September)			
Intersection	Delay (s)	LOS	v/c ratio	Intersection	Delay (s)	LOS	v/c ratio
Galloway Rd and Kingston Rd	24	C	0.69	Galloway Rd and Kingston Rd	26	C	0.88
Guildwood Pkway and Livingstone Rd	13	B	0.2	Guildwood Pkway and Livingstone Rd	13	B	0.22
Guildwood Pkwy and Kingston Rd	19	B	0.67	Guildwood Pkwy and Kingston Rd	17	B	0.59

Table 3-4 – Guildwood Route – All Inbound

Guildwood Inbound Scenarios							
Scenario 1 - Guildwood Parkway Inbound, Guildwood Parkway Outbound							
Inbound Intersections - Guildwood Pkwy and Kingston Rd, Guildwood Pkwy and Livingstone Rd							
Outbound Intersections - Guildwood Pkwy and Kingston Rd, Guildwood Pkwy and Livingstone Rd							
AM Peak Hour (May - September)				PM Peak Hour (May - September)			
Intersection	Delay (s)	LOS	v/c ratio	Intersection	Delay (s)	LOS	v/c ratio
Guildwood Pkwy and Kingston Rd	19	B	0.67	Guildwood Pkwy and Kingston Rd	19	B	0.89
Guildwood Pkway and Livingstone Rd	13	B	0.2	Guildwood Pkway and Livingstone Rd	13	B	0.22
Scenario 2 - Guildwood Parkway Inbound, Morningside Avenue Outbound							
Inbound Intersections - Guildwood Pkwy and Kingston Rd, Guildwood Pkwy and Livingstone Rd							
Outbound Intersections - Morningside Ave and Coronation Dr, Morningside Ave and Danzig Rd, Morningside Ave and Ling Rd, Morningside Ave and Kingston Rd							
AM Peak Hour (May - September)				PM Peak Hour (May - September)			
Intersection	Delay (s)	LOS	v/c ratio	Intersection	Delay (s)	LOS	v/c ratio
Guildwood Pkwy and Kingston Rd	19	B	0.67	Guildwood Pkwy and Kingston Rd	19	B	0.89
Guildwood Pkway and Livingstone Rd	13	B	0.19	Guildwood Pkway and Livingstone Rd	13	B	0.2
Morningside Ave and Kingston Rd	28	C	0.76	Morningside Ave and Kingston Rd	28	C	0.74
Morningside Ave and Ling Rd	8	A	0.15	Morningside Ave and Ling Rd	8	A	0.19
Morningside Ave and Danzig Rd	10	B	0.14	Morningside Ave and Danzig Rd	11	B	0.24
Morningside Ave and Coronation Dr	12	B	0.2	Morningside Ave and Coronation Dr	13	B	0.36
Scenario 3 - Guildwood Parkway Inbound, Galloway Road Outbound							
Inbound Intersections - Guildwood Pkwy and Kingston Rd, Guildwood Pkwy and Livingstone Rd							
Outbound Intersections - Galloway Rd and Kingston Rd							
AM Peak Hour (May - September)				PM Peak Hour (May - September)			
Intersection	Delay (s)	LOS	v/c ratio	Intersection	Delay (s)	LOS	v/c ratio
Guildwood Pkwy and Kingston Rd	19	B	0.67	Guildwood Pkwy and Kingston Rd	19	B	0.89
Guildwood Pkway and Livingstone Rd	13	B	0.19	Guildwood Pkway and Livingstone Rd	13	B	0.2
Galloway Rd and Kingston Rd	24	C	0.73	Galloway Rd and Kingston Rd	23	C	0.64

The following is the summary of results and considerations from the traffic analysis:

- inbound and outbound option via the same route for all routes was cancelled out to disperse truck traffic fairly throughout the study area
- Galloway Route inbound has a capacity issue on the westbound left movement at Kingston Road which means it would not be able to take additional truck traffic inbound, therefore none of the combinations involving Galloway Route inbound were considered
- for the Guildwood Parkway Inbound option, the Guildwood Parkway and Kingston Road intersection has capacity issues on the westbound left movement which means it would not be able to take additional truck traffic inbound, therefore none of these combinations were considered
- additional truck traffic did not change the LOS for either of the combinations when assessing the Morningside Route inbound

The best choice based solely on traffic analysis was determined to be inbound via Morningside Avenue and outbound via Galloway Road. This alternative has the least combined negative impacts on the roadway network and no volume/capacity ratios exceeding one.

3.3.1.2 OCTOBER – APRIL TRAFFIC IMPACT ANALYSIS

In October to April during the construction of West Segment, when both accesses would be utilized (220 trucks from Bluffers Park and 40 from Guildwood Village), it was assumed that trucks would be distributed as follows:

Bluffers Park Access:

- 20 percent (of 220) coming from the west on Kingston Road turning right on to Brimley Road – inbound and outbound
- 50 percent (of 220) coming from the east on Kingston Road turning left on to Brimley Road – inbound and outbound
- 30 percent (of 220) coming from the north via Brimley Road off of Highway 401 – inbound and outbound

Guildwood Village Access:

- Morningside at Kingston Road (inbound):
  - 30 percent (of 40) coming from the north on Morningside Road (from Highway 401)
  - 50 percent (of 40) from the east on Kingston Road
  - 20 percent (of 40) from the west on Kingston Road
- Galloway Road at Kingston Road (outbound):
  - 20 percent (of 40) going to the west on Kingston Road

- 80 percent (of 40) going to the east Kingston Road

For this particular time period, October to April, 220 trucks per day were split up over a ten hour work day (from 7:00AM to 5:00AM) in order to get the volume associated with the Bluffers Park access. The peak hour volume of 22 trucks at Bluffers Park was then assigned based on the distribution discussed, to analyze the operations at the intersections along the proposed truck route.

No growth was applied in this analysis. The construction truck traffic was added to the existing traffic volumes to investigate the impact.

Please note that the sensitivity test completed for May to September construction times provided the Guildwood Village access routes which were used for the October to April worst-case scenario.

3.4 OTHER CRITERIA ANALYSIS AND RESULTS

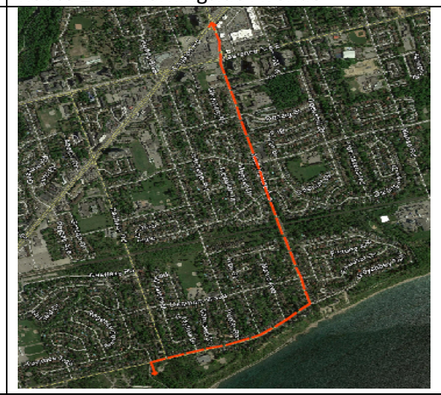
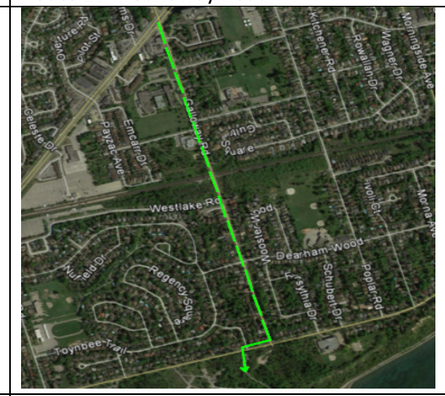
Other impacts as described in Section 3.2 were assessed and are presented in Table 3-5 along with the results obtained from the LOS analysis.

Based on all impacts on each route the following is recommended for each time frame:

→ **October to April** – There are no sidewalk connections on Brimley Road 370m south of Kingston Road which causes high pedestrian and cycling activity to be on the roadway during the peak summer season. Additionally, October to April does not have high pedestrian or cycling activity on the roadway, therefore, it is recommended Brimley Road be used for construction of the West Segment components and the Sylvan Headland component of the Central Segment. It is also recommended that remaining components of the Central Segment and the East Segment be built via the Guildwood Village Community utilizing inbound access south along Morningside Avenue and west along Guildwood Parkway and outbound access north along Galloway Road. Constructing the Sylvan component via Brimley Road will help to alleviate traffic through the Guildwood Village Community.

→ **May to September** – As mentioned before the Brimley Road Access will not be in use. It is recommended that Morningside Avenue is utilized for inbound truck traffic and Galloway Road is utilized for outbound truck traffic. Pedestrian generators are mainly schools which are closed from end of June to beginning of September and the intersections can handle the extra traffic. There is no TTC service on Galloway Road south of Kingston Road and the majority of the roadway has no sidewalks which reduces the level of pedestrian activity.

Table 3-5 – Route Descriptions

Category/Criteria	Route 1 – Brimley Road	Route 2A – Morningside Avenue	Route 2B – Galloway Road	Route 3 – Guildwood Parkway
				
Level of Service • Study intersections on each route was analyzed with construction truck traffic added to the network in order to determine volume capacity ratios and queueing lengths	• LOS of D and C in the AM and PM peak hour during the fall/winter-season at Brimley Road and Kingston Road with inbound and outbound truck traffic	• All intersections operate at an acceptable LOS and all movements can accommodate extra truck traffic without significant delay with inbound truck traffic • With outbound truck traffic there are significant delays on left turns throughout the study intersections	• Capacity and delay problems for left turns during the fall/winter-season that would affect traffic using the route alongside inbound and outbound truck traffic	• Capacity and delay problems for left turns during the fall/winter-season that would affect traffic using the route alongside inbound and outbound truck traffic
Transit Impact • TTC bus routes servicing the study area coincide with some proposed truck routes. • These bus routes were reviewed and probable conflicts were determined and rated	• 12C bus operates on only part of the route • Travels on Brimley Road to Barkdene Hills • Morning buses start operating at 9:39 AM with 2-3 buses per hour during the AM peak and 4 buses per hour during the PM peak	• 116A and 116C buses operate on this route • Frequency of 12 buses per hour during the AM peak hours and 12-13 buses per hour during the PM peak hours	• No TTC transit service on Galloway Road	• 116A and 116C buses operate on this route • Frequency of 11-12 buses per hour during the AM peak hours and 12-13 buses per hour during the PM peak hours
Pedestrian Activity Impact • The study area has pedestrians sharing some of the roadways with vehicular traffic • Schools and crosswalks were looked at as specific locations were pedestrian activity would be highest	• Blessed Cardinal Newman Catholic School on Brimley Road approximately 370m south of Kingtson Road • Sidewalk only present on west side from Kingston Road to Blessed Cardinal Newman Catholic School entrance	• Two schools on the route: St. Martin de Porres Catholic School (approx. 130m south of intersection with Lawrence Avenue) and Jack Miner Senior Public School (approx. 270m east of Navarre Crescent intersection) • Sidewalks present all along route except on south side of Guildwood Parkway between Poplar Road and Morningside Avenue and west side of Morningside Avenue approximately 180m north and 80	• Maplewood High School on the route (approx. 290m south of intersection with Kingston Avenue) • Boys and Girls Club of East Scarborough on the route • Sidewalks only present on both sides between Kingston Road and Coronation Drive, then on west side only from Coronation Drive to Dunera Avenue	• Sir Wilfrid Laurier Collegiate Institute on the route (approx. 130m east of intersection with Livingston Road • Shopping plaza on Guildwood Parkway and Livingston Road • Sidewalks present all along the route • Three crosswalk locations

		south of where the railway crosses the roadway • Ten crosswalk locations	• Five crosswalk locations	
Cyclist Activity • The study area has signed bike routes which coincide with some proposed truck routes. • These routes were reviewed as cyclists and motorists would be sharing the roadways and were analyzed for probable conflicts	• No designated shared bike route or multi-use trail	• Designated shared bike route	• Designated shared bike route	• Shared bike route on a short segment (740m between Livingston Road and Navarre Crescent
Type of Road • The roadways' designations were reviewed • The condition of the roadways were identified to determine if they could accommodate the scheduled construction truck traffic • Number of lanes were taken into consideration as well as speed limit	• Two-lane road • High grade/ slope • Poor pavement conditions from Kingston Road to approximately 650m south of the intersection	• Four-lane road • Passes rail grade crossing • Good pavement condition	• Two-lane road (wide lanes) • Passes rail grade crossing • Good pavement condition	• Some sections are four-lane road and others two-lane • No conflict with rail grade crossings • Good pavement condition
Residential Frontage • Roadways with residential frontage were identified	• No residential frontage	• Residential area - multiple driveways	• Residential area - multiple driveways	• No residential driveways on eastern section (from Kingston Avenue to Rowatson Road)
Restrictions • Roadway restrictions were reviewed on the proposed truck routes	• Trucks allowed	• All types of trucks allowed 7:00 a.m. to 7:00 p.m.	• No trucks allowed (except for trucks making local deliveries)	• No trucks allowed (except for trucks making local deliveries)

3.5 CONSTRUCTION TRUCK DISTRIBUTION AND VOLUMES – SELECTED ROUTES

SUMMER SEASON (OFF SCHOOL PERIOD)

The truck distribution used for the selected route option is depicted in Figure 3-1.

Figure 3-2 shows the construction AM and PM peak hour worst-case truck traffic volumes on the selected truck routes accessing Guildwood Village Access.

FALL/WINTER SEASON (OFF SCHOOL PERIOD)

The truck distribution of the selected route option can be seen in Figure 3-3.

Figure 3-4 shows the construction AM and PM peak hour worst-case truck traffic volumes on the selected truck routes used to access the Bluffers Park Access. The Guildwood Access' worst-case volumes only occur during the summer season and have been shown previously in Figure 3-2. Please refer to Table 3-1 for specific truck volumes in each scenario.

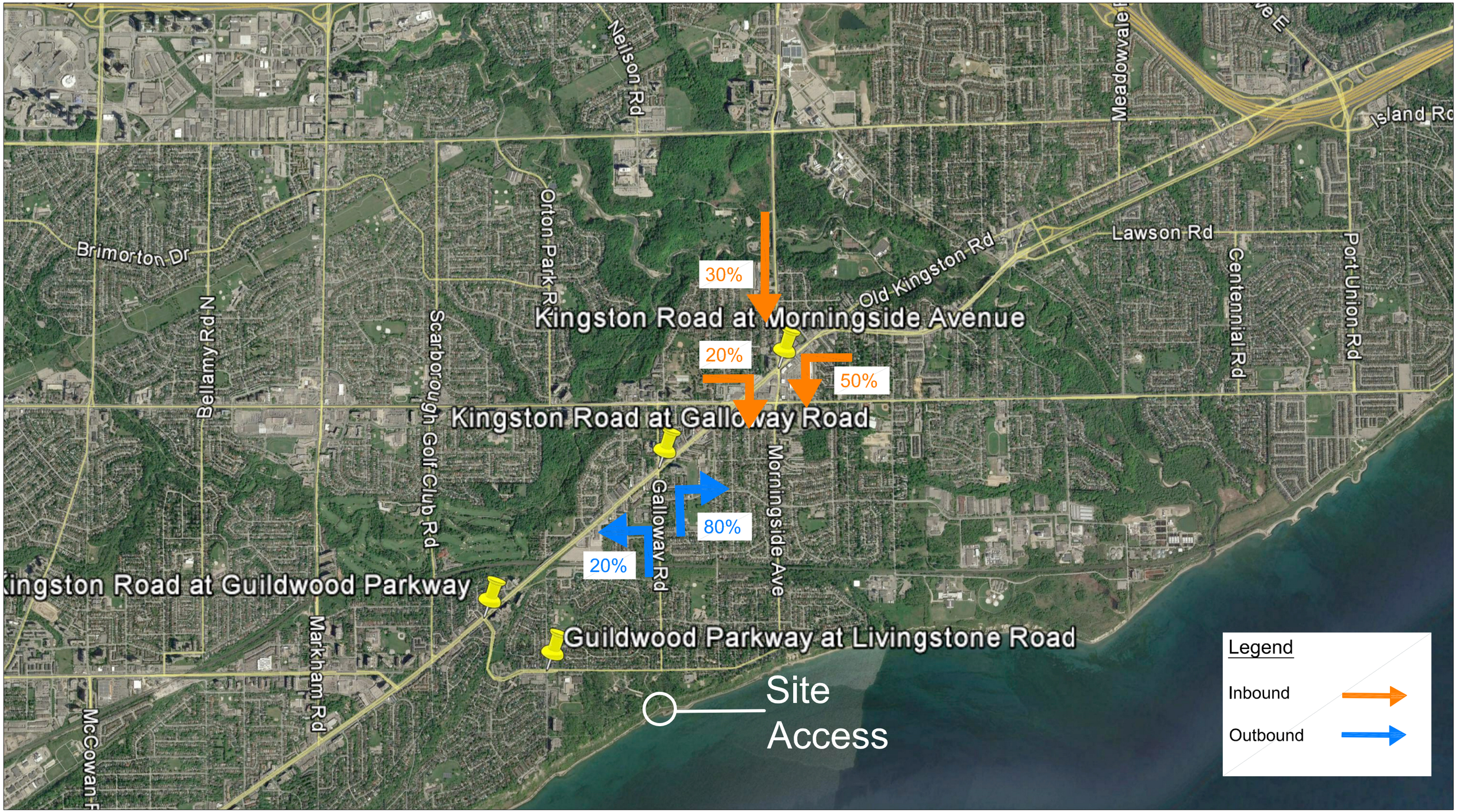
3.6 TOTAL TRAFFIC VOLUMES – SELECTED ROUTES

SUMMER SEASON (OFF SCHOOL PERIOD) TRAFFIC VOLUMES

The following figures, Figure 3-5 and Figure 3-6 show the construction AM and PM peak traffic volumes inclusive of construction truck volumes on the selected truck routes accessing Guildwood Village Access. These were determined by adding the construction truck volumes to the existing traffic volumes.

FALL/WINTER SEASON (SCHOOL PERIOD) TRAFFIC VOLUMES

Figure 3-7 and Figure 3-8 show the construction AM and PM peak hour traffic volumes inclusive of construction truck volumes on the selected truck routes used to access the Bluffers Park Access and the Guildwood Village Access. These were determined by adding the construction truck volumes to the existing traffic volumes.



Source: Google Earth, 2015

Scale: NTS

Figure 3-1
Selected Route Truck Distribution - Summer Season
Toronto and Region Conservation Authority Road Traffic Assessment Study

161-10845-00-TRA_TruckDistribtuion-20161109.dwg _IB

Modified: 6/13/2017 11:44 AM By: racheal.saunders Plot Date: 2017/06/21

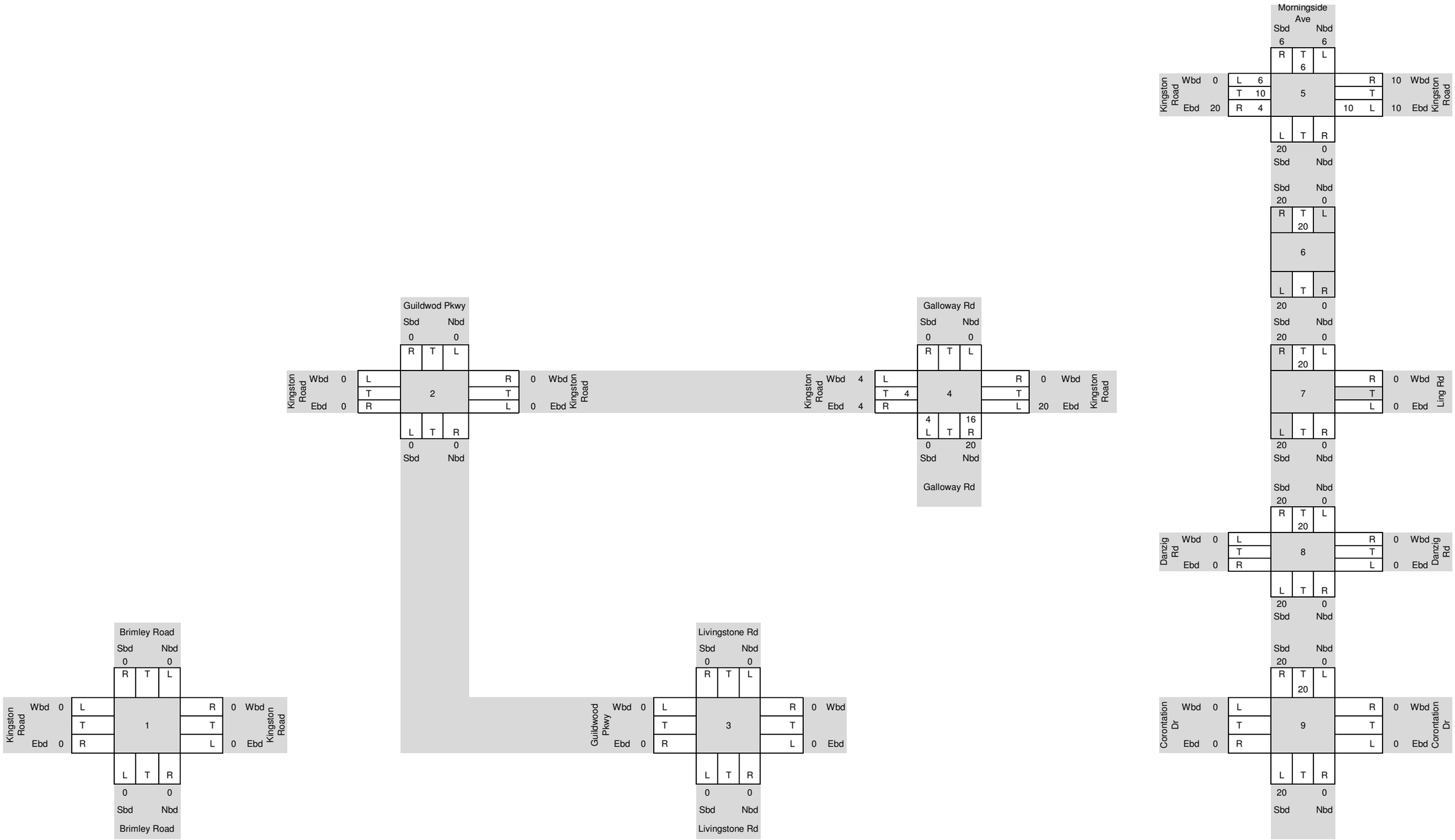
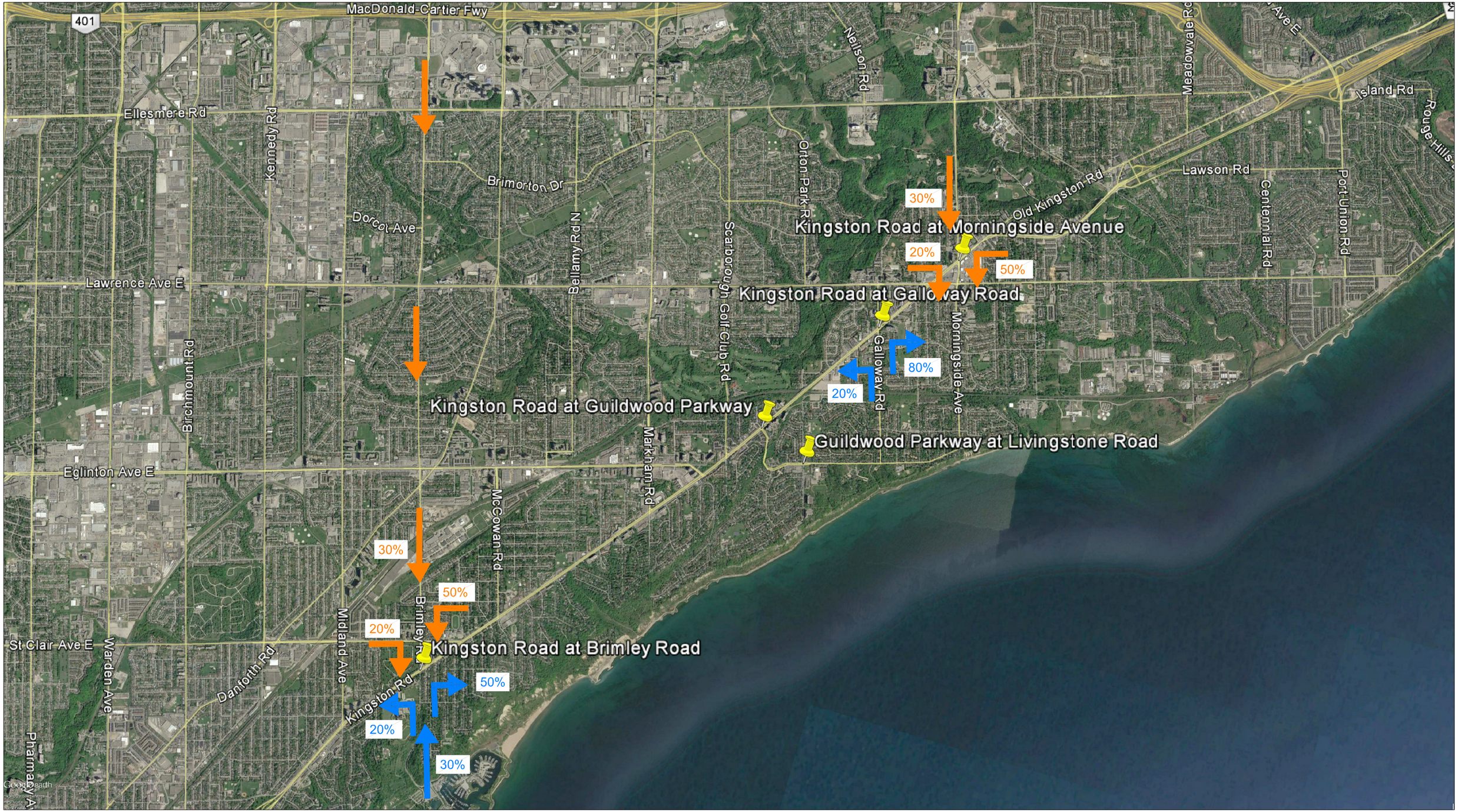


Figure 3-2
Construction Peak Hour Truck Volumes (May-September)
Toronto and Region Conservation Authority Road Traffic Assessment Study

Legend: Wbd: West bound direction; Ebd: East bound direction; Nbd: North bound direction; Sbd: South bound direction; L: Left turn; T: Through; R: Right turn

161-10845-00_TAB_TrafficModel-May-Sept_20160921_v1-0-Morningside-Galloway.xlsx



Source: Google Earth, 2015

Scale: NTS

Figure 3-3
Selected Route Truck Distribution - Fall/Winter Season
Toronto and Region Conservation Authority Road Traffic Assessment Study

161-10845-00-TRA_TruckDistribtuion-20161109.dwg _OB

Modified: 6/13/2017 11:44 AM By: racheal.saunders Plot Date: 2017/06/21

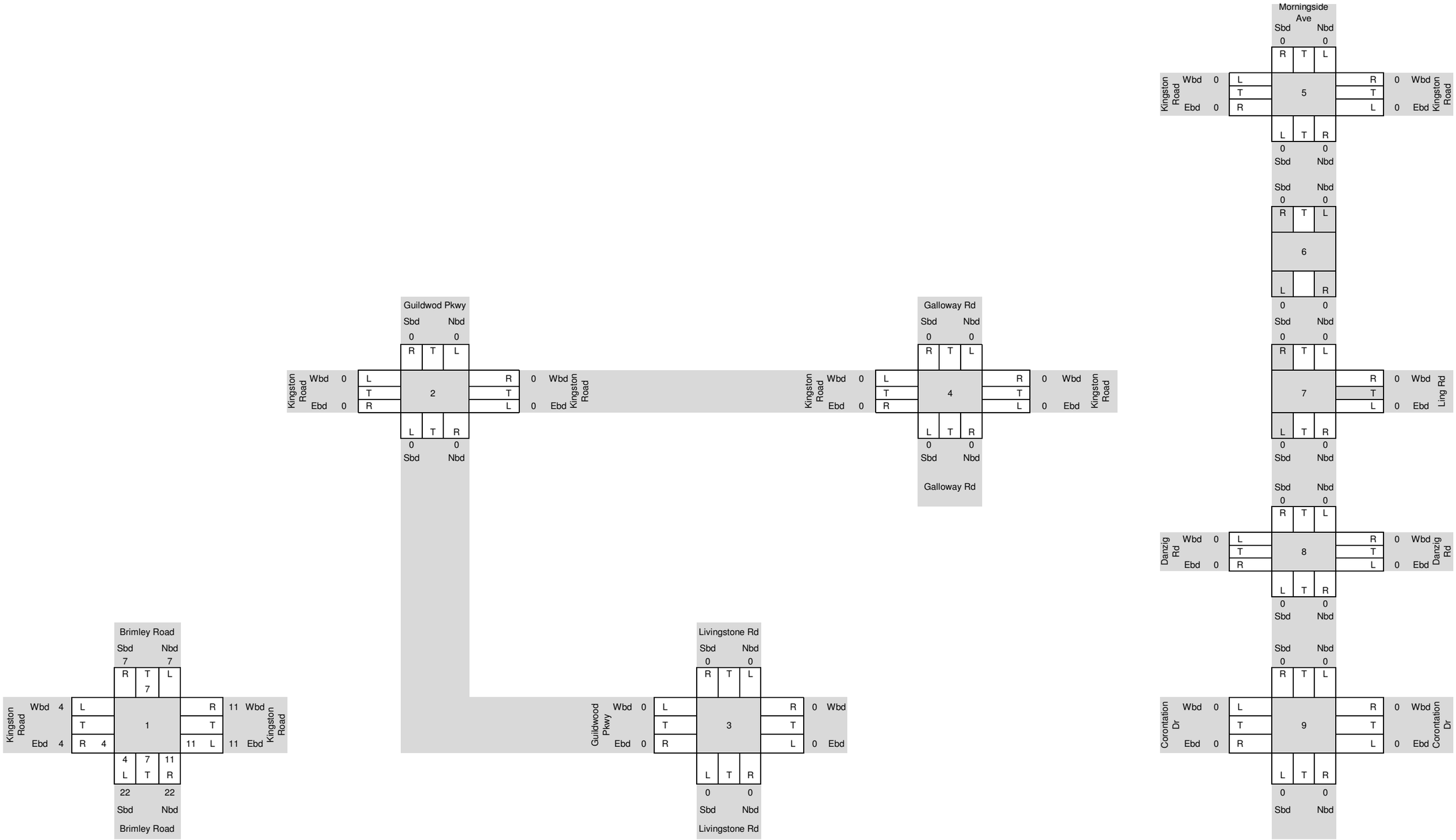


Figure 3-4
Construction Peak Hour Heavy Volumes (October-April)
Toronto and Region Conservation Authority Road Traffic Assessment Study

Legend: Wbd: West bound direction; Ebd: East bound direction; Nbd: North bound direction; Sbd: South bound direction; L: Left turn; T: Through; R: Right turn

161-10845-00_TAB_TrafficModel-Oct-Apr_20161004.xlsx

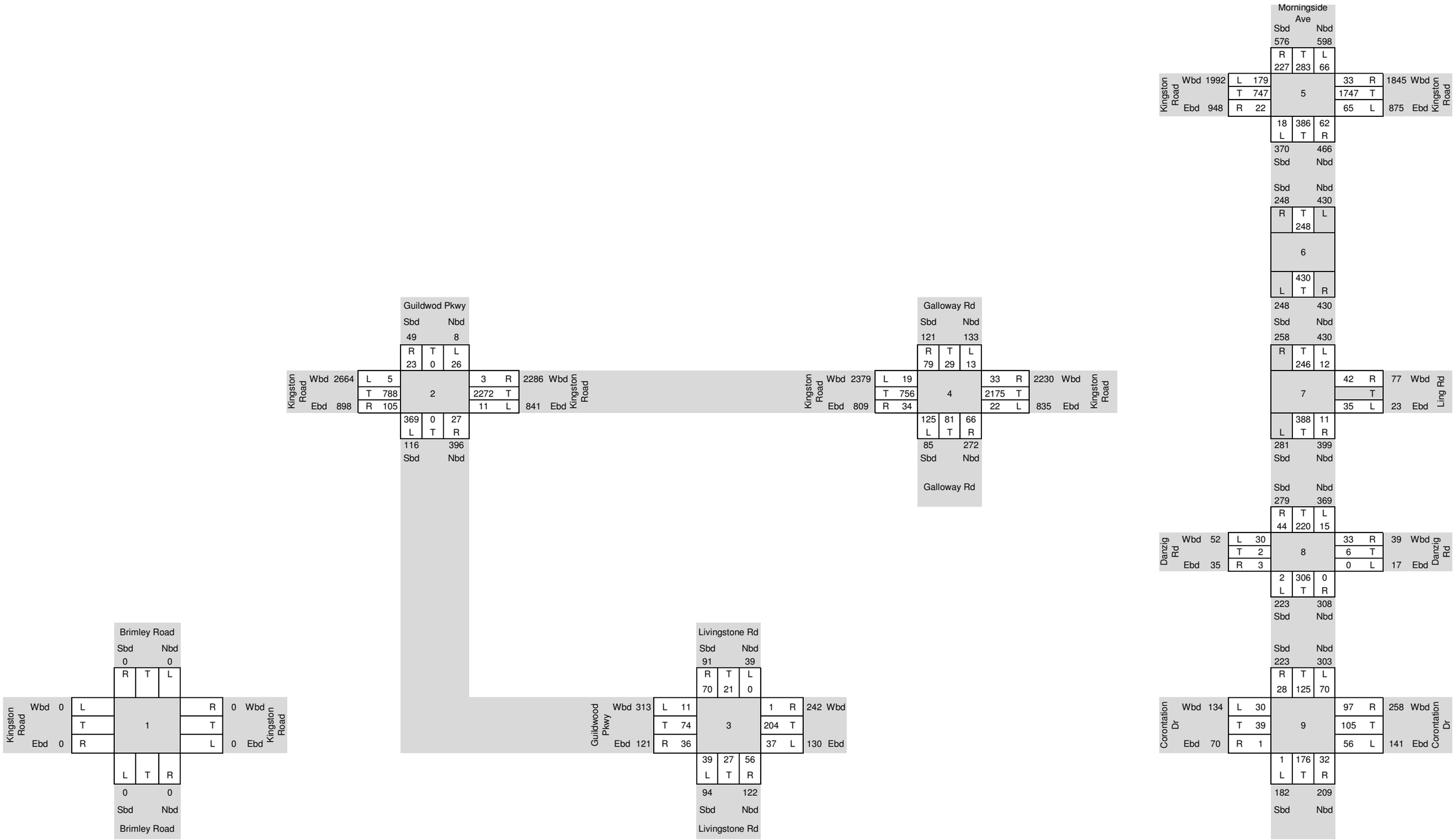


Figure 3-5
Construction AM Peak Hour Volumes (May to September)
Toronto and Region Conservation Authority Road Traffic Assessment Study

Legend: Wbd: West bound direction; Ebd: East bound direction; Nbd: North bound direction; Sbd: South bound direction; L: Left turn; T: Through; R: Right turn

161-10845-00_TAB_TrafficModel-May-Sept_20160921_v1-0-Morningside-Galloway.xlsx

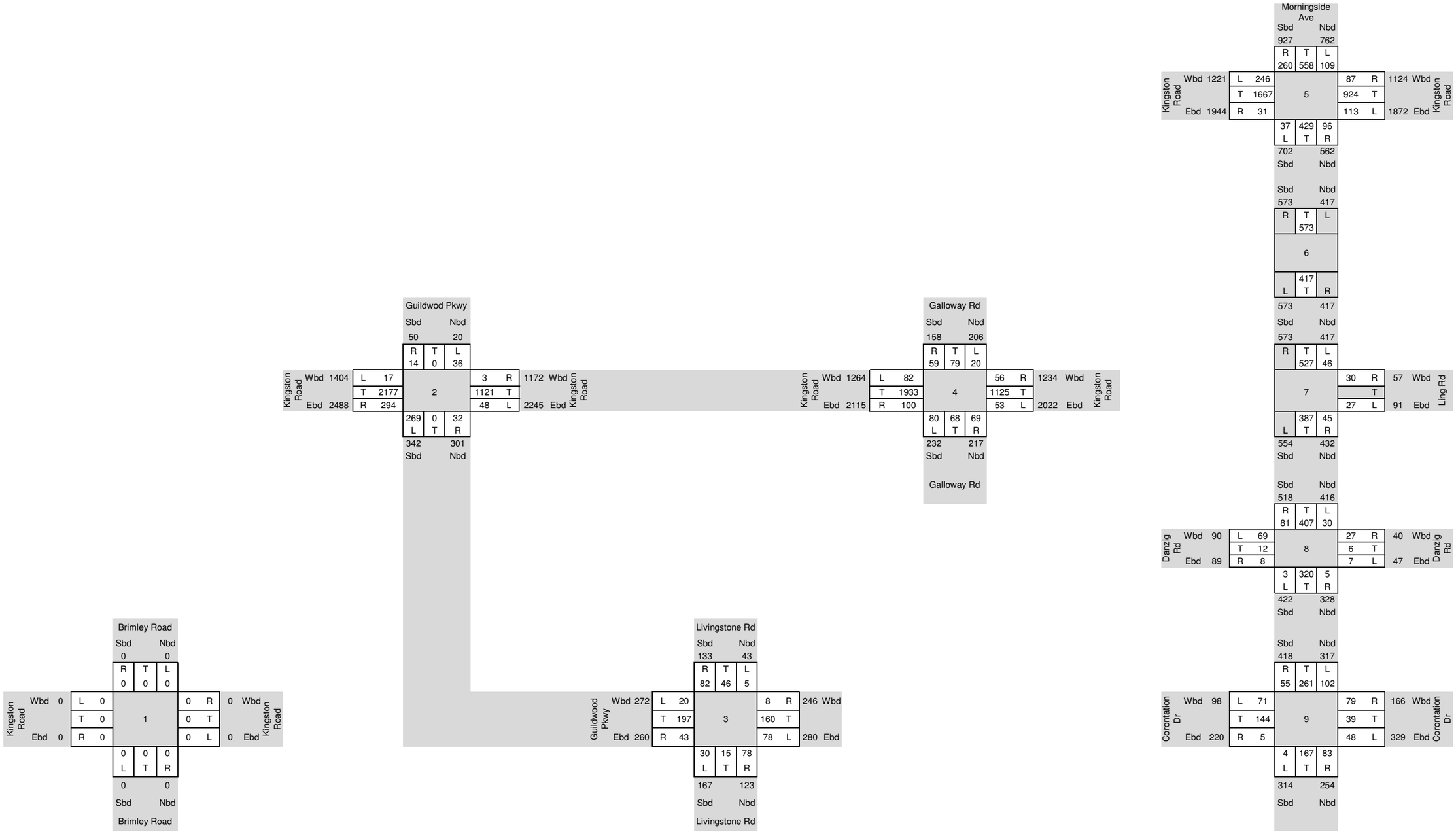


Figure 3-6
Construction PM Peak Hour Volumes (May to September)
Toronto and Region Conservation Authority Road Traffic Assessment Study

Legend: Wbd: West bound direction; Ebd: East bound direction; Nbd: North bound direction; Sbd: South bound direction; L: Left turn; T: Through; R: Right turn

161-10845-00_TAB_TrafficModel-May-Sept_20160921_v1-0-Morningside-Galloway.xlsx

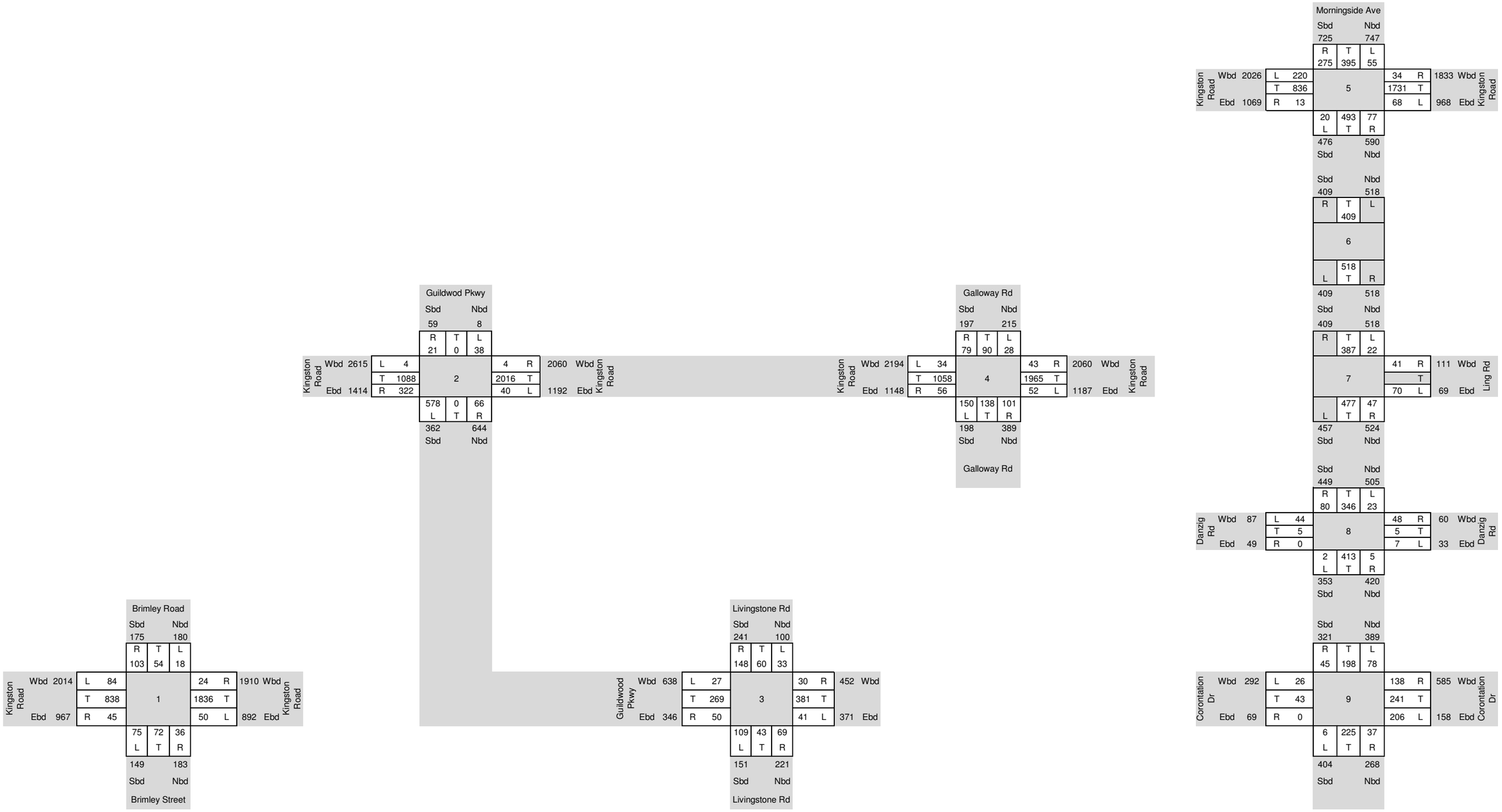


Figure 3-7
Construction AM Peak Hour Heavy Volumes (October to April)
Toronto and Region Conservation Authority Road Traffic Assessment Study

Legend:
Wbd: West bound direction
Ebd: East bound direction
Nbd: North bound direction
Sbd: South bound direction
L: Left turn
T: Through
R: Right turn

161-10845-00_TAB_TrafficModel-Oct-Apr_20161004.xlsx

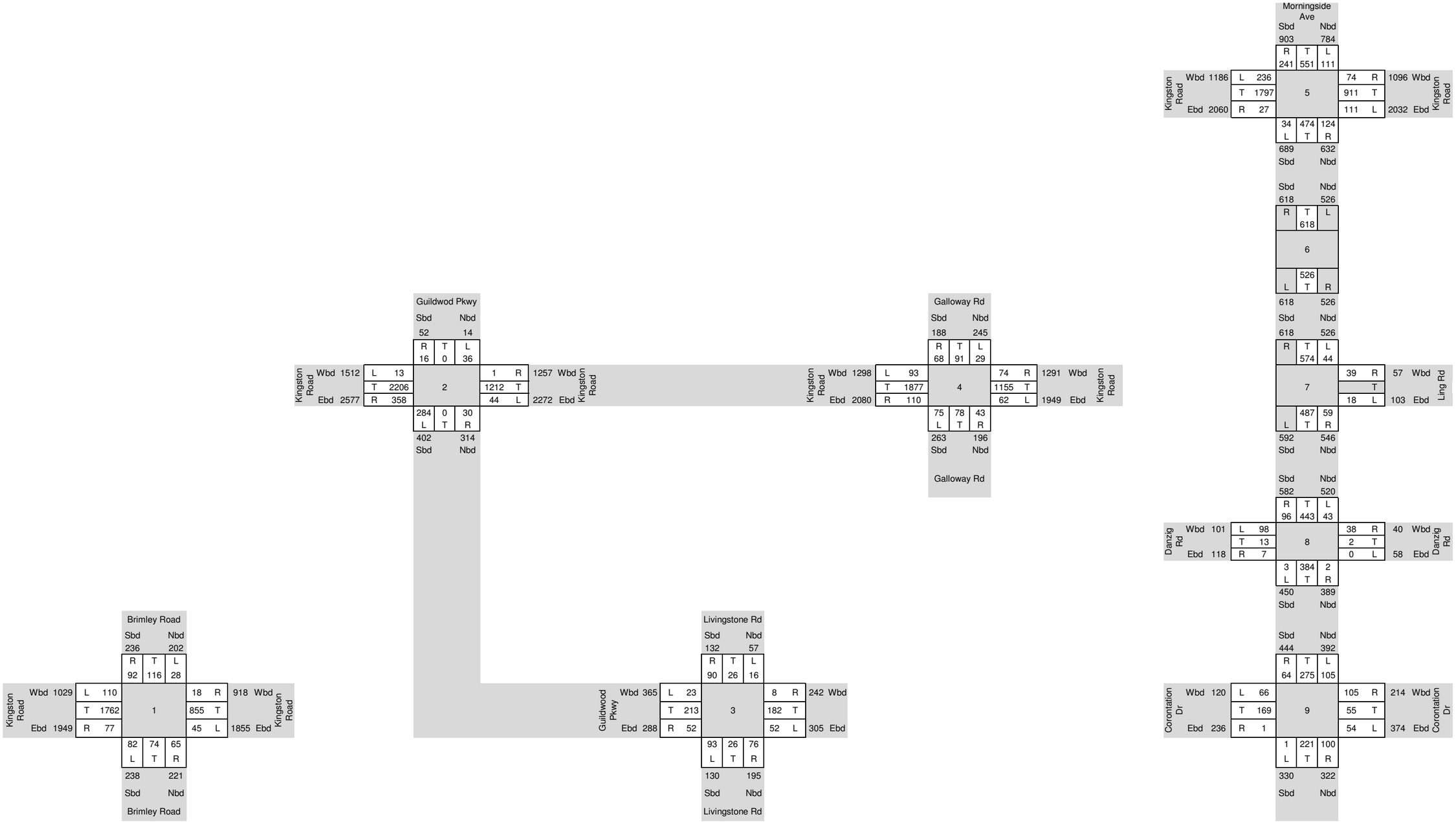


Figure 3-8
Construction PM Peak Hour Heavy Volumes (October to April)
Toronto and Region Conservation Authority Road Traffic Assessment Study

Legend: Wbd: West bound direction; Ebd: East bound direction; Nbd: North bound direction; Sbd: South bound direction; L: Left turn; T: Through; R: Right turn

161-10845-00_TAB_TrafficModel-Oct-Apr_20161004.xlsx

3.7 TRAFFIC ANALYSIS – SELECTED ROUTE

The operation of study intersections was analyzed using Highway Capacity Manual (HCM) methodology, and Synchro 8.0. Queuing at intersections was analyzed using SimTraffic 8.0 software. The analysis assumes the existing lane configurations, adjusted heavy vehicle percentages based on the addition of construction truck traffic and peak hour factors (PHF) determined from existing traffic count volumes.

3.7.1 SUMMER SEASON (OFF SCHOOL PERIOD) CONDITIONS

Table 3-6 provides a summary of intersection level of service (LOS) and volume-to-capacity (V/C) ratios for the signalized intersections analyzed in the study area future summer season (off school period) conditions for the AM and PM peak hours.

Table 3-6 – Construction Summer Season (Off School Period) Traffic Conditions – Signalized Intersections

Intersection Movement	AM Peak Hour			PM Peak Hour		
	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Galloway Road and Kingston Road	**0.71**	**24**	**C**	**0.64**	**23**	**C**
Eastbound Left	0.29	25	C	0.49	27	C
Eastbound Through+Right	0.32	15	B	0.79	24	C
Westbound Left	0.08	13	B	0.79	80	E
Westbound Through+Right	0.86	26	C	0.46	17	B
Northbound Through+Left+Right	0.49	27	C	0.44	26	C
Southbound Through+Left+Right	0.21	23	C	0.23	23	C
Guildwood Parkway/Cromwell Road and Kingston Road	**0.67**	**19**	**B**	**0.59**	**17**	**B**
Eastbound Left	0.07	12	B	0.08	10	B
Eastbound Through	0.29	12	B	0.73	17	B
Eastbound Right	0.08	10	B	0.24	11	B
Westbound Left	0.04	10	B	0.71	63	E
Westbound Through+Right	0.82	21	C	0.38	12	B
Northbound Left	0.41	27	C	0.28	29	C
Northbound Left+Right	0.37	27	C	0.02	27	C
Southbound Left	0.08	24	C	0.07	27	C
Southbound Right	0.02	23	C	0.01	27	C
Livingston Road and Guildwood Parkway	**0.19**	**13**	**B**	**0.20**	**13**	**B**
Eastbound Through+Left+Right	0.10	13	B	0.23	14	B
Westbound Through+Left+Right	0.25	14	B	0.28	15	B
Northbound Through+Left+Right	0.15	11	B	0.13	11	B
Southbound Through+Left+Right	0.08	10	B	0.13	11	B

Morningside Avenue	**0.15**	**8**	**A**	**0.21**	**8**	**A**
Northbound Through	0.24	8	A	0.23	8	A
Southbound Through	0.16	8	A	0.34	9	A
Morningside Avenue and Coronation Drive	**0.22**	**12**	**B**	**0.38**	**13**	**B**
Eastbound Through+Left+Right	0.12	14	B	0.40	16	B
Westbound Left	0.12	14	B	0.13	14	B
Westbound Through+Right	0.25	15	B	0.12	14	B
Northbound Through+Left+Right	0.13	10	A	0.16	10	B
Southbound Through+Left+Right	0.19	10	B	0.36	12	B
Morningside Avenue and Danzig Road	**0.14**	**10**	**B**	**0.25**	**11**	**B**
Eastbound Through+Left+Right	0.06	12	B	0.16	12	B
Westbound Through+Left+Right	0.03	12	B	0.04	12	B
Northbound Left		9	A	0.01	9	A
Northbound Through+Right	0.20	10	B	0.22	10	B
Southbound Left	0.03	9	A	0.07	10	A
Southbound Through+Right	0.18	10	B	0.33	11	B
Morningside Avenue and Kingston Road	**0.68**	**29**	**C**	**0.77**	**29**	**C**
Eastbound Left	0.79	50	D	0.87	46	D
Eastbound Through+Right	0.30	13	B	0.84	31	C
Westbound Left	0.30	24	C	0.56	30	C
Westbound Through+Right	0.86	34	C	0.50	23	C
Northbound Left	0.08	26	C	0.26	26	C
Northbound Through+Right	0.40	29	C	0.41	24	C
Southbound Left	0.27	29	C	0.42	28	C
Southbound Through+Right	0.39	29	C	0.65	29	C

All intersections during the summer season (off school period) will operate at an acceptable LOS of C or better in both the AM and PM peak hours. During the PM peak hour the westbound left movement at Galloway Road and Kingston Road and Guildwood Parkway and Kingston will both operate at LOS of E. The volume to capacity ratio is 0.71 and 0.79 respectively with delays of 63 and 80 seconds. These movements do not have any applied truck traffic and reflects existing level of service.

Table 3-7 provides a summary of the queue analysis for the intersections analyzed in the study area under summer season (off school period) conditions for the AM and PM peak hours. The movements shown only correspond to designated left or right turns.

Table 3-7 – Construction Summer Season (Off School Period) Traffic Conditions – Queues

Intersection Movement	Available Storage	AM Peak Hour 95th Percentile Queues (m)	PM Peak Hour 95th Percentile Queues (m)
Galloway Road and Kingston Road			
Eastbound Left	25	15	58
Westbound Left	18	18	46
Guildwood Parkway/Cromwell Road and Kingston Road			
Eastbound Left	22	5	19
Eastbound Right	49	17	30
Westbound Left	36	17	45
Northbound Left	141*	61	57
Northbound Left/Right	141*	53	48
Southbound Left	23	16	16
Southbound Right	57	12	10
Morningside Avenue and Coronation Drive			
Westbound Left	40	19	17
Morningside Avenue and Danzig Road			
Northbound Left	25	4	3
Southbound Left	30	11	10
Morningside Avenue and Kingston Road			
Eastbound Left	24	45	46
Westbound Left	27	51	58
Northbound Left	28	19	34
Southbound Left	50	23	35

For the summer season, every intersection experiences 95th percentile queueing beyond the available storage except at Morningside Avenue and Coronation Drive and Morningside Avenue and Danzig Road. They occur in both the AM and PM peak periods with the majority taking place on Kingston Road. These queueing results are similar to those experienced in the existing conditions. Therefore adding construction truck traffic is not affecting the queues that are occurring.

3.7.2 FALL/WINTER SEASON (SCHOOL PERIOD) CONDITIONS

Table 3-8 provides a summary of intersection level of service (LOS) and volume-to-capacity (V/C) ratios for the signalized intersections analyzed in the study area under future fall/winter season (school period) conditions for the AM and PM peak hours.

Table 3-8 – Construction Fall/Winter Season (School Period) Traffic Conditions – Signalized Intersections

Intersection Movement	AM Peak Hour			PM Peak Hour		
	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Brimley Road and Kingston Road	**0.63**	**33**	**C**	**0.59**	**27**	**C**
Eastbound Left	0.58	28	C	0.36	14	B
Eastbound Through+Right	0.37	15	B	0.81	29	C
Westbound Left	0.33	25	C	0.33	22	C
Westbound Through+Right	0.97	43	D	0.43	24	C
Northbound Left	0.23	25	C	0.25	25	C
Northbound Through+Right	0.21	25	C	0.21	24	C
Southbound Left	0.05	23	C	0.07	23	C
Southbound Through+Right	0.23	25	C	0.32	26	C
Galloway Road and Kingston Road	**0.79**	**24**	**C**	**0.68**	**23**	**C**
Eastbound Left	0.53	44	D	0.59	33	C
Eastbound Through+Right	0.45	17	B	0.76	23	C
Westbound Left	0.30	19	B	0.91	109	F
Westbound Through+Right	0.79	24	C	0.48	17	B
Northbound Through+Left+Right	0.79	39	D	0.36	25	C
Southbound Through+Left+Right	0.34	25	C	0.28	24	C
Guildwood Parkway/Cromwell Road and Kingston Road	**0.70**	**18**	**B**	**0.59**	**17**	**B**
Eastbound Left	0.05	11	B	0.06	10	A
Eastbound Through	0.40	13	B	0.73	17	B
Eastbound Right	0.22	12	B	0.28	12	B
Westbound Left	0.19	13	B	0.64	52	D
Westbound Through+Right	0.73	18	B	0.41	12	B
Northbound Left	0.63	31	C	0.29	29	C
Northbound Left+Right	0.59	30	C	0.02	27	C
Southbound Left	0.17	24	C	0.07	27	C
Southbound Right	0.01	23	C	0.01	27	C
Livingston Road and Guildwood Parkway	**0.51**	**15**	**B**	**0.42**	**14**	**B**
Eastbound Through+Left+Right	0.40	16	B	0.37	15	B
Westbound Through+Left+Right	0.52	17	B	0.37	15	B
Northbound Through+Left+Right	0.51	14	B	0.47	13	B
Southbound Through+Left+Right	0.39	13	B	0.28	12	B
Morningside Avenue	**0.18**	**9**	**A**	**0.22**	**8**	**A**
Northbound Through	0.30	9	A	0.29	8	A
Southbound Through	0.25	8	A	0.35	9	A

Intersection Movement	AM Peak Hour			PM Peak Hour		
	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Morningside Avenue and Coronation Drive	**0.40**	**14**	**B**	**0.39**	**13**	**B**
Eastbound Through+Left+Right	0.13	14	B	0.38	16	B
Westbound Left	0.46	17	B	0.13	14	B
Westbound Through+Right	0.59	18	B	0.15	14	B
Northbound Through+Left+Right	0.18	10	B	0.18	10	B
Southbound Through+Left+Right	0.26	11	B	0.40	12	B
Morningside Avenue and Danzig Road	**0.20**	**11**	**B**	**0.30**	**11**	**B**
Eastbound Through+Left+Right	0.09	12	B	0.23	13	B
Westbound Through+Left+Right	0.05	12	B	0.03	12	B
Northbound Left		9	A	0.01	9	A
Northbound Through+Right	0.29	11	B	0.26	11	B
Southbound Left	0.06	10	A	0.11	10	B
Southbound Through+Right	0.28	11	B	0.36	12	B
Morningside Avenue and Kingston Road	**0.72**	**30**	**C**	**0.80**	**32**	**C**
Eastbound Left	0.76	44	D	0.87	46	D
Eastbound Through+Right	0.30	13	B	0.93	38	D
Westbound Left	0.30	26	C	0.54	30	C
Westbound Through+Right	0.87	36	D	0.51	24	C
Northbound Left	0.12	27	C	0.25	26	C
Northbound Through+Right	0.50	31	C	0.49	26	C
Southbound Left	0.28	30	C	0.54	34	C
Southbound Through+Right	0.53	32	C	0.66	29	C

All intersections during the fall/winter season (school period) will operate at an acceptable LOS of C or better in both the AM and PM peak hours. During the PM peak hour the westbound left movement at Galloway Road and Kingston Road operates at LOS of F. The volume to capacity ratio is 0.91 with a delay of 109 seconds. This movement does not have any applied truck traffic and reflects existing level of service.

Table 3-9 provides a summary of the queue analysis for the intersections analyzed in the study area under fall/winter season (school period) conditions for the AM and PM peak hours. The movements shown only correspond to designated left or right turns.

Table 3-9 – Construction Fall/Winter Season (Off School Period) Traffic Conditions – Queues

Intersection Movement	Available Storage	AM Peak Hour 95th Percentile Queues (m)	PM Peak Hour 95th Percentile Queues (m)
Brimley Road and Kingston Road			
Eastbound Left	35	31	73
Westbound Left	22	44	36
Northbound Left	127*	30	31
Southbound Left	136*	4	9
Galloway Road and Kingston Road			
Eastbound Left	25	38	60
Westbound Left	18	27	54
Guildwood Parkway/Cromwell Road and Kingston Road			
Eastbound Left	22	10	21
Eastbound Right	49	32	36
Westbound Left	36	47	48
Northbound Left	141*	94	56
Northbound Left+Right	141*	80	47
Southbound Left	23	19	17
Southbound Right	57	13	11
Morningside Avenue and Coronation Drive			
Westbound Left	40	43	22
Morningside Avenue and Danzig Road			
Northbound Left	25	3	4
Southbound Left	30	12	12
Morningside Avenue and Kingston Road			
Eastbound Left	24	49	50
Westbound Left	27	58	50
Northbound Left	28	25	29
Southbound Left	50	27	68

*Note: Link Distance

For the fall/winter season (school period), every intersection experiences 95th percentile queueing beyond the available storage except at Morningside Avenue and Coronation Drive and Morningside Avenue and Danzig Road. They occur in both the AM and PM peak periods with the majority taking place on Kingston Road. These queueing results are similar to those experienced in the existing conditions. Therefore adding construction truck traffic is not affecting the queues that are occurring.

3.8 MITIGATION MEASURES

In order to ameliorate the potential impact of construction heavy vehicle traffic on local roads the following measures are recommended:

1. Provide a dedicated northbound right-turn lane at the intersection of Brimley Road and Kingston Road.

2. The section approximately 700m of Brimley Road from Kingston Road south to the tie with Bluffers Park entrance should be monitored for potential resurfacing. However, based on the City of Toronto staff information, Brimley Road south of Kingston Road is planned for road resurfacing from Kingston Road to Barkdene Hills, in 2020.

3. Cut a portion of the existing speed humps on Bluffers Park Road - access to the beach in order to provide an even surface to regular construction trucks while maintaining the intent of traffic calming for cars. Speed bumps should be painted to mark the vertical change in the road.

4 SUMMARY AND CONCLUSIONS

1. The analysis of existing conditions identifies that all intersections operate with an acceptable LOS of C or better during the summer season (off school period) and an acceptable LOS of D or better during the fall/winter season (school period).

2. Existing 95th percentile queues exceed the available storage on Kingston Road for multiple intersections: Kingston Road and Galloway Road, Guildwood Parkway/Cromwell Road and Kingston Road, Morningside Road and Kingston Road, Brimley Road and Kingston Road.

3. Future 95th percentile queues exceed the available storage on Kingston Road for multiple intersections. They are similar to those seen in the existing conditions which means the capacity and/or delay problems are not caused by future construction traffic.

4. The analysis of future conditions identifies that the selected truck route intersections can accommodate the proposed construction truck volumes with some adjustments to traffic signal times.

5. The road condition assessment identified that Brimley Road route is generally in poor condition. Monitoring is recommended for Morningside Avenue and Galloway Road as they will be taking the trucks entering/exiting the site. Guildwood Parkway is planned for road resurfacing.

6. Transit services were found to be present on all routes except Galloway Road.

7. Construction trucks are exempt to road restrictions and would not be affected by City By-Law regulations.

In conclusion, all year round, trucks travelling to the site are recommended to enter via the Guildwood Village access using the Morningside Route inbound and exit the site via Galloway Route outbound. Based on all criteria presented, especially the level of service at the study intersections, this option would incur the least impact to the roadways while accessing the construction site. From October to April (school season) Brimley access should be used for the construction of the West Segment and may be used for the construction of the Sylvan Headlands (portion of Central Segment) to help remediate heavy traffic through Guildwood Village.

APPENDICES

Appendix A – Study Intersection Turning Movement Count Sheets and Signal Timing Plans

Appendix B – Level of Service (LOS) Definitions for Signalized and Unsignalized Intersections

Appendix C – HCM Intersection Capacity Analysis and Queue Report Sheets

Appendix A

STUDY INTERSECTION TURNING MOVEMENT COUNT SHEETS AND SIGNAL TIMING PLANS

Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Guildwood Pkwy at Livingstone Rd
Site Code : 00000000
Start Date : 8/17/2016
Page No : 5

Peak Hour Data

Peak Hour Begins at 08:00 AM

Cars
Trucks
Heavys
Cyclists

North

Guildwood Pkwy

Out	In	Total
294	123	417
3	1	4
13	13	26
3	3	6
313	140	453

Right	Thru	Left	Peds
35	59	10	19
1	0	0	0
0	13	0	0
0	2	1	0
36	74	11	19

Livingstone Rd

Out	In	Total
34	93	127
0	1	1
0	0	0
5	2	7
39	96	135

Right	Thru	Left	Peds
70	21	0	5
2	0	0	0
0	0	0	0
0	0	0	0
0	1	0	0
68	20	0	5

Guildwood Pkwy

Left	Thru	Right	Peds
35	189	1	18
1	3	0	0
0	11	0	0
1	1	0	0
37	204	1	18

Out	In	Total
114	243	357
0	4	4
14	11	25
2	2	4
130	260	390

Livingstone Rd

Out	In	Total
90	130	220
3	0	3
0	3	3
1	4	5
94	137	231

Left	Thru	Right	Peds
37	23	55	15
0	0	0	0
2	0	1	0
0	4	0	0
39	27	56	15

Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Guildwood Pkwy at Livingstone Rd
Site Code : 00000000
Start Date : 8/17/2016
Page No : 8

Peak Hour Data

Peak Hour Begins at 05:00 PM

Cars
Trucks
Heavys
Cyclists

North

Guildwood Pkwy

	Right	Thru	Left	Peds
Out	43	185	20	21
In	0	0	0	0
Total	0	12	0	0
	0	0	0	0
	43	197	20	21

	Out	In	Total
	252	269	521
	2	0	2
	15	12	27
	3	0	3
	272	281	553

Livingstone Rd

	Left	Thru	Right	Peds
Out	29	15	74	11
In	0	0	0	0
Total	1	0	0	0
	0	0	4	0
	30	15	78	11

	Out	In	Total
	165	129	294
	0	0	0
	0	1	1
	0	4	6
	2		
	167	134	301

Livingstone Rd

	Right	Thru	Left	Peds
Out	80	44	5	27
In	1	0	0	0
Total	1	0	0	0
	0	0	0	0
	2	2	0	0
	82	46	5	27

	Out	In	Total
	42	156	198
	0	1	1
	0	0	0
	1	3	4
	43	160	203

Guildwood Pkwy

	Left	Thru	Right	Peds
Out	78	143	7	20
In	0	1	0	0
Total	0	14	0	0
	0	2	1	0
	78	160	8	20

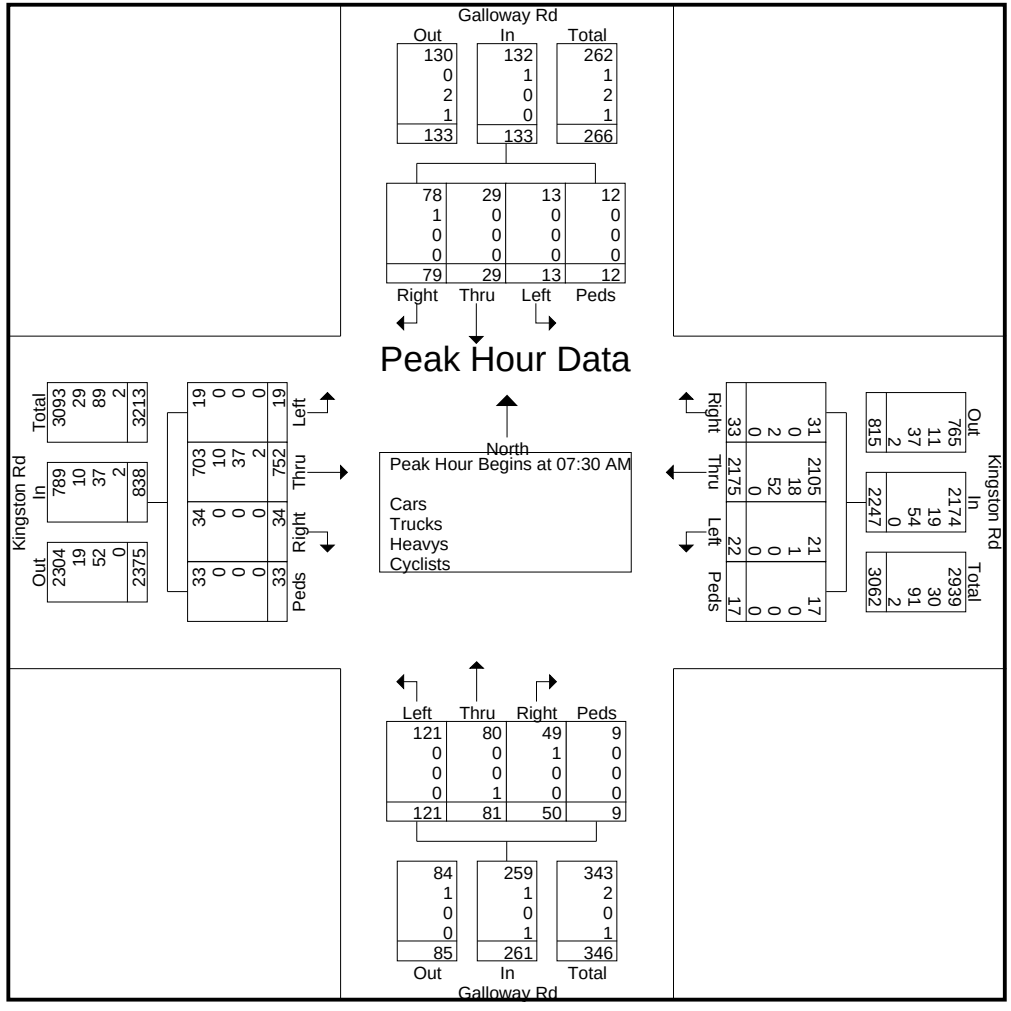
	Out	In	Total
	264	248	512
	0	1	1
	12	14	26
	4	3	7
	280	266	546

Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Kingston Rd at Galloway Rd
Site Code : 00000000
Start Date : 8/17/2016
Page No : 5

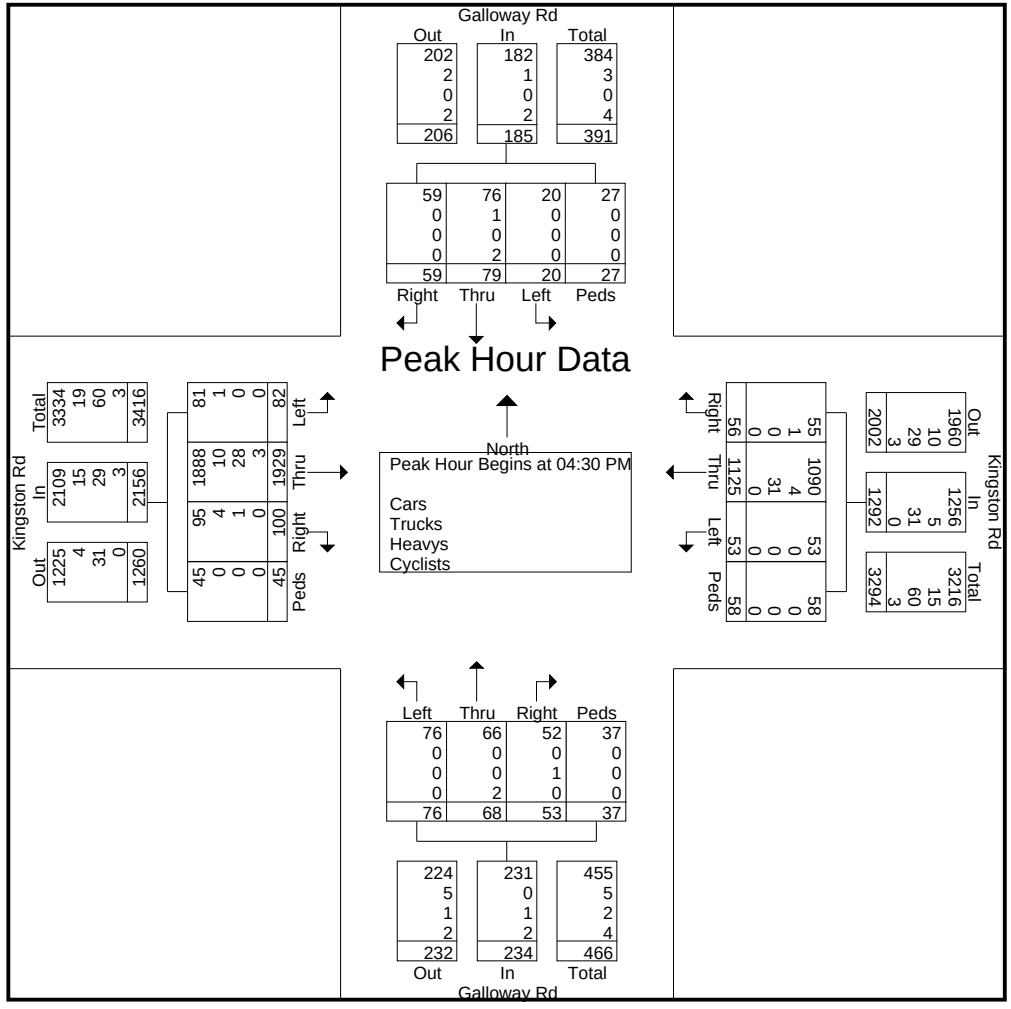


Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Kingston Rd at Galloway Rd
Site Code : 00000000
Start Date : 8/17/2016
Page No : 8



Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Kingston Rd at Guildwood Pkwy
Site Code : 00000000
Start Date : 8/17/2016
Page No : 5

Peak Hour Data

Peak Hour Begins at 07:30 AM

Cars
Trucks
Heavys
Cyclists

North

Cromwell Rd

	Out	In	Total
	8	58	66
	0	0	0
	0	0	0
	0	0	0
	8	58	66

Right	Thru	Left	Peds
23	0	26	9
0	0	0	0
0	0	0	0
0	0	0	0
23	0	26	9

Kingston Rd

	Out	In	Total
	790	2209	2999
	12	24	36
	36	51	87
	3	2	5
	841	2286	3127

Right	Thru	Left	Peds
3	2272	11	0
0	0	0	0
0	23	1	0
0	50	1	0
3	2197	9	0

Kingston Rd

	Out	In	Total
	2573	845	3418
	26	14	40
	63	47	110
	2	4	6
	2664	910	3574

Peds	Right	Thru	Left
12	90	738	5
0	2	12	0
0	12	35	0
0	1	3	0
12	105	788	5

Guildwood Pkwy

Left	Thru	Right	Peds
353	0	26	11
3	0	0	0
13	0	1	0
0	0	0	0
369	0	27	11

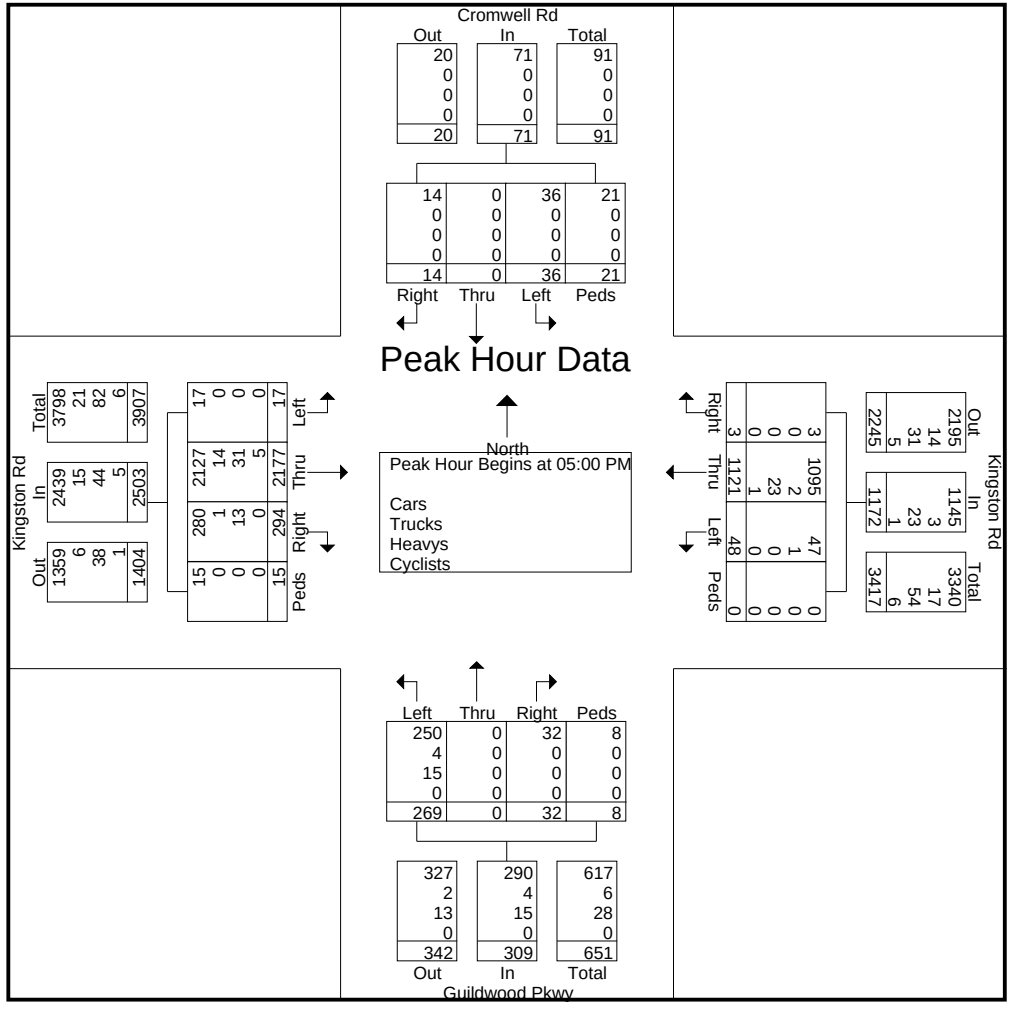
	Out	In	Total
	99	390	489
	3	3	6
	13	14	27
	1	0	1
	116	407	523

Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Kingston Rd at Guildwood Pkwy
Site Code : 00000000
Start Date : 8/17/2016
Page No : 8

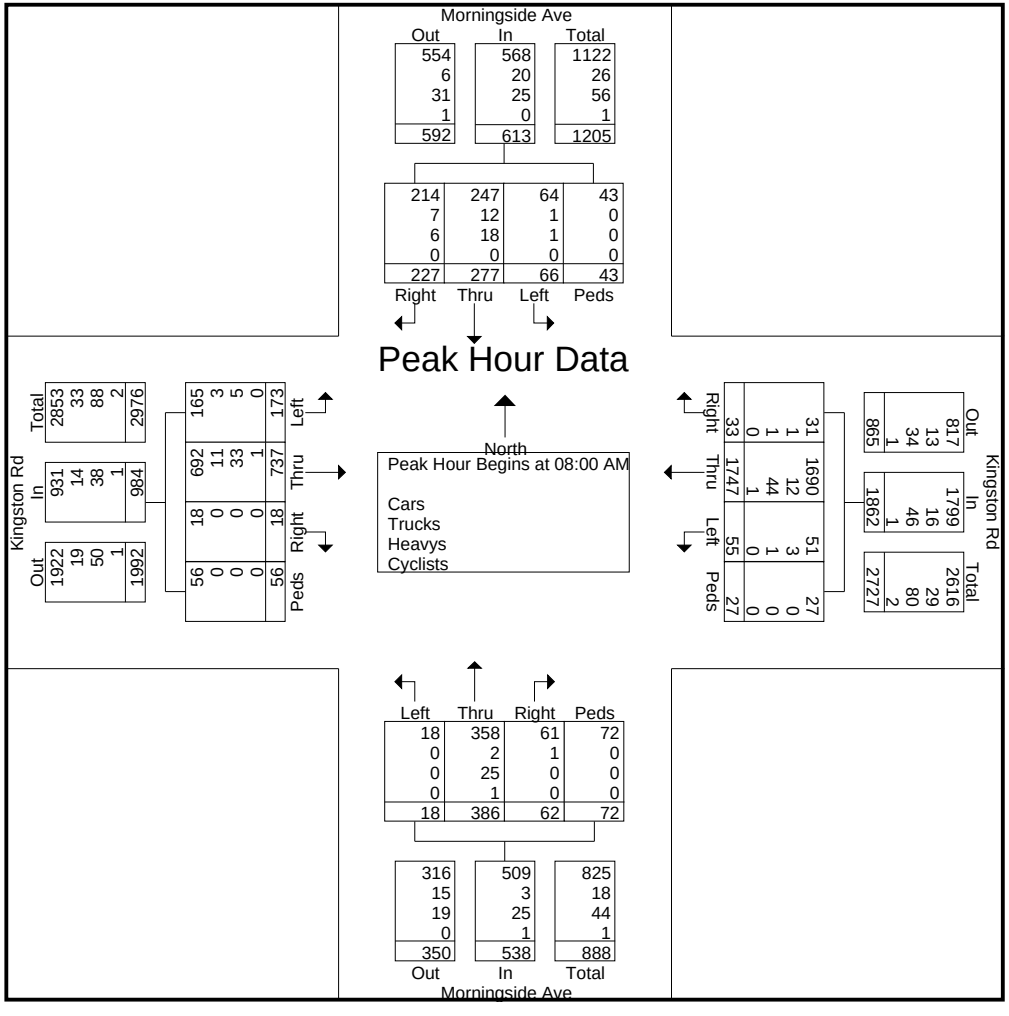


Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Morningside Ave at Kingston Rd
Site Code : 00000000
Start Date : 8/17/2016
Page No : 5

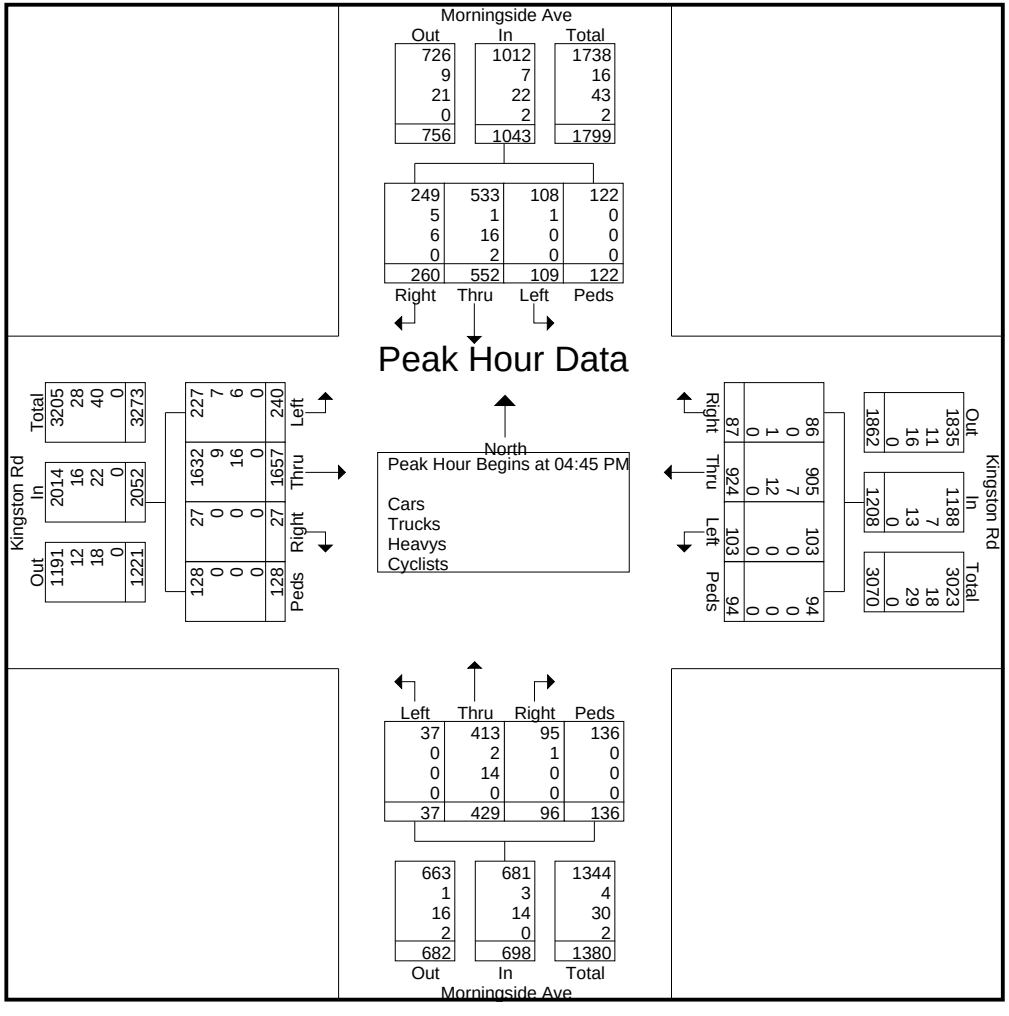


Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Morningside Ave at Kingston Rd
Site Code : 00000000
Start Date : 8/17/2016
Page No : 8

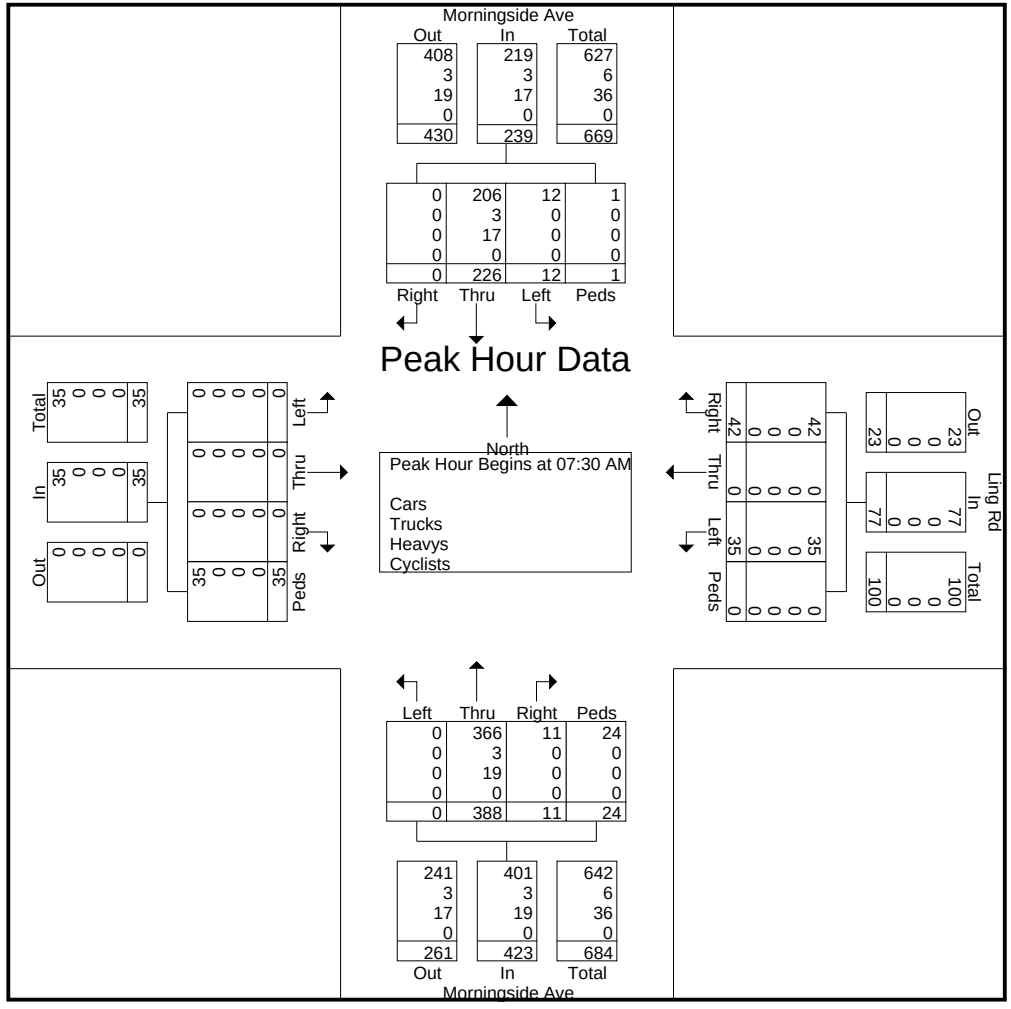


Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Morningside Ave at Ling Rd
Site Code : 00000000
Start Date : 8/17/2016
Page No : 5

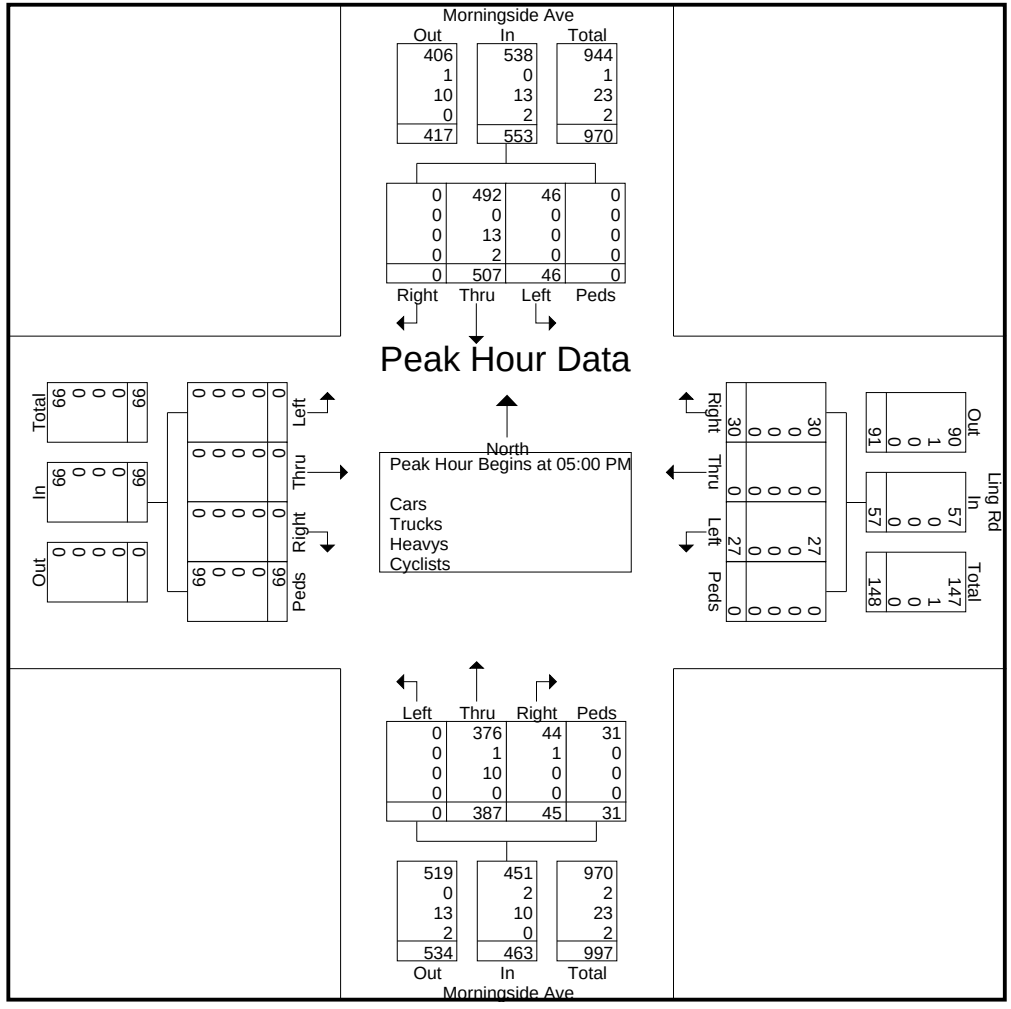


Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Morningside Ave at Ling Rd
Site Code : 00000000
Start Date : 8/17/2016
Page No : 8

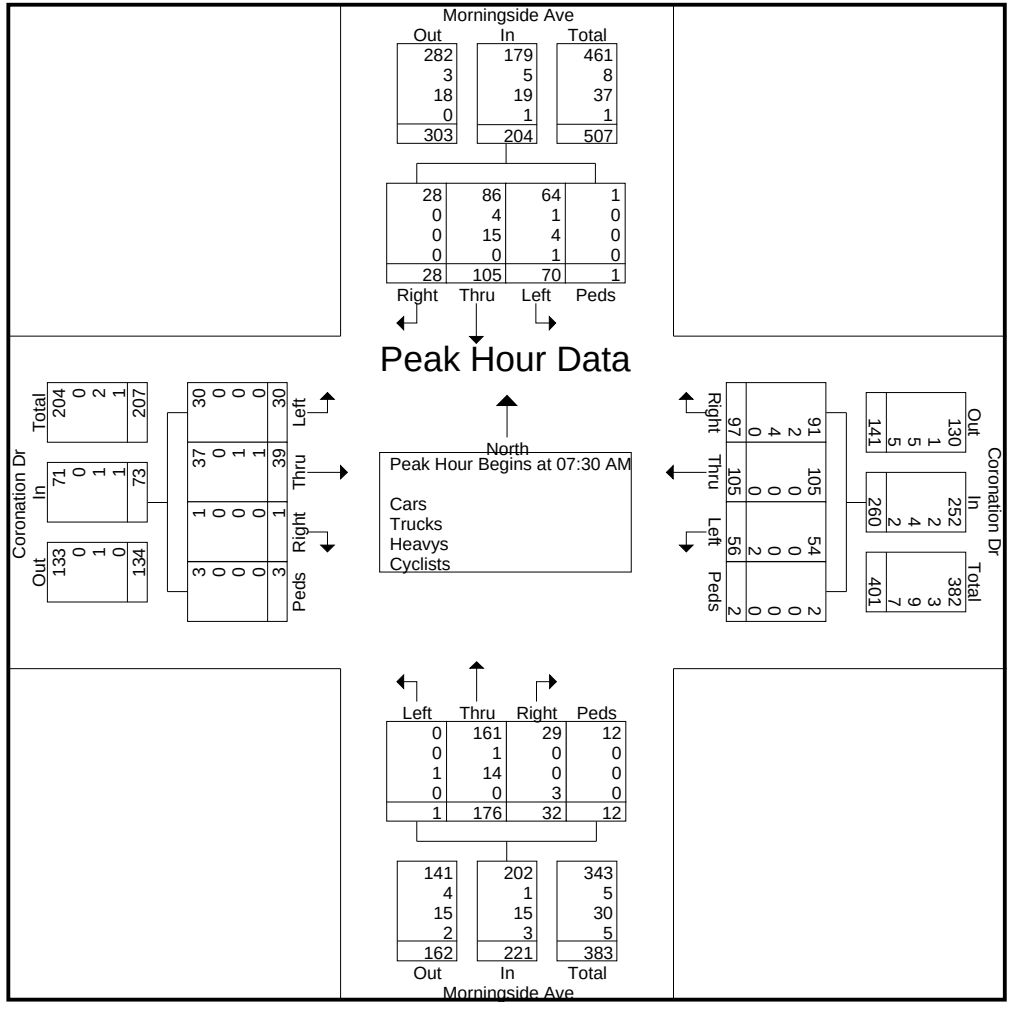


Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Morningside Avenue at Coronation Dr
Site Code : 00000000
Start Date : 8/17/2016
Page No : 5

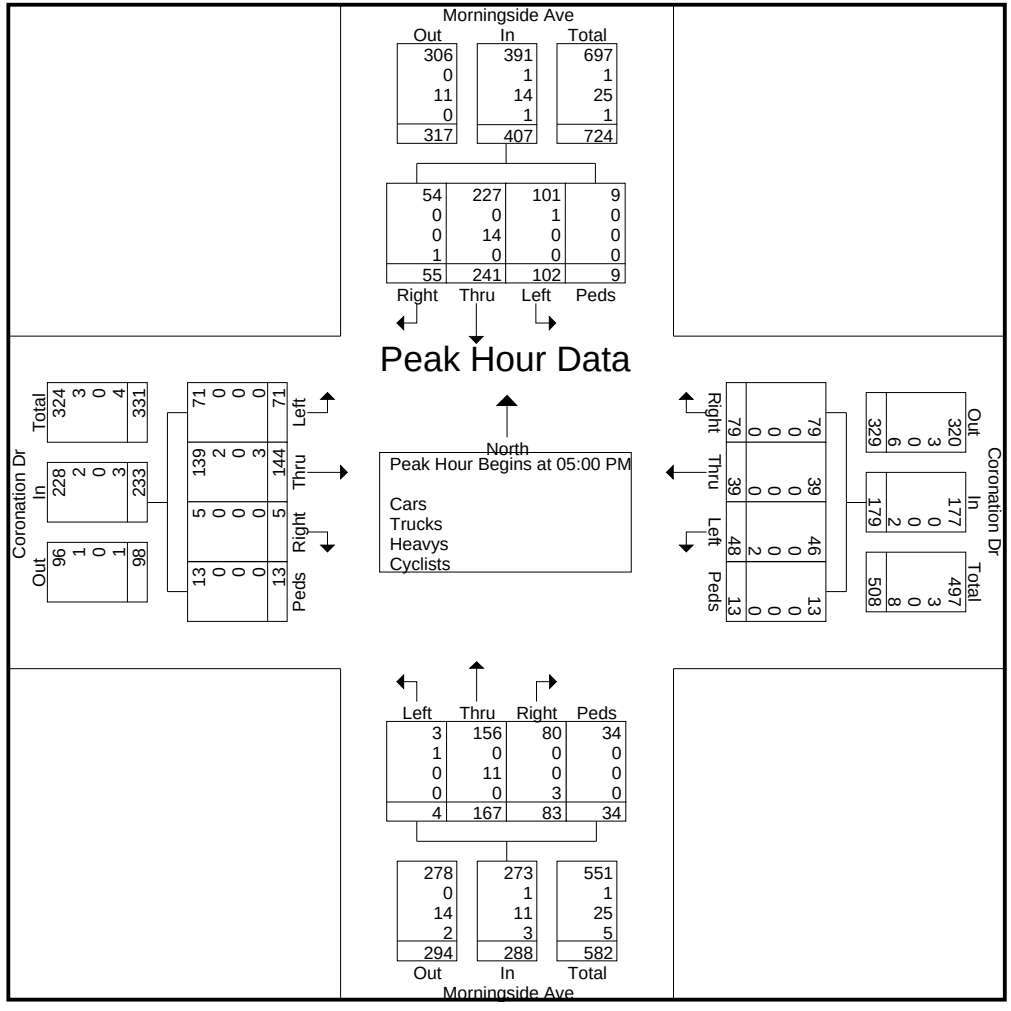


Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Morningside Avenue at Coronation Dr
Site Code : 00000000
Start Date : 8/17/2016
Page No : 8

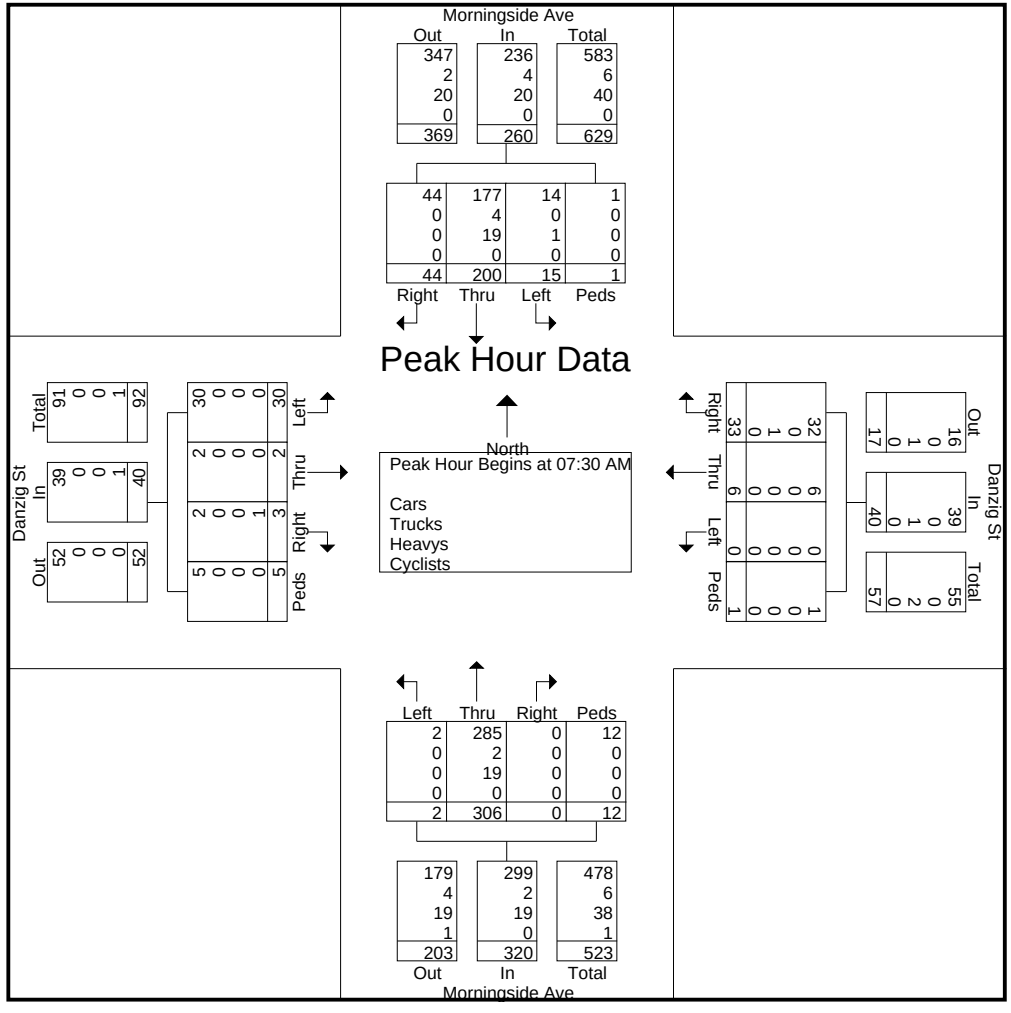


Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Morningside Avenue at Danzig St
Site Code : 00000000
Start Date : 8/17/2016
Page No : 5



Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Morningside Avenue at Danzig St
Site Code : 00000000
Start Date : 8/17/2016
Page No : 8

Peak Hour Data

Morningside Ave

Out	In	Total
404	495	899
2	0	2
10	13	23
0	2	2
416	510	926

Right	Thru	Left	Peds
81	372	30	12
0	0	0	0
0	13	0	0
0	2	0	0
81	387	30	12

Peak Hour Begins at 05:00 PM

Cars
Trucks
Heavys
Cyclists

North

Danzig St

Out	In	Total
90	112	202
0	1	1
0	0	0
0	0	0
90	113	203

Left	Thru	Right	Peds
69	12	7	24
0	0	1	0
0	0	0	0
0	0	0	0
69	12	8	24

Right	Thru	Left	Peds
27	6	7	17
0	0	0	0
0	0	0	0
0	0	0	0
27	6	7	17

Danzig St

Out	In	Total
47	56	103
0	1	1
0	0	0
0	0	0
47	57	104

Left	Thru	Right	Peds
3	309	5	17
0	1	0	0
0	10	0	0
0	0	0	0
3	320	5	17

Out	In	Total
386	334	720
1	1	2
13	10	23
2	0	2
402	345	747

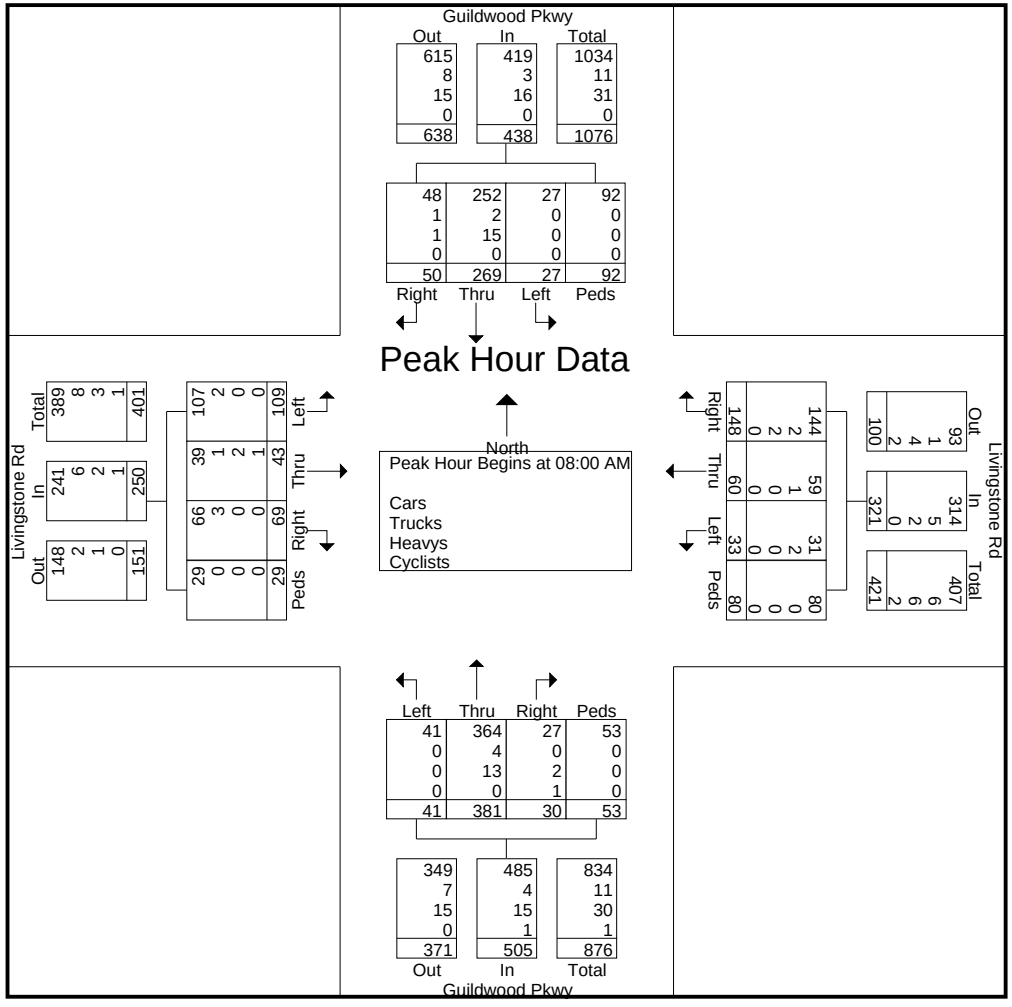
Morningside Ave

Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Guildwood Pkwy at Livingstone Rd
Site Code : 00000000
Start Date : 9/28/2016
Page No : 5



Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Guildwood Pkwy at Livingstone Rd
Site Code : 00000000
Start Date : 9/28/2016
Page No : 8

Peak Hour Data

Peak Hour Begins at 03:00 PM

Cars
Trucks
Heavys
Cyclists

North

Guildwood Pkwy

Out	In	Total
347	407	754
3	1	4
15	12	27
0	1	1
365	421	786

Right	Thru	Left	Peds
52	199	23	133
0	1	0	0
0	12	0	0
0	1	0	0
52	213	23	133

Livingstone Rd

Out	In	Total
55	442	497
1	5	6
0	2	2
1	2	2
57	450	507

Right	Thru	Left	Peds
87	22	15	318
2	2	1	0
1	1	0	0
0	1	0	0
90	26	16	318

Guildwood Pkwy

Left	Thru	Right	Peds
49	168	7	111
1	1	1	0
1	13	0	0
1	0	0	0
52	182	8	111

Out	In	Total
287	335	622
5	3	8
12	14	26
1	1	2
305	353	658

Livingstone Rd

Out	In	Total
123	252	375
3	3	6
2	1	3
2	1	3
130	257	387

Left	Thru	Right	Peds
92	25	73	62
0	0	3	0
1	0	0	0
0	1	0	0
93	26	76	62

Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Kingston Rd at Brimley Rd
Site Code : 00000000
Start Date : 9/28/2016
Page No : 5

Peak Hour Data

Peak Hour Begins at 07:45 AM

Cars
Trucks
Heavys
Cyclists

North

Brimley Rd

Out	In	Total
153	165	318
11	4	15
9	10	19
0	0	0
173	179	352

Right	Thru	Left	Peds
91	47	16	11
3	0	1	0
9	0	1	0
0	0	0	0
103	47	18	11

Kingston Rd

Out	In	Total
844	1847	2691
25	46	71
8	17	25
4	6	10
881	1916	2797

Right	Thru	Left	Peds
21	1773	36	17
3	40	3	0
0	17	0	0
0	6	0	0
24	1836	39	17

Kingston Rd

Out	In	Total
1931	930	2861
44	33	77
27	19	46
8	4	12
2010	986	2996

Peds	Right	Thru	Left
23	32	804	71
0	4	23	6
0	5	7	7
0	0	4	0
23	41	838	84

Left	Thru	Right	Peds
67	61	24	11
1	2	1	0
1	2	0	0
2	0	0	0
71	65	25	11

Brimley Rd

Out	In	Total
115	163	278
7	4	11
5	3	8
0	2	2
127	172	299

Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Kingston Rd at Brimley Rd
Site Code : 00000000
Start Date : 9/28/2016
Page No : 8

Peak Hour Data

Peak Hour Begins at 04:00 PM

Cars
Trucks
Heavys
Cyclists

North

Brimley Rd

Out	In	Total
182	239	421
3	0	3
10	5	15
0	0	0
195	244	439

Right	Thru	Left	Peds
87	109	28	15
0	0	0	0
5	0	0	0
0	0	0	0
92	109	28	15

Kingston Rd In

Right	Thru	Left	Peds
17	844	34	42
1	9	0	0
0	1	0	0
0	1	0	0
18	855	34	42

Out	In	Total
1812	937	2749
24	10	34
6	1	7
2	1	3
1844	949	2793

Kingston Rd Out

Left	Thru	Right	Peds
99	1730	73	12
2	24	0	0
9	6	0	0
0	2	0	0
110	1762	73	12

In	Out	Total
1914	1001	2915
26	11	37
15	12	27
2	1	3
1957	1025	2982

Brimley Rd

Left	Thru	Right	Peds
70	66	54	14
2	0	0	0
6	1	0	0
0	0	0	0
78	67	54	14

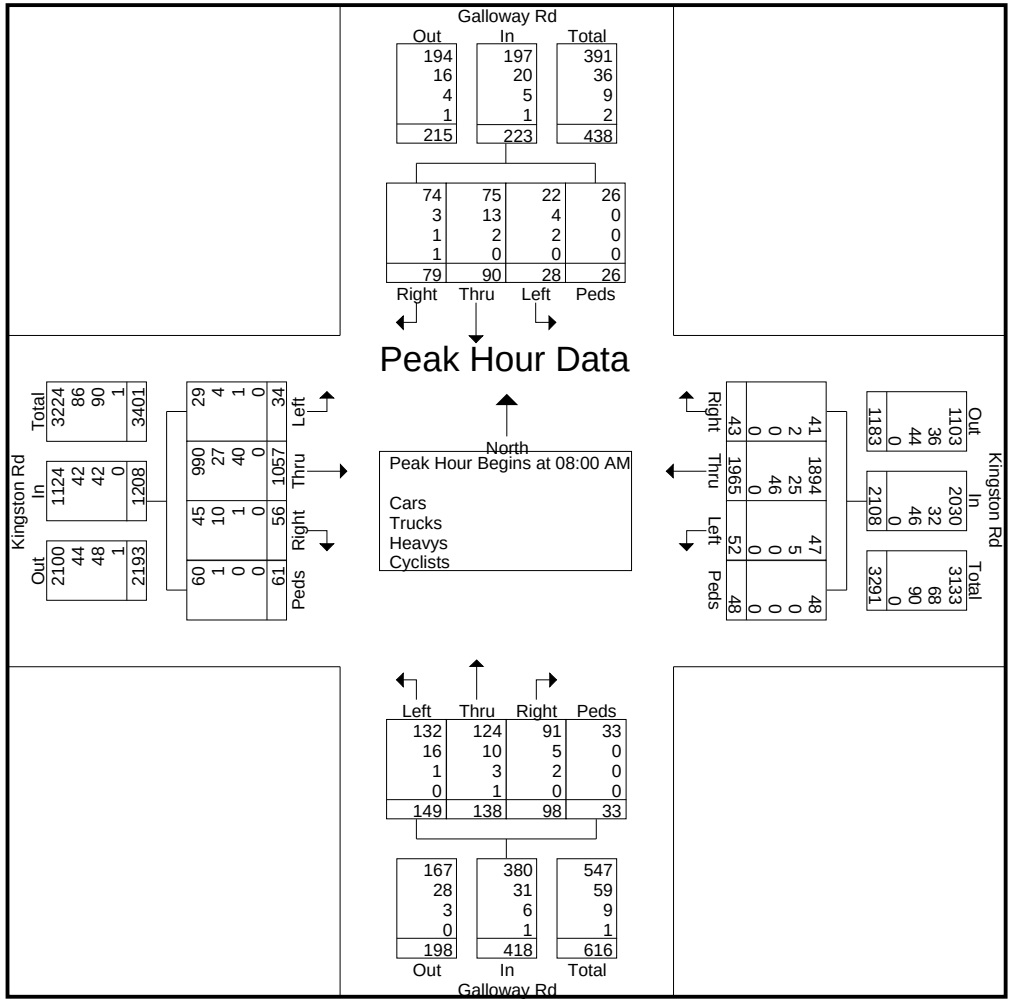
Out	In	Total
216	204	420
0	2	2
0	7	7
0	0	0
216	213	429

Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Kingston Rd at Galloway Rd
Site Code : 00000000
Start Date : 9/28/2016
Page No : 5



Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Kingston Rd at Galloway Rd
Site Code : 00000000
Start Date : 9/28/2016
Page No : 8

Peak Hour Data

Peak Hour Begins at 05:00 PM

Cars
Trucks
Heavys
Cyclists

North

Galloway Rd

Out	In	Total
242	222	464
3	3	6
0	1	1
0	0	0
245	226	471

Right	Thru	Left	Peds
65	90	29	38
3	0	0	0
0	1	0	0
0	0	0	0
68	91	29	38

Kingston Rd

Out	In	Total
1903	1339	3242
13	9	22
27	23	50
2	2	4
1945	1373	3318

Right	Thru	Left	Peds
74	1122	61	82
0	8	1	0
0	23	0	0
0	2	0	0
74	1155	62	82

Kingston Rd

Out	In	Total
1261	2071	3332
11	16	27
23	27	50
2	2	4
1297	2116	3413

Peds	Right	Thru	Left
37	109	1834	91
0	1	13	2
0	0	27	0
0	0	2	0
37	110	1876	93

Galloway Rd

Left	Thru	Right	Peds
74	77	40	45
0	1	0	0
0	0	0	0
0	0	0	0
74	78	40	45

Out	In	Total
260	236	496
2	1	3
1	0	1
0	0	0
263	237	500

Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Kingston Rd at Guildwood Pkwy
Site Code : 00000000
Start Date : 9/28/2016
Page No : 5

Peak Hour Data

Peak Hour Begins at 08:00 AM

Cars
Trucks
Heavys
Cyclists

North

Cromwell Rd

	Out	In	Total
Right	6	75	81
	2	2	4
	0	0	0
	0	0	0
	8	77	85

	Right	Thru	Left	Peds
	19	0	38	18
	2	0	0	0
	0	0	0	0
	0	0	0	0
	21	0	38	18

Kingston Rd

	Out	In	Total
Right	1192	2066	3258
	37	43	80
	39	45	84
	2	0	2
	1114	1978	3092

	Right	Thru	Left	Peds
	3	1931	38	6
	1	40	2	0
	0	45	0	0
	0	0	0	0
	4	2016	40	6

Kingston Rd

	Out	In	Total
Left	2503	1361	3864
	47	39	86
	64	50	114
	1	4	5
	2615	1454	4069

	Left	Thru	Right	Peds
	3	1014	304	40
	1	34	4	0
	0	38	12	0
	0	2	2	0
	4	1088	322	40

Guildwood Pkwy

	Left	Thru	Right	Peds
	553	0	62	7
	5	0	3	0
	19	0	1	0
	1	0	0	0
	578	0	66	7

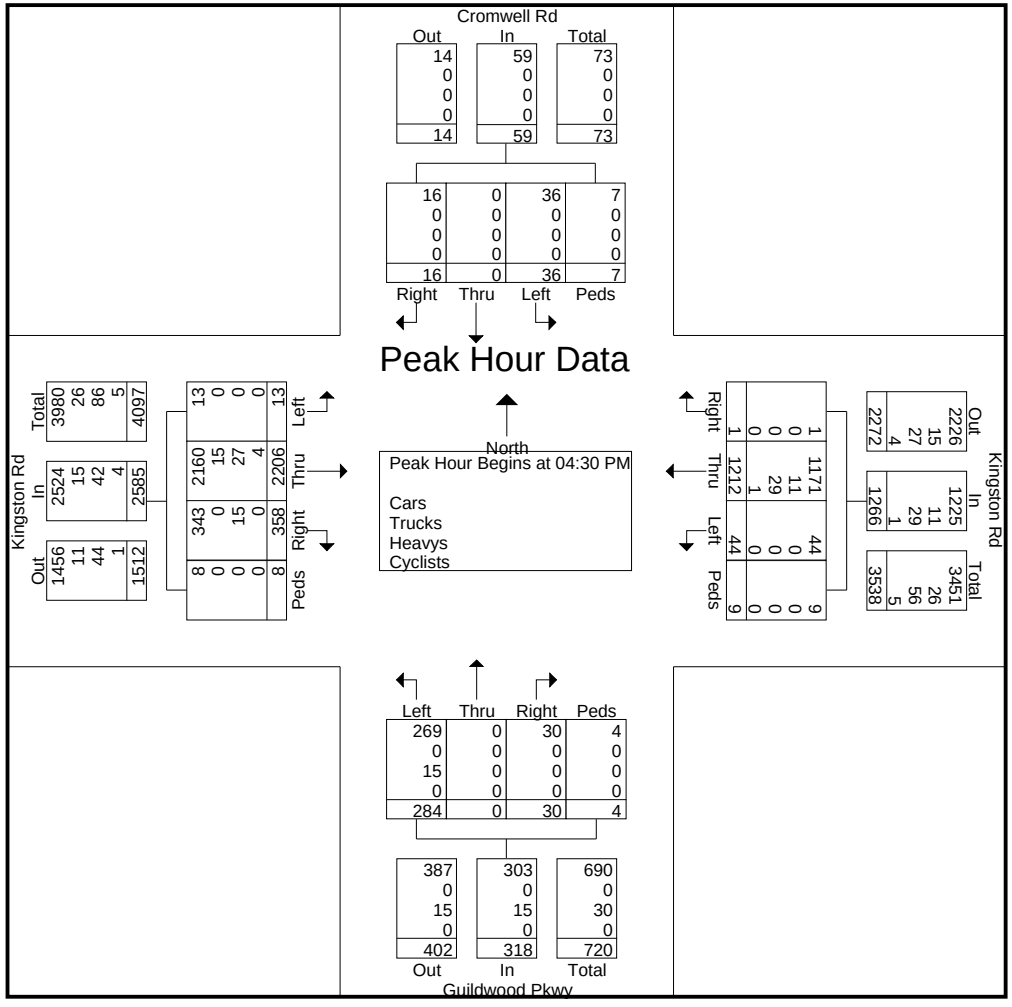
	Out	In	Total
	342	622	964
	6	8	14
	12	20	32
	2	1	3
	362	651	1013

Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Kingston Rd at Guildwood Pkwy
Site Code : 00000000
Start Date : 9/28/2016
Page No : 8

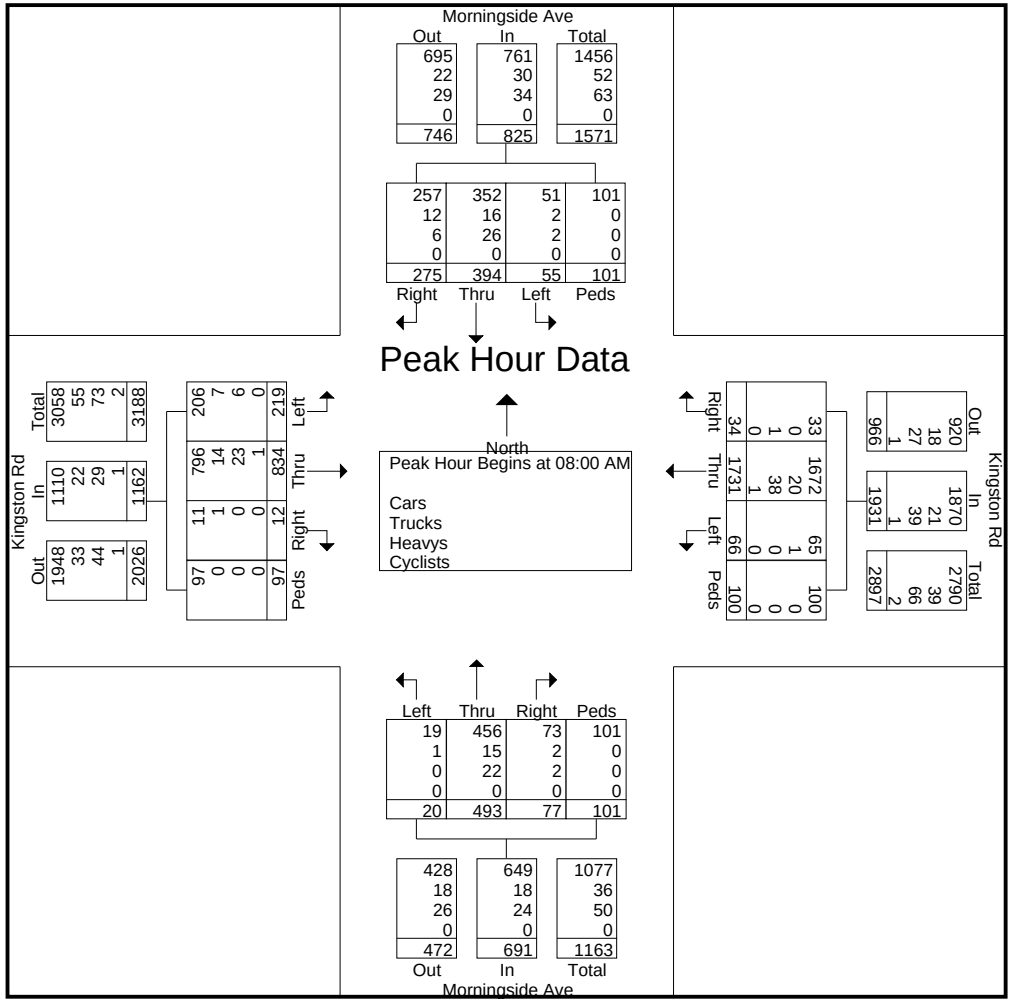


Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Morningside Ave at Kingston Rd
Site Code : 00000000
Start Date : 9/28/2016
Page No : 5

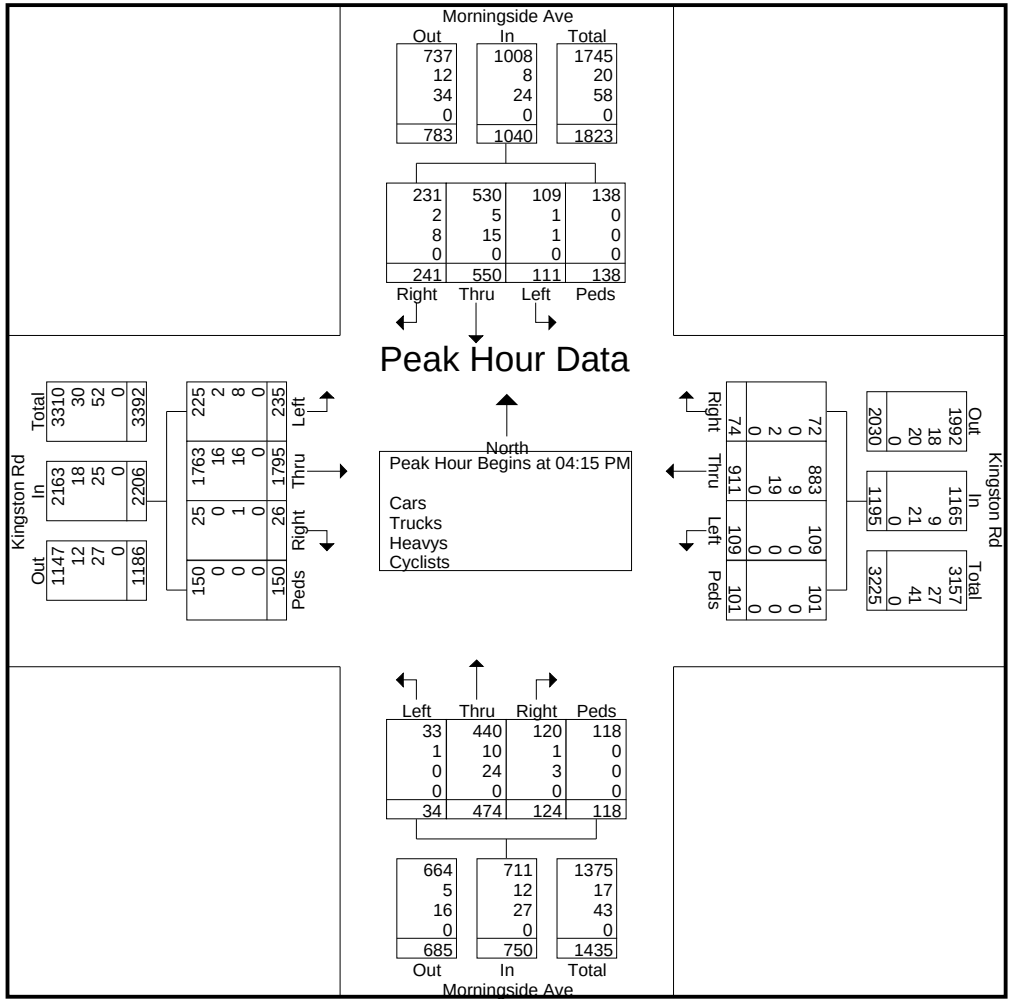


Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Morningside Ave at Kingston Rd
Site Code : 00000000
Start Date : 9/28/2016
Page No : 8

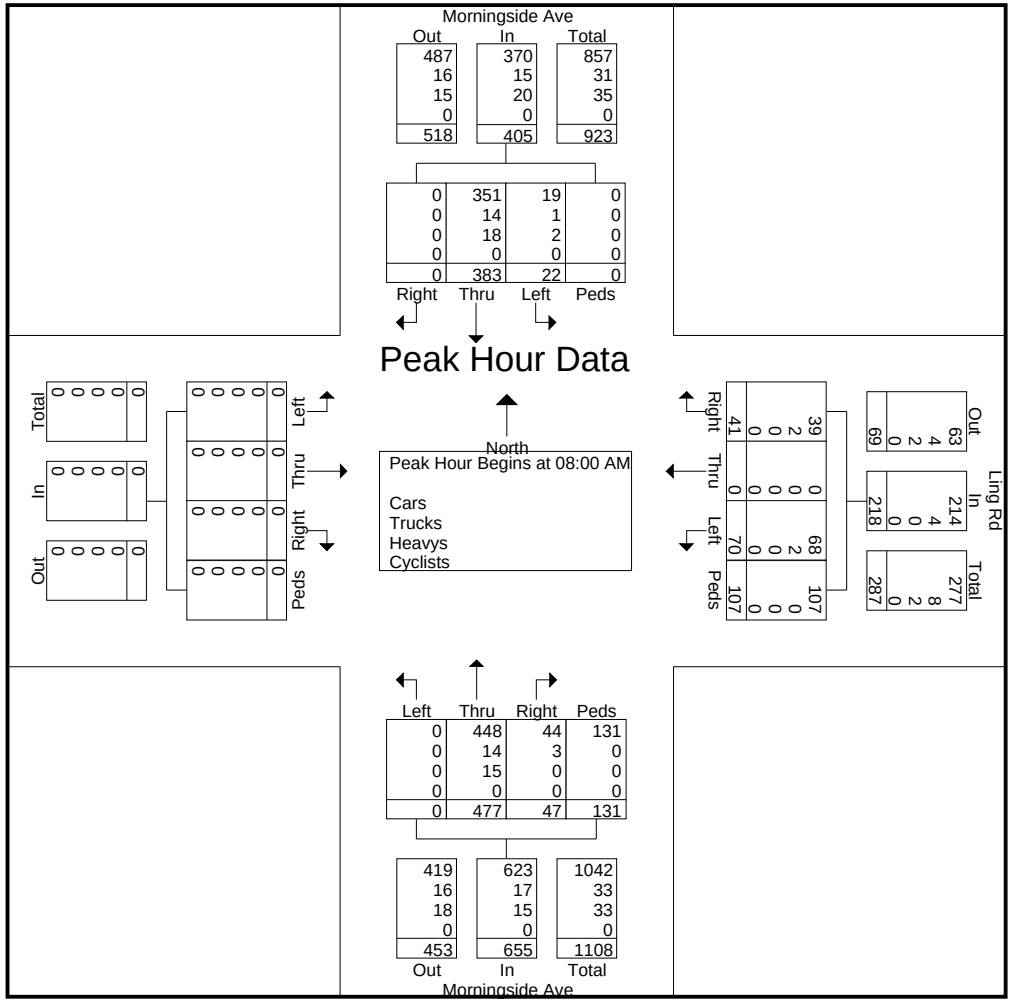


Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Morningside Ave at Ling Rd
Site Code : 00000000
Start Date : 9/28/2016
Page No : 5

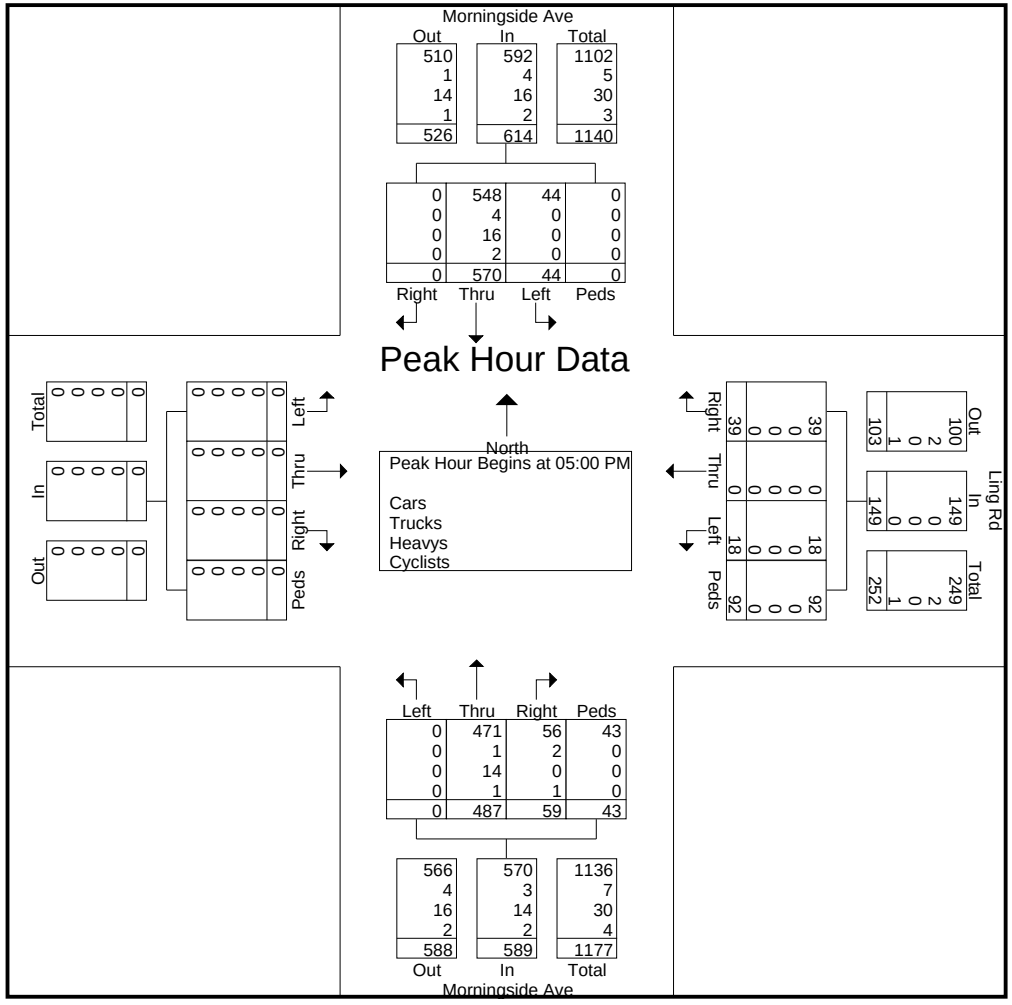


Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Morningside Ave at Ling Rd
Site Code : 00000000
Start Date : 9/28/2016
Page No : 8

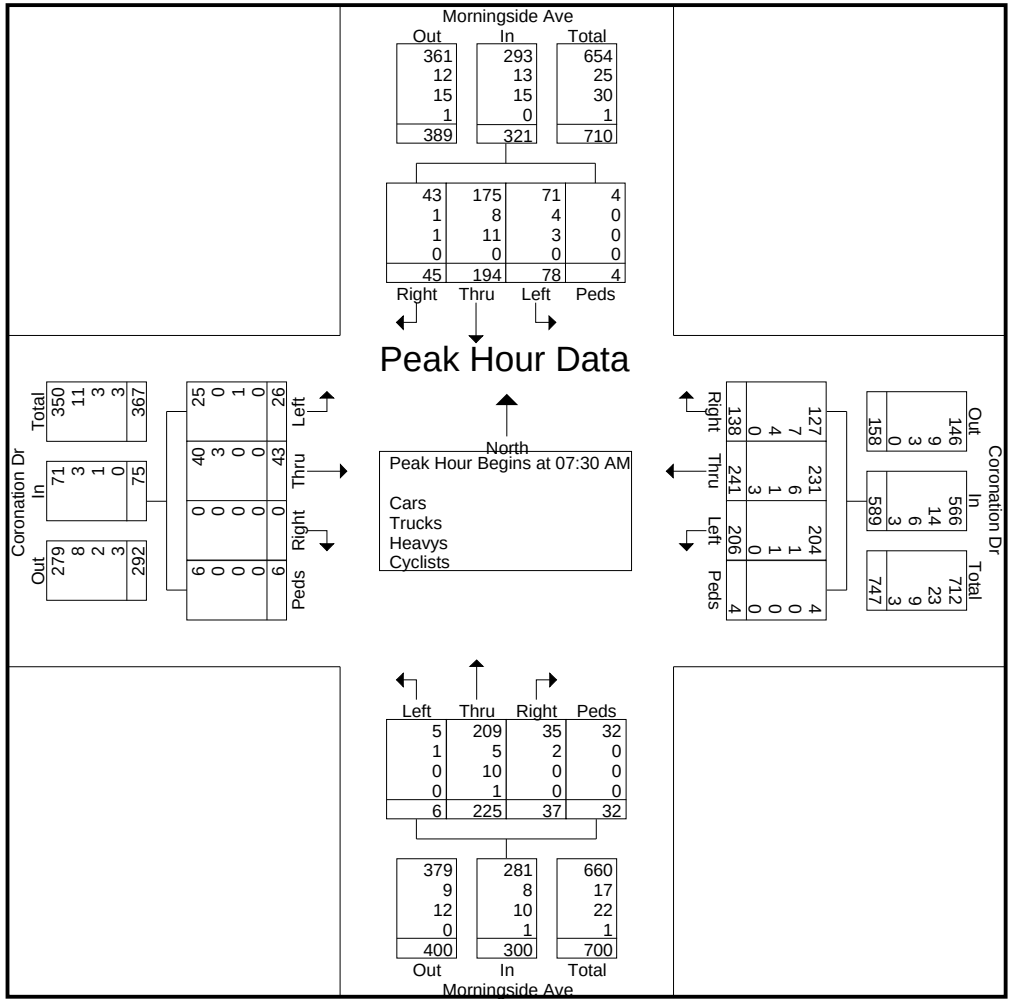


Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Morningside Avenue at Coronation Dr
Site Code : 00000000
Start Date : 9/28/2016
Page No : 5

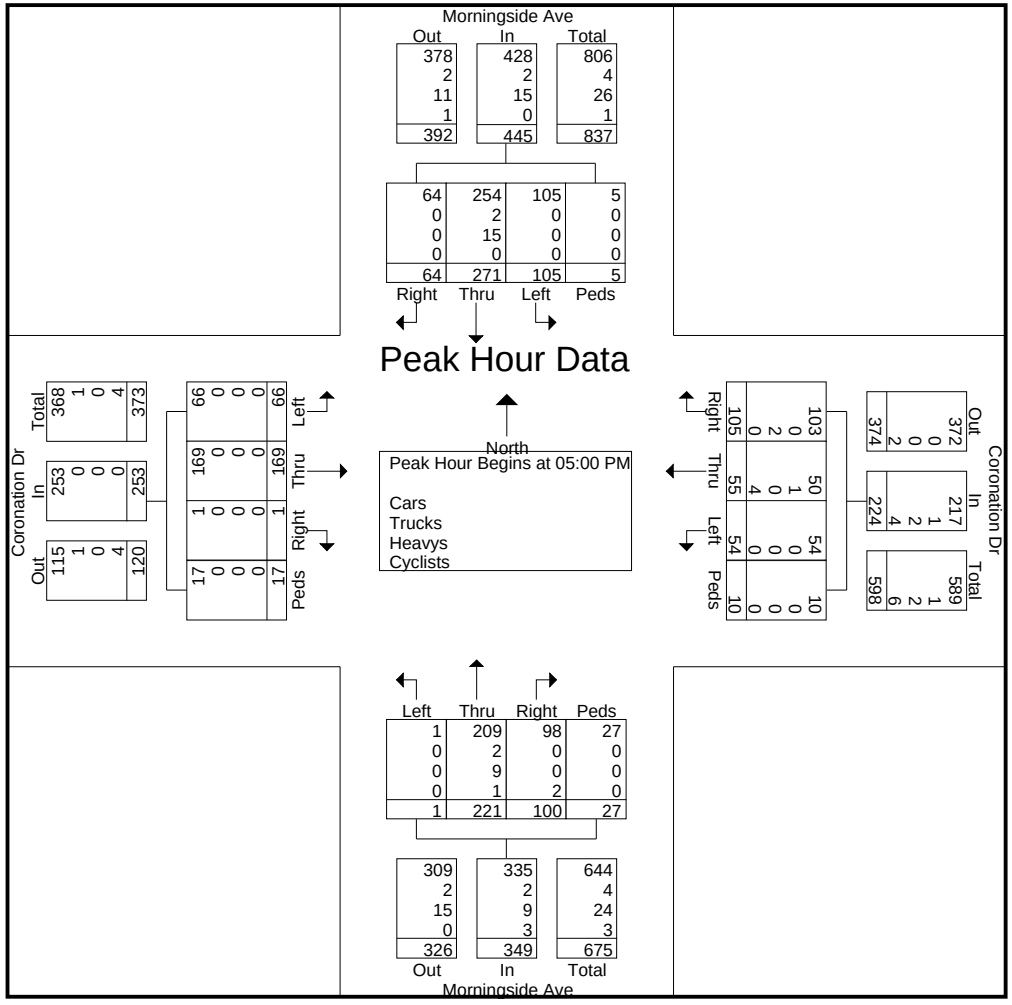


Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Morningside Avenue at Coronation Dr
Site Code : 00000000
Start Date : 9/28/2016
Page No : 8

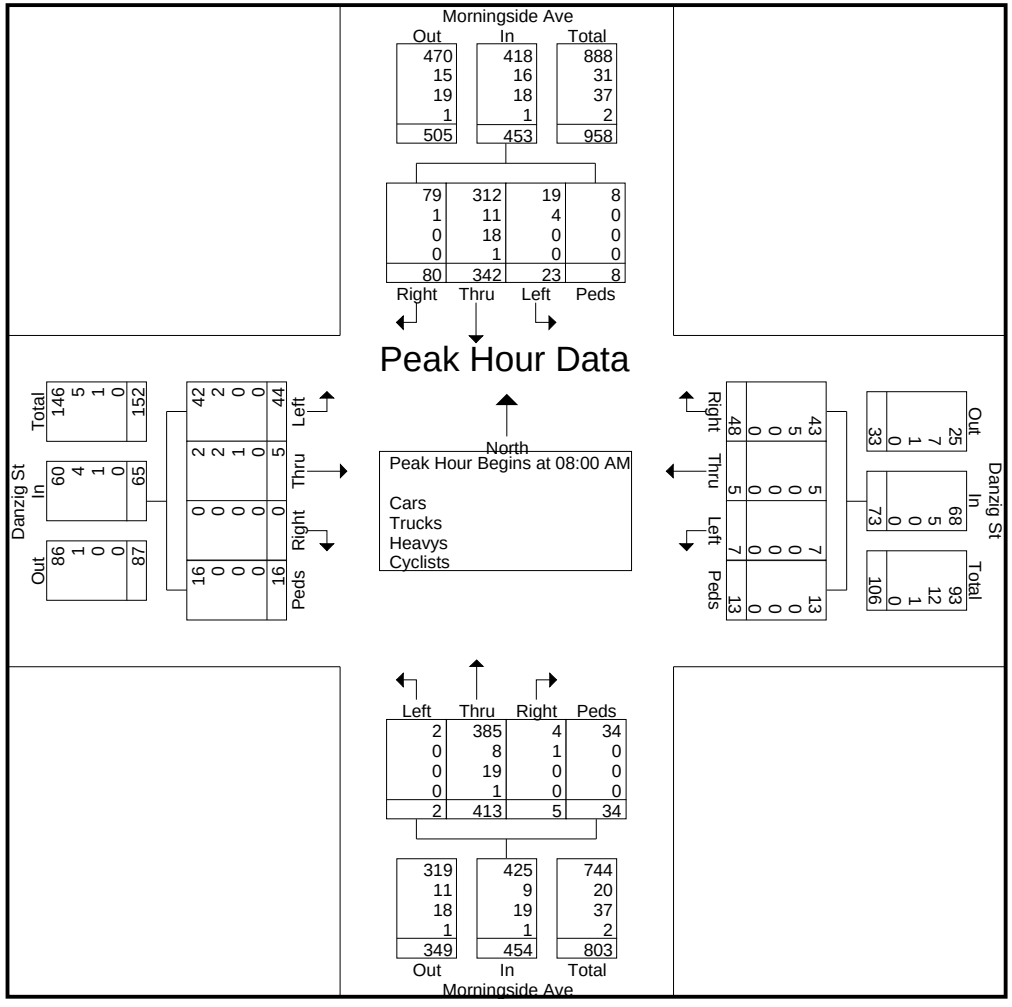


Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Morningside Avenue at Danzig St
Site Code : 00000000
Start Date : 9/28/2016
Page No : 5

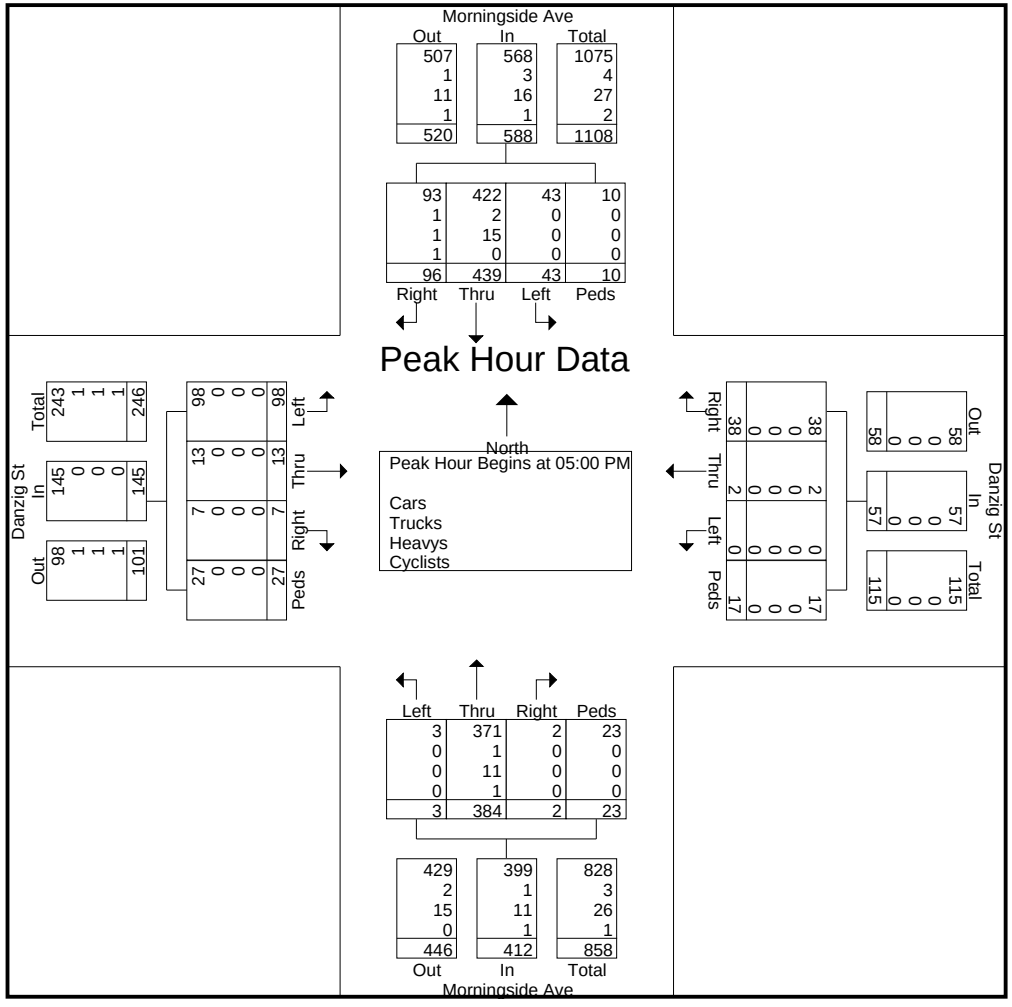


Horizon Data Services Ltd

318 Simonston Boulevard
Thornhill ON L3T 4T5
(416) 840-6619

"We do not estimate...we count"

File Name : Morningside Avenue at Danzig St
Site Code : 00000000
Start Date : 9/28/2016
Page No : 8



CITY OF TORONTO - TRANSPORTATION SERVICES
ITS OPERATIONS - TRAFFIC SIGNALS
703 Don Mills Rd, Toronto ON, M3C 3N3
Phone: (416) 397 5770, Fax (416) 397 5777
CURRENT SIGNAL TIMING INFORMATION

ISSUED TO: WSP Canada Inc. (Racheal Saunders) ***OUR REF: 2016_0099***
DATE: September 20, 2016 ***STAFF: VZ/SQ***

LOCATION:	**Guildwood Parkway & Livingston Rd**	*DISTRICT:*	**Scarborough**
TCS:	**1058**	*COMPUTER SYSTEM:*	**TransSuite**
MODE / COMMENT:	**SAP with WRM**	*CONTROLLER/CABINET TYPE:*	**Econolite ASC/3-2100 / TS2 T1**
PREPARED / CHECKED BY:	**TS**	*CONFLICT FLASH:*	**Red & Red**
PREPARATION DATE:	**November 16, 2010**	*DESIGN WALK SPEED:*	**1.0 m/s (FDW based on full crossing @ 1.2 m/s)**
IMPLEMENTATION DATE:	**November 17, 2010**	*CHANNEL/DROP:*	**4078/1**

N ↑

NEMA Phase		TP1 Patrn 1,2& 3	OFF All Other Times	AM 06:30-09:15 M-F	PM 15:45-18:30 M-F	Phase Mode (Fixed/Demanded/Callable)	Remarks
		Local Plan	Pattern 1	Pattern 2	Pattern 3		
		System Plan	Plan 1	Plan 2	Plan 3		
1	NOT USED	WLK					Pedestrian Minimums: EWWK = 7 sec, EWFD = 16 sec NSWK = 7 sec, NSFD = 21 sec
		FDW					NS phase is callable by vehicle and/or pedestrian actuation. If a vehicle and/or pedestrian call is received, the maximum NSG would be served. The NSWK & NSFD are only displayed on the pedestrian signal heads if a vehicle and/or pedestrian call is received.
		MIN					
		MAX1					
		AMB					
		ALR					
		SPLIT					
Guildwood Parkway 2		WLK 7				Fixed	EWFD reverts to EWWK if there is no side street vehicle demand at the end of the EWFD.
		WLK MAX 8					During free plans, signal rests in EWWK and does not cycle through EWFD unless there is side street vehicle and/or side street pedestrian demand.
		FDW 16					
		MIN 24					
		MAX1 24					In the event of Backup Free operation, signal operates using TP1 timings.
		AMB 4					
		ALR 2					
		SPLIT	0	0	0		Off, AM & PM plans operate free through Patterns 1, 2 & 3 respectively with the following timings: Walk max value (8) on phases 2 & 6 is the NS walk time. The signal will serve 7 sec NSWK following WRM. Max1 value is the green time for phase 4 & 8.
3	NOT USED	WLK					
		FDW					
		MIN					
		MAX1					Side Street Passage Time = 3 sec
		AMB					
		ALR					NS pushbuttons monitored on local detector # 2
		SPLIT					
Livingston Rd 4		WLK 7				Callable by Stopbar Loop and/or Push Button	
		WLK MAX					
		FDW 21					
		MIN 28					
		MAX1 28					
		AMB 4					
		ALR 3					
		SPLIT	0	0	0		
5	NOT USED	WLK					
		FDW					
		MIN					
		MAX1					
		AMB					
		ALR					
		SPLIT					
Guildwood Parkway 6		WLK 7				Fixed	
		WLK MAX 8					
		FDW 16					
		MIN 24					
		MAX1 24					
		AMB 4					
		ALR 2					
		SPLIT	0	0	0		
7	NOT USED	WLK					
		FDW					
		MIN					
		MAX1					
		AMB					
		ALR					
		SPLIT					
Livingston Rd 8		WLK 7				Callable by Stopbar Loop and/or Push Button	
		WLK MAX					
		FDW 21					
		MIN 28					
		MAX1 28					
		AMB 4					
		ALR 3					
		SPLIT	0	0	0		
		CL	65	65	65		
		OF	FREE	FREE	FREE		
		VP	N/A	N/A	N/A		

NOTES: Picked up under TransSuite system control on May 27, 2013 at approximately 13:33

CITY OF TORONTO - TRANSPORTATION SERVICES
ITS OPERATIONS - TRAFFIC SIGNALS
703 Don Mills Rd, Toronto ON, M3C 3N3
Phone: (416) 397 5770, Fax (416) 397 5777
CURRENT SIGNAL TIMING INFORMATION

ISSUED TO: WSP Canada Inc. (Racheal Saunders) ***OUR REF: 2016_0099***
DATE: September 20, 2016 ***STAFF: VZ/SQ***

LOCATION:	**Morningside Av & Coronation Dr**	*DISTRICT:*	**Scarborough**
MODE/COMMENT:	**SAP with WRM & 2-Wire Polara APS**	*COMPUTER SYSTEM:*	**TransSuite**
TCS:	**1184**	*CONTROLLER/CABINET TYPE:*	**Econolite ASC/3-2100 / TS2T1**
PREPARED/CHECKED BY:	**MG/SL**	*CONFLICT FLASH:*	**Red & Red**
PREPARATION DATE:	**June 11, 2013**	*DESIGN WALK SPEED:*	**1.0 m/s (FDW based on full crossing @ 1.2 m/s)**
IMPLEMENTATION DATE:	**May 13, 2014**	*CHANNEL/DROP:*	**4042/8**

N ↑

NEMA Phase		TP1 Backup Free	TP2 Plan 1	TP3 Plan 2 & 3	OFF All Other Times	AM 6:30-9:30 M-F	PM 16:00-18:30 M-F	Phase Mode (Fixed/Demanded or Callable)	Remarks
	System Plan				1	2	3		
	Local Plan				Pattern 1	Pattern 2	Pattern 3		
1 NOT USED	WLK								Pedestrian Minimums: NSWK = 7 sec, NSFD = 11 sec; EWWK = 7 sec, EWFD = 18 sec
	FDW								EW phase is callable by vehicle and/or pedestrian actuation. If a vehicle and/or pedestrian call is received, the maximum EWG would be served. The EWWK & EWFD are only displayed on the pedestrian signal heads if a vehicle and/or pedestrian call is received.
	MIN								
	MAX1								
	AMB								
	ALR								
	SPLIT								
2 Morningside Av	WLK	7	7	7				Fixed	NSFD reverts to NSWK if there is no side street demand at the end of the NSFD.
	WLK MAX		15	20					Side Street Passage Time = 3 sec
	FDW	11	11	11					Signal operates FREE 24/7 through Pattern 1 to 3. Walk max values on phases 2 & 6 are the walk times. The signal will serve a minimum of 7 sec NSWK following WRM. Max1 values on phases 4 & 8 are green times.
	MIN	18	26	31					
	MAX1	24	26	31					
	AMB	4	4	4					
	ALR	2	2	2					
	SPLIT				0	0	0		
3 NOT USED	WLK								The signals rest in main street Green/Walk until a side street vehicle or pedestrian call is received.
	FDW								
	MIN								APS on during 7 sec of NSWK & 7 sec of EWWK
	MAX1								Extended Push Activation = 3 sec
	AMB								In the event of Backup Free operation, signal operates using TP1 timing values.
	ALR								
	SPLIT								
4 Coronation Dr	WLK	7	7	7				Callable by stopbar loop and/or pushbutton.	
	WLK MAX								
	FDW	17	17	17					
	MIN	24	24	24					
	MAX1	24	24	24					
	AMB	4	4	4					
	ALR	2	2	2					
	SPLIT				0	0	0		
5 NOT USED	WLK								
	FDW								
	MIN								
	MAX1								
	AMB								
	ALR								
	SPLIT								
6 Morningside Av	WLK	7	7	7				Fixed	
	WLK MAX		15	20					
	FDW	11	11	11					
	MIN	18	26	31					
	MAX1	24	26	31					
	AMB	4	4	4					
	ALR	2	2	2					
	SPLIT				0	0	0		
7 NOT USED	WLK								
	FDW								
	MIN								
	MAX1								
	AMB								
	ALR								
	SPLIT								
8 Coronation Dr	WLK	7	7	7				Callable by stopbar loop and/or pushbutton.	
	WLK MAX								
	FDW	17	17	17					
	MIN	24	24	24					
	MAX1	24	24	24					
	AMB	4	4	4					
	ALR	2	2	2					
	SPLIT				0	0	0		
	CL				62	67	67		
	OF				0 (FREE)	0 (FREE)	0 (FREE)		
	VP				0	0	0		

Notes: Picked Up on TransSuite on July 22, 2013 at 12:59 p.m

CITY OF TORONTO - TRANSPORTATION SERVICES
ITS OPERATIONS - TRAFFIC SIGNALS
703 Don Mills Rd, Toronto ON, M3C 3N3
Phone: (416) 397 5770, Fax (416) 397 5777

CURRENT SIGNAL TIMING INFORMATION

ISSUED TO: WSP Canada Inc. (Racheal Saunders) ***OUR REF: 2016_0099***
DATE: September 20, 2016 ***STAFF: VZ/SQ***

LOCATION:	**Morningside Ave & 28m North of Ling Rd**	*DISTRICT:*	**Scarborough**
MODE/COMMENT:	**PED with 2-Wire Polara APS**	*COMPUTER SYSTEM:*	**TransSuite**
TCS:	**2171**	*CONTROLLER/CABINET TYPE:*	**PEEK ATC 1000 / TS2 T1**
PREPARED/CHECKED BY:	**HL**	CONFLICT FLASH:	**Red & Red**
PREPARATION DATE:	**January 14, 2016**	DESIGN WALK SPEED:	**1.0 m/s (FDW based on full crossing @ 1.2 m/s)**
IMPLEMENTATION DATE:	**January 22, 2016**	CHANNEL/DROP:	**4042/46**
		CONTROLLER FIRMWARE:	**3.18.1.2976**

N ↑

NEMA Phase		OFF All Other Times	AM 06:30 - 09:30, M-F	PM 16:00 - 18:30, M-F	Phase Mode (Fixed/Demanded or Callable)	Remarks
	Local Plan	Pattern 1	Pattern 2	Pattern 3		
	Split Table	Split 1	Split 2	Split 3		
1 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					Pedestrian Minimums: EWWK = 7 sec, EWFD = 13 sec EW phase is callable by pedestrian actuation. APS on during 7secs of EWWK when activated by pushbutton. Extended Push Activation = 3 sec
2 Morningside Ave ↑	WLK 7 FDW 5 MIN 12 MAX1 31 AMB 4 ALR 2 SPLIT	36	36	36	Fixed	7 & 5 secs entered for phases 2 & 6 WLK & FDW to make controller stay in coordination (any two values that add up to phase min can be entered). 8 secs EWWK served when pedestrian call is received.
3 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					
4 Ped Crosswalk (28 m North of Ling Rd) ↔	WLK 7 FDW 13 MIN 20 MAX1 20 AMB 3 ALR 0 SPLIT	24	24	24	Callable by pushbutton	
5 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					
6 Morningside Ave ↓	WLK 7 FDW 5 MIN 12 MAX1 31 AMB 4 ALR 2 SPLIT	36	36	36	Fixed	
7 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					
8 NOT USED	WLK 7 FDW 13 MIN 20 MAX1 20 AMB 3 ALR 0 SPLIT	24	24	24		
	CL OF	60 49	60 3	60 49		

CITY OF TORONTO - TRANSPORTATION SERVICES
ITS OPERATIONS - TRAFFIC SIGNALS
703 Don Mills Rd, Toronto ON, M3C 3N3
Phone: (416) 397 5770, Fax (416) 397 5777
CURRENT SIGNAL TIMING INFORMATION

ISSUED TO: WSP Canada Inc. (Racheal Saunders) ***OUR REF: 2016_0099***
DATE: September 20, 2016 ***STAFF: VZ/SQ***

LOCATION:	**Morningside Ave & Danzig St**	*DISTRICT:*	**Scarborough**
MODE/COMMENT:	**SA2-VMG with WRM & 2-wire Polara APS**	*COMPUTER SYSTEM:*	**TransSuite**
TCS:	**2173**	*CONTROLLER/CABINET TYPE:*	**PEEK ATC 1000 / TS2 T1**
PREPARED/CHECKED BY:	**HL**	*CONFLICT FLASH:*	**Red & Red**
PREPARATION DATE:	**January 14, 2016**	*DESIGN WALK SPEED:*	**1.0 m/s (FDW based on full using at 1.2 m/s)**
IMPLEMENTATION DATE:	**January 22, 2016**	*CHANNEL/DROP:*	**4042/47**
		CONTROLLER FIRMWARE:	**3.18.1.2976**

N

NEMA Phase		OFF All Other Times	AM 06:30-09:30 M-F	PM 16:00-18:30 M-F	Phase Mode (Fixed/Demanded or Callable)	Remarks
	Local Plan	**Pattern 1**	**Pattern 2**	**Pattern 3**		
	Split Table	**Split 1**	**Split 2**	**Split 3**		
1 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					Pedestrian Minimums: NSWK = 7 sec, NSFD = 12 sec EWWK = 7 sec, EWFD = 15 sec
2 Morningside Ave	WLK 7 FDW 12 MIN 19 MAX1 26 AMB 4 ALR 2 SPLIT	31	31	31	Fixed	EW phase is callable by vehicle or pedestrian actuation. If a vehicle call is received, the minimum EWG is 7 seconds. If ongoing vehicle demand exists on the stopbar loop, the EWG is capable of providing vehicle extensions up to the maximum green split. If a pedestrian call is received, the pedestrian minimums will be served. The EWWK & EWFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle/pedestrian demand. Unused extension time is given to the NSG.
3 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					The signal constantly cycles through main street FDW to improve response to side street vehicle and pedestrian demand. NSFD reverts to NSWK if there is no side street demand at the end of the NSFD. Side Street Passage Time = 3 sec When activated by push button, APS on during 7 sec of NSWK & EWWK. Extended APS Push Activation = 3 sec
4 Danzig St	WLK 7 FDW 15 MIN 7 MAX1 22 AMB 4 ALR 2 SPLIT	29	29	29	Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop.	
5 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					
6 Morningside Ave	WLK 7 FDW 12 MIN 19 MAX1 26 AMB 4 ALR 2 SPLIT	31	31	31	Fixed	
7 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					
8 Danzig St	WLK 7 FDW 15 MIN 7 MAX1 22 AMB 4 ALR 2 SPLIT	29	29	29	Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop.	
	CL OF	60 51	60 2	60 51		

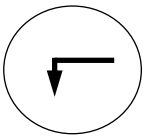
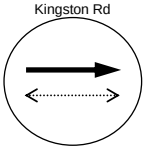
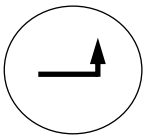
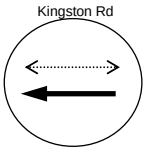
CITY OF TORONTO - TRANSPORTATION SERVICES
ITS OPERATIONS - TRAFFIC SIGNALS
703 Don Mills Rd, Fifth Floor, Toronto ON M3C 3N3
Phone: 416-397-5770 Fax: 416-397-5777

CURRENT SIGNAL TIMING INFORMATION

ISSUED TO:	***WSP Canada Inc. (Racheal Saunders)***	***OUR REF:***	***2016_0099***
DATE :	***Septermber 15, 2016***	***STAFF:***	***JG/RI***

LOCATION:	**Kingston Rd & Morningside Ave**	***DISTRICT:***	**Scarborough**
PX:	**143**	***COMPUTER SYSTEM:***	**TransSuite**
MODE/COMMENT:	**FXT (Master to PX2110 and PX499) ***	***CONTROLLER/CABINET TYPE:***	**PEEK ATC-1000 / TS2 T1**
PREPARED/CHECKED BY:	**SA/DS**	***CONFLICT FLASH:***	**Red & Red**
PREPARATION DATE:	**October 13,2015**	***DESIGN WALK SPEED:***	**1.0 m/s (FDW based on full crossing @ 1.2 m/s)**
IMPLEMENTATION DATE:	**November 23, 2015**	***CHANNEL/DROP:***	**4019/92**
		Controller Firmware:	**3.018.1.2976**

N

NEMA Phase		**OFF All Other Times**	**AM 06:30-09:30 M-F**	**PM 15:45-19:00 M-F**	**Phase Mode (Fixed/Demanded/Callable)**	**Remarks**
	Local Plan	Pattern 1	Pattern 2	Pattern 3		
	Split Table	Split 1	Split 2	Split 3		
1 	WLK FDW MIN 6 MAX 1 6 AMB 3 ALR 1 SPLIT			11	WBLA Callable/Extendable 15:45 - 18:30, M-F by setback loop	Pedestrian Minimums: EWWK = 7 sec., EWFD = 23 sec. NSWK = 7 sec., NSFD = 28 sec. Left-Turn passage = 2 sec. Hardwire connection to Morningside Ave & Private Access/Mall Access (PX 2110) and Lawrence Ave & Morningside Ave (PX 499) to provide simultaneous NSY indications.
2 Kingston Rd 	WLK 7 FDW 23 MIN 30 MAX 1 50 AMB 4 ALR 3 SPLIT	57	67	46	Fixed	Offset pulse is sent to PX2110 and PX499 at the start of NS FDW. Flash condition at one signal is independent of other two signals. *** interconnection temporarily disabled due to damaged cable**
3 NOT USED	WLK FDW MIN MAX 1 AMB ALR SPLIT					
4 Morningside Ave 	WLK 7 FDW 28 MIN 35 MAX 1 36 AMB 4 ALR 3 SPLIT	43	43	43	Fixed	
5 	WLK FDW MIN 6 MAX 1 6 AMB 3 ALR 1 SPLIT	11	11	11	EBLA Callable/Extendable 24 hours by setback loop	
6 Kingston Rd 	WLK 7 FDW 23 MIN 30 MAX 1 39 AMB 4 ALR 3 SPLIT	46	56	46	Fixed	
7 NOT USED	WLK FDW MIN MAX 1 AMB ALR SPLIT					
8 Morningside Ave 	WLK 7 FDW 28 MIN 35 MAX 1 36 AMB 4 ALR 3 SPLIT	43	43	43	Fixed	
	CL OFF	100 57	110 21	100 64		

NOTES: Interconnect operation enabled Nov 27, 2007

CITY OF TORONTO - TRANSPORTATION SERVICES
ITS OPERATIONS - TRAFFIC SIGNALS
703 Don Mills Rd, Fifth Floor, Toronto ON M3C 3N3
Phone: 416-397-5770 Fax: 416-397-5777

CURRENT SIGNAL TIMING INFORMATION

ISSUED TO:	***WSP Canada Inc. (Racheal Saunders)***	***OUR REF:***	***2016_0099***
DATE :	***Septermber 15, 2016***	***STAFF:***	***JG/RI***

LOCATION:	**Kingston Rd & Galloway Rd**	***DISTRICT:***	**Scarborough**
MODE/COMMENT:	**SA2-VMG with WRM & Firehall Pre-emption (NBLA)**	***COMPUTER SYSTEM:***	**TransSuite**
PX:	**145**	***CONTROLLER/CABINET TYPE:***	**Econolite ASC/3S-1000 / TS2 T1**
PREPARED/CHECKED BY:	**JS**	***CONFLICT FLASH:***	**Red & Red**
PREPARATION DATE:	**October 23, 2013**	***DESIGN WALK SPEED:***	**1.0 m/s (FDW based on full crossing @ 1.2 m/s)**
IMPLEMENTATION DATE:	**October 30, 2013**	***CHANNEL/DROP:***	**4027 / 21**

N ↑

NEMA Phase		**OFF All Other Times**	**AM 06:30-09:30 M-F**	**PM 15:00-19:00 M-F**	**Phase Mode (Fixed/Demanded or Callable)**	**Remarks**
	Local Plan	Pattern 1	Pattern 2	Pattern 3		
	System Plan	Plan 1	Plan 2	Plan 3		
1 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					Pedestrian Minimums: EWWK = 7 sec, EWFD = 21 sec NSWK = 7 sec, NSFD = 33 sec NS phase is callable by vehicle and/or pedestrian actuation. If a vehicle call is received, the minimum NSG is 7 seconds. If ongoing vehicle demand exists on the stopbar loop, the NSG is capable of providing vehicle extensions up to the maximum green split. If a pedestrian call is received, the pedestrian minimums will be served. The NSWK & NSFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle demand. Unused extension time is given to the EWG.
2 Kingston Rd	WLK 7 FDW 21 MIN 28 MAX1 28 AMB 4 ALR 3 SPLIT	38	63	63	Fixed	Side Street Passage Time = 3 sec
3 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					EWFD reverts to EWWK if there is no side street vehicle demand at the end of the EWFD. NS pushbutton monitored on local detector 2. The signal constantly cycles through main street FDW to improve response to side street vehicle and pedestrian demand.
4 Galloway Rd	WLK 7 FDW 33 MIN 7 MAX1 40 AMB 4 ALR 2 SPLIT	47	47	47	Callable by Stopbar Loop and/or Push Button. Extendable by Stopbar Loop.	Firehall Preemption Instructions: • If preemption is received in phase 2/6: Time to Preemption Sequence = 0 - 35 secs • If preemption is received in phase 4/8: Time to Preemption Sequence = 0 - 46 secs • Signals go to All Red display before going into preemption sequence Preemption Sequence: Serve 87.0 seconds NBLA/NBG/NSDW Serve 4.0 seconds NBY/NSDW Serve 2.0 second of ALLR Return to normal operation in EWG/EWWK
5 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					
6 Kingston Rd	WLK 7 FDW 21 MIN 28 MAX1 28 AMB 4 ALR 3 SPLIT	38	63	63	Fixed	
7	WLK FDW MIN MAX1 AMB ALR SPLIT				Displayed Only During Firehall Pre-emption	
8 Galloway Rd	WLK 7 FDW 33 MIN 7 MAX1 40 AMB 4 ALR 2 SPLIT	47	47	47	Callable by Stopbar Loop and/or Push Button. Extendable by Stopbar Loop.	
	CL OF VP	85 14 21	110 71 21	110 26 21		

Notes: Transferred to wireless system control on October 31, 2013 at approximately 11:40.

CITY OF TORONTO - TRANSPORTATION SERVICES
ITS OPERATIONS - TRAFFIC SIGNALS
703 Don Mills Rd, Fifth Floor, Toronto ON M3C 3N3
Phone: 416-397-5770 Fax: 416-397-5777

CURRENT SIGNAL TIMING INFORMATION

ISSUED TO:	*WSP Canada Inc. (Racheal Saunders)*	*OUR REF:*	*2016_0099*
DATE :	*September 15, 2016*	*STAFF:*	*JG/RI*
LOCATION:	**Kingston Rd & Guildwood Pkwy / Cromwell Rd**	*DISTRICT:*	**Scarborough**
MODE/COMMENT:	**SA2-VMG with WRM**	*COMPUTER SYSTEM:*	**TransSuite**
PX:	**146**	*CONTROLLER/CABINET TYPE:*	**Econolite ASC/3-2100 / TS2 T1**
PREPARED/CHECKED BY:	**JS**	*CONFLICT FLASH:*	**Red & Red**
PREPARATION DATE:	**October 23, 2013**	*DESIGN WALK SPEED:*	**1.0 m/s (FDW based on full crossing @ 1.2 m/s)**
IMPLEMENTATION DATE:	**October 30, 2013**	*CHANNEL/DROP:*	**4027 / 4**

N ↑

NEMA Phase		OFF All Other Times	AM 06:30-09:30 M-F	PM 15:00-19:00 M-F	Phase Mode (Fixed/Demanded or Callable)	Remarks
	Local Plan	Pattern 1	Pattern 2	Pattern 3		
	System Plan	Plan 1	Plan 2	Plan 3		
1 NOT USED	WLK					Pedestrian Minimums: EWWK = 7 sec, EWFD = 25 sec NSWK = 7 sec, NSFD = 25 sec
	FDW					NS phase is callable by vehicle and/or pedestrian actuation. If a vehicle call is received, the minimum NSG is 7 seconds. If ongoing vehicle demand exists on the stopbar loop, the NSG is capable of providing vehicle extensions up to the maximum green split. If a pedestrian call is received, the pedestrian minimums will be served. The NSWK & NSFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle demand. Unused extension time is given to the EWG.
	MIN					
	MAX1					
	AMB					
	ALR					
	SPLIT					
2 Kingston Rd	WLK	7			Fixed	
	FDW	25				
	MIN	32				
	MAX1	39				
	AMB	4				
	ALR	2				
	SPLIT		45	62	70	Side Street Passage Time = 3 sec
3 NOT USED	WLK					EWFD reverts to EWWK if there is no side street vehicle demand at the end of the EWFD.
	FDW					Side Street Passage Time = 3 sec
	MIN					NS pushbutton monitored on local detector 2.
	MAX1					The signal constantly cycles through main street FDW to improve response to side street vehicle and pedestrian demand. Side street decision point at the end of EWFD.
	AMB					
	ALR					
	SPLIT					
4 Guildwood Pkwy	WLK	7			Callable by Stopbar Loop and/or Push Button. Extendable by Stopbar Loop.	
	FDW	25				
	MIN	7				
	MAX1	32				
	AMB	4				
	ALR	3				
	SPLIT		40	48	40	
5 NOT USED	WLK					
	FDW					
	MIN					
	MAX1					
	AMB					
	ALR					
	SPLIT					
6 Kingston Rd	WLK	7			Fixed	
	FDW	25				
	MIN	32				
	MAX1	39				
	AMB	4				
	ALR	2				
	SPLIT		45	62	70	
7 NOT USED	WLK					
	FDW					
	MIN					
	MAX1					
	AMB					
	ALR					
	SPLIT					
8 Cromwell Rd	WLK	7			Callable by Stopbar Loop and/or Push Button. Extendable by Stopbar Loop.	
	FDW	25				
	MIN	7				
	MAX1	32				
	AMB	4				
	ALR	3				
	SPLIT		40	48	40	
	CL		85	110	110	
	OF		83	59	32	
	VP		25	25	25	

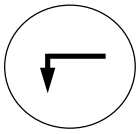
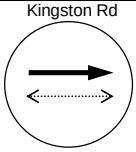
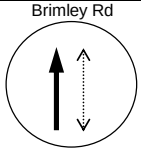
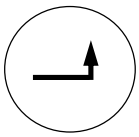
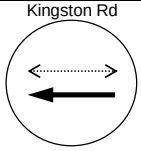
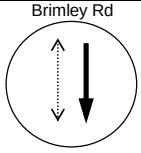
Notes: NS pedestrian crossing prohibited on West leg.
Picked up system control on Mar 22, 2013 at approximately 2:20 pm.

CITY OF TORONTO - TRANSPORTATION SERVICES
ITS OPERATIONS - TRAFFIC SIGNALS
703 Don Mills Rd, Fifth Floor, Toronto ON M3C 3N3
Phone: 416-397-5770 Fax: 416-397-5777

CURRENT SIGNAL TIMING INFORMATION

ISSUED TO:	*WSP Canada Inc. (Racheal Saunders)*	*OUR REF:*	*2016_0099*
DATE :	*Septermber 15, 2016*	*STAFF:*	*JG/RI*

LOCATION:	**Kingston Rd & Brimley Rd**	*DISTRICT:*	**Scarborough**
MODE/COMMENT:	**SA2-VMG with WRM**	*COMPUTER SYSTEM:*	**TransSuite**
PX:	**164**	*CONTROLLER/CABINET TYPE:*	**PEEK ATC 1000 / TS2 T1**
PREPARED/CHECKED BY:	**HZ/HL**	*CONFLICT FLASH:*	**Red & Red**
PREPARATION DATE:	**June 12, 2015**	*DESIGN WALK SPEED:*	**1.0 m/s (FDW based on full crossing at 1.2 m/s)**
IMPLEMENTATION DATE:	**July 3, 2015**	*CHANNEL/DROP:*	**4091/28**
		CONTROLLER FIRMWARE:	**3.014.2511**

NEMA Phase		OFF All Other Times	AM 06:30-09:30 M-F	PM 15:00-19:00 M-F	NGT 21:00-06:30 Daily	Phase Mode (Fixed/Demanded or Callable)	Remarks
	Local Plan	Pattern 1	Pattern 2	Pattern 3	Pattern 4		
	Split Table	Split 1	Split 2	Split 3	Split 4		
1 	WLK FDW MIN 6 MAX 1 6 AMB 3 ALR 1 SPLIT			11		WBLA Callable/Extendable by 9 m Setback Loop during 15:00-19:00, M-F	Pedestrian Minimums: EWWK = 7 sec, EWFD = 16 sec NSWK = 7 sec, NSFD = 31 sec NS phase is callable by vehicle or pedestrian actuation. If a vehicle call is received, the minimum NSG is 7 seconds. If ongoing vehicle demand exists on the stopbar loop, the NSG is capable of providing vehicle extensions up to the maximum green split. If a pedestrian call is received, the pedestrian minimums will be served. The NSWK & NSFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle demand. Unused extension time is given to the EWG for plans 1, 2 & 3.
Kingston Rd 2 	WLK 7 FDW 16 MIN 23 MAX 1 44 AMB 4 ALR 2 SPLIT	49	64	53	44	Fixed	
3 NOT USED	WLK FDW MIN MAX 1 AMB ALR SPLIT						During coordinated operation, the signal constantly cycles through main street FDW to improve response time to side street vehicle and pedestrian demand. During free plan, signal rests in EWWK and does not cycle through EWFD unless there is side street vehicle or pedestrian demand. EWFD reverts to EWWK if there is no side street demand at the end of the EWFD.
Brimley Rd 4 	WLK 7 FDW 31 MIN 7 MAX 1 38 AMB 4 ALR 3 SPLIT	46	46	46	38	Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop.	Side Street Passage Time = 3sec Left-Turn Passage Time = 2 sec Minimum call is placed on NSG if EBLA is called with no side street demand. If EBLA is not called or any unused EBLA time goes to EWG/EWWK during coordinated plans. NGT FREE plan operates through Pattern 4 using split value as green times (WLK & FDW) for phases 2 & 6. The signal will serve the programmed WLK & FDW values following WRM. Phases 4 & 8 uses MAX1 green values.
5 	WLK FDW MIN 6 MAX 1 7 AMB 3 ALR 3 SPLIT	16	18	18	7	EBLA Callable/Extendable 24 hours, daily by stopbar loop; Fully Protected	
Kingston Rd 6 	WLK 7 FDW 16 MIN 23 MAX 1 28 AMB 4 ALR 2 SPLIT	33	46	46	31	Fixed	
7 NOT USED	WLK FDW MIN MAX 1 AMB ALR SPLIT						
Brimley Rd 8 	WLK 7 FDW 31 MIN 7 MAX 1 38 AMB 4 ALR 3 SPLIT	46	46	46	38	Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop.	
	CL OF	95 91	110 95	110 97	0 FREE		

NOTES:

Picked up under TransSuite system on July 21, 2015 at approximately 9:41 A.M.

CITY OF TORONTO - TRANSPORTATION SERVICES
ITS OPERATIONS - TRAFFIC SIGNALS
703 Don Mills Rd, Toronto ON, M3C 3N3
Phone: (416) 397 5770, Fax (416) 397 5777
CURRENT SIGNAL TIMING INFORMATION

ISSUED TO: WSP Canada Inc. (Racheal Saunders) ***OUR REF: 2016_0099***
DATE: September 20, 2016 ***STAFF: VZ/SQ***

LOCATION:	**Guildwood Parkway & Livingston Rd**	*DISTRICT:*	**Scarborough**
TCS:	**1058**	*COMPUTER SYSTEM:*	**TransSuite**
MODE / COMMENT:	**SAP with WRM**	*CONTROLLER/CABINET TYPE:*	**Econolite ASC/3-2100 / TS2 T1**
PREPARED / CHECKED BY:	**TS**	*CONFLICT FLASH:*	**Red & Red**
PREPARATION DATE:	**November 16, 2010**	*DESIGN WALK SPEED:*	**1.0 m/s (FDW based on full crossing @ 1.2 m/s)**
IMPLEMENTATION DATE:	**November 17, 2010**	*CHANNEL/DROP:*	**4078/1**

N ↑

NEMA Phase		TP1 Patrn 1,2& 3	OFF All Other Times	AM 06:30-09:15 M-F	PM 15:45-18:30 M-F	Phase Mode (Fixed/Demanded/Callable)	Remarks
		Local Plan	Pattern 1	Pattern 2	Pattern 3		
		System Plan	Plan 1	Plan 2	Plan 3		
1	NOT USED	WLK					Pedestrian Minimums: EWWK = 7 sec, EWFD = 16 sec NSWK = 7 sec, NSFD = 21 sec
		FDW					NS phase is callable by vehicle and/or pedestrian actuation. If a vehicle and/or pedestrian call is received, the maximum NSG would be served. The NSWK & NSFD are only displayed on the pedestrian signal heads if a vehicle and/or pedestrian call is received.
		MIN					
		MAX1					
		AMB					
		ALR					
		SPLIT					
Guildwood Parkway 2		WLK 7				Fixed	EWFD reverts to EWWK if there is no side street vehicle demand at the end of the EWFD.
		WLK MAX 8					During free plans, signal rests in EWWK and does not cycle through EWFD unless there is side street vehicle and/or side street pedestrian demand.
		FDW 16					
		MIN 24					
		MAX1 24					In the event of Backup Free operation, signal operates using TP1 timings.
		AMB 4					
		ALR 2					
		SPLIT	0	0	0		Off, AM & PM plans operate free through Patterns 1, 2 & 3 respectively with the following timings: Walk max value (8) on phases 2 & 6 is the NS walk time. The signal will serve 7 sec NSWK following WRM. Max1 value is the green time for phase 4 & 8.
3	NOT USED	WLK					
		FDW					
		MIN					
		MAX1					Side Street Passage Time = 3 sec
		AMB					
		ALR					NS pushbuttons monitored on local detector # 2
		SPLIT					
Livingston Rd 4		WLK 7				Callable by Stopbar Loop and/or Push Button	
		WLK MAX					
		FDW 21					
		MIN 28					
		MAX1 28					
		AMB 4					
		ALR 3					
		SPLIT	0	0	0		
5	NOT USED	WLK					
		FDW					
		MIN					
		MAX1					
		AMB					
		ALR					
		SPLIT					
Guildwood Parkway 6		WLK 7				Fixed	
		WLK MAX 8					
		FDW 16					
		MIN 24					
		MAX1 24					
		AMB 4					
		ALR 2					
		SPLIT	0	0	0		
7	NOT USED	WLK					
		FDW					
		MIN					
		MAX1					
		AMB					
		ALR					
		SPLIT					
Livingston Rd 8		WLK 7				Callable by Stopbar Loop and/or Push Button	
		WLK MAX					
		FDW 21					
		MIN 28					
		MAX1 28					
		AMB 4					
		ALR 3					
		SPLIT	0	0	0		
		CL	65	65	65		
		OF	FREE	FREE	FREE		
		VP	N/A	N/A	N/A		

NOTES: Picked up under TransSuite system control on May 27, 2013 at approximately 13:33

CITY OF TORONTO - TRANSPORTATION SERVICES
ITS OPERATIONS - TRAFFIC SIGNALS
703 Don Mills Rd, Toronto ON, M3C 3N3
Phone: (416) 397 5770, Fax (416) 397 5777
CURRENT SIGNAL TIMING INFORMATION

ISSUED TO: WSP Canada Inc. (Racheal Saunders) ***OUR REF: 2016_0099***
DATE: September 20, 2016 ***STAFF: VZ/SQ***

LOCATION:	**Morningside Av & Coronation Dr**	*DISTRICT:*	**Scarborough**
MODE/COMMENT:	**SAP with WRM & 2-Wire Polara APS**	*COMPUTER SYSTEM:*	**TransSuite**
TCS:	**1184**	*CONTROLLER/CABINET TYPE:*	**Econolite ASC/3-2100 / TS2T1**
PREPARED/CHECKED BY:	**MG/SL**	*CONFLICT FLASH:*	**Red & Red**
PREPARATION DATE:	**June 11, 2013**	*DESIGN WALK SPEED:*	**1.0 m/s (FDW based on full crossing @ 1.2 m/s)**
IMPLEMENTATION DATE:	**May 13, 2014**	*CHANNEL/DROP:*	**4042/8**

N ↑

NEMA Phase		TP1 Backup Free	TP2 Plan 1	TP3 Plan 2 & 3	OFF All Other Times	AM 6:30-9:30 M-F	PM 16:00-18:30 M-F	Phase Mode (Fixed/Demanded or Callable)	Remarks
	System Plan				1	2	3		
	Local Plan				Pattern 1	Pattern 2	Pattern 3		
1 NOT USED	WLK								Pedestrian Minimums: NSWK = 7 sec, NSFD = 11 sec; EWWK = 7 sec, EWFD = 18 sec
	FDW								EW phase is callable by vehicle and/or pedestrian actuation. If a vehicle and/or pedestrian call is received, the maximum EWG would be served. The EWWK & EWFD are only displayed on the pedestrian signal heads if a vehicle and/or pedestrian call is received.
	MIN								
	MAX1								
	AMB								
	ALR								
	SPLIT								
2 Morningside Av	WLK	7	7	7				Fixed	NSFD reverts to NSWK if there is no side street demand at the end of the NSFD.
	WLK MAX		15	20					Side Street Passage Time = 3 sec
	FDW	11	11	11					Signal operates FREE 24/7 through Pattern 1 to 3. Walk max values on phases 2 & 6 are the walk times. The signal will serve a minimum of 7 sec NSWK following WRM. Max1 values on phases 4 & 8 are green times.
	MIN	18	26	31					
	MAX1	24	26	31					
	AMB	4	4	4					
	ALR	2	2	2					
	SPLIT				0	0	0		
3 NOT USED	WLK								The signals rest in main street Green/Walk until a side street vehicle or pedestrian call is received.
	FDW								
	MIN								APS on during 7 sec of NSWK & 7 sec of EWWK
	MAX1								Extended Push Activation = 3 sec
	AMB								In the event of Backup Free operation, signal operates using TP1 timing values.
	ALR								
	SPLIT								
4 Coronation Dr	WLK	7	7	7				Callable by stopbar loop and/or pushbutton.	
	WLK MAX								
	FDW	17	17	17					
	MIN	24	24	24					
	MAX1	24	24	24					
	AMB	4	4	4					
	ALR	2	2	2					
	SPLIT				0	0	0		
5 NOT USED	WLK								
	FDW								
	MIN								
	MAX1								
	AMB								
	ALR								
	SPLIT								
6 Morningside Av	WLK	7	7	7				Fixed	
	WLK MAX		15	20					
	FDW	11	11	11					
	MIN	18	26	31					
	MAX1	24	26	31					
	AMB	4	4	4					
	ALR	2	2	2					
	SPLIT				0	0	0		
7 NOT USED	WLK								
	FDW								
	MIN								
	MAX1								
	AMB								
	ALR								
	SPLIT								
8 Coronation Dr	WLK	7	7	7				Callable by stopbar loop and/or pushbutton.	
	WLK MAX								
	FDW	17	17	17					
	MIN	24	24	24					
	MAX1	24	24	24					
	AMB	4	4	4					
	ALR	2	2	2					
	SPLIT				0	0	0		
	CL				62	67	67		
	OF				0 (FREE)	0 (FREE)	0 (FREE)		
	VP				0	0	0		

Notes: Picked Up on TransSuite on July 22, 2013 at 12:59 p.m

CITY OF TORONTO - TRANSPORTATION SERVICES
ITS OPERATIONS - TRAFFIC SIGNALS
703 Don Mills Rd, Toronto ON, M3C 3N3
Phone: (416) 397 5770, Fax (416) 397 5777

CURRENT SIGNAL TIMING INFORMATION

ISSUED TO: WSP Canada Inc. (Racheal Saunders) ***OUR REF: 2016_0099***
DATE: September 20, 2016 ***STAFF: VZ/SQ***

LOCATION:	**Morningside Ave & 28m North of Ling Rd**	*DISTRICT:*	**Scarborough**
MODE/COMMENT:	**PED with 2-Wire Polara APS**	*COMPUTER SYSTEM:*	**TransSuite**
TCS:	**2171**	*CONTROLLER/CABINET TYPE:*	**PEEK ATC 1000 / TS2 T1**
PREPARED/CHECKED BY:	**HL**	CONFLICT FLASH:	**Red & Red**
PREPARATION DATE:	**January 14, 2016**	DESIGN WALK SPEED:	**1.0 m/s (FDW based on full crossing @ 1.2 m/s)**
IMPLEMENTATION DATE:	**January 22, 2016**	CHANNEL/DROP:	**4042/46**
		CONTROLLER FIRMWARE:	**3.18.1.2976**

N ↑

NEMA Phase		OFF All Other Times	AM 06:30 - 09:30, M-F	PM 16:00 - 18:30, M-F	Phase Mode (Fixed/Demanded or Callable)	Remarks
	Local Plan	Pattern 1	Pattern 2	Pattern 3		
	Split Table	Split 1	Split 2	Split 3		
1 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					Pedestrian Minimums: EWWK = 7 sec, EWFD = 13 sec EW phase is callable by pedestrian actuation. APS on during 7secs of EWWK when activated by pushbutton. Extended Push Activation = 3 sec
2 Morningside Ave ↑	WLK 7 FDW 5 MIN 12 MAX1 31 AMB 4 ALR 2 SPLIT	36	36	36	Fixed	7 & 5 secs entered for phases 2 & 6 WLK & FDW to make controller stay in coordination (any two values that add up to phase min can be entered). 8 secs EWWK served when pedestrian call is received.
3 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					
4 Ped Crosswalk (28 m North of Ling Rd) ↔	WLK 7 FDW 13 MIN 20 MAX1 20 AMB 3 ALR 0 SPLIT	24	24	24	Callable by pushbutton	
5 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					
6 Morningside Ave ↓	WLK 7 FDW 5 MIN 12 MAX1 31 AMB 4 ALR 2 SPLIT	36	36	36	Fixed	
7 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					
8 NOT USED	WLK 7 FDW 13 MIN 20 MAX1 20 AMB 3 ALR 0 SPLIT	24	24	24		
	CL OF	60 49	60 3	60 49		

CITY OF TORONTO - TRANSPORTATION SERVICES
ITS OPERATIONS - TRAFFIC SIGNALS
703 Don Mills Rd, Toronto ON, M3C 3N3
Phone: (416) 397 5770, Fax (416) 397 5777
CURRENT SIGNAL TIMING INFORMATION

ISSUED TO: WSP Canada Inc. (Racheal Saunders) ***OUR REF: 2016_0099***
DATE: September 20, 2016 ***STAFF: VZ/SQ***

LOCATION:	**Morningside Ave & Danzig St**	*DISTRICT:*	**Scarborough**
MODE/COMMENT:	**SA2-VMG with WRM & 2-wire Polara APS**	*COMPUTER SYSTEM:*	**TransSuite**
TCS:	**2173**	*CONTROLLER/CABINET TYPE:*	**PEEK ATC 1000 / TS2 T1**
PREPARED/CHECKED BY:	**HL**	*CONFLICT FLASH:*	**Red & Red**
PREPARATION DATE:	**January 14, 2016**	*DESIGN WALK SPEED:*	**1.0 m/s (FDW based on full using at 1.2 m/s)**
IMPLEMENTATION DATE:	**January 22, 2016**	*CHANNEL/DROP:*	**4042/47**
		CONTROLLER FIRMWARE:	**3.18.1.2976**

N

NEMA Phase		OFF All Other Times	AM 06:30-09:30 M-F	PM 16:00-18:30 M-F	Phase Mode (Fixed/Demanded or Callable)	Remarks
	Local Plan	**Pattern 1**	**Pattern 2**	**Pattern 3**		
	Split Table	**Split 1**	**Split 2**	**Split 3**		
1 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					Pedestrian Minimums: NSWK = 7 sec, NSFD = 12 sec EWWK = 7 sec, EWFD = 15 sec
2 Morningside Ave	WLK 7 FDW 12 MIN 19 MAX1 26 AMB 4 ALR 2 SPLIT	31	31	31	Fixed	EW phase is callable by vehicle or pedestrian actuation. If a vehicle call is received, the minimum EWG is 7 seconds. If ongoing vehicle demand exists on the stopbar loop, the EWG is capable of providing vehicle extensions up to the maximum green split. If a pedestrian call is received, the pedestrian minimums will be served. The EWWK & EWFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle/pedestrian demand. Unused extension time is given to the NSG.
3 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					The signal constantly cycles through main street FDW to improve response to side street vehicle and pedestrian demand. NSFD reverts to NSWK if there is no side street demand at the end of the NSFD. Side Street Passage Time = 3 sec When activated by push button, APS on during 7 sec of NSWK & EWWK. Extended APS Push Activation = 3 sec
4 Danzig St	WLK 7 FDW 15 MIN 7 MAX1 22 AMB 4 ALR 2 SPLIT	29	29	29	Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop.	
5 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					
6 Morningside Ave	WLK 7 FDW 12 MIN 19 MAX1 26 AMB 4 ALR 2 SPLIT	31	31	31	Fixed	
7 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					
8 Danzig St	WLK 7 FDW 15 MIN 7 MAX1 22 AMB 4 ALR 2 SPLIT	29	29	29	Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop.	
	CL OF	60 51	60 2	60 51		

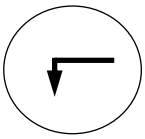
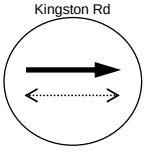
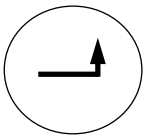
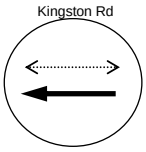
CITY OF TORONTO - TRANSPORTATION SERVICES
ITS OPERATIONS - TRAFFIC SIGNALS
703 Don Mills Rd, Fifth Floor, Toronto ON M3C 3N3
Phone: 416-397-5770 Fax: 416-397-5777

CURRENT SIGNAL TIMING INFORMATION

ISSUED TO:	***WSP Canada Inc. (Racheal Saunders)***	***OUR REF:***	***2016_0099***
DATE :	***Septermber 15, 2016***	***STAFF:***	***JG/RI***

LOCATION:	**Kingston Rd & Morningside Ave**	***DISTRICT:***	**Scarborough**
PX:	**143**	***COMPUTER SYSTEM:***	**TransSuite**
MODE/COMMENT:	**FXT (Master to PX2110 and PX499) ***	***CONTROLLER/CABINET TYPE:***	**PEEK ATC-1000 / TS2 T1**
PREPARED/CHECKED BY:	**SA/DS**	***CONFLICT FLASH:***	**Red & Red**
PREPARATION DATE:	**October 13,2015**	***DESIGN WALK SPEED:***	**1.0 m/s (FDW based on full crossing @ 1.2 m/s)**
IMPLEMENTATION DATE:	**November 23, 2015**	***CHANNEL/DROP:***	**4019/92**
		Controller Firmware:	**3.018.1.2976**

N

NEMA Phase		**OFF All Other Times**	**AM 06:30-09:30 M-F**	**PM 15:45-19:00 M-F**	**Phase Mode (Fixed/Demanded/Callable)**	**Remarks**
	Local Plan	Pattern 1	Pattern 2	Pattern 3		
	Split Table	Split 1	Split 2	Split 3		
1 	WLK FDW MIN 6 MAX 1 6 AMB 3 ALR 1 SPLIT			11	WBLA Callable/Extendable 15:45 - 18:30, M-F by setback loop	Pedestrian Minimums: EWWK = 7 sec., EWFD = 23 sec. NSWK = 7 sec., NSFD = 28 sec. Left-Turn passage = 2 sec. Hardwire connection to Morningside Ave & Private Access/Mall Access (PX 2110) and Lawrence Ave & Morningside Ave (PX 499) to provide simultaneous NSY indications.
2 Kingston Rd 	WLK 7 FDW 23 MIN 30 MAX 1 50 AMB 4 ALR 3 SPLIT	57	67	46	Fixed	Offset pulse is sent to PX2110 and PX499 at the start of NS FDW. Flash condition at one signal is independent of other two signals. *** interconnection temporarily disabled due to damaged cable**
3 NOT USED	WLK FDW MIN MAX 1 AMB ALR SPLIT					
4 Morningside Ave 	WLK 7 FDW 28 MIN 35 MAX 1 36 AMB 4 ALR 3 SPLIT	43	43	43	Fixed	
5 	WLK FDW MIN 6 MAX 1 6 AMB 3 ALR 1 SPLIT	11	11	11	EBLA Callable/Extendable 24 hours by setback loop	
6 Kingston Rd 	WLK 7 FDW 23 MIN 30 MAX 1 39 AMB 4 ALR 3 SPLIT	46	56	46	Fixed	
7 NOT USED	WLK FDW MIN MAX 1 AMB ALR SPLIT					
8 Morningside Ave 	WLK 7 FDW 28 MIN 35 MAX 1 36 AMB 4 ALR 3 SPLIT	43	43	43	Fixed	
	CL OFF	100 57	110 21	100 64		

NOTES: Interconnect operation enabled Nov 27, 2007

CITY OF TORONTO - TRANSPORTATION SERVICES
ITS OPERATIONS - TRAFFIC SIGNALS
703 Don Mills Rd, Fifth Floor, Toronto ON M3C 3N3
Phone: 416-397-5770 Fax: 416-397-5777

CURRENT SIGNAL TIMING INFORMATION

ISSUED TO:	***WSP Canada Inc. (Racheal Saunders)***	***OUR REF:***	***2016_0099***
DATE :	***Septermber 15, 2016***	***STAFF:***	***JG/RI***

LOCATION:	**Kingston Rd & Galloway Rd**	***DISTRICT:***	**Scarborough**
MODE/COMMENT:	**SA2-VMG with WRM & Firehall Pre-emption (NBLA)**	***COMPUTER SYSTEM:***	**TransSuite**
PX:	**145**	***CONTROLLER/CABINET TYPE:***	**Econolite ASC/3S-1000 / TS2 T1**
PREPARED/CHECKED BY:	**JS**	***CONFLICT FLASH:***	**Red & Red**
PREPARATION DATE:	**October 23, 2013**	***DESIGN WALK SPEED:***	**1.0 m/s (FDW based on full crossing @ 1.2 m/s)**
IMPLEMENTATION DATE:	**October 30, 2013**	***CHANNEL/DROP:***	**4027 / 21**

N ↑

NEMA Phase		**OFF All Other Times**	**AM 06:30-09:30 M-F**	**PM 15:00-19:00 M-F**	**Phase Mode (Fixed/Demanded or Callable)**	**Remarks**
	Local Plan	Pattern 1	Pattern 2	Pattern 3		
	System Plan	Plan 1	Plan 2	Plan 3		
1 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					Pedestrian Minimums: EWWK = 7 sec, EWFD = 21 sec NSWK = 7 sec, NSFD = 33 sec NS phase is callable by vehicle and/or pedestrian actuation. If a vehicle call is received, the minimum NSG is 7 seconds. If ongoing vehicle demand exists on the stopbar loop, the NSG is capable of providing vehicle extensions up to the maximum green split. If a pedestrian call is received, the pedestrian minimums will be served. The NSWK & NSFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle demand. Unused extension time is given to the EWG.
2 Kingston Rd	WLK 7 FDW 21 MIN 28 MAX1 28 AMB 4 ALR 3 SPLIT	38	63	63	Fixed	Side Street Passage Time = 3 sec
3 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					EWFD reverts to EWWK if there is no side street vehicle demand at the end of the EWFD. NS pushbutton monitored on local detector 2. The signal constantly cycles through main street FDW to improve response to side street vehicle and pedestrian demand.
4 Galloway Rd	WLK 7 FDW 33 MIN 7 MAX1 40 AMB 4 ALR 2 SPLIT	47	47	47	Callable by Stopbar Loop and/or Push Button. Extendable by Stopbar Loop.	Firehall Preemption Instructions: • If preemption is received in phase 2/6: Time to Preemption Sequence = 0 - 35 secs • If preemption is received in phase 4/8: Time to Preemption Sequence = 0 - 46 secs • Signals go to All Red display before going into preemption sequence Preemption Sequence: Serve 87.0 seconds NBLA/NBG/NSDW Serve 4.0 seconds NBY/NSDW Serve 2.0 second of ALLR Return to normal operation in EWG/EWWK
5 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT					
6 Kingston Rd	WLK 7 FDW 21 MIN 28 MAX1 28 AMB 4 ALR 3 SPLIT	38	63	63	Fixed	
7	WLK FDW MIN MAX1 AMB ALR SPLIT				Displayed Only During Firehall Pre-emption	
8 Galloway Rd	WLK 7 FDW 33 MIN 7 MAX1 40 AMB 4 ALR 2 SPLIT	47	47	47	Callable by Stopbar Loop and/or Push Button. Extendable by Stopbar Loop.	
	CL OF VP	85 14 21	110 71 21	110 26 21		

Notes: Transferred to wireless system control on October 31, 2013 at approximately 11:40.

CITY OF TORONTO - TRANSPORTATION SERVICES
ITS OPERATIONS - TRAFFIC SIGNALS
703 Don Mills Rd, Fifth Floor, Toronto ON M3C 3N3
Phone: 416-397-5770 Fax: 416-397-5777

CURRENT SIGNAL TIMING INFORMATION

ISSUED TO:	*WSP Canada Inc. (Racheal Saunders)*	*OUR REF:*	*2016_0099*
DATE :	*September 15, 2016*	*STAFF:*	*JG/RI*
LOCATION:	**Kingston Rd & Guildwood Pkwy / Cromwell Rd**	*DISTRICT:*	**Scarborough**
MODE/COMMENT:	**SA2-VMG with WRM**	*COMPUTER SYSTEM:*	**TransSuite**
PX:	**146**	*CONTROLLER/CABINET TYPE:*	**Econolite ASC/3-2100 / TS2 T1**
PREPARED/CHECKED BY:	**JS**	*CONFLICT FLASH:*	**Red & Red**
PREPARATION DATE:	**October 23, 2013**	*DESIGN WALK SPEED:*	**1.0 m/s (FDW based on full crossing @ 1.2 m/s)**
IMPLEMENTATION DATE:	**October 30, 2013**	*CHANNEL/DROP:*	**4027 / 4**

N ↑

NEMA Phase		OFF All Other Times	AM 06:30-09:30 M-F	PM 15:00-19:00 M-F	Phase Mode (Fixed/Demanded or Callable)	Remarks
	Local Plan	Pattern 1	Pattern 2	Pattern 3		
	System Plan	Plan 1	Plan 2	Plan 3		
1 NOT USED	WLK					Pedestrian Minimums: EWWK = 7 sec, EWFD = 25 sec NSWK = 7 sec, NSFD = 25 sec
	FDW					NS phase is callable by vehicle and/or pedestrian actuation. If a vehicle call is received, the minimum NSG is 7 seconds. If ongoing vehicle demand exists on the stopbar loop, the NSG is capable of providing vehicle extensions up to the maximum green split. If a pedestrian call is received, the pedestrian minimums will be served. The NSWK & NSFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle demand. Unused extension time is given to the EWG.
	MIN					
	MAX1					
	AMB					
	ALR					
	SPLIT					
2 Kingston Rd	WLK	7			Fixed	
	FDW	25				
	MIN	32				
	MAX1	39				
	AMB	4				
	ALR	2				
	SPLIT		45	62	70	Side Street Passage Time = 3 sec
3 NOT USED	WLK					EWFD reverts to EWWK if there is no side street vehicle demand at the end of the EWFD.
	FDW					Side Street Passage Time = 3 sec
	MIN					NS pushbutton monitored on local detector 2.
	MAX1					The signal constantly cycles through main street FDW to improve response to side street vehicle and pedestrian demand. Side street decision point at the end of EWFD.
	AMB					
	ALR					
	SPLIT					
4 Guildwood Pkwy	WLK	7			Callable by Stopbar Loop and/or Push Button. Extendable by Stopbar Loop.	
	FDW	25				
	MIN	7				
	MAX1	32				
	AMB	4				
	ALR	3				
	SPLIT		40	48	40	
5 NOT USED	WLK					
	FDW					
	MIN					
	MAX1					
	AMB					
	ALR					
	SPLIT					
6 Kingston Rd	WLK	7			Fixed	
	FDW	25				
	MIN	32				
	MAX1	39				
	AMB	4				
	ALR	2				
	SPLIT		45	62	70	
7 NOT USED	WLK					
	FDW					
	MIN					
	MAX1					
	AMB					
	ALR					
	SPLIT					
8 Cromwell Rd	WLK	7			Callable by Stopbar Loop and/or Push Button. Extendable by Stopbar Loop.	
	FDW	25				
	MIN	7				
	MAX1	32				
	AMB	4				
	ALR	3				
	SPLIT		40	48	40	
	CL		85	110	110	
	OF		83	59	32	
	VP		25	25	25	

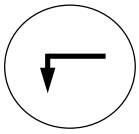
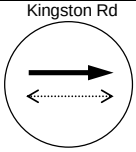
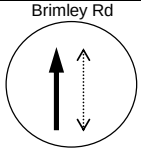
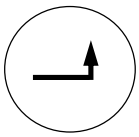
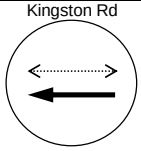
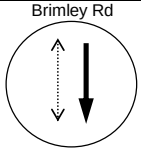
Notes: NS pedestrian crossing prohibited on West leg.
Picked up system control on Mar 22, 2013 at approximately 2:20 pm.

CITY OF TORONTO - TRANSPORTATION SERVICES
ITS OPERATIONS - TRAFFIC SIGNALS
703 Don Mills Rd, Fifth Floor, Toronto ON M3C 3N3
Phone: 416-397-5770 Fax: 416-397-5777

CURRENT SIGNAL TIMING INFORMATION

ISSUED TO:	*WSP Canada Inc. (Racheal Saunders)*	*OUR REF:*	*2016_0099*
DATE :	*Septermber 15, 2016*	*STAFF:*	*JG/RI*

LOCATION:	**Kingston Rd & Brimley Rd**	*DISTRICT:*	**Scarborough**
MODE/COMMENT:	**SA2-VMG with WRM**	*COMPUTER SYSTEM:*	**TransSuite**
PX:	**164**	*CONTROLLER/CABINET TYPE:*	**PEEK ATC 1000 / TS2 T1**
PREPARED/CHECKED BY:	**HZ/HL**	*CONFLICT FLASH:*	**Red & Red**
PREPARATION DATE:	**June 12, 2015**	*DESIGN WALK SPEED:*	**1.0 m/s (FDW based on full crossing at 1.2 m/s)**
IMPLEMENTATION DATE:	**July 3, 2015**	*CHANNEL/DROP:*	**4091/28**
		CONTROLLER FIRMWARE:	**3.014.2511**

NEMA Phase		OFF All Other Times	AM 06:30-09:30 M-F	PM 15:00-19:00 M-F	NGT 21:00-06:30 Daily	Phase Mode (Fixed/Demanded or Callable)	Remarks
	Local Plan	Pattern 1	Pattern 2	Pattern 3	Pattern 4		
	Split Table	Split 1	Split 2	Split 3	Split 4		
1 	WLK FDW MIN 6 MAX 1 6 AMB 3 ALR 1 SPLIT			11		WBLA Callable/Extendable by 9 m Setback Loop during 15:00-19:00, M-F	Pedestrian Minimums: EWWK = 7 sec, EWFD = 16 sec NSWK = 7 sec, NSFD = 31 sec NS phase is callable by vehicle or pedestrian actuation. If a vehicle call is received, the minimum NSG is 7 seconds. If ongoing vehicle demand exists on the stopbar loop, the NSG is capable of providing vehicle extensions up to the maximum green split. If a pedestrian call is received, the pedestrian minimums will be served. The NSWK & NSFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle demand. Unused extension time is given to the EWG for plans 1, 2 & 3.
Kingston Rd 2 	WLK 7 FDW 16 MIN 23 MAX 1 44 AMB 4 ALR 2 SPLIT	49	64	53	44	Fixed	
3 NOT USED	WLK FDW MIN MAX 1 AMB ALR SPLIT						During coordinated operation, the signal constantly cycles through main street FDW to improve response time to side street vehicle and pedestrian demand. During free plan, signal rests in EWWK and does not cycle through EWFD unless there is side street vehicle or pedestrian demand. EWFD reverts to EWWK if there is no side street demand at the end of the EWFD.
Brimley Rd 4 	WLK 7 FDW 31 MIN 7 MAX 1 38 AMB 4 ALR 3 SPLIT	46	46	46	38	Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop.	Side Street Passage Time = 3sec Left-Turn Passage Time = 2 sec Minimum call is placed on NSG if EBLA is called with no side street demand. If EBLA is not called or any unused EBLA time goes to EWG/EWWK during coordinated plans. NGT FREE plan operates through Pattern 4 using split value as green times (WLK & FDW) for phases 2 & 6. The signal will serve the programmed WLK & FDW values following WRM. Phases 4 & 8 uses MAX1 green values.
5 	WLK FDW MIN 6 MAX 1 7 AMB 3 ALR 3 SPLIT	16	18	18	7	EBLA Callable/Extendable 24 hours, daily by stopbar loop; Fully Protected	
Kingston Rd 6 	WLK 7 FDW 16 MIN 23 MAX 1 28 AMB 4 ALR 2 SPLIT	33	46	46	31	Fixed	
7 NOT USED	WLK FDW MIN MAX 1 AMB ALR SPLIT						
Brimley Rd 8 	WLK 7 FDW 31 MIN 7 MAX 1 38 AMB 4 ALR 3 SPLIT	46	46	46	38	Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop.	
	CL OF	95 91	110 95	110 97	0 FREE		

NOTES:

Picked up under TransSuite system on July 21, 2015 at approximately 9:41 A.M.

Appendix B

LEVEL OF SERVICE (LOS) DEFINITIONS FOR SIGNALIZED AND UNSIGNALIZED INTERSECTIONS

Levels of Service – Highway Capacity Manual

Signalized Intersections

Level of Service	Stopped Delay per Vehicle (sec)	Expected delay to Minor Street traffic from the Major Street
A	< 10	Most vehicles arrive during the green phase and do not stop; traffic progression is extremely favourable.
B	10.1 - 20.0	More vehicles stop than for LOS A; traffic progression is good.
C	20.1 - 35.0	Individual cycle failures may appear and the number of vehicles stopping is significant; traffic progression is fair.
D	35.1 - 55.0	Individual cycle failures are noticeable and many vehicles stop; traffic progression is unfavourable.
E	55.1 - 80.0	Individual cycle failures are frequent; traffic progression is poor; acceptable delay is at its limit.
F	> 80	Many individual cycle failures; arrival flow rate exceeds capacity; delay is unacceptable to most drivers.

Source: Highway Capacity Manual, HCM2000

HIGHWAY LOS Signalized 12-09-18

Levels of Service – Highway Capacity Manual

Unsignalized Intersection

Level of Service	Average Control Delays (s/veh)	Expected delay to Minor Street traffic from the Major Street
A	0 - 10	Little or no delay.
B	> 10 – 15	Short traffic delay.
C	> 15 – 25	Average traffic delay.
D	> 25 – 35	Long traffic delay.
E	> 35 – 50	Very long traffic delay.
F	> 50	Extreme delay encountered with queuing, which may cause severe congestion affecting other traffic movements in the intersection.

Source: Highway Capacity Manual, HCM 2000

UNSIGNALIZED LOS 12-09-18

Appendix C

HCM INTERSECTION CAPACITY ANALYSIS SHEETS AND QUEUE REPORT SHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
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)	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	0.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.00		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	788	105	11	2272	3	369	0	27	26	0	23
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		6.0	6.0		6.0		6.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.95	0.95		1.00		1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00		0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		0.99	0.99		1.00		1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.98		1.00		0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96		0.95		1.00
Satd. Flow (prot)	1825	5043	1443	1669	5141		1648	1632		1825		1595
Flt Permitted	0.07	1.00	1.00	0.31	1.00		0.95	0.96		0.56		1.00
Satd. Flow (perm)	135	5043	1443	541	5141		1648	1632		1079		1595
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)	5	821	109	11	2367	3	384	0	28	27	0	24
RTOR Reduction (vph)	0	0	47	0	0	0	0	20	0	0	0	16
Lane Group Flow (vph)	5	821	62	11	2370	0	207	185	0	27	0	8
Confl. Peds. (#/hr)	9		11	11		9	12					12
Confl. Bikes (#/hr)			3			2						
Heavy Vehicles (%)	0%	4%	11%	9%	2%	0%	4%	0%	4%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		custom	NA		D.Pm		Perm
Protected Phases		2			6			8				
Permitted Phases	2		2	6			4			8		8
Actuated Green, G (s)	56.0	56.0	56.0	56.0	56.0		32.0	32.0		32.0		32.0
Effective Green, g (s)	57.0	57.0	57.0	57.0	57.0		33.0	33.0		33.0		33.0
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.56		0.33	0.33		0.33		0.33
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		7.0	7.0		7.0		7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0		3.0
Lane Grp Cap (vph)	76	2846	814	305	2901		538	533		352		521
v/s Ratio Prot		0.16			c0.46							
v/s Ratio Perm	0.04		0.04	0.02			c0.13	0.11		0.03		0.00
v/c Ratio	0.07	0.29	0.08	0.04	0.82		0.38	0.35		0.08		0.02
Uniform Delay, d1	10.0	11.4	10.0	9.8	17.8		26.2	25.8		23.5		23.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2	1.7	0.3	0.2	0.2	2.7		0.5	0.4		0.1		0.0
Delay (s)	11.6	11.7	10.2	10.0	20.5		26.6	26.2		23.6		23.0
Level of Service	B	B	B	B	C		C	C		C		C
Approach Delay (s)		11.5			20.4			26.4			23.3	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	74	36	37	204	1	39	27	56	0	21	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			0.99			0.98	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.96			1.00			0.94			0.90	
Flt Protected		1.00			0.99			0.98			1.00	
Satd. Flow (prot)		3085			3464			1703			1689	
Flt Permitted		0.92			0.90			0.89			1.00	
Satd. Flow (perm)		2858			3125			1542			1689	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	12	84	41	42	232	1	44	31	64	0	24	80
RTOR Reduction (vph)	0	25	0	0	1	0	0	35	0	0	44	0
Lane Group Flow (vph)	0	112	0	0	274	0	0	104	0	0	60	0
Confl. Peds. (#/hr)	5		15	15		5	19		18	18		19
Confl. Bikes (#/hr)			2			1			4			
Heavy Vehicles (%)	0%	18%	0%	0%	5%	0%	5%	0%	2%	0%	0%	0%
Bus Blockages (#/hr)	0	0	13	0	0	12	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		24.0			24.0			28.0			28.0	
Effective Green, g (s)		25.0			25.0			29.0			29.0	
Actuated g/C Ratio		0.38			0.38			0.45			0.45	
Clearance Time (s)		6.0			6.0			7.0			7.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1099			1201			687			753	
v/s Ratio Prot											0.04	
v/s Ratio Perm		0.04			c0.09			c0.07				
v/c Ratio		0.10			0.23			0.15			0.08	
Uniform Delay, d1		12.8			13.5			10.7			10.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			0.4			0.1			0.0	
Delay (s)		13.0			13.9			10.8			10.4	
Level of Service		B			B			B			B	
Approach Delay (s)		13.0			13.9			10.8			10.4	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	752	34	22	2175	33	121	81	50	13	29	79
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			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.97	
Flpb, ped/bikes	1.00	1.00		0.99	1.00			0.99			1.00	
Frt	1.00	0.99		1.00	1.00			0.97			0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1825	4965		1816	5124			1797			1697	
Flt Permitted	0.07	1.00		0.31	1.00			0.79			0.96	
Satd. Flow (perm)	135	4965		584	5124			1454			1632	
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)	20	783	35	23	2266	34	126	84	52	14	30	82
RTOR Reduction (vph)	0	4	0	0	1	0	0	8	0	0	1	0
Lane Group Flow (vph)	20	814	0	23	2299	0	0	254	0	0	125	0
Confl. Peds. (#/hr)	12		9	9		12	33		17	17		33
Confl. Bikes (#/hr)			2						1			
Heavy Vehicles (%)	0%	5%	0%	0%	2%	6%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	17	0	0	17	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	56.0	56.0		56.0	56.0			40.0			40.0	
Effective Green, g (s)	57.0	57.0		57.0	57.0			41.0			41.0	
Actuated g/C Ratio	0.52	0.52		0.52	0.52			0.38			0.38	
Clearance Time (s)	7.0	7.0		7.0	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)	70	2596		305	2679			546			613	
v/s Ratio Prot		0.16			c0.45							
v/s Ratio Perm	0.15			0.04				c0.17			0.08	
v/c Ratio	0.29	0.31		0.08	0.86			0.46			0.20	
Uniform Delay, d1	14.6	14.8		12.9	22.5			25.7			23.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	10.0	0.3		0.5	3.8			0.6			0.2	
Delay (s)	24.6	15.2		13.4	26.3			26.3			23.1	
Level of Service	C	B		B	C			C			C	
Approach Delay (s)		15.4			26.2			26.3			23.1	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	173	737	18	55	1747	33	18	386	62	66	277	227
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		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		0.97	1.00		0.98	1.00		0.99	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1772	4972		1742	5072		1784	3354		1768	3143	
Flt Permitted	0.08	1.00		0.34	1.00		0.36	1.00		0.41	1.00	
Satd. Flow (perm)	141	4972		622	5072		683	3354		760	3143	
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)	182	776	19	58	1839	35	19	406	65	69	292	239
RTOR Reduction (vph)	0	2	0	0	2	0	0	12	0	0	92	0
Lane Group Flow (vph)	182	793	0	58	1872	0	19	459	0	69	439	0
Confl. Peds. (#/hr)	43		72	72		43	56		27	27		56
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	3%	5%	0%	2%	3%	3%	0%	7%	0%	2%	7%	3%
Bus Blockages (#/hr)	0	0	17	0	0	18	0	0	11	0	0	17
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	60.0	60.0		49.0	49.0		36.0	36.0		36.0	36.0	
Effective Green, g (s)	61.0	61.0		50.0	50.0		37.0	37.0		37.0	37.0	
Actuated g/C Ratio	0.55	0.55		0.45	0.45		0.34	0.34		0.34	0.34	
Clearance Time (s)	4.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Grp Cap (vph)	196	2757		282	2305		229	1128		255	1057	
v/s Ratio Prot	c0.07	0.16			0.37			0.14			c0.14	
v/s Ratio Perm	c0.45			0.09			0.03			0.09		
v/c Ratio	0.93	0.29		0.21	0.81		0.08	0.41		0.27	0.42	
Uniform Delay, d1	27.4	13.0		18.1	25.9		24.9	28.1		26.6	28.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	47.9	0.3		1.6	3.3		0.7	1.1		2.6	1.2	
Delay (s)	75.4	13.2		19.7	29.2		25.6	29.2		29.2	29.4	
Level of Service	E	B		B	C		C	C		C	C	
Approach Delay (s)		24.8			28.9			29.0			29.3	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	119.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	0	430	0	0	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0			6.0
Lane Util. Factor			0.95			0.95
Frpb, 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)			3476			3380
Flt Permitted			1.00			1.00
Satd. Flow (perm)			3476			3380
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	443	0	0	235
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	443	0	0	235
Confl. Peds. (#/hr)		24				
Heavy Vehicles (%)	0%	0%	5%	0%	0%	8%
Turn Type	Prot		NA			NA
Protected Phases	4		2			6
Permitted Phases						
Actuated Green, G (s)			31.0			31.0
Effective Green, g (s)			31.0			31.0
Actuated g/C Ratio			0.52			0.52
Clearance Time (s)			6.0			6.0
Vehicle Extension (s)			3.0			3.0
Lane Grp Cap (vph)			1795			1746
v/s Ratio Prot			c0.13			0.07
v/s Ratio Perm						
v/c Ratio			0.25			0.13
Uniform Delay, d1			8.0			7.5
Progression Factor			1.00			1.00
Incremental Delay, d2			0.3			0.2
Delay (s)			8.4			7.7
Level of Service			A			A
Approach Delay (s)	0.0		8.4			7.7
Approach LOS	A		A			A

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	35	42	388	11	12	226
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	36	43	400	11	12	233
Pedestrians			1			
Lane Width (m)			3.7			
Walking Speed (m/s)			1.1			
Percent Blockage			0			
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			200			30
pX, platoon unblocked	0.97					
vC, conflicting volume	548	206			411	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	475	206			411	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	95			99	
cM capacity (veh/h)	502	807			1158	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	79	267	145	90	155
Volume Left	36	0	0	12	0
Volume Right	43	0	11	0	0
cSH	633	1700	1700	1158	1700
Volume to Capacity	0.13	0.16	0.09	0.01	0.09
Queue Length 95th (m)	3.3	0.0	0.0	0.2	0.0
Control Delay (s)	11.5	0.0	0.0	1.2	0.0
Lane LOS	B			A	
Approach Delay (s)	11.5	0.0		0.4	
Approach LOS	B				

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	26.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	2	3	0	6	33	2	306	0	15	200	44
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		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		0.99	1.00		1.00	1.00	
Frt		0.99			0.89		1.00	1.00		1.00	0.97	
Flt Protected		0.96			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1817			1640		1815	3444		1704	3266	
Flt Permitted		0.82			1.00		0.60	1.00		0.56	1.00	
Satd. Flow (perm)		1546			1640		1139	3444		1005	3266	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	31	2	3	0	6	34	2	315	0	15	206	45
RTOR Reduction (vph)	0	2	0	0	21	0	0	0	0	0	25	0
Lane Group Flow (vph)	0	34	0	0	19	0	2	315	0	15	226	0
Confl. Peds. (#/hr)	1		12	12		1	5		1	1		5
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	6%	0%	7%	10%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	9	0	0	12
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		22.0			22.0		26.0	26.0		26.0	26.0	
Effective Green, g (s)		23.0			23.0		27.0	27.0		27.0	27.0	
Actuated g/C Ratio		0.38			0.38		0.45	0.45		0.45	0.45	
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)		592			628		512	1549		452	1469	
v/s Ratio Prot					0.01			c0.09			0.07	
v/s Ratio Perm		c0.02					0.00			0.01		
v/c Ratio		0.06			0.03		0.00	0.20		0.03	0.15	
Uniform Delay, d1		11.7			11.5		9.1	10.0		9.2	9.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.0		0.0	0.3		0.1	0.2	
Delay (s)		11.7			11.6		9.1	10.3		9.3	10.0	
Level of Service		B			B		A	B		A	A	
Approach Delay (s)		11.7			11.6			10.3			9.9	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.14		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	39	1	56	105	97	1	176	32	70	105	28
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	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes		1.00		1.00	0.99			1.00			1.00	
Flpb, ped/bikes		1.00		0.99	1.00			1.00			1.00	
Frt		1.00		1.00	0.93			0.98			0.98	
Flt Protected		0.98		0.95	1.00			1.00			0.98	
Satd. Flow (prot)		1845		1809	1739			3314			3202	
Flt Permitted		0.84		0.71	1.00			0.95			0.80	
Satd. Flow (perm)		1579		1349	1739			3163			2601	
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	41	1	59	111	102	1	185	34	74	111	29
RTOR Reduction (vph)	0	1	0	0	50	0	0	18	0	0	15	0
Lane Group Flow (vph)	0	73	0	59	163	0	0	202	0	0	199	0
Confl. Peds. (#/hr)	1		12	12		1	3		2	1		3
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	3%	0%	0%	0%	4%	100%	8%	0%	6%	14%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	12
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		24.0		24.0	24.0			31.0			31.0	
Effective Green, g (s)		25.0		25.0	25.0			32.0			32.0	
Actuated g/C Ratio		0.37		0.37	0.37			0.48			0.48	
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		589		503	648			1510			1242	
v/s Ratio Prot					c0.09							
v/s Ratio Perm		0.05		0.04				0.06			c0.08	
v/c Ratio		0.12		0.12	0.25			0.13			0.16	
Uniform Delay, d1		13.8		13.8	14.5			9.8			9.9	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.1		0.1	0.2			0.2			0.3	
Delay (s)		13.9		13.9	14.7			10.0			10.2	
Level of Service		B		B	B			A			B	
Approach Delay (s)		13.9			14.6			10.0			10.2	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	67.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	2177	294	48	1121	3	269	0	32	36	0	14
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		6.0		6.0	6.0		6.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97		1.00	1.00		1.00
Frpb, ped/bikes	1.00	1.00	0.98	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		0.98		1.00	1.00		1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00		0.85	1.00		0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95		1.00	0.95		1.00
Satd. Flow (prot)	1818	5193	1542	1825	5140		3289		1633	1825		1589
Flt Permitted	0.20	1.00	1.00	0.06	1.00		0.95		1.00	0.95		1.00
Satd. Flow (perm)	380	5193	1542	118	5140		3289		1633	1825		1589
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)	18	2268	306	50	1168	3	280	0	33	38	0	15
RTOR Reduction (vph)	0	0	88	0	0	0	0	0	21	0	0	10
Lane Group Flow (vph)	18	2268	218	50	1171	0	280	0	12	38	0	5
Confl. Peds. (#/hr)	21		8	8		21	15					15
Confl. Bikes (#/hr)			5			1						
Heavy Vehicles (%)	0%	1%	4%	0%	2%	0%	6%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm		Perm	Perm		Perm
Protected Phases		2			6							
Permitted Phases	2		2	6			4		4	8		8
Actuated Green, G (s)	64.0	64.0	64.0	64.0	64.0		32.0		32.0	32.0		32.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	65.0		33.0		33.0	33.0		33.0
Actuated g/C Ratio	0.60	0.60	0.60	0.60	0.60		0.30		0.30	0.30		0.30
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		7.0		7.0	7.0		7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0		3.0	3.0		3.0
Lane Grp Cap (vph)	226	3096	919	70	3065		995		494	552		481
v/s Ratio Prot		c0.44			0.23							
v/s Ratio Perm	0.05		0.14	0.42			c0.09		0.01	0.02		0.00
v/c Ratio	0.08	0.73	0.24	0.71	0.38		0.28		0.02	0.07		0.01
Uniform Delay, d1	9.3	15.8	10.3	15.5	11.5		29.0		26.7	27.1		26.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00		1.00
Incremental Delay, d2	0.7	1.6	0.6	47.1	0.4		0.2		0.0	0.1		0.0
Delay (s)	10.0	17.3	10.9	62.5	11.9		29.1		26.7	27.1		26.6
Level of Service	B	B	B	E	B		C		C	C		C
Approach Delay (s)		16.5			13.9			28.9			27.0	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	197	43	78	160	8	30	15	78	5	46	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			0.98			0.98	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			1.00			0.91			0.92	
Flt Protected		1.00			0.98			0.99			1.00	
Satd. Flow (prot)		3365			3361			1689			1727	
Flt Permitted		0.92			0.77			0.91			0.99	
Satd. Flow (perm)		3099			2613			1552			1714	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	23	229	50	91	186	9	35	17	91	6	53	95
RTOR Reduction (vph)	0	25	0	0	4	0	0	50	0	0	53	0
Lane Group Flow (vph)	0	277	0	0	282	0	0	93	0	0	101	0
Confl. Peds. (#/hr)	27		11	11		27	21		20	20		21
Confl. Bikes (#/hr)						2						2
Heavy Vehicles (%)	0%	6%	0%	0%	9%	0%	3%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	12	0	0	13	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		24.0			24.0			28.0			28.0	
Effective Green, g (s)		25.0			25.0			29.0			29.0	
Actuated g/C Ratio		0.38			0.38			0.45			0.45	
Clearance Time (s)		6.0			6.0			7.0			7.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1191			1005			692			764	
v/s Ratio Prot												
v/s Ratio Perm		0.09			c0.11			c0.06			0.06	
v/c Ratio		0.23			0.28			0.13			0.13	
Uniform Delay, d1		13.5			13.8			10.6			10.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.5			0.7			0.1			0.1	
Delay (s)		14.0			14.5			10.7			10.7	
Level of Service		B			B			B			B	
Approach Delay (s)		14.0			14.5			10.7			10.7	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	82	1929	100	53	1125	56	76	68	53	20	79	59
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			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.98			0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			0.99			1.00	
Frt	1.00	0.99		1.00	0.99			0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1811	5083		1825	5046			1759			1772	
Flt Permitted	0.17	1.00		0.07	1.00			0.83			0.95	
Satd. Flow (perm)	329	5083		135	5046			1494			1693	
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)	85	2009	104	55	1172	58	79	71	55	21	82	61
RTOR Reduction (vph)	0	5	0	0	5	0	0	2	0	0	19	0
Lane Group Flow (vph)	85	2108	0	55	1225	0	0	203	0	0	145	0
Confl. Peds. (#/hr)	27		37	37		27	45		58	58		45
Confl. Bikes (#/hr)			3						2			2
Heavy Vehicles (%)	0%	2%	1%	0%	3%	0%	0%	0%	2%	0%	0%	0%
Bus Blockages (#/hr)	0	0	14	0	0	14	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	56.0	56.0		56.0	56.0			40.0			40.0	
Effective Green, g (s)	57.0	57.0		57.0	57.0			41.0			41.0	
Actuated g/C Ratio	0.52	0.52		0.52	0.52			0.38			0.38	
Clearance Time (s)	7.0	7.0		7.0	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)	172	2658		70	2638			561			636	
v/s Ratio Prot		c0.41			0.24							
v/s Ratio Perm	0.26			0.41				c0.14			0.09	
v/c Ratio	0.49	0.79		0.79	0.46			0.36			0.23	
Uniform Delay, d1	16.7	21.2		21.1	16.4			24.5			23.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	9.8	2.5		58.6	0.6			0.4			0.2	
Delay (s)	26.5	23.7		79.7	17.0			24.9			23.4	
Level of Service	C	C		E	B			C			C	
Approach Delay (s)		23.8			19.7			24.9			23.4	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	110.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	1657	27	103	924	87	37	429	96	109	552	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.98		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.97	1.00		0.96	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1765	5169		1824	5067		1774	3407		1760	3253	
Flt Permitted	0.20	1.00		0.10	1.00		0.21	1.00		0.39	1.00	
Satd. Flow (perm)	377	5169		192	5067		399	3407		717	3253	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	242	1674	27	104	933	88	37	433	97	110	558	263
RTOR Reduction (vph)	0	2	0	0	11	0	0	19	0	0	56	0
Lane Group Flow (vph)	242	1699	0	104	1010	0	37	511	0	110	765	0
Confl. Peds. (#/hr)	122		136	136		122	128		94	94		128
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	3%	1%	0%	0%	1%	1%	0%	3%	0%	0%	3%	2%
Bus Blockages (#/hr)	0	0	10	0	0	10	0	0	13	0	0	19
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	46.0	39.0		46.0	39.0		36.0	36.0		36.0	36.0	
Effective Green, g (s)	48.0	40.0		48.0	40.0		37.0	37.0		37.0	37.0	
Actuated g/C Ratio	0.48	0.40		0.48	0.40		0.37	0.37		0.37	0.37	
Clearance Time (s)	4.0	7.0		4.0	7.0		7.0	7.0		7.0	7.0	
Lane Grp Cap (vph)	292	2067		222	2026		147	1260		265	1203	
v/s Ratio Prot	c0.07	0.33		0.04	0.20			0.15			c0.24	
v/s Ratio Perm	c0.33			0.19			0.09			0.15		
v/c Ratio	0.83	0.82		0.47	0.50		0.25	0.41		0.42	0.64	
Uniform Delay, d1	16.9	26.8		18.4	22.5		21.9	23.3		23.4	26.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	23.0	3.8		6.9	0.9		4.1	1.0		4.7	2.6	
Delay (s)	39.9	30.7		25.4	23.4		26.0	24.3		28.2	28.5	
Level of Service	D	C		C	C		C	C		C	C	
Approach Delay (s)		31.8			23.6			24.4			28.5	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	115.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	0	417	0	0	553
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0			5.0
Lane Util. Factor			0.95			0.95
Frpb, 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)			3579			3579
Flt Permitted			1.00			1.00
Satd. Flow (perm)			3579			3579
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	453	0	0	601
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	453	0	0	601
Confl. Peds. (#/hr)		31				
Turn Type	Prot		NA			NA
Protected Phases	4		2			6
Permitted Phases						
Actuated Green, G (s)			31.0			31.0
Effective Green, g (s)			32.0			32.0
Actuated g/C Ratio			0.53			0.53
Clearance Time (s)			6.0			6.0
Vehicle Extension (s)			3.0			3.0
Lane Grp Cap (vph)			1908			1908
v/s Ratio Prot			0.13			c0.17
v/s Ratio Perm						
v/c Ratio			0.24			0.31
Uniform Delay, d1			7.5			7.9
Progression Factor			1.00			1.00
Incremental Delay, d2			0.3			0.4
Delay (s)			7.8			8.3
Level of Service			A			A
Approach Delay (s)	0.0		7.8			8.3
Approach LOS	A		A			A

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	27	30	387	45	46	507
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	29	32	416	48	49	545
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			200			33
pX, platoon unblocked	0.91	1.00			1.00	
vC, conflicting volume	812	232			465	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	587	231			463	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	96			96	
cM capacity (veh/h)	387	778			1108	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	61	277	187	231	363
Volume Left	29	0	0	49	0
Volume Right	32	0	48	0	0
cSH	526	1700	1700	1108	1700
Volume to Capacity	0.12	0.16	0.11	0.04	0.21
Queue Length 95th (m)	3.0	0.0	0.0	1.1	0.0
Control Delay (s)	12.8	0.0	0.0	2.1	0.0
Lane LOS	B			A	
Approach Delay (s)	12.8	0.0		0.8	
Approach LOS	B				

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	12	8	7	6	27	3	320	5	30	387	81
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		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		0.98	1.00		0.98	1.00	
Frt		0.99			0.91		1.00	1.00		1.00	0.97	
Flt Protected		0.96			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1809			1701		1791	3535		1795	3434	
Flt Permitted		0.78			0.96		0.46	1.00		0.54	1.00	
Satd. Flow (perm)		1470			1646		859	3535		1025	3434	
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)	74	13	9	8	6	29	3	344	5	32	416	87
RTOR Reduction (vph)	0	6	0	0	18	0	0	2	0	0	29	0
Lane Group Flow (vph)	0	90	0	0	25	0	3	347	0	32	474	0
Confl. Peds. (#/hr)	12		17	17		12	24		17	17		24
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	13	0	0	13
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		22.0			22.0		26.0	26.0		26.0	26.0	
Effective Green, g (s)		23.0			23.0		27.0	27.0		27.0	27.0	
Actuated g/C Ratio		0.38			0.38		0.45	0.45		0.45	0.45	
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)		563			630		386	1590		461	1545	
v/s Ratio Prot								0.10			c0.14	
v/s Ratio Perm		c0.06			0.02		0.00			0.03		
v/c Ratio		0.16			0.04		0.01	0.22		0.07	0.31	
Uniform Delay, d1		12.2			11.6		9.1	10.1		9.4	10.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.0		0.0	0.3		0.3	0.5	
Delay (s)		12.3			11.6		9.1	10.4		9.7	11.0	
Level of Service		B			B		A	B		A	B	
Approach Delay (s)		12.3			11.6			10.4			11.0	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	144	5	48	39	79	4	167	83	102	241	55
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	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes		1.00		1.00	0.99			0.99			0.99	
Flpb, ped/bikes		1.00		0.98	1.00			1.00			1.00	
Frt		1.00		1.00	0.90			0.95			0.98	
Flt Protected		0.98		0.95	1.00			1.00			0.99	
Satd. Flow (prot)		1879		1792	1705			3268			3371	
Flt Permitted		0.86		0.60	1.00			0.95			0.79	
Satd. Flow (perm)		1644		1124	1705			3106			2693	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	79	160	6	53	43	88	4	186	92	113	268	61
RTOR Reduction (vph)	0	1	0	0	55	0	0	48	0	0	19	0
Lane Group Flow (vph)	0	244	0	53	76	0	0	234	0	0	423	0
Confl. Peds. (#/hr)	9		34	34		9	13		13	13		13
Confl. Bikes (#/hr)			3									
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	6%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	13
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		24.0		24.0	24.0			31.0			31.0	
Effective Green, g (s)		25.0		25.0	25.0			32.0			32.0	
Actuated g/C Ratio		0.37		0.37	0.37			0.48			0.48	
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		613		419	636			1483			1286	
v/s Ratio Prot					0.04							
v/s Ratio Perm		c0.15		0.05				0.08			c0.16	
v/c Ratio		0.40		0.13	0.12			0.16			0.33	
Uniform Delay, d1		15.5		13.8	13.8			9.9			10.8	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.4		0.1	0.1			0.2			0.7	
Delay (s)		15.9		14.0	13.9			10.1			11.5	
Level of Service		B		B	B			B			B	
Approach Delay (s)		15.9			13.9			10.1			11.5	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	67.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	84	838	41	39	1836	24	71	65	25	18	47	103
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		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.98	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.96		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1690	5119		1814	5181		1780	1789		1700	1588	
Flt Permitted	0.08	1.00		0.26	1.00		0.62	1.00		0.69	1.00	
Satd. Flow (perm)	144	5119		506	5181		1161	1789		1233	1588	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	99	986	48	46	2160	28	84	76	29	21	55	121
RTOR Reduction (vph)	0	5	0	0	1	0	0	13	0	0	73	0
Lane Group Flow (vph)	99	1029	0	46	2187	0	84	92	0	21	103	0
Confl. Peds. (#/hr)	11		11	11		11	23		17	17		23
Confl. Bikes (#/hr)			4			6						
Heavy Vehicles (%)	8%	1%	12%	0%	1%	0%	1%	3%	0%	6%	0%	9%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	58.0	58.0		43.3	43.3		38.0	38.0		38.0	38.0	
Effective Green, g (s)	59.0	59.0		44.3	44.3		39.0	39.0		39.0	39.0	
Actuated g/C Ratio	0.54	0.54		0.41	0.41		0.36	0.36		0.36	0.36	
Clearance Time (s)	6.0	6.0		6.0	6.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	215	2770		205	2105		415	640		441	568	
v/s Ratio Prot	c0.04	0.20			c0.42			0.05			0.07	
v/s Ratio Perm	0.21			0.09			c0.07			0.02		
v/c Ratio	0.46	0.37		0.22	1.04		0.20	0.14		0.05	0.18	
Uniform Delay, d1	22.1	14.4		21.1	32.4		24.2	23.7		22.9	24.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	0.4		2.5	30.6		0.2	0.1		0.0	0.2	
Delay (s)	23.7	14.7		23.7	62.9		24.5	23.8		22.9	24.2	
Level of Service	C	B		C	E		C	C		C	C	
Approach Delay (s)		15.5			62.1			24.1			24.1	
Approach LOS		B			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	44.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	1088	322	40	2016	4	578	0	66	38	0	21
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		6.0	6.0		6.0		6.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.95	0.95		1.00		1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00		0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		0.96	0.97		1.00		1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.97		1.00		0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96		0.95		1.00
Satd. Flow (prot)	1824	5043	1544	1823	5140		1619	1599		1820		1552
Flt Permitted	0.07	1.00	1.00	0.20	1.00		0.95	0.96		0.38		1.00
Satd. Flow (perm)	135	5043	1544	391	5140		1619	1599		725		1552
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)	4	1133	335	42	2100	4	602	0	69	40	0	22
RTOR Reduction (vph)	0	0	147	0	0	0	0	20	0	0	0	15
Lane Group Flow (vph)	4	1133	188	42	2104	0	337	314	0	40	0	7
Confl. Peds. (#/hr)	18		7	7		18	40		6	6		40
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	0%	4%	4%	0%	2%	0%	3%	0%	2%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		custom	NA		D.Pm		Perm
Protected Phases		2			6			8				
Permitted Phases	2		2	6			4			8		8
Actuated Green, G (s)	56.0	56.0	56.0	56.0	56.0		32.6	32.6		32.6		32.6
Effective Green, g (s)	57.0	57.0	57.0	57.0	57.0		33.6	33.6		33.6		33.6
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.56		0.33	0.33		0.33		0.33
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		7.0	7.0		7.0		7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0		3.0
Lane Grp Cap (vph)	75	2829	866	219	2883		535	528		239		513
v/s Ratio Prot		0.22			c0.41							
v/s Ratio Perm	0.03		0.12	0.11			c0.21	0.20		0.06		0.00
v/c Ratio	0.05	0.40	0.22	0.19	0.73		0.63	0.59		0.17		0.01
Uniform Delay, d1	10.1	12.6	11.1	11.0	16.6		28.7	28.3		24.1		22.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2	1.3	0.4	0.6	1.9	1.7		2.3	1.8		0.3		0.0
Delay (s)	11.4	13.1	11.7	12.9	18.2		31.1	30.1		24.4		22.9
Level of Service	B	B	B	B	B		C	C		C		C
Approach Delay (s)		12.7			18.1			30.6			23.9	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	101.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	106.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	269	50	41	381	30	109	43	69	33	60	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			0.98			0.95	
Flpb, ped/bikes		1.00			1.00			0.98			1.00	
Frt		0.98			0.99			0.96			0.92	
Flt Protected		1.00			1.00			0.98			0.99	
Satd. Flow (prot)		3348			3455			1719			1654	
Flt Permitted		0.87			0.87			0.68			0.92	
Satd. Flow (perm)		2940			3014			1206			1530	
Peak-hour factor, PHF	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Adj. Flow (vph)	36	364	68	55	515	41	147	58	93	45	81	200
RTOR Reduction (vph)	0	21	0	0	8	0	0	25	0	0	58	0
Lane Group Flow (vph)	0	447	0	0	603	0	0	273	0	0	268	0
Confl. Peds. (#/hr)	80		29	29		80	92		53	53		92
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	6%	2%	0%	3%	7%	0%	5%	0%	0%	0%	1%
Bus Blockages (#/hr)	0	0	13	0	0	12	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		24.0			24.0			28.0			28.0	
Effective Green, g (s)		25.0			25.0			29.0			29.0	
Actuated g/C Ratio		0.38			0.38			0.45			0.45	
Clearance Time (s)		6.0			6.0			7.0			7.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1130			1159			538			682	
v/s Ratio Prot												
v/s Ratio Perm		0.15			c0.20			c0.23			0.18	
v/c Ratio		0.40			0.52			0.51			0.39	
Uniform Delay, d1		14.5			15.4			12.9			12.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.0			1.7			0.8			0.4	
Delay (s)		15.6			17.1			13.6			12.5	
Level of Service		B			B			B			B	
Approach Delay (s)		15.6			17.1			13.6			12.5	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	34	1057	56	52	1965	43	149	138	98	28	90	79
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			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.98	
Flpb, ped/bikes	1.00	1.00		0.99	1.00			0.99			1.00	
Frt	1.00	0.99		1.00	1.00			0.97			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1772	4989		1806	5120			1744			1716	
Flt Permitted	0.07	1.00		0.19	1.00			0.75			0.92	
Satd. Flow (perm)	131	4989		356	5120			1328			1584	
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)	36	1113	59	55	2068	45	157	145	103	29	95	83
RTOR Reduction (vph)	0	5	0	0	2	0	0	11	0	0	2	0
Lane Group Flow (vph)	36	1167	0	55	2111	0	0	394	0	0	205	0
Confl. Peds. (#/hr)	26		33	33		26	61		48	48		61
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	3%	4%	2%	0%	2%	0%	1%	2%	2%	7%	2%	1%
Bus Blockages (#/hr)	0	0	17	0	0	17	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	56.0	56.0		56.0	56.0			40.4			40.4	
Effective Green, g (s)	57.0	57.0		57.0	57.0			41.4			41.4	
Actuated g/C Ratio	0.52	0.52		0.52	0.52			0.38			0.38	
Clearance Time (s)	7.0	7.0		7.0	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)	68	2599		185	2667			502			599	
v/s Ratio Prot		0.23			c0.41							
v/s Ratio Perm	0.28			0.15				c0.30			0.13	
v/c Ratio	0.53	0.45		0.30	0.79			0.78			0.34	
Uniform Delay, d1	17.3	16.4		14.8	21.4			30.1			24.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	26.5	0.6		4.1	2.5			7.9			0.3	
Delay (s)	43.8	16.9		18.9	23.9			37.9			24.6	
Level of Service	D	B		B	C			D			C	
Approach Delay (s)		17.7			23.7			37.9			24.6	
Approach LOS		B			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	109.4	Sum of lost time (s)	11.0
Intersection Capacity Utilization	100.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	219	834	12	66	1731	34	20	493	77	55	394	275
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		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		0.97	1.00		0.97	1.00		0.96	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1772	5075		1763	5114		1771	3366		1690	3127	
Flt Permitted	0.08	1.00		0.32	1.00		0.27	1.00		0.33	1.00	
Satd. Flow (perm)	141	5075		592	5114		497	3366		590	3127	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	221	842	12	67	1748	34	20	498	78	56	398	278
RTOR Reduction (vph)	0	1	0	0	2	0	0	11	0	0	92	0
Lane Group Flow (vph)	221	853	0	67	1780	0	20	565	0	56	584	0
Confl. Peds. (#/hr)	101		101	101		101	97		100	100		97
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	3%	3%	0%	0%	2%	3%	0%	5%	3%	4%	7%	2%
Bus Blockages (#/hr)	0	0	17	0	0	18	0	0	11	0	0	17
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	60.0	60.0		49.0	49.0		36.0	36.0		36.0	36.0	
Effective Green, g (s)	61.0	61.0		50.0	50.0		37.0	37.0		37.0	37.0	
Actuated g/C Ratio	0.55	0.55		0.45	0.45		0.34	0.34		0.34	0.34	
Clearance Time (s)	4.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Grp Cap (vph)	196	2814		269	2324		167	1132		198	1051	
v/s Ratio Prot	c0.08	0.17			0.35			0.17			c0.19	
v/s Ratio Perm	c0.54			0.11			0.04			0.09		
v/c Ratio	1.13	0.30		0.25	0.77		0.12	0.50		0.28	0.56	
Uniform Delay, d1	28.9	13.1		18.5	25.1		25.2	29.1		26.8	29.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	102.7	0.3		2.2	2.5		1.5	1.6		3.5	2.1	
Delay (s)	131.6	13.4		20.7	27.6		26.7	30.7		30.3	31.9	
Level of Service	F	B		C	C		C	C		C	C	
Approach Delay (s)		37.7			27.3			30.5			31.8	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	110.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	0	518	0	0	405
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0			6.0
Lane Util. Factor			0.95			0.95
Frpb, 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)			3579			3579
Flt Permitted			1.00			1.00
Satd. Flow (perm)			3579			3579
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	563	0	0	440
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	563	0	0	440
Confl. Peds. (#/hr)		131				
Turn Type	Prot		NA			NA
Protected Phases	4		2			6
Permitted Phases						
Actuated Green, G (s)			31.0			31.0
Effective Green, g (s)			31.0			31.0
Actuated g/C Ratio			0.52			0.52
Clearance Time (s)			6.0			6.0
Vehicle Extension (s)			3.0			3.0
Lane Grp Cap (vph)			1849			1849
v/s Ratio Prot			c0.16			0.12
v/s Ratio Perm						
v/c Ratio			0.30			0.24
Uniform Delay, d1			8.3			8.0
Progression Factor			1.00			1.00
Incremental Delay, d2			0.4			0.3
Delay (s)			8.7			8.3
Level of Service			A			A
Approach Delay (s)	0.0		8.7			8.3
Approach LOS	A		A			A

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	39.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

7: Morningside Ave & Ling Rd

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	70	41	477	47	22	383
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	45	518	51	24	416
Pedestrians	107					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	10					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			200			30
pX, platoon unblocked	0.95	0.97			0.97	
vC, conflicting volume	907	392			677	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	636	297			592	
tC, single (s)	6.8	6.9			4.3	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	78	93			97	
cM capacity (veh/h)	343	609			806	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	121	346	224	163	278
Volume Left	76	0	0	24	0
Volume Right	45	0	51	0	0
cSH	409	1700	1700	806	1700
Volume to Capacity	0.30	0.20	0.13	0.03	0.16
Queue Length 95th (m)	9.2	0.0	0.0	0.7	0.0
Control Delay (s)	17.4	0.0	0.0	1.7	0.0
Lane LOS	C			A	
Approach Delay (s)	17.4	0.0		0.6	
Approach LOS	C				

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	5	0	7	5	48	2	413	5	23	342	80
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		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		0.99	1.00		0.99	1.00	
Frt		1.00			0.89		1.00	1.00		1.00	0.97	
Flt Protected		0.96			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1794			1673		1801	3471		1805	3379	
Flt Permitted		0.77			0.98		0.49	1.00		0.49	1.00	
Satd. Flow (perm)		1447			1641		927	3471		936	3379	
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)	47	5	0	8	5	52	2	444	5	25	368	86
RTOR Reduction (vph)	0	0	0	0	32	0	0	1	0	0	34	0
Lane Group Flow (vph)	0	52	0	0	33	0	2	448	0	25	420	0
Confl. Peds. (#/hr)	8		34	34		8	16		13	13		16
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	0%	20%	0%	0%	0%	0%	0%	5%	0%	0%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	9	0	0	12
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		22.0			22.0		26.0	26.0		26.0	26.0	
Effective Green, g (s)		23.0			23.0		27.0	27.0		27.0	27.0	
Actuated g/C Ratio		0.38			0.38		0.45	0.45		0.45	0.45	
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)		554			629		417	1561		421	1520	
v/s Ratio Prot								c0.13			0.12	
v/s Ratio Perm		c0.04			0.02		0.00			0.03		
v/c Ratio		0.09			0.05		0.00	0.29		0.06	0.28	
Uniform Delay, d1		11.8			11.6		9.1	10.4		9.3	10.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.0		0.0	0.5		0.3	0.5	
Delay (s)		11.9			11.7		9.1	10.9		9.6	10.8	
Level of Service		B			B		A	B		A	B	
Approach Delay (s)		11.9			11.7			10.9			10.8	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	43	0	206	241	138	6	225	37	78	194	45
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	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes		1.00		1.00	0.99			1.00			1.00	
Flpb, ped/bikes		1.00		0.98	1.00			1.00			1.00	
Frt		1.00		1.00	0.95			0.98			0.98	
Flt Protected		0.98		0.95	1.00			1.00			0.99	
Satd. Flow (prot)		1857		1763	1786			3441			3344	
Flt Permitted		0.80		0.71	1.00			0.95			0.80	
Satd. Flow (perm)		1517		1312	1786			3260			2714	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	48	0	229	268	153	7	250	41	87	216	50
RTOR Reduction (vph)	0	0	0	0	31	0	0	19	0	0	20	0
Lane Group Flow (vph)	0	77	0	229	390	0	0	279	0	0	333	0
Confl. Peds. (#/hr)	4		32	32		4	6		4	4		6
Confl. Bikes (#/hr)						3			1			
Heavy Vehicles (%)	4%	0%	0%	1%	0%	3%	0%	4%	0%	4%	6%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	12
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		24.0		24.0	24.0			31.0			31.0	
Effective Green, g (s)		25.0		25.0	25.0			32.0			32.0	
Actuated g/C Ratio		0.37		0.37	0.37			0.48			0.48	
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		566		489	666			1557			1296	
v/s Ratio Prot					c0.22							
v/s Ratio Perm		0.05		0.17				0.09			c0.12	
v/c Ratio		0.14		0.47	0.59			0.18			0.26	
Uniform Delay, d1		13.9		16.0	16.8			10.0			10.4	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.1		0.7	1.3			0.3			0.5	
Delay (s)		14.0		16.7	18.2			10.3			10.9	
Level of Service		B		B	B			B			B	
Approach Delay (s)		14.0			17.6			10.3			10.9	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	67.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	1762	73	34	855	18	78	67	54	28	109	92
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	5.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.93		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1689	5202		1825	5225		1677	1736		1770	1732	
Flt Permitted	0.21	1.00		0.09	1.00		0.57	1.00		0.68	1.00	
Satd. Flow (perm)	372	5202		177	5225		1015	1736		1260	1732	
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)	115	1835	76	35	891	19	81	70	56	29	114	96
RTOR Reduction (vph)	0	4	0	0	2	0	0	26	0	0	28	0
Lane Group Flow (vph)	115	1907	0	35	908	0	81	100	0	29	182	0
Confl. Peds. (#/hr)	15		14	14		15	12		42	42		12
Confl. Bikes (#/hr)			2			1						
Heavy Vehicles (%)	8%	0%	0%	0%	0%	0%	8%	2%	0%	0%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	57.7	49.7		46.5	42.5		38.0	38.0		38.0	38.0	
Effective Green, g (s)	58.7	50.7		48.5	43.5		39.0	39.0		39.0	39.0	
Actuated g/C Ratio	0.54	0.47		0.45	0.40		0.36	0.36		0.36	0.36	
Clearance Time (s)	6.0	6.0		4.0	6.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	324	2426		154	2090		364	622		452	621	
v/s Ratio Prot	c0.03	c0.37		0.01	0.17			0.06			c0.11	
v/s Ratio Perm	0.16			0.09			0.08			0.02		
v/c Ratio	0.35	0.79		0.23	0.43		0.22	0.16		0.06	0.29	
Uniform Delay, d1	13.6	24.4		20.1	23.7		24.3	23.7		22.9	25.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	2.7		0.8	0.7		0.3	0.1		0.1	0.3	
Delay (s)	14.3	27.1		20.8	24.3		24.6	23.8		22.9	25.2	
Level of Service	B	C		C	C		C	C		C	C	
Approach Delay (s)		26.4			24.2			24.1			25.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	108.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	2206	358	44	1212	1	284	0	30	36	0	16
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		6.0		6.0	6.0		6.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97		1.00	1.00		1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00		0.98	1.00		0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		0.99		1.00	0.99		1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00		0.85	1.00		0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95		1.00	0.95		1.00
Satd. Flow (prot)	1823	5193	1546	1825	5141		3344		1599	1808		1600
Flt Permitted	0.18	1.00	1.00	0.06	1.00		0.95		1.00	0.95		1.00
Satd. Flow (perm)	343	5193	1546	118	5141		3344		1599	1808		1600
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	13	2274	369	45	1249	1	293	0	31	37	0	16
RTOR Reduction (vph)	0	0	107	0	0	0	0	0	21	0	0	11
Lane Group Flow (vph)	13	2274	262	45	1250	0	293	0	10	37	0	5
Confl. Peds. (#/hr)	7		4	4		7	8		9	9		8
Confl. Bikes (#/hr)			4			1						
Heavy Vehicles (%)	0%	1%	4%	0%	2%	0%	5%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm		Perm	Perm		Perm
Protected Phases		2			6							
Permitted Phases	2		2	6			4		4	8		8
Actuated Green, G (s)	64.0	64.0	64.0	64.0	64.0		32.0		32.0	32.0		32.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	65.0		33.0		33.0	33.0		33.0
Actuated g/C Ratio	0.60	0.60	0.60	0.60	0.60		0.30		0.30	0.30		0.30
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		7.0		7.0	7.0		7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0		3.0	3.0		3.0
Lane Grp Cap (vph)	204	3096	921	70	3065		1012		484	547		484
v/s Ratio Prot		c0.44			0.24							
v/s Ratio Perm	0.04		0.17	0.38			c0.09		0.01	0.02		0.00
v/c Ratio	0.06	0.73	0.28	0.64	0.41		0.29		0.02	0.07		0.01
Uniform Delay, d1	9.2	15.8	10.7	14.4	11.7		29.0		26.7	27.0		26.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00		1.00
Incremental Delay, d2	0.6	1.6	0.8	37.5	0.4		0.2		0.0	0.1		0.0
Delay (s)	9.8	17.4	11.5	51.9	12.1		29.2		26.7	27.1		26.6
Level of Service	A	B	B	D	B		C		C	C		C
Approach Delay (s)		16.5			13.5			29.0			26.9	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	213	52	52	182	8	93	26	76	16	26	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.98			0.99			0.97			0.93	
Flpb, ped/bikes		0.98			0.99			0.97			0.99	
Frt		0.97			1.00			0.95			0.91	
Flt Protected		1.00			0.99			0.98			0.99	
Satd. Flow (prot)		3251			3317			1653			1580	
Flt Permitted		0.90			0.78			0.77			0.94	
Satd. Flow (perm)		2934			2602			1298			1491	
Peak-hour factor, PHF	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64
Adj. Flow (vph)	36	333	81	81	284	12	145	41	119	25	41	141
RTOR Reduction (vph)	0	29	0	0	4	0	0	35	0	0	22	0
Lane Group Flow (vph)	0	421	0	0	373	0	0	270	0	0	185	0
Confl. Peds. (#/hr)	318		62	62		318	133		111	111		133
Confl. Bikes (#/hr)			1						1			1
Heavy Vehicles (%)	0%	6%	0%	2%	7%	0%	1%	0%	0%	0%	4%	1%
Bus Blockages (#/hr)	0	0	12	0	0	13	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		24.0			24.0			28.0			28.0	
Effective Green, g (s)		25.0			25.0			29.0			29.0	
Actuated g/C Ratio		0.38			0.38			0.45			0.45	
Clearance Time (s)		6.0			6.0			7.0			7.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1128			1000			579			665	
v/s Ratio Prot												
v/s Ratio Perm		c0.14			0.14			c0.21			0.12	
v/c Ratio		0.37			0.37			0.47			0.28	
Uniform Delay, d1		14.4			14.4			12.6			11.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			1.1			0.6			0.2	
Delay (s)		15.3			15.4			13.2			11.6	
Level of Service		B			B			B			B	
Approach Delay (s)		15.3			15.4			13.2			11.6	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	93	1876	110	62	1155	74	74	78	40	29	91	68
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			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			0.98			0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			0.99			0.99	
Frt	1.00	0.99		1.00	0.99			0.97			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1807	5122		1825	5073			1787			1748	
Flt Permitted	0.16	1.00		0.07	1.00			0.82			0.93	
Satd. Flow (perm)	311	5122		135	5073			1498			1644	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	96	1934	113	64	1191	76	76	80	41	30	94	70
RTOR Reduction (vph)	0	6	0	0	6	0	0	3	0	0	19	0
Lane Group Flow (vph)	96	2041	0	64	1261	0	0	194	0	0	175	0
Confl. Peds. (#/hr)	38		45	45		38	37		82	82		37
Confl. Bikes (#/hr)			2			2						
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	4%
Bus Blockages (#/hr)	0	0	14	0	0	14	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	56.0	56.0		56.0	56.0			40.0			40.0	
Effective Green, g (s)	57.0	57.0		57.0	57.0			41.0			41.0	
Actuated g/C Ratio	0.52	0.52		0.52	0.52			0.38			0.38	
Clearance Time (s)	7.0	7.0		7.0	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)	162	2678		70	2652			563			618	
v/s Ratio Prot		0.40			0.25							
v/s Ratio Perm	0.31			c0.47				c0.13			0.11	
v/c Ratio	0.59	0.76		0.91	0.48			0.34			0.28	
Uniform Delay, d1	18.0	20.6		23.8	16.5			24.4			23.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	14.9	2.1		85.4	0.6			0.4			0.3	
Delay (s)	32.9	22.7		109.1	17.1			24.7			24.0	
Level of Service	C	C		F	B			C			C	
Approach Delay (s)		23.2			21.5			24.7			24.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	109.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	235	1795	26	109	911	74	34	474	124	111	550	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.98		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.97	1.00		0.97	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1764	5170		1825	5024		1766	3320		1715	3267	
Flt Permitted	0.20	1.00		0.10	1.00		0.21	1.00		0.32	1.00	
Satd. Flow (perm)	367	5170		192	5024		386	3320		580	3267	
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)	247	1889	27	115	959	78	36	499	131	117	579	254
RTOR Reduction (vph)	0	1	0	0	9	0	0	23	0	0	50	0
Lane Group Flow (vph)	247	1915	0	115	1028	0	36	607	0	117	783	0
Confl. Peds. (#/hr)	138		118	118		138	150		101	101		158
Heavy Vehicles (%)	3%	1%	4%	0%	2%	3%	0%	5%	2%	3%	1%	4%
Bus Blockages (#/hr)	0	0	10	0	0	10	0	0	13	0	0	19
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	46.0	39.0		46.0	39.0		36.0	36.0		36.0	36.0	
Effective Green, g (s)	48.0	40.0		48.0	40.0		37.0	37.0		37.0	37.0	
Actuated g/C Ratio	0.48	0.40		0.48	0.40		0.37	0.37		0.37	0.37	
Clearance Time (s)	4.0	7.0		4.0	7.0		7.0	7.0		7.0	7.0	
Lane Grp Cap (vph)	287	2068		222	2009		142	1228		214	1208	
v/s Ratio Prot	c0.07	c0.37		0.04	0.20			0.18			c0.24	
v/s Ratio Perm	0.34			0.21			0.09			0.20		
v/c Ratio	0.86	0.93		0.52	0.51		0.25	0.49		0.55	0.65	
Uniform Delay, d1	17.4	28.6		20.3	22.6		21.9	24.3		24.9	26.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	27.1	8.6		8.4	0.9		4.3	1.4		9.7	2.7	
Delay (s)	44.4	37.2		28.7	23.6		26.2	25.7		34.6	28.8	
Level of Service	D	D		C	C		C	C		C	C	
Approach Delay (s)		38.0			24.1			25.7			29.5	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	118.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	0	526	0	0	614
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0			5.0
Lane Util. Factor			0.95			0.95
Frpb, 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)			3579			3579
Flt Permitted			1.00			1.00
Satd. Flow (perm)			3579			3579
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	572	0	0	667
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	572	0	0	667
Confl. Peds. (#/hr)		43				
Turn Type	Prot		NA			NA
Protected Phases	4		2			6
Permitted Phases						
Actuated Green, G (s)			31.0			31.0
Effective Green, g (s)			32.0			32.0
Actuated g/C Ratio			0.53			0.53
Clearance Time (s)			6.0			6.0
Vehicle Extension (s)			3.0			3.0
Lane Grp Cap (vph)			1908			1908
v/s Ratio Prot			0.16			c0.19
v/s Ratio Perm						
v/c Ratio			0.30			0.35
Uniform Delay, d1			7.8			8.0
Progression Factor			1.00			1.00
Incremental Delay, d2			0.4			0.5
Delay (s)			8.2			8.5
Level of Service			A			A
Approach Delay (s)	0.0		8.2			8.5
Approach LOS	A		A			A

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	18	39	487	59	44	570
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	19	41	518	63	47	606
Pedestrians	92					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	9					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			200			33
pX, platoon unblocked	0.91	0.97			0.97	
vC, conflicting volume	1038	382			673	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	712	314			612	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	93			95	
cM capacity (veh/h)	290	610			866	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	61	345	235	249	404
Volume Left	19	0	0	47	0
Volume Right	41	0	63	0	0
cSH	452	1700	1700	866	1700
Volume to Capacity	0.13	0.20	0.14	0.05	0.24
Queue Length 95th (m)	3.5	0.0	0.0	1.3	0.0
Control Delay (s)	14.2	0.0	0.0	2.2	0.0
Lane LOS	B			A	
Approach Delay (s)	14.2	0.0		0.9	
Approach LOS	B				

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	13	7	0	2	38	3	384	2	43	439	96
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		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.98		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		0.98	1.00		0.98	1.00	
Frt		0.99			0.87		1.00	1.00		1.00	0.97	
Flt Protected		0.96			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1814			1642		1792	3541		1798	3422	
Flt Permitted		0.75			1.00		0.41	1.00		0.51	1.00	
Satd. Flow (perm)		1417			1642		771	3541		963	3422	
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)	105	14	8	0	2	41	3	413	2	46	472	103
RTOR Reduction (vph)	0	4	0	0	25	0	0	1	0	0	31	0
Lane Group Flow (vph)	0	123	0	0	18	0	3	414	0	46	544	0
Confl. Peds. (#/hr)	10		23	23		10	27		17	17		27
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	3%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	13	0	0	13
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		22.0			22.0		26.0	26.0		26.0	26.0	
Effective Green, g (s)		23.0			23.0		27.0	27.0		27.0	27.0	
Actuated g/C Ratio		0.38			0.38		0.45	0.45		0.45	0.45	
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)		543			629		346	1593		433	1539	
v/s Ratio Prot					0.01			0.12			c0.16	
v/s Ratio Perm		c0.09					0.00			0.05		
v/c Ratio		0.23			0.03		0.01	0.26		0.11	0.35	
Uniform Delay, d1		12.5			11.5		9.1	10.3		9.5	10.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.0		0.0	0.4		0.5	0.6	
Delay (s)		12.7			11.6		9.2	10.7		10.0	11.4	
Level of Service		B			B		A	B		B	B	
Approach Delay (s)		12.7			11.6			10.7			11.3	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	66	169	1	54	55	105	1	221	100	105	271	64
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	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes		1.00		1.00	0.99			0.99			0.98	
Flpb, ped/bikes		1.00		0.99	1.00			1.00			1.00	
Frt		1.00		1.00	0.90			0.95			0.94	
Flt Protected		0.99		0.95	1.00			1.00			0.99	
Satd. Flow (prot)		1892		1798	1689			3346			3242	
Flt Permitted		0.87		0.60	1.00			0.95			0.82	
Satd. Flow (perm)		1675		1131	1689			3192			2687	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.25
Adj. Flow (vph)	67	172	1	55	56	107	1	226	102	107	277	256
RTOR Reduction (vph)	0	0	0	0	67	0	0	53	0	0	134	0
Lane Group Flow (vph)	0	240	0	55	96	0	0	276	0	0	506	0
Confl. Peds. (#/hr)	5		27	27		5	17		10	10		17
Confl. Bikes (#/hr)						4			1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	4%	0%	0%	6%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	13
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		24.0		24.0	24.0			31.0			31.0	
Effective Green, g (s)		25.0		25.0	25.0			32.0			32.0	
Actuated g/C Ratio		0.37		0.37	0.37			0.48			0.48	
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		625		422	630			1524			1283	
v/s Ratio Prot					0.06							
v/s Ratio Perm		c0.14		0.05				0.09			c0.19	
v/c Ratio		0.38		0.13	0.15			0.18			0.39	
Uniform Delay, d1		15.4		13.8	14.0			10.0			11.3	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.4		0.1	0.1			0.3			0.9	
Delay (s)		15.8		14.0	14.1			10.3			12.2	
Level of Service		B		B	B			B			B	
Approach Delay (s)		15.8			14.0			10.3			12.2	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	67.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	108.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	792	105	11	2272	3	373	0	43	26	0	23
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		6.0	6.0		6.0		6.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.95	0.95		1.00		1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00		0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		0.99	0.99		1.00		1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.97		1.00		0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96		0.95		1.00
Satd. Flow (prot)	1825	5043	1443	1669	5141		1648	1621		1825		1595
Flt Permitted	0.07	1.00	1.00	0.31	1.00		0.95	0.96		0.55		1.00
Satd. Flow (perm)	135	5043	1443	539	5141		1648	1621		1047		1595
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)	5	825	109	11	2367	3	389	0	45	27	0	24
RTOR Reduction (vph)	0	0	47	0	0	0	0	20	0	0	0	16
Lane Group Flow (vph)	5	825	62	11	2370	0	218	196	0	27	0	8
Confl. Peds. (#/hr)	9		11	11		9	12					12
Confl. Bikes (#/hr)			3			2						
Heavy Vehicles (%)	0%	4%	11%	9%	2%	0%	4%	0%	4%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		custom	NA		D.Pm		Perm
Protected Phases		2			6			8				
Permitted Phases	2		2	6			4			8		8
Actuated Green, G (s)	56.0	56.0	56.0	56.0	56.0		32.0	32.0		32.0		32.0
Effective Green, g (s)	57.0	57.0	57.0	57.0	57.0		33.0	33.0		33.0		33.0
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.56		0.33	0.33		0.33		0.33
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		7.0	7.0		7.0		7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0		3.0
Lane Grp Cap (vph)	76	2846	814	304	2901		538	529		342		521
v/s Ratio Prot		0.16			c0.46							
v/s Ratio Perm	0.04		0.04	0.02			c0.13	0.12		0.03		0.00
v/c Ratio	0.07	0.29	0.08	0.04	0.82		0.41	0.37		0.08		0.02
Uniform Delay, d1	10.0	11.5	10.0	9.8	17.8		26.4	26.0		23.5		23.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2	1.7	0.3	0.2	0.2	2.7		0.5	0.4		0.1		0.0
Delay (s)	11.6	11.7	10.2	10.0	20.5		26.9	26.5		23.6		23.0
Level of Service	B	B	B	B	C		C	C		C		C
Approach Delay (s)		11.5			20.4			26.7			23.3	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	96.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	74	36	37	224	1	39	27	56	0	21	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			0.99			0.98	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.96			1.00			0.94			0.90	
Flt Protected		1.00			0.99			0.98			1.00	
Satd. Flow (prot)		3085			3465			1703			1689	
Flt Permitted		0.92			0.90			0.89			1.00	
Satd. Flow (perm)		2853			3137			1542			1689	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	12	84	41	42	255	1	44	31	64	0	24	80
RTOR Reduction (vph)	0	25	0	0	1	0	0	35	0	0	44	0
Lane Group Flow (vph)	0	112	0	0	297	0	0	104	0	0	60	0
Confl. Peds. (#/hr)	5		15	15		5	19		18	18		19
Confl. Bikes (#/hr)			2			1			4			
Heavy Vehicles (%)	0%	18%	0%	0%	5%	0%	5%	0%	2%	0%	0%	0%
Bus Blockages (#/hr)	0	0	13	0	0	12	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		24.0			24.0			28.0			28.0	
Effective Green, g (s)		25.0			25.0			29.0			29.0	
Actuated g/C Ratio		0.38			0.38			0.45			0.45	
Clearance Time (s)		6.0			6.0			7.0			7.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1097			1206			687			753	
v/s Ratio Prot											0.04	
v/s Ratio Perm		0.04			c0.09			c0.07				
v/c Ratio		0.10			0.25			0.15			0.08	
Uniform Delay, d1		12.8			13.6			10.7			10.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			0.5			0.1			0.0	
Delay (s)		13.0			14.1			10.8			10.4	
Level of Service		B			B			B			B	
Approach Delay (s)		13.0			14.1			10.8			10.4	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	772	34	22	2175	33	121	81	50	13	29	79
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			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.97	
Flpb, ped/bikes	1.00	1.00		0.99	1.00			0.99			1.00	
Frt	1.00	0.99		1.00	1.00			0.97			0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1825	4966		1816	5124			1692			1677	
Flt Permitted	0.07	1.00		0.30	1.00			0.79			0.96	
Satd. Flow (perm)	135	4966		568	5124			1369			1613	
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)	20	804	35	23	2266	34	126	84	52	14	30	82
RTOR Reduction (vph)	0	4	0	0	1	0	0	8	0	0	1	0
Lane Group Flow (vph)	20	835	0	23	2299	0	0	254	0	0	125	0
Confl. Peds. (#/hr)	12		9	9		12	33		17	17		33
Confl. Bikes (#/hr)			2						1			
Heavy Vehicles (%)	0%	5%	0%	0%	2%	6%	3%	0%	24%	0%	5%	0%
Bus Blockages (#/hr)	0	0	17	0	0	17	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	56.0	56.0		56.0	56.0			40.0			40.0	
Effective Green, g (s)	57.0	57.0		57.0	57.0			41.0			41.0	
Actuated g/C Ratio	0.52	0.52		0.52	0.52			0.38			0.38	
Clearance Time (s)	7.0	7.0		7.0	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)	70	2596		297	2679			514			606	
v/s Ratio Prot		0.17			c0.45							
v/s Ratio Perm	0.15			0.04				c0.19			0.08	
v/c Ratio	0.29	0.32		0.08	0.86			0.49			0.21	
Uniform Delay, d1	14.6	14.9		12.9	22.5			26.1			23.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	10.0	0.3		0.5	3.8			0.7			0.2	
Delay (s)	24.6	15.2		13.4	26.3			26.8			23.2	
Level of Service	C	B		B	C			C			C	
Approach Delay (s)		15.5			26.2			26.8			23.2	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	179	747	22	65	1747	33	18	386	62	66	283	227
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		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		0.97	1.00		0.98	1.00		0.99	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1722	4898		1520	5072		1784	3381		1768	3129	
Flt Permitted	0.08	1.00		0.33	1.00		0.36	1.00		0.41	1.00	
Satd. Flow (perm)	145	4898		535	5072		675	3381		760	3129	
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)	188	786	23	68	1839	35	19	406	65	69	298	239
RTOR Reduction (vph)	0	3	0	0	2	0	0	12	0	0	130	0
Lane Group Flow (vph)	188	806	0	68	1872	0	19	459	0	69	407	0
Confl. Peds. (#/hr)	43		72	72		43	56		27	27		56
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	6%	6%	18%	17%	3%	3%	0%	6%	0%	2%	8%	3%
Bus Blockages (#/hr)	0	0	17	0	0	18	0	0	11	0	0	17
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	60.0	60.0		46.0	46.0		36.0	36.0		36.0	36.0	
Effective Green, g (s)	61.0	61.0		47.0	47.0		37.0	37.0		37.0	37.0	
Actuated g/C Ratio	0.55	0.55		0.43	0.43		0.34	0.34		0.34	0.34	
Clearance Time (s)	4.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Grp Cap (vph)	238	2716		228	2167		227	1137		255	1052	
v/s Ratio Prot	c0.08	0.16			c0.37			c0.14			0.13	
v/s Ratio Perm	0.36			0.13			0.03			0.09		
v/c Ratio	0.79	0.30		0.30	0.86		0.08	0.40		0.27	0.39	
Uniform Delay, d1	26.9	13.1		20.7	28.6		24.9	28.0		26.6	27.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	22.9	0.3		3.3	4.9		0.7	1.1		2.6	1.1	
Delay (s)	49.8	13.3		24.0	33.5		25.6	29.1		29.2	28.9	
Level of Service	D	B		C	C		C	C		C	C	
Approach Delay (s)		20.2			33.2			29.0			29.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	119.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	0	430	0	0	248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0			6.0
Lane Util. Factor			0.95			0.95
Frpb, 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)			3510			3174
Flt Permitted			1.00			1.00
Satd. Flow (perm)			3510			3174
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	443	0	0	256
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	443	0	0	256
Confl. Peds. (#/hr)		24				
Heavy Vehicles (%)	0%	0%	4%	0%	0%	15%
Turn Type	Prot		NA			NA
Protected Phases	4		2			6
Permitted Phases						
Actuated Green, G (s)			31.0			31.0
Effective Green, g (s)			31.0			31.0
Actuated g/C Ratio			0.52			0.52
Clearance Time (s)			6.0			6.0
Vehicle Extension (s)			3.0			3.0
Lane Grp Cap (vph)			1813			1639
v/s Ratio Prot			c0.13			0.08
v/s Ratio Perm						
v/c Ratio			0.24			0.16
Uniform Delay, d1			8.0			7.6
Progression Factor			1.00			1.00
Incremental Delay, d2			0.3			0.2
Delay (s)			8.3			7.8
Level of Service			A			A
Approach Delay (s)	0.0		8.3			7.8
Approach LOS	A		A			A

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	35	42	388	11	12	246
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	36	43	400	11	12	254
Pedestrians			1			
Lane Width (m)			3.7			
Walking Speed (m/s)			1.1			
Percent Blockage			0			
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			200			30
pX, platoon unblocked	0.97					
vC, conflicting volume	558	206			411	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	475	206			411	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	95			99	
cM capacity (veh/h)	501	807			1158	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	79	267	145	97	169
Volume Left	36	0	0	12	0
Volume Right	43	0	11	0	0
cSH	631	1700	1700	1158	1700
Volume to Capacity	0.13	0.16	0.09	0.01	0.10
Queue Length 95th (m)	3.3	0.0	0.0	0.2	0.0
Control Delay (s)	11.5	0.0	0.0	1.1	0.0
Lane LOS	B			A	
Approach Delay (s)	11.5	0.0		0.4	
Approach LOS	B				

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	26.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	2	3	0	6	33	2	306	0	15	220	44
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		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		0.99	1.00		1.00	1.00	
Frt		0.99			0.89		1.00	1.00		1.00	0.98	
Flt Protected		0.96			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1817			1640		1815	3444		1704	3080	
Flt Permitted		0.82			1.00		0.58	1.00		0.56	1.00	
Satd. Flow (perm)		1546			1640		1116	3444		1005	3080	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	31	2	3	0	6	34	2	315	0	15	227	45
RTOR Reduction (vph)	0	2	0	0	21	0	0	0	0	0	25	0
Lane Group Flow (vph)	0	34	0	0	19	0	2	315	0	15	247	0
Confl. Peds. (#/hr)	1		12	12		1	5		1	1		5
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	6%	0%	7%	18%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	9	0	0	12
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		22.0			22.0		26.0	26.0		26.0	26.0	
Effective Green, g (s)		23.0			23.0		27.0	27.0		27.0	27.0	
Actuated g/C Ratio		0.38			0.38		0.45	0.45		0.45	0.45	
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)		592			628		502	1549		452	1386	
v/s Ratio Prot					0.01			c0.09			0.08	
v/s Ratio Perm		c0.02					0.00			0.01		
v/c Ratio		0.06			0.03		0.00	0.20		0.03	0.18	
Uniform Delay, d1		11.7			11.5		9.1	10.0		9.2	9.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.0		0.0	0.3		0.1	0.3	
Delay (s)		11.7			11.6		9.1	10.3		9.3	10.1	
Level of Service		B			B		A	B		A	B	
Approach Delay (s)		11.7			11.6			10.3			10.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.14		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	39	1	56	105	97	1	176	32	70	125	28
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	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes		1.00		1.00	0.99			1.00			1.00	
Flpb, ped/bikes		1.00		0.99	1.00			1.00			1.00	
Frt		1.00		1.00	0.93			0.98			0.98	
Flt Protected		0.98		0.95	1.00			1.00			0.98	
Satd. Flow (prot)		1845		1809	1739			3314			2988	
Flt Permitted		0.84		0.71	1.00			0.95			0.81	
Satd. Flow (perm)		1579		1349	1739			3163			2450	
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	41	1	59	111	102	1	185	34	74	132	29
RTOR Reduction (vph)	0	1	0	0	50	0	0	18	0	0	15	0
Lane Group Flow (vph)	0	73	0	59	163	0	0	202	0	0	220	0
Confl. Peds. (#/hr)	1		12	12		1	3		2	1		3
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	3%	0%	0%	0%	4%	100%	8%	0%	6%	28%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	12
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		24.0		24.0	24.0			31.0			31.0	
Effective Green, g (s)		25.0		25.0	25.0			32.0			32.0	
Actuated g/C Ratio		0.37		0.37	0.37			0.48			0.48	
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		589		503	648			1510			1170	
v/s Ratio Prot					c0.09							
v/s Ratio Perm		0.05		0.04				0.06			c0.09	
v/c Ratio		0.12		0.12	0.25			0.13			0.19	
Uniform Delay, d1		13.8		13.8	14.5			9.8			10.0	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.1		0.1	0.2			0.2			0.4	
Delay (s)		13.9		13.9	14.7			10.0			10.4	
Level of Service		B		B	B			A			B	
Approach Delay (s)		13.9			14.6			10.0			10.4	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	67.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	2177	294	48	1121	3	269	0	32	36	0	14
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		6.0		6.0	6.0		6.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97		1.00	1.00		1.00
Frpb, ped/bikes	1.00	1.00	0.98	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		0.98		1.00	1.00		1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00		0.85	1.00		0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95		1.00	0.95		1.00
Satd. Flow (prot)	1818	5193	1542	1825	5140		3289		1633	1825		1589
Flt Permitted	0.20	1.00	1.00	0.06	1.00		0.95		1.00	0.95		1.00
Satd. Flow (perm)	380	5193	1542	118	5140		3289		1633	1825		1589
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)	18	2268	306	50	1168	3	280	0	33	38	0	15
RTOR Reduction (vph)	0	0	88	0	0	0	0	0	21	0	0	10
Lane Group Flow (vph)	18	2268	218	50	1171	0	280	0	12	38	0	5
Confl. Peds. (#/hr)	21		8	8		21	15					15
Confl. Bikes (#/hr)			5			1						
Heavy Vehicles (%)	0%	1%	4%	0%	2%	0%	6%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm		Perm	Perm		Perm
Protected Phases		2			6							
Permitted Phases	2		2	6			4		4	8		8
Actuated Green, G (s)	64.0	64.0	64.0	64.0	64.0		32.0		32.0	32.0		32.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	65.0		33.0		33.0	33.0		33.0
Actuated g/C Ratio	0.60	0.60	0.60	0.60	0.60		0.30		0.30	0.30		0.30
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		7.0		7.0	7.0		7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0		3.0	3.0		3.0
Lane Grp Cap (vph)	226	3096	919	70	3065		995		494	552		481
v/s Ratio Prot		c0.44			0.23							
v/s Ratio Perm	0.05		0.14	0.42			c0.09		0.01	0.02		0.00
v/c Ratio	0.08	0.73	0.24	0.71	0.38		0.28		0.02	0.07		0.01
Uniform Delay, d1	9.3	15.8	10.3	15.5	11.5		29.0		26.7	27.1		26.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00		1.00
Incremental Delay, d2	0.7	1.6	0.6	47.1	0.4		0.2		0.0	0.1		0.0
Delay (s)	10.0	17.3	10.9	62.5	11.9		29.1		26.7	27.1		26.6
Level of Service	B	B	B	E	B		C		C	C		C
Approach Delay (s)		16.5			13.9			28.9			27.0	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	197	43	78	160	8	30	15	78	5	46	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			0.98			0.98	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			1.00			0.91			0.92	
Flt Protected		1.00			0.98			0.99			1.00	
Satd. Flow (prot)		3365			3361			1689			1727	
Flt Permitted		0.92			0.77			0.91			0.99	
Satd. Flow (perm)		3099			2613			1552			1714	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	23	229	50	91	186	9	35	17	91	6	53	95
RTOR Reduction (vph)	0	25	0	0	4	0	0	50	0	0	53	0
Lane Group Flow (vph)	0	277	0	0	282	0	0	93	0	0	101	0
Confl. Peds. (#/hr)	27		11	11		27	21		20	20		21
Confl. Bikes (#/hr)						2						2
Heavy Vehicles (%)	0%	6%	0%	0%	9%	0%	3%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	12	0	0	13	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		24.0			24.0			28.0			28.0	
Effective Green, g (s)		25.0			25.0			29.0			29.0	
Actuated g/C Ratio		0.38			0.38			0.45			0.45	
Clearance Time (s)		6.0			6.0			7.0			7.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1191			1005			692			764	
v/s Ratio Prot												
v/s Ratio Perm		0.09			c0.11			c0.06			0.06	
v/c Ratio		0.23			0.28			0.13			0.13	
Uniform Delay, d1		13.5			13.8			10.6			10.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.5			0.7			0.1			0.1	
Delay (s)		14.0			14.5			10.7			10.7	
Level of Service		B			B			B			B	
Approach Delay (s)		14.0			14.5			10.7			10.7	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	82	1933	100	53	1125	56	80	68	69	20	79	59
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			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.98			0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			0.99			1.00	
Frt	1.00	0.99		1.00	0.99			0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1811	5083		1825	5046			1597			1773	
Flt Permitted	0.17	1.00		0.07	1.00			0.84			0.95	
Satd. Flow (perm)	329	5083		135	5046			1362			1689	
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)	85	2014	104	55	1172	58	83	71	72	21	82	61
RTOR Reduction (vph)	0	5	0	0	5	0	0	2	0	0	19	0
Lane Group Flow (vph)	85	2113	0	55	1225	0	0	224	0	0	145	0
Confl. Peds. (#/hr)	27		37	37		27	45		58	58		45
Confl. Bikes (#/hr)			3						2			2
Heavy Vehicles (%)	0%	2%	1%	0%	3%	0%	5%	0%	25%	0%	0%	0%
Bus Blockages (#/hr)	0	0	14	0	0	14	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	56.0	56.0		56.0	56.0			40.0			40.0	
Effective Green, g (s)	57.0	57.0		57.0	57.0			41.0			41.0	
Actuated g/C Ratio	0.52	0.52		0.52	0.52			0.38			0.38	
Clearance Time (s)	7.0	7.0		7.0	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)	172	2658		70	2638			512			635	
v/s Ratio Prot		c0.42			0.24							
v/s Ratio Perm	0.26			0.41				c0.16			0.09	
v/c Ratio	0.49	0.79		0.79	0.46			0.44			0.23	
Uniform Delay, d1	16.7	21.2		21.1	16.4			25.4			23.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	9.8	2.6		58.6	0.6			0.6			0.2	
Delay (s)	26.5	23.8		79.7	17.0			26.0			23.4	
Level of Service	C	C		E	B			C			C	
Approach Delay (s)		23.9			19.7			26.0			23.4	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	110.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	246	1667	31	113	924	87	37	429	96	109	558	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.98		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.97	1.00		0.96	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1731	5104		1674	5067		1774	3407		1760	3234	
Flt Permitted	0.20	1.00		0.10	1.00		0.21	1.00		0.39	1.00	
Satd. Flow (perm)	370	5104		176	5067		393	3407		717	3234	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	248	1684	31	114	933	88	37	433	97	110	564	263
RTOR Reduction (vph)	0	2	0	0	11	0	0	19	0	0	55	0
Lane Group Flow (vph)	248	1713	0	114	1010	0	37	511	0	110	772	0
Confl. Peds. (#/hr)	122		136	136		122	128		94	94		128
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	5%	2%	13%	9%	1%	1%	0%	3%	0%	0%	4%	2%
Bus Blockages (#/hr)	0	0	10	0	0	10	0	0	13	0	0	19
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	46.0	39.0		46.0	39.0		36.0	36.0		36.0	36.0	
Effective Green, g (s)	48.0	40.0		48.0	40.0		37.0	37.0		37.0	37.0	
Actuated g/C Ratio	0.48	0.40		0.48	0.40		0.37	0.37		0.37	0.37	
Clearance Time (s)	4.0	7.0		4.0	7.0		7.0	7.0		7.0	7.0	
Lane Grp Cap (vph)	286	2041		204	2026		145	1260		265	1196	
v/s Ratio Prot	c0.07	0.34		0.04	0.20			0.15			c0.24	
v/s Ratio Perm	c0.35			0.22			0.09			0.15		
v/c Ratio	0.87	0.84		0.56	0.50		0.26	0.41		0.42	0.65	
Uniform Delay, d1	17.6	27.1		18.9	22.5		21.9	23.3		23.4	26.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	28.0	4.3		10.6	0.9		4.2	1.0		4.7	2.7	
Delay (s)	45.6	31.4		29.5	23.4		26.1	24.3		28.2	28.8	
Level of Service	D	C		C	C		C	C		C	C	
Approach Delay (s)		33.2			24.0			24.4			28.7	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	115.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	0	417	0	0	573
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0			5.0
Lane Util. Factor			0.95			0.95
Frpb, 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)			3650			3444
Flt Permitted			1.00			1.00
Satd. Flow (perm)			3650			3444
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	448	0	0	616
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	448	0	0	616
Confl. Peds. (#/hr)		31				
Heavy Vehicles (%)	0%	0%	0%	0%	0%	6%
Turn Type	Prot		NA			NA
Protected Phases	4		2			6
Permitted Phases						
Actuated Green, G (s)			31.0			31.0
Effective Green, g (s)			32.0			32.0
Actuated g/C Ratio			0.53			0.53
Clearance Time (s)			6.0			6.0
Vehicle Extension (s)			3.0			3.0
Lane Grp Cap (vph)			1946			1836
v/s Ratio Prot			0.12			c0.18
v/s Ratio Perm						
v/c Ratio			0.23			0.34
Uniform Delay, d1			7.4			8.0
Progression Factor			1.00			1.00
Incremental Delay, d2			0.3			0.5
Delay (s)			7.7			8.5
Level of Service			A			A
Approach Delay (s)	0.0		7.7			8.5
Approach LOS	A		A			A

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	27	30	387	45	46	527
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	29	32	416	48	49	567
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			200			33
pX, platoon unblocked	0.90	1.00			1.00	
vC, conflicting volume	823	232			465	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	581	231			463	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	96			96	
cM capacity (veh/h)	387	778			1108	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	61	277	187	238	378
Volume Left	29	0	0	49	0
Volume Right	32	0	48	0	0
cSH	526	1700	1700	1108	1700
Volume to Capacity	0.12	0.16	0.11	0.04	0.22
Queue Length 95th (m)	3.0	0.0	0.0	1.1	0.0
Control Delay (s)	12.7	0.0	0.0	2.1	0.0
Lane LOS	B			A	
Approach Delay (s)	12.7	0.0		0.8	
Approach LOS	B				

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	41.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	12	8	7	6	27	3	320	5	30	407	81
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		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		0.98	1.00		0.98	1.00	
Frt		0.99			0.91		1.00	1.00		1.00	0.98	
Flt Protected		0.96			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1809			1701		1793	3535		1795	3304	
Flt Permitted		0.78			0.96		0.44	1.00		0.54	1.00	
Satd. Flow (perm)		1470			1646		832	3535		1025	3304	
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)	74	13	9	8	6	29	3	344	5	32	438	87
RTOR Reduction (vph)	0	6	0	0	18	0	0	2	0	0	28	0
Lane Group Flow (vph)	0	90	0	0	25	0	3	347	0	32	498	0
Confl. Peds. (#/hr)	12		17	17		12	24		17	17		24
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	8%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	13	0	0	13
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		22.0			22.0		26.0	26.0		26.0	26.0	
Effective Green, g (s)		23.0			23.0		27.0	27.0		27.0	27.0	
Actuated g/C Ratio		0.38			0.38		0.45	0.45		0.45	0.45	
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)		563			630		374	1590		461	1486	
v/s Ratio Prot								0.10			c0.15	
v/s Ratio Perm		c0.06			0.02		0.00			0.03		
v/c Ratio		0.16			0.04		0.01	0.22		0.07	0.33	
Uniform Delay, d1		12.2			11.6		9.1	10.1		9.4	10.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.0		0.0	0.3		0.3	0.6	
Delay (s)		12.3			11.6		9.1	10.4		9.7	11.3	
Level of Service		B			B		A	B		A	B	
Approach Delay (s)		12.3			11.6			10.4			11.2	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	144	5	48	39	79	4	167	83	102	261	55
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	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes		1.00		1.00	0.99			0.99			0.99	
Flpb, ped/bikes		1.00		0.98	1.00			1.00			1.00	
Frt		1.00		1.00	0.90			0.95			0.98	
Flt Protected		0.98		0.95	1.00			1.00			0.99	
Satd. Flow (prot)		1879		1792	1705			3268			3238	
Flt Permitted		0.86		0.60	1.00			0.95			0.79	
Satd. Flow (perm)		1644		1124	1705			3105			2602	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	79	160	6	53	43	88	4	186	92	113	290	61
RTOR Reduction (vph)	0	1	0	0	55	0	0	48	0	0	18	0
Lane Group Flow (vph)	0	244	0	53	76	0	0	234	0	0	446	0
Confl. Peds. (#/hr)	9		34	34		9	13		13	13		13
Confl. Bikes (#/hr)			3									
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	13%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	13
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		24.0		24.0	24.0			31.0			31.0	
Effective Green, g (s)		25.0		25.0	25.0			32.0			32.0	
Actuated g/C Ratio		0.37		0.37	0.37			0.48			0.48	
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		613		419	636			1482			1242	
v/s Ratio Prot					0.04							
v/s Ratio Perm		c0.15		0.05				0.08			c0.17	
v/c Ratio		0.40		0.13	0.12			0.16			0.36	
Uniform Delay, d1		15.5		13.8	13.8			9.9			11.0	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.4		0.1	0.1			0.2			0.8	
Delay (s)		15.9		14.0	13.9			10.1			11.8	
Level of Service		B		B	B			B			B	
Approach Delay (s)		15.9			13.9			10.1			11.8	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	67.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	84	838	45	50	1836	24	75	72	36	18	54	103
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		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.98	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.95		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1690	5091		1487	5181		1680	1521		1700	1537	
Flt Permitted	0.08	1.00		0.26	1.00		0.61	1.00		0.68	1.00	
Satd. Flow (perm)	134	5091		412	5181		1071	1521		1209	1537	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	99	986	53	59	2160	28	88	85	42	21	64	121
RTOR Reduction (vph)	0	5	0	0	1	0	0	16	0	0	62	0
Lane Group Flow (vph)	99	1034	0	59	2187	0	88	111	0	21	123	0
Confl. Peds. (#/hr)	11		11	11		11	23		17	17		23
Confl. Bikes (#/hr)			4			6						
Heavy Vehicles (%)	8%	1%	20%	22%	1%	0%	7%	13%	31%	6%	13%	9%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	59.0	59.0		47.0	47.0		38.0	38.0		38.0	38.0	
Effective Green, g (s)	60.0	60.0		48.0	48.0		39.0	39.0		39.0	39.0	
Actuated g/C Ratio	0.55	0.55		0.44	0.44		0.35	0.35		0.35	0.35	
Clearance Time (s)	6.0	6.0		6.0	6.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	172	2776		179	2260		379	539		428	544	
v/s Ratio Prot	c0.04	0.20			c0.42			0.07			0.08	
v/s Ratio Perm	0.28			0.14			c0.08			0.02		
v/c Ratio	0.58	0.37		0.33	0.97		0.23	0.21		0.05	0.23	
Uniform Delay, d1	23.6	14.3		20.4	30.2		25.0	24.7		23.3	24.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.6	0.4		4.9	12.7		0.3	0.2		0.0	0.2	
Delay (s)	28.2	14.6		25.3	43.0		25.3	24.9		23.4	25.1	
Level of Service	C	B		C	D		C	C		C	C	
Approach Delay (s)		15.8			42.5			25.1			24.9	
Approach LOS		B			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	1088	322	40	2016	4	578	0	66	38	0	21
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		6.0	6.0		6.0		6.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.95	0.95		1.00		1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00		0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		0.96	0.97		1.00		1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.97		1.00		0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96		0.95		1.00
Satd. Flow (prot)	1824	5043	1544	1823	5140		1619	1599		1820		1552
Flt Permitted	0.07	1.00	1.00	0.20	1.00		0.95	0.96		0.38		1.00
Satd. Flow (perm)	135	5043	1544	391	5140		1619	1599		725		1552
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)	4	1133	335	42	2100	4	602	0	69	40	0	22
RTOR Reduction (vph)	0	0	147	0	0	0	0	20	0	0	0	15
Lane Group Flow (vph)	4	1133	188	42	2104	0	337	314	0	40	0	7
Confl. Peds. (#/hr)	18		7	7		18	40		6	6		40
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	0%	4%	4%	0%	2%	0%	3%	0%	2%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		custom	NA		D.Pm		Perm
Protected Phases		2			6			8				
Permitted Phases	2		2	6			4			8		8
Actuated Green, G (s)	56.0	56.0	56.0	56.0	56.0		32.6	32.6		32.6		32.6
Effective Green, g (s)	57.0	57.0	57.0	57.0	57.0		33.6	33.6		33.6		33.6
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.56		0.33	0.33		0.33		0.33
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		7.0	7.0		7.0		7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0		3.0
Lane Grp Cap (vph)	75	2829	866	219	2883		535	528		239		513
v/s Ratio Prot		0.22			c0.41							
v/s Ratio Perm	0.03		0.12	0.11			c0.21	0.20		0.06		0.00
v/c Ratio	0.05	0.40	0.22	0.19	0.73		0.63	0.59		0.17		0.01
Uniform Delay, d1	10.1	12.6	11.1	11.0	16.6		28.7	28.3		24.1		22.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2	1.3	0.4	0.6	1.9	1.7		2.3	1.8		0.3		0.0
Delay (s)	11.4	13.1	11.7	12.9	18.2		31.1	30.1		24.4		22.9
Level of Service	B	B	B	B	B		C	C		C		C
Approach Delay (s)		12.7			18.1			30.6			23.9	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	101.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	106.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	269	50	41	381	30	109	43	69	33	60	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			0.98			0.95	
Flpb, ped/bikes		1.00			1.00			0.98			1.00	
Frt		0.98			0.99			0.96			0.92	
Flt Protected		1.00			1.00			0.98			0.99	
Satd. Flow (prot)		3348			3455			1719			1654	
Flt Permitted		0.87			0.87			0.68			0.92	
Satd. Flow (perm)		2940			3014			1206			1530	
Peak-hour factor, PHF	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Adj. Flow (vph)	36	364	68	55	515	41	147	58	93	45	81	200
RTOR Reduction (vph)	0	21	0	0	8	0	0	25	0	0	58	0
Lane Group Flow (vph)	0	447	0	0	603	0	0	273	0	0	268	0
Confl. Peds. (#/hr)	80		29	29		80	92		53	53		92
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	6%	2%	0%	3%	7%	0%	5%	0%	0%	0%	1%
Bus Blockages (#/hr)	0	0	13	0	0	12	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		24.0			24.0			28.0			28.0	
Effective Green, g (s)		25.0			25.0			29.0			29.0	
Actuated g/C Ratio		0.38			0.38			0.45			0.45	
Clearance Time (s)		6.0			6.0			7.0			7.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1130			1159			538			682	
v/s Ratio Prot												
v/s Ratio Perm		0.15			c0.20			c0.23			0.18	
v/c Ratio		0.40			0.52			0.51			0.39	
Uniform Delay, d1		14.5			15.4			12.9			12.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.0			1.7			0.8			0.4	
Delay (s)		15.6			17.1			13.6			12.5	
Level of Service		B			B			B			B	
Approach Delay (s)		15.6			17.1			13.6			12.5	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	34	1058	56	52	1965	43	150	138	101	28	90	79
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			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.98	
Flpb, ped/bikes	1.00	1.00		0.99	1.00			0.99			1.00	
Frt	1.00	0.99		1.00	1.00			0.97			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1772	4989		1806	5120			1743			1716	
Flt Permitted	0.07	1.00		0.19	1.00			0.75			0.92	
Satd. Flow (perm)	131	4989		356	5120			1328			1583	
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)	36	1114	59	55	2068	45	158	145	106	29	95	83
RTOR Reduction (vph)	0	5	0	0	2	0	0	12	0	0	2	0
Lane Group Flow (vph)	36	1168	0	55	2111	0	0	397	0	0	205	0
Confl. Peds. (#/hr)	26		33	33		26	61		48	48		61
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	3%	4%	2%	0%	2%	0%	1%	2%	2%	7%	2%	1%
Bus Blockages (#/hr)	0	0	17	0	0	17	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	56.0	56.0		56.0	56.0			40.4			40.4	
Effective Green, g (s)	57.0	57.0		57.0	57.0			41.4			41.4	
Actuated g/C Ratio	0.52	0.52		0.52	0.52			0.38			0.38	
Clearance Time (s)	7.0	7.0		7.0	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)	68	2599		185	2667			502			599	
v/s Ratio Prot		0.23			c0.41							
v/s Ratio Perm	0.28			0.15				c0.30			0.13	
v/c Ratio	0.53	0.45		0.30	0.79			0.79			0.34	
Uniform Delay, d1	17.3	16.4		14.8	21.4			30.2			24.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	26.5	0.6		4.1	2.5			8.3			0.3	
Delay (s)	43.8	16.9		18.9	23.9			38.5			24.6	
Level of Service	D	B		B	C			D			C	
Approach Delay (s)		17.7			23.7			38.5			24.6	
Approach LOS		B			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	109.4	Sum of lost time (s)	11.0
Intersection Capacity Utilization	100.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	836	13	68	1731	34	20	493	77	55	395	275
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		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		0.97	1.00		0.97	1.00		0.96	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1772	5067		1696	5114		1771	3366		1690	3128	
Flt Permitted	0.09	1.00		0.32	1.00		0.27	1.00		0.33	1.00	
Satd. Flow (perm)	159	5067		568	5114		496	3366		590	3128	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	222	844	13	69	1748	34	20	498	78	56	399	278
RTOR Reduction (vph)	0	1	0	0	2	0	0	11	0	0	115	0
Lane Group Flow (vph)	222	856	0	69	1780	0	20	565	0	56	562	0
Confl. Peds. (#/hr)	101		101	101		101	97		100	100		97
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	3%	3%	8%	4%	2%	3%	0%	5%	3%	4%	7%	2%
Bus Blockages (#/hr)	0	0	17	0	0	18	0	0	11	0	0	17
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	60.0	60.0		43.0	43.0		36.0	36.0		36.0	36.0	
Effective Green, g (s)	61.0	61.0		44.0	44.0		37.0	37.0		37.0	37.0	
Actuated g/C Ratio	0.55	0.55		0.40	0.40		0.34	0.34		0.34	0.34	
Clearance Time (s)	4.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Grp Cap (vph)	293	2809		227	2045		166	1132		198	1052	
v/s Ratio Prot	c0.10	0.17			c0.35			0.17			c0.18	
v/s Ratio Perm	0.32			0.12			0.04			0.09		
v/c Ratio	0.76	0.30		0.30	0.87		0.12	0.50		0.28	0.53	
Uniform Delay, d1	27.6	13.1		22.5	30.4		25.2	29.1		26.8	29.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.7	0.3		3.4	5.4		1.5	1.6		3.5	1.9	
Delay (s)	44.2	13.4		26.0	35.8		26.7	30.7		30.3	31.5	
Level of Service	D	B		C	D		C	C		C	C	
Approach Delay (s)		19.8			35.4			30.5			31.4	
Approach LOS		B			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	110.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	0	518	0	0	409
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0			6.0
Lane Util. Factor			0.95			0.95
Frpb, 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)			3544			3444
Flt Permitted			1.00			1.00
Satd. Flow (perm)			3544			3444
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	557	0	0	440
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	557	0	0	440
Confl. Peds. (#/hr)		131				
Heavy Vehicles (%)	0%	0%	3%	0%	0%	6%
Turn Type	Prot		NA			NA
Protected Phases	4		2			6
Permitted Phases						
Actuated Green, G (s)			31.0			31.0
Effective Green, g (s)			31.0			31.0
Actuated g/C Ratio			0.52			0.52
Clearance Time (s)			6.0			6.0
Vehicle Extension (s)			3.0			3.0
Lane Grp Cap (vph)			1831			1779
v/s Ratio Prot			c0.16			0.13
v/s Ratio Perm						
v/c Ratio			0.30			0.25
Uniform Delay, d1			8.3			8.0
Progression Factor			1.00			1.00
Incremental Delay, d2			0.4			0.3
Delay (s)			8.7			8.4
Level of Service			A			A
Approach Delay (s)	0.0		8.7			8.4
Approach LOS	A		A			A

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	39.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	70	41	477	47	22	387
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	45	518	51	24	421
Pedestrians	107					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	10					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			200			30
pX, platoon unblocked	0.95	0.97			0.97	
vC, conflicting volume	909	392			677	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	635	297			592	
tC, single (s)	6.8	6.9			4.3	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	78	93			97	
cM capacity (veh/h)	343	609			806	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	121	346	224	164	280
Volume Left	76	0	0	24	0
Volume Right	45	0	51	0	0
cSH	409	1700	1700	806	1700
Volume to Capacity	0.29	0.20	0.13	0.03	0.16
Queue Length 95th (m)	9.2	0.0	0.0	0.7	0.0
Control Delay (s)	17.4	0.0	0.0	1.7	0.0
Lane LOS	C			A	
Approach Delay (s)	17.4	0.0		0.6	
Approach LOS	C				

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	5	0	7	5	48	2	413	5	23	346	80
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		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		0.99	1.00		0.99	1.00	
Frt		1.00			0.89		1.00	1.00		1.00	0.97	
Flt Protected		0.96			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1794			1673		1801	3471		1736	3354	
Flt Permitted		0.77			0.98		0.49	1.00		0.49	1.00	
Satd. Flow (perm)		1447			1641		922	3471		900	3354	
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)	47	5	0	8	5	52	2	444	5	25	372	86
RTOR Reduction (vph)	0	0	0	0	32	0	0	1	0	0	34	0
Lane Group Flow (vph)	0	52	0	0	33	0	2	448	0	25	424	0
Confl. Peds. (#/hr)	8		34	34		8	16		13	13		16
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	0%	20%	0%	0%	0%	0%	0%	5%	0%	4%	6%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	9	0	0	12
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		22.0			22.0		26.0	26.0		26.0	26.0	
Effective Green, g (s)		23.0			23.0		27.0	27.0		27.0	27.0	
Actuated g/C Ratio		0.38			0.38		0.45	0.45		0.45	0.45	
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)		554			629		414	1561		405	1509	
v/s Ratio Prot								c0.13			0.13	
v/s Ratio Perm		c0.04			0.02		0.00			0.03		
v/c Ratio		0.09			0.05		0.00	0.29		0.06	0.28	
Uniform Delay, d1		11.8			11.6		9.1	10.4		9.3	10.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.0		0.0	0.5		0.3	0.5	
Delay (s)		11.9			11.7		9.1	10.9		9.6	10.9	
Level of Service		B			B		A	B		A	B	
Approach Delay (s)		11.9			11.7			10.9			10.8	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	43	0	206	241	138	6	225	37	78	198	45
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	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes		1.00		1.00	0.99			1.00			1.00	
Flpb, ped/bikes		1.00		0.98	1.00			1.00			1.00	
Frt		1.00		1.00	0.95			0.98			0.98	
Flt Protected		0.98		0.95	1.00			1.00			0.99	
Satd. Flow (prot)		1884		1781	1786			3441			3306	
Flt Permitted		0.80		0.71	1.00			0.95			0.80	
Satd. Flow (perm)		1540		1325	1786			3260			2687	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	48	0	229	268	153	7	250	41	87	220	50
RTOR Reduction (vph)	0	0	0	0	31	0	0	19	0	0	19	0
Lane Group Flow (vph)	0	77	0	229	390	0	0	279	0	0	338	0
Confl. Peds. (#/hr)	4		32	32		4	6		4	4		6
Confl. Bikes (#/hr)						3			1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	4%	0%	4%	8%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	12
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		24.0		24.0	24.0			31.0			31.0	
Effective Green, g (s)		25.0		25.0	25.0			32.0			32.0	
Actuated g/C Ratio		0.37		0.37	0.37			0.48			0.48	
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		574		494	666			1557			1283	
v/s Ratio Prot					c0.22							
v/s Ratio Perm		0.05		0.17				0.09			c0.13	
v/c Ratio		0.13		0.46	0.59			0.18			0.26	
Uniform Delay, d1		13.9		15.9	16.8			10.0			10.5	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.1		0.7	1.3			0.3			0.5	
Delay (s)		14.0		16.6	18.2			10.3			11.0	
Level of Service		B		B	B			B			B	
Approach Delay (s)		14.0			17.6			10.3			11.0	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	67.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	1762	77	45	855	18	82	74	65	28	116	92
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	5.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.93		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1689	5189		1472	5225		1618	1534		1771	1683	
Flt Permitted	0.21	1.00		0.09	1.00		0.57	1.00		0.66	1.00	
Satd. Flow (perm)	371	5189		143	5225		964	1534		1236	1683	
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)	115	1835	80	47	891	19	85	77	68	29	121	96
RTOR Reduction (vph)	0	4	0	0	2	0	0	29	0	0	26	0
Lane Group Flow (vph)	115	1911	0	47	908	0	85	116	0	29	191	0
Confl. Peds. (#/hr)	15		14	14		15	12		42	42		12
Confl. Bikes (#/hr)			2			1						
Heavy Vehicles (%)	8%	0%	5%	24%	0%	0%	12%	11%	17%	0%	6%	5%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	57.4	48.2		47.8	42.4		38.0	38.0		38.0	38.0	
Effective Green, g (s)	58.6	49.2		49.8	43.4		39.0	39.0		39.0	39.0	
Actuated g/C Ratio	0.54	0.45		0.46	0.40		0.36	0.36		0.36	0.36	
Clearance Time (s)	6.0	6.0		4.0	6.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	323	2350		143	2088		346	550		443	604	
v/s Ratio Prot	c0.03	c0.37		0.02	0.17			0.08			c0.11	
v/s Ratio Perm	0.16			0.13			0.09			0.02		
v/c Ratio	0.36	0.81		0.33	0.43		0.25	0.21		0.07	0.32	
Uniform Delay, d1	13.6	25.7		20.3	23.7		24.5	24.1		22.8	25.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	3.2		1.3	0.7		0.4	0.2		0.1	0.3	
Delay (s)	14.3	28.9		21.7	24.4		24.8	24.3		22.9	25.5	
Level of Service	B	C		C	C		C	C		C	C	
Approach Delay (s)		28.1			24.2			24.5			25.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	108.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	2206	358	44	1212	1	284	0	30	36	0	16
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		6.0		6.0	6.0		6.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97		1.00	1.00		1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00		0.98	1.00		0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		0.99		1.00	0.99		1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00		0.85	1.00		0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95		1.00	0.95		1.00
Satd. Flow (prot)	1823	5193	1546	1825	5141		3344		1599	1808		1600
Flt Permitted	0.18	1.00	1.00	0.06	1.00		0.95		1.00	0.95		1.00
Satd. Flow (perm)	343	5193	1546	118	5141		3344		1599	1808		1600
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	13	2274	369	45	1249	1	293	0	31	37	0	16
RTOR Reduction (vph)	0	0	107	0	0	0	0	0	21	0	0	11
Lane Group Flow (vph)	13	2274	262	45	1250	0	293	0	10	37	0	5
Confl. Peds. (#/hr)	7		4	4		7	8		9	9		8
Confl. Bikes (#/hr)			4			1						
Heavy Vehicles (%)	0%	1%	4%	0%	2%	0%	5%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm		Perm	Perm		Perm
Protected Phases		2			6							
Permitted Phases	2		2	6			4		4	8		8
Actuated Green, G (s)	64.0	64.0	64.0	64.0	64.0		32.0		32.0	32.0		32.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	65.0		33.0		33.0	33.0		33.0
Actuated g/C Ratio	0.60	0.60	0.60	0.60	0.60		0.30		0.30	0.30		0.30
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		7.0		7.0	7.0		7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0		3.0	3.0		3.0
Lane Grp Cap (vph)	204	3096	921	70	3065		1012		484	547		484
v/s Ratio Prot		c0.44			0.24							
v/s Ratio Perm	0.04		0.17	0.38			c0.09		0.01	0.02		0.00
v/c Ratio	0.06	0.73	0.28	0.64	0.41		0.29		0.02	0.07		0.01
Uniform Delay, d1	9.2	15.8	10.7	14.4	11.7		29.0		26.7	27.0		26.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00		1.00
Incremental Delay, d2	0.6	1.6	0.8	37.5	0.4		0.2		0.0	0.1		0.0
Delay (s)	9.8	17.4	11.5	51.9	12.1		29.2		26.7	27.1		26.6
Level of Service	A	B	B	D	B		C		C	C		C
Approach Delay (s)		16.5			13.5			29.0			26.9	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	213	52	52	182	8	93	26	76	16	26	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.98			0.99			0.97			0.93	
Flpb, ped/bikes		0.98			0.99			0.97			0.99	
Frt		0.97			1.00			0.95			0.91	
Flt Protected		1.00			0.99			0.98			0.99	
Satd. Flow (prot)		3251			3317			1653			1580	
Flt Permitted		0.90			0.78			0.77			0.94	
Satd. Flow (perm)		2934			2602			1298			1491	
Peak-hour factor, PHF	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64
Adj. Flow (vph)	36	333	81	81	284	12	145	41	119	25	41	141
RTOR Reduction (vph)	0	29	0	0	4	0	0	35	0	0	22	0
Lane Group Flow (vph)	0	421	0	0	373	0	0	270	0	0	185	0
Confl. Peds. (#/hr)	318		62	62		318	133		111	111		133
Confl. Bikes (#/hr)			1						1			1
Heavy Vehicles (%)	0%	6%	0%	2%	7%	0%	1%	0%	0%	0%	4%	1%
Bus Blockages (#/hr)	0	0	12	0	0	13	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		24.0			24.0			28.0			28.0	
Effective Green, g (s)		25.0			25.0			29.0			29.0	
Actuated g/C Ratio		0.38			0.38			0.45			0.45	
Clearance Time (s)		6.0			6.0			7.0			7.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1128			1000			579			665	
v/s Ratio Prot												
v/s Ratio Perm		c0.14			0.14			c0.21			0.12	
v/c Ratio		0.37			0.37			0.47			0.28	
Uniform Delay, d1		14.4			14.4			12.6			11.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			1.1			0.6			0.2	
Delay (s)		15.3			15.4			13.2			11.6	
Level of Service		B			B			B			B	
Approach Delay (s)		15.3			15.4			13.2			11.6	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	93	1877	110	62	1155	74	75	78	43	29	91	68
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			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			0.98			0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			0.99			0.99	
Frt	1.00	0.99		1.00	0.99			0.97			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1807	5122		1825	5073			1750			1765	
Flt Permitted	0.16	1.00		0.07	1.00			0.82			0.93	
Satd. Flow (perm)	311	5122		135	5073			1466			1659	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	96	1935	113	64	1191	76	77	80	44	30	94	70
RTOR Reduction (vph)	0	6	0	0	6	0	0	3	0	0	19	0
Lane Group Flow (vph)	96	2042	0	64	1261	0	0	198	0	0	175	0
Confl. Peds. (#/hr)	38		45	45		38	37		82	82		37
Confl. Bikes (#/hr)			2			2						
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	1%	0%	7%	0%	1%	0%
Bus Blockages (#/hr)	0	0	14	0	0	14	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	56.0	56.0		56.0	56.0			40.0			40.0	
Effective Green, g (s)	57.0	57.0		57.0	57.0			41.0			41.0	
Actuated g/C Ratio	0.52	0.52		0.52	0.52			0.38			0.38	
Clearance Time (s)	7.0	7.0		7.0	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)	162	2678		70	2652			551			624	
v/s Ratio Prot		0.40			0.25							
v/s Ratio Perm	0.31			c0.47				c0.13			0.11	
v/c Ratio	0.59	0.76		0.91	0.48			0.36			0.28	
Uniform Delay, d1	18.0	20.6		23.8	16.5			24.5			23.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	14.9	2.1		85.4	0.6			0.4			0.2	
Delay (s)	32.9	22.7		109.1	17.1			24.9			24.0	
Level of Service	C	C		F	B			C			C	
Approach Delay (s)		23.2			21.5			24.9			24.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	109.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	236	1797	27	111	911	74	34	474	124	111	551	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.98		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.97	1.00		0.97	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1747	5167		1789	5024		1766	3320		1749	3233	
Flt Permitted	0.20	1.00		0.10	1.00		0.21	1.00		0.32	1.00	
Satd. Flow (perm)	364	5167		188	5024		385	3320		591	3233	
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)	248	1892	28	117	959	78	36	499	131	117	580	254
RTOR Reduction (vph)	0	1	0	0	9	0	0	23	0	0	49	0
Lane Group Flow (vph)	248	1919	0	117	1028	0	36	607	0	117	785	0
Confl. Peds. (#/hr)	138		118	118		138	150		101	101		158
Heavy Vehicles (%)	4%	1%	7%	2%	2%	3%	0%	5%	2%	1%	3%	3%
Bus Blockages (#/hr)	0	0	10	0	0	10	0	0	13	0	0	19
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	46.0	39.0		46.0	39.0		36.0	36.0		36.0	36.0	
Effective Green, g (s)	48.0	40.0		48.0	40.0		37.0	37.0		37.0	37.0	
Actuated g/C Ratio	0.48	0.40		0.48	0.40		0.37	0.37		0.37	0.37	
Clearance Time (s)	4.0	7.0		4.0	7.0		7.0	7.0		7.0	7.0	
Lane Grp Cap (vph)	285	2066		218	2009		142	1228		218	1196	
v/s Ratio Prot	c0.07	c0.37		0.04	0.20			0.18			c0.24	
v/s Ratio Perm	0.35			0.21			0.09			0.20		
v/c Ratio	0.87	0.93		0.54	0.51		0.25	0.49		0.54	0.66	
Uniform Delay, d1	17.6	28.6		20.4	22.6		21.9	24.3		24.8	26.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	28.5	8.9		9.2	0.9		4.3	1.4		9.2	2.8	
Delay (s)	46.1	37.5		29.6	23.6		26.2	25.7		33.9	29.0	
Level of Service	D	D		C	C		C	C		C	C	
Approach Delay (s)		38.5			24.2			25.7			29.6	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	118.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	0	526	0	0	618
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0			5.0
Lane Util. Factor			0.95			0.95
Frpb, 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)			3650			3544
Flt Permitted			1.00			1.00
Satd. Flow (perm)			3650			3544
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	566	0	0	665
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	566	0	0	665
Confl. Peds. (#/hr)		43				
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%
Turn Type	Prot		NA			NA
Protected Phases	4		2			6
Permitted Phases						
Actuated Green, G (s)			31.0			31.0
Effective Green, g (s)			32.0			32.0
Actuated g/C Ratio			0.53			0.53
Clearance Time (s)			6.0			6.0
Vehicle Extension (s)			3.0			3.0
Lane Grp Cap (vph)			1946			1890
v/s Ratio Prot			0.16			c0.19
v/s Ratio Perm						
v/c Ratio			0.29			0.35
Uniform Delay, d1			7.7			8.0
Progression Factor			1.00			1.00
Incremental Delay, d2			0.4			0.5
Delay (s)			8.1			8.6
Level of Service			A			A
Approach Delay (s)	0.0		8.1			8.6
Approach LOS	A		A			A

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	18	39	487	59	44	574
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	19	41	518	63	47	611
Pedestrians	92					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	9					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			200			33
pX, platoon unblocked	0.91	0.97			0.97	
vC, conflicting volume	1040	382			673	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	712	314			612	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	93			95	
cM capacity (veh/h)	290	610			866	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	61	345	235	250	407
Volume Left	19	0	0	47	0
Volume Right	41	0	63	0	0
cSH	452	1700	1700	866	1700
Volume to Capacity	0.13	0.20	0.14	0.05	0.24
Queue Length 95th (m)	3.5	0.0	0.0	1.3	0.0
Control Delay (s)	14.2	0.0	0.0	2.2	0.0
Lane LOS	B			A	
Approach Delay (s)	14.2	0.0		0.8	
Approach LOS	B				

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	13	7	0	2	38	3	384	2	43	443	96
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		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.98		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		0.98	1.00		0.98	1.00	
Frt		0.99			0.87		1.00	1.00		1.00	0.97	
Flt Protected		0.96			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1814			1642		1792	3541		1798	3396	
Flt Permitted		0.75			1.00		0.41	1.00		0.51	1.00	
Satd. Flow (perm)		1417			1642		766	3541		963	3396	
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)	105	14	8	0	2	41	3	413	2	46	476	103
RTOR Reduction (vph)	0	4	0	0	25	0	0	1	0	0	31	0
Lane Group Flow (vph)	0	123	0	0	18	0	3	414	0	46	548	0
Confl. Peds. (#/hr)	10		23	23		10	27		17	17		27
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	4%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	13	0	0	13
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		22.0			22.0		26.0	26.0		26.0	26.0	
Effective Green, g (s)		23.0			23.0		27.0	27.0		27.0	27.0	
Actuated g/C Ratio		0.38			0.38		0.45	0.45		0.45	0.45	
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)		543			629		344	1593		433	1528	
v/s Ratio Prot					0.01			0.12			c0.16	
v/s Ratio Perm		c0.09					0.00			0.05		
v/c Ratio		0.23			0.03		0.01	0.26		0.11	0.36	
Uniform Delay, d1		12.5			11.5		9.1	10.3		9.5	10.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.0		0.0	0.4		0.5	0.7	
Delay (s)		12.7			11.6		9.2	10.7		10.0	11.5	
Level of Service		B			B		A	B		B	B	
Approach Delay (s)		12.7			11.6			10.7			11.4	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	66	169	1	54	55	105	1	221	100	105	275	64
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	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes		1.00		1.00	0.99			0.99			0.98	
Flpb, ped/bikes		1.00		0.99	1.00			1.00			1.00	
Frt		1.00		1.00	0.90			0.95			0.94	
Flt Protected		0.99		0.95	1.00			1.00			0.99	
Satd. Flow (prot)		1892		1798	1689			3346			3230	
Flt Permitted		0.87		0.60	1.00			0.95			0.82	
Satd. Flow (perm)		1675		1131	1689			3191			2678	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.25
Adj. Flow (vph)	67	172	1	55	56	107	1	226	102	107	281	256
RTOR Reduction (vph)	0	0	0	0	67	0	0	53	0	0	134	0
Lane Group Flow (vph)	0	240	0	55	96	0	0	276	0	0	510	0
Confl. Peds. (#/hr)	5		27	27		5	17		10	10		17
Confl. Bikes (#/hr)						4			1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	4%	0%	0%	7%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	13
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		24.0		24.0	24.0			31.0			31.0	
Effective Green, g (s)		25.0		25.0	25.0			32.0			32.0	
Actuated g/C Ratio		0.37		0.37	0.37			0.48			0.48	
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		625		422	630			1524			1279	
v/s Ratio Prot					0.06							
v/s Ratio Perm		c0.14		0.05				0.09			c0.19	
v/c Ratio		0.38		0.13	0.15			0.18			0.40	
Uniform Delay, d1		15.4		13.8	14.0			10.0			11.3	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.4		0.1	0.1			0.3			0.9	
Delay (s)		15.8		14.0	14.1			10.3			12.2	
Level of Service		B		B	B			B			B	
Approach Delay (s)		15.8			14.0			10.3			12.2	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	67.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	108.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 2: Guildwood Pkwy/Cromwell Rd & Kingston Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	T	R	L	T	T	TR	L	LTR	L
Maximum Queue (m)	14.5	75.2	58.2	35.8	23.1	47.6	145.0	136.8	99.0	70.8	57.0	17.3
Average Queue (m)	1.6	42.6	25.7	4.9	8.8	5.3	118.3	93.2	63.0	43.0	26.6	4.9
95th Queue (m)	8.6	64.9	51.7	17.5	18.3	26.7	154.8	127.2	92.5	64.7	54.8	13.4
Link Distance (m)		153.8	153.8	153.8			138.7	138.7	138.7	140.6	140.6	
Upstream Blk Time (%)							3	0				
Queuing Penalty (veh)							0	0				
Storage Bay Dist (m)	22.0				49.0	36.0						23.0
Storage Blk Time (%)		23					34					0
Queuing Penalty (veh)		1					4					0

Intersection: 2: Guildwood Pkwy/Cromwell Rd & Kingston Rd

Movement	SB
Directions Served	R
Maximum Queue (m)	12.9
Average Queue (m)	3.7
95th Queue (m)	11.2
Link Distance (m)	56.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Livingston Rd & Guildwood Pkwy

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	26.4	15.4	45.7	26.6	28.6	21.0
Average Queue (m)	10.3	4.9	23.5	4.7	13.0	9.4
95th Queue (m)	22.6	12.6	38.5	16.3	24.0	18.3
Link Distance (m)	146.5	146.5	138.1	138.1	38.2	47.1
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Galloway Rd & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	LTR	LTR
Maximum Queue (m)	27.0	73.2	61.6	28.2	41.8	171.8	163.5	126.2	60.5	27.2
Average Queue (m)	3.4	43.5	28.3	5.3	3.3	114.6	104.1	77.8	32.4	10.8
95th Queue (m)	14.2	67.1	54.6	19.1	20.4	152.5	143.9	112.5	55.3	25.0
Link Distance (m)		159.2	159.2	159.2		211.4	211.4	211.4	180.3	141.8
Upstream Blk Time (%)						0	0			
Queuing Penalty (veh)						0	0			
Storage Bay Dist (m)	25.0				18.0					
Storage Blk Time (%)		19				42				
Queuing Penalty (veh)		4				9				

Intersection: 5: Morningside Ave & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	43.8	92.6	73.0	32.9	49.8	150.0	137.2	114.2	32.6	71.2	57.2	25.2
Average Queue (m)	24.2	38.0	28.0	8.7	8.3	121.2	99.5	66.3	2.4	36.6	21.9	7.2
95th Queue (m)	45.7	70.2	54.5	23.4	35.7	155.6	132.1	102.6	15.0	59.7	50.0	19.7
Link Distance (m)		218.9	218.9	218.9		139.7	139.7	139.7		96.4	96.4	
Upstream Blk Time (%)						5	1	0				
Queuing Penalty (veh)						0	0	0				
Storage Bay Dist (m)	24.0				27.0				28.0			50.0
Storage Blk Time (%)	16	12			0	48				17		
Queuing Penalty (veh)	40	21			0	26				3		

Intersection: 5: Morningside Ave & Kingston Rd

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	55.0	62.0
Average Queue (m)	23.9	23.2
95th Queue (m)	44.4	50.7
Link Distance (m)	146.2	146.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 6: Morningside Ave

Movement	NB	NB	SB	SB
Directions Served	T	T	T	T
Maximum Queue (m)	25.6	25.0	36.2	20.7
Average Queue (m)	12.2	14.2	16.9	6.8
95th Queue (m)	22.5	23.7	30.9	17.2
Link Distance (m)	23.1	23.1	63.2	63.2
Upstream Blk Time (%)	1	2		
Queuing Penalty (veh)	2	4		
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Morningside Ave & Ling Rd

Movement	WB	NB	NB	SB
Directions Served	LR	T	TR	LT
Maximum Queue (m)	18.2	7.8	8.0	9.7
Average Queue (m)	9.5	0.4	0.4	1.1
95th Queue (m)	15.5	4.2	4.2	6.3
Link Distance (m)	171.9	185.1	185.1	23.1
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: Morningside Ave & Danzig Rd

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	14.2	14.9	6.9	28.6	33.5	13.6	37.6	31.1
Average Queue (m)	5.3	5.1	0.3	14.5	15.3	2.8	16.3	10.2
95th Queue (m)	13.4	13.3	2.6	25.3	28.4	9.6	29.9	24.2
Link Distance (m)	89.2	125.8		330.4	330.4		185.1	185.1
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			25.0			30.0		
Storage Blk Time (%)				1			1	
Queuing Penalty (veh)				0			0	

Intersection: 9: Morningside Ave & Coronation Dr

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	L	TR	LT	TR	LT	TR
Maximum Queue (m)	26.1	25.5	46.7	35.0	16.8	42.2	27.8
Average Queue (m)	9.9	8.8	20.0	15.9	5.9	15.1	9.4
95th Queue (m)	20.7	20.3	35.7	28.7	14.8	31.7	22.0
Link Distance (m)	124.7		163.8	150.5	150.5	330.4	330.4
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)		40.0					
Storage Blk Time (%)			0				
Queuing Penalty (veh)			0				

Zone Summary

Zone wide Queuing Penalty: 114

Intersection: 1: Brimley Rd & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	TR	L	TR
Maximum Queue (m)	63.8	139.0	116.7	87.7	50.8	73.7	65.2	50.4	39.0	49.5	14.4	64.8
Average Queue (m)	28.4	90.8	78.4	52.7	9.9	52.1	39.3	15.3	14.3	14.9	2.2	19.2
95th Queue (m)	72.9	126.4	112.2	78.9	35.6	73.7	61.6	38.3	31.4	35.5	8.9	44.4
Link Distance (m)		183.0	183.0	183.0		184.9	184.9	184.9	127.1	127.1	136.2	136.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	35.0				22.0							
Storage Blk Time (%)	0	36			0	34						
Queuing Penalty (veh)	0	39			1	15						

Intersection: 2: Guildwood Pkwy/Cromwell Rd & Kingston Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	TR	L	L	R
Maximum Queue (m)	33.8	152.2	114.0	89.1	55.2	52.6	104.8	76.8	44.2	60.5	48.8	12.3
Average Queue (m)	4.6	101.8	83.5	52.4	18.4	21.8	59.7	44.8	13.1	37.6	19.9	3.1
95th Queue (m)	21.4	140.2	114.3	84.3	35.9	48.4	87.0	72.3	31.7	55.9	46.6	9.1
Link Distance (m)		152.0	152.0	152.0			137.2	137.2	137.2	140.6	140.6	140.6
Upstream Blk Time (%)		0					0					
Queuing Penalty (veh)		0					0					
Storage Bay Dist (m)	22.0				49.0	36.0						
Storage Blk Time (%)	0	33		3	0	15	17					
Queuing Penalty (veh)	0	4		11	1	61	8					

Intersection: 2: Guildwood Pkwy/Cromwell Rd & Kingston Rd

Movement	SB	SB
Directions Served	L	R
Maximum Queue (m)	21.9	10.7
Average Queue (m)	7.5	3.4
95th Queue (m)	17.2	10.8
Link Distance (m)		56.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)	23.0	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 3: Livingston Rd & Guildwood Pkwy

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	40.5	21.3	45.2	26.7	41.1	31.6
Average Queue (m)	21.1	8.3	24.0	6.4	21.2	13.6
95th Queue (m)	35.0	16.7	40.9	17.5	37.3	24.5
Link Distance (m)	146.5	146.5	138.1	138.1	38.2	47.1
Upstream Blk Time (%)					1	
Queuing Penalty (veh)					0	
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Galloway Rd & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	LTR	LTR
Maximum Queue (m)	46.9	164.7	150.3	127.6	41.9	152.7	145.3	92.1	75.0	61.4
Average Queue (m)	32.1	121.0	107.8	79.4	29.6	83.9	72.4	36.2	29.2	19.9
95th Queue (m)	60.1	174.5	164.9	154.2	54.3	152.5	141.5	85.3	54.9	43.6
Link Distance (m)		159.2	159.2	159.2		211.4	211.4	211.4	180.3	141.8
Upstream Blk Time (%)		18	9	8						
Queuing Penalty (veh)		0	0	0						
Storage Bay Dist (m)	25.0				18.0					
Storage Blk Time (%)	36	34			64	25				
Queuing Penalty (veh)	225	32			247	15				

Intersection: 5: Morningside Ave & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	44.0	231.6	229.2	229.3	49.8	95.7	77.3	51.0	36.0	80.3	69.8	77.2
Average Queue (m)	42.8	197.8	181.2	151.5	18.7	58.4	45.7	24.5	8.3	41.9	33.2	30.4
95th Queue (m)	50.2	261.5	251.9	244.8	50.1	87.1	70.8	46.9	28.5	68.4	61.1	67.8
Link Distance (m)		218.9	218.9	218.9		139.7	139.7	139.7		96.4	96.4	
Upstream Blk Time (%)		33	16	13						0	0	
Queuing Penalty (veh)		0	0	0						0	0	
Storage Bay Dist (m)	24.0				27.0				28.0			50.0
Storage Blk Time (%)	78	36			0	33			4	21		11
Queuing Penalty (veh)	465	84			1	37			9	7		30

Intersection: 5: Morningside Ave & Kingston Rd

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	115.7	113.1
Average Queue (m)	55.5	60.3
95th Queue (m)	95.8	104.5
Link Distance (m)	146.2	146.2
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (m)		
Storage Blk Time (%)	9	
Queuing Penalty (veh)	10	

Intersection: 6: Morningside Ave

Movement	NB	NB	SB	SB
Directions Served	T	T	T	T
Maximum Queue (m)	31.3	35.4	66.2	39.7
Average Queue (m)	20.4	24.5	30.9	16.1
95th Queue (m)	31.4	33.9	52.6	32.5
Link Distance (m)	25.7	25.7	67.5	67.5
Upstream Blk Time (%)	4	7	0	
Queuing Penalty (veh)	10	17	0	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Morningside Ave & Ling Rd

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	TR	LT	T
Maximum Queue (m)	22.2	23.2	30.7	30.0	25.3
Average Queue (m)	8.4	1.6	2.6	9.3	2.4
95th Queue (m)	16.4	10.1	13.9	26.4	14.2
Link Distance (m)	171.9	185.6	185.6	25.7	25.7
Upstream Blk Time (%)				1	0
Queuing Penalty (veh)				2	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: Morningside Ave & Danzig Rd

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	40.1	12.1	6.8	38.0	50.0	13.3	33.4	27.8
Average Queue (m)	13.6	4.8	0.6	17.9	20.0	4.8	13.1	9.1
95th Queue (m)	29.1	11.6	4.1	30.6	36.4	12.1	24.4	20.2
Link Distance (m)	89.2	125.9		330.4	330.4		185.6	185.6
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			25.0			30.0		
Storage Blk Time (%)				1			0	
Queuing Penalty (veh)				0			0	

Intersection: 9: Morningside Ave & Coronation Dr

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	L	TR	LT	TR	LT	TR
Maximum Queue (m)	55.7	24.7	30.1	35.5	28.1	45.1	49.8
Average Queue (m)	24.7	10.5	14.8	16.9	12.0	22.7	20.9
95th Queue (m)	43.4	21.6	26.3	30.2	23.0	41.0	43.6
Link Distance (m)	124.7		163.8	150.5	150.5	330.4	330.4
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)		40.0					
Storage Blk Time (%)			0				
Queuing Penalty (veh)			0				

Zone Summary

Zone wide Queuing Penalty: 1332

Intersection: 2: Guildwood Pkwy/Cromwell Rd & Kingston Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	TR	L	L	R
Maximum Queue (m)	47.9	150.7	121.4	92.8	47.0	56.8	115.1	99.7	62.0	65.7	57.4	13.3
Average Queue (m)	6.1	101.4	84.3	51.2	16.8	35.7	69.1	52.9	17.8	39.7	20.7	3.1
95th Queue (m)	26.3	137.4	113.1	80.9	32.8	65.7	120.6	102.2	46.6	60.2	50.7	8.8
Link Distance (m)		152.0	152.0	152.0			137.2	137.2	137.2	140.6	140.6	140.6
Upstream Blk Time (%)		0					2	0				
Queuing Penalty (veh)		0					0	0				
Storage Bay Dist (m)	22.0				49.0	36.0						
Storage Blk Time (%)	0	33		3	0	45	16					
Queuing Penalty (veh)	0	6		7	1	168	7					

Intersection: 2: Guildwood Pkwy/Cromwell Rd & Kingston Rd

Movement	SB	SB
Directions Served	L	R
Maximum Queue (m)	19.0	10.5
Average Queue (m)	6.7	2.9
95th Queue (m)	16.6	9.9
Link Distance (m)		56.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)	23.0	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 3: Livingston Rd & Guildwood Pkwy

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	41.9	22.2	56.9	33.7	32.7	28.6
Average Queue (m)	20.3	7.9	26.4	6.0	11.6	12.4
95th Queue (m)	34.6	17.7	44.6	22.9	24.1	23.6
Link Distance (m)	146.5	146.5	138.1	138.1	38.2	47.1
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Galloway Rd & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	LTR	LTR
Maximum Queue (m)	46.9	158.2	132.0	99.2	42.0	128.2	117.8	73.3	60.6	43.0
Average Queue (m)	23.2	107.4	89.3	60.6	25.9	71.8	60.3	30.8	28.4	17.4
95th Queue (m)	51.7	148.1	124.3	92.5	48.8	124.6	113.0	68.7	51.3	37.5
Link Distance (m)		159.2	159.2	159.2		211.4	211.4	211.4	180.3	141.8
Upstream Blk Time (%)		0								
Queuing Penalty (veh)		0								
Storage Bay Dist (m)	25.0				18.0					
Storage Blk Time (%)	13	38			57	28				
Queuing Penalty (veh)	84	31			213	15				

Intersection: 5: Morningside Ave & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	44.0	213.0	197.1	160.5	49.7	91.8	69.8	49.9	34.0	67.6	50.9	75.0
Average Queue (m)	41.8	158.6	143.2	103.3	16.3	55.3	42.4	24.2	5.5	34.8	22.4	24.0
95th Queue (m)	53.1	234.8	219.9	174.3	48.4	82.7	67.4	45.7	19.9	60.4	47.1	58.2
Link Distance (m)		218.9	218.9	218.9		139.7	139.7	139.7		96.4	96.4	
Upstream Blk Time (%)		11	1	0						0		
Queuing Penalty (veh)		0	0	0						0		
Storage Bay Dist (m)	24.0				27.0				28.0			50.0
Storage Blk Time (%)	71	36			0	32			0	13		6
Queuing Penalty (veh)	389	87			1	32			0	5		16

Intersection: 5: Morningside Ave & Kingston Rd

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	109.9	126.6
Average Queue (m)	56.8	64.4
95th Queue (m)	96.5	112.9
Link Distance (m)	146.2	146.2
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (m)		
Storage Blk Time (%)	12	
Queuing Penalty (veh)	13	

Intersection: 6: Morningside Ave

Movement	NB	NB	SB	SB
Directions Served	T	T	T	T
Maximum Queue (m)	29.8	29.7	51.3	32.4
Average Queue (m)	18.6	21.2	26.3	13.8
95th Queue (m)	28.7	32.9	44.2	27.6
Link Distance (m)	25.7	25.7	67.5	67.5
Upstream Blk Time (%)	2	4		
Queuing Penalty (veh)	4	9		
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Morningside Ave & Ling Rd

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	TR	LT	T
Maximum Queue (m)	19.5	10.3	9.9	28.1	7.7
Average Queue (m)	9.2	0.5	0.9	5.4	0.3
95th Queue (m)	15.2	5.3	5.7	18.5	4.0
Link Distance (m)	171.9	185.6	185.6	25.7	25.7
Upstream Blk Time (%)				0	0
Queuing Penalty (veh)				1	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: Morningside Ave & Danzig Rd

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	27.0	16.6	6.8	31.5	30.4	11.1	25.5	19.8
Average Queue (m)	9.9	4.7	0.6	14.2	15.6	3.5	11.4	8.5
95th Queue (m)	21.5	12.9	3.9	25.7	26.5	10.3	20.8	16.8
Link Distance (m)	89.2	125.9		330.4	330.4		185.6	185.6
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			25.0			30.0		
Storage Blk Time (%)				1			0	
Queuing Penalty (veh)				0			0	

Intersection: 9: Morningside Ave & Coronation Dr

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	L	TR	LT	TR	LT	TR
Maximum Queue (m)	52.7	22.5	27.2	34.4	27.2	40.9	41.1
Average Queue (m)	22.5	9.4	12.0	15.3	10.1	19.2	17.2
95th Queue (m)	41.6	20.5	23.3	27.5	22.0	35.4	36.4
Link Distance (m)	124.7		163.8	150.5	150.5	330.4	330.4
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)		40.0					
Storage Blk Time (%)			0				
Queuing Penalty (veh)			0				

Zone Summary

Zone wide Queuing Penalty: 1090

Intersection: 1: Brimley Rd & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	TR	L	TR
Maximum Queue (m)	44.9	72.1	53.7	33.5	50.8	183.4	156.3	129.3	27.0	26.8	10.8	40.2
Average Queue (m)	10.0	39.7	26.4	11.1	10.9	120.9	104.1	71.7	7.9	6.6	0.9	10.8
95th Queue (m)	27.8	60.9	49.2	25.5	42.6	176.7	151.1	114.5	19.2	19.2	5.2	29.2
Link Distance (m)		183.0	183.0	183.0		184.9	184.9	184.9	127.1	127.1	136.2	136.2
Upstream Blk Time (%)						1						
Queuing Penalty (veh)						0						
Storage Bay Dist (m)	35.0				22.0							
Storage Blk Time (%)	0	10				49						
Queuing Penalty (veh)	1	8				19						

Intersection: 2: Guildwood Pkwy/Cromwell Rd & Kingston Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	T	R	L	T	T	TR	L	LTR	L
Maximum Queue (m)	15.0	102.9	81.8	51.4	38.4	57.8	143.3	123.2	96.0	106.0	89.0	17.9
Average Queue (m)	0.9	59.6	45.5	15.2	17.7	15.1	106.4	84.5	53.1	69.0	54.9	7.1
95th Queue (m)	8.0	85.1	73.6	40.3	31.6	47.9	145.6	117.2	86.0	97.3	82.8	16.6
Link Distance (m)		153.8	153.8	153.8			138.7	138.7	138.7	140.6	140.6	
Upstream Blk Time (%)							1					
Queuing Penalty (veh)							0					
Storage Bay Dist (m)	22.0				49.0	36.0						23.0
Storage Blk Time (%)		31		0	0	0	32					0
Queuing Penalty (veh)		1		0	0	0	13					0

Intersection: 2: Guildwood Pkwy/Cromwell Rd & Kingston Rd

Movement	SB
Directions Served	R
Maximum Queue (m)	14.8
Average Queue (m)	4.1
95th Queue (m)	12.6
Link Distance (m)	56.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 3: Livingston Rd & Guildwood Pkwy

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	51.5	37.2	63.9	52.0	42.8	50.6
Average Queue (m)	27.4	12.4	37.3	18.0	23.8	24.5
95th Queue (m)	44.0	26.7	56.9	40.9	40.6	42.8
Link Distance (m)	146.5	146.5	138.1	138.1	38.2	47.1
Upstream Blk Time (%)					2	1
Queuing Penalty (veh)					0	0
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Galloway Rd & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	LTR	LTR
Maximum Queue (m)	46.8	91.7	83.1	54.4	41.9	133.2	122.0	95.8	163.4	62.1
Average Queue (m)	13.2	61.3	47.5	15.2	11.4	95.9	83.9	59.8	92.0	22.6
95th Queue (m)	37.8	84.5	74.6	40.0	37.0	127.5	116.6	90.1	159.6	48.1
Link Distance (m)		159.2	159.2	159.2		211.4	211.4	211.4	180.3	141.8
Upstream Blk Time (%)									1	
Queuing Penalty (veh)									0	
Storage Bay Dist (m)	25.0				18.0					
Storage Blk Time (%)	8	29			2	40				
Queuing Penalty (veh)	29	10			11	21				

Intersection: 5: Morningside Ave & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	44.0	164.7	152.2	66.0	49.8	149.5	145.9	127.3	39.8	83.6	62.8	26.8
Average Queue (m)	38.5	94.1	77.9	14.9	18.8	126.4	107.8	79.0	4.5	45.8	30.4	8.0
95th Queue (m)	54.6	191.9	170.1	42.8	53.8	163.5	150.6	126.4	22.2	72.2	58.5	21.9
Link Distance (m)		218.9	218.9	218.9		139.7	139.7	139.7		96.4	96.4	
Upstream Blk Time (%)		1				11	4	3		0		
Queuing Penalty (veh)		0				0	0	0		0		
Storage Bay Dist (m)	24.0				27.0				28.0			50.0
Storage Blk Time (%)	67	7			1	53				24		
Queuing Penalty (veh)	185	15			4	35				5		

Intersection: 5: Morningside Ave & Kingston Rd

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	88.4	103.0
Average Queue (m)	45.4	55.6
95th Queue (m)	78.6	98.6
Link Distance (m)	146.2	146.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)	4	
Queuing Penalty (veh)	2	

Intersection: 6: Morningside Ave

Movement	NB	NB	SB	SB
Directions Served	T	T	T	T
Maximum Queue (m)	23.2	26.4	51.8	30.2
Average Queue (m)	12.9	16.8	22.6	11.7
95th Queue (m)	22.1	26.5	38.4	23.2
Link Distance (m)	23.1	23.1	63.2	63.2
Upstream Blk Time (%)	1	3	0	
Queuing Penalty (veh)	2	8	0	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Morningside Ave & Ling Rd

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	TR	LT	T
Maximum Queue (m)	28.3	6.7	15.6	25.4	9.0
Average Queue (m)	13.2	0.3	1.6	5.2	0.5
95th Queue (m)	22.2	2.6	8.1	18.8	6.0
Link Distance (m)	171.9	185.1	185.1	23.1	23.1
Upstream Blk Time (%)				1	0
Queuing Penalty (veh)				1	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: Morningside Ave & Danzig Rd

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	19.1	15.5	5.1	35.6	36.5	14.9	38.3	34.7
Average Queue (m)	6.5	7.1	0.4	18.7	19.1	5.1	22.4	17.5
95th Queue (m)	16.2	15.0	3.3	32.3	31.5	13.0	34.7	30.2
Link Distance (m)	89.2	125.8		330.4	330.4		185.1	185.1
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			25.0			30.0		
Storage Blk Time (%)				2			2	
Queuing Penalty (veh)				0			0	

Intersection: 9: Morningside Ave & Coronation Dr

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	L	TR	LT	TR	LT	TR
Maximum Queue (m)	24.0	57.5	66.1	36.4	19.5	42.0	36.0
Average Queue (m)	10.1	27.8	37.9	16.8	6.8	17.4	16.0
95th Queue (m)	21.6	46.6	62.1	28.6	16.4	32.8	30.1
Link Distance (m)	124.7		163.8	150.5	150.5	330.4	330.4
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)		40.0					
Storage Blk Time (%)		2	6				
Queuing Penalty (veh)		8	12				

Network Summary

Network wide Queuing Penalty: 392

Intersection: 1: Brimley Rd & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	TR	L	TR
Maximum Queue (m)	63.9	133.4	124.2	95.0	50.8	75.7	63.9	43.7	36.0	35.3	12.1	42.2
Average Queue (m)	29.8	86.6	74.8	53.3	6.3	51.5	39.7	15.9	11.3	10.8	1.6	16.0
95th Queue (m)	73.9	121.8	108.4	80.5	30.9	71.2	60.9	38.0	27.3	27.3	6.8	36.1
Link Distance (m)		183.0	183.0	183.0		184.9	184.9	184.9	127.1	127.1	136.2	136.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	35.0				22.0							
Storage Blk Time (%)	1	33			0	36						
Queuing Penalty (veh)	4	37			0	12						

Intersection: 2: Guildwood Pkwy/Cromwell Rd & Kingston Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	TR	L	L	R
Maximum Queue (m)	47.8	147.6	123.2	91.1	43.9	52.4	99.1	85.8	58.9	70.1	60.5	13.1
Average Queue (m)	5.3	100.8	83.6	51.3	18.2	18.9	60.1	45.4	16.5	39.2	21.3	2.7
95th Queue (m)	23.8	138.1	116.3	83.1	36.5	45.9	90.3	76.6	40.6	62.0	51.5	7.9
Link Distance (m)		152.0	152.0	152.0			137.2	137.2	137.2	140.6	140.6	140.6
Upstream Blk Time (%)		0					0	0				
Queuing Penalty (veh)		0					0	0				
Storage Bay Dist (m)	22.0				49.0	36.0						
Storage Blk Time (%)	0	32		3	0	9	17					
Queuing Penalty (veh)	0	4		10	0	35	7					

Intersection: 2: Guildwood Pkwy/Cromwell Rd & Kingston Rd

Movement	SB	SB
Directions Served	L	R
Maximum Queue (m)	19.3	13.5
Average Queue (m)	7.6	4.2
95th Queue (m)	17.9	12.1
Link Distance (m)		56.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)	23.0	
Storage Blk Time (%)	0	0
Queuing Penalty (veh)	0	0

Intersection: 3: Livingston Rd & Guildwood Pkwy

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	46.0	33.6	41.6	26.2	43.0	33.9
Average Queue (m)	21.8	9.8	22.1	5.2	22.1	14.9
95th Queue (m)	38.6	22.5	35.5	16.8	38.4	27.0
Link Distance (m)	146.5	146.5	138.1	138.1	38.2	47.1
Upstream Blk Time (%)					2	
Queuing Penalty (veh)					0	
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Galloway Rd & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	LTR	LTR
Maximum Queue (m)	46.9	161.3	146.4	126.3	41.9	148.6	131.7	90.8	71.4	54.4
Average Queue (m)	31.8	116.3	100.2	70.7	34.1	100.1	86.9	43.0	27.1	20.8
95th Queue (m)	58.3	167.7	149.1	122.6	53.5	174.8	160.9	97.0	52.8	43.0
Link Distance (m)		159.2	159.2	159.2		211.4	211.4	211.4	180.3	141.8
Upstream Blk Time (%)		6	2	0						
Queuing Penalty (veh)		0	0	0						
Storage Bay Dist (m)	25.0				18.0					
Storage Blk Time (%)	38	36			79	20				
Queuing Penalty (veh)	235	34			303	12				

Intersection: 5: Morningside Ave & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	44.0	222.1	214.5	196.4	49.8	86.1	79.2	60.9	38.5	71.1	70.9	96.5
Average Queue (m)	43.3	191.5	177.4	145.6	18.8	54.6	43.8	25.9	6.5	40.0	29.9	48.0
95th Queue (m)	48.0	261.2	254.5	240.6	51.9	80.6	67.4	49.7	25.6	63.9	58.6	98.2
Link Distance (m)		218.9	218.9	218.9		139.7	139.7	139.7		96.4	96.4	
Upstream Blk Time (%)		36	12	9							0	
Queuing Penalty (veh)		0	0	0							0	
Storage Bay Dist (m)	24.0				27.0				28.0			50.0
Storage Blk Time (%)	77	39			1	32			1	19		34
Queuing Penalty (veh)	462	91			2	35			2	6		92

Intersection: 5: Morningside Ave & Kingston Rd

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	109.5	124.8
Average Queue (m)	58.5	64.8
95th Queue (m)	106.7	115.1
Link Distance (m)	146.2	146.2
Upstream Blk Time (%)	2	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (m)		
Storage Blk Time (%)	7	
Queuing Penalty (veh)	8	

Intersection: 6: Morningside Ave

Movement	NB	NB	SB	SB
Directions Served	T	T	T	T
Maximum Queue (m)	30.4	33.7	58.3	40.9
Average Queue (m)	21.0	23.7	28.0	16.2
95th Queue (m)	32.6	33.8	46.7	31.6
Link Distance (m)	25.7	25.7	67.5	67.5
Upstream Blk Time (%)	4	8	0	
Queuing Penalty (veh)	11	20	0	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Morningside Ave & Ling Rd

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	TR	LT	T
Maximum Queue (m)	17.0	16.9	26.5	25.1	11.6
Average Queue (m)	9.2	2.2	3.6	6.8	0.5
95th Queue (m)	16.1	10.5	14.9	19.7	5.6
Link Distance (m)	171.9	185.6	185.6	25.7	25.7
Upstream Blk Time (%)				0	0
Queuing Penalty (veh)				0	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: Morningside Ave & Danzig Rd

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	33.0	14.2	8.6	34.2	44.4	14.9	26.4	20.8
Average Queue (m)	13.9	4.6	0.7	16.4	19.4	5.0	11.7	8.9
95th Queue (m)	27.5	12.2	4.6	28.4	33.9	12.9	21.4	18.1
Link Distance (m)	89.2	125.9		330.4	330.4		185.6	185.6
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			25.0			30.0		
Storage Blk Time (%)				1			0	
Queuing Penalty (veh)				0			0	

Intersection: 9: Morningside Ave & Coronation Dr

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	L	TR	LT	TR	LT	TR
Maximum Queue (m)	71.4	24.2	34.5	32.2	29.6	41.6	42.6
Average Queue (m)	26.0	10.1	15.2	16.7	12.0	20.6	18.8
95th Queue (m)	49.2	19.8	27.3	28.3	22.4	36.1	36.4
Link Distance (m)	124.7		163.8	150.5	150.5	330.4	330.4
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)		40.0					
Storage Blk Time (%)			0				
Queuing Penalty (veh)			0				

Network Summary

Network wide Queuing Penalty: 1424

Intersection: 2: Guildwood Pkwy/Cromwell Rd & Kingston Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	T	R	L	T	T	TR	L	LTR	L
Maximum Queue (m)	7.8	80.9	61.1	23.6	20.9	38.6	146.4	129.9	101.5	66.7	57.7	17.0
Average Queue (m)	1.0	44.5	27.9	4.6	8.6	3.0	116.1	92.1	60.4	40.6	25.9	6.2
95th Queue (m)	4.8	68.1	54.4	15.0	17.2	16.9	151.4	122.6	94.3	61.1	52.8	15.5
Link Distance (m)		153.8	153.8	153.8			138.7	138.7	138.7	140.6	140.6	
Upstream Blk Time (%)							2	0				
Queuing Penalty (veh)							0	0				
Storage Bay Dist (m)	22.0				49.0	36.0						23.0
Storage Blk Time (%)		24					34					0
Queuing Penalty (veh)		1					4					0

Intersection: 2: Guildwood Pkwy/Cromwell Rd & Kingston Rd

Movement	SB
Directions Served	R
Maximum Queue (m)	13.7
Average Queue (m)	4.1
95th Queue (m)	11.7
Link Distance (m)	56.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Livingston Rd & Guildwood Pkwy

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	36.2	13.8	47.1	35.6	30.2	18.5
Average Queue (m)	13.2	4.9	25.3	5.5	12.2	8.6
95th Queue (m)	27.2	13.2	41.4	18.9	25.7	16.9
Link Distance (m)	146.5	146.5	138.1	138.1	38.2	47.1
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Galloway Rd & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	LTR	LTR
Maximum Queue (m)	28.8	73.2	72.9	33.9	34.6	161.0	155.9	118.0	82.0	30.8
Average Queue (m)	3.4	43.6	28.9	6.3	2.5	110.9	99.2	72.4	35.0	11.4
95th Queue (m)	14.5	65.3	57.7	23.1	18.0	153.9	143.7	106.3	63.7	26.0
Link Distance (m)		159.2	159.2	159.2		211.4	211.4	211.4	180.3	141.8
Upstream Blk Time (%)						0				
Queuing Penalty (veh)						0				
Storage Bay Dist (m)	25.0				18.0					
Storage Blk Time (%)	1	20				41				
Queuing Penalty (veh)	2	4				9				

Intersection: 5: Morningside Ave & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	43.8	80.9	69.6	39.0	49.8	154.1	147.1	130.9	39.7	62.8	50.9	32.2
Average Queue (m)	23.8	35.7	27.0	9.1	17.2	130.7	112.0	82.8	3.7	36.7	18.8	8.2
95th Queue (m)	45.1	62.6	51.1	26.2	51.2	163.7	151.0	123.3	19.4	60.1	45.3	23.1
Link Distance (m)		218.9	218.9	218.9		139.7	139.7	139.7		96.4	96.4	
Upstream Blk Time (%)						11	2	1				
Queuing Penalty (veh)						0	0	0				
Storage Bay Dist (m)	24.0				27.0				28.0			50.0
Storage Blk Time (%)	11	13			0	52				17		
Queuing Penalty (veh)	27	24			1	34				3		

Intersection: 5: Morningside Ave & Kingston Rd

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	61.5	72.2
Average Queue (m)	25.2	28.2
95th Queue (m)	48.9	60.8
Link Distance (m)	146.2	146.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 6: Morningside Ave

Movement	NB	NB	SB	SB
Directions Served	T	T	T	T
Maximum Queue (m)	23.1	23.8	43.1	23.5
Average Queue (m)	11.8	14.4	19.2	7.7
95th Queue (m)	20.5	24.7	35.3	17.9
Link Distance (m)	23.1	23.1	63.2	63.2
Upstream Blk Time (%)	1	2		
Queuing Penalty (veh)	1	5		
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Morningside Ave & Ling Rd

Movement	WB	NB	NB	SB
Directions Served	LR	T	TR	LT
Maximum Queue (m)	21.3	5.5	12.5	22.4
Average Queue (m)	9.4	0.2	0.7	2.2
95th Queue (m)	16.7	2.7	6.3	11.4
Link Distance (m)	171.9	185.1	185.1	23.1
Upstream Blk Time (%)				0
Queuing Penalty (veh)				0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: Morningside Ave & Danzig Rd

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	15.9	15.3	6.9	30.3	33.8	10.6	45.3	35.8
Average Queue (m)	5.9	4.4	0.5	13.8	14.9	3.5	18.6	12.3
95th Queue (m)	14.9	12.3	3.7	25.6	26.7	10.6	35.2	26.4
Link Distance (m)	89.2	125.8		330.4	330.4		185.1	185.1
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			25.0			30.0		
Storage Blk Time (%)				1			2	
Queuing Penalty (veh)				0			0	

Intersection: 9: Morningside Ave & Coronation Dr

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	L	TR	LT	TR	LT	TR
Maximum Queue (m)	19.9	21.7	43.0	33.1	16.9	40.3	37.2
Average Queue (m)	8.6	8.6	19.5	14.7	5.5	15.6	12.6
95th Queue (m)	18.0	18.9	35.0	27.8	14.0	30.7	29.7
Link Distance (m)	124.7		163.8	150.5	150.5	330.4	330.4
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)		40.0					
Storage Blk Time (%)			0				
Queuing Penalty (veh)			0				

Zone Summary

Zone wide Queuing Penalty: 115

Intersection: 2: Guildwood Pkwy/Cromwell Rd & Kingston Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	TR	L	L	R
Maximum Queue (m)	13.5	118.8	98.2	68.7	26.4	41.5	72.6	57.8	36.5	51.3	38.6	6.4
Average Queue (m)	3.5	97.6	79.4	48.8	16.2	20.8	57.9	44.4	16.8	36.0	20.2	2.6
95th Queue (m)	19.0	125.1	111.9	77.7	30.0	45.2	77.2	62.9	40.0	57.2	47.9	7.6
Link Distance (m)		152.0	152.0	152.0			137.2	137.2	137.2	140.6	140.6	140.6
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	22.0				49.0	36.0						
Storage Blk Time (%)		35		2		1	19					
Queuing Penalty (veh)		6		6		2	9					

Intersection: 2: Guildwood Pkwy/Cromwell Rd & Kingston Rd

Movement	SB	SB
Directions Served	L	R
Maximum Queue (m)	12.6	8.6
Average Queue (m)	6.4	2.4
95th Queue (m)	15.6	9.8
Link Distance (m)		56.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)	23.0	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Livingston Rd & Guildwood Pkwy

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	36.6	12.2	35.7	7.1	21.2	17.5
Average Queue (m)	22.8	7.2	21.9	2.1	11.7	11.4
95th Queue (m)	40.8	14.9	39.6	8.4	23.0	18.8
Link Distance (m)	146.5	146.5	138.1	138.1	38.2	47.1
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Galloway Rd & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	LTR	LTR
Maximum Queue (m)	40.8	128.7	122.2	79.4	38.1	89.2	76.1	38.6	44.8	31.6
Average Queue (m)	29.2	112.8	97.8	59.7	18.0	72.5	60.3	26.6	31.3	16.7
95th Queue (m)	57.5	157.4	150.5	95.8	46.4	123.6	116.2	48.9	53.0	36.0
Link Distance (m)		159.2	159.2	159.2		211.4	211.4	211.4	180.3	141.8
Upstream Blk Time (%)		3	0							
Queuing Penalty (veh)		0	0							
Storage Bay Dist (m)	25.0				18.0					
Storage Blk Time (%)	24	37			23	29				
Queuing Penalty (veh)	158	31			85	15				

Intersection: 5: Morningside Ave & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	43.9	183.0	155.9	118.6	49.8	81.7	70.4	45.5	31.6	54.4	39.4	28.9
Average Queue (m)	43.0	147.4	126.7	87.2	24.0	60.3	48.2	27.0	11.6	39.2	21.2	15.8
95th Queue (m)	46.4	206.5	179.5	125.5	58.1	85.0	77.9	50.2	33.7	61.4	45.2	34.8
Link Distance (m)		218.9	218.9	218.9		139.7	139.7	139.7		96.4	96.4	
Upstream Blk Time (%)		0										
Queuing Penalty (veh)		0										
Storage Bay Dist (m)	24.0				27.0				28.0			50.0
Storage Blk Time (%)	70	44			5	33			0	16		
Queuing Penalty (veh)	390	107			15	37			0	6		

Intersection: 5: Morningside Ave & Kingston Rd

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	71.8	81.4
Average Queue (m)	52.4	63.2
95th Queue (m)	89.4	107.9
Link Distance (m)	146.2	146.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)	9	
Queuing Penalty (veh)	10	

Intersection: 6: Moningside Ave

Movement	NB	NB	SB	SB
Directions Served	T	T	T	T
Maximum Queue (m)	24.6	27.1	41.5	23.7
Average Queue (m)	17.7	20.8	26.8	14.3
95th Queue (m)	27.4	30.3	43.4	27.4
Link Distance (m)	25.7	25.7	67.5	67.5
Upstream Blk Time (%)	1	3		
Queuing Penalty (veh)	3	6		
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Moningside Ave & Ling Rd

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	14.4	3.2	13.6
Average Queue (m)	9.3	1.0	4.5
95th Queue (m)	16.0	5.6	14.3
Link Distance (m)	171.9	185.6	25.7
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: Moningside Ave & Danzig Rd

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	16.7	10.0	1.6	24.3	24.6	8.3	17.7	15.0
Average Queue (m)	10.4	5.0	0.3	13.9	15.9	4.1	10.5	8.6
95th Queue (m)	18.3	12.3	2.9	26.6	28.2	10.4	22.0	17.2
Link Distance (m)	89.2	125.9		330.4	330.4		185.6	185.6
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			25.0			30.0		
Storage Blk Time (%)				1			1	
Queuing Penalty (veh)				0			0	

Intersection: 9: Moningside Ave & Coronation Dr

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	L	TR	LT	TR	LT	TR
Maximum Queue (m)	38.9	15.2	19.0	29.5	19.2	36.7	39.9
Average Queue (m)	23.3	6.8	11.7	17.1	9.2	22.0	20.5
95th Queue (m)	44.5	17.2	21.1	31.5	20.5	38.5	45.1
Link Distance (m)	124.7		163.8	150.5	150.5	330.4	330.4
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)		40.0					
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 887

Intersection: 1: Brimley Rd & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	TR	L	TR
Maximum Queue (m)	44.5	67.6	56.3	33.3	50.8	175.0	156.3	117.8	40.0	46.7	8.2	43.9
Average Queue (m)	11.9	39.8	28.2	11.7	13.1	116.0	101.0	69.3	13.0	13.2	0.7	12.4
95th Queue (m)	30.6	61.1	49.3	26.4	44.1	166.5	147.4	106.6	29.6	34.9	4.1	32.0
Link Distance (m)		183.0	183.0	183.0		184.9	184.9	184.9	127.1	127.1	136.2	136.2
Upstream Blk Time (%)						1						
Queuing Penalty (veh)						0						
Storage Bay Dist (m)	35.0				22.0							
Storage Blk Time (%)	0	11			1	48						
Queuing Penalty (veh)	1	9			7	24						

Intersection: 2: Guildwood Pkwy/Cromwell Rd & Kingston Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	T	R	L	T	T	TR	L	LTR	L
Maximum Queue (m)	14.8	100.1	91.9	48.1	40.6	57.8	144.0	128.2	93.5	102.6	86.7	24.3
Average Queue (m)	1.2	62.2	49.2	16.0	18.3	15.0	109.6	87.3	56.8	67.4	54.2	7.2
95th Queue (m)	10.3	88.4	82.1	39.9	32.1	46.7	146.4	118.4	85.9	94.0	79.7	18.7
Link Distance (m)		153.8	153.8	153.8			138.7	138.7	138.7	140.6	140.6	
Upstream Blk Time (%)							1	0				
Queuing Penalty (veh)							0	0				
Storage Bay Dist (m)	22.0				49.0	36.0						23.0
Storage Blk Time (%)		32		0	0	0	33					0
Queuing Penalty (veh)		1		0	0	0	13					0

Intersection: 2: Guildwood Pkwy/Cromwell Rd & Kingston Rd

Movement	SB
Directions Served	R
Maximum Queue (m)	17.4
Average Queue (m)	4.2
95th Queue (m)	12.9
Link Distance (m)	56.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Livingston Rd & Guildwood Pkwy

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	45.6	34.5	61.5	53.3	43.8	44.6
Average Queue (m)	27.3	11.7	36.4	18.6	26.5	21.8
95th Queue (m)	41.4	25.1	54.0	40.5	42.8	38.0
Link Distance (m)	146.5	146.5	138.1	138.1	38.2	47.1
Upstream Blk Time (%)					3	0
Queuing Penalty (veh)					0	0
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Galloway Rd & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	LTR	LTR
Maximum Queue (m)	46.7	105.5	92.0	50.1	41.8	139.6	131.0	98.3	180.3	56.7
Average Queue (m)	13.4	61.4	46.9	14.8	7.4	96.8	84.7	62.6	104.5	25.0
95th Queue (m)	38.3	91.9	78.7	40.4	26.7	129.8	114.4	87.6	185.8	49.3
Link Distance (m)		159.2	159.2	159.2		211.4	211.4	211.4	180.3	141.8
Upstream Blk Time (%)									7	
Queuing Penalty (veh)									0	
Storage Bay Dist (m)	25.0				18.0					
Storage Blk Time (%)	11	28			1	40				
Queuing Penalty (veh)	39	9			6	21				

Intersection: 5: Morningside Ave & Kingston Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	43.8	95.7	75.4	37.1	49.8	149.3	145.4	138.4	39.8	91.1	68.2	36.6
Average Queue (m)	28.1	38.6	31.0	10.4	20.8	133.8	114.7	85.7	5.5	47.0	32.9	9.7
95th Queue (m)	48.6	69.3	58.2	27.4	57.7	162.9	152.0	129.5	25.0	75.7	60.5	27.2
Link Distance (m)		218.9	218.9	218.9		139.7	139.7	139.7		96.4	96.4	
Upstream Blk Time (%)						14	4	2		0		
Queuing Penalty (veh)						0	0	0		0		
Storage Bay Dist (m)	24.0				27.0				28.0			50.0
Storage Blk Time (%)	19	13			0	57				25		0
Queuing Penalty (veh)	53	29			1	39				5		1

Intersection: 5: Morningside Ave & Kingston Rd

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	91.6	119.1
Average Queue (m)	48.8	61.6
95th Queue (m)	85.4	110.4
Link Distance (m)	146.2	146.2
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (m)		
Storage Blk Time (%)	6	
Queuing Penalty (veh)	4	

Intersection: 6: Morningside Ave

Movement	NB	NB	SB	SB
Directions Served	T	T	T	T
Maximum Queue (m)	25.1	23.8	51.8	28.2
Average Queue (m)	13.0	15.5	24.7	10.1
95th Queue (m)	23.5	24.7	41.3	21.9
Link Distance (m)	23.1	23.1	63.2	63.2
Upstream Blk Time (%)	1	2	0	
Queuing Penalty (veh)	3	5	0	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Morningside Ave & Ling Rd

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	TR	LT	T
Maximum Queue (m)	28.1	3.7	15.7	24.8	4.6
Average Queue (m)	12.0	0.2	1.0	4.4	0.3
95th Queue (m)	20.9	2.6	6.9	17.0	4.2
Link Distance (m)	171.9	185.1	185.1	23.1	23.1
Upstream Blk Time (%)				0	0
Queuing Penalty (veh)				1	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: Morningside Ave & Danzig Rd

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	21.7	17.7	5.2	35.2	41.4	13.0	46.7	38.8
Average Queue (m)	6.5	6.0	0.3	18.0	19.7	4.0	23.6	17.9
95th Queue (m)	16.9	14.7	2.9	30.1	33.4	11.5	40.2	34.3
Link Distance (m)	89.2	125.8		330.4	330.4		185.1	185.1
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			25.0			30.0		
Storage Blk Time (%)				2			3	
Queuing Penalty (veh)				0			1	

Intersection: 9: Morningside Ave & Coronation Dr

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	L	TR	LT	TR	LT	TR
Maximum Queue (m)	20.2	54.2	79.2	37.0	19.8	40.2	40.2
Average Queue (m)	9.1	25.8	38.9	17.8	8.2	17.0	16.4
95th Queue (m)	18.6	43.0	64.6	30.8	18.1	31.8	32.7
Link Distance (m)	124.7		163.8	150.5	150.5	330.4	330.4
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)		40.0					
Storage Blk Time (%)		1	8				
Queuing Penalty (veh)		5	16				

Network Summary

Network wide Queuing Penalty: 293