

# Appendix **B8**

## Traffic Impact Study

Metrolinx

# Highway 27-Woodbine Station Traffic Impact Study

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# 1. Introduction

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Woodbine Entertainment Group (WEG) has proposed a new GO Station to be developed in partnership with Metrolinx, located at 555 Rexdale Boulevard (Woodbine Racetrack) in the City of Toronto (the Project). The Project has been assessed under the Transit Project Assessment Process (TPAP). For TPAP purposes, Metrolinx is the proponent. WEG will be constructing the Project and will be responsible for the corresponding mitigation and commitments to future work.

AECOM Canada Limited (AECOM) was retained by WEG to undertake an environmental impact assessment for the Highway 27-Woodbine Station per the TPAP. AECOM conducted a Traffic Impact Study (TIS) for the Project. This TIS is one of a number of environmental studies that was completed as a part of the TPAP, under which project impacts have been assessed as prescribed in Ontario Regulation (O. Reg.) 231/08 under the *Environmental Assessment Act*. As part of the TPAP, an Environmental Project Report (EPR) has been prepared for public review and includes the findings of this TIS.

Due to future development and increased demand at the Woodbine Districts, an early stage initiative calls for the expansion of new public transit options to service the area. Metrolinx and WEG have partnered together to develop the proposed Project, which is anticipated to evolve from the proposed GO station into a multi-modal transportation hub that will increase annual visits to the Woodbine Districts to potentially over 16 million. GO Transit currently operates train service along the Kitchener Rail Corridor, from Union Station in Toronto to Kitchener GO Station in Kitchener. The new proposed Project will provide a new station stop along the Kitchener Rail Corridor.

The proposed Project will include:

- Two island platforms (north and south);
- Passenger pick up and drop off;
- Bus loop;
- Passenger plaza;
- Vehicle parking;
- Bicycle storage facility;
- Station building;
- Roadway with direct access to the station building, parking facility and public roadway;
- Electrification enabling infrastructure at the station (e.g., integration of support structures into platform areas and grounding and bonding); and
- New tracks and/or realignment of the existing tracks.

The Project Site is an approximate 17-acre parcel of land located on the southeast corner of Woodbine Districts west of Highway 27 and south of Rexdale Boulevard in the City of Toronto, which is the hatched area shown as bounded by the black dashed line in **Figure 1-1**. The Project Site encompasses the southeastern portion of the practice racetrack, the southern portion of the southeast stormwater pond, the eastern portion of Entrance Road, the southern portion of Grandstand Entrance Road, a portion of the rail tracks east and west of Highway 27, and the Highway 27 underpass structure. For the purposes of this TIS, the area of investigation and assessment includes the Project Site and the adjacent intersections that would be impacted by the site-generated traffic (the Study Area). The Study Area is the area marked by the red dashed line in **Figure 1-1**.



This TIS describes traffic operations in the Study Area in the existing conditions and determines the potential effects on traffic conditions during the anticipated opening year of the Project that is assumed to be 2023. This TIS also recommends mitigation measures for any major traffic issues identified.



Figure 1-1: Project Site and Study Area

## 2. Methods

### 2.1 Data Collection

#### 2.1.1 Turning Movement Count

Turning Movement Count (TMC) data at the Study Area intersections were collected by Spectrum Traffic Data Inc. and LEA Consulting Ltd. at 15-minute intervals during the weekday and weekend peak periods in the Spring of 2017 and 2019, respectively. The Study Area intersections were selected according to one of the technical parameters identified in City of Toronto's Guidelines for Traffic Impact Studies<sup>1</sup>; vehicle traffic volumes exceeding five percent. Accordingly, the site-generated traffic volumes entering the boundary Study Area intersections are less than 5% of the total volumes entering the Study Area intersections in the opening year of the Project. The Study Area intersections and source and date of TMC data collection are shown in **Table 2-1**. The raw traffic data is attached in **Appendix A**.

**Table 2-1: Study Area Intersections and Source and Date of TMC Data**

Intersection	Source	Survey Date
Highway 27 and Belfield Road – Signalized	Spectrum Traffic Data	Spring 2017
	LEA Consulting	Spring 2019
Highway 27 and Bethridge Road – Unsignalized	Spectrum Traffic Data	Spring 2017
	LEA Consulting	Spring 2019
Highway 27 and Vice Regent Boulevard – Unsignalized	Spectrum Traffic Data	Spring 2017
	LEA Consulting	Spring 2019
Highway 27 and Nearctic Drive – Unsignalized	Spectrum Traffic Data	Spring 2017
	LEA Consulting	Spring 2019
Highway 27 and Rexdale Boulevard – Signalized	Spectrum Traffic Data	Spring 2017
	LEA Consulting	Spring 2019
Rexdale Boulevard and Queens Plate Drive (East) – Signalized	Spectrum Traffic Data	Spring 2017
Rexdale Boulevard and Queens Plate Drive (West) – Signalized	Spectrum Traffic Data	Spring 2017
Rexdale Boulevard and Humberwood Boulevard – Signalized	Spectrum Traffic Data	Spring 2017
Goreway Drive at Club House Road (Woodbine Entrance) – Unsignalized	Spectrum Traffic Data	Spring 2017
Entrance Road at Carlingview Drive – Unsignalized	Spectrum Traffic Data	Spring 2017
	LEA Consulting	Spring 2019

#### 2.1.2 Signal Timing Plans

The signal timing plans for the signalized Study Area intersections listed in **Section 2.1.1** were extracted from the BA Group Traffic Operations Report<sup>2</sup> and attached in **Appendix B**.

1. "Guidelines for the Preparation of Transportation Impact Studies" – City of Toronto, 2013
2. "Draft Plan of Subdivision Traffic Operations" – BA Group, May 2017

## 2.2 Traffic Analysis Methodology, Assumptions and Parameters

### 2.2.1 Intersection Capacity Analysis

The analyses have been completed using Synchro 9 capacity analysis software in accordance with the methodologies outlined in the Highway Capacity Manual (HCM) and in accordance with the City's Guidelines for Using Synchro 9<sup>3</sup>.

The measures of effectiveness used to assess intersection operations are level of service (LOS) and volume-to-capacity (V/C) ratio. LOS is a qualitative measure describing the performance of individual movements and of an overall intersection from the traffic operations standpoint. The LOS designation ranges from LOS A to LOS F based on the amount of average delay that a motorist experiences before taking a specific manoeuvre at an intersection. LOS A designation indicates free-flowing traffic conditions with minimal delays to drivers, while LOS F designation indicates forced or breakdown traffic flow with extensive delays. The V/C ratio is an indicator of the capacity utilization at an intersection or on specific movements at an intersection. A V/C ratio of 1.00 indicates that a movement or an intersection is operating at capacity.

### 2.2.2 Horizon Year and Peak Period

According to the City of Toronto's Guidelines for Traffic Impact Studies, the TIS horizon year is either five years from the date the TIS is commissioned (i.e., 2024 which is five years after 2019 when the TIS is commissioned) or the year of the proposed Highway 27-Woodbine Station's opening year, whichever comes earlier. It is anticipated that the proposed station will be completed and operational by 2023; thus, year 2023 was selected as the TIS horizon year.

The proposed Transit Station is anticipated to have peak ridership in the AM and PM peak hours of a typical weekday. Hence, the trips generated by the Project Site were estimated for both peak hours.

### 2.2.3 Assessment Scenarios

The traffic analysis includes assessment of traffic conditions at the Study Area intersections during the AM and PM peak hours under the following scenarios:

- **Existing Conditions Scenario:**

The Existing Conditions assessment and Synchro modelling works are intended to develop a model replicating the actual traffic operations in the existing conditions. The Existing Conditions model serves as a basis for assessment of traffic operations in the horizon year of 2023 under the following Future Condition scenarios;

- **Future Background Scenario:**

The Future Background assessment and corresponding Synchro modelling works for the horizon year of 2023 (i.e., the anticipated opening year for the proposed Transit Station) are intended to determine traffic operations at the Study Area intersections in the absence of the proposed Transit Station in 2023. The Future Background assessment is undertaken based on optimized signal timing plans and accounts for the anticipated growth in turning movement volumes at the Study Area intersections due to the background developments including the nearby planned and approved developments with their anticipated build-out being prior to or in 2023. In addition, the Future Background assessment takes

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3. "Guidelines for Using Synchro 9" – City of Toronto, March 2016

into consideration any planned street network improvements (including planned modifications to the intersections geometry) that are to be implemented by 2023; and

- **Future Total Scenario:**

The Future Total assessment and related Synchro modelling works for the horizon year of 2023 are intended to determine traffic operations at the Study Area intersections in 2023 with the proposed Transit Station in place. Like the Future Background assessment, the Future Total assessment has been performed using optimized signal timing plans and accounts for the planned street network improvements that are to be implemented by 2023. The turning movement volumes at the Study Area intersections under the Future Total scenario are calculated as the summation of their respective turning movement volumes under the Future Background conditions and the turning movement volumes generated by the Project.

## **2.2.4 Synchro Modelling Parameters and Assumptions**

**Peak Hour Factors (PHF)** are calculated and applied to the existing Study Area intersections as per the available TMC data. In the Future Conditions analysis, the calculated PHF values were considered applicable to the existing intersections and even applicable to the new movements allowed at the existing intersections. However, for the new intersections in the Future Conditions analysis and as per the City's Synchro Guidelines, a PHF of 0.95 was applied for through movements and right-turn movements and a PHF of 0.90 was applied for left-turn movements.

For the purpose of the PM peak hour model calibration, at the intersection of Highway 27 and Belfield Road, the PHF values for the northbound through and southbound left-turn movements were increased from the calculated value of 0.92 to 0.99 and 0.95, respectively in order for the two noted movements to operate within capacity in the Existing Conditions. For consistency, the noted PHF values were input to the PM peak hour models pertaining to the Future Background and Future Total Scenarios.

**Heavy Vehicle Percentages** are calculated for each movement at the existing intersections as per the observed data. For new intersections and movements, however, a default heavy vehicle percentage of 2% was applied.

**Lost Time Adjust** of -1 second was adopted for all signalized intersections within the Study Area, consistent with the City's Synchro Guidelines.

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## 3. Existing Conditions

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### 3.1 Road Network

An overview of the public streets within the Study Area is provided below. It is noteworthy that roadways within the Woodbine Districts are still in the planning phase and hence were neither described in this section nor assessed in the Existing Conditions Scenario. **Section 4.1** introduces the planned roads within the Woodbine Districts as they are assessed as part of the Future Background and Future Total Scenarios.

The existing street network as well as the lane configurations and traffic control devices of the Study Area intersections are illustrated in **Figure 3-1**.

**Highway 27** is a major north-south arterial road under the jurisdiction of the City of Toronto. It runs along the eastern boundary of the Project Site and Woodbine Districts and it extends northward from Highway 401 / Highway 409 into the City of Vaughan and beyond. Highway 27 maintains a four-lane cross-section within the Study Area between the intersection of Belfield Road and Highway 27 to the south and the intersection of Rexdale Boulevard and Highway 27 to the north. There is a sidewalk running north-south and located on the east side of Highway 27 within the Study Area between Bethridge Road and Rexdale Boulevard. The sidewalk is separated by a wide grass boulevard from the paved portion of the road. The posted speed along the studied section of Highway 27 is 70 km/h.

**Rexdale Boulevard** is a major east-west arterial road under the jurisdiction of the City of Toronto. Within the Study Area, Rexdale Boulevard has a six-lane cross-section (i.e., three travel lanes in each direction and exclusive left turn lanes at the Humberwood Boulevard, Queens Plate Drive, and Highway 27 intersections) and a posted speed of 60 km/h. There is a sidewalk running east-west and located on the north side of Rexdale Boulevard within the Study Area. The sidewalk is separated from the travel lanes by a landscaped boulevard.

**Belfield Road** is a minor east-west arterial road under the City of Toronto's jurisdiction. At the Highway 27 intersection, Belfield has a four-lane cross-section (i.e., two travel lanes in each direction, exclusive left-turn lanes, and channelized right turn). There are no posted speed signs along Belfield Road, so it is assumed that the statutory speed limit of 50 km/h applies. Sidewalks are provided on both sides of Belfield Road within the Study Area.

**Carlingview Drive** is a minor north-south arterial road under the jurisdiction of the City of Toronto. It extends southwards from the southern boundary of the Woodbine Districts across the rail tracks (as an underpass) and connects to Highway 401. Within the Study Area, Carlingview Drive has a two-lane cross-section (i.e., one travel lane in each direction and an exclusive left turn lane at the intersection) and a posted speed of 60 km/h. Sidewalks are provided on both sides of Carlingview Drive within the Study Area.

**Goreway Drive** is a north-south collector road under the jurisdiction of the City of Mississauga. At the Goreway Drive and Woodbine Entrance / Club House Road intersection, Goreway Drive has a four-lane cross-section (i.e., two travel lanes in each direction and an exclusive left turn lane at the intersection) and a posted speed of 60 km/h.

**Queens Plate Drive** is a north-south collector road under the jurisdiction of the City of Toronto. Queens Plate Drive intersects Highway 27 around the Woodbine Mall and extends east of Highway 27 to connect back (and across) to Rexdale Boulevard. The south leg of the intersection of Queens Plate Drive West and Rexdale Boulevard is restricted for the use of transit buses. There are no posted speed signs along Queens Plate Drive, so it is assumed

that the statutory speed limit of 50 km/h applies. Sidewalks and landscaped boulevards are provided on both sides of Queens Plate Drive within the Study Area.

**Humberwood Boulevard** is a north-south collector road under the jurisdiction of the City of Toronto. It extends north from Rexdale Boulevard to Humberline Drive south of Finch Avenue West. Humberwood Boulevard has a two-lane cross-section with exclusive left turn lanes at the Rexdale Boulevard intersection and a posted speed of 50 km/h. Sidewalks and landscaped boulevards are provided on both sides of Humberwood Boulevard within the Study Area.

**Nearctic Drive, Vice Regent Boulevard, and Bethridge Road** are parallel east-west local roads under the jurisdiction of the City. They connect Highway 27 and Queens Plate Drive East on the east side of Highway 27. The Nearctic Drive and Bethridge Road intersections with Highway 27 operate as Right-In-Right-Out (RIRO) only. Sidewalks and landscaped boulevards are provided on both sides of Nearctic Drive and Vice Regent Boulevard but only on the north side of Bethridge Road.



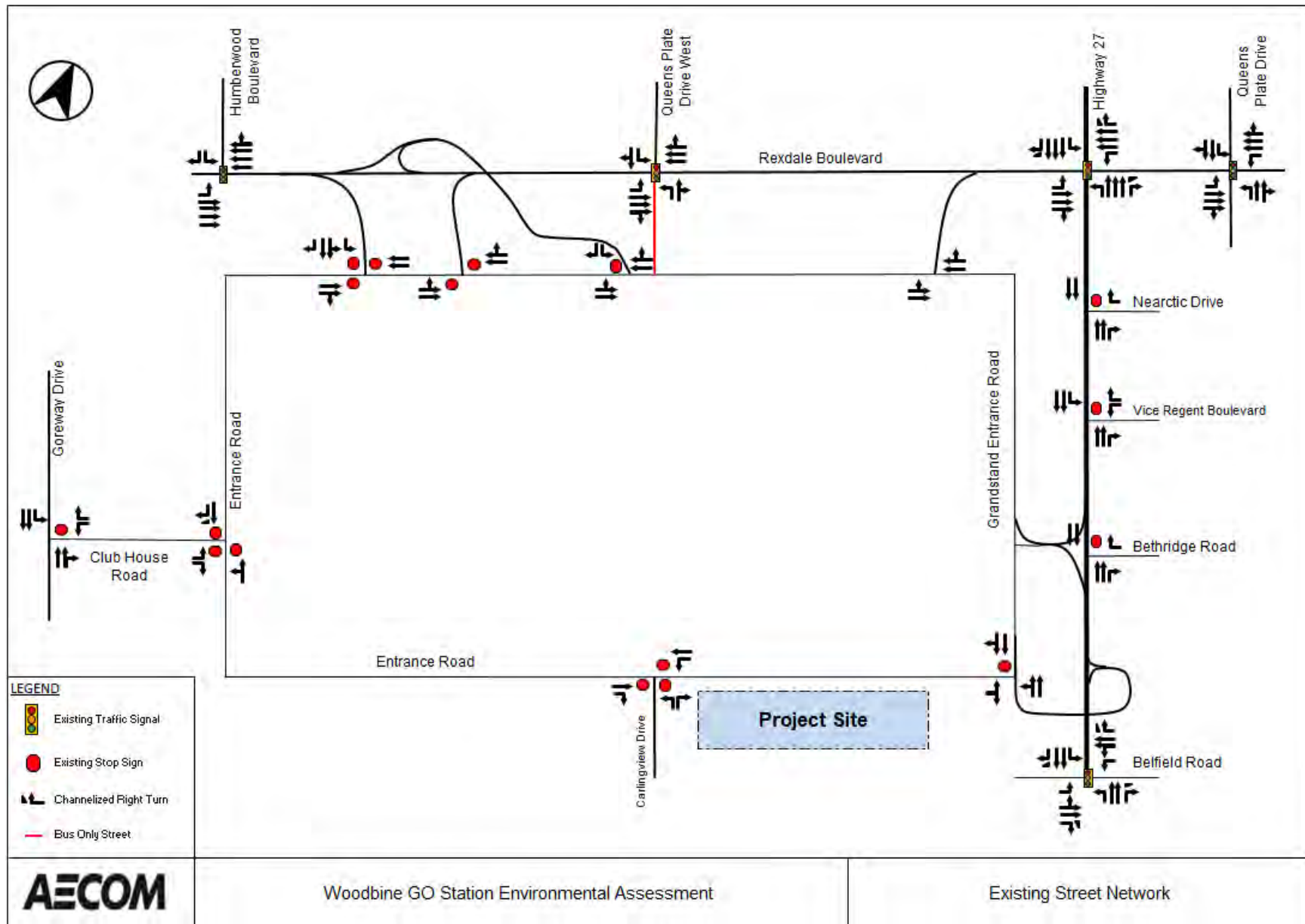


Figure 3-1: Existing Street Network as well as Lane Configuration and Traffic Control Devices at the Study Area Intersections

### 3.1.1 Traffic Volumes

The TMC data pertaining to the Study Area intersections (listed in **Section 2.1.1**) were collected in the Spring of 2017 by Spectrum Traffic Data Inc. and in the Spring of 2019 by LEA Consulting Ltd.

Comparing the raw TMC data from the two data sources revealed that the total traffic volume entering the Study Area intersections from the 2019 TMC data is higher than that from the 2017 TMC data in the AM peak hour but lower in the PM peak hour. Hence, for the AM peak hour, the 2019 TMC data were used at the Study Area intersections where the 2019 data is available and at the remaining Study Area intersections, the 2017 TMC data were used. For the intersections that the 2019 TMC data were not available, the AM peak hour volumes were estimated by adjusting the related 2017 counts to balance with the 2019 counts of the intersections for which 2019 TMC data are available. However, for the PM peak hour, the Existing Conditions traffic volumes were obtained by applying growth factors (discussed in **Section 4.1.1.1**) to the 2017 counts that were used at all Study Area intersections. The TMC data comparison details are provided in **Appendix C**.

The turning movement volumes at the Study Area intersections in the Existing Conditions during the AM and PM peak hours are illustrated in **Figure 3-2** and **Figure 3-3**, respectively. Cyclist traffic volumes at the Study Area intersections were generally low and therefore, not included in **Figure 3-2** and **Figure 3-3**, and the related modelling exercise.



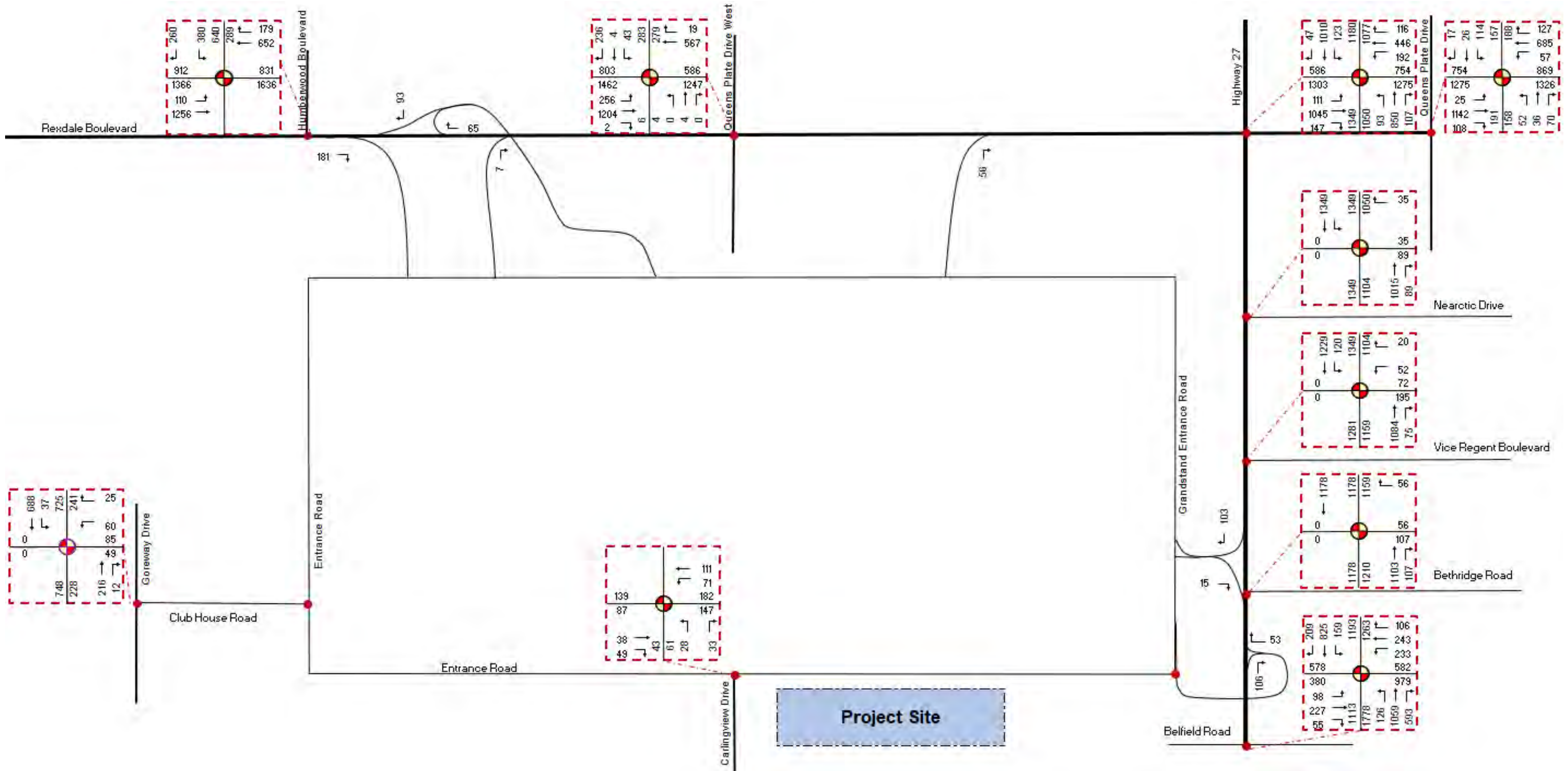


Figure 3-2: Existing Turning Movement Volumes at the Study Area Intersections during the AM Peak Hour

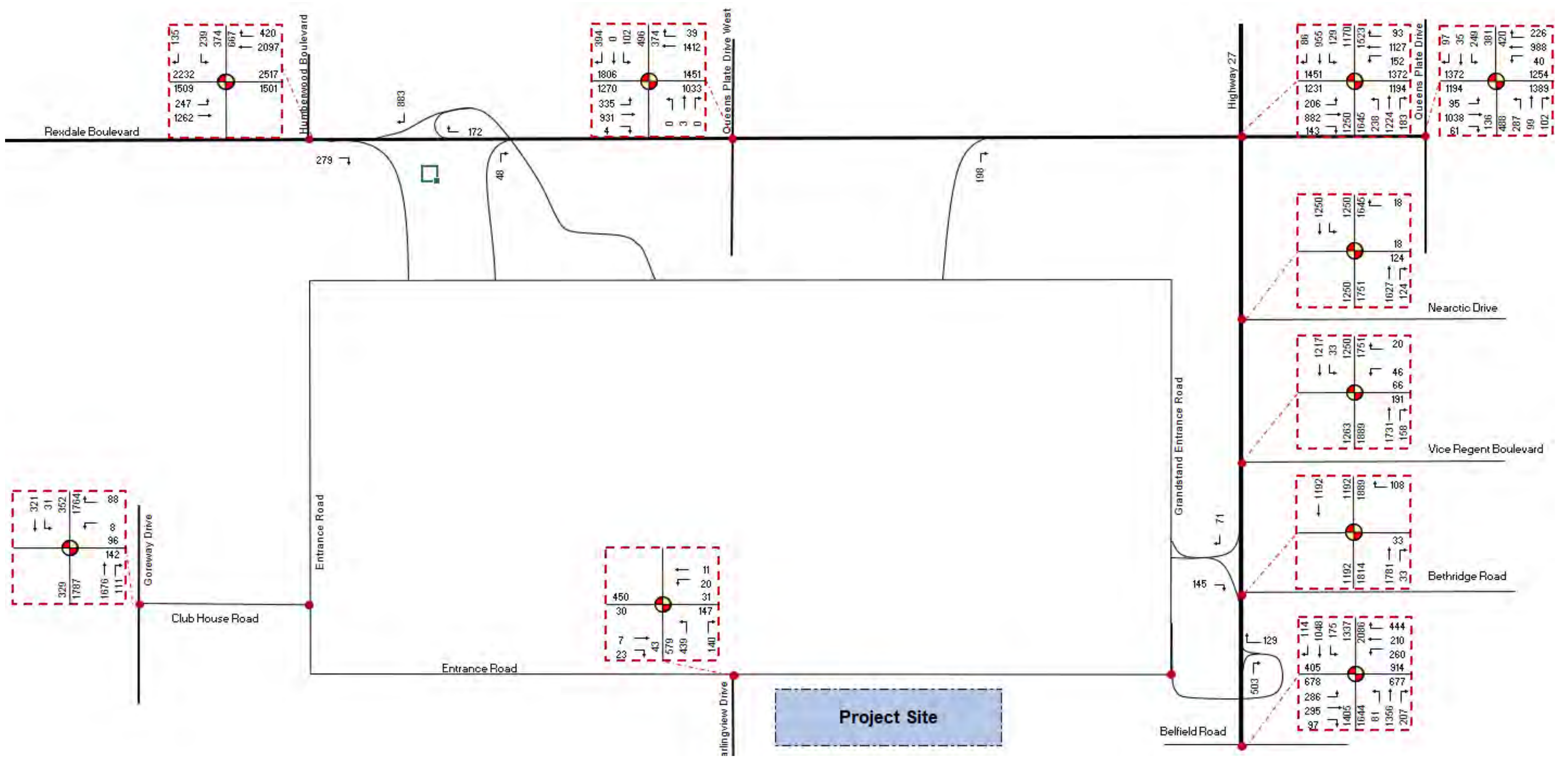


Figure 3-3: Existing Turning Movement Volumes at the Study Area Intersections during the PM Peak Hour

### 3.1.2 Traffic Operations

The traffic operations at the Study Area intersections in the Existing Conditions are summarized in **Table 3-1**. Critical movements are highlighted in gray in **Table 3-1** and are defined to be movements where the V/C Ratio exceeds 0.85 or where LOS is 'E' or worse. The detailed Synchro reports are attached in **Appendix D**.

As shown in **Table 3-1** and at the intersection level, all the Study Area intersections operate at acceptable LOS D or better and within capacity with overall V/C Ratio of 0.84 or lower in the AM peak hour. However, motorists experience relatively long average delays in making the following movements. The following movements operate at LOS 'E' or worse.

- Eastbound through, westbound left-turn, westbound through, northbound left-turn, and southbound left-turn movements at the intersection of Highway 27 and Belfield Road;
- Westbound left-turn movement at the intersection of Highway 27 and Vice Regent Boulevard;
- Westbound left-turn, northbound left-turn, and southbound left-turn movements at the intersection of Highway 27 and Rexdale Boulevard; and
- Southbound left-turn at the intersection of Rexdale Boulevard and Queens Plate Drive (East).

Among the signalized intersections, the westbound left-turn movement at the intersection of Highway 27 and Rexdale Boulevard has the longest average delay of 109.4 seconds representing LOS 'F' and operating almost at capacity with V/C ratio of 0.98 during the AM peak hour. In addition, among the unsignalized intersections, the westbound left-turning motorists at the intersection of Highway 27 and Vice Regent Boulevard are experiencing very long average delays of 417.2 seconds (i.e., approximately seven minutes), causing the movement and hence the overall intersection to operate at LOS 'F' in the AM peak hour.

During the PM peak hour and at the intersection level, the intersection of Highway 27 and Belfield Road and the intersection of Highway 27 and Rexdale Boulevard are operating near capacity with V/C Ratio of 0.93 and 0.90, respectively. The following movements experience long average delays and operate at LOS 'E' or worse:

- Eastbound left-turn, eastbound through, westbound left-turn, westbound through, northbound left-turn, northbound through, and southbound left-turn at the intersection of Highway 27 and Belfield Road;
- Westbound left-turn movement at the intersection of Highway 27 and Vice Regent Boulevard;
- Eastbound left-turn, northbound left-turn, and southbound left-turn at the intersection of Highway 27 and Rexdale Boulevard;
- Northbound left-turn at the intersection of Rexdale Boulevard and Queens Plate Drive (East); and
- Westbound left-turn at the intersection of Goreway Drive and Club House Road.

Notably and among the signalized intersections, at the intersection of Highway 27 and Belfield Road, the northbound through and southbound left-turn movements are operating almost at capacity with V/C Ratio of 0.99 and the eastbound through movement is approaching capacity with V/C Ratio of 0.89. In addition, at the intersection of Highway 27 and Rexdale Boulevard, the eastbound left-turn and northbound left-turn movements are operating near capacity with both having a V/C Ratio of 0.95. Among the signalized intersection, the southbound left-turn movement at the intersection of Highway 27 and Belfield Road are experiencing the longest average delay of 141.2 seconds representing LOS 'F'. Furthermore, of note and among the unsignalized intersections, the westbound left-turn movements at the intersections of Highway 27 and Vice Regent Boulevard and the intersection of Goreway Drive and Club House Road are operating poorly in the Existing Conditions during the PM peak hour. The westbound left-turning vehicles at the noted intersections are experiencing extremely long average delays of 1065.9 seconds (i.e., approximately eighteen minutes) and 106.9 seconds (i.e., approximately two minutes), respectively.

**Table 3-1: Summary of the Existing Traffic Operations at the Study Area Intersections during the AM and PM Peak Hours**

Intersection	Movement	AM Peak Hour				PM Peak Hour			
		V/C Ratio	Delay(s)	LOS	95 <sup>th</sup> Percentile Queue (m)	V/C Ratio	Delay(s)	LOS	95 <sup>th</sup> Percentile Queue (m)
Highway 27 / Belfield Road	EBL	0.50	51.9	D	40.8	0.82	72.2	E	#99.1
	EBT	0.66	55.5	E	44.9	0.89	71.2	E	#87.9
	EBR	0.05	0.1	A	0.0	0.07	0.1	A	0.0
	WBL	0.69	58.0	E	66.9	0.70	61.4	E	71.3
	WBT	0.72	55.7	E	59.0	0.77	61.2	E	64.2
	WBR	0.08	0.1	A	0.0	0.31	0.5	A	0.0
	NBL	0.76	71.0	E	#64.5	0.67	69.5	E	#43.5
	NBT	0.82	40.1	D	157.0	0.99	59.6	E	#231.3
	NBR	0.40	0.8	A	0.0	0.15	25.4	C	15.4
	SBL	0.80	71.1	E	#85.8	0.99	141.2	F	m#101.7
	SBT	0.61	31.0	C	113.2	0.77	23.5	C	175.5
	SBR	0.15	0.2	A	0.0	0.09	0.5	A	m0.0
<b>Overall Intersection</b>	-	<b>33.9</b>	<b>C</b>	-	-	<b>45.9</b>	<b>D</b>	-	
Highway 27 / Rexdale Boulevard	EBL	0.30	27.4	C	29.3	0.95	80.6	F	#100.2
	EBTR	0.82	46.9	D	122.4	0.70	41.2	D	102.1
	WBL	0.98	109.4	F	#85.7	0.74	47.8	D	m#51.9
	WBT	0.30	28.8	C	31.5	0.80	36.4	D	90.3
	WBR	0.08	15.8	B	4.0	0.07	0.1	A	m0.0
	NBL	0.71	71.9	E	#47.7	0.95	73.0	E	m#87.1
	NBT	0.55	37.4	D	82.0	0.72	53.6	D	m120.1
	NBR	0.07	0.07	C	8.1	0.12	0.1	A	m0.0
	SBL	0.75	72.2	E	#57.8	0.69	65.5	E	54.3
	SBT	0.62	37.2	D	96.2	0.69	43.8	D	93.8
	SBR	0.03	28.4	C	0.0	0.06	0.1	A	0.0
	<b>Overall Intersection</b>	-	<b>43.0</b>	<b>D</b>	-	-	<b>44.2</b>	<b>D</b>	-
Rexdale Boulevard / Queens Plate Drive (East)	EBL	0.06	0.7	A	m0.4	0.45	9.4	A	m7.1
	EBTR	0.37	0.7	A	4.6	0.37	2.5	A	10.6
	WBL	0.26	7.3	A	13.0	0.17	12.2	B	12.2
	WBTR	0.24	4.9	A	31.2	0.40	13.1	B	73.2
	NBL	0.34	50.7	D	24.2	0.85	60.8	E	97.2
	NBTR	0.11	47.8	D	12.2	0.15	34.3	C	19.0
	SBL	0.68	61.9	E	47.2	0.75	51.0	D	82.8
	SBTR	0.07	47.4	D	8.4	0.07	33.4	C	10.0
	<b>Overall Intersection</b>	-	<b>8.9</b>	<b>A</b>	-	-	<b>18.5</b>	<b>B</b>	-
Rexdale Boulevard / Queens Plate Drive (West)	EBL	0.43	3.6	A	21.3	0.72	25.8	C	#107.3
	EBT	0.36	4.1	A	37.7	0.30	6.5	A	39.5
	WBTR	0.22	8.0	A	28.5	0.74	24.7	C	94.3
	NBLTR	0.04	35.4	D	3.4	0.02	28.9	C	2.3
	SBL	0.29	37.3	D	16.2	0.36	31.8	C	25.7
	SBR	0.19	37.3	D	20.5	0.71	41.8	D	54.8
	<b>Overall Intersection</b>	-	<b>9.1</b>	<b>A</b>	-	-	<b>21.8</b>	<b>C</b>	-

Intersection	Movement	AM Peak Hour				PM Peak Hour			
		V/C Ratio	Delay(s)	LOS	95 <sup>th</sup> Percentile Queue (m)	V/C Ratio	Delay(s)	LOS	95 <sup>th</sup> Percentile Queue (m)
Rexdale Boulevard / Humberwood Boulevard	EBL	0.29	8.9	A	19.4	0.80	41.0	D	55.8
	EBT	0.36	10.4	B	52.9	0.30	6.0	A	37.0
	WBTR	0.30	15.7	B	41.5	0.77	20.1	C	#179.3
	SBL	0.76	38.0	D	89.8	0.68	41.8	D	63.3
	SBR	0.21	26.5	C	18.3	0.09	32.5	C	13.6
	<b>Overall Intersection</b>	-	<b>17.1</b>	<b>B</b>	-	-	<b>18.8</b>	<b>B</b>	-
Highway 27 / Bethridge Road (Unsignalized)	WBR	0.10	12.1	B	2.6	0.27	16.9	C	8.3
	<b>Overall Intersection</b>	-	<b>0.3</b>	<b>A</b>	-	-	<b>0.6</b>	<b>A</b>	-
Highway 27 / Vice Regent Boulevard (Unsignalized)	WBL	1.33	417.2	F	40.2	2.44	1065.9	F	48.4
	WBR	0.05	13.6	B	1.1	0.07	18.6	C	1.8
	SBL	0.21	12.9	B	6.0	0.14	22.0	C	3.6
	<b>Overall Intersection</b>	-	<b>9.1</b>	<b>A</b>	-	-	<b>15.7</b>	<b>B</b>	-
Highway 27 / Nearctic Drive (Unsignalized)	WBR	0.08	13.7	B	1.9	0.06	16.9	C	1.3
	<b>Overall Intersection</b>	-	<b>0.2</b>	<b>A</b>	-	-	<b>0.1</b>	<b>A</b>	-
Entrance Road / Rexdale Boulevard (Unsignalized)	NBR	0.02	12.4	B	0.4	0.09	12.0	B	2.3
	<b>Overall Intersection</b>	-	<b>0.0</b>	<b>A</b>	-	-	<b>0.2</b>	<b>A</b>	-
Goreway Drive / Club House Road (Unsignalized)	WBL	0.17	16.9	C	4.7	0.19	106.9	F	4.6
	WBR	0.03	9.1	A	0.7	0.36	26.3	D	11.8
	SBL	0.03	7.8	A	0.7	0.12	19.7	C	3.0
	<b>Overall Intersection</b>	-	<b>1.5</b>	<b>A</b>	-	-	<b>1.7</b>	<b>A</b>	-
Carlingview Drive / Entrance Road (Unsignalized)	EBT	0.06	7.1	A	-	0.01	7.9	A	-
	EBR	0.06	6.3	A	-	0.04	7.5	A	-
	WBL	0.12	7.9	A	-	0.04	8.7	A	-
	WBT	0.17	7.6	A	-	0.02	8.0	A	-
	NBL	0.05	8.0	A	-	0.68	17.1	B	-
	NBR	0.05	6.7	A	-	0.17	6.9	A	-
	<b>Overall Intersection</b>	-	<b>7.4</b>	<b>A</b>	-	-	<b>14.0</b>	<b>B</b>	-

Notes: #: 95<sup>th</sup> percentile cycle volume exceeds capacity, queue may be longer  
m: Volume for the 95<sup>th</sup> percentile queue is metered by an upstream signal



## 3.2 Transit Network

The Project Site and the surrounding area are connected to downtown Toronto, Etobicoke, and the rest of the City of Toronto as well as Mississauga, and Vaughan through surface transit routes operated by Toronto Transit Commission (TTC), Mississauga Transit (MiWay), and York Region Transit (YRT/Viva).

A brief description of the existing transit routes is provided below.

- 37A Islington is operated by TTC. This bus route operates between Islington Station on Subway Line 2 (Bloor-Danforth), the Islington Avenue and Steeles Avenue West area, and the Woodbine Racetrack and Humberwood Boulevard area, generally in a north-south direction. There is a bus stop within the Woodbine Districts approximately 300 m south of the intersection of Rexdale Boulevard and Queens Plate Drive.
- 927 Highway 27 Express is operated by TTC. This bus route operates between Kipling Station on Subway Line 2 (Bloor-Danforth), the Atwell Drive Employment Area<sup>4</sup>, Humber College North Campus, and the Steeles Avenue West and Martin Grove Road area, generally in a north-south direction. In proximity to the Project Site, the nearest bus stop is located at the Highway 27 and Queens Plate Drive intersection.
- 11 Westwood is operated by MiWay. This bus service links Islington Station on Subway Line 2 (Bloor-Danforth) and Kipling GO Station in the south to the Westwood Mall Bus Terminal in the. This route generally runs north-south on Highway 27 and east-west on Rexdale Boulevard. In proximity to the Project Site, there are three bus stops located along Rexdale Boulevard at the Humberwood Boulevard, Queens Plate Drive and Highway 27 intersections.
- 30 Woodbine is operated by MiWay. This bus service generally runs on Rexdale Boulevard and links the Woodbine Mall to the Westwood Mall Terminal. In proximity to the site, the nearest bus stop is located at the Rexdale Boulevard and Humberwood Boulevard intersection.
- 7 Martin Grove is operated by YRT and runs in the north-south direction from the Rutherford Road and Highway 27 area to Humber College North Campus and Woodbine Mall. The nearest bus stop to the Project Site is located on Queens Plate Drive West, approximately 125 m north of the Rexdale Boulevard at Queens Plate Drive West intersection.

## 3.3 Pedestrian and Cycling Network

The existing pedestrian connections to the Project Site are provided from the southwestern corner of the site through the sidewalks along Carlingview Drive and from the northern side through the sidewalks along Rexdale Boulevard and Queens Plate Drive West and across the Woodbine Districts.

The Study Area lacks any existing dedicated cycling facilities with the closest cycling facility being the West Humber Trail which is approximately 3 km to the north of the Project Site.

A multi-use path (MUP) currently runs in the north-south direction along the east side of Highway 27, terminating at Bethridge Road and providing connection to the MUP on the north and south sides of Rexdale Boulevard. This MUP along Highway 27 does not provide access to the Project Site.

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4. The area bounded by Atwell Drive to the east, Carlingview Drive to the west, Dixon Road to the south, and Disco Road to the north.

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## 4. Effects Assessment, Mitigation and Monitoring

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### 4.1 Road Network

The planned street network improvements within the Study Area were obtained from the BA Group Traffic Operations Report Addendum<sup>5</sup> which has been approved by the City of Toronto. The noted report has also specified that all the new intersections (presented further below) resulting from the planned roadways are to be signalized.

For this TIS, it is assumed that the following planned street network improvements / additions within the Study Area will be completed by 2023.

**Private Driveway** is a north-south private street that reconfigures the existing directional ramp connecting Rexdale Boulevard in the eastbound direction to the Woodbine Districts. Private Driveway will have a two-lane cross-section and sidewalks and would intersect with Rexdale Boulevard at three-legged signalized intersection allowing Right-In and Left-Out movements only.

**Queens Plate Drive (West) Extension** into the Woodbine Districts as a private street will have a four-lane cross-section, left-turn lanes, bicycle lanes, sidewalks, landscaped boulevard, and a substantial landscaped median. The intersection of Rexdale Boulevard and Queens Plate Drive (West) will be transformed into an all-movement signalized intersection after lifting the existing prohibition for passenger vehicles to travel on the south leg of the intersection.

**Street D** is a new north-south public street located immediately east of and parallel to the Queens Plate Drive Extension. It would cross Rexdale Boulevard at an all-movement three-legged signalized intersection. Street D will have a four-lane cross-section, left-turn lanes, sidewalks, and landscaped boulevards.

**Street F** is a new north-south private street located between Highway 27 and the existing RIRO access driveway of Woodbine Mall. It would intersect with Rexdale Boulevard at RIRO three-legged stop-controlled intersection. Street F will have a two-lane cross-section and sidewalks.

**Block 10 East Access** is a new east-west private street within the Woodbine Districts providing connection from the existing private ring road to the planned retail developments in Block 10 of the Woodbine Districts. It will have a two-lane cross-section and sidewalks.

**Street E** is a new east-west public street as an extension of Nearctic Drive into the Woodbine Districts. Street E would cross Highway 27 at a signalized intersection. It will have a four-lane cross-section, left-turn lanes, bicycle lanes, sidewalks, landscaped boulevards, and a substantial landscaped median.

**Street C** is a new east-west public street that reconfigures and replaces the existing private ring road. It runs from Queens Plate Drive Extension to Street E and with signalized intersections at Queens Plate Drive Extension, Street D, Street F, Block 10 East Access, and Street E. It will have a four-lane cross-section, bicycle lanes, sidewalks, landscaped boulevards, and a substantial landscaped median.

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5. "Traffic Operations Report Addendum" – BA Group, February 2018

In addition, the Highway 27 and Nearctic Drive / Street E intersection will be transformed from RIRO only three-legged stop-controlled intersection to an all-movement four-legged signalized intersection. The following improvements will be implemented in conjunction with the introduction of traffic signals at this intersection:

- Extension of the three southbound lane cross-section on Highway 27 through the Nearctic Drive intersection;
- Extension of the three northbound lane cross-section on Highway 27 through the Nearctic Drive intersection; and
- Provision of northbound and southbound left-turn lanes.

The noted planned street network improvements / additions were considered in assessing the Future Background and Future Total scenarios in 2023. Accordingly, the following intersections were added to the Existing Conditions road network to represent the road networks in the Future Background and Future Total models:

- Rexdale Boulevard and Private Driveway (Signalized);
- Rexdale Boulevard and Street D (Signalized);
- Street C and Street D (Signalized);
- Street C and Street E (Signalized);
- Street C and Street F (Signalized);
- Street C and Block 10 East Access (Signalized); and
- Street C and Queens Plate Drive (West) Extension (Signalized).

In addition, the following existing intersections were included in the Future Background and Future Total road networks as they would serve as major accesses to the Project Site:

- Entrance Road and Club House Road / Woodbine Entrance (Unsignalized); and
- Entrance Road and Grandstand Entrance Road (Unsignalized).

The planned street network within the Study Area as well as the lane configurations and traffic control devices of the Study Area intersections in the opening year (2023) are illustrated in **Figure 4-1**. Note that due to uncertainties about number and location of access driveway(s) to the Project Site, they are not included in this TIS and therefore not shown in **Figure 4-1**.

## **4.1.1 Traffic Volumes**

### **4.1.1.1 Background Traffic**

#### Growth Rates

Assuming a linear growth and as described in the BA Group Traffic Operations Report, the 2017 TMC data and the 2005 TMC data at the Study Area intersections were used to estimate growth rates in traffic volumes along the Study Area streets. For the purpose of the TIS for the proposed Transit Station, these growth rates were applied to the through volumes along Rexdale Boulevard and Highway 27 as well as the southbound left-turn and right-turn movements at the intersection of Humberwood Boulevard and Rexdale Boulevard to estimate turning movement volumes at the Study Area intersections in the Future Conditions (2023) which were then balanced across the network. **Table 4-1** presents the estimated growth rates along the studied sections of Rexdale Boulevard, Highway 27, and Humberwood Boulevard. For the other Study Area streets not included in **Table 4-1**, the estimated growth rates were negative; thus, they are assumed to have no growth between 2017 and 2023. Detailed calculations of the growth rates are provided in **Appendix E**.



**Table 4-1: Estimated Annual Growth Rates**

<b>Roadway</b>	<b>Annual Growth Rate</b>
<b>Rexdale Boulevard</b>	0.5%
<b>Highway 27</b>	0.5%
<b>Humberwood Boulevard</b>	1.0%

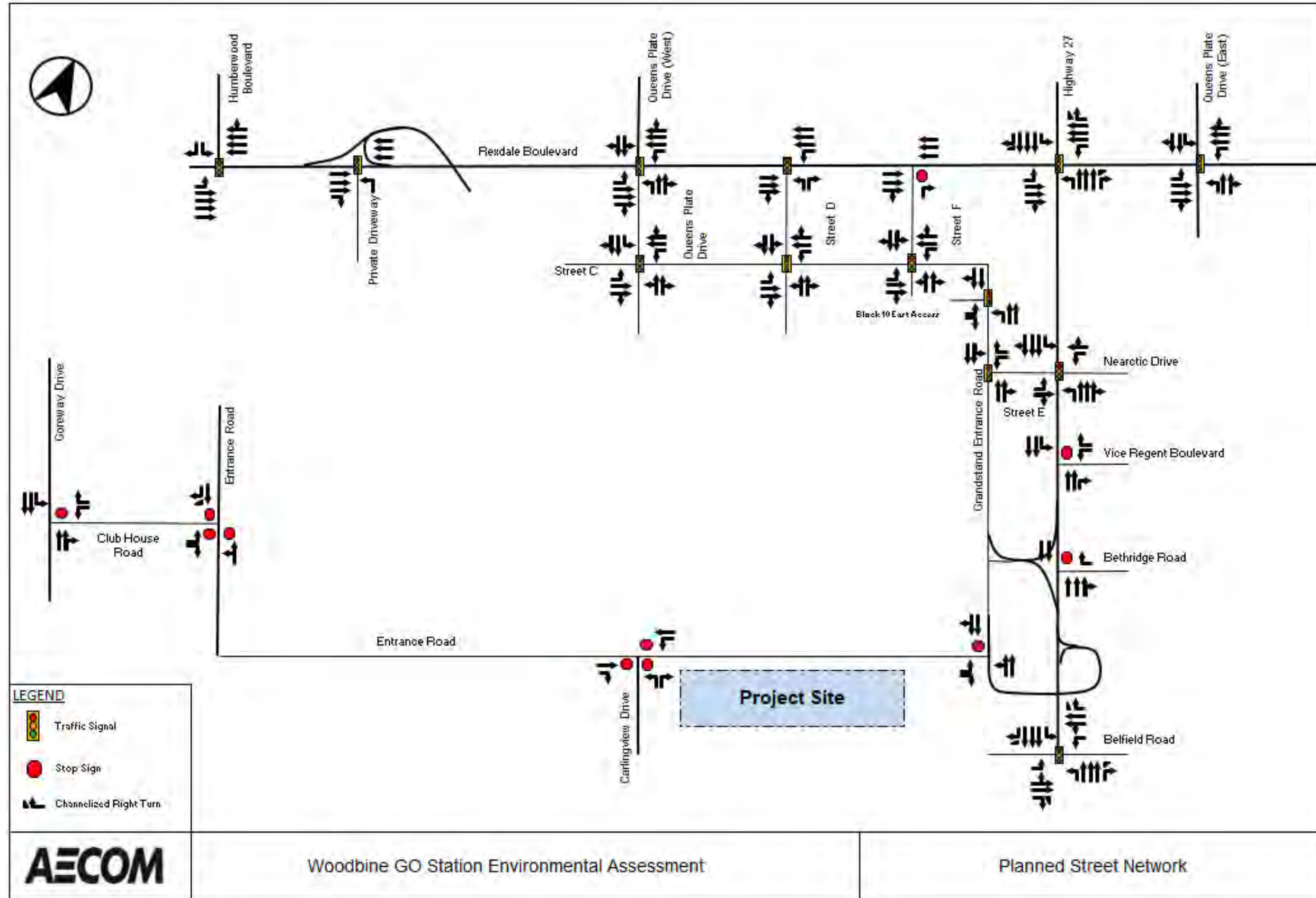


Figure 4-1: Planned Street Network as well as Lane Configurations and Traffic Control Devices at the Study Area Intersections in 2023

### Background Developments

The planned and approved developments near the Woodbine Districts with their anticipated build-out being prior to or in 2023 were accounted for in estimating the Future Background traffic volumes. The traffic volumes attributed to such background developments were extracted from the corresponding traffic impact studies prepared as part of the approval processes for these background developments.

The background developments that are considered as part of this TIS are summarized in **Table 4-2**. As shown in **Table 4-2**, the background developments include Phase 1 of the Woodbine Districts Development which has an anticipated opening year of 2022. The remaining phases of the noted development have not been included in this TIS as they have not been finalized and are subject to change upon the City's review process.

**Table 4-2: Background Developments**

Development	Description	Transportation Study Undertaken by
<b>50 Humberwood Boulevard</b>	140 townhouse dwelling units	BA Group
<b>101 Humber College Boulevard</b>	Addition of 20,385 m <sup>2</sup> of hospital expansion on the west Wing of the William Osler Health System	Stantec
<b>330 Queens Plate Drive (East)</b>	750 m <sup>2</sup> of retail space	LEA
<b>840 Queens Plate Drive (West)</b>	125 residential condominium units	GHD
<b>Woodbine Districts Development (Phase 1)</b>	Addition of 39,356 m <sup>2</sup> of gaming, entertainment, and retail land uses	BA Group

The traffic volumes generated by the above-noted background developments were added to the Existing Conditions TMC data after being grown by the estimated annual growth rates to 2023 to estimate the traffic volumes under the Future Background scenario in the AM and PM peak hours of 2023. The traffic volumes in the Future Background conditions in the AM and PM peak hours are illustrated in **Figure 4-2** and **Figure 4-3**, respectively. The traffic volumes generated by the above-noted background developments are presented in **Appendix F**.

#### 4.1.1.2 Project Site Traffic

##### Trip Generation

Number of trips generated by the Project Site was determined based on the average trip generation rate per parking stall obtained from the GO Passenger Survey and Metrolinx's trip generation model for the AM and PM peak periods. In consultation with Metrolinx, these estimated trip generation rates for the proposed Transit Station in the AM and PM peak periods were validated against those at the Malton and Etobicoke North GO Stations. PRESTO cordon count data for Malton GO Station was then used to obtain the typical trip distribution within the AM and PM peak periods and accordingly the trip generation rates in the AM and PM peak hours.

As shown in the Project Site Plan (Concept Design) presented in **Appendix G**, the transit station will provide a total of 1,000 parking spaces designated for park-and-ride passengers, 40 spaces for passenger pickup and drop off (PPUDO), and four bus bays with provisions for four additional bus bays and space for Wheel-Trans. As per the information provided by Metrolinx, the need for 1,000 parking spaces was based on the modelling results in the framework of the GO Rail Station Access Plan<sup>6</sup> and planning with broader perspective on network needs. The approach taken conforms to the assumptions and commitments within the GO Expansion Full Business Case (e.g., the planned closure of Etobicoke North GO Station, the latent demand at Malton GO Station, etc.). These modelling works anticipate that by 2041, approximately 5,000 daily riders from the surrounding areas would use the Woodbine Station and their access mode share to the station would be 46% auto and 54% other / non-auto (i.e., passenger pick-

<sup>6</sup> "GO Rail Station Access Plan" – Metrolinx, December 2016.

up / drop-off, transit, walk, etc.). The horizon year (2023) mode shares at the proposed Transit Station were obtained by assuming a linear relationship between the 2015 mode shares at the Etobicoke North GO Station, obtained from Metrolinx GO Rail Station Access Plan, and Metrolinx's target mode shares for the proposed Transit Station in 2041. To estimate the number of inbound and outbound trips generated by the Project Site and as advised by Metrolinx, it was assumed that in the AM peak hour all alighting passengers would be non-automobile users (i.e., public transit, shuttle service, or active transportation modes) and hence PPUDO and transit trips would be the only vehicular modes exiting the Project Site in the AM peak hour. On the other hand, it was assumed in the PM peak hour that all boarding passengers would be non-automobile users and hence PPUDO and transit trips would be the only vehicular modes entering the Project Site in the PM peak hour. By using the 1,000 parking spaces as the basis for estimating the number of trips generated by the proposed Transit Station, the potential impacts of the future Etobicoke North GO Station closure (although anticipated to materialize beyond 2023) have been captured in this traffic analysis.

**Table 4-3** presents the estimated site-generated traffic during the weekday AM and PM peak hours in 2023. As shown in **Table 4-3**, the proposed Transit Station would generate a total of 507 inbound trips and 109 outbound trips in the AM peak hour and a total of 115 inbound trips and 536 outbound trips in the PM peak hour.

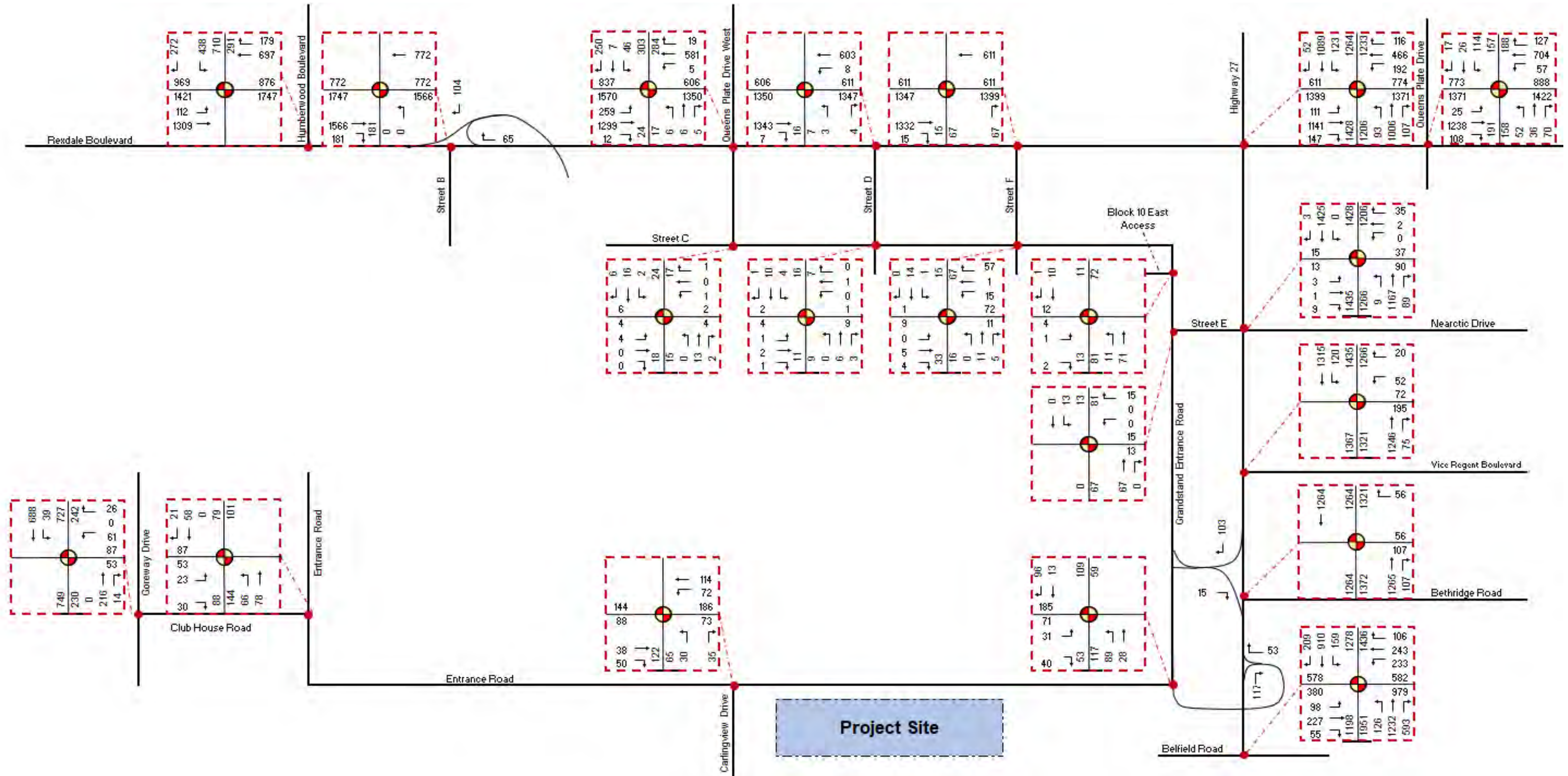


Figure 4-2: Future Background Turning Movement Volumes at the Study Area intersections during the AM Peak Hour in 2023



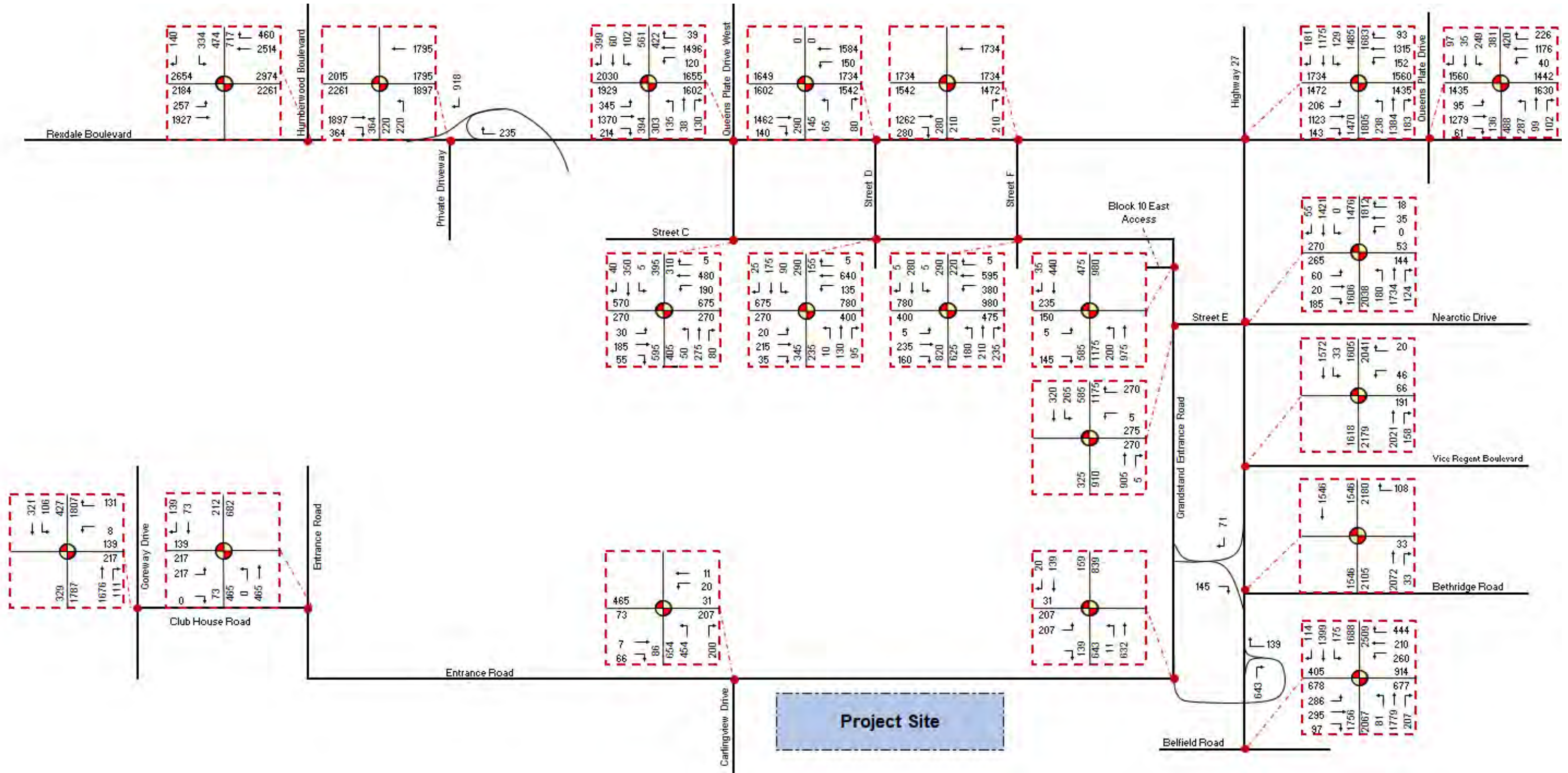


Figure 4-3: Future Background Turning Movement Volumes at the Study Area intersections during the PM Peak Hour in 2023

**Table 4-3: Site-Generated Traffic during the AM and PM Peak Hours in the Opening Year (2023)**

Number of parking stalls	Mode	2023 Mode Share	AM Peak Hour			PM Peak Hour		
			Trip Generation Rate (Trip/parking stall)	IN	OUT	Trip Generation Rate (Trip/parking stall)	IN	OUT
1000	Park & Ride	71%	0.56	398	0	0.59	0	421
	PPUDO	11%		62	62		66	66
	Transit	8%		47	47		49	49
<b>Total</b>				<b>507</b>	<b>109</b>		<b>115</b>	<b>536</b>

Trip Distribution and Trip Assignment

The site-generated traffic was distributed and assigned to the road network based on an assessment of the overall transportation network within and in the vicinity of the Study Area, the existing traffic distribution within the Woodbine Districts, and on the findings of the 2016 Transportation Tomorrow Survey (TTS). The distribution of the site-generated traffic on the Study Area road network that was adopted for both the AM and PM peak hours is presented in **Table 4-4** and illustrated in **Figure 4-4**. Accordingly, the site-generated traffic volumes for the AM and PM peak hours are illustrated in **Figure 4-5** and **Figure 4-6**.

**Table 4-4: Site-Generated Traffic Distribution Patterns on the Study Area Road Network**

Direction	Route	Site-Generated Traffic Distribution
North	Highway 27	10%
	Highway 427	10%
	Humberwood Boulevard	5%
East	Rexdale Boulevard	15%
South	Highway 27	25%
	Carlingview Drive	20%
West	Goreway Drive	15%

4.1.1.3 Future Total Traffic Volumes

The Future Background traffic volumes in the AM and PM peak hours of 2023 (shown in **Figure 4-2** and **Figure 4-3**, respectively) were added to the site-generated traffic volumes in their respective peak-hour (shown in **Figure 4-5** and **Figure 4-6**) to develop the Future Total traffic volumes in 2023. The Future Total traffic volumes during the AM and PM peak hours in 2023 are shown in **Figure 4-7** and **Figure 4-8**, respectively.

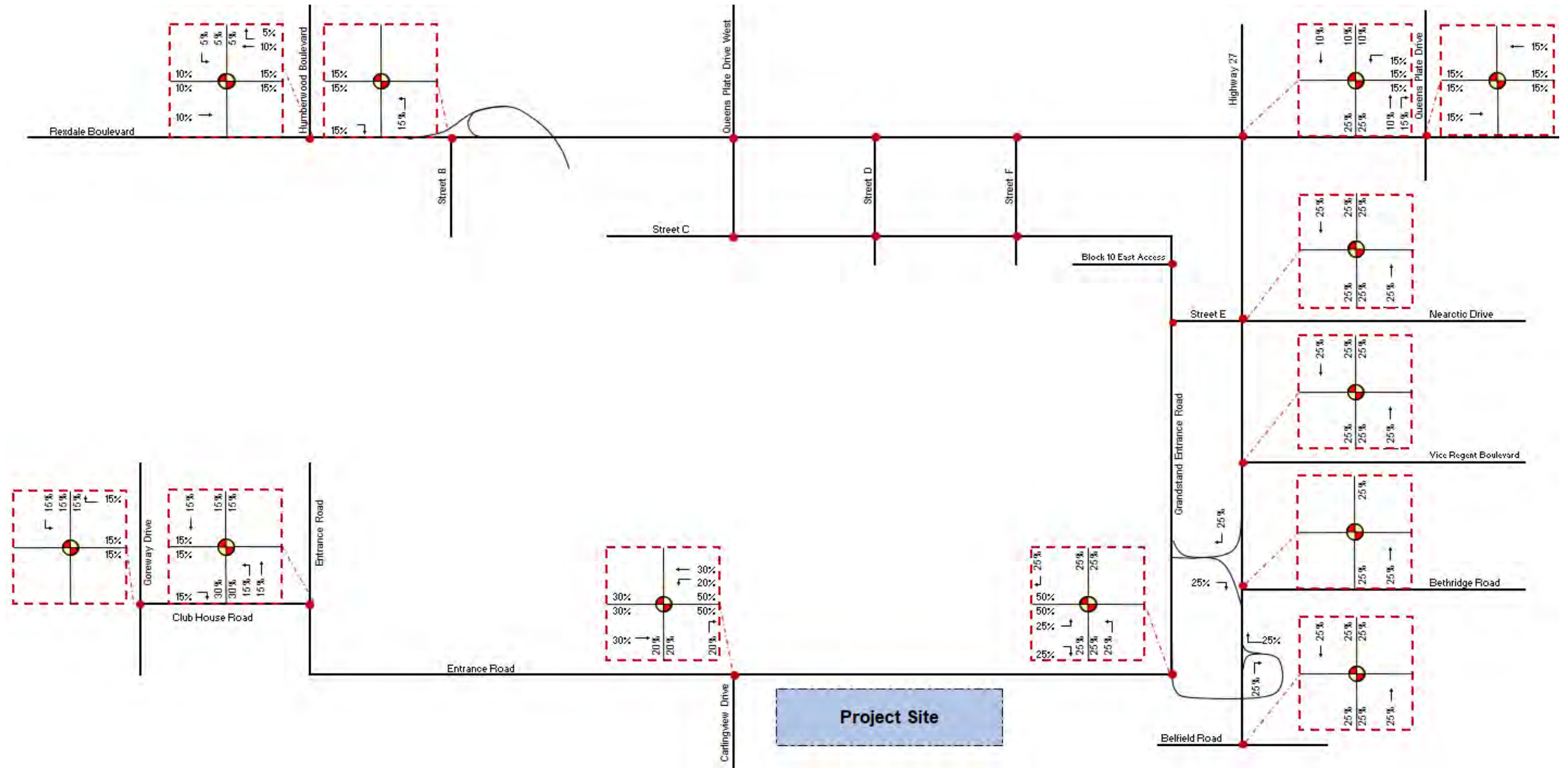


Figure 4-4: Site-Generated Traffic Distribution Patterns on the Study Area Road Network



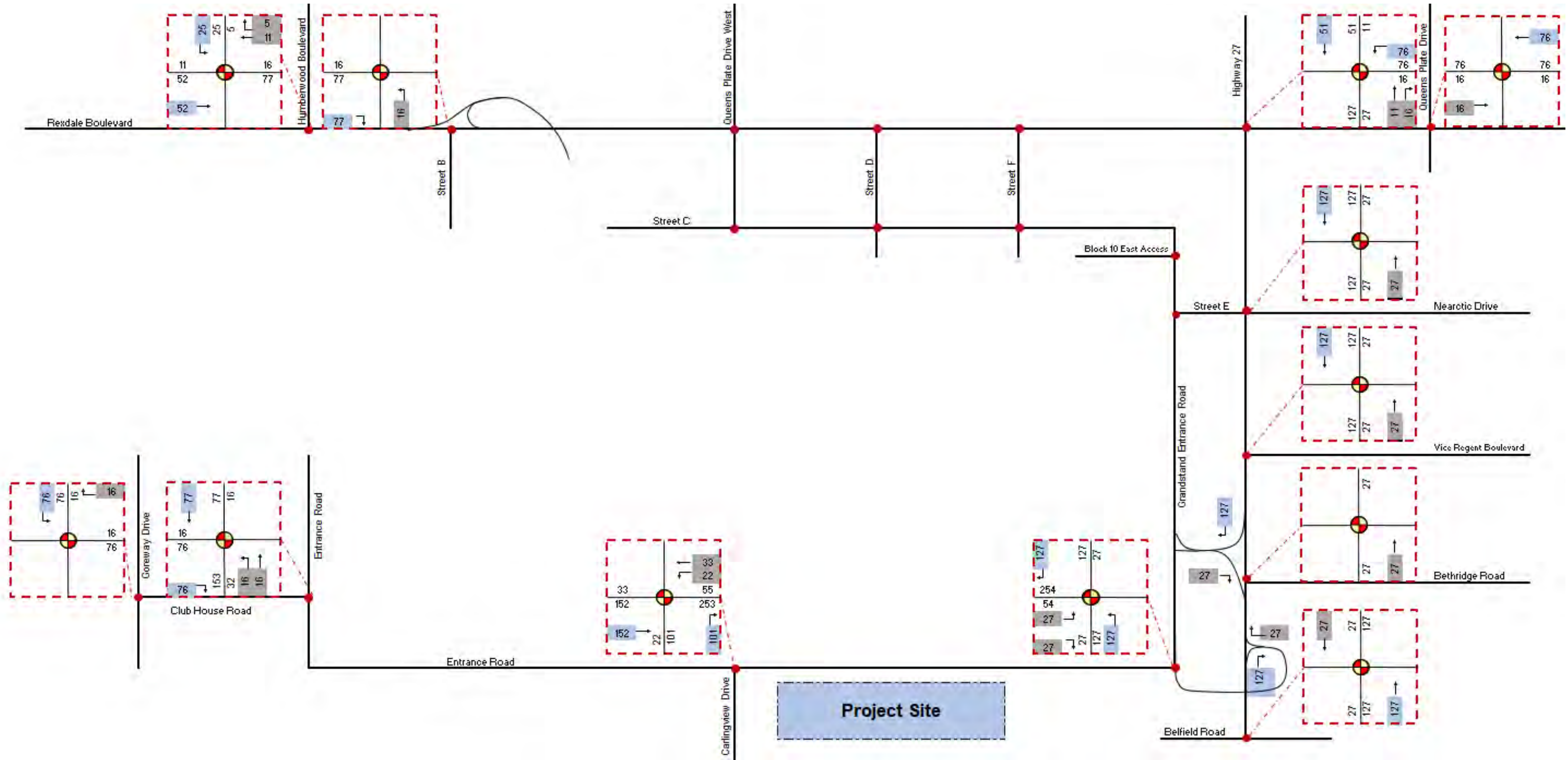


Figure 4-5: Site-Generated Traffic Volumes during the AM Peak Hour in the Opening Year (2023)

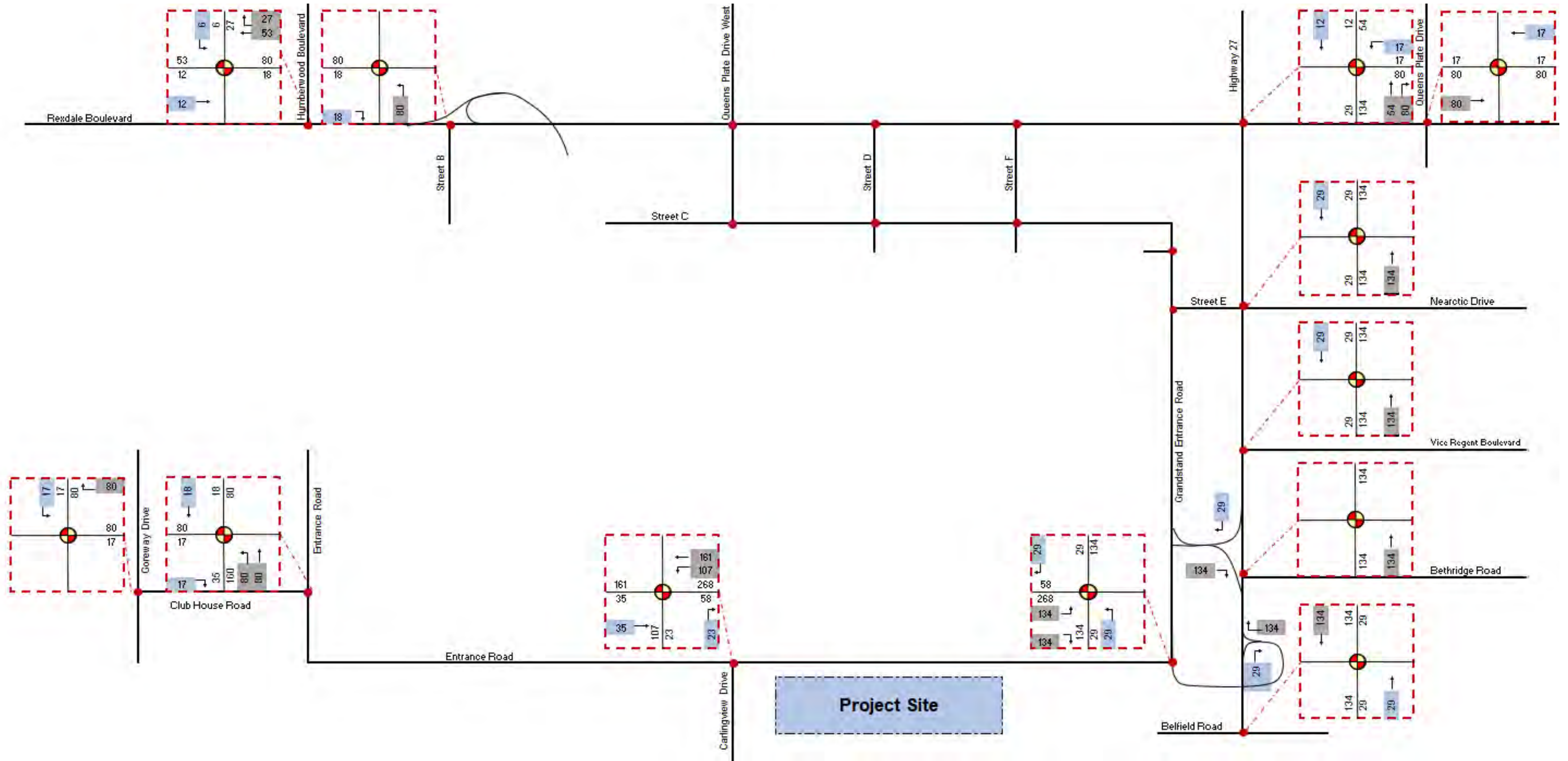


Figure 4-6: Site-Generated Traffic Volumes during the PM Peak Hour in the Opening Year (2023)



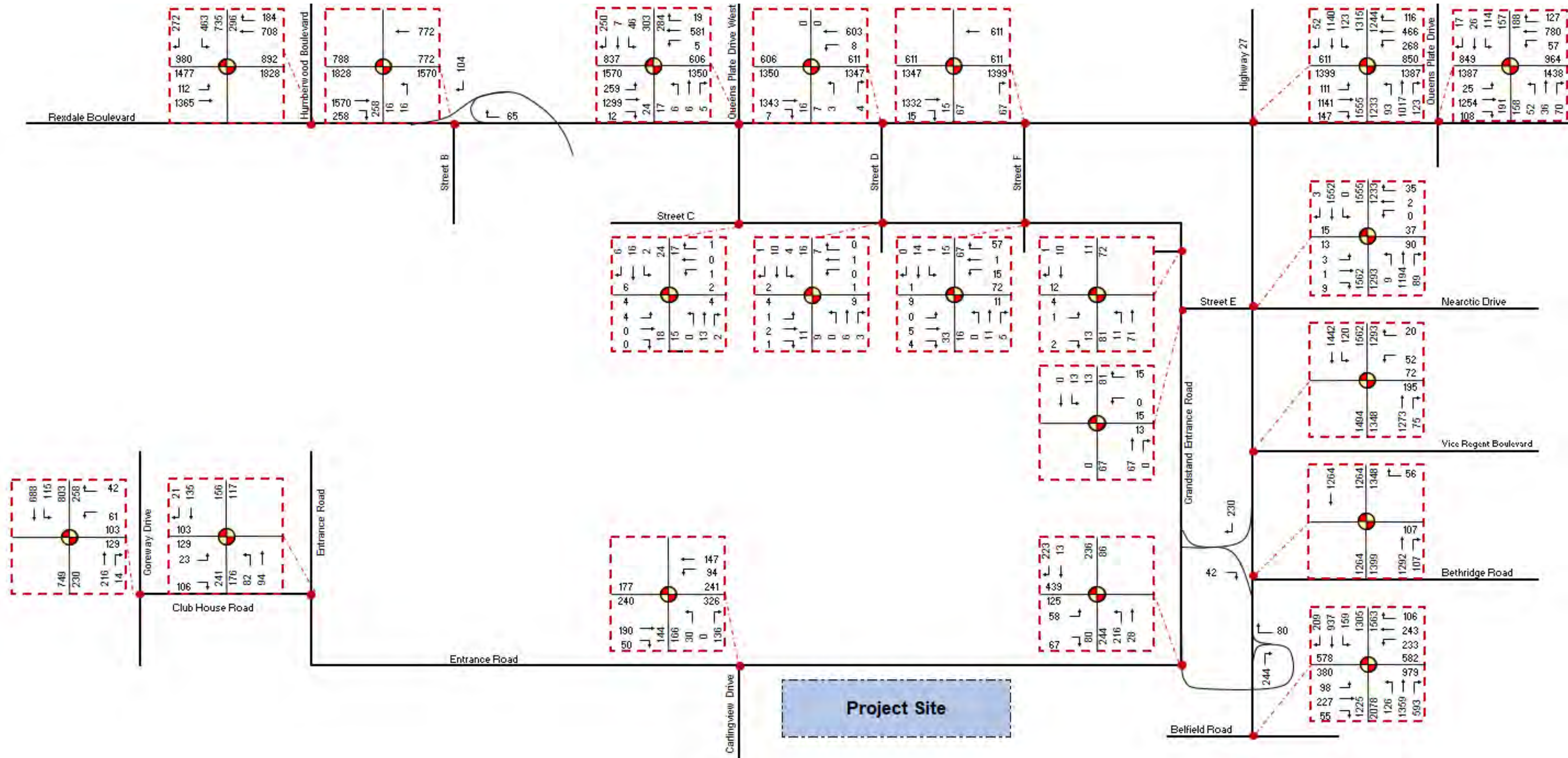


Figure 4-7: Future Total Turning Movement Volumes at the Study Area Intersections during the AM Peak Hour in 2023



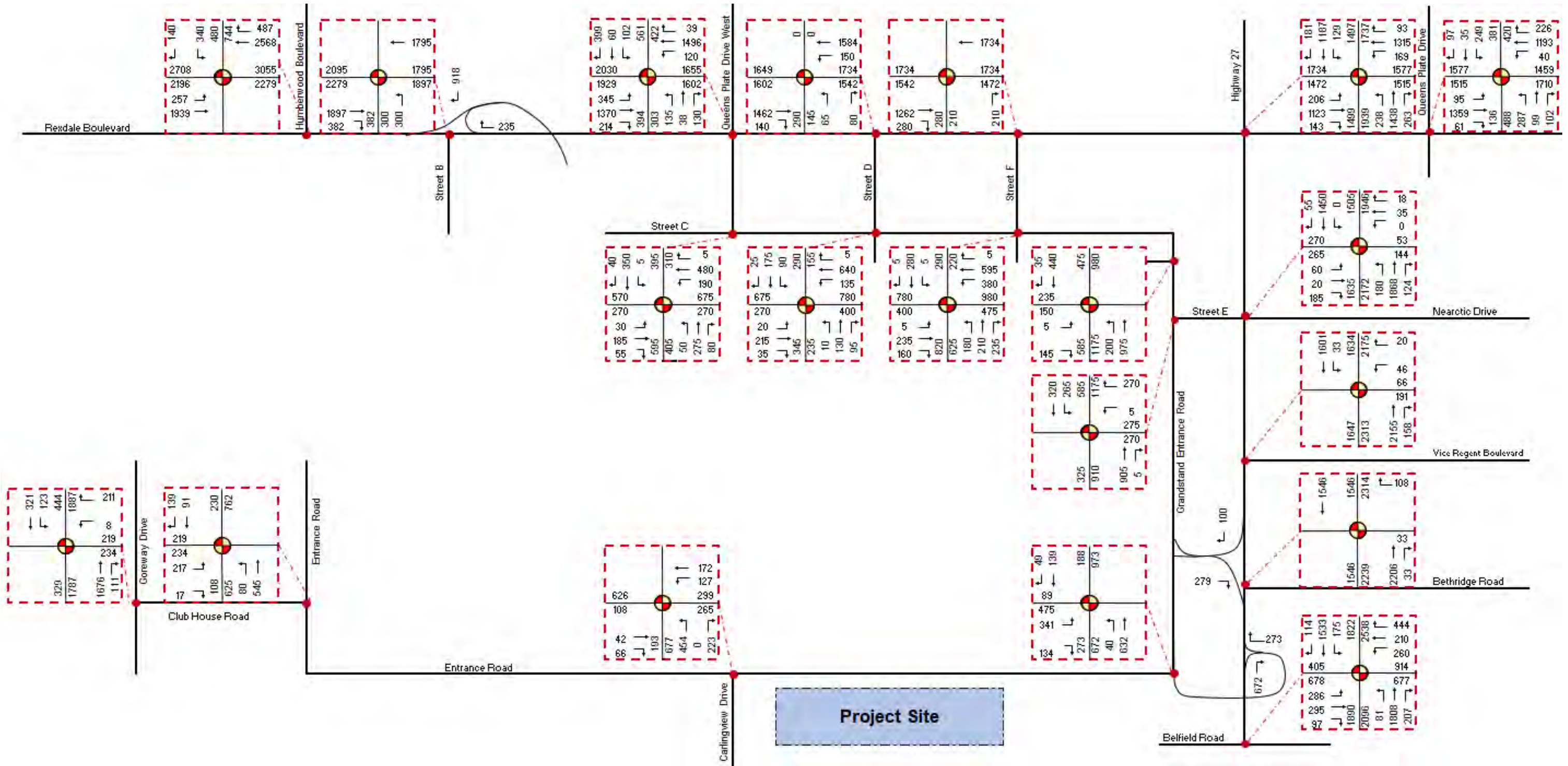


Figure 4-8: Future Total Turning Movement Volumes at the Study Area Intersections during the PM Peak Hour in 2023

## 4.1.2 Traffic Operations

### 4.1.2.1 Potential Effects

The findings of the traffic operations analysis for the Study Area intersections in the Future Background and Future Total Scenarios during the AM and PM peak hours in 2023 are summarized in **Table 4-5**. **Table 4-5** shows the Future Background and Future Total analysis findings for all the Study Area intersections both at the overall intersection level and for the specific movements, identified as critical in the AM or PM peak hour of the Future Total conditions. The detailed Synchro reports are attached in **Appendix D**.

The 95<sup>th</sup> percentile queues for the critical movements in the Future Background and Future Total Scenarios in 2023 are presented in **Table 4-6** and are compared against the existing storage lengths. The movements for which the 95<sup>th</sup> percentile queue length exceeds their respective storage length are highlighted in gray in **Table 4-6**.

**Table 4-5: Summary of the Traffic Operations in the Future Background and Future Total Conditions during the AM and PM Peak Hours in 2023**

Intersection	Movement	AM Peak Hour						PM Peak Hour					
		2023 Future Background			2023 Future Total			2023 Future Background			2023 Future Total		
		V/C Ratio	Delay (s)	LOS	V/C Ratio	Delay (s)	LOS	V/C Ratio	Delay (s)	LOS	V/C Ratio	Delay (s)	LOS
Highway 27 / Belfield Road	EBL	0.50	51.9	D	0.50	51.9	D	0.82	72.2	E	0.82	72.2	E
	EBT	0.66	55.5	E	0.66	55.5	E	0.89	71.2	E	0.89	71.2	E
	WBL	0.67	56.7	E	0.69	58.0	E	0.70	61.4	E	0.70	61.4	E
	WBT	0.71	54.6	D	0.72	55.7	E	0.77	61.2	E	0.77	61.2	E
	NBL	0.68	60.5	E	0.68	60.5	E	0.61	63.5	E	0.73	79.0	E
	NBT	0.63	33.3	C	0.68	33.9	C	0.95	50.2	D	0.96	52.5	D
	SBL	0.73	62.2	E	0.76	65.3	E	0.85	99.9	F	0.85	98.4	F
	<b>Overall Intersection</b>	-	<b>30.9</b>	<b>C</b>	-	<b>31.4</b>	<b>C</b>	-	<b>40.3</b>	<b>D</b>	-	<b>41.0</b>	<b>D</b>
Highway 27 / Nearctic Drive	EBL	0.04	61.0	E	0.04	61.6	E	0.48	44.8	D	0.48	44.8	D
	EBTR	0.02	73.8	E	0.02	75.0	E	0.25	69.6	E	0.25	69.6	E
	WBT	0.05	59.1	E	0.05	59.1	E	0.22	55.1	E	0.22	55.1	E
	<b>Overall Intersection</b>	-	<b>2.8</b>	<b>A</b>	-	<b>2.8</b>	<b>A</b>	-	<b>8.0</b>	<b>A</b>	-	<b>7.8</b>	<b>A</b>
Highway 27 / Rexdale Boulevard	EBL	0.32	36.2	D	0.32	32.0	C	1.15	132.5	F	1.15	132.5	F
	EBTR	0.89	56.0	E	0.91	51.7	D	0.90	39.3	D	0.90	39.3	D
	WBL	0.85	75.4	E	1.03	122.2	F	0.88	78.2	E	0.97	102.7	F
	WBT	0.29	26.5	C	0.28	25.2	C	0.91	47.1	D	0.91	47.4	D
	NBL	0.66	63.7	E	0.82	89.6	F	1.00	102.2	F	1.00	101.9	F
	NBT	0.68	39.9	D	0.68	39.9	D	0.81	54.5	D	0.84	55.1	E
	SBL	0.78	75.9	E	0.93	115.7	F	0.77	75.9	E	0.77	75.9	E
	<b>Overall Intersection</b>	-	<b>43.9</b>	<b>D</b>	-	<b>47.1</b>	<b>D</b>	-	<b>49.6</b>	<b>D</b>	-	<b>49.9</b>	<b>D</b>
Rexdale Boulevard / Queens Plate Drive (East)	NBL	0.34	50.7	D	0.34	50.7	D	0.87	65.5	E	0.87	65.5	E
	SBL	0.68	61.9	E	0.68	61.9	E	0.77	53.6	D	0.77	53.6	D
	<b>Overall Intersection</b>	-	<b>8.6</b>	<b>A</b>	-	<b>8.5</b>	<b>A</b>	-	<b>17.5</b>	<b>B</b>	-	<b>17.3</b>	<b>B</b>
Rexdale Boulevard / Queens Plate Drive (West)	EBL	0.43	3.4	A	0.43	3.4	A	0.90	48.1	D	0.90	48.1	D
	NBL	0.07	36.5	D	0.07	36.5	D	0.93	84.2	F	0.93	84.2	F
	<b>Overall Intersection</b>	-	<b>9.2</b>	<b>A</b>	-	<b>9.2</b>	<b>A</b>	-	<b>27.4</b>	<b>C</b>	-	<b>27.4</b>	<b>C</b>
Rexdale Boulevard / Humberwood Boulevard	WBTR	0.35	18.5	B	0.36	18.1	B	1.14	95.1	F	1.16	106	F
	<b>Overall Intersection</b>	-	<b>19.3</b>	<b>B</b>	-	<b>19.6</b>	<b>B</b>	-	<b>57.9</b>	<b>E</b>	-	<b>64.3</b>	<b>E</b>
Rexdale Boulevard & Street D	NBL	0.01	41.7	D	0.01	41.7	D	0.20	57.2	E	0.20	57.2	E
	<b>Overall Intersection</b>	-	<b>5.5</b>	<b>A</b>	-	<b>5.5</b>	<b>A</b>	-	<b>17.4</b>	<b>B</b>	-	<b>17.3</b>	<b>B</b>
	NBL	-	-	-	0.20	46.7	D	0.73	57.4	E	0.78	55	E

Intersection	Movement	AM Peak Hour						PM Peak Hour					
		2023 Future Background			2023 Future Total			2023 Future Background			2023 Future Total		
		V/C Ratio	Delay (s)	LOS	V/C Ratio	Delay (s)	LOS	V/C Ratio	Delay (s)	LOS	V/C Ratio	Delay (s)	LOS
Rexdale Boulevard & Private Driveway	<b>Overall Intersection</b>	-	<b>0.1</b>	<b>A</b>	-	<b>1.7</b>	<b>A</b>	-	<b>10.5</b>	<b>B</b>	-	<b>14.5</b>	<b>B</b>
Grandstand Entrance Road / Street E	WBR	0.01	54.5	D	0.01	54.5	D	0.61	80.7	F	0.61	77.2	E
	<b>Overall Intersection</b>	-	<b>10.1</b>	<b>B</b>	-	<b>10.1</b>	<b>B</b>	-	<b>16.7</b>	<b>B</b>	-	<b>16.1</b>	<b>B</b>
Street C & Block 10 East Access	EBL	0.02	42.2	D	0.02	42.2	D	0.05	57.1	E	0.05	57.1	E
	EBR	0.00	42.1	D	0.00	42.1	D	0.10	57.5	E	0.10	57.5	E
	<b>Overall Intersection</b>	-	<b>2.1</b>	<b>A</b>	-	<b>2.1</b>	<b>A</b>	-	<b>6.5</b>	<b>A</b>	-	<b>6.5</b>	<b>A</b>
Street C & Street F	<b>Overall Intersection</b>	-	<b>12.0</b>	<b>B</b>	-	<b>12.0</b>	<b>B</b>	-	<b>24.9</b>	<b>C</b>	-	<b>24.8</b>	<b>C</b>
Street C & Street D	SBT	0.14	42.9	D	0.14	42.9	D	0.74	80.2	F	0.74	80.2	F
	<b>Overall Intersection</b>	-	<b>35.6</b>	<b>D</b>	-	<b>35.6</b>	<b>D</b>	-	<b>24.7</b>	<b>C</b>	-	<b>24.7</b>	<b>C</b>
Street C & Queens Plate Drive	<b>Overall Intersection</b>	-	<b>40.6</b>	<b>D</b>	-	<b>40.6</b>	<b>D</b>	-	<b>26.4</b>	<b>C</b>	-	<b>26.4</b>	<b>C</b>
Highway 27 / Bethridge Road (Unsignalized)	<b>Overall Intersection</b>	-	<b>0.3</b>	<b>A</b>	-	<b>0.3</b>	<b>A</b>	-	<b>0.6</b>	<b>A</b>	-	<b>0.6</b>	<b>A</b>
Highway 27 / Vice Regent Boulevard (Unsignalized)	WBL	1.84	697.4	F	2.17	881.8	F	6.88	-	F	9.79	-	F
	<b>Overall Intersection</b>	-	<b>13.5</b>	<b>B</b>	-	<b>16.1</b>	<b>B</b>	-	-	<b>F</b>	-	-	<b>F</b>
Goreway Drive / Club House Road (Unsignalized)	WBL	0.18	17.0	C	0.24	22.7	C	0.35	232.6	F	0.41	287.2	F
	<b>Overall Intersection</b>	-	<b>1.5</b>	<b>A</b>	-	<b>2.4</b>	<b>A</b>	-	<b>3.8</b>	<b>A</b>	-	<b>8.0</b>	<b>A</b>
Carlingview Drive / Entrance Road (Unsignalized)	<b>Overall Intersection</b>	-	<b>7.4</b>	<b>A</b>	-	<b>9.0</b>	<b>A</b>	-	<b>14.8</b>	<b>B</b>	-	<b>20.5</b>	<b>C</b>
Club House Road / Woodbine Entrance (Unsignalized)	NBLT	0.21	8.4	A	0.28	9.4	A	0.69	17.9	C	0.95	44.6	E
	<b>Overall Intersection</b>	-	<b>7.8</b>	<b>A</b>	-	<b>8.6</b>	<b>A</b>	-	<b>14.3</b>	<b>B</b>	-	<b>30.4</b>	<b>D</b>
Grandstand Entrance / Entrance Road (Unsignalized)	EBL	0.05	10.8	B	0.17	17.2	C	0.47	19.2	C	0.90	53.8	F
	<b>Overall Intersection</b>	-	<b>4.6</b>	<b>A</b>	-	<b>5.7</b>	<b>A</b>	-	<b>4.0</b>	<b>A</b>	-	<b>15.0</b>	<b>B</b>

**Table 4-6: Summary of the Queuing Analysis in the Future Background and Future Total Conditions during the AM and PM Peak Hours in 2023**

Intersection	Movement	95th Percentile Queue (m)				Existing Storage Length (m)
		AM Peak Hour		PM Peak Hour		
		2023 Future Background	2023 Future Total	2023 Future Background	2023 Future Total	
Highway 27 / Belfield Road	EBL	40.8	40.8	#99.1	#99.1	145
	EBT	44.9	44.9	#87.9	#87.9	250
	WBL	66.2	66.9	71.3	71.3	200
	WBT	58.4	59.0	64.2	64.2	400
	NBL	51.0	51.0	39.2	#49.8	140
	NBT	110.6	120.3	#200.0	#205.4	800
	SBL	61.1	#65.1	#88.2	#88.3	110
Highway 27 / Nearctic Drive	EBL	3.8	3.9	m20.1	m20.1	80
	EBTR	6.4	6.4	32.0	32.0	80
	WBT	11.4	11.4	20.4	20.4	160
Highway 27 / Rexdale Boulevard	EBL	34.2	31.0	#92.4	#92.4	100
	EBTR	#114.4	#104.8	#136.4	#136.4	300
	WBL	#75.2	#116.9	m#60.5	m#72.1	30
	WBT	30.9	29.6	#119.0	#120.8	250
	NBL	41.6	#53.5	#120.1	#120.0	80
	NBT	101.0	101.3	153.3	158.9	350
	SBL	#61.1	#70.9	#64.2	#64.2	110
Rexdale Boulevard / Queens Plate Drive (East)	NBL	24.1	24.1	#108.0	#108.0	140
	SBL	47.1	47.1	87.0	87.0	125
Rexdale Boulevard / Queens Plate Drive (West)	EBL	18.7	18.7	#92.4	#92.4	65
	NBL	5.2	5.2	#52.6	#52.6	55
Rexdale Boulevard / Humberwood Boulevard	WBT	3.4	3.4	33.8	33.8	300
Rexdale Boulevard / Street D	NBL	-	9.8	81.6	103.9	250
Rexdale Boulevard / Private Driveway	NBL	-	m0.0	59.4	59.1	80
Grandstand Entrance Road / Nearctic Drive (Street E)	WBTR	1.6	1.6	5.7	5.7	60
Block 10 East Access / Street C	WBTR	-	-	19.9	19.9	60
Street D / Street C	EBT	4.2	4.2	42.2	42.2	300
Goreway Drive / Club House Road (Unsignalized)	WBL	4.9	7.0	7.9	8.8	250
Entrance Road / Grandstand Entrance Road (Unsignalized)	EBL	1.2	4.7	19.0	71.3	-

Notes: #: 95<sup>th</sup> percentile cycle volume exceeds capacity; queue may be longer  
m: Volume for the 95<sup>th</sup> percentile queue is metered by an upstream signal



The following conclusions are drawn based on the traffic operations and queuing analysis results presented in **Table 4-5** and **Table 4-6** for the Future Background and Future Total scenarios during the peak hour in 2023.

- The Highway 27 and Belfield Road intersection is expected to operate overall near capacity in the PM peak hour with V/C Ratios of 0.90 in both the Future Background and Future Total Scenarios. The southbound left-turn movement is expected to experience the longest average delay of 99.9 seconds and 98.4 seconds in the Future Background and Future Total Scenarios, respectively;
- The Highway 27 and Rexdale Boulevard intersection is expected to operate overall near capacity in the AM peak hour of the Future Total Scenario with V/C Ratio of 0.94 and over capacity in the PM peak hour of the Future Background and Future Total Scenarios with V/C ratio exceeding 1.00. The V/C ratio and average vehicle delay pertaining to the westbound left-turn movement would experience a relatively large increase in the Future Total conditions as compared to the Future Background conditions due to the site-generated traffic during both the AM and PM peak hours. Furthermore, and only during the AM peak hour, the V/C ratios and average vehicle delays related to the northbound left-turn and southbound left-turn movements in the Future Total conditions would be notably larger as compared to those in the Future Background conditions. In addition, the existing storage lanes for both the westbound and northbound left-turn movements would not be able to accommodate the anticipated 95<sup>th</sup> percentile queues for the noted movements both with and without site-generated traffic;
- The Rexdale Boulevard and Queens Plate Drive (West) intersection is expected to operate overall at near-capacity conditions with V/C ratio of 0.94 after becoming an all-movement signalized intersection (i.e., after lifting the passenger vehicles prohibition from using the south leg of the intersection) in the PM peak hour of both the Future Background and Future Total Scenarios. Although not caused by the site-generated traffic, the newly-introduced northbound left-turn movement is expected to experience the longest average delay of 84.2 seconds representing LOS 'F' in both the Future Background and Future Total scenarios. In addition, the storage lanes for the eastbound left-turn movements would not be able to accommodate the anticipated 95<sup>th</sup> percentile queues for the noted movement both with and without site-generated traffic in the PM peak hour;
- The Rexdale Boulevard and Humberwood Boulevard intersection is expected to operate at LOS 'E' in the PM peak hour Future Background and Future Total Scenarios. In addition, the intersection is expected to operate overall at near-capacity conditions in the PM peak hour with V/C Ratio of 0.91 and 0.93 in the Future Background and Future Total Scenarios, respectively. Although not caused by the site-generated traffic, the westbound through movement is expected to operate at LOS 'F' and over capacity with V/C Ratio of 1.14 and 1.16 in the Future Background and Future Total Scenarios, respectively;
- The westbound left-turn movement at the unsignalized intersection of Highway 27 and Vice Regent Boulevard is expected to continue operating poorly and over capacity in the AM and PM peak hours of the Future Background and Future Total Scenarios;
- The unsignalized intersection of Goreway Drive and Club House Road is expected to continue operating at LOS 'F' in the PM peak hour but with substantially longer average vehicle delays in both the Future Background and Future Total Scenarios as compared to the Existing Conditions. The westbound left-turn movement is expected to operate at LOS 'F' in the PM peak hour of both scenarios and to experience the longest average vehicle delays of up to 232.6 seconds (i.e., approximately four minutes) in the Future Background Scenario and up to 287.2 seconds (i.e., approximately five minutes) in the Future Total Scenario;
- The unsignalized intersection of Club House Road and Entrance Road is expected to operate at LOS 'C' and LOS 'E' in the PM peak hour of the Future Background and Future Total scenarios, respectively. The average vehicle delay pertaining to the northbound approach would have a

relatively large increase in the Future Total conditions as compared to the Future Background conditions due to the site-generated traffic; and

- The unsignalized intersection of Entrance Road and Grandstand Entrance Road is expected to operate at LOS 'C' and LOS 'F' in the PM peak hour of the Future Background and Future Total scenarios, respectively. The V/C Ratio and average vehicle delay pertaining to the eastbound left-turn movement would significantly increase in the Future Total conditions as compared to the Future Background conditions due to the site-generated traffic.

#### 4.1.2.2 Mitigation and Monitoring

This section presents mitigation measures to improve traffic operations at the intersections and / or their specific movements that are expected to be significantly impacted by the site-generated traffic. Movements and intersections are considered significantly impacted by the Project if they meet either of the following criteria:

- Movements and/or intersections are expected to be critical (i.e., V/C Ratio above 0.85 and/or LOS 'E' or worse) in the Future Total Scenario but not in the Future Background Scenario; or
- Movements and/or intersections are expected to operate above capacity (i.e., V/C Ratio above 1.00) in the Future Total Scenario but not in the Future Background Scenario.

Based on the noted criteria, the Project is expected to have a significant operational impact on the following:

- The westbound left-turn movement at the signalized intersection of Highway 27 and Rexdale Boulevard in the AM peak hour;
- The shared northbound left-turn and through movement at the unsignalized intersection of Club House Road and Entrance Road in the PM peak hour; and
- The eastbound left-turn movement at the unsignalized intersection of Entrance Road and Grandstand Entrance Road in the PM peak hour.

#### Proposed Signal Timings, Lane Configurations, and Road Improvements

To mitigate these potential negative impacts, the westbound left-turn signal phase at the intersection of Highway 27 and Rexdale Boulevard in the AM peak hour can be adjusted by granting it two additional seconds of green time and by adjusting the intersection offset time to 10 seconds. These changes would enhance traffic operations at the westbound left-turn movement by reducing the average vehicle delay from 122.2 seconds to 76.6 seconds and decreasing the V/C ratio from 1.03 to 0.95. In addition, the noted adjustments in the signal timing plan would improve the overall traffic operations of the intersection by reducing the average vehicle delay from 47.1 seconds to 46.4 seconds and the V/C ratio from 0.94 to 0.90.

For the intersection of Club House Road and Entrance Road, providing an additional lane in the northbound direction, in which the northbound approach lane configuration becomes a northbound through lane and a shared northbound through and left lane, would improve traffic operations at the intersection by reducing the average vehicle delay from 53.9 seconds representing LOS 'F' to 15.8 seconds representing LOS 'B'.

At the intersection of Grandstand Entrance Road and Entrance Road, changing the intersection control type from a side-street stop-controlled intersection to an all-way stop-controlled intersection would improve traffic operations of the eastbound left-turn movement by reducing the average vehicle delay from 53.8 seconds representing LOS 'F' to 30.0 seconds representing LOS 'C' and the overall average intersection delay from 53.8 seconds representing LOS 'F' to 35.6 seconds representing LOS 'D'.

The detailed Synchro outputs that outline the proposed measures and the traffic operations findings are provided in **Appendix H**.

In addition, storage lane improvements are proposed for the movements that the queue analysis (**Table 4-6**) revealed inadequacy of their storage lanes in accommodating the anticipated queue lengths in the Future Total Scenario during the AM and/or the PM peak hour in 2023.

Subject to a future design exercise, it appears that the storage lanes for the identified movements can be extended without any need to widen the respective roads' cross-sections and/or need for additional right of way. The proposed lengths of the storage lanes are provided in **Table 4-7**.

**Table 4-7: Proposed Modifications to Length of Storage Lanes**

Location of Storage Lane	Existing Length (m)	Proposed Length (m)
Westbound left-turn at the intersection of Highway 27 and Rexdale Boulevard	30	110
Northbound left-turn at the intersection of Highway 27 and Rexdale Boulevard	80	125
Eastbound left-turn at the intersection of Rexdale Boulevard and Queens Plate Drive (West)	65	95

Signal Warrant Analysis

Signal warrant analysis was conducted for the intersections that would serve as major accesses to the Project Site. The signal warrant analysis was undertaken using the methodologies outlined in the Ontario Traffic Manual (OTM) Book 12. Need for installation of traffic signals was assessed for the following four intersections:

- Carlingview Drive and Entrance Road;
- Entrance Road and Club House Road; and
- Grandstand Entrance Road and Entrance Road;
- Goreway Drive and Club House Road.

For the purposes of this analysis, the eight highest hourly volumes were selected from the 24-hour period counts at the intersections of Carlingview Drive / Entrance Road and Goreway Drive / Club House Road and added to the anticipated site traffic at the noted intersections. For the intersections of Grandstand Entrance Road and Entrance Road as well as Entrance Road and Club House Road and in the absence of existing 24-hour counts, the off-peak traffic volumes were assumed to be half of the average of the AM and PM Peak volumes at the noted intersections.

The signal warrant analysis indicated that the Project would not generate enough traffic volumes to warrant installation of traffic signals at any of the four noted intersections.

Signal warrant calculation sheets are attached in **Appendix I**.

## 4.2 Transit Network

### 4.2.1 Potential Effects

The Finch West LRT project which is currently under construction will run along Finch Avenue West between the Humber College North Campus and the planned Finch West Subway Station to be located at the intersection of Keele Street and Finch Avenue West. The design of the terminal station at Humber College North Campus permits the potential extension of the Finch West LRT south along Highway 27, which could include a potential connection to the Project Site in the future<sup>7</sup>.

<sup>7</sup> The Finch West LRT was not considered in any of the technical assessments prepared for the Project. This section is intended to identify the Finch West LRT as new nearby transit infrastructure and the opportunity for a future connection to potentially strengthen regional transit. Feasibility regarding a potential future connection would be a separate undertaking.

The Union Pearson (UP) Express operates on the Kitchener Rail Corridor between Union Station and the Wice control location (i.e., a series of switches and signals that allow for crossover movements between tracks) where it diverges onto a separate spur track to Toronto Pearson International Airport. The Project Site is located immediately east of the Wice control location and, while the currently proposed and assessed project does not include an Airport Service stop, the design could accommodate an Airport Service stop should that be added to the Project Site in the future<sup>8</sup>.

Once implemented, the Project is anticipated to trigger a set of modifications to the existing transit services provided by other transit agencies serving the Study Area. Metrolinx and WEG are engaging with the following regional transit operators regarding the Project and future commitment opportunities: TTC, Mississauga Transit (MiWay), Brampton Transit, and York Region Transit (YRT/Viva). It is anticipated that these discussions will be ongoing during detailed design through to station operations to determine servicing agreements<sup>9</sup>.

#### 4.2.2 Mitigation and Monitoring

The report assesses four bus bays with provisions for a total of eight bus bays and space for Wheel-Trans. The increase in the number of bus bays (i.e. from four to eight plus Wheel-Trans) is would have a minor impact with no need for mitigation measures. During detailed design and prior to permitting, the number of bus bays will be confirmed. At that time, potential impacts will be reviewed and mitigation measures may be proposed, if needed.

The Project design will not preclude a future connection to the Finch West LRT. Metrolinx and WEG will continue discussions with transit operators as needed to confirm connections.

### 4.3 Pedestrian and Cycling Network

#### 4.3.1 Potential Effects

Pedestrian and cycling facilities will develop over time with the approved subdivisions of the Woodbine Districts and their planned active transportation connections. In addition, once the proposed Transit Station is built, it is anticipated that the surrounding lands will be redeveloped, improving the active transportation network as part of their respective planning approval process. Therefore, the active transportation network focuses on establishing connection to the existing infrastructure with the anticipation that the existing deficiency in the active transportation infrastructure would be addressed through the forthcoming development approval process and/or City's capital infrastructure improvement program.

To provide a connection to the existing nearby infrastructure, a MUP is proposed to run along the north side of the rail platform connecting with Grandstand Entrance Road. The proposed MUP would continue along the south side of Grandstand Entrance Road, prior to connecting to the existing MUP that runs along the east side of Highway 27 through the Grandstand Entrance Road off-ramp. In addition, walkway connections are proposed along the perimeters of the proposed Transit Station and parking lots so that pedestrian connections to/from the Transit Station can be established as the surrounding lands develop over time.

The proposed MUP and walkway connections along with potential future improvements to the existing active transportation network would make the proposed Transit Station easily accessible by active transportation modes

<sup>8</sup> The Initial Business Case prepared in support of the Highway 27-Woodbine Station and approved by Metrolinx does not account for an UP Express stop at the proposed Transit Station. Hence, UP Express was not considered in any of the technical assessments prepared for the Project. This section is intended to identify the UP Express as nearby transit infrastructure and the opportunity for a future connection to potentially strengthen regional transit. Feasibility regarding a potential future connection would be a separate undertaking.

<sup>9</sup> Transit operators may decide to adjust their routes to take advantage of potential new ridership generated by a new GO Station. Note that transit connections are subject to evolve as the site develops.

and possibly trigger a shift in mode choices to/from Project Site from auto-dependant modes to active transportation modes.

### **4.3.2 Mitigation and Monitoring**

Currently, Casino Woodbine provides complimentary parking lot shuttle service to the Grandstand Building. The shuttle service operates 7 days a week (weekdays from 7:00AM to 11:30PM, with Fridays and weekends having 24-hour service). It is anticipated that this shuttle service will be expanded to include riders as an interim connectivity solution as the long-term sidewalk connections are being developed.

The Project Site and the surrounding street network should provide for a well-connected, safe and comfortable walking and cycling facilities. WEG will coordinate with the City during detailed design to ensure that the roads connecting the station to nearby public roads are accessible by active transportation modes and meet the City design requirements and GO Design Requirements Manual (DRM) and GO Rail Station Access Plan guidelines for station access roads.

Traffic strategies will be developed and implemented during construction and operations to ensure safe access for pedestrians and cyclists.

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# Appendix **A**

## Traffic Volume Data

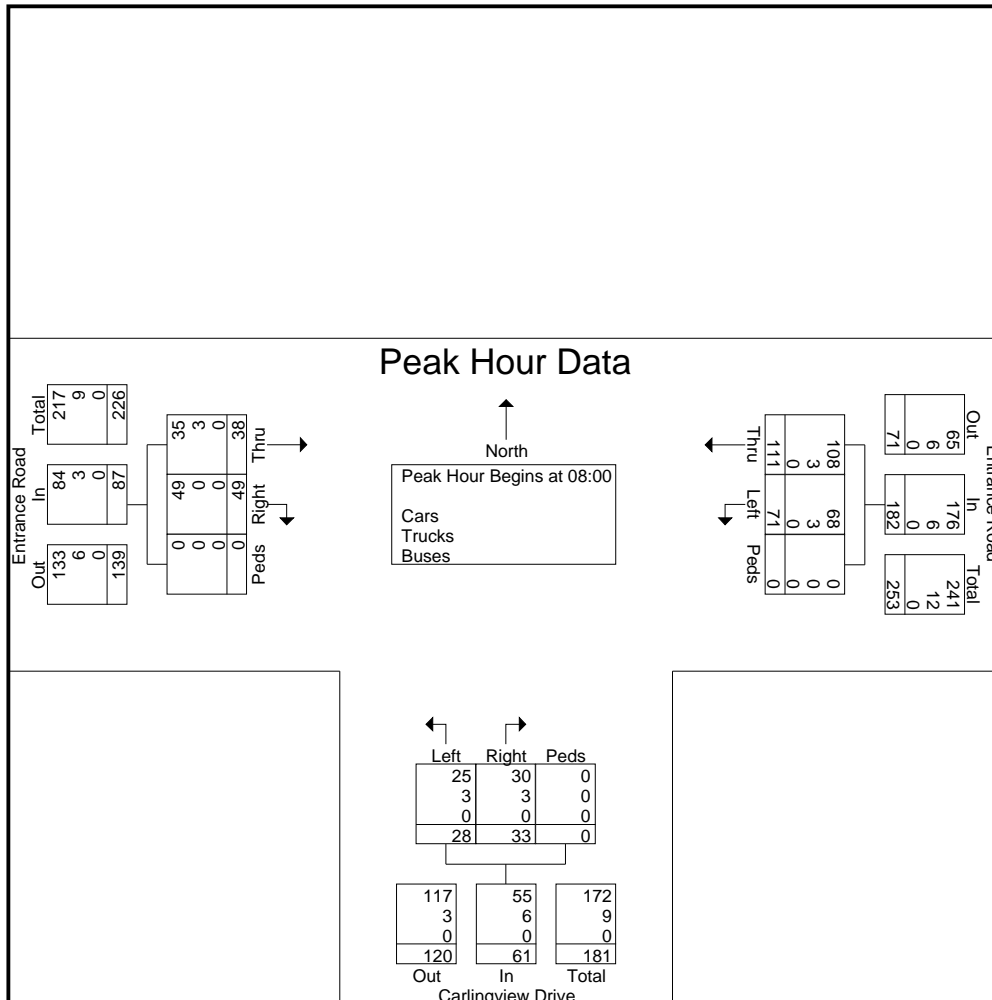


# LEA CONSULTING LTD

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

File Name : Carlingview&Entrance-AM  
Site Code : 01936316  
Start Date : 2019-04-25  
Page No : 3

Start Time	Entrance Road Westbound				Carlingview Drive Northbound				Entrance Road Eastbound				Int. Total
	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00													
08:00	18	24	0	42	6	7	0	13	11	14	0	25	80
08:15	19	24	0	43	7	7	0	14	5	12	0	17	74
08:30	15	33	0	48	5	10	0	15	7	11	0	18	81
08:45	19	30	0	49	10	9	0	19	15	12	0	27	95
Total Volume	71	111	0	182	28	33	0	61	38	49	0	87	330
% App. Total	39	61	0		45.9	54.1	0		43.7	56.3	0		
PHF	.934	.841	.000	.929	.700	.825	.000	.803	.633	.875	.000	.806	.868
Cars	68	108	0	176	25	30	0	55	35	49	0	84	315
% Cars	95.8	97.3	0	96.7	89.3	90.9	0	90.2	92.1	100	0	96.6	95.5
Trucks	3	3	0	6	3	3	0	6	3	0	0	3	15
% Trucks	4.2	2.7	0	3.3	10.7	9.1	0	9.8	7.9	0	0	3.4	4.5
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0







**Peak Hour: 07:30 AM - 08:30 AM Weather: Rain (2.5 °C)**

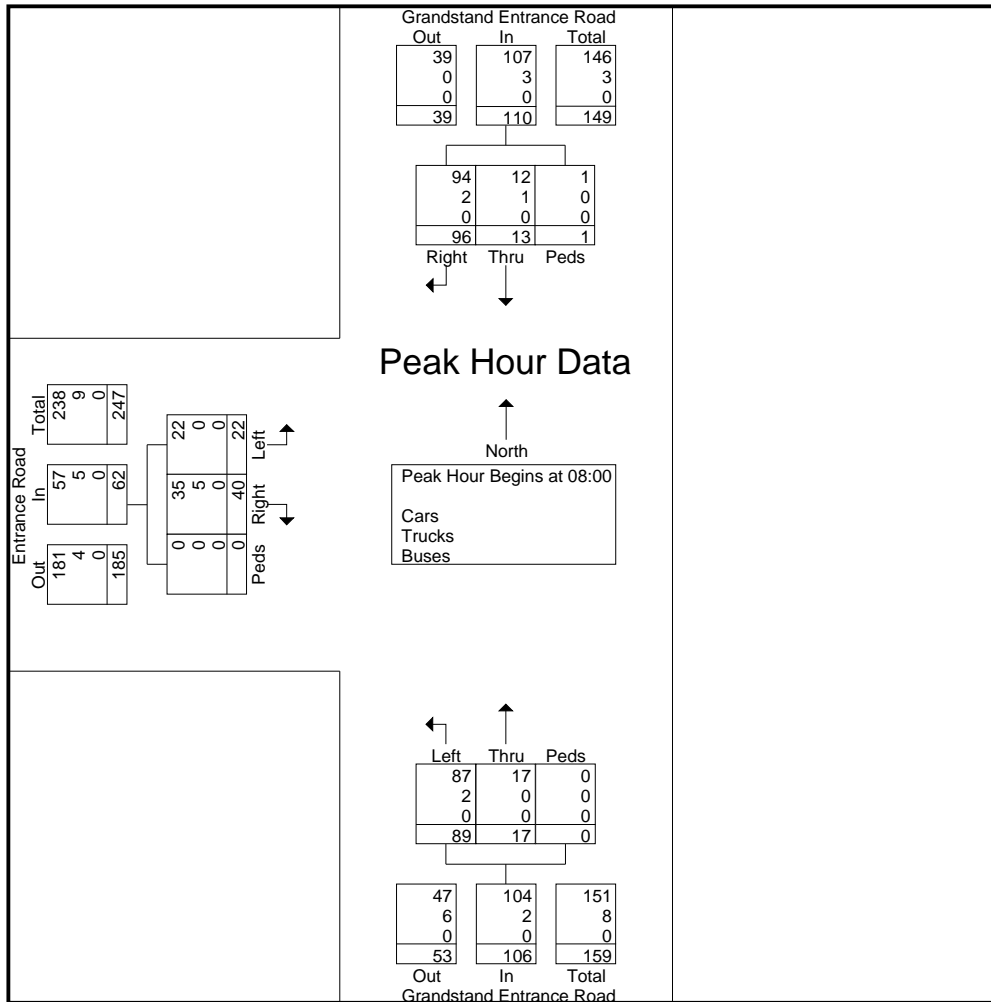
Start Time	N Approach GOREWAY DR					E Approach CLUB HOUSE RD ( GOREWAY DRIVE AT WOODBINE ENTRANCE					S Approach GOREWAY DR					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
07:30:00	181	6	0	0	187	3	12	0	0	15	3	41	0	0	44	246
07:45:00	172	12	0	0	184	5	14	0	0	19	1	62	0	0	63	266
08:00:00	152	7	0	0	159	8	8	0	0	16	4	48	0	0	52	227
08:15:00	183	3	0	0	186	2	9	0	0	11	1	65	0	0	66	263
<b>Grand Total</b>	<b>688</b>	<b>28</b>	<b>0</b>	<b>0</b>	<b>716</b>	<b>18</b>	<b>43</b>	<b>0</b>	<b>0</b>	<b>61</b>	<b>9</b>	<b>216</b>	<b>0</b>	<b>0</b>	<b>225</b>	<b>1002</b>
<b>Approach%</b>	96.1%	3.9%	0%	-	-	29.5%	70.5%	0%	-	-	4%	96%	0%	-	-	-
<b>Totals %</b>	68.7%	2.8%	0%	-	71.5%	1.8%	4.3%	0%	-	6.1%	0.9%	21.6%	0%	-	22.5%	-
<b>PHF</b>	0.94	0.58	0	-	0.96	0.56	0.77	0	-	0.8	0.56	0.83	0	-	0.85	-
<b>Heavy</b>	29	0	0	-	29	0	2	0	-	2	1	43	0	-	44	-
<b>Heavy %</b>	4.2%	0%	0%	-	4.1%	0%	4.7%	0%	-	3.3%	11.1%	19.9%	0%	-	19.6%	-
<b>Lights</b>	659	28	0	-	687	18	41	0	-	59	8	173	0	-	181	-
<b>Lights %</b>	95.8%	100%	0%	-	95.9%	100%	95.3%	0%	-	96.7%	88.9%	80.1%	0%	-	80.4%	-
<b>Single-Unit Trucks</b>	15	0	0	-	15	0	2	0	-	2	1	26	0	-	27	-
<b>Single-Unit Trucks %</b>	2.2%	0%	0%	-	2.1%	0%	4.7%	0%	-	3.3%	11.1%	12%	0%	-	12%	-
<b>Buses</b>	6	0	0	-	6	0	0	0	-	0	0	6	0	-	6	-
<b>Buses %</b>	0.9%	0%	0%	-	0.8%	0%	0%	0%	-	0%	0%	2.8%	0%	-	2.7%	-
<b>Articulated Trucks</b>	8	0	0	-	8	0	0	0	-	0	0	11	0	-	11	-
<b>Articulated Trucks %</b>	1.2%	0%	0%	-	1.1%	0%	0%	0%	-	0%	0%	5.1%	0%	-	4.9%	-
<b>Bicycles on Road</b>	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-
<b>Bicycles on Road%</b>	-	-	-	%	-	-	-	-	%	-	-	-	-	%	-	-

# LEA CONSULTING LTD

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

File Name : GrandstandEntrance&Entrance-AM  
Site Code : 19363029  
Start Date : 2019-04-25  
Page No : 3

Start Time	Grandstand Entrance Road Southbound				Grandstand Entrance Road Northbound				Entrance Road Eastbound				Int. Total
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00													
08:00	4	25	0	29	19	7	0	26	6	10	0	16	71
08:15	4	28	0	32	18	4	0	22	4	8	0	12	66
08:30	3	20	1	24	23	2	0	25	5	13	0	18	67
08:45	2	23	0	25	29	4	0	33	7	9	0	16	74
Total Volume	13	96	1	110	89	17	0	106	22	40	0	62	278
% App. Total	11.8	87.3	0.9	97.3	97.8	100	0	98.1	100	87.5	0	91.9	96.4
PHF	.813	.857	.250	.859	.767	.607	.000	.803	.786	.769	.000	.861	.939
Cars	12	94	1	107	87	17	0	104	22	35	0	57	268
% Cars	92.3	97.9	100	97.3	97.8	100	0	98.1	100	87.5	0	91.9	96.4
Trucks	1	2	0	3	2	0	0	2	0	5	0	5	10
% Trucks	7.7	2.1	0	2.7	2.2	0	0	1.9	0	12.5	0	8.1	3.6
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0

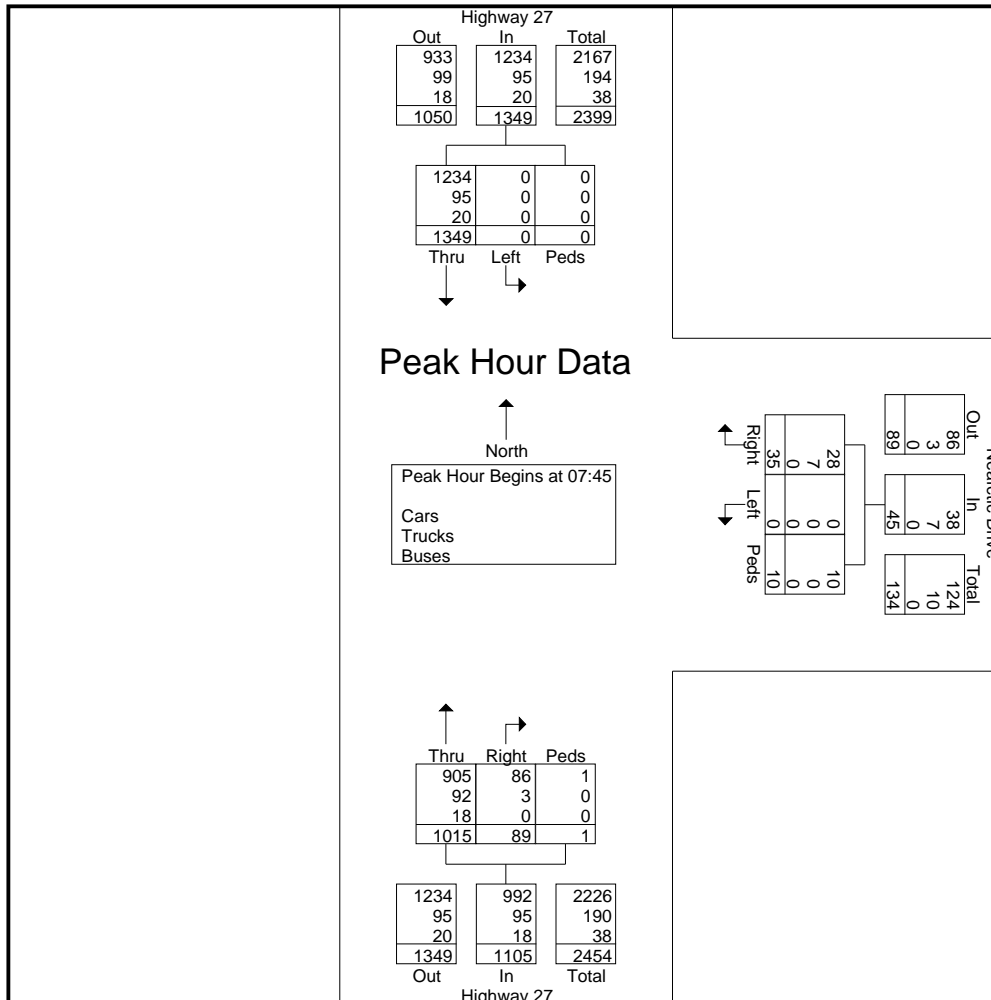


# LEA CONSULTING LTD

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

File Name : Hwy27&Nearctic-AM  
Site Code : 01936319  
Start Date : 2019-04-25  
Page No : 3

Start Time	Highway 27 Southbound				Nearctic Drive Westbound				Highway 27 Northbound				Int. Total
	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45													
07:45	0	348	0	348	0	7	5	12	250	22	0	272	632
08:00	0	305	0	305	0	8	0	8	274	29	0	303	616
08:15	0	347	0	347	0	12	2	14	247	21	1	269	630
08:30	0	349	0	349	0	8	3	11	244	17	0	261	621
Total Volume	0	1349	0	1349	0	35	10	45	1015	89	1	1105	2499
% App. Total	0	100	0		0	77.8	22.2		91.9	8.1	0.1		
PHF	.000	.966	.000	.966	.000	.729	.500	.804	.926	.767	.250	.912	.989
Cars	0	1234	0	1234	0	28	10	38	905	86	1	992	2264
% Cars	0	91.5	0	91.5	0	80.0	100	84.4	89.2	96.6	100	89.8	90.6
Trucks	0	95	0	95	0	7	0	7	92	3	0	95	197
% Trucks	0	7.0	0	7.0	0	20.0	0	15.6	9.1	3.4	0	8.6	7.9
Buses	0	20	0	20	0	0	0	0	18	0	0	18	38
% Buses	0	1.5	0	1.5	0	0	0	0	1.8	0	0	1.6	1.5

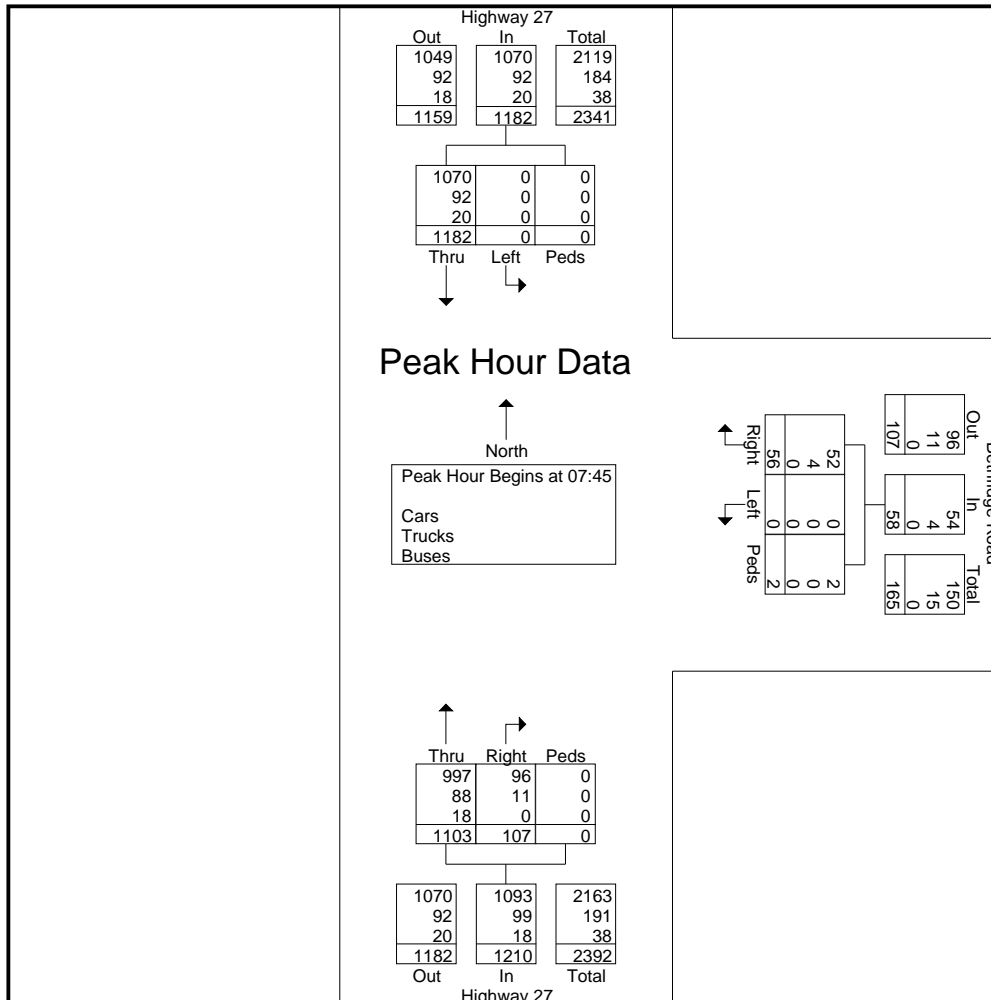


# LEA CONSULTING LTD

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

File Name : Hwy27&Bethridge-AM  
Site Code : 01936330  
Start Date : 2019-04-25  
Page No : 3

Start Time	Highway 27 Southbound				Bethridge Road Westbound				Highway 27 Northbound				Int. Total
	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45													
07:45	0	315	0	315	0	6	0	6	276	23	0	299	620
08:00	0	274	0	274	0	24	1	25	295	21	0	316	615
08:15	0	297	0	297	0	14	0	14	265	31	0	296	607
08:30	0	296	0	296	0	12	1	13	267	32	0	299	608
Total Volume	0	1182	0	1182	0	56	2	58	1103	107	0	1210	2450
% App. Total	0	100	0		0	96.6	3.4		91.2	8.8	0		
PHF	.000	.938	.000	.938	.000	.583	.500	.580	.935	.836	.000	.957	.988
Cars	0	1070	0	1070	0	52	2	54	997	96	0	1093	2217
% Cars	0	90.5	0	90.5	0	92.9	100	93.1	90.4	89.7	0	90.3	90.5
Trucks	0	92	0	92	0	4	0	4	88	11	0	99	195
% Trucks	0	7.8	0	7.8	0	7.1	0	6.9	8.0	10.3	0	8.2	8.0
Buses	0	20	0	20	0	0	0	0	18	0	0	18	38
% Buses	0	1.7	0	1.7	0	0	0	0	1.6	0	0	1.5	1.6

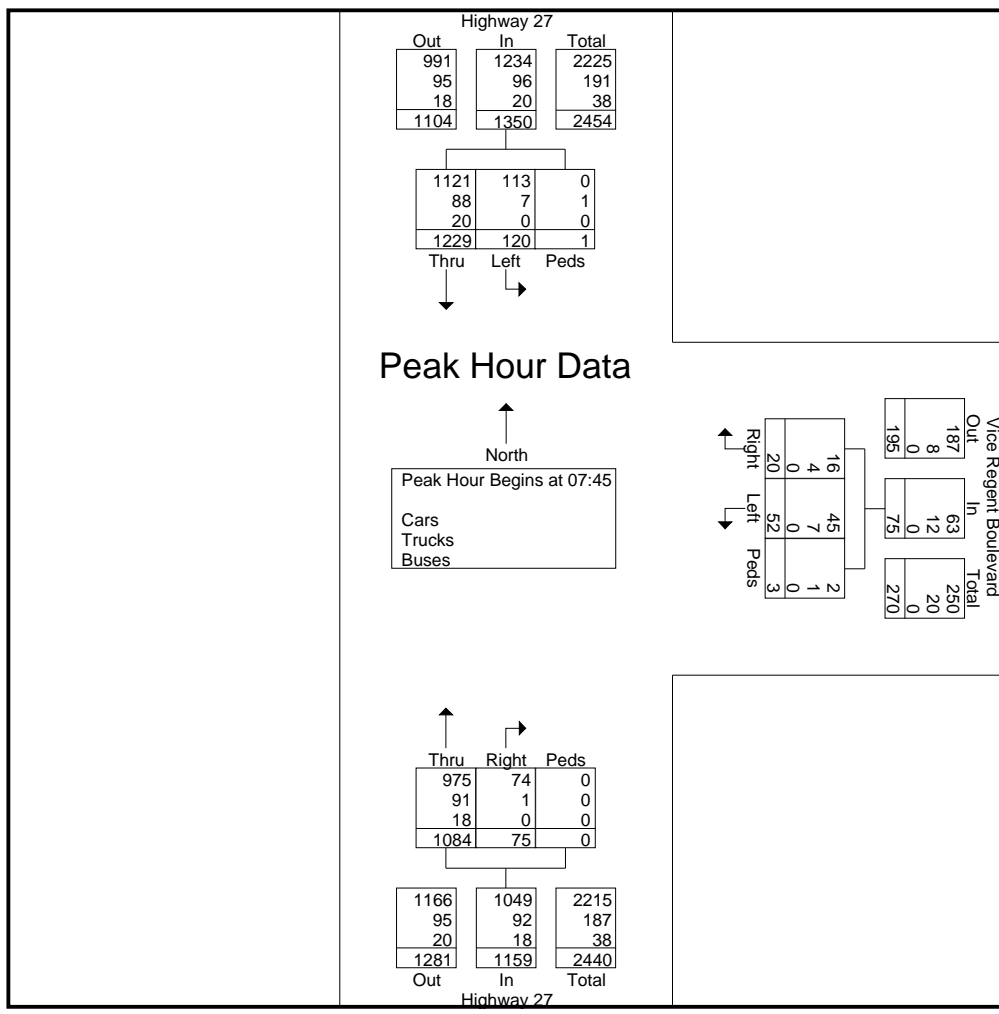


# LEA CONSULTING LTD

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

File Name : Hwy27&ViceRegent-AM  
Site Code : 01936328  
Start Date : 2019-04-25  
Page No : 3

Start Time	Highway 27 Southbound				Vice Regent Boulevard Westbound				Highway 27 Northbound				Int. Total
	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45													
07:45	17	331	1	349	11	4	1	16	268	14	0	282	647
08:00	24	281	0	305	18	4	0	22	299	20	0	319	646
08:15	39	308	0	347	13	6	1	20	262	17	0	279	646
08:30	40	309	0	349	10	6	1	17	255	24	0	279	645
Total Volume	120	1229	1	1350	52	20	3	75	1084	75	0	1159	2584
% App. Total	8.9	91	0.1		69.3	26.7	4		93.5	6.5	0		
PHF	.750	.928	.250	.967	.722	.833	.750	.852	.906	.781	.000	.908	.998
Cars	113	1121	0	1234	45	16	2	63	975	74	0	1049	2346
% Cars	94.2	91.2	0	91.4	86.5	80.0	66.7	84.0	89.9	98.7	0	90.5	90.8
Trucks	7	88	1	96	7	4	1	12	91	1	0	92	200
% Trucks	5.8	7.2	100	7.1	13.5	20.0	33.3	16.0	8.4	1.3	0	7.9	7.7
Buses	0	20	0	20	0	0	0	0	18	0	0	18	38
% Buses	0	1.6	0	1.5	0	0	0	0	1.7	0	0	1.6	1.5

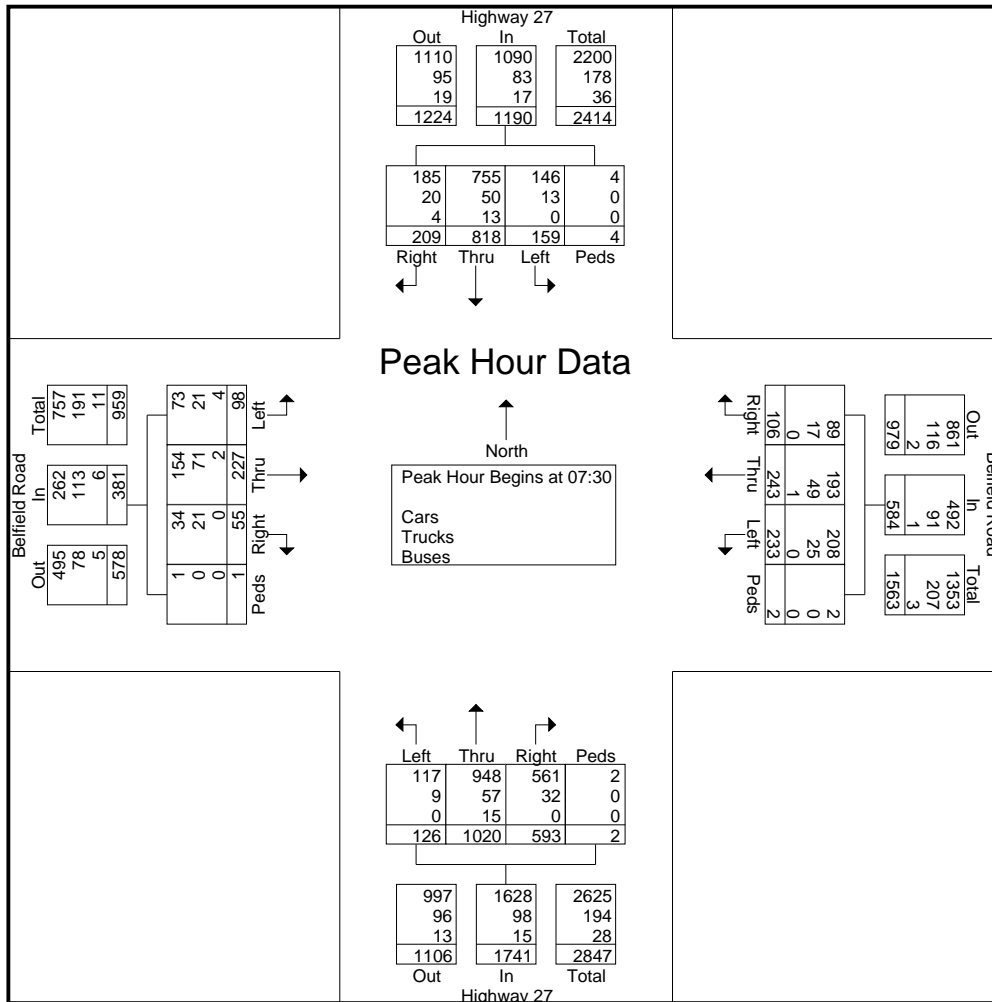


# LEA CONSULTING LTD

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

File Name : Hwy27&Belfield-AM  
Site Code : 00000001  
Start Date : 2019-04-25  
Page No : 3

Start Time	Highway 27 Southbound					Belfield Road Westbound					Highway 27 Northbound					Belfield Road Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30																					
07:30	51	186	56	1	294	37	46	16	0	99	42	266	205	1	514	18	45	20	1	84	991
07:45	29	228	65	2	324	57	70	27	1	155	24	243	120	0	387	34	57	8	0	99	965
08:00	38	190	41	1	270	83	58	34	1	176	35	251	109	1	396	30	56	9	0	95	937
08:15	41	214	47	0	302	56	69	29	0	154	25	260	159	0	444	16	69	18	0	103	1003
Total Volume	159	818	209	4	1190	233	243	106	2	584	126	1020	593	2	1741	98	227	55	1	381	3896
% App. Total	13.4	68.7	17.6	0.3		39.9	41.6	18.2	0.3		7.2	58.6	34.1	0.1		25.7	59.6	14.4	0.3		
PHF	.779	.897	.804	.500	.918	.702	.868	.779	.500	.830	.750	.959	.723	.500	.847	.721	.822	.688	.250	.925	.971
Cars	146	755	185	4	1090	208	193	89	2	492	117	948	561	2	1628	73	154	34	1	262	3472
% Cars	91.8	92.3	88.5	100	91.6	89.3	79.4	84.0	100	84.2	92.9	92.9	94.6	100	93.5	74.5	67.8	61.8	100	68.8	89.1
Trucks	13	50	20	0	83	25	49	17	0	91	9	57	32	0	98	21	71	21	0	113	385
% Trucks	8.2	6.1	9.6	0	7.0	10.7	20.2	16.0	0	15.6	7.1	5.6	5.4	0	5.6	21.4	31.3	38.2	0	29.7	9.9
Buses	0	13	4	0	17	0	1	0	0	1	0	15	0	0	15	4	2	0	0	6	39
% Buses	0	1.6	1.9	0	1.4	0	0.4	0	0	0.2	0	1.5	0	0	0.9	4.1	0.9	0	0	1.6	1.0

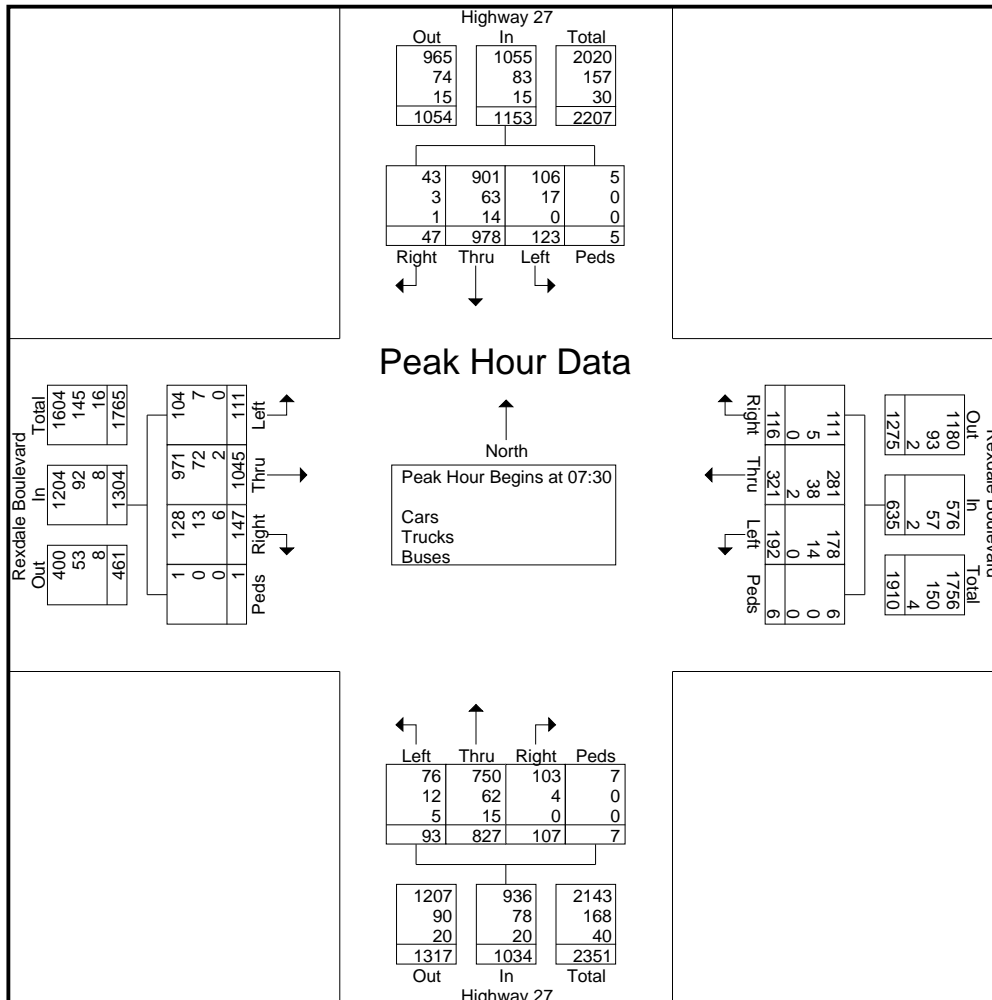


# LEA CONSULTING LTD

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

File Name : Hwy27&Rexdale-AM  
Site Code : 01936300  
Start Date : 2019-04-25  
Page No : 3

Start Time	Highway 27 Southbound					Rexdale Boulevard Westbound					Highway 27 Northbound					Rexdale Boulevard Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30																					
07:30	28	223	11	2	264	41	74	31	1	147	14	221	30	1	266	32	283	41	0	356	1033
07:45	32	272	11	0	315	57	75	33	2	167	24	186	16	0	226	24	298	27	0	349	1057
08:00	34	216	13	2	265	51	99	30	0	180	23	196	27	0	246	29	256	38	0	323	1014
08:15	29	267	12	1	309	43	73	22	3	141	32	224	34	6	296	26	208	41	1	276	1022
Total Volume	123	978	47	5	1153	192	321	116	6	635	93	827	107	7	1034	111	1045	147	1	1304	4126
% App. Total	10.7	84.8	4.1	0.4		30.2	50.6	18.3	0.9		9	80	10.3	0.7		8.5	80.1	11.3	0.1		
PHF	.904	.899	.904	.625	.915	.842	.811	.879	.500	.882	.727	.923	.787	.292	.873	.867	.877	.896	.250	.916	.976
Cars	106	901	43	5	1055	178	281	111	6	576	76	750	103	7	936	104	971	128	1	1204	3771
% Cars	86.2	92.1	91.5	100	91.5	92.7	87.5	95.7	100	90.7	81.7	90.7	96.3	100	90.5	93.7	92.9	87.1	100	92.3	91.4
Trucks	17	63	3	0	83	14	38	5	0	57	12	62	4	0	78	7	72	13	0	92	310
% Trucks	13.8	6.4	6.4	0	7.2	7.3	11.8	4.3	0	9.0	12.9	7.5	3.7	0	7.5	6.3	6.9	8.8	0	7.1	7.5
Buses	0	14	1	0	15	0	2	0	0	2	5	15	0	0	20	0	2	6	0	8	45
% Buses	0	1.4	2.1	0	1.3	0	0.6	0	0	0.3	5.4	1.8	0	0	1.9	0	0.2	4.1	0	0.6	1.1





**Peak Hour: 07:30 AM - 08:30 AM Weather: Rain (2.5 °C)**

Start Time	N Approach HUMBERWOOD BLVD					E Approach REXDALE BLVD					W Approach REXDALE BLVD					Int. Total (15 min)
	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	Thru	Left	U-Turn	Peds	Approach Total	
07:30:00	66	85	0	0	151	32	188	0	0	220	306	33	4	0	343	714
07:45:00	59	86	0	3	145	60	159	0	0	219	291	23	1	0	315	679
08:00:00	66	114	0	2	180	47	151	0	0	198	252	34	0	0	286	664
08:15:00	69	95	0	1	164	40	139	2	0	181	285	20	1	0	306	651
<b>Grand Total</b>	260	380	0	6	640	179	637	2	0	818	1134	110	6	0	1250	<b>2708</b>
<b>Approach%</b>	40.6%	59.4%	0%	-	-	21.9%	77.9%	0.2%	-	-	90.7%	8.8%	0.5%	-	-	-
<b>Totals %</b>	9.6%	14%	0%	23.6%	6.6%	23.5%	0.1%	30.2%	41.9%	4.1%	0.2%	46.2%	-	-	-	-
<b>PHF</b>	0.94	0.83	0	0.89	0.75	0.85	0.25	0.93	0.93	0.81	0.38	0.91	-	-	-	-
<b>Heavy</b>	4	11	0	15	14	75	0	89	96	3	1	100	-	-	-	-
<b>Heavy %</b>	1.5%	2.9%	0%	2.3%	7.8%	11.8%	0%	10.9%	8.5%	2.7%	16.7%	8%	-	-	-	-
<b>Lights</b>	256	369	0	625	165	562	2	729	1038	107	5	1150	-	-	-	-
<b>Lights %</b>	98.5%	97.1%	0%	97.7%	92.2%	88.2%	100%	89.1%	91.5%	97.3%	83.3%	92%	-	-	-	-
<b>Single-Unit Trucks</b>	0	0	0	0	3	44	0	47	52	1	1	54	-	-	-	-
<b>Single-Unit Trucks %</b>	0%	0%	0%	0%	1.7%	6.9%	0%	5.7%	4.6%	0.9%	16.7%	4.3%	-	-	-	-
<b>Buses</b>	4	11	0	15	11	13	0	24	12	2	0	14	-	-	-	-
<b>Buses %</b>	1.5%	2.9%	0%	2.3%	6.1%	2%	0%	2.9%	1.1%	1.8%	0%	1.1%	-	-	-	-
<b>Articulated Trucks</b>	0	0	0	0	0	18	0	18	32	0	0	32	-	-	-	-
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	2.8%	0%	2.2%	2.8%	0%	0%	2.6%	-	-	-	-
<b>Pedestrians</b>	-	-	-	6	-	-	-	0	-	-	-	0	-	-	-	-
<b>Pedestrians%</b>	-	-	-	100%	-	-	-	0%	-	-	-	0%	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	-
<b>Bicycles on Crosswalk%</b>	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-





**Peak Hour: 07:30 AM - 08:30 AM Weather: Light Snow (0.0 °C)**

Start Time	N Approach QUEENS PLATE DR						E Approach REXDALE BLVD						S Approach QUEENS PLATE DRIVE						W Approach REXDALE BLVD						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
07:30:00	53	1	9	0	2	63	4	148	0	0	2	152	0	1	0	0	2	1	0	231	66	0	0	297	513
07:45:00	70	2	8	0	0	80	5	151	0	0	0	156	0	2	0	1	0	3	1	278	52	0	0	331	570
08:00:00	59	0	14	0	4	73	6	137	0	0	1	143	0	1	0	0	0	1	1	249	64	0	0	314	531
08:15:00	54	1	12	0	0	67	4	131	0	0	0	135	0	0	0	0	0	0	0	230	74	0	0	304	506
<b>Grand Total</b>	<b>236</b>	<b>4</b>	<b>43</b>	<b>0</b>	<b>6</b>	<b>283</b>	<b>19</b>	<b>567</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>586</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>5</b>	<b>2</b>	<b>988</b>	<b>256</b>	<b>0</b>	<b>0</b>	<b>1246</b>	<b>2120</b>
<b>Approach%</b>	83.4%	1.4%	15.2%	0%	-	-	3.2%	96.8%	0%	0%	-	-	0%	80%	0%	20%	-	-	0.2%	79.3%	20.5%	0%	-	-	-
<b>Totals %</b>	11.1%	0.2%	2%	0%	13.3%	0.9%	26.7%	0%	0%	27.6%	0%	0.2%	0%	0%	0.2%	0.1%	46.6%	12.1%	0%	58.8%	-	-	-	-	-
<b>PHF</b>	0.84	0.5	0.77	0	0.88	0.79	0.94	0	0	0.94	0	0.5	0	0.25	0.42	0.5	0.89	0.86	0	0.94	-	-	-	-	-
<b>Heavy</b>	10	3	2	0	15	3	67	0	0	70	0	4	0	0	4	2	80	5	0	87	-	-	-	-	-
<b>Heavy %</b>	4.2%	75%	4.7%	0%	5.3%	15.8%	11.8%	0%	0%	11.9%	0%	100%	0%	0%	80%	100%	8.1%	2%	0%	7%	-	-	-	-	-
<b>Lights</b>	226	1	41	0	268	16	500	0	0	516	0	0	0	1	1	0	908	251	0	1159	-	-	-	-	-
<b>Lights %</b>	95.8%	25%	95.3%	0%	94.7%	84.2%	88.2%	0%	0%	88.1%	0%	0%	0%	100%	20%	0%	91.9%	98%	0%	93%	-	-	-	-	-
<b>Single-Unit Trucks</b>	3	0	1	0	4	0	32	0	0	32	0	0	0	0	0	0	34	2	0	36	-	-	-	-	-
<b>Single-Unit Trucks %</b>	1.3%	0%	2.3%	0%	1.4%	0%	5.6%	0%	0%	5.5%	0%	0%	0%	0%	0%	0%	3.4%	0.8%	0%	2.9%	-	-	-	-	-
<b>Buses</b>	6	3	1	0	10	3	10	0	0	13	0	4	0	0	4	2	11	3	0	16	-	-	-	-	-
<b>Buses %</b>	2.5%	75%	2.3%	0%	3.5%	15.8%	1.8%	0%	0%	2.2%	0%	100%	0%	0%	80%	100%	1.1%	1.2%	0%	1.3%	-	-	-	-	-
<b>Articulated Trucks</b>	1	0	0	0	1	0	25	0	0	25	0	0	0	0	0	0	35	0	0	35	-	-	-	-	-
<b>Articulated Trucks %</b>	0.4%	0%	0%	0%	0.4%	0%	4.4%	0%	0%	4.3%	0%	0%	0%	0%	0%	0%	3.5%	0%	0%	2.8%	-	-	-	-	-
<b>Pedestrians</b>	-	-	-	-	6	-	-	-	-	3	-	-	-	-	2	-	-	-	-	0	-	-	-	-	-
<b>Pedestrians%</b>	-	-	-	-	54.5%	-	-	-	-	27.3%	-	-	-	-	18.2%	-	-	-	-	0%	-	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-
<b>Bicycles on Crosswalk%</b>	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-
<b>Bicycles on Road</b>	0	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-	-	-	-
<b>Bicycles on Road%</b>	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-



**Peak Hour: 07:30 AM - 08:30 AM Weather: Rain (2.5 °C)**

Start Time	N Approach QUEENS PLATE DRIVE						E Approach REXDALE BLVD						S Approach QUEENS PLATE DRIVE						W Approach REXDALE BLVD						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
07:30:00	4	5	30	0	0	39	28	153	10	1	4	192	13	7	13	0	1	33	24	223	3	0	0	250	514
07:45:00	3	5	28	0	0	36	34	157	16	0	0	207	20	10	10	0	1	40	21	243	7	1	0	272	555
08:00:00	6	5	27	0	0	38	34	125	10	0	1	169	20	12	13	0	0	45	27	237	5	0	0	269	521
08:15:00	4	11	29	0	0	44	31	142	21	0	3	194	17	7	16	0	0	40	36	252	10	0	0	298	576
<b>Grand Total</b>	<b>17</b>	<b>26</b>	<b>114</b>	<b>0</b>	<b>0</b>	<b>157</b>	<b>127</b>	<b>577</b>	<b>57</b>	<b>1</b>	<b>8</b>	<b>762</b>	<b>70</b>	<b>36</b>	<b>52</b>	<b>0</b>	<b>2</b>	<b>158</b>	<b>108</b>	<b>955</b>	<b>25</b>	<b>1</b>	<b>0</b>	<b>1089</b>	<b>2166</b>
<b>Approach%</b>	10.8%	16.6%	72.6%	0%	-	-	16.7%	75.7%	7.5%	0.1%	-	-	44.3%	22.8%	32.9%	0%	-	-	9.9%	87.7%	2.3%	0.1%	-	-	
<b>Totals %</b>	0.8%	1.2%	5.3%	0%	7.2%	5.9%	26.6%	2.6%	0%	35.2%	3.2%	1.7%	2.4%	0%	7.3%	5%	44.1%	1.2%	0%	50.3%	-	-	-	-	
<b>PHF</b>	0.71	0.59	0.95	0	0.89	0.93	0.92	0.68	0.25	0.92	0.88	0.75	0.81	0	0.88	0.75	0.95	0.63	0.25	0.91	-	-	-	-	
<b>Heavy</b>	4	2	10	0	16	7	66	6	0	79	5	3	15	0	23	6	96	2	0	104	-	-	-	-	
<b>Heavy %</b>	23.5%	7.7%	8.8%	0%	10.2%	5.5%	11.4%	10.5%	0%	10.4%	7.1%	8.3%	28.8%	0%	14.6%	5.6%	10.1%	8%	0%	9.6%	-	-	-	-	
<b>Lights</b>	13	24	104	0	141	120	511	51	1	683	65	33	37	0	135	102	859	23	1	985	-	-	-	-	
<b>Lights %</b>	76.5%	92.3%	91.2%	0%	89.8%	94.5%	88.6%	89.5%	100%	89.6%	92.9%	91.7%	71.2%	0%	85.4%	94.4%	89.9%	92%	100%	90.4%	-	-	-	-	
<b>Single-Unit Trucks</b>	4	2	6	0	12	1	31	5	0	37	3	2	7	0	12	4	48	2	0	54	-	-	-	-	
<b>Single-Unit Trucks %</b>	23.5%	7.7%	5.3%	0%	7.6%	0.8%	5.4%	8.8%	0%	4.9%	4.3%	5.6%	13.5%	0%	7.6%	3.7%	5%	8%	0%	5%	-	-	-	-	
<b>Buses</b>	0	0	4	0	4	6	11	0	0	17	0	1	0	0	1	0	9	0	0	9	-	-	-	-	
<b>Buses %</b>	0%	0%	3.5%	0%	2.5%	4.7%	1.9%	0%	0%	2.2%	0%	2.8%	0%	0%	0.6%	0%	0.9%	0%	0%	0.8%	-	-	-	-	
<b>Articulated Trucks</b>	0	0	0	0	0	0	24	1	0	25	2	0	8	0	10	2	39	0	0	41	-	-	-	-	
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	0%	4.2%	1.8%	0%	3.3%	2.9%	0%	15.4%	0%	6.3%	1.9%	4.1%	0%	0%	3.8%	-	-	-	-	
<b>Pedestrians</b>	-	-	-	-	0	-	-	-	-	8	-	-	-	-	2	-	-	-	-	0	-	-	-	-	
<b>Pedestrians%</b>	-	-	-	-	0%	-	-	-	-	80%	-	-	-	-	20%	-	-	-	-	0%	-	-	-	-	
<b>Bicycles on Crosswalk</b>	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	
<b>Bicycles on Crosswalk%</b>	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	
<b>Bicycles on Road</b>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	
<b>Bicycles on Road%</b>	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	



**Peak Hour: 07:30 AM - 08:30 AM Weather: Rain (2.5 °C)**

Start Time	E Approach REXDALE BLVD					S Approach REXDALE BOULEVARD WEST TO WOODBINE ACCESS					W Approach REXDALE BLVD					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
07:30:00	206	0	0	0	206	0	0	0	0	0	52	315	0	0	367	573
07:45:00	210	0	0	0	210	0	0	0	0	0	44	374	0	0	418	628
08:00:00	195	0	0	0	195	0	0	0	0	0	45	330	0	0	375	570
08:15:00	177	0	0	0	177	0	0	0	0	0	40	345	0	0	385	562
<b>Grand Total</b>	<b>788</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>788</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>181</b>	<b>1364</b>	<b>0</b>	<b>0</b>	<b>1545</b>	<b>2333</b>
<b>Approach%</b>	100%	0%	0%		-	0%	0%	0%		-	11.7%	88.3%	0%		-	-
<b>Totals %</b>	33.8%	0%	0%		33.8%	0%	0%	0%		0%	7.8%	58.5%	0%		66.2%	-
<b>PHF</b>	0.94	0	0		0.94	0	0	0		0	0.87	0.91	0		0.92	-
<b>Heavy</b>	82	0	0		82	0	0	0		0	3	105	0		108	-
<b>Heavy %</b>	10.4%	0%	0%		10.4%	0%	0%	0%		0%	1.7%	7.7%	0%		7%	-
<b>Lights</b>	706	0	0		706	0	0	0		0	178	1259	0		1437	-
<b>Lights %</b>	89.6%	0%	0%		89.6%	0%	0%	0%		0%	98.3%	92.3%	0%		93%	-
<b>Single-Unit Trucks</b>	26	0	0		26	0	0	0		0	2	51	0		53	-
<b>Single-Unit Trucks %</b>	3.3%	0%	0%		3.3%	0%	0%	0%		0%	1.1%	3.7%	0%		3.4%	-
<b>Buses</b>	24	0	0		24	0	0	0		0	1	23	0		24	-
<b>Buses %</b>	3%	0%	0%		3%	0%	0%	0%		0%	0.6%	1.7%	0%		1.6%	-
<b>Articulated Trucks</b>	32	0	0		32	0	0	0		0	0	31	0		31	-
<b>Articulated Trucks %</b>	4.1%	0%	0%		4.1%	0%	0%	0%		0%	0%	2.3%	0%		2%	-
<b>Pedestrians</b>	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
<b>Pedestrians%</b>	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-



**Peak Hour: 07:30 AM - 08:30 AM Weather: Rain (2.5 °C)**

Start Time	N Approach WOODBINE CENTRE ACCESS					E Approach REXDALE BLVD					W Approach REXDALE BLVD					Int. Total (15 min)
	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	Thru	Left	U-Turn	Peds	Approach Total	
07:30:00	0	0	0	0	0	3	153	0	0	156	268	0	0	1	268	424
07:45:00	4	0	0	0	4	2	150	0	0	152	303	0	0	0	303	459
08:00:00	3	0	0	0	3	9	134	0	0	143	265	0	0	0	265	411
08:15:00	2	0	0	0	2	9	145	0	0	154	310	0	0	0	310	466
<b>Grand Total</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>23</b>	<b>582</b>	<b>0</b>	<b>0</b>	<b>605</b>	<b>1146</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1146</b>	<b>1760</b>
<b>Approach%</b>	100%	0%	0%		-	3.8%	96.2%	0%		-	100%	0%	0%		-	-
<b>Totals %</b>	0.5%	0%	0%		0.5%	1.3%	33.1%	0%		34.4%	65.1%	0%	0%		65.1%	-
<b>PHF</b>	0.56	0	0		0.56	0.64	0.95	0		0.97	0.92	0	0		0.92	-
<b>Heavy</b>	0	0	0		0	1	84	0		85	102	0	0		102	-
<b>Heavy %</b>	0%	0%	0%		0%	4.3%	14.4%	0%		14%	8.9%	0%	0%		8.9%	-
<b>Lights</b>	9	0	0		9	22	498	0		520	1044	0	0		1044	-
<b>Lights %</b>	100%	0%	0%		100%	95.7%	85.6%	0%		86%	91.1%	0%	0%		91.1%	-
<b>Single-Unit Trucks</b>	0	0	0		0	0	35	0		35	51	0	0		51	-
<b>Single-Unit Trucks %</b>	0%	0%	0%		0%	0%	6%	0%		5.8%	4.5%	0%	0%		4.5%	-
<b>Buses</b>	0	0	0		0	0	18	0		18	18	0	0		18	-
<b>Buses %</b>	0%	0%	0%		0%	0%	3.1%	0%		3%	1.6%	0%	0%		1.6%	-
<b>Articulated Trucks</b>	0	0	0		0	1	31	0		32	33	0	0		33	-
<b>Articulated Trucks %</b>	0%	0%	0%		0%	4.3%	5.3%	0%		5.3%	2.9%	0%	0%		2.9%	-
<b>Pedestrians</b>	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
<b>Pedestrians%</b>	-	-	-	0%	-	-	-	-	0%	-	-	-	-	100%	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
<b>Bicycles on Crosswalk%</b>	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-



**Peak Hour: 07:45 AM - 08:45 AM Weather: Rain (2.5 °C)**

Start Time	E Approach REXDALE BLVD		S Approach WOODBINE TO REXDALE BOULEVARD EAST ACCESS (EAST)			W Approach REXDALE BLVD			Int. Total (15 min)
	Peds	Approach Total	Right	Peds	Approach Total	Thru	Peds	Approach Total	
07:45:00	0	0	15	0	15	301	0	301	316
08:00:00	0	0	14	0	14	252	0	252	266
08:15:00	0	0	16	0	16	314	0	314	330
08:30:00	0	0	11	0	11	284	1	284	295
<b>Grand Total</b>	0	0	56	0	56	1151	1	1151	<b>1207</b>
<b>Approach%</b>	-	-	100%	-	-	100%	-	-	-
<b>Totals %</b>		0%	4.6%		4.6%	95.4%		95.4%	-
<b>PHF</b>		0	0.88		0.88	0.92		0.92	-
<b>Heavy</b>		0	1		1	111		111	-
<b>Heavy %</b>		0%	1.8%		1.8%	9.6%		9.6%	-
<b>Lights</b>		0	55		55	1040		1040	-
<b>Lights %</b>		0%	98.2%		98.2%	90.4%		90.4%	-
<b>Single-Unit Trucks</b>		0	1		1	55		55	-
<b>Single-Unit Trucks %</b>		0%	1.8%		1.8%	4.8%		4.8%	-
<b>Buses</b>		0	0		0	19		19	-
<b>Buses %</b>		0%	0%		0%	1.7%		1.7%	-
<b>Articulated Trucks</b>		0	0		0	37		37	-
<b>Articulated Trucks %</b>		0%	0%		0%	3.2%		3.2%	-
<b>Pedestrians</b>	0	-	-	0	-	-	1	-	-
<b>Pedestrians%</b>	0%	-	-	0%	-	-	100%	-	-
<b>Bicycles on Road</b>	0	-	0	0	-	0	0	-	-
<b>Bicycles on Road%</b>	0%	-	-	0%	-	-	0%	-	-



**Peak Hour: 07:45 AM - 08:45 AM Weather: Rain (2.5 °C)**

Start Time	E Approach REXDALE BLVD					S Approach WOODBINE TO REXDALE BOULEVARD EAST ACCESS (WEST)					W Approach REXDALE BLVD					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
07:45:00	0	0	0	0	0	3	0	0	0	3	0	361	0	0	361	364
08:00:00	0	0	0	0	0	4	0	0	0	4	0	325	0	0	325	329
08:15:00	0	0	0	0	0	0	0	0	0	0	0	345	0	0	345	345
08:30:00	0	0	0	0	0	0	0	0	0	0	0	326	0	0	326	326
<b>Grand Total</b>	0	0	0	0	0	7	0	0	0	7	0	1357	0	0	1357	<b>1364</b>
<b>Approach%</b>	0%	0%	0%	-	100%	0%	0%	-	0%	100%	0%	0%	-	-	-	-
<b>Totals %</b>	0%	0%	0%	0%	0.5%	0%	0%	0.5%	0%	99.5%	0%	99.5%	-	-	-	-
<b>PHF</b>	0	0	0	0	0.44	0	0	0.44	0	0.94	0	0.94	-	-	-	-
<b>Heavy</b>	0	0	0	0	1	0	0	1	0	111	0	111	-	-	-	-
<b>Heavy %</b>	0%	0%	0%	0%	14.3%	0%	0%	14.3%	0%	8.2%	0%	8.2%	-	-	-	-
<b>Lights</b>	0	0	0	0	6	0	0	6	0	1246	0	1246	-	-	-	-
<b>Lights %</b>	0%	0%	0%	0%	85.7%	0%	0%	85.7%	0%	91.8%	0%	91.8%	-	-	-	-
<b>Single-Unit Trucks</b>	0	0	0	0	1	0	0	1	0	55	0	55	-	-	-	-
<b>Single-Unit Trucks %</b>	0%	0%	0%	0%	14.3%	0%	0%	14.3%	0%	4.1%	0%	4.1%	-	-	-	-
<b>Buses</b>	0	0	0	0	0	0	0	0	0	22	0	22	-	-	-	-
<b>Buses %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	1.6%	0%	1.6%	-	-	-	-
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	0	34	0	34	-	-	-	-
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	2.5%	0%	2.5%	-	-	-	-
<b>Pedestrians</b>	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	-
<b>Pedestrians%</b>	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-



**Peak Hour: 07:30 AM - 08:30 AM Weather: Rain (2.5 °C)**

Start Time	N Approach HIGHWAY 27		E Approach WOODBINE ACCESS TO HIGHWAY 27 NORTH			S Approach HIGHWAY 27			Int. Total (15 min)
	Peds	Approach Total	Right	Peds	Approach Total	Thru	Peds	Approach Total	
07:30:00	0	0	4	0	4	311	0	311	315
07:45:00	0	0	6	0	6	314	0	314	320
08:00:00	0	0	10	0	10	272	0	272	282
08:15:00	0	0	9	0	9	265	0	265	274
<b>Grand Total</b>	0	0	29	0	29	1162	0	1162	<b>1191</b>
<b>Approach%</b>	-	-	100%	-	-	100%	-	-	-
<b>Totals %</b>	0%	0%	2.4%	0%	2.4%	97.6%	0%	97.6%	-
<b>PHF</b>	0	0	0.73	0	0.73	0.93	0	0.93	-
<b>Heavy</b>	0	0	2	0	2	88	0	88	-
<b>Heavy %</b>	0%	0%	6.9%	0%	6.9%	7.6%	0%	7.6%	-
<b>Lights</b>	0	0	27	0	27	1074	0	1074	-
<b>Lights %</b>	0%	0%	93.1%	0%	93.1%	92.4%	0%	92.4%	-
<b>Single-Unit Trucks</b>	0	0	2	0	2	53	0	53	-
<b>Single-Unit Trucks %</b>	0%	0%	6.9%	0%	6.9%	4.6%	0%	4.6%	-
<b>Buses</b>	0	0	0	0	0	24	0	24	-
<b>Buses %</b>	0%	0%	0%	0%	0%	2.1%	0%	2.1%	-
<b>Articulated Trucks</b>	0	0	0	0	0	11	0	11	-
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	0.9%	0%	0.9%	-



**Peak Hour: 08:00 AM - 09:00 AM Weather: Rain (2.5 °C)**

Start Time	N Approach HIGHWAY 27					S Approach HIGHWAY 27				W Approach WOODBINE ACCESS TO HIGHWAY 27 SOUTH					Int. Total (15 min)
	Right	Thru	U-Turn	Peds	Approach Total	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	
08:00:00	0	311	0	0	311	0	0	0	0	18	0	0	0	18	329
08:15:00	0	314	0	0	314	0	0	0	0	6	0	0	0	6	320
08:30:00	0	307	0	0	307	0	0	0	0	8	0	0	0	8	315
08:45:00	0	305	0	0	305	0	0	0	0	9	0	0	0	9	314
<b>Grand Total</b>	0	1237	0	0	1237	0	0	0	0	41	0	0	0	41	<b>1278</b>
<b>Approach%</b>	0%	100%	0%		-	0%	0%		-	100%	0%	0%		-	-
<b>Totals %</b>	0%	96.8%	0%		96.8%	0%	0%		0%	3.2%	0%	0%		3.2%	-
<b>PHF</b>	0	0.98	0		0.98	0	0		0	0.57	0	0		0.57	-
<b>Heavy</b>	0	125	0		125	0	0		0	1	0	0		1	-
<b>Heavy %</b>	0%	10.1%	0%		10.1%	0%	0%		0%	2.4%	0%	0%		2.4%	-
<b>Lights</b>	0	1112	0		1112	0	0		0	40	0	0		40	-
<b>Lights %</b>	0%	89.9%	0%		89.9%	0%	0%		0%	97.6%	0%	0%		97.6%	-
<b>Single-Unit Trucks</b>	0	71	0		71	0	0		0	1	0	0		1	-
<b>Single-Unit Trucks %</b>	0%	5.7%	0%		5.7%	0%	0%		0%	2.4%	0%	0%		2.4%	-
<b>Buses</b>	0	36	0		36	0	0		0	0	0	0		0	-
<b>Buses %</b>	0%	2.9%	0%		2.9%	0%	0%		0%	0%	0%	0%		0%	-
<b>Articulated Trucks</b>	0	18	0		18	0	0		0	0	0	0		0	-
<b>Articulated Trucks %</b>	0%	1.5%	0%		1.5%	0%	0%		0%	0%	0%	0%		0%	-





**Peak Hour: 04:30 PM - 05:30 PM Weather: Rain (3.7 °C)**

Start Time	E Approach ENTRANCE RD					S Approach CARLINGVIEW DR					W Approach ENTRANCE RD					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
16:30:00	2	6	0	0	8	25	111	0	0	136	7	1	0	0	8	152
16:45:00	2	6	0	0	8	31	93	0	0	124	7	4	0	0	11	143
17:00:00	5	4	0	0	9	48	124	0	0	172	2	0	0	0	2	183
17:15:00	2	4	0	0	6	36	111	0	0	147	7	2	0	0	9	162
<b>Grand Total</b>	<b>11</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>31</b>	<b>140</b>	<b>439</b>	<b>0</b>	<b>0</b>	<b>579</b>	<b>23</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>30</b>	<b>640</b>
<b>Approach%</b>	35.5%	64.5%	0%	-	-	24.2%	75.8%	0%	-	-	76.7%	23.3%	0%	-	-	-
<b>Totals %</b>	1.7%	3.1%	0%	4.8%	4.8%	21.9%	68.6%	0%	90.5%	90.5%	3.6%	1.1%	0%	4.7%	4.7%	-
<b>PHF</b>	0.55	0.83	0	0.86	0.86	0.73	0.89	0	0.84	0.84	0.82	0.44	0	0.68	0.68	-
<b>Heavy</b>	0	1	0	1	1	19	5	0	24	24	2	0	0	2	2	-
<b>Heavy %</b>	0%	5%	0%	3.2%	3.2%	13.6%	1.1%	0%	4.1%	4.1%	8.7%	0%	0%	6.7%	6.7%	-
<b>Lights</b>	11	19	0	30	30	121	434	0	555	555	21	7	0	28	28	-
<b>Lights %</b>	100%	95%	0%	96.8%	96.8%	86.4%	98.9%	0%	95.9%	95.9%	91.3%	100%	0%	93.3%	93.3%	-
<b>Single-Unit Trucks</b>	0	0	0	0	0	19	2	0	21	21	2	0	0	2	2	-
<b>Single-Unit Trucks %</b>	0%	0%	0%	0%	0%	13.6%	0.5%	0%	3.6%	3.6%	8.7%	0%	0%	6.7%	6.7%	-
<b>Buses</b>	0	1	0	1	1	0	3	0	3	3	0	0	0	0	0	-
<b>Buses %</b>	0%	5%	0%	3.2%	3.2%	0%	0.7%	0%	0.5%	0.5%	0%	0%	0%	0%	0%	-
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-



**Peak Hour: 04:30 PM - 05:30 PM Weather: Rain (3.7 °C)**

Start Time	N Approach GOREWAY DR					E Approach CLUB HOUSE RD ( GOREWAY DRIVE AT WOODBINE ENTRANCE					S Approach GOREWAY DR					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
16:30:00	85	6	0	0	91	22	1	0	0	23	37	408	0	0	445	559
16:45:00	86	8	0	0	94	10	3	0	0	13	31	364	1	0	396	503
17:00:00	83	9	0	0	92	23	2	0	0	25	13	462	0	0	475	592
17:15:00	67	8	0	0	75	33	2	0	0	35	30	442	0	0	472	582
<b>Grand Total</b>	<b>321</b>	<b>31</b>	<b>0</b>	<b>0</b>	<b>352</b>	<b>88</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>96</b>	<b>111</b>	<b>1676</b>	<b>1</b>	<b>0</b>	<b>1788</b>	<b>2236</b>
<b>Approach%</b>	91.2%	8.8%	0%	-	-	91.7%	8.3%	0%	-	-	6.2%	93.7%	0.1%	-	-	-
<b>Totals %</b>	14.4%	1.4%	0%	15.7%	3.9%	0.4%	0%	4.3%	5%	75%	0%	80%	-	-	-	-
<b>PHF</b>	0.93	0.86	0	0.94	0.67	0.67	0	0.69	0.75	0.91	0.25	0.94	-	-	-	-
<b>Heavy</b>	41	4	0	45	0	0	0	0	2	71	0	73	-	-	-	-
<b>Heavy %</b>	12.8%	12.9%	0%	12.8%	0%	0%	0%	0%	1.8%	4.2%	0%	4.1%	-	-	-	-
<b>Lights</b>	280	27	0	307	88	8	0	96	109	1605	1	1715	-	-	-	-
<b>Lights %</b>	87.2%	87.1%	0%	87.2%	100%	100%	0%	100%	98.2%	95.8%	100%	95.9%	-	-	-	-
<b>Single-Unit Trucks</b>	24	4	0	28	0	0	0	0	2	42	0	44	-	-	-	-
<b>Single-Unit Trucks %</b>	7.5%	12.9%	0%	8%	0%	0%	0%	0%	1.8%	2.5%	0%	2.5%	-	-	-	-
<b>Buses</b>	6	0	0	6	0	0	0	0	0	9	0	9	-	-	-	-
<b>Buses %</b>	1.9%	0%	0%	1.7%	0%	0%	0%	0%	0%	0.5%	0%	0.5%	-	-	-	-
<b>Articulated Trucks</b>	11	0	0	11	0	0	0	0	0	20	0	20	-	-	-	-
<b>Articulated Trucks %</b>	3.4%	0%	0%	3.1%	0%	0%	0%	0%	0%	1.2%	0%	1.1%	-	-	-	-
<b>Bicycles on Road</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Bicycles on Road%</b>	-	-	-	%	-	-	-	%	-	-	-	%	-	-	-	-



**Peak Hour: 04:30 PM - 05:30 PM Weather: Rain (3.7 °C)**

Start Time	N Approach REXDALE BLVD WB ON/OFF RAMP					E Approach GRANDSTAND ENTRANCE RD					W Approach ENTRANCE RD					Int. Total (15 min)
	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	Thru	Left	U-Turn	Peds	Approach Total	
	16:30:00	11	21	0	0	32	158	11	0	0	169	61	101	0	0	
16:45:00	8	15	0	0	23	103	7	0	0	110	37	112	0	0	149	282
17:00:00	18	17	0	0	35	121	7	0	0	128	54	115	0	0	169	332
17:15:00	18	25	0	0	43	143	7	0	0	150	46	112	0	0	158	351
<b>Grand Total</b>	55	78	0	0	133	525	32	0	0	557	198	440	0	0	638	<b>1328</b>
<b>Approach%</b>	41.4%	58.6%	0%	-	-	94.3%	5.7%	0%	-	-	31%	69%	0%	-	-	-
<b>Totals %</b>	4.1%	5.9%	0%	10%	39.5%	2.4%	0%	41.9%	14.9%	33.1%	0%	48%	-	-	-	-
<b>PHF</b>	0.76	0.78	0	0.77	0.83	0.73	0	0.82	0.81	0.96	0	0.94	-	-	-	-
<b>Heavy</b>	1	0	0	1	6	1	0	7	5	5	0	10	-	-	-	-
<b>Heavy %</b>	1.8%	0%	0%	0.8%	1.1%	3.1%	0%	1.3%	2.5%	1.1%	0%	1.6%	-	-	-	-
<b>Lights</b>	54	78	0	132	519	31	0	550	193	435	0	628	-	-	-	-
<b>Lights %</b>	98.2%	100%	0%	99.2%	98.9%	96.9%	0%	98.7%	97.5%	98.9%	0%	98.4%	-	-	-	-
<b>Single-Unit Trucks</b>	1	0	0	1	2	1	0	3	2	4	0	6	-	-	-	-
<b>Single-Unit Trucks %</b>	1.8%	0%	0%	0.8%	0.4%	3.1%	0%	0.5%	1%	0.9%	0%	0.9%	-	-	-	-
<b>Buses</b>	0	0	0	0	4	0	0	4	3	1	0	4	-	-	-	-
<b>Buses %</b>	0%	0%	0%	0%	0.8%	0%	0%	0.7%	1.5%	0.2%	0%	0.6%	-	-	-	-
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-	-	-
<b>Bicycles on Road</b>	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-
<b>Bicycles on Road%</b>	-	-	-	%	-	-	-	%	-	-	-	%	-	-	-	-



**Peak Hour: 04:00 PM - 05:00 PM Weather: Rain (3.7 °C)**

Start Time	N Approach HIGHWAY 27				S Approach HIGHWAY 27		W Approach HIGHWAY 27 NORTH TO WOODBINE ACCESS		Int. Total (15 min)
	Right	Thru	Peds	Approach Total	Peds	Approach Total	Peds	Approach Total	
16:00:00	16	303	0	319	0	0	0	0	319
16:15:00	14	305	0	319	0	0	0	0	319
16:30:00	20	321	0	341	0	0	0	0	341
16:45:00	21	345	0	366	0	0	0	0	366
<b>Grand Total</b>	<b>71</b>	<b>1274</b>	<b>0</b>	<b>1345</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1345</b>
<b>Approach%</b>	5.3%	94.7%	-	-	-	-	-	-	-
<b>Totals %</b>	5.3%	94.7%	100%	0%	0%	0%	0%	0%	-
<b>PHF</b>	0.85	0.92	0.92	0	0	0	0	0	-
<b>Heavy</b>	3	72	75	0	0	0	0	0	-
<b>Heavy %</b>	4.2%	5.7%	5.6%	0%	0%	0%	0%	0%	-
<b>Lights</b>	68	1202	1270	0	0	0	0	0	-
<b>Lights %</b>	95.8%	94.3%	94.4%	0%	0%	0%	0%	0%	-
<b>Single-Unit Trucks</b>	1	26	27	0	0	0	0	0	-
<b>Single-Unit Trucks %</b>	1.4%	2%	2%	0%	0%	0%	0%	0%	-
<b>Buses</b>	2	27	29	0	0	0	0	0	-
<b>Buses %</b>	2.8%	2.1%	2.2%	0%	0%	0%	0%	0%	-
<b>Articulated Trucks</b>	0	19	19	0	0	0	0	0	-
<b>Articulated Trucks %</b>	0%	1.5%	1.4%	0%	0%	0%	0%	0%	-



**Peak Hour: 04:45 PM - 05:45 PM Weather: Rain (3.7 °C)**

Start Time	N Approach HIGHWAY 27					E Approach HIGHWAY 27 SOUTH TO WOODBINE ACCESS					S Approach HIGHWAY 27					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
16:45:00	0	0	0	0	0	0	0	0	0	0	117	431	0	0	548	548
17:00:00	0	0	0	0	0	0	0	0	0	0	121	421	0	0	542	542
17:15:00	0	0	0	0	0	0	0	0	0	0	129	432	0	0	561	561
17:30:00	0	0	0	0	0	0	0	0	0	0	136	412	0	0	548	548
<b>Grand Total</b>	0	0	0	0	0	0	0	0	0	0	503	1696	0	0	2199	<b>2199</b>
<b>Approach%</b>	0%	0%	0%		-	0%	0%	0%		-	22.9%	77.1%	0%		-	-
<b>Totals %</b>	0%	0%	0%		0%	0%	0%	0%		0%	22.9%	77.1%	0%		100%	-
<b>PHF</b>	0	0	0		0	0	0	0		0	0.92	0.98	0		0.98	-
<b>Heavy</b>	0	0	0		0	0	0	0		0	5	101	0		106	-
<b>Heavy %</b>	0%	0%	0%		0%	0%	0%	0%		0%	1%	6%	0%		4.8%	-
<b>Lights</b>	0	0	0		0	0	0	0		0	498	1595	0		2093	-
<b>Lights %</b>	0%	0%	0%		0%	0%	0%	0%		0%	99%	94%	0%		95.2%	-
<b>Single-Unit Trucks</b>	0	0	0		0	0	0	0		0	3	36	0		39	-
<b>Single-Unit Trucks %</b>	0%	0%	0%		0%	0%	0%	0%		0%	0.6%	2.1%	0%		1.8%	-
<b>Buses</b>	0	0	0		0	0	0	0		0	1	22	0		23	-
<b>Buses %</b>	0%	0%	0%		0%	0%	0%	0%		0%	0.2%	1.3%	0%		1%	-
<b>Articulated Trucks</b>	0	0	0		0	0	0	0		0	1	43	0		44	-
<b>Articulated Trucks %</b>	0%	0%	0%		0%	0%	0%	0%		0%	0.2%	2.5%	0%		2%	-



**Peak Hour: 04:30 PM - 05:30 PM Weather: Rain (3.7 °C)**

Start Time	N Approach HIGHWAY 27					E Approach NEARCTIC DR					S Approach HIGHWAY 27					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
16:30:00	329	0	0	0	329	5	0	0	0	5	39	362	0	0	401	735
16:45:00	353	0	0	0	353	7	0	0	0	7	42	388	0	0	430	790
17:00:00	288	0	0	0	288	3	0	0	2	3	20	409	0	0	429	720
17:15:00	274	0	0	0	274	3	1	0	0	4	23	397	0	0	420	698
<b>Grand Total</b>	1244	0	0	0	1244	18	1	0	2	19	124	1556	0	0	1680	<b>2943</b>
<b>Approach%</b>	100%	0%	0%		-	94.7%	5.3%	0%		-	7.4%	92.6%	0%		-	-
<b>Totals %</b>	42.3%	0%	0%		42.3%	0.6%	0%	0%		0.6%	4.2%	52.9%	0%		57.1%	-
<b>PHF</b>	0.88	0	0		0.88	0.64	0.25	0		0.68	0.74	0.95	0		0.98	-
<b>Heavy</b>	55	0	0		55	1	0	0		1	10	87	0		97	-
<b>Heavy %</b>	4.4%	0%	0%		4.4%	5.6%	0%	0%		5.3%	8.1%	5.6%	0%		5.8%	-
<b>Lights</b>	1189	0	0		1189	17	1	0		18	114	1469	0		1583	-
<b>Lights %</b>	95.6%	0%	0%		95.6%	94.4%	100%	0%		94.7%	91.9%	94.4%	0%		94.2%	-
<b>Single-Unit Trucks</b>	23	0	0		23	0	0	0		0	6	41	0		47	-
<b>Single-Unit Trucks %</b>	1.8%	0%	0%		1.8%	0%	0%	0%		0%	4.8%	2.6%	0%		2.8%	-
<b>Buses</b>	21	0	0		21	0	0	0		0	2	20	0		22	-
<b>Buses %</b>	1.7%	0%	0%		1.7%	0%	0%	0%		0%	1.6%	1.3%	0%		1.3%	-
<b>Articulated Trucks</b>	11	0	0		11	1	0	0		1	2	26	0		28	-
<b>Articulated Trucks %</b>	0.9%	0%	0%		0.9%	5.6%	0%	0%		5.3%	1.6%	1.7%	0%		1.7%	-
<b>Pedestrians</b>	-	-	-	0	-	-	-	-	2	-	-	-	-	0	-	-
<b>Pedestrians%</b>	-	-	-	0%	-	-	-	-	100%	-	-	-	-	0%	-	-
<b>Bicycles on Road</b>	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-
<b>Bicycles on Road%</b>	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-





**Peak Hour: 04:00 PM - 05:00 PM Weather: Partly Cloudy (5.0 °C)**

Start Time	N Approach HWY 27						E Approach BELFIELD RD						S Approach HWY 27						W Approach BELFIELD RD						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:00:00	29	237	32	0	1	298	107	45	72	0	0	224	48	359	23	0	0	430	23	87	80	0	1	190	1142
16:15:00	36	302	49	0	1	387	92	39	48	0	0	179	53	357	15	0	1	425	24	69	68	0	0	161	1152
16:30:00	21	329	49	0	0	399	131	80	68	0	0	279	57	379	27	0	1	463	25	58	60	0	1	143	1284
16:45:00	28	266	45	0	0	339	114	46	72	0	0	232	49	349	16	1	0	415	25	81	78	0	0	184	1170
<b>Grand Total</b>	114	1134	175	0	2	1423	444	210	260	0	0	914	207	1444	81	1	2	1733	97	295	286	0	2	678	<b>4748</b>
<b>Approach%</b>	8%	79.7%	12.3%	0%	-	-	48.6%	23%	28.4%	0%	-	11.9%	83.3%	4.7%	0.1%	-	-	14.3%	43.5%	42.2%	0%	-	-	-	-
<b>Totals %</b>	2.4%	23.9%	3.7%	0%	30%	9.4%	4.4%	5.5%	0%	19.3%	4.4%	30.4%	1.7%	0%	36.5%	2%	6.2%	6%	0%	14.3%	-	-	-	-	-
<b>PHF</b>	0.79	0.86	0.89	0	0.89	0.85	0.66	0.9	0	0.82	0.91	0.95	0.75	0.25	0.94	0.97	0.85	0.89	0	0.89	-	-	-	-	-
<b>Heavy</b>	16	36	9	0	61	16	47	13	0	76	19	76	16	0	111	6	49	18	0	73	-	-	-	-	-
<b>Heavy %</b>	14%	3.2%	5.1%	0%	4.3%	3.6%	22.4%	5%	0%	8.3%	9.2%	5.3%	19.8%	0%	6.4%	6.2%	16.6%	6.3%	0%	10.8%	-	-	-	-	-
<b>Lights</b>	98	1098	166	0	1362	428	163	247	0	838	188	1368	65	1	1622	91	246	268	0	605	-	-	-	-	-
<b>Lights %</b>	86%	96.8%	94.9%	0%	95.7%	96.4%	77.6%	95%	0%	91.7%	90.8%	94.7%	80.2%	100%	93.6%	93.8%	83.4%	93.7%	0%	89.2%	-	-	-	-	-
<b>Single-Unit Trucks</b>	7	13	4	0	24	9	22	7	0	38	9	35	11	0	55	2	15	8	0	25	-	-	-	-	-
<b>Single-Unit Trucks %</b>	6.1%	1.1%	2.3%	0%	1.7%	2%	10.5%	2.7%	0%	4.2%	4.3%	2.4%	13.6%	0%	3.2%	2.1%	5.1%	2.8%	0%	3.7%	-	-	-	-	-
<b>Buses</b>	5	19	0	0	24	0	4	2	0	6	2	22	1	0	25	0	4	5	0	9	-	-	-	-	-
<b>Buses %</b>	4.4%	1.7%	0%	0%	1.7%	0%	1.9%	0.8%	0%	0.7%	1%	1.5%	1.2%	0%	1.4%	0%	1.4%	1.7%	0%	1.3%	-	-	-	-	-
<b>Articulated Trucks</b>	4	4	5	0	13	7	21	4	0	32	8	19	4	0	31	4	30	5	0	39	-	-	-	-	-
<b>Articulated Trucks %</b>	3.5%	0.4%	2.9%	0%	0.9%	1.6%	10%	1.5%	0%	3.5%	3.9%	1.3%	4.9%	0%	1.8%	4.1%	10.2%	1.7%	0%	5.8%	-	-	-	-	-
<b>Pedestrians</b>	-	-	-	-	2	-	-	-	-	0	-	-	-	-	2	-	-	-	-	2	-	-	-	-	-
<b>Pedestrians%</b>	-	-	-	-	33.3%	-	-	-	0%	-	-	-	-	33.3%	-	-	-	-	33.3%	-	-	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-
<b>Bicycles on Crosswalk%</b>	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-
<b>Bicycles on Road</b>	0	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	0	-	-	-	-
<b>Bicycles on Road%</b>	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-



**Peak Hour: 04:30 PM - 05:30 PM Weather: Partly Cloudy (5.0 °C)**

Start Time	N Approach REXDALE BLVD						E Approach HIGHWAY 27						S Approach REXDALE BLVD						W Approach HIGHWAY 27						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:30:00	26	246	32	0	1	304	24	272	48	0	0	344	41	261	60	0	0	362	38	184	48	1	1	271	1281
16:45:00	16	227	35	0	4	278	24	271	32	0	0	327	41	278	57	0	0	376	25	182	59	4	0	270	1251
17:00:00	18	259	26	1	1	304	20	284	30	0	0	334	58	277	66	1	0	402	40	186	48	3	0	277	1317
17:15:00	26	214	36	1	4	277	25	289	42	0	0	356	43	308	55	0	0	406	40	215	51	0	2	306	1345
<b>Grand Total</b>	<b>86</b>	<b>946</b>	<b>129</b>	<b>2</b>	<b>10</b>	<b>1163</b>	<b>93</b>	<b>1116</b>	<b>152</b>	<b>0</b>	<b>0</b>	<b>1361</b>	<b>183</b>	<b>1124</b>	<b>238</b>	<b>1</b>	<b>0</b>	<b>1546</b>	<b>143</b>	<b>767</b>	<b>206</b>	<b>8</b>	<b>3</b>	<b>1124</b>	<b>5194</b>
<b>Approach%</b>	7.4%	81.3%	11.1%	0.2%	-	-	6.8%	82%	11.2%	0%	-	-	11.8%	72.7%	15.4%	0.1%	-	-	12.7%	68.2%	18.3%	0.7%	-	-	-
<b>Totals %</b>	1.7%	18.2%	2.5%	0%	-	22.4%	1.8%	21.5%	2.9%	0%	-	26.2%	3.5%	21.6%	4.6%	0%	-	29.8%	2.8%	14.8%	4%	0.2%	-	21.6%	-
<b>PHF</b>	0.83	0.91	0.9	0.5	-	0.96	0.93	0.97	0.79	0	-	0.96	0.79	0.91	0.9	0.25	-	0.95	0.89	0.89	0.87	0.5	-	0.92	-
<b>Heavy</b>	7	44	13	0	-	64	10	61	5	0	-	76	15	51	17	0	-	83	13	55	3	0	-	71	-
<b>Heavy %</b>	8.1%	4.7%	10.1%	0%	-	5.5%	10.8%	5.5%	3.3%	0%	-	5.6%	8.2%	4.5%	7.1%	0%	-	5.4%	9.1%	7.2%	1.5%	0%	-	6.3%	-
<b>Lights</b>	79	902	116	2	-	1099	83	1055	147	0	-	1285	168	1073	221	1	-	1463	130	712	203	8	-	1053	-
<b>Lights %</b>	91.9%	95.3%	89.9%	100%	-	94.5%	89.2%	94.5%	96.7%	0%	-	94.4%	91.8%	95.5%	92.9%	100%	-	94.6%	90.9%	92.8%	98.5%	100%	-	93.7%	-
<b>Single-Unit Trucks</b>	2	15	7	0	-	24	6	29	3	0	-	38	9	20	9	0	-	38	2	34	3	0	-	39	-
<b>Single-Unit Trucks %</b>	2.3%	1.6%	5.4%	0%	-	2.1%	6.5%	2.6%	2%	0%	-	2.8%	4.9%	1.8%	3.8%	0%	-	2.5%	1.4%	4.4%	1.5%	0%	-	3.5%	-
<b>Buses</b>	3	17	0	0	-	20	0	8	1	0	-	9	0	17	1	0	-	18	7	3	0	0	-	10	-
<b>Buses %</b>	3.5%	1.8%	0%	0%	-	1.7%	0%	0.7%	0.7%	0%	-	0.7%	0%	1.5%	0.4%	0%	-	1.2%	4.9%	0.4%	0%	0%	-	0.9%	-
<b>Articulated Trucks</b>	2	12	6	0	-	20	4	24	1	0	-	29	6	14	7	0	-	27	4	18	0	0	-	22	-
<b>Articulated Trucks %</b>	2.3%	1.3%	4.7%	0%	-	1.7%	4.3%	2.2%	0.7%	0%	-	2.1%	3.3%	1.2%	2.9%	0%	-	1.7%	2.8%	2.3%	0%	0%	-	2%	-
<b>Pedestrians</b>	-	-	-	-	9	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-	3	-	-
<b>Pedestrians%</b>	-	-	-	-	69.2%	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	-	23.1%	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	1	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-
<b>Bicycles on Crosswalk%</b>	-	-	-	-	7.7%	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	-	0%	-	-
<b>Bicycles on Road</b>	0	0	0	0	0	-	0	0	0	0	-	-	0	0	0	0	-	-	1	0	0	0	0	-	-
<b>Bicycles on Road%</b>	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	-	0%	-	-



**Peak Hour: 05:00 PM - 06:00 PM Weather: Rain (3.7 °C)**

Start Time	N Approach HUMBERWOOD BLVD					E Approach REXDALE BLVD					W Approach REXDALE BLVD					Int. Total (15 min)
	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	Thru	Left	U-Turn	Peds	Approach Total	
17:00:00	36	47	0	5	83	105	550	0	0	655	264	55	3	5	322	1060
17:15:00	30	62	0	3	92	97	555	0	0	652	312	59	2	1	373	1117
17:30:00	32	65	0	1	97	103	552	1	1	656	293	71	2	4	366	1119
17:45:00	34	60	0	5	94	115	547	0	1	662	310	62	3	1	375	1131
<b>Grand Total</b>	<b>132</b>	<b>234</b>	<b>0</b>	<b>14</b>	<b>366</b>	<b>420</b>	<b>2204</b>	<b>1</b>	<b>2</b>	<b>2625</b>	<b>1179</b>	<b>247</b>	<b>10</b>	<b>11</b>	<b>1436</b>	<b>4427</b>
<b>Approach%</b>	36.1%	63.9%	0%	-	-	16%	84%	0%	-	-	82.1%	17.2%	0.7%	-	-	-
<b>Totals %</b>	3%	5.3%	0%	8.3%	9.5%	49.8%	0%	59.3%	26.6%	5.6%	0.2%	32.4%	-	-	-	-
<b>PHF</b>	0.92	0.9	0	0.94	0.91	0.99	0.25	0.99	0.94	0.87	0.83	0.96	-	-	-	-
<b>Heavy</b>	1	3	0	4	6	101	0	107	92	1	0	93	-	-	-	-
<b>Heavy %</b>	0.8%	1.3%	0%	1.1%	1.4%	4.6%	0%	4.1%	7.8%	0.4%	0%	6.5%	-	-	-	-
<b>Lights</b>	131	231	0	362	414	2103	1	2518	1087	246	10	1343	-	-	-	-
<b>Lights %</b>	99.2%	98.7%	0%	98.9%	98.6%	95.4%	100%	95.9%	92.2%	99.6%	100%	93.5%	-	-	-	-
<b>Single-Unit Trucks</b>	1	1	0	2	2	39	0	41	45	1	0	46	-	-	-	-
<b>Single-Unit Trucks %</b>	0.8%	0.4%	0%	0.5%	0.5%	1.8%	0%	1.6%	3.8%	0.4%	0%	3.2%	-	-	-	-
<b>Buses</b>	0	2	0	2	4	13	0	17	10	0	0	10	-	-	-	-
<b>Buses %</b>	0%	0.9%	0%	0.5%	1%	0.6%	0%	0.6%	0.8%	0%	0%	0.7%	-	-	-	-
<b>Articulated Trucks</b>	0	0	0	0	0	49	0	49	37	0	0	37	-	-	-	-
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	2.2%	0%	1.9%	3.1%	0%	0%	2.6%	-	-	-	-
<b>Pedestrians</b>	-	-	-	12	-	-	-	2	-	-	-	10	-	-	-	-
<b>Pedestrians%</b>	-	-	-	44.4%	-	-	-	7.4%	-	-	-	37%	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	2	-	-	-	0	-	-	-	1	-	-	-	-
<b>Bicycles on Crosswalk%</b>	-	-	-	7.4%	-	-	-	0%	-	-	-	3.7%	-	-	-	-



**Peak Hour: 04:30 PM - 05:30 PM Weather: Partly Cloudy (5.0 °C)**

Start Time	N Approach QUEENS PLATE DR						E Approach REXDALE BLVD						S Approach QUEENS PLATE DRIVE						W Approach REXDALE BLVD						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:30:00	93	0	22	0	5	115	7	315	0	0	5	322	0	1	0	0	2	1	1	210	85	0	0	296	734
16:45:00	101	1	23	0	13	125	7	304	0	0	4	311	0	0	0	0	2	0	0	242	82	0	7	324	760
17:00:00	99	0	18	0	8	117	14	296	0	0	5	310	0	2	0	0	0	2	1	237	84	0	0	322	751
17:15:00	101	0	39	0	6	140	11	316	1	0	0	328	0	0	0	0	2	0	2	216	84	0	4	302	770
<b>Grand Total</b>	<b>394</b>	<b>1</b>	<b>102</b>	<b>0</b>	<b>32</b>	<b>497</b>	<b>39</b>	<b>1231</b>	<b>1</b>	<b>0</b>	<b>14</b>	<b>1271</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>3</b>	<b>4</b>	<b>905</b>	<b>335</b>	<b>0</b>	<b>11</b>	<b>1244</b>	<b>3015</b>
<b>Approach%</b>	79.3%	0.2%	20.5%	0%	-	-	3.1%	96.9%	0.1%	0%	-	-	0%	100%	0%	0%	-	0.3%	72.7%	26.9%	0%	-	-	-	-
<b>Totals %</b>	13.1%	0%	3.4%	0%	16.5%	16.5%	1.3%	40.8%	0%	0%	42.2%	42.2%	0%	0.1%	0%	0%	0.1%	0.1%	30%	11.1%	0%	41.3%	41.3%	-	-
<b>PHF</b>	0.98	0.25	0.65	0	0.89	0.89	0.7	0.97	0.25	0	0.97	0.97	0	0.38	0	0	0.38	0.5	0.93	0.99	0	0.96	0.96	-	-
<b>Heavy</b>	1	1	1	0	3	3	2	92	1	0	95	95	0	3	0	0	3	2	76	5	0	83	83	-	-
<b>Heavy %</b>	0.3%	100%	1%	0%	0.6%	0.6%	5.1%	7.5%	100%	0%	7.5%	7.5%	0%	100%	0%	0%	100%	50%	8.4%	1.5%	0%	6.7%	6.7%	-	-
<b>Lights</b>	393	0	101	0	494	494	37	1139	0	0	1176	1176	0	0	0	0	0	2	829	330	0	1161	1161	-	-
<b>Lights %</b>	99.7%	0%	99%	0%	99.4%	99.4%	94.9%	92.5%	0%	0%	92.5%	92.5%	0%	0%	0%	0%	0%	50%	91.6%	98.5%	0%	93.3%	93.3%	-	-
<b>Single-Unit Trucks</b>	1	0	0	0	1	1	0	45	0	0	45	45	0	0	0	0	0	0	37	4	0	41	41	-	-
<b>Single-Unit Trucks %</b>	0.3%	0%	0%	0%	0.2%	0.2%	0%	3.7%	0%	0%	3.5%	3.5%	0%	0%	0%	0%	0%	0%	4.1%	1.2%	0%	3.3%	3.3%	-	-
<b>Buses</b>	0	1	1	0	2	2	2	11	1	0	14	14	0	3	0	0	3	2	10	0	0	12	12	-	-
<b>Buses %</b>	0%	100%	1%	0%	0.4%	0.4%	5.1%	0.9%	100%	0%	1.1%	1.1%	0%	100%	0%	0%	100%	50%	1.1%	0%	0%	1%	1%	-	-
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	36	0	0	36	36	0	0	0	0	0	0	29	1	0	30	30	-	-
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	0%	0%	2.9%	0%	0%	2.8%	2.8%	0%	0%	0%	0%	0%	0%	3.2%	0.3%	0%	2.4%	2.4%	-	-
<b>Pedestrians</b>	-	-	-	-	31	-	-	-	-	-	13	-	-	-	-	-	6	-	-	-	-	11	-	-	-
<b>Pedestrians%</b>	-	-	-	-	49.2%	-	-	-	-	-	20.6%	-	-	-	-	-	9.5%	-	-	-	-	17.5%	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	0	-	-	-
<b>Bicycles on Crosswalk%</b>	-	-	-	-	1.6%	-	-	-	-	-	1.6%	-	-	-	-	-	0%	-	-	-	-	0%	-	-	-
<b>Bicycles on Road</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	0	-	0	0	0	0	-	-	-
<b>Bicycles on Road%</b>	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	0%	-	-	-



**Peak Hour: 04:45 PM - 05:45 PM Weather: Rain (3.7 °C)**

Start Time	N Approach QUEENS PLATE DRIVE						E Approach REXDALE BLVD						S Approach QUEENS PLATE DRIVE						W Approach REXDALE BLVD						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:45:00	28	9	79	0	1	116	50	262	11	0	1	323	29	26	70	0	0	125	20	243	19	7	0	289	853
17:00:00	18	9	58	0	3	85	53	267	11	0	2	331	25	35	82	0	3	142	13	255	28	3	3	299	857
17:15:00	20	8	54	0	5	82	61	280	8	0	2	349	29	17	70	0	3	116	13	251	25	2	0	291	838
17:30:00	31	9	58	0	2	98	62	279	10	0	0	351	19	21	65	0	0	105	15	248	23	2	0	288	842
<b>Grand Total</b>	<b>97</b>	<b>35</b>	<b>249</b>	<b>0</b>	<b>11</b>	<b>381</b>	<b>226</b>	<b>1088</b>	<b>40</b>	<b>0</b>	<b>5</b>	<b>1354</b>	<b>102</b>	<b>99</b>	<b>287</b>	<b>0</b>	<b>6</b>	<b>488</b>	<b>61</b>	<b>997</b>	<b>95</b>	<b>14</b>	<b>3</b>	<b>1167</b>	<b>3390</b>
<b>Approach%</b>	25.5%	9.2%	65.4%	0%	-	-	16.7%	80.4%	3%	0%	-	-	20.9%	20.3%	58.8%	0%	-	-	5.2%	85.4%	8.1%	1.2%	-	-	-
<b>Totals %</b>	2.9%	1%	7.3%	0%	11.2%	6.7%	32.1%	1.2%	0%	39.9%	3%	2.9%	8.5%	0%	14.4%	1.8%	29.4%	2.8%	0.4%	34.4%	-	-	-	-	-
<b>PHF</b>	0.78	0.97	0.79	0	0.82	0.91	0.97	0.91	0	0.96	0.88	0.71	0.88	0	0.86	0.76	0.98	0.85	0.5	0.98	-	-	-	-	-
<b>Heavy</b>	1	1	7	0	9	6	63	3	0	72	11	2	23	0	36	5	73	6	0	84	-	-	-	-	-
<b>Heavy %</b>	1%	2.9%	2.8%	0%	2.4%	2.7%	5.8%	7.5%	0%	5.3%	10.8%	2%	8%	0%	7.4%	8.2%	7.3%	6.3%	0%	7.2%	-	-	-	-	-
<b>Lights</b>	96	34	242	0	372	220	1025	37	0	1282	91	97	264	0	452	56	924	89	14	1083	-	-	-	-	-
<b>Lights %</b>	99%	97.1%	97.2%	0%	97.6%	97.3%	94.2%	92.5%	0%	94.7%	89.2%	98%	92%	0%	92.6%	91.8%	92.7%	93.7%	100%	92.8%	-	-	-	-	-
<b>Single-Unit Trucks</b>	1	0	4	0	5	3	27	2	0	32	9	2	6	0	17	4	38	3	0	45	-	-	-	-	-
<b>Single-Unit Trucks %</b>	1%	0%	1.6%	0%	1.3%	1.3%	2.5%	5%	0%	2.4%	8.8%	2%	2.1%	0%	3.5%	6.6%	3.8%	3.2%	0%	3.9%	-	-	-	-	-
<b>Buses</b>	0	0	3	0	3	2	3	0	0	5	0	0	4	0	4	0	1	2	0	3	-	-	-	-	-
<b>Buses %</b>	0%	0%	1.2%	0%	0.8%	0.9%	0.3%	0%	0%	0.4%	0%	0%	1.4%	0%	0.8%	0%	0.1%	2.1%	0%	0.3%	-	-	-	-	-
<b>Articulated Trucks</b>	0	1	0	0	1	1	33	1	0	35	2	0	13	0	15	1	34	1	0	36	-	-	-	-	-
<b>Articulated Trucks %</b>	0%	2.9%	0%	0%	0.3%	0.4%	3%	2.5%	0%	2.6%	2%	0%	4.5%	0%	3.1%	1.6%	3.4%	1.1%	0%	3.1%	-	-	-	-	-
<b>Pedestrians</b>	-	-	-	-	9	-	-	-	-	5	-	-	-	-	6	-	-	-	-	3	-	-	-	-	-
<b>Pedestrians%</b>	-	-	-	-	36%	-	-	-	-	20%	-	-	-	-	24%	-	-	-	-	12%	-	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	2	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-
<b>Bicycles on Crosswalk%</b>	-	-	-	-	8%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-
<b>Bicycles on Road</b>	0	0	0	0	0	-	0	1	0	0	-	0	0	0	0	0	0	0	0	0	-	-	-	-	-
<b>Bicycles on Road%</b>	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-



**Peak Hour: 05:00 PM - 06:00 PM Weather: Rain (3.7 °C)**

Start Time	E Approach REXDALE BLVD					S Approach REXDALE BOULEVARD WEST TO WOODBINE ACCESS					W Approach REXDALE BLVD					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
17:00:00	697	0	0	0	697	0	0	0	0	0	57	252	0	0	309	1006
17:15:00	649	0	0	0	649	0	0	0	0	0	75	303	0	0	378	1027
17:30:00	659	0	0	0	659	0	0	0	0	0	63	296	0	0	359	1018
17:45:00	647	0	0	0	647	0	0	0	0	0	84	304	0	0	388	1035
<b>Grand Total</b>	<b>2652</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2652</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>279</b>	<b>1155</b>	<b>0</b>	<b>0</b>	<b>1434</b>	<b>4086</b>
<b>Approach%</b>	100%	0%	0%		-	0%	0%	0%		-	19.5%	80.5%	0%		-	-
<b>Totals %</b>	64.9%	0%	0%		64.9%	0%	0%	0%		0%	6.8%	28.3%	0%		35.1%	-
<b>PHF</b>	0.95	0	0		0.95	0	0	0		0	0.83	0.95	0		0.92	-
<b>Heavy</b>	105	0	0		105	0	0	0		0	11	88	0		99	-
<b>Heavy %</b>	4%	0%	0%		4%	0%	0%	0%		0%	3.9%	7.6%	0%		6.9%	-
<b>Lights</b>	2547	0	0		2547	0	0	0		0	268	1067	0		1335	-
<b>Lights %</b>	96%	0%	0%		96%	0%	0%	0%		0%	96.1%	92.4%	0%		93.1%	-
<b>Single-Unit Trucks</b>	45	0	0		45	0	0	0		0	10	40	0		50	-
<b>Single-Unit Trucks %</b>	1.7%	0%	0%		1.7%	0%	0%	0%		0%	3.6%	3.5%	0%		3.5%	-
<b>Buses</b>	15	0	0		15	0	0	0		0	1	10	0		11	-
<b>Buses %</b>	0.6%	0%	0%		0.6%	0%	0%	0%		0%	0.4%	0.9%	0%		0.8%	-
<b>Articulated Trucks</b>	45	0	0		45	0	0	0		0	0	38	0		38	-
<b>Articulated Trucks %</b>	1.7%	0%	0%		1.7%	0%	0%	0%		0%	0%	3.3%	0%		2.6%	-
<b>Pedestrians</b>	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
<b>Pedestrians%</b>	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-





**Peak Hour: 05:00 PM - 06:00 PM Weather: Rain (3.7 °C)**

Start Time	N Approach WOODBINE CENTRE ACCESS					E Approach REXDALE BLVD					W Approach REXDALE BLVD					Int. Total (15 min)
	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	Thru	Left	U-Turn	Peds	Approach Total	
	17:00:00	26	0	0	1	26	41	370	0	0	411	244	0	0	0	
17:15:00	29	0	0	2	29	37	342	0	0	379	263	0	0	0	263	671
17:30:00	12	0	0	2	12	36	364	0	0	400	266	0	0	0	266	678
17:45:00	22	0	0	0	22	48	356	0	0	404	268	0	0	0	268	694
<b>Grand Total</b>	<b>89</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>89</b>	<b>162</b>	<b>1432</b>	<b>0</b>	<b>0</b>	<b>1594</b>	<b>1041</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1041</b>	<b>2724</b>
<b>Approach%</b>	100%	0%	0%	-	-	10.2%	89.8%	0%	-	-	100%	0%	0%	-	-	-
<b>Totals %</b>	3.3%	0%	0%	3.3%	3.3%	5.9%	52.6%	0%	58.5%	38.2%	0%	0%	38.2%	-	-	-
<b>PHF</b>	0.77	0	0	0.77	0.77	0.84	0.97	0	0.97	0.97	0	0	0.97	-	-	-
<b>Heavy</b>	1	0	0	1	1	90	0	91	82	0	0	82	-	-	-	-
<b>Heavy %</b>	1.1%	0%	0%	1.1%	1.1%	0.6%	6.3%	0%	5.7%	7.9%	0%	0%	7.9%	-	-	-
<b>Lights</b>	88	0	0	88	88	161	1342	0	1503	959	0	0	959	-	-	-
<b>Lights %</b>	98.9%	0%	0%	98.9%	98.9%	99.4%	93.7%	0%	94.3%	92.1%	0%	0%	92.1%	-	-	-
<b>Single-Unit Trucks</b>	1	0	0	1	1	0	33	0	33	37	0	0	37	-	-	-
<b>Single-Unit Trucks %</b>	1.1%	0%	0%	1.1%	1.1%	0%	2.3%	0%	2.1%	3.6%	0%	0%	3.6%	-	-	-
<b>Buses</b>	0	0	0	0	0	1	11	0	12	8	0	0	8	-	-	-
<b>Buses %</b>	0%	0%	0%	0%	0%	0.6%	0.8%	0%	0.8%	0.8%	0%	0%	0.8%	-	-	-
<b>Articulated Trucks</b>	0	0	0	0	0	0	46	0	46	37	0	0	37	-	-	-
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	0%	3.2%	0%	2.9%	3.6%	0%	0%	3.6%	-	-	-
<b>Pedestrians</b>	-	-	-	3	-	-	-	0	-	-	-	-	0	-	-	-
<b>Pedestrians%</b>	-	-	-	60%	-	-	-	0%	-	-	-	-	0%	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	2	-	-	-	0	-	-	-	-	0	-	-	-
<b>Bicycles on Crosswalk%</b>	-	-	-	40%	-	-	-	0%	-	-	-	-	0%	-	-	-



**Peak Hour: 05:00 PM - 06:00 PM Weather: Rain (3.7 °C)**

Start Time	E Approach REXDALE BLVD		S Approach WOODBINE TO REXDALE BOULEVARD EAST ACCESS (EAST)			W Approach REXDALE BLVD			Int. Total (15 min)
	Peds	Approach Total	Right	Peds	Approach Total	Thru	Peds	Approach Total	
17:00:00	0	0	57	0	57	242	0	242	299
17:15:00	0	0	50	0	50	262	0	262	312
17:30:00	0	0	52	0	52	258	0	258	310
17:45:00	0	0	39	0	39	268	0	268	307
<b>Grand Total</b>	0	0	198	0	198	1030	0	1030	<b>1228</b>
<b>Approach%</b>	-	-	100%	-	-	100%	-	-	-
<b>Totals %</b>		0%	16.1%		16.1%	83.9%		83.9%	-
<b>PHF</b>		0	0.87		0.87	0.96		0.96	-
<b>Heavy</b>		0	3		3	80		80	-
<b>Heavy %</b>		0%	1.5%		1.5%	7.8%		7.8%	-
<b>Lights</b>		0	195		195	950		950	-
<b>Lights %</b>		0%	98.5%		98.5%	92.2%		92.2%	-
<b>Single-Unit Trucks</b>		0	3		3	40		40	-
<b>Single-Unit Trucks %</b>		0%	1.5%		1.5%	3.9%		3.9%	-
<b>Buses</b>		0	0		0	7		7	-
<b>Buses %</b>		0%	0%		0%	0.7%		0.7%	-
<b>Articulated Trucks</b>		0	0		0	33		33	-
<b>Articulated Trucks %</b>		0%	0%		0%	3.2%		3.2%	-
<b>Pedestrians</b>	0	-	-	0	-	-	0	-	-
<b>Pedestrians%</b>	0%	-	-	0%	-	-	0%	-	-
<b>Bicycles on Road</b>	0	-	1	0	-	0	0	-	-
<b>Bicycles on Road%</b>	0%	-	-	0%	-	-	0%	-	-



**Peak Hour: 05:15 PM - 06:15 PM Weather: Rain (3.7 °C)**

Start Time	E Approach REXDALE BLVD					S Approach WOODBINE TO REXDALE BOULEVARD EAST ACCESS (WEST)					W Approach REXDALE BLVD					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
17:15:00	0	0	0	0	0	12	0	0	0	12	0	303	0	0	303	315
17:30:00	0	0	0	0	0	16	0	0	0	16	0	310	0	0	310	326
17:45:00	0	0	0	0	0	11	0	0	0	11	0	316	0	0	316	327
18:00:00	0	0	0	0	0	9	0	0	0	9	0	281	0	0	281	290
<b>Grand Total</b>	0	0	0	0	0	48	0	0	0	48	0	1210	0	0	1210	<b>1258</b>
<b>Approach%</b>	0%	0%	0%	-	100%	0%	0%	-	0%	100%	0%	0%	-	-	-	-
<b>Totals %</b>	0%	0%	0%	0%	3.8%	0%	0%	3.8%	0%	96.2%	0%	96.2%	-	-	-	-
<b>PHF</b>	0	0	0	0	0.75	0	0	0.75	0	0.96	0	0.96	-	-	-	-
<b>Heavy</b>	0	0	0	0	2	0	0	2	0	88	0	88	-	-	-	-
<b>Heavy %</b>	0%	0%	0%	0%	4.2%	0%	0%	4.2%	0%	7.3%	0%	7.3%	-	-	-	-
<b>Lights</b>	0	0	0	0	46	0	0	46	0	1122	0	1122	-	-	-	-
<b>Lights %</b>	0%	0%	0%	0%	95.8%	0%	0%	95.8%	0%	92.7%	0%	92.7%	-	-	-	-
<b>Single-Unit Trucks</b>	0	0	0	0	2	0	0	2	0	36	0	36	-	-	-	-
<b>Single-Unit Trucks %</b>	0%	0%	0%	0%	4.2%	0%	0%	4.2%	0%	3%	0%	3%	-	-	-	-
<b>Buses</b>	0	0	0	0	0	0	0	0	0	11	0	11	-	-	-	-
<b>Buses %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.9%	0%	0.9%	-	-	-	-
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	0	41	0	41	-	-	-	-
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	3.4%	0%	3.4%	-	-	-	-
<b>Pedestrians</b>	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	-
<b>Pedestrians%</b>	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-



**Peak Hour: 04:45 PM - 05:45 PM Weather: Rain (3.7 °C)**

Start Time	N Approach HIGHWAY 27		E Approach WOODBINE ACCESS TO HIGHWAY 27 NORTH			S Approach HIGHWAY 27			Int. Total (15 min)
	Peds	Approach Total	Right	Peds	Approach Total	Thru	Peds	Approach Total	
16:45:00	0	0	31	0	31	431	0	431	462
17:00:00	0	0	39	0	39	425	0	425	464
17:15:00	0	0	27	0	27	435	0	435	462
17:30:00	0	0	32	0	32	414	0	414	446
<b>Grand Total</b>	0	0	129	0	129	1705	0	1705	<b>1834</b>
<b>Approach%</b>	-	-	100%	-	-	100%	-	-	-
<b>Totals %</b>	0%	0%	7%	0%	7%	93%	0%	93%	-
<b>PHF</b>	0	0	0.83	0	0.83	0.98	0	0.98	-
<b>Heavy</b>	0	0	21	0	21	104	0	104	-
<b>Heavy %</b>	0%	0%	16.3%	0%	16.3%	6.1%	0%	6.1%	-
<b>Lights</b>	0	0	108	0	108	1601	0	1601	-
<b>Lights %</b>	0%	0%	83.7%	0%	83.7%	93.9%	0%	93.9%	-
<b>Single-Unit Trucks</b>	0	0	21	0	21	39	0	39	-
<b>Single-Unit Trucks %</b>	0%	0%	16.3%	0%	16.3%	2.3%	0%	2.3%	-
<b>Buses</b>	0	0	0	0	0	22	0	22	-
<b>Buses %</b>	0%	0%	0%	0%	0%	1.3%	0%	1.3%	-
<b>Articulated Trucks</b>	0	0	0	0	0	43	0	43	-
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	2.5%	0%	2.5%	-



**Peak Hour: 04:00 PM - 05:00 PM Weather: Rain (3.7 °C)**

Start Time	N Approach HIGHWAY 27					S Approach HIGHWAY 27				W Approach WOODBINE ACCESS TO HIGHWAY 27 SOUTH					Int. Total (15 min)
	Right	Thru	U-Turn	Peds	Approach Total	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	
16:00:00	0	304	0	0	304	0	0	0	0	37	0	0	0	37	341
16:15:00	0	306	0	0	306	0	0	0	0	35	0	0	0	35	341
16:30:00	0	324	0	0	324	0	0	0	0	39	0	0	0	39	363
16:45:00	0	350	0	0	350	0	0	0	0	34	0	0	0	34	384
<b>Grand Total</b>	0	1284	0	0	1284	0	0	0	0	145	0	0	0	145	<b>1429</b>
<b>Approach%</b>	0%	100%	0%		-	0%	0%		-	100%	0%	0%		-	-
<b>Totals %</b>	0%	89.9%	0%		89.9%	0%	0%		0%	10.1%	0%	0%		10.1%	-
<b>PHF</b>	0	0.92	0		0.92	0	0		0	0.93	0	0		0.93	-
<b>Heavy</b>	0	73	0		73	0	0		0	1	0	0		1	-
<b>Heavy %</b>	0%	5.7%	0%		5.7%	0%	0%		0%	0.7%	0%	0%		0.7%	-
<b>Lights</b>	0	1211	0		1211	0	0		0	144	0	0		144	-
<b>Lights %</b>	0%	94.3%	0%		94.3%	0%	0%		0%	99.3%	0%	0%		99.3%	-
<b>Single-Unit Trucks</b>	0	27	0		27	0	0		0	1	0	0		1	-
<b>Single-Unit Trucks %</b>	0%	2.1%	0%		2.1%	0%	0%		0%	0.7%	0%	0%		0.7%	-
<b>Buses</b>	0	27	0		27	0	0		0	0	0	0		0	-
<b>Buses %</b>	0%	2.1%	0%		2.1%	0%	0%		0%	0%	0%	0%		0%	-
<b>Articulated Trucks</b>	0	19	0		19	0	0		0	0	0	0		0	-
<b>Articulated Trucks %</b>	0%	1.5%	0%		1.5%	0%	0%		0%	0%	0%	0%		0%	-

# Appendix **B**

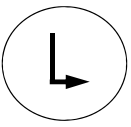
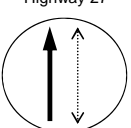
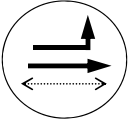
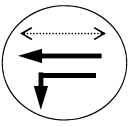
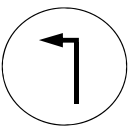

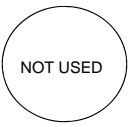
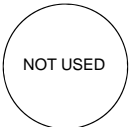
## Signal Timing Plans

**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: BA Consulting Group Ltd. (Karen L. MacDougall)  
DATE: March 30, 2017

OUR REF: 2017\_0075  
STAFF: GY/ND

LOCATION: Highway 27 & Belfield Rd		DISTRICT: Etobicoke York			N ↑	
MODE/COMMENT: SA2-VMG		COMPUTER SYSTEM: Peek ATC 1000 / TS2 T1				
TCS: 1160		CONTROLLER/CABINET TYPE: Red & Red			1.0 m/s (FDW based on full crossing at 1.2 m/s) 4077 / 23	
PREPARED/CHECKED BY: JS / SL		CONFLICT FLASH: 1.0 m/s (FDW based on full crossing at 1.2 m/s)				
PREPARATION DATE: January 27, 2014		DESIGN WALK SPEED: 4077 / 23				
IMPLEMENTATION DATE: January 27, 2014		CHANNEL/DROP:				
NEMA Phase	Local Plan Split Table	OFF	AM	PM		Phase Mode (Fixed/Demanded or Callable)
		All Other Times	06:30-09:30 M-F	15:00-18:30 M-F		
1	 WLK FDW MIN 10 MAX1 18 MAX2 18 AMB 4 ALR 3 SPLIT	18	18	18	Fully Protected. SBLA Callable/Extendable by Stopbar Loop. 24 hrs Daily.	Pedestrian Minimums: NSWK = 7 sec, NSFD = 20 sec EWWK = 7 sec, EWFD = 20 sec EB phase is callable by vehicle or pedestrian actuation with the EWWK & EWFD displayed on south leg only. WB phase is callable by vehicle or pedestrian actuation with the EWWK & EWFD displayed on north leg only. If an EB or WB vehicle call is received, the minimum green is 7 seconds. If ongoing EB or WB vehicle demand exists on the stopbar loop, the EBSA/EBLA or WBSA/WBLA is capable of providing vehicle extensions up to the maximum. If a pedestrian call is received the pedestrian maximum will be served.
2	Highway 27  WLK 7 FDW 20 MIN 27 MAX1 32 MAX2 33 AMB 5 ALR 2 SPLIT	32	53	58	NBSA Fixed.	EB and WB phases are callable and skippable. If EB and WB detectors are both active at the end of the NS phase, the EB phase is served first followed by the WB phase. If only the WB detector is active at the end of the NS phase, only the WB phase is served (and any late EB demand will only be served the following cycle). EB and WB phases are only permitted once per cycle. The signal rests in NSWK and does not cycle through NSFD unless there is side street vehicle and/or pedestrian demand.
3	Belfield Rd (EB)  WLK 7 FDW 20 MIN 9 MAX1 27 MAX2 27 AMB 4 ALR 3 SPLIT	27	27	27	EBSA/EBLA Callable by Stopbar Loop and/or Push Button. Extendable by Stopbar Loop.	If there is demand for NBLT and/or SBLT in the absence of side street calls, the signal will cycle to serve the minimum EB before serving NBLA and/or SBLA. Side Street Passage Time = 3 sec. Left-turn Passage Time = 2 sec.
4	Belfield Rd (WB)  WLK 7 FDW 20 MIN 9 MAX1 27 MAX2 27 AMB 4 ALR 3 SPLIT	27	27	27	WBSA/WBLA Callable by Stopbar Loop and/or Push Button. Extendable by Stopbar Loop.	All plans operates FREE using split value as the green times (WLK & FDW) for phases 2 & 6. Phases 1,3, 4 & 5 uses MAX1 green values during the OFF and AM plans and MAX2 green values during the PM plan.
5	 WLK FDW MIN 6 MAX1 18 MAX2 18 AMB 4 ALR 3 SPLIT	18	18	18	Fully Protected. NBLA Callable/Extendable by Stopbar Loop. 24 hrs Daily.	Ring Structure: 1 2 3 4 5 6
6	Highway 27  WLK 7 FDW 20 MIN 27 MAX1 32 MAX2 38 AMB 5 ALR 2 SPLIT	32	53	58	SBSA Fixed.	
7	 NOT USED					
8	 NOT USED					
	CL OF	0 FREE	0 FREE	0 FREE		

Notes: WRM not applicable as all right-turns are channelized.



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: BA Consulting Group Ltd. (Karen L. MacDougall)  
DATE: February 10, 2017

OUR REF: 2017\_0037  
STAFF: GY/ND

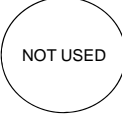
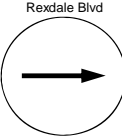
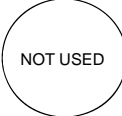
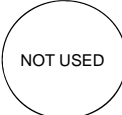
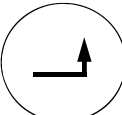
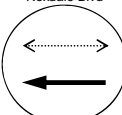
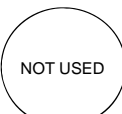
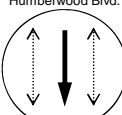
LOCATION: Highway 27 & Rexdale Blvd 1161					DISTRICT: Etobicoke York	 N	
TCS: FXT with UPS					COMPUTER SYSTEM: TransSuite		
MODE/COMMENT: QF / HL					CONTROLLER/CABINET TYPE: PEEK ATC 1000 / TS2 T1		
PREPARED/CHECKED BY: October 21, 2013					CONFLICT FLASH: Red & Red		
IMPLEMENTATION DATE: November 23, 2016					DESIGN WALK SPEED: 1.0 m/s (FDW based on full crossing @ 1.2 m/s)		
CHANNEL/DROP: 4077 / 19							
NEMA Phase			OFF All Other Times	AM 06:30-09:30 M-F	PM 15:00-18:30 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 MAX1 6 AMB 3 ALR 3 SPLIT	22	20	22	Fully Protected. Callable/Extendable by Stopbar Loop. 24 hrs Daily.	Pedestrian Minimums: NSWK = 7 sec, NSFD = 32 sec EWWK = 7 sec, EWFD = 31 sec Left Turn Passage Time = 2 sec Equipped with 15 system loops (see loop drawing for details).	
2 Highway 27 	WLK 7 FDW 32 MIN 39 MAX1 41 AMB 5 ALR 3 SPLIT		48	49	Fixed. NBSA.		
3 	WLK FDW MIN 6 MAX1 6 AMB 3 ALR 3 SPLIT	13	16	13	Protected/Permissive. Callable/Extendable by Stopbar Loop 24 hrs Daily.		
4 Rexdale Blvd 	WLK 7 FDW 31 MIN 38 MAX1 39 AMB 4 ALR 3 SPLIT	46	46	46	Fixed.		
5 	WLK FDW MIN 6 MAX1 6 AMB 3 ALR 3 SPLIT	20	17	23	Fully Protected. Callable/Extendable by Stopbar Loop. 24 hrs Daily.		
6 Highway 27 	WLK 7 FDW 32 MIN 39 MAX1 41 AMB 5 ALR 3 SPLIT	51	51	48	Fixed. SBSA.		
7 	WLK FDW MIN 6 MAX1 6 AMB 3 ALR 3 SPLIT	13	14	13	Protected/Permissive. Callable/Extendable by Stopbar Loop 24 hrs Daily.		
8 Rexdale Blvd 	WLK 7 FDW 31 MIN 38 MAX1 39 AMB 4 ALR 3 SPLIT	46	48	46	Fixed.		
	CL OF	130 1	130 58	130 108			

NOTES: Transferred to wireless system control on November 1, 2013 at approximately 11:25.

**CURRENT SIGNAL TIMING INFORMATION**

ISSUED TO: BA Consulting Group Ltd. (Karen L. MacDougall)  
DATE: February 10, 2017

OUR REF: 2017\_0037  
STAFF: GY/ND

LOCATION: Rexdale Blvd & Humberwood Blvd		DISTRICT: Etobicoke York					N ↑		
MODE/COMMENT: SA2-VMG with WRM		COMPUTER SYSTEM: TransSuite							
TCS: 1619		CONTROLLER/CABINET TYPE: Econolite ASC/3-2100 / TS2T1							
PREPARED/CHECKED BY: SQ/IA		CONFLICT FLASH: Red & Red							
PREPARATION DATE: September 15, 2016		DESIGN WALK SPEED: 1.0 m/s (FDW based on full crossing at 1.2 m/s)							
IMPLEMENTATION DATE: November 1, 2016		CHANNEL/DROP: 5005/12							
		CONTROLLER FIRMWARE: 2.47.10							
NEMA Phase	Local Plan System Plan	OFF	AM	PM	NGHT	WKND	Phase Mode (Fixed/Demanded or Callable)	Remarks	
		All Other Times	06:30-09:30 M-F	15:00-18:30 M-F	22:00-06:30 Daily	11:00-18:00 Sat - Sun			
		Pattern 1 Plan 1	Pattern 2 Plan 2	Pattern 3 Plan 3	Pattern 4 Plan 4	Pattern 5 Plan 5			
1	 NOT USED	WLK FDW MIN MAX1 AMB ALR SPLIT						Pedestrian Minimums: EWWK = 7 sec., EWFD = 17 sec. NSWK = 7 sec., NSFD = 28 sec.	
2	Rexdale Blvd 	WLK 7 FDW 17 MIN 24 MAX1 43 AMB 4 ALR 2 SPLIT	48	51	56	38	58	Fixed.	NS phase is callable by vehicle or pedestrian actuation. If a vehicle call is received, the minimum SBG is 7 seconds. If ongoing vehicle demand exists on the stopbar loop, the SBG is capable of providing vehicle extensions up to the maximum. If a pedestrian call is received, the pedestrian minimums will be served. The NSWK & NSFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle demand. Unused extension time is given to the EWG.
3		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. Side Street Passage Time = 3 sec. Left-turn Passage Time = 2 sec. Signal serves EWFD every cycle. Side street decision point at end of EWFD.
4		WLK 7 FDW 28 MIN 7 MAX1 35 AMB 3 ALR 3 SPLIT	42	49	44	42	42		The signal constantly cycles through main street FDW to improve response to side street vehicle and pedestrian demand.
5		WLK FDW MIN 6 MAX1 8 AMB 3 ALR 1 SPLIT	12	11	20		15	Callable & Extendable by Setback Loop, all times except 22:00 - 06:30, Daily	
6	Rexdale Blvd 	WLK 7 FDW 17 MIN 24 MAX1 31 AMB 4 ALR 2 SPLIT	36	40	36	38	43	Fixed.	
7		WLK FDW MIN MAX1 AMB ALR SPLIT							
8	Humberwood Blvd. 	WLK 7 FDW 28 MIN 7 MAX1 35 AMB 3 ALR 3 SPLIT	42	49	44	42	42	Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop.	
		CL 90 OF 1 VP 17	90 1 17	100 4 17	100 96 17	80 1 17	100 98 17		

NOTES: T-intersection, no South leg.

**CURRENT SIGNAL TIMING INFORMATION**

ISSUED TO: BA Consulting Group Ltd. (Karen L. MacDougall)

OUR REF: 2017\_0037

DATE: February 10, 2017

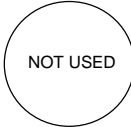
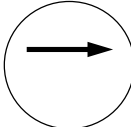
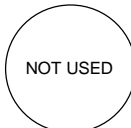
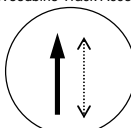
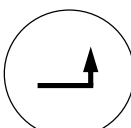
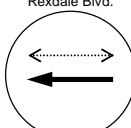
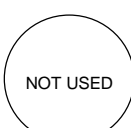
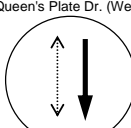
STAFF: GY/ND

LOCATION:		Rexdale Blvd. & Queen's Plate Dr					DISTRICT:		Etobicoke York	
MODE/COMMENT:		SA2-VMG with WRM					COMPUTER SYSTEM:		TransSuite	
TCS:		1668					CONTROLLER/CABINET TYPE:		Econolite ASC/3-2100 / TS2T1	
PREPARED/CHECKED BY:		IA/PV					CONFLICT FLASH:		Red & Red	
PREPARATION DATE:		September 25, 2016					DESIGN WALK SPEED:		1.0 m/s (FDW based on full crossing at 1.2 m/s)	
IMPLEMENTATION DATE:		October 6, 2016					CHANNEL/DROP:		5002/26	
							CONTROLLER FIRMWARE:		2.47.10	
NEMA Phase	Diagram	OFF All Other Times	AM	PM	NGHT	WKND	Phase Mode (Fixed/Demanded or Callable)	Remarks		
			06:30-09:30 M-F	15:00-18:30 M-F	22:00-06:30 Daily	11:00-18:00 Sat-Sun				
			Local Plan	Pattern 1	Pattern 2	Pattern 3			Pattern 4	Pattern 5
System Plan	Plan 1	Plan 2	Plan 3	Plan 4	Plan 5					
1		WLK FDW MIN MAX1 AMB ALR SPLIT						Pedestrian Minimums: EWWK = 7 sec, EWFD = 25 sec NSWK = 7 sec, NSFD = 28 sec		
2	Rexdale Blvd 	WLK 7 FDW 25 MIN 32 MAX1 45 AMB 4 ALR 3 SPLIT					Fixed	NS phase is callable by vehicle or pedestrian actuation. If a vehicle call is received, the minimum NSG is 7 seconds. If ongoing vehicle demand exists on the stopbar loop, the NSG is capable of providing vehicle extensions up to the maximum. If a pedestrian call is received, the pedestrian minimums will be served. The NSWK & NSFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle demand. Unused extension time is given to the EWG.		
3		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.  Side Street Passage Time = 3 sec The signal constantly cycles through main street FDW to improve response to side street vehicle and pedestrian demand.		
4	Queen's Plate Dr 	WLK 7 FDW 28 MIN 7 MAX1 35 AMB 4 ALR 3 SPLIT					Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop.			
5		WLK FDW MIN MAX1 AMB ALR SPLIT								
6	Rexdale Blvd 	WLK 7 FDW 25 MIN 32 MAX1 45 AMB 4 ALR 3 SPLIT					Fixed			
7		WLK FDW MIN MAX1 AMB ALR SPLIT								
8	Queen's Plate Dr 	WLK 7 FDW 28 MIN 7 MAX1 35 AMB 4 ALR 3 SPLIT					Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop.			
		CL OF VP	94 48 25	130 129 25	130 42 25	85 1 25	120 86 25			

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

ISSUED TO: BA Consulting Group Ltd.( Karen L. MacDougall )  
 DATE: June 17, 2011

OUR REF: 11077  
 STAFF: SY/HP

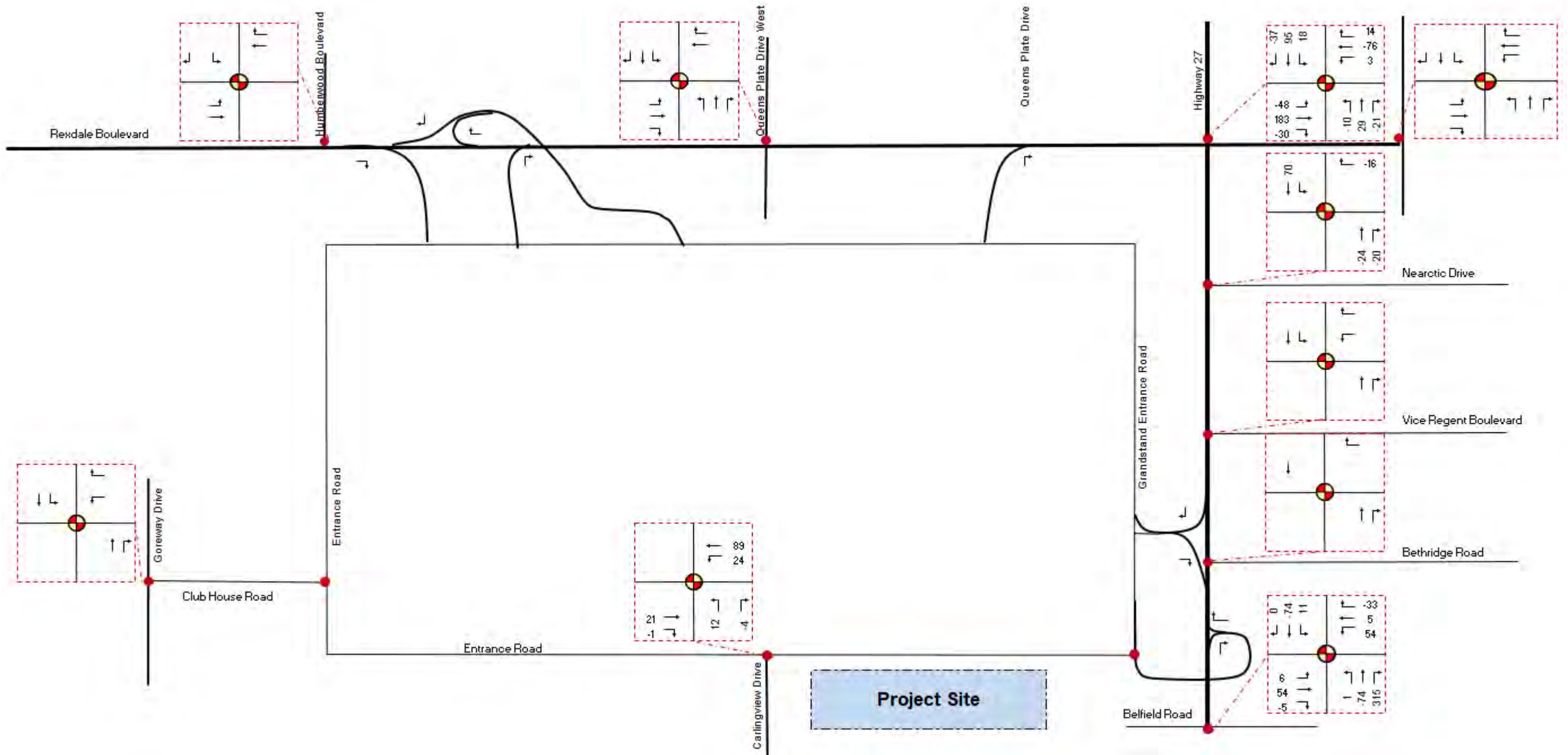
LOCATION: Rexdale Blvd. & Queen's Plate Dr.(West). / Woodbine Track Access					DISTRICT: Etobicoke York	
MODE/COMMENT: SA2-VMG with WRM					COMPUTER SYSTEM: Series 2000	
PX: 622					CONTROLLER/CABINET TYPE: Econolite ASC/2S-1000 / TS2T1	
PREPARED/CHECKED BY: HP/LL					CONFLICT FLASH: Red & Red	
PREPARATION DATE: October 19, 2007					DESIGN WALK SPEED: 1.2 m/s	
IMPLEMENTATION DATE: November 12, 2007					CHANNEL/DROP: 32 / 1	
NEMA Phase		OFF All Other Times (Plan 1)	AM 06:30-09:15 M-F (Plan 2)	PM 15:30-18:15 M-F (Plan 3)	Phase Mode (Fixed/Demanded or Callable)	Remarks
		Sytem Plan				N ↑
1		WLK FDW MIN MAX1 AMB ALR SPLIT				Pedestrian Minimums: EWWK = 7 sec., EWFD = 13 sec. (EW Ped crossing on North leg only) NSWK = 9 sec., NSFD = 16 sec. NS phase is callable by vehicle or pedestrian actuation. If a vehicle call is received, the minimum NSG is 7 seconds. If ongoing vehicle demand exists on the stopbar loop, the NSG is capable of providing vehicle extensions up to the maximum. If a pedestrian call is received, the pedestrian minimums will be served. The NSWK & NSFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle demand. Unused extension time is given to the EWG.
2	Rexdale Blvd. 	WLK 7 FDW 13 MIN 20 MAX1 20 AMB 5 ALR 2 SPLIT	46	56	56	Fixed.
3		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. Side Street Passage Time = 3 sec. Left-turn Passage Time = 2 sec. Signal serves EWFD every cycle. Side street decision point is at the end of EWFD.
4	Woodbine Track Access 	WLK 9 FDW 16 MIN 7 MAX1 25 AMB 4 ALR 3 SPLIT	34	34	34	Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop. Auto. Perm. Min. Grn. = 19 NS pushbuttons monitored on local detector # 2.
5		WLK FDW MIN 6 MAX1 6 AMB 3 ALR 1 SPLIT				Callable & Extendable by Setback Loop, 24hrs Daily.
6	Rexdale Blvd. 	WLK 7 FDW 13 MIN 20 MAX 20 AMB 5 ALR 2 SPLIT	35	43	43	Fixed.
7		WLK FDW MIN MAX AMB ALR SPLIT				
8	Queen's Plate Dr. (West) 	WLK 9 FDW 16 MIN 7 MAX 25 AMB 4 ALR 3 SPLIT	34	34	34	Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop. Auto. Perm. Min. Grn. = 19
		CL OF VP	80 25 Auto (0)	90 32 Auto (0)	90 37 Auto (0)	

NOTES: No East/West pedestrian crossing on the south side.

# Appendix **C**

## TMC Data Comparison





TMC Data Comparison (2019 AM – 2017 AM)



TMC Data Comparison (2019 PM – 2017 PM)

# Appendix **D**

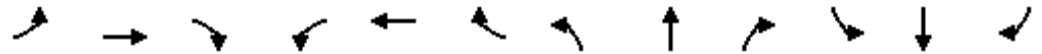
## Synchro Output



# Queues

## 1: Highway 27 & Belfield Rd

01/12/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	91	244	57	161	330	109	130	1092	611	164	851	215
v/c Ratio	0.50	0.66	0.05	0.69	0.73	0.08	0.76	0.82	0.40	0.79	0.61	0.15
Control Delay	58.7	59.8	0.1	65.4	59.7	0.1	81.6	41.0	0.8	80.3	32.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	59.8	0.1	65.4	59.7	0.1	81.6	41.0	0.8	80.3	32.3	0.2
Queue Length 50th (m)	22.9	31.5	0.0	40.9	42.1	0.0	30.9	128.5	0.0	39.9	91.0	0.0
Queue Length 95th (m)	40.8	44.9	0.0	66.9	59.0	0.0	#64.5	157.0	0.0	#85.8	113.2	0.0
Internal Link Dist (m)		253.2			275.1			169.6			234.9	
Turn Bay Length (m)	145.0		65.0	200.0		200.0	140.0		155.0	110.0		75.0
Base Capacity (vph)	221	444	1168	254	496	1389	176	1329	1536	207	1391	1440
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.55	0.05	0.63	0.67	0.08	0.74	0.82	0.40	0.79	0.61	0.15

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 1: Highway 27 & Belfield Rd

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↔↗	↗	↘	↔↗	↗	↘	↕↗	↗	↘	↕↗	↗
Traffic Volume (vph)	98	227	55	233	243	106	126	1059	593	159	825	209
Future Volume (vph)	98	227	55	233	243	106	126	1059	593	159	825	209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	3.0
Lane Util. Factor	0.91	0.91	1.00	0.91	0.91	1.00	1.00	*0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1318	2648	1168	1496	2913	1389	1706	3411	1536	1690	3380	1440
Flt Permitted	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1318	2648	1168	1496	2913	1389	1706	3411	1536	1690	3380	1440
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)	101	234	57	240	251	109	130	1092	611	164	851	215
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	91	244	57	161	330	109	130	1092	611	164	851	215
Confl. Peds. (#/hr)	4		2	2		4	1		2	2		1
Heavy Vehicles (%)	26%	32%	38%	11%	21%	16%	7%	7%	5%	8%	8%	12%
Turn Type	Split	NA	Free	Split	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	3	3		4	4		5	2		1		6
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	16.4	16.4	125.0	18.6	18.6	125.0	11.6	47.7	125.0	14.3	50.4	125.0
Effective Green, g (s)	17.4	17.4	125.0	19.6	19.6	125.0	12.6	48.7	125.0	15.3	51.4	125.0
Actuated g/C Ratio	0.14	0.14	1.00	0.16	0.16	1.00	0.10	0.39	1.00	0.12	0.41	1.00
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	183	368	1168	234	456	1389	171	1328	1536	206	1389	1440
v/s Ratio Prot	0.07	c0.09		0.11	c0.11		0.08	c0.32		c0.10	0.25	
v/s Ratio Perm			0.05			0.08			c0.40			0.15
v/c Ratio	0.50	0.66	0.05	0.69	0.72	0.08	0.76	0.82	0.40	0.80	0.61	0.15
Uniform Delay, d1	49.8	51.0	0.0	49.8	50.1	0.0	54.7	34.3	0.0	53.3	29.0	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	4.5	0.1	8.1	5.6	0.1	16.2	5.8	0.8	17.7	2.0	0.2
Delay (s)	51.9	55.5	0.1	58.0	55.7	0.1	71.0	40.1	0.8	71.1	31.0	0.2
Level of Service	D	E	A	E	E	A	E	D	A	E	C	A
Approach Delay (s)		46.6			46.2			29.2			31.0	
Approach LOS		D			D			C			C	

### Intersection Summary

HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 2: Highway 27 & Bethridge Rd

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕↕↕			↕↕
Traffic Volume (veh/h)	0	56	1103	107	0	1178
Future Volume (Veh/h)	0	56	1103	107	0	1178
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	0	57	1114	108	0	1190
Pedestrians	2					
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)						
pX, platoon unblocked						
vC, conflicting volume	1765	427			1224	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1765	427			1224	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	100	90			100	
cM capacity (veh/h)	77	561			575	
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	57	446	446	331	595	595
Volume Left	0	0	0	0	0	0
Volume Right	57	0	0	108	0	0
cSH	561	1700	1700	1700	1700	1700
Volume to Capacity	0.10	0.26	0.26	0.19	0.35	0.35
Queue Length 95th (m)	2.6	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	12.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	12.1	0.0			0.0	
Approach LOS	B					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			35.9%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: Highway 27 & Vice Regent Blvd

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	52	20	1084	75	120	1229		
Future Volume (Veh/h)	52	20	1084	75	120	1229		
Sign Control	Stop		Free			Free		
Grade	0%		0%			0%		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Hourly flow rate (vph)	52	20	1084	75	120	1229		
Pedestrians	3					1		
Lane Width (m)	3.7					3.7		
Walking Speed (m/s)	1.1					1.1		
Percent Blockage	0					0		
Right turn flare (veh)								
Median type	None			None				
Median storage veh								
Upstream signal (m)								
pX, platoon unblocked								
vC, conflicting volume	1942	546				1162		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	1942	546				1162		
tC, single (s)	7.1	7.3				4.2		
tC, 2 stage (s)								
tF (s)	3.6	3.5				2.3		
p0 queue free %	0	95				79		
cM capacity (veh/h)	39	436				573		
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	52	20	542	542	75	120	614	614
Volume Left	52	0	0	0	0	120	0	0
Volume Right	0	20	0	0	75	0	0	0
cSH	39	436	1700	1700	1700	573	1700	1700
Volume to Capacity	1.33	0.05	0.32	0.32	0.04	0.21	0.36	0.36
Queue Length 95th (m)	40.2	1.1	0.0	0.0	0.0	6.0	0.0	0.0
Control Delay (s)	417.2	13.6	0.0	0.0	0.0	12.9	0.0	0.0
Lane LOS	F	B				B		
Approach Delay (s)	305.1		0.0			1.2		
Approach LOS	F							
Intersection Summary								
Average Delay			9.1					
Intersection Capacity Utilization			50.3%			ICU Level of Service		A
Analysis Period (min)			15					

# HCM Unsignalized Intersection Capacity Analysis

## 4: Highway 27 & Nearctic Dr

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕	↗		↕
Traffic Volume (veh/h)	0	35	1015	89	0	1349
Future Volume (Veh/h)	0	35	1015	89	0	1349
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	0	35	1025	90	0	1363
Pedestrians	10					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						370
pX, platoon unblocked	0.79					
vC, conflicting volume	1716	522			1125	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1376	522			1125	
tC, single (s)	6.8	7.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.5			2.2	
p0 queue free %	100	92			100	
cM capacity (veh/h)	109	450			622	
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	35	512	512	90	682	682
Volume Left	0	0	0	0	0	0
Volume Right	35	0	0	90	0	0
cSH	450	1700	1700	1700	1700	1700
Volume to Capacity	0.08	0.30	0.30	0.05	0.40	0.40
Queue Length 95th (m)	1.9	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	13.7	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	13.7	0.0			0.0	
Approach LOS	B					
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			40.6%		ICU Level of Service	A
Analysis Period (min)			15			

# Queues

## 5: Highway 27 & Rexdale Blvd

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	113	1216	196	455	118	95	867	109	126	1031	48
v/c Ratio	0.29	0.82	0.98	0.30	0.20	0.72	0.55	0.18	0.75	0.62	0.08
Control Delay	24.3	46.6	102.9	29.1	2.1	86.5	38.0	3.5	83.0	37.5	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	46.6	102.9	29.1	2.1	86.5	38.0	3.5	83.0	37.5	0.3
Queue Length 50th (m)	17.1	104.2	40.6	25.1	0.0	23.9	67.8	0.0	31.5	80.9	0.0
Queue Length 95th (m)	29.3	122.4	#85.7	31.5	4.0	#47.7	82.0	8.1	#57.8	96.2	0.0
Internal Link Dist (m)		621.3		242.9			315.2			293.8	
Turn Bay Length (m)	100.0		30.0		80.0	80.0		200.0	110.0		115.0
Base Capacity (vph)	393	1479	200	1525	599	142	1567	593	184	1674	598
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.82	0.98	0.30	0.20	0.67	0.55	0.18	0.68	0.62	0.08

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 5: Highway 27 & Rexdale Blvd

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↗↗		↗	↗↗↗	↗	↗	↗↗↗	↗	↗	↗↗↗	↗
Traffic Volume (vph)	111	1045	147	192	446	116	93	850	107	123	1010	47
Future Volume (vph)	111	1045	147	192	446	116	93	850	107	123	1010	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.8	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0	5.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1739	4767		1706	4683	1543	1547	4812	1542	1601	4856	1479
Flt Permitted	0.47	1.00		0.09	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	867	4767		169	4683	1543	1547	4812	1542	1601	4856	1479
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	113	1066	150	196	455	118	95	867	109	126	1031	48
RTOR Reduction (vph)	0	14	0	0	0	80	0	0	73	0	0	31
Lane Group Flow (vph)	113	1202	0	196	455	38	95	867	36	126	1031	17
Confl. Peds. (#/hr)	5		7	7		5	1		6	6		1
Heavy Vehicles (%)	6%	7%	13%	7%	12%	4%	18%	9%	4%	14%	8%	9%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8			2			6
Actuated Green, G (s)	46.6	39.0		51.4	41.4	41.4	10.2	41.4	41.4	12.6	43.8	43.8
Effective Green, g (s)	48.6	40.0		53.4	42.4	42.4	11.2	42.4	42.4	13.6	44.8	44.8
Actuated g/C Ratio	0.37	0.31		0.41	0.33	0.33	0.09	0.33	0.33	0.10	0.34	0.34
Clearance Time (s)	6.0	7.0		6.0	7.0	7.0	6.0	8.0	8.0	6.0	8.0	8.0
Vehicle Extension (s)	2.0	3.0		2.0	3.0	3.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	381	1466		199	1527	503	133	1569	502	167	1673	509
v/s Ratio Prot	0.02	0.25		c0.08	0.10		0.06	0.18		c0.08	c0.21	
v/s Ratio Perm	0.09			c0.32		0.02			0.02			0.01
v/c Ratio	0.30	0.82		0.98	0.30	0.08	0.71	0.55	0.07	0.75	0.62	0.03
Uniform Delay, d1	27.3	41.7		34.0	32.7	30.3	57.8	36.0	30.2	56.6	35.4	28.2
Progression Factor	1.00	1.00		1.50	0.87	0.51	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	5.3		58.4	0.5	0.3	14.0	1.4	0.3	15.7	1.7	0.1
Delay (s)	27.4	46.9		109.4	28.8	15.8	71.9	37.4	30.5	72.2	37.2	28.4
Level of Service	C	D		F	C	B	E	D	C	E	D	C
Approach Delay (s)		45.3			47.4			39.8			40.5	
Approach LOS		D			D			D			D	

### Intersection Summary

HCM 2000 Control Delay	43.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Queues

6: Rexdale Blvd & Queens Plate Drive

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	27	1330	61	864	55	112	121	46
v/c Ratio	0.06	0.37	0.26	0.24	0.34	0.22	0.68	0.10
Control Delay	0.9	0.7	9.3	5.0	53.0	18.5	69.7	30.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.9	0.7	9.3	5.0	53.0	18.5	69.7	30.6
Queue Length 50th (m)	0.2	3.1	4.1	19.4	12.8	4.4	29.7	3.2
Queue Length 95th (m)	m0.4	4.6	13.0	31.2	24.2	12.2	47.2	8.4
Internal Link Dist (m)		242.9		949.9		173.2		283.9
Turn Bay Length (m)	55.0		40.0		125.0		120.0	
Base Capacity (vph)	421	3575	239	3532	307	913	338	868
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.37	0.26	0.24	0.18	0.12	0.36	0.05

Intersection Summary

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



# HCM Signalized Intersection Capacity Analysis

## 6: Rexdale Blvd & Queens Plate Drive

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑↑		↗	↑↑↑		↗	↑↑		↗	↑↑	
Traffic Volume (vph)	25	1142	108	57	685	127	52	36	70	114	26	17
Future Volume (vph)	25	1142	108	57	685	127	52	36	70	114	26	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.90		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)	1690	4715		1644	4647		1415	3022		1662	3007	
Flt Permitted	0.31	1.00		0.18	1.00		0.73	1.00		0.68	1.00	
Satd. Flow (perm)	558	4715		316	4647		1080	3022		1191	3007	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	27	1215	115	61	729	135	55	38	74	121	28	18
RTOR Reduction (vph)	0	6	0	0	13	0	0	63	0	0	15	0
Lane Group Flow (vph)	27	1324	0	61	851	0	55	49	0	121	31	0
Confl. Peds. (#/hr)			2	2					8	8		
Heavy Vehicles (%)	8%	10%	6%	11%	11%	6%	29%	8%	7%	9%	8%	24%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	97.4	97.4		97.4	97.4		18.6	18.6		18.6	18.6	
Effective Green, g (s)	98.4	98.4		98.4	98.4		19.6	19.6		19.6	19.6	
Actuated g/C Ratio	0.76	0.76		0.76	0.76		0.15	0.15		0.15	0.15	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	422	3568		239	3517		162	455		179	453	
v/s Ratio Prot		c0.28			0.18			0.02			0.01	
v/s Ratio Perm	0.05			0.19			0.05			c0.10		
v/c Ratio	0.06	0.37		0.26	0.24		0.34	0.11		0.68	0.07	
Uniform Delay, d1	4.0	5.3		4.8	4.7		49.4	47.7		52.2	47.4	
Progression Factor	0.13	0.09		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2		2.6	0.2		1.3	0.1		9.7	0.1	
Delay (s)	0.7	0.7		7.3	4.9		50.7	47.8		61.9	47.4	
Level of Service	A	A		A	A		D	D		E	D	
Approach Delay (s)		0.7			5.0			48.7			57.9	
Approach LOS		A			A			D			E	

### Intersection Summary

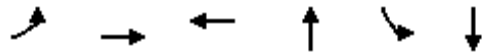
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

## Queues

### 9: Rexdale Blvd & Queens Plate Drive West

01/12/2020



Lane Group	EBL	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	275	1297	630	4	46	258
v/c Ratio	0.41	0.36	0.22	0.04	0.29	0.66
Control Delay	4.8	4.5	8.7	33.2	39.5	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.8	4.5	8.7	33.2	39.5	13.8
Queue Length 50th (m)	8.5	21.0	15.1	0.6	7.5	0.6
Queue Length 95th (m)	21.3	37.7	28.5	3.4	16.2	20.5
Internal Link Dist (m)		320.6	621.3	131.9		93.9
Turn Bay Length (m)	65.0					
Base Capacity (vph)	685	3635	2850	298	428	644
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.36	0.22	0.01	0.11	0.40

#### Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 9: Rexdale Blvd & Queens Plate Drive West

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑↑			↑↑↑			↕		↖	↗	
Traffic Volume (vph)	256	1204	2	0	567	19	0	4	0	43	4	236
Future Volume (vph)	256	1204	2	0	567	19	0	4	0	43	4	236
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	7.0	
Lane Util. Factor	1.00	0.91			0.91			1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00			1.00			1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00		1.00	1.00	
Frt	1.00	1.00			1.00			1.00		1.00	0.85	
Flt Protected	0.95	1.00			1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1786	4848			4650			961		1733	1558	
Flt Permitted	0.38	1.00			1.00			1.00		0.76	1.00	
Satd. Flow (perm)	716	4848			4650			961		1377	1558	
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)	275	1295	2	0	610	20	0	4	0	46	4	254
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	227	0
Lane Group Flow (vph)	275	1297	0	0	628	0	0	4	0	46	31	0
Confl. Peds. (#/hr)	6		2	2		6			3	3		
Heavy Vehicles (%)	2%	8%	100%	0%	12%	16%	0%	100%	0%	5%	75%	4%
Turn Type	pm+pt	NA			NA			NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2						4			8		
Actuated Green, G (s)	66.5	66.5			54.2			9.5		9.5	9.5	
Effective Green, g (s)	67.5	67.5			55.2			10.5		10.5	9.5	
Actuated g/C Ratio	0.75	0.75			0.61			0.12		0.12	0.11	
Clearance Time (s)	4.0	7.0			7.0			7.0		7.0	7.0	
Vehicle Extension (s)	2.0	3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	647	3636			2852			112		160	164	
v/s Ratio Prot	c0.04	0.27			0.13			0.00			0.02	
v/s Ratio Perm	c0.27									c0.03		
v/c Ratio	0.43	0.36			0.22			0.04		0.29	0.19	
Uniform Delay, d1	3.4	3.8			7.8			35.3		36.3	36.7	
Progression Factor	1.00	1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.3			0.2			0.1		1.0	0.6	
Delay (s)	3.6	4.1			8.0			35.4		37.3	37.3	
Level of Service	A	A			A			D		D	D	
Approach Delay (s)		4.0			8.0			35.4			37.3	
Approach LOS		A			A			D			D	

### Intersection Summary

HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 10: Entrance Rd & Rexdale Blvd

01/12/2020

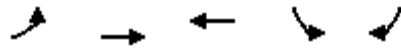


Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑↑			↑↑↑		↗		
Traffic Volume (veh/h)	1455	0	0	803	0	7		
Future Volume (Veh/h)	1455	0	0	803	0	7		
Sign Control	Free			Free	Stop			
Grade	0%			0%	0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	1582	0	0	873	0	8		
Pedestrians								
Lane Width (m)								
Walking Speed (m/s)								
Percent Blockage								
Right turn flare (veh)								
Median type	None			None				
Median storage (veh)								
Upstream signal (m)	345							
pX, platoon unblocked								
vC, conflicting volume			1582		1800	527		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol			1582		1800	527		
tC, single (s)			4.1		6.8	6.9		
tC, 2 stage (s)								
tF (s)			2.2		3.5	3.3		
p0 queue free %			100		100	98		
cM capacity (veh/h)			412		71	495		
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	527	527	527	218	218	218	218	8
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0	8
cSH	1700	1700	1700	1700	1700	1700	1700	495
Volume to Capacity	0.31	0.31	0.31	0.13	0.13	0.13	0.13	0.02
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.4
Lane LOS								B
Approach Delay (s)	0.0			0.0			12.4	
Approach LOS								B
Intersection Summary								
Average Delay	0.0							
Intersection Capacity Utilization	38.1%			ICU Level of Service			A	
Analysis Period (min)	15							

## Queues

### 11: Rexdale Blvd & Humberwood Blvd

01/12/2020



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	116	1322	874	400	274
v/c Ratio	0.28	0.36	0.31	0.76	0.42
Control Delay	11.0	11.3	15.7	40.7	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	11.3	15.7	40.7	6.0
Queue Length 50th (m)	8.3	35.0	25.5	70.1	3.3
Queue Length 95th (m)	19.4	52.9	41.5	89.8	18.3
Internal Link Dist (m)		361.4	146.0	175.4	
Turn Bay Length (m)	40.0			30.0	
Base Capacity (vph)	415	3648	2816	779	844
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.28	0.36	0.31	0.51	0.32

#### Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 11: Rexdale Blvd & Humberwood Blvd

01/12/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	110	1256	652	179	380	260
Future Volume (vph)	110	1256	652	179	380	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.86	0.86		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1771	6063	5714		1772	1601
Flt Permitted	0.26	1.00	1.00		0.95	1.00
Satd. Flow (perm)	484	6063	5714		1772	1601
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	116	1322	686	188	400	274
RTOR Reduction (vph)	0	0	39	0	0	176
Lane Group Flow (vph)	116	1322	835	0	400	99
Confl. Peds. (#/hr)	6			6		
Heavy Vehicles (%)	3%	9%	12%	8%	3%	2%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	59.2	59.2	47.6		28.8	28.8
Effective Green, g (s)	60.2	60.2	48.6		29.8	29.8
Actuated g/C Ratio	0.60	0.60	0.49		0.30	0.30
Clearance Time (s)	4.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	2.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	402	3649	2777		528	477
v/s Ratio Prot	0.02	c0.22	0.15		c0.23	
v/s Ratio Perm	0.15					0.06
v/c Ratio	0.29	0.36	0.30		0.76	0.21
Uniform Delay, d1	8.7	10.1	15.5		31.8	26.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.3	0.3		6.2	0.2
Delay (s)	8.9	10.4	15.7		38.0	26.5
Level of Service	A	B	B		D	C
Approach Delay (s)		10.3	15.7		33.3	
Approach LOS		B	B		C	

### Intersection Summary

HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis  
 12: Goreway Dr & Woodbine Entrance/Club House Rd













01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations							
Traffic Volume (veh/h)	60	25	216	12	37	688	
Future Volume (Veh/h)	60	25	216	12	37	688	
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)	64	27	230	13	39	732	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type			None		None		
Median storage veh							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	680	122			243		
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	680	122			243		
tC, single (s)	6.9	6.9			4.1		
tC, 2 stage (s)							
tF (s)	3.5	3.3			2.2		
p0 queue free %	83	97			97		
cM capacity (veh/h)	367	913			1335		
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	64	27	153	90	39	366	366
Volume Left	64	0	0	0	39	0	0
Volume Right	0	27	0	13	0	0	0
cSH	367	913	1700	1700	1335	1700	1700
Volume to Capacity	0.17	0.03	0.09	0.05	0.03	0.22	0.22
Queue Length 95th (m)	4.7	0.7	0.0	0.0	0.7	0.0	0.0
Control Delay (s)	16.9	9.1	0.0	0.0	7.8	0.0	0.0
Lane LOS	C	A			A		
Approach Delay (s)	14.6		0.0		0.4		
Approach LOS	B						
Intersection Summary							
Average Delay			1.5				
Intersection Capacity Utilization			29.0%		ICU Level of Service		A
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis  
 14: Carlingview Dr & Entrance Rd

01/12/2020

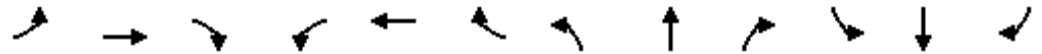
						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	38	49	71	111	28	33
Future Volume (vph)	38	49	71	111	28	33
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	44	56	82	128	32	38
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total (vph)	44	56	82	128	32	38
Volume Left (vph)	0	0	82	0	32	0
Volume Right (vph)	0	56	0	0	0	38
Hadj (s)	0.14	-0.70	0.57	0.05	0.69	-0.55
Departure Headway (s)	5.0	4.2	5.3	4.8	5.9	4.7
Degree Utilization, x	0.06	0.06	0.12	0.17	0.05	0.05
Capacity (veh/h)	703	836	656	729	580	724
Control Delay (s)	7.1	6.3	7.9	7.6	8.0	6.7
Approach Delay (s)	6.6		7.7		7.3	
Approach LOS	A		A		A	
Intersection Summary						
Delay			7.4			
Level of Service			A			
Intersection Capacity Utilization			20.6%		ICU Level of Service	A
Analysis Period (min)			15			



# Queues

## 1: Highway 27 & Belfield Rd

01/12/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	205	427	105	167	344	483	88	1370	225	184	1139	124
v/c Ratio	0.82	0.89	0.07	0.70	0.77	0.31	0.67	0.99	0.31	0.99	0.77	0.18
Control Delay	78.5	74.4	0.1	68.6	65.4	0.5	81.2	59.7	4.2	136.7	24.1	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.5	74.4	0.1	68.6	65.4	0.5	81.2	59.7	4.2	136.7	24.1	0.5
Queue Length 50th (m)	56.3	59.3	0.0	44.6	46.4	0.0	22.1	180.9	0.0	-55.4	146.1	0.1
Queue Length 95th (m)	#99.1	#87.9	0.0	71.3	64.2	0.0	#43.5	#231.3	15.4m	#102.2	175.5	m0.0
Internal Link Dist (m)		253.2			275.1			169.6			234.9	
Turn Bay Length (m)	145.0		65.0	200.0		200.0	140.0		155.0	110.0		75.0
Base Capacity (vph)	253	488	1541	255	477	1570	140	1390	734	186	1481	686
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.88	0.07	0.65	0.72	0.31	0.63	0.99	0.31	0.99	0.77	0.18

### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 1: Highway 27 & Belfield Rd

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	286	295	97	260	210	444	81	1356	207	175	1048	114
Future Volume (vph)	286	295	97	260	210	444	81	1356	207	175	1048	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.91	0.91	1.00	0.91	0.91	1.00	1.00	*0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.99	1.00	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1567	3022	1541	1582	2957	1570	1521	3476	1498	1772	3544	1432
Flt Permitted	0.95	0.99	1.00	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1567	3022	1541	1582	2957	1570	1521	3476	1498	1772	3544	1432
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.99	0.92	0.95	0.92	0.92
Adj. Flow (vph)	311	321	105	283	228	483	88	1370	225	184	1139	124
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	135	0	0	72
Lane Group Flow (vph)	205	427	105	167	344	483	88	1370	90	184	1139	52
Heavy Vehicles (%)	6%	17%	6%	5%	22%	4%	20%	5%	9%	3%	3%	14%
Turn Type	Split	NA	Free	Split	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4		5	2		1		6
Permitted Phases			Free			Free			2			6
Actuated Green, G (s)	19.7	19.7	130.0	18.6	18.6	130.0	10.3	51.0	51.0	12.7	53.4	53.4
Effective Green, g (s)	20.7	20.7	130.0	19.6	19.6	130.0	11.3	52.0	52.0	13.7	54.4	54.4
Actuated g/C Ratio	0.16	0.16	1.00	0.15	0.15	1.00	0.09	0.40	0.40	0.11	0.42	0.42
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	249	481	1541	238	445	1570	132	1390	599	186	1483	599
v/s Ratio Prot	0.13	c0.14		0.11	c0.12		0.06	c0.39		c0.10	0.32	
v/s Ratio Perm			0.07			c0.31			0.06			0.04
v/c Ratio	0.82	0.89	0.07	0.70	0.77	0.31	0.67	0.99	0.15	0.99	0.77	0.09
Uniform Delay, d1	52.9	53.5	0.0	52.4	53.1	0.0	57.5	38.6	24.9	58.1	32.4	22.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.44	0.62	0.01
Incremental Delay, d2	19.3	17.7	0.1	9.0	8.1	0.5	12.0	20.9	0.5	57.7	3.4	0.2
Delay (s)	72.2	71.2	0.1	61.4	61.2	0.5	69.5	59.6	25.4	141.4	23.4	0.5
Level of Service	E	E	A	E	E	A	E	E	C	F	C	A
Approach Delay (s)		61.4			31.7			55.5			36.5	
Approach LOS		E			C			E			D	

### Intersection Summary

HCM 2000 Control Delay	45.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Unsignalized Intersection Capacity Analysis

## 2: Highway 27 & Bethridge Rd

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕↕↕↔			↕↕
Traffic Volume (veh/h)	0	108	1781	33	0	1192
Future Volume (Veh/h)	0	108	1781	33	0	1192
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	113	1855	34	0	1242
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2493	635			1889	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2493	635			1889	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	73			100	
cM capacity (veh/h)	25	414			321	
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	113	742	742	405	621	621
Volume Left	0	0	0	0	0	0
Volume Right	113	0	0	34	0	0
cSH	414	1700	1700	1700	1700	1700
Volume to Capacity	0.27	0.44	0.44	0.24	0.37	0.37
Queue Length 95th (m)	8.3	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	16.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	16.9	0.0			0.0	
Approach LOS	C					
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			48.5%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: Highway 27 & Vice Regent Blvd

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	46	20	1731	158	33	1217
Future Volume (Veh/h)	46	20	1731	158	33	1217
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	48	21	1803	165	34	1268
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2505	902			1968	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2505	902			1968	
tC, single (s)	6.9	6.9			4.4	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.4	
p0 queue free %	0	93			86	
cM capacity (veh/h)	20	285			246	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	48	21	902	902	165	34	634	634
Volume Left	48	0	0	0	0	34	0	0
Volume Right	0	21	0	0	165	0	0	0
cSH	20	285	1700	1700	1700	246	1700	1700
Volume to Capacity	2.44	0.07	0.53	0.53	0.10	0.14	0.37	0.37
Queue Length 95th (m)	48.4	1.8	0.0	0.0	0.0	3.6	0.0	0.0
Control Delay (s)	1065.9	18.6	0.0	0.0	0.0	22.0	0.0	0.0
Lane LOS	F	C				C		
Approach Delay (s)	747.1	0.0				0.6		
Approach LOS	F							

Intersection Summary			
Average Delay	15.7		
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

# HCM Unsignalized Intersection Capacity Analysis

## 4: Highway 27 & Nearctic Dr

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕	↗		↕
Traffic Volume (veh/h)	0	18	1627	124	0	1250
Future Volume (Veh/h)	0	18	1627	124	0	1250
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	0	18	1643	125	0	1263
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (m)						370
pX, platoon unblocked	0.78					
vC, conflicting volume	2274	822			1768	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2073	822			1768	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	94			100	
cM capacity (veh/h)	37	322			357	
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	18	822	822	125	632	632
Volume Left	0	0	0	0	0	0
Volume Right	18	0	0	125	0	0
cSH	322	1700	1700	1700	1700	1700
Volume to Capacity	0.06	0.48	0.48	0.07	0.37	0.37
Queue Length 95th (m)	1.3	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	16.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	16.9	0.0			0.0	
Approach LOS	C					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			55.0%	ICU Level of Service	A	
Analysis Period (min)			15			

# Queues

## 5: Highway 27 & Rexdale Blvd

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	212	1056	157	1162	96	245	1170	189	133	985	89
v/c Ratio	0.95	0.71	0.73	0.80	0.07	0.95	0.72	0.12	0.69	0.69	0.06
Control Delay	82.0	41.9	50.5	37.8	0.1	77.3	54.0	0.1	73.8	43.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.0	41.9	50.5	37.8	0.1	77.3	54.0	0.1	73.8	43.5	0.1
Queue Length 50th (m)	-47.4	85.9	23.1	69.1	0.0	-66.8	112.9	0.0	32.8	79.5	0.0
Queue Length 95th (m)	#100.2	102.1	m#51.9	90.3	m0.0	m#87.1	m120.1	m0.0	54.3	93.8	0.0
Internal Link Dist (m)		621.3		242.9			315.2			293.8	
Turn Bay Length (m)	100.0		30.0		80.0	80.0		200.0	110.0		115.0
Base Capacity (vph)	223	1508	215	1522	1471	257	1635	1512	216	1575	1512
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.70	0.73	0.76	0.07	0.95	0.72	0.13	0.62	0.63	0.06

### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 5: Highway 27 & Rexdale Blvd

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗↗↗		↘	↗↗↗	↗	↘	↗↗↗	↗	↘	↗↗↗	↗
Traffic Volume (vph)	206	882	143	152	1127	93	238	1135	183	129	955	86
Future Volume (vph)	206	882	143	152	1127	93	238	1135	183	129	955	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.8	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Total Lost time (s)	5.0	6.0		5.0	6.0	3.0	5.0	7.0	3.0	5.0	7.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Fr <sub>t</sub>	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1827	4787		1772	4948	1471	1706	5043	1512	1659	4995	1512
Fl <sub>t</sub> Permitted	0.10	1.00		0.15	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	191	4787		272	4948	1471	1706	5043	1512	1659	4995	1512
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)	212	909	147	157	1162	96	245	1170	189	133	985	89
RTOR Reduction (vph)	0	17	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	212	1039	0	157	1162	96	245	1170	189	133	985	89
Heavy Vehicles (%)	1%	7%	9%	3%	6%	11%	7%	4%	8%	10%	5%	8%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1		6
Permitted Phases	4			8		Free			Free			Free
Actuated Green, G (s)	49.8	39.2		46.2	37.4	130.0	18.6	40.9	130.0	14.1	36.4	130.0
Effective Green, g (s)	51.8	40.2		48.2	38.4	130.0	19.6	41.9	130.0	15.1	37.4	130.0
Actuated g/C Ratio	0.40	0.31		0.37	0.30	1.00	0.15	0.32	1.00	0.12	0.29	1.00
Clearance Time (s)	6.0	7.0		6.0	7.0		6.0	8.0		6.0	8.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	222	1480		213	1461	1471	257	1625	1512	192	1437	1512
v/s Ratio Prot	c0.09	0.22		0.06	0.23		c0.14	c0.23		0.08	0.20	
v/s Ratio Perm	c0.29			0.22		0.07			c0.13			0.06
v/c Ratio	0.95	0.70		0.74	0.80	0.07	0.95	0.72	0.12	0.69	0.69	0.06
Uniform Delay, d <sub>1</sub>	33.3	39.6		29.8	42.2	0.0	54.7	38.9	0.0	55.2	41.1	0.0
Progression Factor	1.00	1.00		1.22	0.80	1.00	0.73	1.33	1.00	1.00	1.00	1.00
Incremental Delay, d <sub>2</sub>	47.4	1.5		11.5	2.8	0.1	32.9	1.8	0.1	10.3	2.7	0.1
Delay (s)	80.6	41.2		47.8	36.4	0.1	73.0	53.6	0.1	65.5	43.8	0.1
Level of Service	F	D		D	D	A	E	D	A	E	D	A
Approach Delay (s)		47.8			35.2			50.2			42.9	
Approach LOS		D			D			D			D	

### Intersection Summary

HCM 2000 Control Delay	44.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 6: Rexdale Blvd & Queens Plate Drive

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	96	1110	40	1226	290	203	252	133
v/c Ratio	0.45	0.37	0.17	0.41	0.85	0.21	0.75	0.13
Control Delay	10.8	2.6	15.5	13.3	65.0	18.3	55.5	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	2.6	15.5	13.3	65.0	18.3	55.5	9.8
Queue Length 50th (m)	1.3	5.0	4.3	54.2	68.8	11.2	57.7	3.3
Queue Length 95th (m)	m7.1	10.6	12.2	73.2	97.2	19.0	82.8	10.0
Internal Link Dist (m)		242.9		949.9		173.2		283.9
Turn Bay Length (m)	55.0		40.0		125.0		120.0	
Base Capacity (vph)	214	2974	235	3008	416	1182	407	1185
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.37	0.17	0.41	0.70	0.17	0.62	0.11

### Intersection Summary

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



# HCM Signalized Intersection Capacity Analysis

## 6: Rexdale Blvd & Queens Plate Drive

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑↑		↗	↑↑↑		↗	↑↑		↗	↑↑	
Traffic Volume (vph)	95	1038	61	40	988	226	287	99	102	249	35	97
Future Volume (vph)	95	1038	61	40	988	226	287	99	102	249	35	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.97		1.00	0.92		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1755	4810		1659	4835		1674	3180		1755	3172	
Flt Permitted	0.19	1.00		0.22	1.00		0.67	1.00		0.62	1.00	
Satd. Flow (perm)	347	4810		382	4835		1177	3180		1153	3172	
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)	96	1048	62	40	998	228	290	100	103	252	35	98
RTOR Reduction (vph)	0	4	0	0	25	0	0	62	0	0	70	0
Lane Group Flow (vph)	96	1106	0	40	1201	0	290	141	0	252	63	0
Heavy Vehicles (%)	4%	8%	10%	10%	6%	3%	9%	2%	10%	4%	9%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	79.2	79.2		79.2	79.2		36.8	36.8		36.8	36.8	
Effective Green, g (s)	80.2	80.2		80.2	80.2		37.8	37.8		37.8	37.8	
Actuated g/C Ratio	0.62	0.62		0.62	0.62		0.29	0.29		0.29	0.29	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	214	2967		235	2982		342	924		335	922	
v/s Ratio Prot		0.23			0.25			0.04			0.02	
v/s Ratio Perm	c0.28			0.10			c0.25			0.22		
v/c Ratio	0.45	0.37		0.17	0.40		0.85	0.15		0.75	0.07	
Uniform Delay, d1	13.2	12.4		10.7	12.7		43.4	34.2		41.8	33.4	
Progression Factor	0.31	0.17		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.4	0.3		1.6	0.4		17.4	0.1		9.2	0.0	
Delay (s)	9.4	2.5		12.2	13.1		60.8	34.3		51.0	33.4	
Level of Service	A	A		B	B		E	C		D	C	
Approach Delay (s)		3.0			13.1			49.9			44.9	
Approach LOS		A			B			D			D	

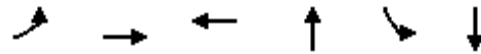
### Intersection Summary

HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# Queues

## 7: Rexdale Blvd & Queens Plate Drive West

01/12/2020



Lane Group	EBL	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	342	954	1481	3	104	402
v/c Ratio	0.71	0.30	0.74	0.02	0.36	0.82
Control Delay	30.7	7.5	25.0	23.7	32.0	28.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.7	7.5	25.0	23.7	32.0	28.1
Queue Length 50th (m)	36.7	22.5	77.2	0.4	15.5	29.3
Queue Length 95th (m)	#107.3	39.5	94.3	2.3	25.7	54.8
Internal Link Dist (m)		320.6	621.3	131.9		93.9
Turn Bay Length (m)	65.0					
Base Capacity (vph)	481	3227	2005	298	447	647
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.30	0.74	0.01	0.23	0.62

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 7: Rexdale Blvd & Queens Plate Drive West

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑↑			↑↑↑			↕		↗	↘	
Traffic Volume (vph)	335	931	4	0	1412	39	0	3	0	102	0	394
Future Volume (vph)	335	931	4	0	1412	39	0	3	0	102	0	394
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	7.0	
Lane Util. Factor	1.00	0.91			0.91			1.00		1.00	1.00	
Frt	1.00	1.00			1.00			1.00		1.00	0.85	
Flt Protected	0.95	1.00			1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1789	4845			4840			961		1807	1633	
Flt Permitted	0.10	1.00			1.00			1.00		0.76	1.00	
Satd. Flow (perm)	187	4845			4840			961		1438	1633	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	342	950	4	0	1441	40	0	3	0	104	0	402
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	183	0
Lane Group Flow (vph)	342	954	0	0	1478	0	0	3	0	104	220	0
Heavy Vehicles (%)	2%	8%	50%	0%	8%	5%	0%	100%	0%	1%	0%	0%
Turn Type	pm+pt	NA			NA			NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2						4			8		
Actuated Green, G (s)	59.0	59.0			36.3			17.0		17.0	17.0	
Effective Green, g (s)	60.0	60.0			37.3			18.0		18.0	17.0	
Actuated g/C Ratio	0.67	0.67			0.41			0.20		0.20	0.19	
Clearance Time (s)	4.0	7.0			7.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	475	3230			2005			192		287	308	
v/s Ratio Prot	c0.16	0.20			0.31			0.00			c0.13	
v/s Ratio Perm	c0.32									0.07		
v/c Ratio	0.72	0.30			0.74			0.02		0.36	0.71	
Uniform Delay, d1	20.7	6.2			22.2			28.9		31.1	34.2	
Progression Factor	1.00	1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2	5.2	0.2			2.5			0.0		0.8	7.6	
Delay (s)	25.8	6.5			24.7			28.9		31.8	41.8	
Level of Service	C	A			C			C		C	D	
Approach Delay (s)		11.6			24.7			28.9			39.7	
Approach LOS		B			C			C			D	

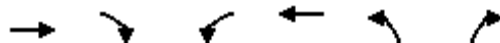
### Intersection Summary

HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Unsignalized Intersection Capacity Analysis

## 8: Entrance Rd & Rexdale Blvd

01/12/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑↑		↗
Traffic Volume (veh/h)	1222	0	0	1775	0	48
Future Volume (Veh/h)	1222	0	0	1775	0	48
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1328	0	0	1929	0	52
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	345					
pX, platoon unblocked					0.88	
vC, conflicting volume	1328			1810		443
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1328			1228		443
tC, single (s)	4.1			6.8		6.9
tC, 2 stage (s)						
tF (s)	2.2			3.5		3.3
p0 queue free %	100			100		91
cM capacity (veh/h)	516			150		563

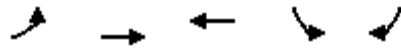
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	443	443	443	482	482	482	482	52
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0	52
cSH	1700	1700	1700	1700	1700	1700	1700	563
Volume to Capacity	0.26	0.26	0.26	0.28	0.28	0.28	0.28	0.09
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0
Lane LOS	B							
Approach Delay (s)	0.0			0.0		12.0		
Approach LOS	B							

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	33.6%	ICU Level of Service	A
Analysis Period (min)	15		

## Queues

### 9: Rexdale Blvd & Humberwood Blvd

01/12/2020



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	252	1288	2569	244	138
v/c Ratio	0.79	0.30	0.77	0.68	0.32
Control Delay	40.1	6.5	22.0	45.9	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	6.5	22.0	45.9	7.2
Queue Length 50th (m)	30.8	24.2	103.8	44.1	0.0
Queue Length 95th (m)	55.8	37.0	#179.3	63.3	13.6
Internal Link Dist (m)		361.4	146.0	175.4	
Turn Bay Length (m)	40.0			30.0	
Base Capacity (vph)	393	4272	3330	697	714
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.64	0.30	0.77	0.35	0.19

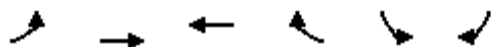
#### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 9: Rexdale Blvd & Humberwood Blvd

01/12/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	247	1262	2097	420	239	135
Future Volume (vph)	247	1262	2097	420	239	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.86	0.86		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1807	6119	6166		1789	1617
Flt Permitted	0.07	1.00	1.00		0.95	1.00
Satd. Flow (perm)	134	6119	6166		1789	1617
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	252	1288	2140	429	244	138
RTOR Reduction (vph)	0	0	24	0	0	110
Lane Group Flow (vph)	252	1288	2545	0	244	28
Heavy Vehicles (%)	1%	8%	5%	2%	2%	1%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	68.8	68.8	52.6		19.2	19.2
Effective Green, g (s)	69.8	69.8	53.6		20.2	20.2
Actuated g/C Ratio	0.70	0.70	0.54		0.20	0.20
Clearance Time (s)	4.0	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)	314	4271	3304		361	326
v/s Ratio Prot	c0.11	0.21	0.41		c0.14	
v/s Ratio Perm	c0.45					0.02
v/c Ratio	0.80	0.30	0.77		0.68	0.09
Uniform Delay, d1	27.3	5.8	18.3		36.9	32.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	13.7	0.2	1.8		4.9	0.1
Delay (s)	41.0	6.0	20.1		41.8	32.5
Level of Service	D	A	C		D	C
Approach Delay (s)		11.7	20.1		38.5	
Approach LOS		B	C		D	

### Intersection Summary

HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis  
 10: Goreway Dr & Woodbine Entrance/Club House Rd

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	88	1676	111	31	321
Future Volume (Veh/h)	8	88	1676	111	31	321
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	93	1764	117	33	338
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2058	940			1881	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2058	940			1881	
tC, single (s)	6.8	7.0			4.3	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	81	64			88	
cM capacity (veh/h)	43	261			277	













Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	8	93	1176	705	33	169	169
Volume Left	8	0	0	0	33	0	0
Volume Right	0	93	0	117	0	0	0
cSH	43	261	1700	1700	277	1700	1700
Volume to Capacity	0.19	0.36	0.69	0.41	0.12	0.10	0.10
Queue Length 95th (m)	4.6	11.8	0.0	0.0	3.0	0.0	0.0
Control Delay (s)	106.9	26.3	0.0	0.0	19.7	0.0	0.0
Lane LOS	F	D			C		
Approach Delay (s)	32.6		0.0		1.8		
Approach LOS	D						

Intersection Summary							
Average Delay			1.7				
Intersection Capacity Utilization			62.0%		ICU Level of Service		B
Analysis Period (min)			15				

# HCM Unsignalized Intersection Capacity Analysis

## 12: Carlingview Dr & Entrance Rd

01/12/2020

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	7	23	20	11	439	140
Future Volume (vph)	7	23	20	11	439	140
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	7	24	21	12	467	149
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total (vph)	7	24	21	12	467	149
Volume Left (vph)	0	0	21	0	467	0
Volume Right (vph)	0	24	0	0	0	149
Hadj (s)	0.00	-0.55	0.58	0.00	0.52	-0.46
Departure Headway (s)	6.1	5.5	6.7	6.1	5.2	4.2
Degree Utilization, x	0.01	0.04	0.04	0.02	0.68	0.17
Capacity (veh/h)	545	598	500	547	676	835
Control Delay (s)	7.9	7.5	8.7	8.0	17.1	6.9
Approach Delay (s)	7.6		8.5		14.7	
Approach LOS	A		A		B	
Intersection Summary						
Delay			14.0			
Level of Service			B			
Intersection Capacity Utilization			38.8%		ICU Level of Service	A
Analysis Period (min)			15			



# Queues

## 1: Highway 27 & Belfield Rd

01/12/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	91	244	57	161	330	109	130	1270	611	164	938	215
v/c Ratio	0.50	0.66	0.05	0.68	0.71	0.08	0.68	0.63	0.40	0.73	0.49	0.15
Control Delay	58.7	59.8	0.1	63.7	58.4	0.1	70.4	35.2	0.8	70.4	30.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	59.8	0.1	63.7	58.4	0.1	70.4	35.2	0.8	70.4	30.8	0.2
Queue Length 50th (m)	22.9	31.5	0.0	40.9	42.1	0.0	31.0	86.9	0.0	39.0	64.5	0.0
Queue Length 95th (m)	40.8	44.9	0.0	66.2	58.4	0.0	51.0	110.6	0.0	61.1	84.5	0.0
Internal Link Dist (m)		253.2			275.1			169.6			234.9	
Turn Bay Length (m)	145.0		65.0	200.0		200.0	140.0		155.0	110.0		75.0
Base Capacity (vph)	221	444	1168	266	518	1389	232	2026	1536	270	1925	1440
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.55	0.05	0.61	0.64	0.08	0.56	0.63	0.40	0.61	0.49	0.15

### Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 1: Highway 27 & Belfield Rd

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷↷	↷	↶	↷↷	↷	↶	↷↷↷	↷	↶	↷↷↷	↷
Traffic Volume (vph)	98	227	55	233	243	106	126	1232	593	159	910	209
Future Volume (vph)	98	227	55	233	243	106	126	1232	593	159	910	209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	3.0
Lane Util. Factor	0.91	0.91	1.00	0.91	0.91	1.00	1.00	*1.00	1.00	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1318	2648	1168	1496	2913	1389	1706	5386	1536	1690	4856	1440
Flt Permitted	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1318	2648	1168	1496	2913	1389	1706	5386	1536	1690	4856	1440
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)	101	234	57	240	251	109	130	1270	611	164	938	215
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	91	244	57	161	330	109	130	1270	611	164	938	215
Confl. Peds. (#/hr)	4		2	2		4	1		2	2		1
Heavy Vehicles (%)	26%	32%	38%	11%	21%	16%	7%	7%	5%	8%	8%	12%
Turn Type	Split	NA	Free	Split	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	3	3		4	4		5	2		1		6
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	16.4	16.4	125.0	19.0	19.0	125.0	13.1	46.0	125.0	15.6	48.5	125.0
Effective Green, g (s)	17.4	17.4	125.0	20.0	20.0	125.0	14.1	47.0	125.0	16.6	49.5	125.0
Actuated g/C Ratio	0.14	0.14	1.00	0.16	0.16	1.00	0.11	0.38	1.00	0.13	0.40	1.00
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	183	368	1168	239	466	1389	192	2025	1536	224	1922	1440
v/s Ratio Prot	0.07	c0.09		0.11	c0.11		0.08	c0.24		c0.10	0.19	
v/s Ratio Perm			0.05			0.08			c0.40			0.15
v/c Ratio	0.50	0.66	0.05	0.67	0.71	0.08	0.68	0.63	0.40	0.73	0.49	0.15
Uniform Delay, d1	49.8	51.0	0.0	49.4	49.7	0.0	53.3	31.8	0.0	52.1	28.3	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	4.5	0.1	7.3	4.9	0.1	7.2	1.5	0.8	10.1	0.9	0.2
Delay (s)	51.9	55.5	0.1	56.7	54.6	0.1	60.5	33.3	0.8	62.2	29.2	0.2
Level of Service	D	E	A	E	D	A	E	C	A	E	C	A
Approach Delay (s)		46.6			45.3			25.2			28.5	
Approach LOS		D			D			C			C	

Intersection Summary		
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.68	C
Actuated Cycle Length (s)	125.0	Sum of lost time (s)
Intersection Capacity Utilization	70.7%	ICU Level of Service
Analysis Period (min)	15	C

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 2: Highway 27 & Bethridge Rd

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕↕↕↕			↕↕
Traffic Volume (veh/h)	0	56	1265	107	0	1264
Future Volume (Veh/h)	0	56	1265	107	0	1264
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	0	57	1278	108	0	1277
Pedestrians	2					
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)						
pX, platoon unblocked						
vC, conflicting volume	1972	482			1388	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1972	482			1388	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	100	89			100	
cM capacity (veh/h)	56	516			499	
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	57	511	511	364	638	638
Volume Left	0	0	0	0	0	0
Volume Right	57	0	0	108	0	0
cSH	516	1700	1700	1700	1700	1700
Volume to Capacity	0.11	0.30	0.30	0.21	0.38	0.38
Queue Length 95th (m)	2.8	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	12.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	12.8	0.0			0.0	
Approach LOS	B					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			38.3%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: Highway 27 & Vice Regent Blvd

01/12/2020

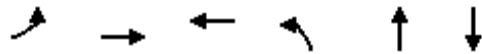


Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	52	20	1246	75	120	1315		
Future Volume (Veh/h)	52	20	1246	75	120	1315		
Sign Control	Stop		Free			Free		
Grade	0%		0%			0%		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Hourly flow rate (vph)	52	20	1246	75	120	1315		
Pedestrians	3					1		
Lane Width (m)	3.7					3.7		
Walking Speed (m/s)	1.1					1.1		
Percent Blockage	0					0		
Right turn flare (veh)								
Median type	None				None			
Median storage (veh)								
Upstream signal (m)							333	
pX, platoon unblocked	0.90							
vC, conflicting volume	2146	627				1324		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	2050	627				1324		
tC, single (s)	7.1	7.3				4.2		
tC, 2 stage (s)								
tF (s)	3.6	3.5				2.3		
p0 queue free %	0	95				76		
cM capacity (veh/h)	28	384				495		
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	52	20	623	623	75	120	658	658
Volume Left	52	0	0	0	0	120	0	0
Volume Right	0	20	0	0	75	0	0	0
cSH	28	384	1700	1700	1700	495	1700	1700
Volume to Capacity	1.84	0.05	0.37	0.37	0.04	0.24	0.39	0.39
Queue Length 95th (m)	46.7	1.2	0.0	0.0	0.0	7.1	0.0	0.0
Control Delay (s)	697.4	14.9	0.0	0.0	0.0	14.6	0.0	0.0
Lane LOS	F	B				B		
Approach Delay (s)	507.8		0.0			1.2		
Approach LOS	F							
Intersection Summary								
Average Delay			13.5					
Intersection Capacity Utilization			54.8%			ICU Level of Service		A
Analysis Period (min)			15					

# Queues

## 4: Highway 27 & Nearctic Dr/Street E

01/12/2020



Lane Group	EBL	EBT	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	3	10	37	9	1269	1442
v/c Ratio	0.04	0.10	0.32	0.03	0.31	0.35
Control Delay	59.3	40.1	26.7	1.3	1.8	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.3	40.1	26.7	1.3	1.8	1.3
Queue Length 50th (m)	0.7	0.8	0.5	0.3	15.4	6.7
Queue Length 95th (m)	3.8	6.4	11.4	0.9	23.9	21.7
Internal Link Dist (m)		77.8	141.3		184.1	346.1
Turn Bay Length (m)				125.0		
Base Capacity (vph)	371	445	398	356	4137	4173
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.02	0.09	0.03	0.31	0.35

### Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 4: Highway 27 & Nearctic Dr/Street E

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷		↶	↑↑↑		↶	↑↑↑	
Traffic Volume (vph)	3	1	9	0	2	35	9	1167	89	0	1425	3
Future Volume (vph)	3	1	9	0	2	35	9	1167	89	0	1425	3
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		3.5	6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91			0.91	
Frbp, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	
Frt	1.00	0.86			0.86		1.00	0.99			1.00	
Flt Protected	0.95	1.00			1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1789	1629			1385		1789	4684			4811	
Flt Permitted	0.73	1.00			1.00		0.16	1.00			1.00	
Satd. Flow (perm)	1381	1629			1385		304	4684			4811	
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)	3	1	9	0	2	35	9	1179	90	0	1439	3
RTOR Reduction (vph)	0	9	0	0	33	0	0	3	0	0	0	0
Lane Group Flow (vph)	3	1	0	0	4	0	9	1266	0	0	1442	0
Confl. Peds. (#/hr)									10			
Heavy Vehicles (%)	2%	2%	2%	0%	2%	20%	2%	11%	3%	0%	9%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	5.6	5.6			5.6		111.4	111.4			105.7	
Effective Green, g (s)	6.6	6.6			6.6		112.4	112.4			106.7	
Actuated g/C Ratio	0.05	0.05			0.05		0.86	0.86			0.82	
Clearance Time (s)	6.0	6.0			6.0		4.5	7.0			7.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	70	82			70		287	4049			3948	
v/s Ratio Prot		0.00			c0.00		0.00	c0.27			c0.30	
v/s Ratio Perm	0.00						0.03					
v/c Ratio	0.04	0.02			0.05		0.03	0.31			0.37	
Uniform Delay, d1	58.7	58.6			58.7		1.4	1.6			3.0	
Progression Factor	1.04	1.26			1.00		1.00	1.00			0.47	
Incremental Delay, d2	0.3	0.1			0.3		0.0	0.2			0.2	
Delay (s)	61.1	73.9			59.1		1.4	1.8			1.6	
Level of Service	E	E			E		A	A			A	
Approach Delay (s)		70.9			59.1			1.8			1.6	
Approach LOS		E			E			A			A	

### Intersection Summary

HCM 2000 Control Delay	2.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 5: Highway 27 & Rexdale Boulevard

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	113	1314	196	476	118	95	1027	109	126	1111	53
v/c Ratio	0.31	0.90	0.84	0.29	0.08	0.66	0.68	0.07	0.78	0.71	0.04
Control Delay	30.0	55.7	76.1	26.6	0.1	76.3	40.3	0.1	87.3	42.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	55.7	76.1	26.6	0.1	76.3	40.3	0.1	87.3	42.0	0.0
Queue Length 50th (m)	18.6	95.5	40.0	24.7	0.0	23.6	84.8	0.0	31.8	92.7	0.0
Queue Length 95th (m)	34.2	#114.4	#75.2	30.9	0.0	41.6	101.0	0.0	#61.1	110.5	0.0
Internal Link Dist (m)		271.0		242.9			346.1			293.8	
Turn Bay Length (m)	100.0		30.0		80.0	80.0		200.0	110.0		115.0
Base Capacity (vph)	362	1466	239	1657	1549	166	1511	1549	172	1566	1480
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.90	0.82	0.29	0.08	0.57	0.68	0.07	0.73	0.71	0.04

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 5: Highway 27 & Rexdale Boulevard

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗↗↗		↘	↗↗↗	↗	↘	↗↗↗	↗	↘	↗↗↗	↗
Traffic Volume (vph)	111	1141	147	192	466	116	93	1006	107	123	1089	52
Future Volume (vph)	111	1141	147	192	466	116	93	1006	107	123	1089	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.8	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Total Lost time (s)	5.0	6.0		5.0	6.0	3.0	5.0	7.0	3.0	5.0	7.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1739	4777		1706	4683	1549	1547	4812	1549	1601	4856	1480
Flt Permitted	0.47	1.00		0.09	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	860	4777		161	4683	1549	1547	4812	1549	1601	4856	1480
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	113	1164	150	196	476	118	95	1027	109	126	1111	53
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	113	1301	0	196	476	118	95	1027	109	126	1111	53
Confl. Peds. (#/hr)	5		7	7		5	1		6	6		1
Heavy Vehicles (%)	6%	7%	13%	7%	12%	4%	18%	9%	4%	14%	8%	9%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		Free			Free			Free
Actuated Green, G (s)	44.6	38.6		57.0	45.0	130.0	11.1	39.8	130.0	12.2	40.9	130.0
Effective Green, g (s)	46.6	39.6		58.0	46.0	130.0	12.1	40.8	130.0	13.2	41.9	130.0
Actuated g/C Ratio	0.36	0.30		0.45	0.35	1.00	0.09	0.31	1.00	0.10	0.32	1.00
Clearance Time (s)	6.0	7.0		6.0	7.0		6.0	8.0		6.0	8.0	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	355	1455		231	1657	1549	143	1510	1549	162	1565	1480
v/s Ratio Prot	0.02	0.27		c0.09	0.10		0.06	0.21		c0.08	c0.23	
v/s Ratio Perm	0.10			c0.29		c0.08			0.07			0.04
v/c Ratio	0.32	0.89		0.85	0.29	0.08	0.66	0.68	0.07	0.78	0.71	0.04
Uniform Delay, d1	28.6	43.2		33.4	30.2	0.0	57.0	38.9	0.0	57.0	38.7	0.0
Progression Factor	1.26	1.10		1.57	0.86	1.00	0.97	0.96	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	8.4		22.9	0.4	0.1	8.4	2.4	0.1	19.0	2.8	0.0
Delay (s)	36.2	56.0		75.4	26.5	0.1	63.7	39.9	0.1	75.9	41.5	0.0
Level of Service	D	E		E	C	A	E	D	A	E	D	A
Approach Delay (s)		54.5			34.7			38.2			43.1	
Approach LOS		D			C			D			D	

### Intersection Summary

HCM 2000 Control Delay	43.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



# Queues

## 6: Rexdale Boulevard & Queens Plate Drive

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	27	1432	61	884	55	112	121	46
v/c Ratio	0.07	0.40	0.29	0.25	0.34	0.22	0.68	0.10
Control Delay	0.9	0.7	10.5	5.1	52.9	24.3	69.6	30.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.9	0.7	10.5	5.1	52.9	24.3	69.6	30.6
Queue Length 50th (m)	0.2	3.3	4.2	20.1	12.8	6.5	29.7	3.2
Queue Length 95th (m)	m0.3	4.8	14.1	32.4	24.1	14.2	47.1	8.4
Internal Link Dist (m)		242.9		949.9		173.2		283.9
Turn Bay Length (m)	65.0		45.0		140.0		125.0	
Base Capacity (vph)	411	3576	211	3530	332	969	366	937
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.40	0.29	0.25	0.17	0.12	0.33	0.05

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 6: Rexdale Boulevard & Queens Plate Drive

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕↕↗		↖	↕↕↗		↖	↕↗		↖	↕↗	
Traffic Volume (vph)	25	1238	108	57	704	127	52	36	70	114	26	17
Future Volume (vph)	25	1238	108	57	704	127	52	36	70	114	26	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.90		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)	1690	4719		1644	4649		1415	3022		1662	3007	
Flt Permitted	0.31	1.00		0.16	1.00		0.73	1.00		0.68	1.00	
Satd. Flow (perm)	545	4719		280	4649		1080	3022		1191	3007	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	27	1317	115	61	749	135	55	38	74	121	28	18
RTOR Reduction (vph)	0	5	0	0	12	0	0	48	0	0	15	0
Lane Group Flow (vph)	27	1427	0	61	872	0	55	64	0	121	31	0
Confl. Peds. (#/hr)			2	2					8	8		
Heavy Vehicles (%)	8%	10%	6%	11%	11%	6%	29%	8%	7%	9%	8%	24%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	97.4	97.4		97.4	97.4		18.6	18.6		18.6	18.6	
Effective Green, g (s)	98.4	98.4		98.4	98.4		19.6	19.6		19.6	19.6	
Actuated g/C Ratio	0.76	0.76		0.76	0.76		0.15	0.15		0.15	0.15	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	412	3571		211	3518		162	455		179	453	
v/s Ratio Prot		c0.30			0.19			0.02			0.01	
v/s Ratio Perm	0.05			0.22			0.05			c0.10		
v/c Ratio	0.07	0.40		0.29	0.25		0.34	0.14		0.68	0.07	
Uniform Delay, d1	4.0	5.5		4.9	4.7		49.4	47.9		52.2	47.4	
Progression Factor	0.13	0.08		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2		3.4	0.2		1.3	0.1		9.7	0.1	
Delay (s)	0.7	0.7		8.3	4.9		50.7	48.0		61.9	47.4	
Level of Service	A	A		A	A		D	D		E	D	
Approach Delay (s)		0.7			5.1			48.9			57.9	
Approach LOS		A			A			D			E	

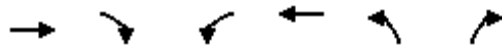
Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 7: Street F & Rexdale Boulevard

01/12/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑			↑↑↑		↗	
Traffic Volume (veh/h)	1332	15	0	611	0	67	
Future Volume (Veh/h)	1332	15	0	611	0	67	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly flow rate (vph)	1480	17	0	679	0	74	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None			None			
Median storage (veh)							
Upstream signal (m)	148			295			
pX, platoon unblocked				0.89	0.91	0.89	
vC, conflicting volume				1480	1715	502	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol				1092	1096	0	
tC, single (s)				4.1	6.8	6.9	
tC, 2 stage (s)							
tF (s)				2.2	3.5	3.3	
p0 queue free %				100	100	92	
cM capacity (veh/h)				563	189	961	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	592	592	313	226	226	226	74
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	17	0	0	0	74
cSH	1700	1700	1700	1700	1700	1700	961
Volume to Capacity	0.35	0.35	0.18	0.13	0.13	0.13	0.08
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	1.9
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.1
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.1
Approach LOS							A
Intersection Summary							
Average Delay				0.3			
Intersection Capacity Utilization				36.9%			ICU Level of Service
Analysis Period (min)				15			A

## Queues

### 8: Street D & Rexdale Boulevard

01/12/2020



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1500	9	670	3	4
v/c Ratio	0.40	0.05	0.18	0.01	0.01
Control Delay	7.4	1.2	0.9	42.0	25.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.4	1.2	0.9	42.0	25.8
Queue Length 50th (m)	49.2	0.1	2.5	0.6	0.0
Queue Length 95th (m)	56.5	m0.3	3.0	3.4	3.1
Internal Link Dist (m)	178.1		124.2	288.3	
Turn Bay Length (m)		130.0			
Base Capacity (vph)	3714	194	3718	412	372
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.40	0.05	0.18	0.01	0.01

#### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 8: Street D & Rexdale Boulevard

01/12/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↵	↑↑↑	↵	↵
Traffic Volume (vph)	1343	7	8	603	3	4
Future Volume (vph)	1343	7	8	603	3	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5138		1789	5142	1789	1601
Flt Permitted	1.00		0.14	1.00	0.95	1.00
Satd. Flow (perm)	5138		270	5142	1789	1601
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1492	8	9	670	3	4
RTOR Reduction (vph)	0	0	0	0	0	3
Lane Group Flow (vph)	1500	0	9	670	3	1
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases			6			8
Actuated Green, G (s)	93.0		93.0	93.0	25.0	25.0
Effective Green, g (s)	94.0		94.0	94.0	26.0	26.0
Actuated g/C Ratio	0.72		0.72	0.72	0.20	0.20
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)	3715		195	3718	357	320
v/s Ratio Prot	c0.29			0.13	c0.00	
v/s Ratio Perm			0.03			0.00
v/c Ratio	0.40		0.05	0.18	0.01	0.00
Uniform Delay, d1	7.0		5.2	5.7	41.7	41.6
Progression Factor	1.00		0.14	0.14	1.00	1.00
Incremental Delay, d2	0.3		0.4	0.1	0.0	0.0
Delay (s)	7.4		1.2	0.9	41.7	41.6
Level of Service	A		A	A	D	D
Approach Delay (s)	7.4			0.9	41.6	
Approach LOS	A			A	D	

### Intersection Summary

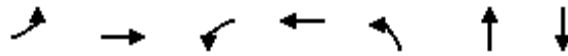
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 9: Rexdale Boulevard & Queens Plate Drive West

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	278	1410	5	645	6	11	326
v/c Ratio	0.42	0.39	0.02	0.22	0.07	0.05	0.64
Control Delay	4.5	4.3	9.4	8.1	36.3	27.5	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.5	4.3	9.4	8.1	36.3	27.5	14.6
Queue Length 50th (m)	8.0	22.3	0.3	15.0	1.1	0.6	4.9
Queue Length 95th (m)	18.7	37.3	2.1	26.7	5.2	3.4	16.5
Internal Link Dist (m)		487.3		178.1		345.3	93.9
Turn Bay Length (m)	120.0		100.0		70.0		
Base Capacity (vph)	739	3648	209	2898	331	853	1200
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.39	0.02	0.22	0.02	0.01	0.27

### Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 9: Rexdale Boulevard & Queens Plate Drive West

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖↖		↖	↖↖↖		↖	↖↖			↖↖	
Traffic Volume (vph)	259	1299	12	5	581	19	6	6	5	46	7	250
Future Volume (vph)	259	1299	12	5	581	19	6	6	5	46	7	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		7.0	6.0		7.0	6.0			7.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95			0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.93			0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1787	4811		1824	4653		1825	2186			2997	
Flt Permitted	0.38	1.00		0.18	1.00		0.46	1.00			0.91	
Satd. Flow (perm)	707	4811		343	4653		877	2186			2736	
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)	278	1397	13	5	625	20	6	6	5	49	8	269
RTOR Reduction (vph)	0	0	0	0	2	0	0	4	0	0	243	0
Lane Group Flow (vph)	278	1410	0	5	643	0	6	7	0	0	83	0
Confl. Peds. (#/hr)	6		2	2		6			3	3		
Heavy Vehicles (%)	2%	8%	100%	0%	12%	16%	0%	100%	0%	5%	75%	4%
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)	67.2	67.2		55.0	55.0		8.8	8.8			8.8	
Effective Green, g (s)	68.2	68.2		55.0	56.0		8.8	9.8			8.8	
Actuated g/C Ratio	0.76	0.76		0.61	0.62		0.10	0.11			0.10	
Clearance Time (s)	4.0	7.0		7.0	7.0		7.0	7.0			7.0	
Vehicle Extension (s)	2.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	646	3645		209	2895		85	238			267	
v/s Ratio Prot	c0.04	0.29			0.14			0.00				
v/s Ratio Perm	c0.28			0.01			0.01				c0.03	
v/c Ratio	0.43	0.39		0.02	0.22		0.07	0.03			0.31	
Uniform Delay, d1	3.2	3.7		6.9	7.5		36.9	35.8			37.8	
Progression Factor	1.00	1.00		1.00	1.00		0.98	1.01			1.00	
Incremental Delay, d2	0.2	0.3		0.2	0.2		0.4	0.0			0.7	
Delay (s)	3.4	4.0		7.1	7.6		36.5	36.4			38.5	
Level of Service	A	A		A	A		D	D			D	
Approach Delay (s)		3.9			7.6			36.5			38.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

10: Private Driveway & Rexdale Boulevard

01/12/2020



Lane Group	EBT	EBR	WBT	WBR
Lane Group Flow (vph)	1740	201	858	72
v/c Ratio	0.34	0.13	0.17	0.04
Control Delay	0.2	0.1	0.1	0.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	0.2	0.1	0.1	0.0
Queue Length 50th (m)	0.0	0.0	0.0	0.0
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Internal Link Dist (m)	26.5		487.3	
Turn Bay Length (m)		150.0		80.0
Base Capacity (vph)	5142	1601	5142	1601
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.13	0.17	0.04

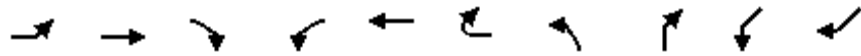
Intersection Summary



# HCM Signalized Intersection Capacity Analysis

## 10: Private Driveway & Rexdale Boulevard

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL	SWR
Lane Configurations		↑↑↑	↑		↑↑↑	↑	↑			
Traffic Volume (vph)	0	1566	181	0	772	65	0	0	0	0
Future Volume (vph)	0	1566	181	0	772	65	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	7.0				
Lane Util. Factor		0.91	1.00		0.91	1.00				
Frt		1.00	0.85		1.00	0.85				
Flt Protected		1.00	1.00		1.00	1.00				
Satd. Flow (prot)		5142	1601		5142	1601				
Flt Permitted		1.00	1.00		1.00	1.00				
Satd. Flow (perm)		5142	1601		5142	1601				
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1740	201	0	858	72	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1740	201	0	858	72	0	0	0	0
Turn Type		NA	Perm		NA	Perm	Prot			
Protected Phases		2			6		8			
Permitted Phases			2			6				
Actuated Green, G (s)		100.0	100.0		100.0	100.0				
Effective Green, g (s)		100.0	100.0		100.0	100.0				
Actuated g/C Ratio		1.00	1.00		1.00	1.00				
Clearance Time (s)		7.0	7.0		7.0	7.0				
Vehicle Extension (s)		3.0	3.0		3.0	3.0				
Lane Grp Cap (vph)		5142	1601		5142	1601				
v/s Ratio Prot		c0.34			0.17					
v/s Ratio Perm			0.13			0.04				
v/c Ratio		0.34	0.13		0.17	0.04				
Uniform Delay, d1		0.0	0.0		0.0	0.0				
Progression Factor		1.00	1.00		1.00	1.00				
Incremental Delay, d2		0.2	0.1		0.1	0.1				
Delay (s)		0.2	0.1		0.1	0.1				
Level of Service		A	A		A	A				
Approach Delay (s)		0.2			0.1		0.0		0.0	
Approach LOS		A			A		A		A	

### Intersection Summary

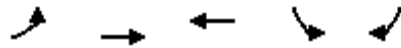
HCM 2000 Control Delay	0.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

## Queues

### 11: Rexdale Boulevard & Humberwood Boulevard

01/12/2020



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	118	1378	922	461	286
v/c Ratio	0.31	0.51	0.36	0.78	0.40
Control Delay	13.4	15.2	18.8	38.6	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	15.2	18.8	38.6	4.2
Queue Length 50th (m)	9.6	56.7	30.6	79.0	0.5
Queue Length 95th (m)	21.7	84.5	48.2	99.3	14.8
Internal Link Dist (m)		361.4	134.8	181.9	
Turn Bay Length (m)	85.0			35.0	
Base Capacity (vph)	395	2716	2588	797	875
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.30	0.51	0.36	0.58	0.33

#### Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 11: Rexdale Boulevard & Humberwood Boulevard

01/12/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	112	1309	697	179	438	272
Future Volume (vph)	112	1309	697	179	438	272
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91	0.86		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1771	4812	5724		1772	1601
Flt Permitted	0.24	1.00	1.00		0.95	1.00
Satd. Flow (perm)	440	4812	5724		1772	1601
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	118	1378	734	188	461	286
RTOR Reduction (vph)	0	0	38	0	0	188
Lane Group Flow (vph)	118	1378	884	0	461	98
Confl. Peds. (#/hr)	6			6		
Heavy Vehicles (%)	3%	9%	12%	8%	3%	2%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	55.5	55.5	43.6		32.5	32.5
Effective Green, g (s)	56.5	56.5	44.6		33.5	33.5
Actuated g/C Ratio	0.56	0.56	0.45		0.34	0.34
Clearance Time (s)	4.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	2.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	367	2718	2552		593	536
v/s Ratio Prot	0.03	c0.29	0.15		c0.26	
v/s Ratio Perm	0.15					0.06
v/c Ratio	0.32	0.51	0.35		0.78	0.18
Uniform Delay, d1	10.5	13.3	18.2		29.9	23.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.2	0.7	0.4		6.4	0.2
Delay (s)	10.7	13.9	18.5		36.3	23.7
Level of Service	B	B	B		D	C
Approach Delay (s)		13.7	18.5		31.5	
Approach LOS		B	B		C	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			19.3		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.63			
Actuated Cycle Length (s)			100.0		Sum of lost time (s)	13.0
Intersection Capacity Utilization			62.1%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis  
 12: Goreway Dr & Woodbine Entrance/Club House Rd

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	61	26	216	14	39	688
Future Volume (Veh/h)	61	26	216	14	39	688
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)	65	28	230	15	41	732
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	686	122			245	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	686	122			245	
tC, single (s)	6.9	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	82	97			97	
cM capacity (veh/h)	363	912			1333	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	65	28	153	92	41	366	366
Volume Left	65	0	0	0	41	0	0
Volume Right	0	28	0	15	0	0	0
cSH	363	912	1700	1700	1333	1700	1700
Volume to Capacity	0.18	0.03	0.09	0.05	0.03	0.22	0.22
Queue Length 95th (m)	4.9	0.7	0.0	0.0	0.7	0.0	0.0
Control Delay (s)	17.0	9.1	0.0	0.0	7.8	0.0	0.0
Lane LOS	C	A			A		
Approach Delay (s)	14.6		0.0		0.4		
Approach LOS	B						

Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization	29.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis  
 13: Entrance Road & Woodbine Entrance/Club House Rd

01/12/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	23	30	66	78	58	21
Future Volume (vph)	23	30	66	78	58	21
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	28	37	81	96	72	26







Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total (vph)	28	37	177	72	26
Volume Left (vph)	28	0	81	0	0
Volume Right (vph)	0	37	0	0	26
Hadj (s)	0.50	-0.70	0.14	0.07	-0.60
Departure Headway (s)	5.6	4.4	4.3	4.3	3.2
Degree Utilization, x	0.04	0.04	0.21	0.09	0.02
Capacity (veh/h)	615	776	820	814	1121
Control Delay (s)	7.6	6.4	8.4	7.7	6.3
Approach Delay (s)	6.9		8.4	7.3	
Approach LOS	A		A	A	

Intersection Summary					
Delay			7.8		
Level of Service			A		
Intersection Capacity Utilization		24.4%		ICU Level of Service	A
Analysis Period (min)			15		

# HCM Unsignalized Intersection Capacity Analysis

## 14: Carlingview Drive & Entrance Road

01/12/2020

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	38	50	72	114	30	35
Future Volume (vph)	38	50	72	114	30	35
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	44	57	83	131	34	40
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total (vph)	44	57	83	131	34	40
Volume Left (vph)	0	0	83	0	34	0
Volume Right (vph)	0	57	0	0	0	40
Hadj (s)	0.14	-0.70	0.57	0.05	0.69	-0.55
Departure Headway (s)	5.0	4.2	5.3	4.8	5.9	4.7
Degree Utilization, x	0.06	0.07	0.12	0.18	0.06	0.05
Capacity (veh/h)	701	832	654	727	578	722
Control Delay (s)	7.2	6.3	7.9	7.7	8.1	6.7
Approach Delay (s)	6.7		7.8		7.3	
Approach LOS	A		A		A	
Intersection Summary						
Delay			7.4			
Level of Service			A			
Intersection Capacity Utilization			20.7%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 15: Grandstand Entrance Rd & Entrance Road

01/12/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	31	40	89	28	13	96
Future Volume (Veh/h)	31	40	89	28	13	96
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)	33	43	95	30	14	102
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	270	58	116			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	270	58	116			
tC, single (s)	6.8	7.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.2			
p0 queue free %	95	96	94			
cM capacity (veh/h)	657	961	1470			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	33	43	105	20	9	107
Volume Left	33	0	95	0	0	0
Volume Right	0	43	0	0	0	102
cSH	657	961	1470	1700	1700	1700
Volume to Capacity	0.05	0.04	0.06	0.01	0.01	0.06
Queue Length 95th (m)	1.2	1.1	1.6	0.0	0.0	0.0
Control Delay (s)	10.8	8.9	6.9	0.0	0.0	0.0
Lane LOS	B	A	A			
Approach Delay (s)	9.7		5.8		0.0	
Approach LOS	A					
Intersection Summary						
Average Delay			4.6			
Intersection Capacity Utilization			21.6%		ICU Level of Service	A
Analysis Period (min)			15			

## Queues

### 16: Grandstand Entrance Rd/Street C & Nearctic Dr

01/12/2020



Lane Group	WBR	NBT	SBL
Lane Group Flow (vph)	16	71	14
v/c Ratio	0.02	0.02	0.01
Control Delay	0.0	1.7	1.9
Queue Delay	0.0	0.0	0.0
Total Delay	0.0	1.7	1.9
Queue Length 50th (m)	0.0	1.2	0.5
Queue Length 95th (m)	0.0	2.2	1.4
Internal Link Dist (m)	627.7		
Turn Bay Length (m)			
Base Capacity (vph)	1094	3000	1107
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.01	0.02	0.01

#### Intersection Summary



# HCM Signalized Intersection Capacity Analysis

## 16: Grandstand Entrance Rd/Street C & Nearctic Dr

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶	↶	↷↶		↶	↷↶
Traffic Volume (vph)	0	15	67	0	13	0
Future Volume (vph)	0	15	67	0	13	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		6.0	
Lane Util. Factor		1.00	0.95		1.00	
Frt		0.85	1.00		1.00	
Flt Protected		1.00	1.00		0.95	
Satd. Flow (prot)		1601	3579		1789	
Flt Permitted		1.00	1.00		0.71	
Satd. Flow (perm)		1601	3579		1334	
Peak-hour factor, PHF	0.90	0.95	0.95	0.95	0.90	0.95
Adj. Flow (vph)	0	16	71	0	14	0
RTOR Reduction (vph)	0	15	0	0	0	0
Lane Group Flow (vph)	0	1	71	0	14	0
Turn Type	Prot	Perm	NA		Perm	
Protected Phases	8		2			6
Permitted Phases		8			6	
Actuated Green, G (s)		10.0	108.0		108.0	
Effective Green, g (s)		11.0	109.0		108.0	
Actuated g/C Ratio		0.08	0.84		0.83	
Clearance Time (s)		6.0	6.0		6.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		135	3000		1108	
v/s Ratio Prot			c0.02			
v/s Ratio Perm		c0.00			0.01	
v/c Ratio		0.01	0.02		0.01	
Uniform Delay, d1		54.5	1.7		1.9	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		0.0	0.0		0.0	
Delay (s)		54.5	1.7		1.9	
Level of Service		D	A		A	
Approach Delay (s)	54.5		1.7			1.9
Approach LOS	D		A			A

### Intersection Summary

HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.02		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

## Queues

### 17: Street C & Block 10 East Access

01/12/2020



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	1	2	12	75	12
v/c Ratio	0.00	0.01	0.01	0.02	0.00
Control Delay	35.0	25.5	1.4	1.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	25.5	1.4	1.0	0.2
Queue Length 50th (m)	0.2	0.0	0.0	0.0	0.0
Queue Length 95th (m)	1.6	2.0	1.4	2.5	0.0
Internal Link Dist (m)	336.9			138.6	33.1
Turn Bay Length (m)			100.0		
Base Capacity (vph)	556	499	1345	3412	3367
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.00	0.00	0.01	0.02	0.00

#### Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 17: Street C & Block 10 East Access

01/12/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1	2	11	71	10	1
Future Volume (vph)	1	2	11	71	10	1
Ideal Flow (vphpl)	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	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1789	1601	1789	3579	3534	
Flt Permitted	0.95	1.00	0.75	1.00	1.00	
Satd. Flow (perm)	1789	1601	1411	3579	3534	
Peak-hour factor, PHF	0.90	0.95	0.90	0.95	0.95	0.95
Adj. Flow (vph)	1	2	12	75	11	1
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	1	0	12	75	12	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	2.0	2.0	76.0	76.0	76.0	
Effective Green, g (s)	3.0	3.0	77.0	77.0	77.0	
Actuated g/C Ratio	0.03	0.03	0.86	0.86	0.86	
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)	59	53	1207	3062	3023	
v/s Ratio Prot	c0.00			c0.02	0.00	
v/s Ratio Perm		0.00	0.01			
v/c Ratio	0.02	0.00	0.01	0.02	0.00	
Uniform Delay, d1	42.1	42.1	0.9	1.0	0.9	
Progression Factor	1.00	1.00	1.00	1.00	0.12	
Incremental Delay, d2	0.1	0.0	0.0	0.0	0.0	
Delay (s)	42.2	42.1	1.0	1.0	0.1	
Level of Service	D	D	A	A	A	
Approach Delay (s)	42.1			1.0	0.1	
Approach LOS	D			A	A	

### Intersection Summary

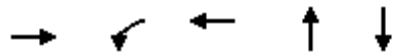
HCM 2000 Control Delay	2.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.02		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 18: Street C & Street F

01/12/2020



Lane Group	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	9	17	61	17	16
v/c Ratio	0.00	0.01	0.02	0.04	0.04
Control Delay	0.0	2.0	0.0	28.9	35.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.0	2.0	0.0	28.9	35.2
Queue Length 50th (m)	0.0	0.0	0.0	1.0	1.3
Queue Length 95th (m)	0.0	1.8	0.0	4.0	4.2
Internal Link Dist (m)	120.1		212.6	69.4	249.0
Turn Bay Length (m)		60.0			
Base Capacity (vph)	3027	1282	2861	1067	1040
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.00	0.01	0.02	0.02	0.02

### Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 18: Street C & Street F

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Volume (vph)	0	5	4	15	1	57	0	11	5	1	14	0
Future Volume (vph)	0	5	4	15	1	57	0	11	5	1	14	0
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		0.95		1.00	0.95			0.95			0.95	
Frt		0.93		1.00	0.85			0.96			1.00	
Flt Protected		1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		3340		1789	3051			3421			3567	
Flt Permitted		1.00		0.75	1.00			1.00			0.94	
Satd. Flow (perm)		3340		1415	3051			3421			3347	
Peak-hour factor, PHF	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95
Adj. Flow (vph)	0	5	4	17	1	60	0	12	5	1	15	0
RTOR Reduction (vph)	0	1	0	0	10	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	8	0	17	51	0	0	12	0	0	16	0
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		74.0		74.0	74.0			4.0			4.0	
Effective Green, g (s)		75.0		75.0	75.0			5.0			5.0	
Actuated g/C Ratio		0.83		0.83	0.83			0.06			0.06	
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)		2783		1179	2542			190			185	
v/s Ratio Prot		0.00			c0.02			0.00				
v/s Ratio Perm				0.01							c0.00	
v/c Ratio		0.00		0.01	0.02			0.06			0.09	
Uniform Delay, d1		1.3		1.3	1.3			40.3			40.3	
Progression Factor		0.00		0.99	1.00			1.00			1.00	
Incremental Delay, d2		0.0		0.0	0.0			0.1			0.2	
Delay (s)		0.0		1.3	1.3			40.4			40.5	
Level of Service		A		A	A			D			D	
Approach Delay (s)		0.0			1.3			40.4			40.5	
Approach LOS		A			A			D			D	

### Intersection Summary

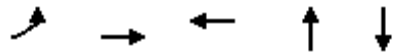
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.02		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 19: Street C & Street D

01/12/2020



Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	1	3	1	9	16
v/c Ratio	0.00	0.00	0.00	0.02	0.04
Control Delay	0.0	0.0	1.0	29.8	33.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.0	0.0	1.0	29.8	33.7
Queue Length 50th (m)	0.0	0.0	0.0	0.4	1.2
Queue Length 95th (m)	0.0	0.0	0.0	2.6	4.2
Internal Link Dist (m)		164.9	120.1	41.0	288.3
Turn Bay Length (m)	65.0				
Base Capacity (vph)	1359	1705	3412	1550	1472
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.00	0.00	0.00	0.01	0.01

### Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 19: Street C & Street D

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↶	↷		↶	↷
Traffic Volume (vph)	1	2	1	0	1	0	0	6	3	4	10	1
Future Volume (vph)	1	2	1	0	1	0	0	6	3	4	10	1
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			0.95			0.95			0.95	
Frt	1.00	0.95			1.00			0.95			0.99	
Flt Protected	0.95	1.00			1.00			1.00			0.99	
Satd. Flow (prot)	1789	1789			3579			3400			3501	
Flt Permitted	0.76	1.00			1.00			1.00			0.91	
Satd. Flow (perm)	1426	1789			3579			3400			3229	
Peak-hour factor, PHF	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95
Adj. Flow (vph)	1	2	1	0	1	0	0	6	3	4	11	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	1	0
Lane Group Flow (vph)	1	3	0	0	1	0	0	6	0	0	15	0
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	76.0	76.0			76.0			2.0			2.0	
Effective Green, g (s)	77.0	77.0			77.0			3.0			3.0	
Actuated g/C Ratio	0.86	0.86			0.86			0.03			0.03	
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)	1220	1530			3062			113			107	
v/s Ratio Prot		c0.00			0.00			0.00				
v/s Ratio Perm	0.00										c0.00	
v/c Ratio	0.00	0.00			0.00			0.05			0.14	
Uniform Delay, d1	0.9	0.9			0.9			42.1			42.2	
Progression Factor	0.00	0.00			0.59			1.00			1.00	
Incremental Delay, d2	0.0	0.0			0.0			0.2			0.6	
Delay (s)	0.0	0.0			0.6			42.3			42.9	
Level of Service	A	A			A			D			D	
Approach Delay (s)		0.0			0.6			42.3			42.9	
Approach LOS		A			A			D			D	

### Intersection Summary

HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.01		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 20: Queens Plate Dr & Street C

01/12/2020



Lane Group	EBL	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	4	1	1	16	25
v/c Ratio	0.00	0.00	0.00	0.07	0.06
Control Delay	2.2	4.0	0.0	33.0	36.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	2.2	4.0	0.0	33.0	36.0
Queue Length 50th (m)	0.0	0.0	0.0	2.2	1.8
Queue Length 95th (m)	0.8	0.6	0.0	7.9	m5.1
Internal Link Dist (m)				69.8	345.3
Turn Bay Length (m)	45.0	60.0			
Base Capacity (vph)	1293	1293	1549	904	1571
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.00	0.00	0.00	0.02	0.02

### Intersection Summary

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



# HCM Signalized Intersection Capacity Analysis

## 20: Queens Plate Dr & Street C

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↖	↗	↖	↗			↖↗	
Traffic Volume (vph)	4	0	0	1	0	1	0	13	2	2	16	6
Future Volume (vph)	4	0	0	1	0	1	0	13	2	2	16	6
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		1.00			0.95	
Frt	1.00			1.00		0.85		0.98			0.96	
Flt Protected	0.95			0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1789			1789		1601		1848			3436	
Flt Permitted	0.76			0.76		1.00		1.00			0.93	
Satd. Flow (perm)	1426			1426		1601		1848			3209	
Peak-hour factor, PHF	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95
Adj. Flow (vph)	4	0	0	1	0	1	0	14	2	2	17	6
RTOR Reduction (vph)	0	0	0	0	0	0	0	2	0	0	6	0
Lane Group Flow (vph)	4	0	0	1	0	1	0	14	0	0	19	0
Turn Type	Perm			Perm		Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	74.0			74.0		74.0		4.0			4.0	
Effective Green, g (s)	75.0			75.0		75.0		5.0			5.0	
Actuated g/C Ratio	0.83			0.83		0.83		0.06			0.06	
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)	1188			1188		1334		102			178	
v/s Ratio Prot								c0.01				
v/s Ratio Perm	c0.00			0.00		0.00					0.01	
v/c Ratio	0.00			0.00		0.00		0.14			0.11	
Uniform Delay, d1	1.3			1.3		1.3		40.4			40.4	
Progression Factor	1.00			1.65		1.00		1.00			1.23	
Incremental Delay, d2	0.0			0.0		0.0		0.6			0.3	
Delay (s)	1.3			2.1		1.3		41.1			49.8	
Level of Service	A			A		A		D			D	
Approach Delay (s)		1.3			1.7			41.1			49.8	
Approach LOS		A			A			D			D	

### Intersection Summary

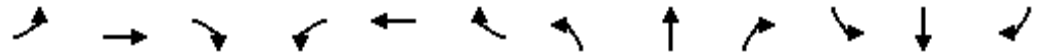
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.01		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 1: Highway 27 & Belfield Rd

01/12/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	205	427	105	167	344	483	88	1797	225	184	1521	124
v/c Ratio	0.82	0.89	0.07	0.70	0.77	0.31	0.61	0.94	0.32	0.86	0.73	0.18
Control Delay	78.5	74.4	0.1	68.6	65.4	0.5	74.2	50.5	4.7	105.1	21.0	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.5	74.4	0.1	68.6	65.4	0.5	74.2	50.5	4.7	105.1	21.0	0.9
Queue Length 50th (m)	56.3	59.3	0.0	44.6	46.4	0.0	21.7	164.8	0.0	49.8	103.4	0.0
Queue Length 95th (m)	#99.1	#87.9	0.0	71.3	64.2	0.0	39.2	#200.0	16.3	#88.2	117.3	0.3
Internal Link Dist (m)		253.2			275.1			169.6			234.9	
Turn Bay Length (m)	145.0		65.0	200.0		200.0	140.0		155.0	110.0		75.0
Base Capacity (vph)	253	488	1541	255	477	1570	163	1902	710	218	2087	676
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.88	0.07	0.65	0.72	0.31	0.54	0.94	0.32	0.84	0.73	0.18

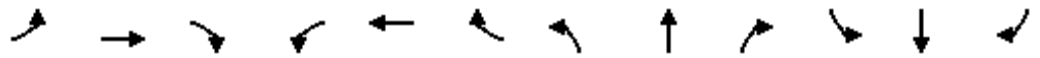
### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 1: Highway 27 & Belfield Rd

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↗	↖	↖↗	↗	↖	↖↗↘	↗	↖	↖↗↘	↗
Traffic Volume (vph)	286	295	97	260	210	444	81	1779	207	175	1399	114
Future Volume (vph)	286	295	97	260	210	444	81	1779	207	175	1399	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.91	0.91	1.00	0.91	0.91	1.00	1.00	*0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.99	1.00	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1567	3022	1541	1582	2957	1570	1521	4995	1498	1738	5092	1432
Flt Permitted	0.95	0.99	1.00	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1567	3022	1541	1582	2957	1570	1521	4995	1498	1738	5092	1432
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.99	0.92	0.95	0.92	0.92
Adj. Flow (vph)	311	321	105	283	228	483	88	1797	225	184	1521	124
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	139	0	0	73
Lane Group Flow (vph)	205	427	105	167	344	483	88	1797	86	184	1521	51
Heavy Vehicles (%)	6%	17%	6%	5%	22%	4%	20%	5%	9%	5%	3%	14%
Turn Type	Split	NA	Free	Split	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4		5	2		1		6
Permitted Phases			Free			Free			2			6
Actuated Green, G (s)	19.7	19.7	130.0	18.6	18.6	130.0	11.4	48.5	48.5	15.2	52.3	52.3
Effective Green, g (s)	20.7	20.7	130.0	19.6	19.6	130.0	12.4	49.5	49.5	16.2	53.3	53.3
Actuated g/C Ratio	0.16	0.16	1.00	0.15	0.15	1.00	0.10	0.38	0.38	0.12	0.41	0.41
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	249	481	1541	238	445	1570	145	1901	570	216	2087	587
v/s Ratio Prot	0.13	c0.14		0.11	c0.12		0.06	c0.36		c0.11	0.30	
v/s Ratio Perm			0.07			c0.31			0.06			0.04
v/c Ratio	0.82	0.89	0.07	0.70	0.77	0.31	0.61	0.95	0.15	0.85	0.73	0.09
Uniform Delay, d1	52.9	53.5	0.0	52.4	53.1	0.0	56.5	38.9	26.4	55.7	32.3	23.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.34	0.57	0.16
Incremental Delay, d2	19.3	17.7	0.1	9.0	8.1	0.5	7.0	11.2	0.6	25.4	2.2	0.3
Delay (s)	72.2	71.2	0.1	61.4	61.2	0.5	63.5	50.2	27.0	99.9	20.5	4.1
Level of Service	E	E	A	E	E	A	E	D	C	F	C	A
Approach Delay (s)		61.4			31.7			48.3			27.3	
Approach LOS		E			C			D			C	

### Intersection Summary

HCM 2000 Control Delay	40.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Unsignalized Intersection Capacity Analysis

## 2: Highway 27 & Bethridge Rd

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕↕↕↕			↕↕
Traffic Volume (veh/h)	0	108	2072	33	0	1546
Future Volume (Veh/h)	0	108	2072	33	0	1546
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	113	2158	34	0	1610
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2980	736			2192	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2980	736			2192	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	68			100	
cM capacity (veh/h)	11	355			245	
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	113	863	863	466	805	805
Volume Left	0	0	0	0	0	0
Volume Right	113	0	0	34	0	0
cSH	355	1700	1700	1700	1700	1700
Volume to Capacity	0.32	0.51	0.51	0.27	0.47	0.47
Queue Length 95th (m)	10.2	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	19.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	19.8	0.0			0.0	
Approach LOS	C					
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			54.1%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: Highway 27 & Vice Regent Blvd

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	46	20	2021	158	33	1572
Future Volume (Veh/h)	46	20	2021	158	33	1572
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	48	21	2105	165	34	1638
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh						
Upstream signal (m)					333	
pX, platoon unblocked	0.82					
vC, conflicting volume	2992	1052			2270	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2990	1052			2270	
tC, single (s)	6.9	6.9			4.4	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.4	
p0 queue free %	0	91			81	
cM capacity (veh/h)	7	226			183	

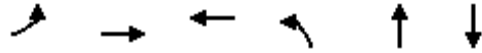
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	48	21	1052	1052	165	34	819	819
Volume Left	48	0	0	0	0	34	0	0
Volume Right	0	21	0	0	165	0	0	0
cSH	7	226	1700	1700	1700	183	1700	1700
Volume to Capacity	6.88	0.09	0.62	0.62	0.10	0.19	0.48	0.48
Queue Length 95th (m)	Err	2.3	0.0	0.0	0.0	5.0	0.0	0.0
Control Delay (s)	Err	22.5	0.0	0.0	0.0	29.1	0.0	0.0
Lane LOS	F	C			D			
Approach Delay (s)	6962.7		0.0		0.6			
Approach LOS	F							

Intersection Summary		
Average Delay	120.0	
Intersection Capacity Utilization	65.9%	ICU Level of Service C
Analysis Period (min)	15	

# Queues

## 4: Highway 27 & Nearctic Dr/Street E

01/12/2020



Lane Group	EBL	EBT	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	61	207	53	182	1877	1491
v/c Ratio	0.48	0.64	0.29	0.52	0.46	0.42
Control Delay	51.0	19.8	41.5	16.6	1.8	3.0
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	51.0	19.9	41.5	16.6	1.8	3.0
Queue Length 50th (m)	16.0	22.0	8.4	6.4	14.6	15.7
Queue Length 95th (m)	m20.1	32.0	20.4	m15.8	m22.2	18.7
Internal Link Dist (m)		77.8	141.3		184.1	346.1
Turn Bay Length (m)				125.0		
Base Capacity (vph)	376	585	511	474	4059	3555
Starvation Cap Reductn	0	42	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.38	0.10	0.38	0.46	0.42

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 4: Highway 27 & Nearctic Dr/Street E

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑↑		↖	↑↑↑	
Traffic Volume (vph)	60	20	185	0	35	18	180	1734	124	0	1421	55
Future Volume (vph)	60	20	185	0	35	18	180	1734	124	0	1421	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		3.5	6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91			0.91	
Frt	1.00	0.86			0.95		1.00	0.99			0.99	
Flt Protected	0.95	1.00			1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1789	1628			1799		1789	4939			5018	
Flt Permitted	0.72	1.00			1.00		0.14	1.00			1.00	
Satd. Flow (perm)	1361	1628			1799		263	4939			5018	
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)	61	20	187	0	35	18	182	1752	125	0	1435	56
RTOR Reduction (vph)	0	169	0	0	16	0	0	3	0	0	2	0
Lane Group Flow (vph)	61	38	0	0	37	0	182	1874	0	0	1489	0
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	5%	7%	0%	4%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.2	11.2			11.2		105.8	105.8			91.1	
Effective Green, g (s)	12.2	12.2			12.2		106.8	106.8			92.1	
Actuated g/C Ratio	0.09	0.09			0.09		0.82	0.82			0.71	
Clearance Time (s)	6.0	6.0			6.0		4.5	7.0			7.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	127	152			168		347	4057			3555	
v/s Ratio Prot		0.02			0.02		c0.05	0.38			0.30	
v/s Ratio Perm	c0.04						c0.38					
v/c Ratio	0.48	0.25			0.22		0.52	0.46			0.42	
Uniform Delay, d1	55.9	54.6			54.5		4.1	3.3			7.9	
Progression Factor	0.76	1.26			1.00		4.71	0.41			0.33	
Incremental Delay, d2	2.1	0.6			0.7		1.1	0.3			0.2	
Delay (s)	44.8	69.6			55.1		20.7	1.7			2.8	
Level of Service	D	E			E		C	A			A	
Approach Delay (s)		63.9			55.1			3.3			2.8	
Approach LOS		E			E			A			A	

### Intersection Summary

HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# Queues

## 5: Highway 27 & Rexdale Boulevard

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	212	1305	157	1356	96	245	1427	189	133	1211	187
v/c Ratio	1.13	0.90	0.87	0.91	0.07	1.00	0.81	0.12	0.78	0.78	0.12
Control Delay	127.6	39.3	75.5	47.4	0.1	103.3	55.0	0.2	85.5	45.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	127.6	39.3	75.5	47.4	0.1	103.3	55.0	0.2	85.5	45.3	0.2
Queue Length 50th (m)	-45.4	116.0	29.3	85.3	0.0	66.5	136.7	0.0	33.6	103.6	0.0
Queue Length 95th (m)	#92.4	#136.4	m#60.5	#119.0	m0.0	#120.1	153.3	0.0	#64.2	121.2	0.0
Internal Link Dist (m)		271.0		242.9			346.1			293.8	
Turn Bay Length (m)	100.0		30.0		80.0	80.0		200.0	110.0		115.0
Base Capacity (vph)	187	1455	181	1484	1471	246	1766	1512	178	1544	1512
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.90	0.87	0.91	0.07	1.00	0.81	0.13	0.75	0.78	0.12

### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.



# HCM Signalized Intersection Capacity Analysis

## 5: Highway 27 & Rexdale Boulevard

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑↑		↘	↑↑↑	↗	↘	↑↑↑	↗	↘	↑↑↑	↗
Traffic Volume (vph)	206	1123	143	152	1315	93	238	1384	183	129	1175	181
Future Volume (vph)	206	1123	143	152	1315	93	238	1384	183	129	1175	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.8	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Total Lost time (s)	5.0	6.0		5.0	6.0	3.0	5.0	7.0	3.0	5.0	7.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Fr <sub>t</sub>	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1827	4809		1772	4948	1471	1706	5043	1512	1659	4995	1512
Fl <sub>t</sub> Permitted	0.10	1.00		0.10	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	197	4809		191	4948	1471	1706	5043	1512	1659	4995	1512
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)	212	1158	147	157	1356	96	245	1427	189	133	1211	187
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	212	1292	0	157	1356	96	245	1427	189	133	1211	187
Heavy Vehicles (%)	1%	7%	9%	3%	6%	11%	7%	4%	8%	10%	5%	8%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		Free			Free			Free
Actuated Green, G (s)	46.0	38.0		46.0	38.0	130.0	17.8	44.5	130.0	12.5	39.2	130.0
Effective Green, g (s)	48.0	39.0		48.0	39.0	130.0	18.8	45.5	130.0	13.5	40.2	130.0
Actuated g/C Ratio	0.37	0.30		0.37	0.30	1.00	0.14	0.35	1.00	0.10	0.31	1.00
Clearance Time (s)	6.0	7.0		6.0	7.0		6.0	8.0		6.0	8.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	1442		179	1484	1471	246	1765	1512	172	1544	1512
v/s Ratio Prot	c0.08	0.27		0.06	0.27		c0.14	c0.28		0.08	0.24	
v/s Ratio Perm	c0.34			0.26		0.07			0.13			0.12
v/c Ratio	1.15	0.90		0.88	0.91	0.07	1.00	0.81	0.12	0.77	0.78	0.12
Uniform Delay, d <sub>1</sub>	33.6	43.6		32.1	43.9	0.0	55.6	38.3	0.0	56.8	40.9	0.0
Progression Factor	0.73	0.71		1.44	0.86	1.00	0.88	1.33	1.00	1.00	1.00	1.00
Incremental Delay, d <sub>2</sub>	107.8	8.3		31.9	9.2	0.1	53.4	3.8	0.2	19.2	4.1	0.2
Delay (s)	132.5	39.3		78.2	47.1	0.1	102.2	54.5	0.2	75.9	45.0	0.2
Level of Service	F	D		E	D	A	F	D	A	E	D	A
Approach Delay (s)		52.3			47.3			55.3			42.2	
Approach LOS		D			D			E			D	

### Intersection Summary

HCM 2000 Control Delay	49.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 6: Rexdale Boulevard & Queens Plate Drive

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	96	1354	40	1416	290	203	252	133
v/c Ratio	0.56	0.45	0.23	0.46	0.87	0.22	0.77	0.14
Control Delay	18.1	0.9	16.9	13.6	69.5	24.7	58.6	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	0.9	16.9	13.6	69.5	24.7	58.6	15.4
Queue Length 50th (m)	1.7	3.4	4.5	67.5	68.7	14.3	57.6	5.7
Queue Length 95th (m)	m4.7	4.3	12.6	82.8	#108.0	23.2	87.0	13.0
Internal Link Dist (m)		242.9		949.9		173.2		283.9
Turn Bay Length (m)	65.0		45.0		140.0		125.0	
Base Capacity (vph)	170	3013	174	3049	380	1065	372	1073
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.45	0.23	0.46	0.76	0.19	0.68	0.12

### Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 6: Rexdale Boulevard & Queens Plate Drive

01/12/2020



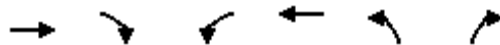
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑↑		↗	↑↑↑		↗	↑↑		↗	↑↑	
Traffic Volume (vph)	95	1279	61	40	1176	226	287	99	102	249	35	97
Future Volume (vph)	95	1279	61	40	1176	226	287	99	102	249	35	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.98		1.00	0.92		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1755	4819		1659	4850		1674	3180		1755	3172	
Flt Permitted	0.15	1.00		0.16	1.00		0.67	1.00		0.62	1.00	
Satd. Flow (perm)	272	4819		279	4850		1177	3180		1153	3172	
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)	96	1292	62	40	1188	228	290	100	103	252	35	98
RTOR Reduction (vph)	0	4	0	0	20	0	0	41	0	0	52	0
Lane Group Flow (vph)	96	1350	0	40	1396	0	290	162	0	252	81	0
Heavy Vehicles (%)	4%	8%	10%	10%	6%	3%	9%	2%	10%	4%	9%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	80.2	80.2		80.2	80.2		35.8	35.8		35.8	35.8	
Effective Green, g (s)	81.2	81.2		81.2	81.2		36.8	36.8		36.8	36.8	
Actuated g/C Ratio	0.62	0.62		0.62	0.62		0.28	0.28		0.28	0.28	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	169	3010		174	3029		333	900		326	897	
v/s Ratio Prot		0.28			0.29			0.05			0.03	
v/s Ratio Perm	c0.35			0.14			c0.25			0.22		
v/c Ratio	0.57	0.45		0.23	0.46		0.87	0.18		0.77	0.09	
Uniform Delay, d1	14.2	12.7		10.7	12.9		44.3	35.2		42.8	34.3	
Progression Factor	0.51	0.05		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.0	0.3		3.1	0.5		21.2	0.1		10.8	0.0	
Delay (s)	15.2	0.9		13.8	13.4		65.5	35.3		53.6	34.3	
Level of Service	B	A		B	B		E	D		D	C	
Approach Delay (s)		1.9			13.4			53.1			46.9	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Unsignalized Intersection Capacity Analysis

## 7: Street F & Rexdale Boulevard

01/12/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑↑		↗
Traffic Volume (veh/h)	1262	280	0	1734	0	210
Future Volume (Veh/h)	1262	280	0	1734	0	210
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1328	295	0	1825	0	221
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	148			295		
pX, platoon unblocked				0.81	0.84	0.81
vC, conflicting volume				1328	2084	590
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				586	93	0
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				100	100	75
cM capacity (veh/h)				798	752	879

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	531	531	561	608	608	608	221
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	295	0	0	0	221
cSH	1700	1700	1700	1700	1700	1700	879
Volume to Capacity	0.31	0.31	0.33	0.36	0.36	0.36	0.25
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	7.6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.5
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.5
Approach LOS							B

Intersection Summary						
Average Delay	0.6					
Intersection Capacity Utilization	50.3%			ICU Level of Service	A	
Analysis Period (min)	15					

## Queues

### 8: Street D & Rexdale Boulevard

01/12/2020



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1686	167	1667	72	84
v/c Ratio	0.55	0.59	0.45	0.20	0.22
Control Delay	16.4	11.5	12.8	58.8	27.7
Queue Delay	0.4	0.0	0.0	0.0	0.0
Total Delay	16.7	11.5	12.8	58.8	27.7
Queue Length 50th (m)	86.8	14.1	134.3	17.4	0.0
Queue Length 95th (m)	113.8	m15.1	m148.1	33.8	21.9
Internal Link Dist (m)	178.1		124.2	288.3	
Turn Bay Length (m)		130.0			
Base Capacity (vph)	3071	388	3718	440	457
Starvation Cap Reductn	710	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.71	0.43	0.45	0.16	0.18

#### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 8: Street D & Rexdale Boulevard

01/12/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↵	↑↑↑	↵	↵
Traffic Volume (vph)	1462	140	150	1584	65	80
Future Volume (vph)	1462	140	150	1584	65	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		3.0	5.0	5.0	5.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5075		1789	5142	1789	1601
Flt Permitted	1.00		0.09	1.00	0.95	1.00
Satd. Flow (perm)	5075		174	5142	1789	1601
Peak-hour factor, PHF	0.95	0.95	0.90	0.95	0.90	0.95
Adj. Flow (vph)	1539	147	167	1667	72	84
RTOR Reduction (vph)	7	0	0	0	0	67
Lane Group Flow (vph)	1679	0	167	1667	72	17
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases			6			8
Actuated Green, G (s)	77.5		93.0	93.0	25.0	25.0
Effective Green, g (s)	78.5		94.0	94.0	26.0	26.0
Actuated g/C Ratio	0.60		0.72	0.72	0.20	0.20
Clearance Time (s)	6.0		4.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3064		281	3718	357	320
v/s Ratio Prot	0.33		c0.06	0.32	c0.04	
v/s Ratio Perm			c0.37			0.01
v/c Ratio	0.55		0.59	0.45	0.20	0.05
Uniform Delay, d1	15.2		12.7	7.4	43.3	42.0
Progression Factor	1.00		0.58	1.69	1.31	2.96
Incremental Delay, d2	0.7		1.8	0.2	0.3	0.1
Delay (s)	16.0		9.2	12.7	57.2	124.7
Level of Service	B		A	B	E	F
Approach Delay (s)	16.0			12.3	93.5	
Approach LOS	B			B	F	

### Intersection Summary

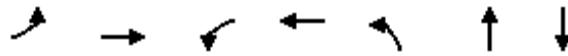
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 9: Rexdale Boulevard & Queens Plate Drive West

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	352	1616	122	1567	138	172	572
v/c Ratio	0.89	0.70	0.51	0.81	0.93	0.22	0.60
Control Delay	46.9	19.3	19.5	29.6	89.6	7.6	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	19.3	19.5	29.6	89.6	7.6	14.7
Queue Length 50th (m)	42.8	79.1	7.8	94.7	22.1	2.5	18.3
Queue Length 95th (m)	#92.4	97.1	#20.1	#125.9	#52.6	9.4	33.3
Internal Link Dist (m)		487.3		178.1		345.3	93.9
Turn Bay Length (m)	120.0		100.0		70.0		
Base Capacity (vph)	413	2318	241	1946	178	909	1073
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.70	0.51	0.81	0.78	0.19	0.53

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 9: Rexdale Boulevard & Queens Plate Drive West

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑↑		↗	↑↑↑		↗	↑↑			↖	
Traffic Volume (vph)	345	1370	214	120	1496	39	135	38	130	102	60	399
Future Volume (vph)	345	1370	214	120	1496	39	135	38	130	102	60	399
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		2.0	6.0		6.0	6.0			6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95			0.95	
Frt	1.00	0.98		1.00	1.00		1.00	0.88			0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1789	4521		1825	4841		1825	2630			3225	
Flt Permitted	0.10	1.00		0.12	1.00		0.30	1.00			0.85	
Satd. Flow (perm)	192	4521		228	4841		575	2630			2756	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	352	1398	218	122	1527	40	138	39	133	104	61	407
RTOR Reduction (vph)	0	22	0	0	3	0	0	98	0	0	232	0
Lane Group Flow (vph)	352	1594	0	122	1564	0	138	74	0	0	340	0
Heavy Vehicles (%)	2%	8%	50%	0%	8%	5%	0%	100%	0%	1%	0%	0%
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)	53.6	44.7		41.1	35.2		22.4	22.4			22.4	
Effective Green, g (s)	54.6	45.7		43.1	36.2		23.4	23.4			23.4	
Actuated g/C Ratio	0.61	0.51		0.48	0.40		0.26	0.26			0.26	
Clearance Time (s)	4.0	7.0		3.0	7.0		7.0	7.0			7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	389	2295		231	1947		149	683			716	
v/s Ratio Prot	c0.15	0.35		0.04	0.32			0.03				
v/s Ratio Perm	c0.39			0.21			c0.24				0.12	
v/c Ratio	0.90	0.69		0.53	0.80		0.93	0.11			0.48	
Uniform Delay, d1	24.3	16.8		13.5	23.8		32.5	25.4			28.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	23.8	1.8		2.2	3.6		51.7	0.1			0.5	
Delay (s)	48.1	18.6		15.7	27.4		84.2	25.4			28.6	
Level of Service	D	B		B	C		F	C			C	
Approach Delay (s)		23.9			26.5			51.6			28.6	
Approach LOS		C			C			D			C	

### Intersection Summary

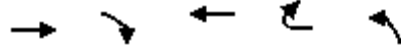
HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Queues

10: Private Driveway & Rexdale Boulevard

01/12/2020



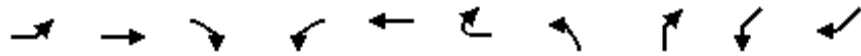
Lane Group	EBT	EBR	WBT	WBR	NBL
Lane Group Flow (vph)	1997	383	1889	247	244
v/c Ratio	0.53	0.30	0.50	0.20	0.73
Control Delay	9.1	1.3	8.8	1.4	61.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	1.3	8.8	1.4	61.8
Queue Length 50th (m)	74.2	0.0	67.8	0.3	59.4
Queue Length 95th (m)	106.4	9.7	97.5	8.8	81.6
Internal Link Dist (m)	26.5		487.3		237.1
Turn Bay Length (m)		150.0		80.0	
Base Capacity (vph)	3741	1269	3741	1220	674
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.53	0.30	0.50	0.20	0.36

Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 10: Private Driveway & Rexdale Boulevard

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL	SWR
Lane Configurations		↑↑↑	↑		↑↑↑	↑	↑			
Traffic Volume (vph)	0	1897	364	0	1795	235	220	0	0	0
Future Volume (vph)	0	1897	364	0	1795	235	220	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	7.0	5.0			
Lane Util. Factor		0.91	1.00		0.91	1.00	1.00			
Frt		1.00	0.85		1.00	0.85	1.00			
Flt Protected		1.00	1.00		1.00	1.00	0.95			
Satd. Flow (prot)		5142	1601		5142	1601	1789			
Flt Permitted		1.00	1.00		1.00	1.00	0.95			
Satd. Flow (perm)		5142	1601		5142	1601	1789			
Peak-hour factor, PHF	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95	0.95
Adj. Flow (vph)	0	1997	383	0	1889	247	244	0	0	0
RTOR Reduction (vph)	0	0	104	0	0	68	0	0	0	0
Lane Group Flow (vph)	0	1997	279	0	1889	179	244	0	0	0
Turn Type		NA	Perm		NA	Perm	Prot			
Protected Phases		2			6		8			
Permitted Phases			2			6				
Actuated Green, G (s)		93.6	93.6		93.6	93.6	23.4			
Effective Green, g (s)		94.6	94.6		94.6	93.6	24.4			
Actuated g/C Ratio		0.73	0.73		0.73	0.72	0.19			
Clearance Time (s)		7.0	7.0		7.0	7.0	6.0			
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0			
Lane Grp Cap (vph)		3741	1165		3741	1152	335			
v/s Ratio Prot		c0.39			0.37		c0.14			
v/s Ratio Perm			0.17			0.11				
v/c Ratio		0.53	0.24		0.50	0.16	0.73			
Uniform Delay, d1		7.9	5.8		7.6	5.7	49.7			
Progression Factor		1.00	1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.5	0.5		0.5	0.3	7.7			
Delay (s)		8.4	6.3		8.1	6.0	57.4			
Level of Service		A	A		A	A	E			
Approach Delay (s)		8.1			7.9		57.4	0.0		
Approach LOS		A			A		E	A		

### Intersection Summary

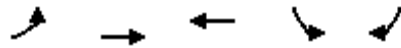
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

## Queues

### 11: Rexdale Boulevard & Humberwood Boulevard

01/12/2020



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	262	1966	3034	341	143
v/c Ratio	0.63	0.50	1.14	0.74	0.28
Control Delay	28.8	10.6	94.3	43.8	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	28.8	10.6	94.3	43.8	5.7
Queue Length 50th (m)	29.1	52.6	~201.8	60.9	0.0
Queue Length 95th (m)	#82.2	77.9	#224.1	81.2	12.4
Internal Link Dist (m)		361.4	134.8	181.9	
Turn Bay Length (m)	85.0			35.0	
Base Capacity (vph)	415	3938	2672	661	688
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.63	0.50	1.14	0.52	0.21

#### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

## 11: Rexdale Boulevard & Humberwood Boulevard

01/12/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	257	1927	2514	460	334	140
Future Volume (vph)	257	1927	2514	460	334	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.86	0.86		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1807	6119	6175		1789	1617
Flt Permitted	0.09	1.00	1.00		0.95	1.00
Satd. Flow (perm)	166	6119	6175		1789	1617
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	262	1966	2565	469	341	143
RTOR Reduction (vph)	0	0	33	0	0	106
Lane Group Flow (vph)	262	1966	3001	0	341	37
Heavy Vehicles (%)	1%	8%	5%	2%	2%	1%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	63.4	63.4	41.8		24.6	24.6
Effective Green, g (s)	64.4	64.4	42.8		25.6	25.6
Actuated g/C Ratio	0.64	0.64	0.43		0.26	0.26
Clearance Time (s)	4.0	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)	412	3940	2642		457	413
v/s Ratio Prot	c0.12	0.32	c0.49		c0.19	
v/s Ratio Perm	0.29					0.02
v/c Ratio	0.64	0.50	1.14		0.75	0.09
Uniform Delay, d1	24.5	9.3	28.6		34.2	28.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.2	0.5	66.5		6.5	0.1
Delay (s)	27.7	9.8	95.1		40.7	28.4
Level of Service	C	A	F		D	C
Approach Delay (s)		11.9	95.1		37.1	
Approach LOS		B	F		D	

### Intersection Summary

HCM 2000 Control Delay	57.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis  
 12: Goreway Dr & Woodbine Entrance/Club House Rd

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	131	1676	111	106	321
Future Volume (Veh/h)	8	131	1676	111	106	321
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	138	1764	117	112	338
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2216	940			1881	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2216	940			1881	
tC, single (s)	6.8	7.0			4.3	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	65	47			60	
cM capacity (veh/h)	23	261			277	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	8	138	1176	705	112	169	169
Volume Left	8	0	0	0	112	0	0
Volume Right	0	138	0	117	0	0	0
cSH	23	261	1700	1700	277	1700	1700
Volume to Capacity	0.35	0.53	0.69	0.41	0.40	0.10	0.10
Queue Length 95th (m)	7.9	21.6	0.0	0.0	14.2	0.0	0.0
Control Delay (s)	232.6	33.3	0.0	0.0	26.5	0.0	0.0
Lane LOS	F	D			D		
Approach Delay (s)	44.2		0.0		6.6		
Approach LOS	E						

Intersection Summary			
Average Delay		3.8	
Intersection Capacity Utilization		69.1%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis  
 13: Entrance Road & Woodbine Entrance/Club House Rd

01/12/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	217	0	0	465	73	139
Future Volume (vph)	217	0	0	465	73	139
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	236	0	0	505	79	151













Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total (vph)	236	0	505	79	151
Volume Left (vph)	236	0	0	0	0
Volume Right (vph)	0	0	0	0	151
Hadj (s)	0.53	0.00	0.03	0.03	-0.57
Departure Headway (s)	6.5	6.0	4.9	5.5	3.2
Degree Utilization, x	0.43	0.00	0.69	0.12	0.13
Capacity (veh/h)	513	574	714	610	1121
Control Delay (s)	13.1	7.8	17.9	9.2	6.7
Approach Delay (s)	13.1		17.9	7.6	
Approach LOS	B		C	A	

Intersection Summary					
Delay			14.3		
Level of Service			B		
Intersection Capacity Utilization		43.2%		ICU Level of Service	A
Analysis Period (min)			15		

# HCM Unsignalized Intersection Capacity Analysis

## 14: Carlingview Drive & Entrance Road

01/12/2020

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	7	66	20	11	454	200
Future Volume (vph)	7	66	20	11	454	200
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	7	70	21	12	483	213
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total (vph)	7	70	21	12	483	213
Volume Left (vph)	0	0	21	0	483	0
Volume Right (vph)	0	70	0	0	0	213
Hadj (s)	0.00	-0.55	0.58	0.00	0.52	-0.46
Departure Headway (s)	6.2	5.7	6.9	6.3	5.3	4.4
Degree Utilization, x	0.01	0.11	0.04	0.02	0.72	0.26
Capacity (veh/h)	532	584	482	526	661	809
Control Delay (s)	8.1	8.2	9.0	8.2	19.4	7.7
Approach Delay (s)	8.2		8.7		15.8	
Approach LOS	A		A		C	
Intersection Summary						
Delay			14.8			
Level of Service			B			
Intersection Capacity Utilization			39.6%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 15: Grandstand Entrance Rd & Entrance Road

01/12/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	207	0	11	632	139	20
Future Volume (Veh/h)	207	0	11	632	139	20
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)	225	0	12	687	151	22
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	530	86	173			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	530	86	173			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	53	100	99			
cM capacity (veh/h)	475	955	1401			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	225	0	241	458	101	72
Volume Left	225	0	12	0	0	0
Volume Right	0	0	0	0	0	22
cSH	475	1700	1401	1700	1700	1700
Volume to Capacity	0.47	0.00	0.01	0.27	0.06	0.04
Queue Length 95th (m)	19.0	0.0	0.2	0.0	0.0	0.0
Control Delay (s)	19.2	0.0	0.4	0.0	0.0	0.0
Lane LOS	C	A	A			
Approach Delay (s)	19.2		0.2		0.0	
Approach LOS	C					
Intersection Summary						
Average Delay			4.0			
Intersection Capacity Utilization			43.4%		ICU Level of Service	A
Analysis Period (min)			15			



Queues

16: Grandstand Entrance Rd/Street C & Nearctic Dr

01/12/2020



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	6	284	958	294	337
v/c Ratio	0.03	0.80	0.33	0.69	0.12
Control Delay	45.6	40.7	4.3	17.1	2.0
Queue Delay	0.0	0.2	0.0	0.0	0.0
Total Delay	45.6	40.9	4.3	17.1	2.0
Queue Length 50th (m)	1.3	32.3	27.4	32.7	8.6
Queue Length 95th (m)	m3.0	59.4	51.7	#108.7	4.3
Internal Link Dist (m)	77.8		627.7		138.6
Turn Bay Length (m)					
Base Capacity (vph)	371	483	2880	428	2882
Starvation Cap Reductn	0	19	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.61	0.33	0.69	0.12

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 16: Grandstand Entrance Rd/Street C & Nearctic Dr

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	270	905	5	265	320
Future Volume (vph)	5	270	905	5	265	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		6.0	5.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1789	1601	3576		1789	3579
Flt Permitted	0.95	1.00	1.00		0.28	1.00
Satd. Flow (perm)	1789	1601	3576		537	3579
Peak-hour factor, PHF	0.90	0.95	0.95	0.95	0.90	0.95
Adj. Flow (vph)	6	284	953	5	294	337
RTOR Reduction (vph)	0	169	0	0	0	0
Lane Group Flow (vph)	6	115	958	0	294	337
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Actuated Green, G (s)	14.3	14.3	103.7		103.7	103.7
Effective Green, g (s)	15.3	15.3	104.7		103.7	104.7
Actuated g/C Ratio	0.12	0.12	0.81		0.80	0.81
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)	210	188	2880		428	2882
v/s Ratio Prot	0.00		0.27			0.09
v/s Ratio Perm		c0.07			c0.55	
v/c Ratio	0.03	0.61	0.33		0.69	0.12
Uniform Delay, d1	50.8	54.5	3.4		5.9	2.7
Progression Factor	1.00	1.38	1.00		0.84	0.59
Incremental Delay, d2	0.1	5.6	0.3		8.6	0.1
Delay (s)	50.7	80.7	3.7		13.6	1.7
Level of Service	D	F	A		B	A
Approach Delay (s)	80.1		3.7			7.2
Approach LOS	F		A			A

### Intersection Summary

HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

## Queues

### 17: Street C & Block 10 East Access

01/12/2020



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	6	153	222	1026	500
v/c Ratio	0.05	0.62	0.29	0.33	0.16
Control Delay	55.4	19.4	2.4	1.7	2.3
Queue Delay	0.0	0.0	0.0	0.1	0.0
Total Delay	55.4	19.4	2.4	1.9	2.3
Queue Length 50th (m)	1.5	0.0	5.2	12.7	1.7
Queue Length 95th (m)	5.7	19.9	12.1	23.5	34.1
Internal Link Dist (m)	336.9			138.6	33.1
Turn Bay Length (m)			100.0		
Base Capacity (vph)	495	553	756	3066	3033
Starvation Cap Reductn	0	0	0	820	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.28	0.29	0.46	0.16

### Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 17: Street C & Block 10 East Access

01/12/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	145	200	975	440	35
Future Volume (vph)	5	145	200	975	440	35
Ideal Flow (vphpl)	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	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1789	1601	1789	3579	3539	
Flt Permitted	0.95	1.00	0.47	1.00	1.00	
Satd. Flow (perm)	1789	1601	883	3579	3539	
Peak-hour factor, PHF	0.90	0.95	0.90	0.95	0.95	0.95
Adj. Flow (vph)	6	153	222	1026	463	37
RTOR Reduction (vph)	0	143	0	0	2	0
Lane Group Flow (vph)	6	10	222	1026	498	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	7.6	7.6	110.4	110.4	110.4	
Effective Green, g (s)	8.6	8.6	111.4	111.4	111.4	
Actuated g/C Ratio	0.07	0.07	0.86	0.86	0.86	
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)	118	105	756	3066	3032	
v/s Ratio Prot	0.00			c0.29	0.14	
v/s Ratio Perm		c0.01	0.25			
v/c Ratio	0.05	0.10	0.29	0.33	0.16	
Uniform Delay, d1	56.9	57.0	1.8	1.9	1.5	
Progression Factor	1.00	1.00	0.69	0.72	1.35	
Incremental Delay, d2	0.2	0.4	0.9	0.3	0.1	
Delay (s)	57.1	57.5	2.2	1.6	2.2	
Level of Service	E	E	A	A	A	
Approach Delay (s)	57.4			1.7	2.2	
Approach LOS	E			A	A	

### Intersection Summary

HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 18: Street C & Street F

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	6	415	422	631	668	306
v/c Ratio	0.02	0.27	0.61	0.28	0.84	0.30
Control Delay	26.8	15.6	16.0	11.1	45.2	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.8	15.6	16.0	11.1	45.2	23.2
Queue Length 50th (m)	0.8	18.5	58.5	42.8	72.3	15.7
Queue Length 95th (m)	m3.6	31.6	93.2	64.2	87.0	14.0
Internal Link Dist (m)		120.1		212.6	69.4	249.0
Turn Bay Length (m)	60.0		60.0			
Base Capacity (vph)	333	1515	784	2225	954	1244
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.27	0.54	0.28	0.70	0.25

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 18: Street C & Street F

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↷			↷	
Traffic Volume (vph)	5	235	160	380	595	5	180	210	235	5	280	5
Future Volume (vph)	5	235	160	380	595	5	180	210	235	5	280	5
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			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.94		1.00	1.00			0.94			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)	1789	3361		1789	3574			3330			3566	
Flt Permitted	0.41	1.00		0.44	1.00			0.71			0.94	
Satd. Flow (perm)	777	3361		825	3574			2403			3358	
Peak-hour factor, PHF	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95
Adj. Flow (vph)	6	247	168	422	626	5	200	221	247	6	295	5
RTOR Reduction (vph)	0	72	0	0	0	0	0	72	0	0	1	0
Lane Group Flow (vph)	6	343	0	422	631	0	0	596	0	0	305	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	54.9	54.9		79.8	79.8			38.2			38.2	
Effective Green, g (s)	55.9	55.9		80.8	80.8			39.2			39.2	
Actuated g/C Ratio	0.43	0.43		0.62	0.62			0.30			0.30	
Clearance Time (s)	6.0	6.0		4.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	334	1445		675	2221			724			1012	
v/s Ratio Prot		0.10		c0.11	0.18							
v/s Ratio Perm	0.01			c0.28				c0.25			0.09	
v/c Ratio	0.02	0.24		0.63	0.28			0.82			0.30	
Uniform Delay, d1	21.3	23.5		12.6	11.3			42.2			34.9	
Progression Factor	0.89	0.80		0.96	0.88			1.00			0.67	
Incremental Delay, d2	0.1	0.4		1.7	0.3			7.5			0.1	
Delay (s)	19.0	19.2		13.9	10.3			49.7			23.5	
Level of Service	B	B		B	B			D			C	
Approach Delay (s)		19.2			11.7			49.7			23.5	
Approach LOS		B			B			D			C	

### Intersection Summary

HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 19: Street C & Street D

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	22	263	150	679	248	310
v/c Ratio	0.04	0.19	0.18	0.25	0.41	0.74
Control Delay	3.5	3.4	5.0	4.6	29.8	81.1
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	3.5	3.4	5.0	4.9	29.8	81.1
Queue Length 50th (m)	0.8	10.3	6.7	16.5	17.6	43.7
Queue Length 95th (m)	m2.5	18.6	m18.2	35.2	28.9	41.9
Internal Link Dist (m)		164.9		120.1	41.0	288.3
Turn Bay Length (m)	65.0		60.0			
Base Capacity (vph)	545	1400	849	2711	1287	986
Starvation Cap Reductn	0	0	0	1349	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.19	0.18	0.50	0.19	0.31

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 19: Street C & Street D

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	215	35	135	640	5	10	130	95	90	175	25
Future Volume (vph)	20	215	35	135	640	5	10	130	95	90	175	25
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			0.95			0.95	
Frt	1.00	0.98		1.00	1.00			0.94			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.98	
Satd. Flow (prot)	1789	1844		1789	3575			3355			3477	
Flt Permitted	0.38	1.00		0.59	1.00			0.93			0.71	
Satd. Flow (perm)	720	1844		1120	3575			3126			2501	
Peak-hour factor, PHF	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95
Adj. Flow (vph)	22	226	37	150	674	5	11	137	100	100	184	26
RTOR Reduction (vph)	0	2	0	0	0	0	0	84	0	0	8	0
Lane Group Flow (vph)	22	261	0	150	679	0	0	164	0	0	302	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	97.6	97.6		97.6	97.6			20.4			20.4	
Effective Green, g (s)	98.6	98.6		98.6	98.6			21.4			21.4	
Actuated g/C Ratio	0.76	0.76		0.76	0.76			0.16			0.16	
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)	546	1398		849	2711			514			411	
v/s Ratio Prot		0.14			c0.19							
v/s Ratio Perm	0.03			0.13				0.05			c0.12	
v/c Ratio	0.04	0.19		0.18	0.25			0.32			0.74	
Uniform Delay, d1	3.9	4.4		4.4	4.7			47.9			51.6	
Progression Factor	0.70	0.65		0.91	0.87			1.00			1.44	
Incremental Delay, d2	0.1	0.3		0.4	0.2			0.4			6.0	
Delay (s)	2.9	3.1		4.4	4.3			48.2			80.2	
Level of Service	A	A		A	A			D			F	
Approach Delay (s)		3.1			4.3			48.2			80.2	
Approach LOS		A			A			D			F	

### Intersection Summary

HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

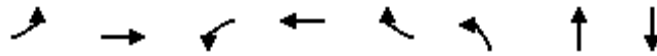
c Critical Lane Group



# Queues

## 20: Queens Plate Dr & Street C

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	33	253	211	505	5	56	373	416
v/c Ratio	0.06	0.21	0.29	0.40	0.00	0.31	0.79	0.49
Control Delay	10.0	9.3	10.6	11.2	3.2	41.2	54.9	41.1
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	10.0	9.3	10.6	11.6	3.2	41.2	54.9	41.1
Queue Length 50th (m)	2.7	21.2	18.0	43.5	0.0	11.7	86.8	46.8
Queue Length 95th (m)	8.3	41.1	41.5	91.3	m0.5	22.0	110.0	56.0
Internal Link Dist (m)		194.0		164.9			69.8	345.3
Turn Bay Length (m)	45.0		60.0					
Base Capacity (vph)	519	1219	738	1256	1076	286	735	1316
Starvation Cap Reductn	0	0	0	326	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.21	0.29	0.54	0.00	0.20	0.51	0.32

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 20: Queens Plate Dr & Street C

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	185	55	190	480	5	50	275	80	5	350	40
Future Volume (vph)	30	185	55	190	480	5	50	275	80	5	350	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.97			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1789	1819		1789	1883	1601	1789	1820			3522	
Flt Permitted	0.41	1.00		0.59	1.00	1.00	0.38	1.00			0.93	
Satd. Flow (perm)	777	1819		1108	1883	1601	715	1820			3275	
Peak-hour factor, PHF	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95
Adj. Flow (vph)	33	195	58	211	505	5	56	289	84	6	368	42
RTOR Reduction (vph)	0	6	0	0	0	2	0	10	0	0	8	0
Lane Group Flow (vph)	33	247	0	211	505	3	56	363	0	0	408	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	85.8	85.8		85.8	85.8	85.8	32.2	32.2			32.2	
Effective Green, g (s)	86.8	86.8		86.8	86.8	86.8	33.2	33.2			33.2	
Actuated g/C Ratio	0.67	0.67		0.67	0.67	0.67	0.26	0.26			0.26	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	518	1214		739	1257	1068	182	464			836	
v/s Ratio Prot		0.14			c0.27			c0.20				
v/s Ratio Perm	0.04			0.19		0.00	0.08				0.12	
v/c Ratio	0.06	0.20		0.29	0.40	0.00	0.31	0.78			0.49	
Uniform Delay, d1	7.5	8.3		8.9	9.8	7.2	39.1	45.0			41.2	
Progression Factor	1.00	1.00		0.92	0.92	1.00	1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.4		1.0	0.9	0.0	1.0	8.4			0.5	
Delay (s)	7.7	8.7		9.1	9.9	7.2	40.1	53.5			41.6	
Level of Service	A	A		A	A	A	D	D			D	
Approach Delay (s)		8.6			9.7			51.7			41.6	
Approach LOS		A			A			D			D	

### Intersection Summary

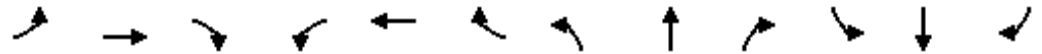
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 1: Highway 27 & Belfield Rd

01/12/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	91	244	57	161	330	109	130	1401	611	164	966	215
v/c Ratio	0.50	0.66	0.05	0.69	0.73	0.08	0.68	0.68	0.40	0.76	0.50	0.15
Control Delay	58.7	59.8	0.1	65.4	59.7	0.1	70.4	35.3	0.8	74.8	30.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	59.8	0.1	65.4	59.7	0.1	70.4	35.3	0.8	74.8	30.7	0.2
Queue Length 50th (m)	22.9	31.5	0.0	40.9	42.1	0.0	31.0	99.3	0.0	38.9	66.8	0.0
Queue Length 95th (m)	40.8	44.9	0.0	66.9	59.0	0.0	51.0	120.3	0.0	#65.1	86.2	0.0
Internal Link Dist (m)		253.2			275.1			169.6			234.9	
Turn Bay Length (m)	145.0		65.0	200.0		200.0	140.0		155.0	110.0		75.0
Base Capacity (vph)	221	444	1168	254	496	1389	232	2072	1536	243	1940	1440
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.55	0.05	0.63	0.67	0.08	0.56	0.68	0.40	0.67	0.50	0.15

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 1: Highway 27 & Belfield Rd

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↔↗	↗	↘	↔↗	↗	↘	↕↗↘	↗	↘	↕↗↘	↗
Traffic Volume (vph)	98	227	55	233	243	106	126	1359	593	159	937	209
Future Volume (vph)	98	227	55	233	243	106	126	1359	593	159	937	209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	3.0
Lane Util. Factor	0.91	0.91	1.00	0.91	0.91	1.00	1.00	*1.00	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1318	2648	1168	1496	2913	1389	1706	5386	1536	1690	4856	1440
Flt Permitted	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1318	2648	1168	1496	2913	1389	1706	5386	1536	1690	4856	1440
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)	101	234	57	240	251	109	130	1401	611	164	966	215
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	91	244	57	161	330	109	130	1401	611	164	966	215
Confl. Peds. (#/hr)	4		2	2		4	1		2	2		1
Heavy Vehicles (%)	26%	32%	38%	11%	21%	16%	7%	7%	5%	8%	8%	12%
Turn Type	Split	NA	Free	Split	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	3	3		4	4		5	2		1		6
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	16.4	16.4	125.0	18.6	18.6	125.0	13.1	47.0	125.0	15.0	48.9	125.0
Effective Green, g (s)	17.4	17.4	125.0	19.6	19.6	125.0	14.1	48.0	125.0	16.0	49.9	125.0
Actuated g/C Ratio	0.14	0.14	1.00	0.16	0.16	1.00	0.11	0.38	1.00	0.13	0.40	1.00
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	183	368	1168	234	456	1389	192	2068	1536	216	1938	1440
v/s Ratio Prot	0.07	c0.09		0.11	c0.11		0.08	c0.26		c0.10	0.20	
v/s Ratio Perm			0.05			0.08			c0.40			0.15
v/c Ratio	0.50	0.66	0.05	0.69	0.72	0.08	0.68	0.68	0.40	0.76	0.50	0.15
Uniform Delay, d1	49.8	51.0	0.0	49.8	50.1	0.0	53.3	32.1	0.0	52.6	28.2	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	4.5	0.1	8.1	5.6	0.1	7.2	1.8	0.8	12.7	0.9	0.2
Delay (s)	51.9	55.5	0.1	58.0	55.7	0.1	60.5	33.9	0.8	65.3	29.1	0.2
Level of Service	D	E	A	E	E	A	E	C	A	E	C	A
Approach Delay (s)		46.6			46.2			26.0			28.9	
Approach LOS		D			D			C			C	

### Intersection Summary

HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 2: Highway 27 & Bethridge Rd

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕↕↕↔			↕↕
Traffic Volume (veh/h)	0	56	1292	107	0	1264
Future Volume (Veh/h)	0	56	1292	107	0	1264
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	0	57	1305	108	0	1277
Pedestrians	2					
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)						
pX, platoon unblocked						
vC, conflicting volume	2000	491			1415	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2000	491			1415	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	100	89			100	
cM capacity (veh/h)	53	509			487	
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	57	522	522	369	638	638
Volume Left	0	0	0	0	0	0
Volume Right	57	0	0	108	0	0
cSH	509	1700	1700	1700	1700	1700
Volume to Capacity	0.11	0.31	0.31	0.22	0.38	0.38
Queue Length 95th (m)	2.9	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	13.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	13.0	0.0			0.0	
Approach LOS	B					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			38.3%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: Highway 27 & Vice Regent Blvd

01/12/2020

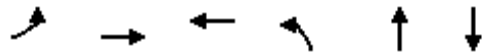


Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	52	20	1273	75	120	1442		
Future Volume (Veh/h)	52	20	1273	75	120	1442		
Sign Control	Stop		Free			Free		
Grade	0%		0%			0%		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Hourly flow rate (vph)	52	20	1273	75	120	1442		
Pedestrians	3					1		
Lane Width (m)	3.7					3.7		
Walking Speed (m/s)	1.1					1.1		
Percent Blockage	0					0		
Right turn flare (veh)								
Median type			None			None		
Median storage veh								
Upstream signal (m)						333		
pX, platoon unblocked	0.88							
vC, conflicting volume	2237	640			1351			
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	2133	640			1351			
tC, single (s)	7.1	7.3			4.2			
tC, 2 stage (s)								
tF (s)	3.6	3.5			2.3			
p0 queue free %	0	95			75			
cM capacity (veh/h)	24	376			484			
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	52	20	636	636	75	120	721	721
Volume Left	52	0	0	0	0	120	0	0
Volume Right	0	20	0	0	75	0	0	0
cSH	24	376	1700	1700	1700	484	1700	1700
Volume to Capacity	2.17	0.05	0.37	0.37	0.04	0.25	0.42	0.42
Queue Length 95th (m)	49.4	1.3	0.0	0.0	0.0	7.4	0.0	0.0
Control Delay (s)	881.8	15.1	0.0	0.0	0.0	14.9	0.0	0.0
Lane LOS	F	C				B		
Approach Delay (s)	641.1		0.0			1.1		
Approach LOS	F							
Intersection Summary								
Average Delay			16.1					
Intersection Capacity Utilization			55.5%		ICU Level of Service		B	
Analysis Period (min)			15					

# Queues

## 4: Highway 27 & Nearctic Dr/Street E

01/12/2020



Lane Group	EBL	EBT	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	3	10	37	9	1296	1571
v/c Ratio	0.04	0.10	0.32	0.03	0.31	0.38
Control Delay	60.0	40.7	26.7	1.3	1.9	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	40.7	26.7	1.3	1.9	1.5
Queue Length 50th (m)	0.7	0.8	0.5	0.3	15.9	7.1
Queue Length 95th (m)	3.9	6.4	11.4	0.9	24.6	m28.4
Internal Link Dist (m)		77.8	141.3		184.1	346.1
Turn Bay Length (m)				125.0		
Base Capacity (vph)	361	432	388	322	4141	4173
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.02	0.10	0.03	0.31	0.38

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 4: Highway 27 & Nearctic Dr/Street E

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑↑		↖	↑↑↑	
Traffic Volume (vph)	3	1	9	0	2	35	9	1194	89	0	1552	3
Future Volume (vph)	3	1	9	0	2	35	9	1194	89	0	1552	3
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		3.5	6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91			0.91	
Frbp, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	
Frt	1.00	0.86			0.86		1.00	0.99			1.00	
Flt Protected	0.95	1.00			1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1789	1629			1385		1789	4685			4811	
Flt Permitted	0.73	1.00			1.00		0.14	1.00			1.00	
Satd. Flow (perm)	1381	1629			1385		261	4685			4811	
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)	3	1	9	0	2	35	9	1206	90	0	1568	3
RTOR Reduction (vph)	0	9	0	0	33	0	0	3	0	0	0	0
Lane Group Flow (vph)	3	1	0	0	4	0	9	1293	0	0	1571	0
Confl. Peds. (#/hr)									10			
Heavy Vehicles (%)	2%	2%	2%	0%	2%	20%	2%	11%	3%	0%	9%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	5.6	5.6			5.6		111.4	111.4			105.7	
Effective Green, g (s)	6.6	6.6			6.6		112.4	112.4			106.7	
Actuated g/C Ratio	0.05	0.05			0.05		0.86	0.86			0.82	
Clearance Time (s)	6.0	6.0			6.0		4.5	7.0			7.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	70	82			70		251	4050			3948	
v/s Ratio Prot		0.00			c0.00		0.00	c0.28			c0.33	
v/s Ratio Perm	0.00						0.03					
v/c Ratio	0.04	0.02			0.05		0.04	0.32			0.40	
Uniform Delay, d1	58.7	58.6			58.7		1.5	1.6			3.1	
Progression Factor	1.05	1.28			1.00		1.00	1.00			0.51	
Incremental Delay, d2	0.3	0.1			0.3		0.1	0.2			0.2	
Delay (s)	61.7	75.0			59.1		1.5	1.9			1.7	
Level of Service	E	E			E		A	A			A	
Approach Delay (s)		71.9			59.1			1.9			1.7	
Approach LOS		E			E			A			A	

### Intersection Summary

HCM 2000 Control Delay	2.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



# Queues

## 5: Highway 27 & Rexdale Boulevard

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	113	1314	273	476	118	95	1038	126	126	1163	53
v/c Ratio	0.32	0.91	1.03	0.28	0.08	0.81	0.68	0.08	0.93	0.74	0.04
Control Delay	25.4	51.4	111.0	25.3	0.1	100.8	40.1	0.1	120.3	42.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.4	51.4	111.0	25.3	0.1	100.8	40.1	0.1	120.3	42.5	0.0
Queue Length 50th (m)	16.3	85.4	~61.3	23.8	0.0	24.3	85.0	0.0	32.6	96.9	0.0
Queue Length 95th (m)	31.0	#104.8	#116.9	29.6	0.0	#53.5	101.3	0.0	#70.9	113.9	0.0
Internal Link Dist (m)		271.0		242.9			346.1			293.8	
Turn Bay Length (m)	100.0		30.0		80.0	80.0		200.0	110.0		115.0
Base Capacity (vph)	358	1445	266	1729	1549	119	1517	1549	135	1575	1480
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.91	1.03	0.28	0.08	0.80	0.68	0.08	0.93	0.74	0.04

### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

## 5: Highway 27 & Rexdale Boulevard

01/12/2020



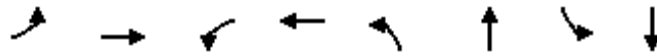
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑↑		↖	↑↑↑	↗	↖	↑↑↑	↗	↖	↑↑↑	↗
Traffic Volume (vph)	111	1141	147	268	466	116	93	1017	123	123	1140	52
Future Volume (vph)	111	1141	147	268	466	116	93	1017	123	123	1140	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.8	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Total Lost time (s)	5.0	6.0		5.0	6.0	3.0	5.0	7.0	3.0	5.0	7.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1739	4777		1706	4683	1549	1547	4812	1549	1601	4856	1480
Flt Permitted	0.47	1.00		0.09	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	860	4777		163	4683	1549	1547	4812	1549	1601	4856	1480
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	113	1164	150	273	476	118	95	1038	126	126	1163	53
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	113	1301	0	273	476	118	95	1038	126	126	1163	53
Confl. Peds. (#/hr)	5		7	7		5	1		6	6		1
Heavy Vehicles (%)	6%	7%	13%	7%	12%	4%	18%	9%	4%	14%	8%	9%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		Free			Free			Free
Actuated Green, G (s)	44.0	38.0		59.0	47.0	130.0	8.8	40.0	130.0	10.0	41.2	130.0
Effective Green, g (s)	46.0	39.0		60.0	48.0	130.0	9.8	41.0	130.0	11.0	42.2	130.0
Actuated g/C Ratio	0.35	0.30		0.46	0.37	1.00	0.08	0.32	1.00	0.08	0.32	1.00
Clearance Time (s)	6.0	7.0		6.0	7.0		6.0	8.0		6.0	8.0	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	351	1433		265	1729	1549	116	1517	1549	135	1576	1480
v/s Ratio Prot	0.02	0.27		c0.13	0.10		0.06	0.22		c0.08	c0.24	
v/s Ratio Perm	0.10			c0.35		0.08			c0.08			0.04
v/c Ratio	0.32	0.91		1.03	0.28	0.08	0.82	0.68	0.08	0.93	0.74	0.04
Uniform Delay, d1	29.0	43.8		39.5	28.8	0.0	59.2	38.8	0.0	59.1	39.0	0.0
Progression Factor	1.10	0.96		1.50	0.86	1.00	0.97	0.96	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	9.5		62.7	0.4	0.1	32.1	2.4	0.1	56.5	3.1	0.0
Delay (s)	32.0	51.7		122.2	25.2	0.1	89.6	39.9	0.1	115.7	42.1	0.0
Level of Service	C	D		F	C	A	F	D	A	F	D	A
Approach Delay (s)		50.2			52.3			39.6			47.4	
Approach LOS		D			D			D			D	

Intersection Summary		
HCM 2000 Control Delay	47.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.94	D
Actuated Cycle Length (s)	130.0	Sum of lost time (s)
Intersection Capacity Utilization	105.0%	23.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		G

# Queues

## 6: Rexdale Boulevard & Queens Plate Drive

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	27	1449	61	965	55	112	121	46
v/c Ratio	0.07	0.41	0.29	0.27	0.34	0.22	0.68	0.10
Control Delay	0.9	0.7	10.7	5.3	52.9	24.3	69.6	30.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.9	0.7	10.7	5.3	52.9	24.3	69.6	30.6
Queue Length 50th (m)	0.2	3.6	4.3	22.7	12.8	6.5	29.7	3.2
Queue Length 95th (m)	m0.3	m5.3	14.3	36.2	24.1	14.2	47.1	8.4
Internal Link Dist (m)		242.9		949.9		173.2		283.9
Turn Bay Length (m)	65.0		45.0		140.0		125.0	
Base Capacity (vph)	376	3576	208	3534	324	946	357	914
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.41	0.29	0.27	0.17	0.12	0.34	0.05

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 6: Rexdale Boulevard & Queens Plate Drive

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↗↗		↗	↗↗↗		↗	↗↗		↗	↗↗	
Traffic Volume (vph)	25	1254	108	57	780	127	52	36	70	114	26	17
Future Volume (vph)	25	1254	108	57	780	127	52	36	70	114	26	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.90		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)	1690	4719		1644	4655		1415	3022		1662	3007	
Flt Permitted	0.28	1.00		0.16	1.00		0.73	1.00		0.68	1.00	
Satd. Flow (perm)	497	4719		274	4655		1080	3022		1191	3007	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	27	1334	115	61	830	135	55	38	74	121	28	18
RTOR Reduction (vph)	0	5	0	0	11	0	0	48	0	0	15	0
Lane Group Flow (vph)	27	1444	0	61	954	0	55	64	0	121	31	0
Confl. Peds. (#/hr)			2	2					8	8		
Heavy Vehicles (%)	8%	10%	6%	11%	11%	6%	29%	8%	7%	9%	8%	24%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	97.4	97.4		97.4	97.4		18.6	18.6		18.6	18.6	
Effective Green, g (s)	98.4	98.4		98.4	98.4		19.6	19.6		19.6	19.6	
Actuated g/C Ratio	0.76	0.76		0.76	0.76		0.15	0.15		0.15	0.15	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	376	3571		207	3523		162	455		179	453	
v/s Ratio Prot		c0.31			0.21			0.02			0.01	
v/s Ratio Perm	0.05			0.22			0.05			c0.10		
v/c Ratio	0.07	0.40		0.29	0.27		0.34	0.14		0.68	0.07	
Uniform Delay, d1	4.1	5.5		4.9	4.8		49.4	47.9		52.2	47.4	
Progression Factor	0.13	0.09		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2		3.6	0.2		1.3	0.1		9.7	0.1	
Delay (s)	0.7	0.7		8.5	5.0		50.7	48.0		61.9	47.4	
Level of Service	A	A		A	A		D	D		E	D	
Approach Delay (s)		0.7			5.2			48.9			57.9	
Approach LOS		A			A			D			E	

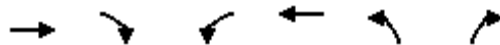
### Intersection Summary

HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Unsignalized Intersection Capacity Analysis

## 7: Street F & Rexdale Boulevard

01/12/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑			↑↑↑		↗	
Traffic Volume (veh/h)	1332	15	0	611	0	67	
Future Volume (Veh/h)	1332	15	0	611	0	67	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly flow rate (vph)	1480	17	0	679	0	74	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None			None			
Median storage (veh)							
Upstream signal (m)	148			295			
pX, platoon unblocked				0.89	0.91	0.89	
vC, conflicting volume				1480	1715	502	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol				1092	1108	0	
tC, single (s)				4.1	6.8	6.9	
tC, 2 stage (s)							
tF (s)				2.2	3.5	3.3	
p0 queue free %				100	100	92	
cM capacity (veh/h)				563	185	961	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	592	592	313	226	226	226	74
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	17	0	0	0	74
cSH	1700	1700	1700	1700	1700	1700	961
Volume to Capacity	0.35	0.35	0.18	0.13	0.13	0.13	0.08
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	1.9
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.1
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.1
Approach LOS							A
Intersection Summary							
Average Delay				0.3			
Intersection Capacity Utilization	36.9%			ICU Level of Service			A
Analysis Period (min)	15						

# Queues

## 8: Street D & Rexdale Boulevard

01/12/2020



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1500	9	670	3	4
v/c Ratio	0.40	0.05	0.18	0.01	0.01
Control Delay	7.4	1.2	0.9	42.0	25.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.4	1.2	0.9	42.0	25.8
Queue Length 50th (m)	49.2	0.1	2.5	0.6	0.0
Queue Length 95th (m)	56.5	m0.3	3.0	3.4	3.1
Internal Link Dist (m)	178.1		124.2	288.3	
Turn Bay Length (m)		130.0			
Base Capacity (vph)	3714	194	3718	412	372
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.40	0.05	0.18	0.01	0.01

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 8: Street D & Rexdale Boulevard

01/12/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↵	↑↑↑	↵	↵
Traffic Volume (vph)	1343	7	8	603	3	4
Future Volume (vph)	1343	7	8	603	3	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5138		1789	5142	1789	1601
Flt Permitted	1.00		0.14	1.00	0.95	1.00
Satd. Flow (perm)	5138		270	5142	1789	1601
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1492	8	9	670	3	4
RTOR Reduction (vph)	0	0	0	0	0	3
Lane Group Flow (vph)	1500	0	9	670	3	1
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases			6			8
Actuated Green, G (s)	93.0		93.0	93.0	25.0	25.0
Effective Green, g (s)	94.0		94.0	94.0	26.0	26.0
Actuated g/C Ratio	0.72		0.72	0.72	0.20	0.20
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)	3715		195	3718	357	320
v/s Ratio Prot	c0.29			0.13	c0.00	
v/s Ratio Perm			0.03			0.00
v/c Ratio	0.40		0.05	0.18	0.01	0.00
Uniform Delay, d1	7.0		5.2	5.7	41.7	41.6
Progression Factor	1.00		0.14	0.14	1.00	1.00
Incremental Delay, d2	0.3		0.4	0.1	0.0	0.0
Delay (s)	7.4		1.2	0.9	41.7	41.6
Level of Service	A		A	A	D	D
Approach Delay (s)	7.4			0.9	41.6	
Approach LOS	A			A	D	

### Intersection Summary

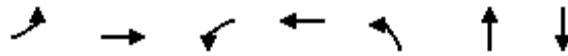
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 9: Rexdale Boulevard & Queens Plate Drive West

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	278	1410	5	645	6	11	326
v/c Ratio	0.42	0.39	0.02	0.22	0.07	0.05	0.64
Control Delay	4.5	4.3	9.4	8.1	36.3	27.5	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.5	4.3	9.4	8.1	36.3	27.5	14.6
Queue Length 50th (m)	8.0	22.3	0.3	15.0	1.1	0.6	4.9
Queue Length 95th (m)	18.7	37.3	2.1	26.7	5.2	3.4	16.5
Internal Link Dist (m)		487.3		178.1		345.3	93.9
Turn Bay Length (m)	120.0		100.0		70.0		
Base Capacity (vph)	739	3648	209	2898	331	853	1200
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.39	0.02	0.22	0.02	0.01	0.27

### Intersection Summary



# HCM Signalized Intersection Capacity Analysis

## 9: Rexdale Boulevard & Queens Plate Drive West

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑↑		↗	↑↑↑		↗	↑↑			↖	
Traffic Volume (vph)	259	1299	12	5	581	19	6	6	5	46	7	250
Future Volume (vph)	259	1299	12	5	581	19	6	6	5	46	7	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		7.0	6.0		7.0	6.0			7.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95			0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.93			0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1787	4811		1824	4653		1825	2186			2997	
Flt Permitted	0.38	1.00		0.18	1.00		0.46	1.00			0.91	
Satd. Flow (perm)	707	4811		343	4653		877	2186			2736	
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)	278	1397	13	5	625	20	6	6	5	49	8	269
RTOR Reduction (vph)	0	0	0	0	2	0	0	4	0	0	243	0
Lane Group Flow (vph)	278	1410	0	5	643	0	6	7	0	0	83	0
Confl. Peds. (#/hr)	6		2	2		6			3	3		
Heavy Vehicles (%)	2%	8%	100%	0%	12%	16%	0%	100%	0%	5%	75%	4%
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)	67.2	67.2		55.0	55.0		8.8	8.8			8.8	
Effective Green, g (s)	68.2	68.2		55.0	56.0		8.8	9.8			8.8	
Actuated g/C Ratio	0.76	0.76		0.61	0.62		0.10	0.11			0.10	
Clearance Time (s)	4.0	7.0		7.0	7.0		7.0	7.0			7.0	
Vehicle Extension (s)	2.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	646	3645		209	2895		85	238			267	
v/s Ratio Prot	c0.04	0.29			0.14			0.00				
v/s Ratio Perm	c0.28			0.01			0.01				c0.03	
v/c Ratio	0.43	0.39		0.02	0.22		0.07	0.03			0.31	
Uniform Delay, d1	3.2	3.7		6.9	7.5		36.9	35.8			37.8	
Progression Factor	1.00	1.00		1.00	1.00		0.98	1.01			1.00	
Incremental Delay, d2	0.2	0.3		0.2	0.2		0.4	0.0			0.7	
Delay (s)	3.4	4.0		7.1	7.6		36.5	36.4			38.5	
Level of Service	A	A		A	A		D	D			D	
Approach Delay (s)		3.9			7.6			36.5			38.5	
Approach LOS		A			A			D			D	

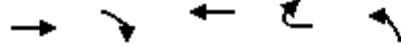
Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

10: Private Driveway & Rexdale Boulevard

01/12/2020



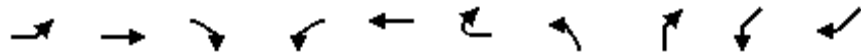
Lane Group	EBT	EBR	WBT	WBR	NBL
Lane Group Flow (vph)	1744	287	858	72	18
v/c Ratio	0.37	0.19	0.18	0.05	0.09
Control Delay	1.3	0.3	1.5	0.8	41.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	1.3	0.3	1.5	0.8	41.4
Queue Length 50th (m)	0.0	0.0	0.0	0.0	3.2
Queue Length 95th (m)	23.1	0.1	16.0	2.6	9.8
Internal Link Dist (m)	26.5		487.3		237.1
Turn Bay Length (m)		150.0		80.0	
Base Capacity (vph)	4689	1485	4689	1460	500
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.37	0.19	0.18	0.05	0.04

Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 10: Private Driveway & Rexdale Boulevard

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL	SWR
Lane Configurations		↑↑↑	↑		↑↑↑	↑	↑			
Traffic Volume (vph)	0	1570	258	0	772	65	16	0	0	0
Future Volume (vph)	0	1570	258	0	772	65	16	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	7.0	5.0			
Lane Util. Factor		0.91	1.00		0.91	1.00	1.00			
Frt		1.00	0.85		1.00	0.85	1.00			
Flt Protected		1.00	1.00		1.00	1.00	0.95			
Satd. Flow (prot)		5142	1601		5142	1601	1789			
Flt Permitted		1.00	1.00		1.00	1.00	0.95			
Satd. Flow (perm)		5142	1601		5142	1601	1789			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1744	287	0	858	72	18	0	0	0
RTOR Reduction (vph)	0	0	46	0	0	12	0	0	0	0
Lane Group Flow (vph)	0	1744	241	0	858	60	18	0	0	0
Turn Type		NA	Perm		NA	Perm	Prot			
Protected Phases		2			6		8			
Permitted Phases			2			6				
Actuated Green, G (s)		83.0	83.0		83.0	83.0	4.0			
Effective Green, g (s)		84.0	84.0		84.0	83.0	5.0			
Actuated g/C Ratio		0.84	0.84		0.84	0.83	0.05			
Clearance Time (s)		7.0	7.0		7.0	7.0	6.0			
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0			
Lane Grp Cap (vph)		4319	1344		4319	1328	89			
v/s Ratio Prot		c0.34			0.17		c0.01			
v/s Ratio Perm			0.15			0.04				
v/c Ratio		0.40	0.18		0.20	0.04	0.20			
Uniform Delay, d1		1.9	1.5		1.5	1.5	45.6			
Progression Factor		0.65	0.04		1.00	1.00	1.00			
Incremental Delay, d2		0.2	0.3		0.1	0.1	1.1			
Delay (s)		1.5	0.3		1.6	1.6	46.7			
Level of Service		A	A		A	A	D			
Approach Delay (s)		1.3			1.6		46.7		0.0	
Approach LOS		A			A		D		A	

### Intersection Summary

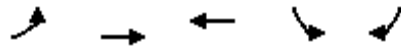
HCM 2000 Control Delay	1.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 11: Rexdale Boulevard & Humberwood Boulevard

01/12/2020



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	118	1437	939	487	286
v/c Ratio	0.33	0.54	0.37	0.78	0.40
Control Delay	14.3	16.4	18.2	37.9	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	16.4	18.2	37.9	5.0
Queue Length 50th (m)	10.0	62.2	32.7	82.9	3.3
Queue Length 95th (m)	22.4	92.1	49.5	103.3	17.1
Internal Link Dist (m)		361.4	134.8	181.9	
Turn Bay Length (m)	85.0			35.0	
Base Capacity (vph)	370	2656	2528	822	869
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.54	0.37	0.59	0.33

### Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 11: Rexdale Boulevard & Humberwood Boulevard

01/12/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	112	1365	708	184	463	272
Future Volume (vph)	112	1365	708	184	463	272
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91	0.86		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1771	4812	5722		1789	1585
Flt Permitted	0.23	1.00	1.00		0.95	1.00
Satd. Flow (perm)	425	4812	5722		1789	1585
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	118	1437	745	194	487	286
RTOR Reduction (vph)	0	0	39	0	0	170
Lane Group Flow (vph)	118	1437	900	0	487	116
Confl. Peds. (#/hr)	6			6		
Heavy Vehicles (%)	3%	9%	12%	8%	2%	3%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	54.2	54.2	42.5		33.8	33.8
Effective Green, g (s)	55.2	55.2	43.5		34.8	34.8
Actuated g/C Ratio	0.55	0.55	0.44		0.35	0.35
Clearance Time (s)	4.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	2.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	351	2656	2489		622	551
v/s Ratio Prot	0.03	c0.30	0.16		c0.27	
v/s Ratio Perm	0.16					0.07
v/c Ratio	0.34	0.54	0.36		0.78	0.21
Uniform Delay, d1	11.2	14.3	18.9		29.2	22.9
Progression Factor	1.00	1.00	0.93		1.00	1.00
Incremental Delay, d2	0.2	0.8	0.4		6.4	0.2
Delay (s)	11.4	15.1	18.1		35.6	23.1
Level of Service	B	B	B		D	C
Approach Delay (s)		14.8	18.1		31.0	
Approach LOS		B	B		C	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			19.6		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.66			
Actuated Cycle Length (s)			100.0		Sum of lost time (s)	13.0
Intersection Capacity Utilization			63.5%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis  
 12: Goreway Dr & Woodbine Entrance/Club House Rd

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	61	42	216	14	115	688
Future Volume (Veh/h)	61	42	216	14	115	688
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)	65	45	230	15	122	732
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	848	122			245	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	848	122			245	
tC, single (s)	6.9	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	76	95			91	
cM capacity (veh/h)	268	912			1333	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	65	45	153	92	122	366	366
Volume Left	65	0	0	0	122	0	0
Volume Right	0	45	0	15	0	0	0
cSH	268	912	1700	1700	1333	1700	1700
Volume to Capacity	0.24	0.05	0.09	0.05	0.09	0.22	0.22
Queue Length 95th (m)	7.0	1.2	0.0	0.0	2.3	0.0	0.0
Control Delay (s)	22.7	9.2	0.0	0.0	8.0	0.0	0.0
Lane LOS	C	A			A		
Approach Delay (s)	17.2		0.0		1.1		
Approach LOS	C						

Intersection Summary			
Average Delay		2.4	
Intersection Capacity Utilization		29.1%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis  
 13: Entrance Road & Woodbine Entrance/Club House Rd

01/12/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	23	106	82	94	135	21
Future Volume (vph)	23	106	82	94	135	21
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	28	131	101	116	167	26













Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total (vph)	28	131	217	167	26
Volume Left (vph)	28	0	101	0	0
Volume Right (vph)	0	131	0	0	26
Hadj (s)	0.50	-0.70	0.15	0.07	-0.60
Departure Headway (s)	5.9	4.7	4.6	4.6	3.2
Degree Utilization, x	0.05	0.17	0.28	0.21	0.02
Capacity (veh/h)	573	712	747	742	1121
Control Delay (s)	8.0	7.5	9.4	8.9	6.3
Approach Delay (s)	7.6		9.4	8.5	
Approach LOS	A		A	A	

Intersection Summary					
Delay			8.6		
Level of Service			A		
Intersection Capacity Utilization		29.9%		ICU Level of Service	A
Analysis Period (min)			15		

# HCM Unsignalized Intersection Capacity Analysis

## 14: Carlingview Drive & Entrance Road

01/12/2020

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	190	50	94	147	30	136
Future Volume (vph)	190	50	94	147	30	136
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	218	57	108	169	34	156
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total (vph)	218	57	108	169	34	156
Volume Left (vph)	0	0	108	0	34	0
Volume Right (vph)	0	57	0	0	0	156
Hadj (s)	0.14	-0.70	0.57	0.07	0.69	-0.55
Departure Headway (s)	5.5	4.6	5.9	5.4	6.5	5.3
Degree Utilization, x	0.33	0.07	0.18	0.25	0.06	0.23
Capacity (veh/h)	628	736	584	641	517	632
Control Delay (s)	10.0	6.8	9.0	9.0	8.7	8.7
Approach Delay (s)	9.3		9.0		8.7	
Approach LOS	A		A		A	
Intersection Summary						
Delay			9.0			
Level of Service			A			
Intersection Capacity Utilization			28.5%	ICU Level of Service	A	
Analysis Period (min)			15			



# HCM Unsignalized Intersection Capacity Analysis

## 15: Grandstand Entrance Rd & Entrance Road

01/12/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	58	67	216	28	13	223
Future Volume (Veh/h)	58	67	216	28	13	223
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)	62	71	230	30	14	237
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	608	126	251			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	608	126	251			
tC, single (s)	6.8	7.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.2			
p0 queue free %	83	92	82			
cM capacity (veh/h)	357	868	1311			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	62	71	240	20	9	242
Volume Left	62	0	230	0	0	0
Volume Right	0	71	0	0	0	237
cSH	357	868	1311	1700	1700	1700
Volume to Capacity	0.17	0.08	0.18	0.01	0.01	0.14
Queue Length 95th (m)	4.7	2.0	4.8	0.0	0.0	0.0
Control Delay (s)	17.2	9.5	8.0	0.0	0.0	0.0
Lane LOS	C	A	A			
Approach Delay (s)	13.1		7.4		0.0	
Approach LOS	B					
Intersection Summary						
Average Delay			5.7			
Intersection Capacity Utilization			32.9%		ICU Level of Service	A
Analysis Period (min)			15			

## Queues

### 16: Grandstand Entrance Rd/Street C & Nearctic Dr

01/12/2020



Lane Group	WBR	NBT	SBL
Lane Group Flow (vph)	16	71	14
v/c Ratio	0.02	0.02	0.01
Control Delay	0.0	1.7	1.9
Queue Delay	0.0	0.0	0.0
Total Delay	0.0	1.7	1.9
Queue Length 50th (m)	0.0	1.2	0.5
Queue Length 95th (m)	m0.0	2.2	1.4
Internal Link Dist (m)	627.7		
Turn Bay Length (m)			
Base Capacity (vph)	1094	3000	1107
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.01	0.02	0.01

#### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 16: Grandstand Entrance Rd/Street C & Nearctic Dr

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶	↶	↷↶		↶	↷↶
Traffic Volume (vph)	0	15	67	0	13	0
Future Volume (vph)	0	15	67	0	13	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		6.0	
Lane Util. Factor		1.00	0.95		1.00	
Frt		0.85	1.00		1.00	
Flt Protected		1.00	1.00		0.95	
Satd. Flow (prot)		1601	3579		1789	
Flt Permitted		1.00	1.00		0.71	
Satd. Flow (perm)		1601	3579		1334	
Peak-hour factor, PHF	0.90	0.95	0.95	0.95	0.90	0.95
Adj. Flow (vph)	0	16	71	0	14	0
RTOR Reduction (vph)	0	15	0	0	0	0
Lane Group Flow (vph)	0	1	71	0	14	0
Turn Type	Prot	Perm	NA		Perm	
Protected Phases	8		2			6
Permitted Phases		8			6	
Actuated Green, G (s)		10.0	108.0		108.0	
Effective Green, g (s)		11.0	109.0		108.0	
Actuated g/C Ratio		0.08	0.84		0.83	
Clearance Time (s)		6.0	6.0		6.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		135	3000		1108	
v/s Ratio Prot			c0.02			
v/s Ratio Perm		c0.00			0.01	
v/c Ratio		0.01	0.02		0.01	
Uniform Delay, d1		54.5	1.7		1.9	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		0.0	0.0		0.0	
Delay (s)		54.5	1.7		1.9	
Level of Service		D	A		A	
Approach Delay (s)	54.5		1.7			1.9
Approach LOS	D		A			A

### Intersection Summary

HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.02		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 17: Street C & Block 10 East Access

01/12/2020



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	1	2	12	75	12
v/c Ratio	0.00	0.01	0.01	0.02	0.00
Control Delay	35.0	25.5	1.4	1.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	25.5	1.4	1.0	0.2
Queue Length 50th (m)	0.2	0.0	0.0	0.0	0.0
Queue Length 95th (m)	1.6	2.0	1.4	2.5	0.0
Internal Link Dist (m)	336.9			138.6	33.1
Turn Bay Length (m)			100.0		
Base Capacity (vph)	556	499	1345	3412	3367
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.00	0.00	0.01	0.02	0.00

### Intersection Summary

HCM Signalized Intersection Capacity Analysis  
 17: Street C & Block 10 East Access

01/12/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1	2	11	71	10	1
Future Volume (vph)	1	2	11	71	10	1
Ideal Flow (vphpl)	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	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1789	1601	1789	3579	3534	
Flt Permitted	0.95	1.00	0.75	1.00	1.00	
Satd. Flow (perm)	1789	1601	1411	3579	3534	
Peak-hour factor, PHF	0.90	0.95	0.90	0.95	0.95	0.95
Adj. Flow (vph)	1	2	12	75	11	1
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	1	0	12	75	12	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	2.0	2.0	76.0	76.0	76.0	
Effective Green, g (s)	3.0	3.0	77.0	77.0	77.0	
Actuated g/C Ratio	0.03	0.03	0.86	0.86	0.86	
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)	59	53	1207	3062	3023	
v/s Ratio Prot	c0.00			c0.02	0.00	
v/s Ratio Perm		0.00	0.01			
v/c Ratio	0.02	0.00	0.01	0.02	0.00	
Uniform Delay, d1	42.1	42.1	0.9	1.0	0.9	
Progression Factor	1.00	1.00	1.00	1.00	0.12	
Incremental Delay, d2	0.1	0.0	0.0	0.0	0.0	
Delay (s)	42.2	42.1	1.0	1.0	0.1	
Level of Service	D	D	A	A	A	
Approach Delay (s)	42.1			1.0	0.1	
Approach LOS	D			A	A	

Intersection Summary

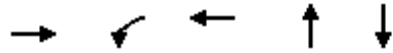
HCM 2000 Control Delay	2.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.02		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

18: Street C & Street F

01/12/2020



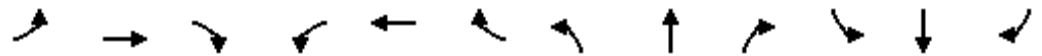
Lane Group	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	9	17	61	17	16
v/c Ratio	0.00	0.01	0.02	0.04	0.04
Control Delay	0.0	2.0	0.0	28.9	35.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.0	2.0	0.0	28.9	35.2
Queue Length 50th (m)	0.0	0.0	0.0	1.0	1.3
Queue Length 95th (m)	0.0	1.8	0.0	4.0	4.2
Internal Link Dist (m)	120.1		212.6	69.4	249.0
Turn Bay Length (m)		60.0			
Base Capacity (vph)	3027	1282	2861	1067	1040
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.00	0.01	0.02	0.02	0.02

Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 18: Street C & Street F

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Volume (vph)	0	5	4	15	1	57	0	11	5	1	14	0
Future Volume (vph)	0	5	4	15	1	57	0	11	5	1	14	0
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		0.95		1.00	0.95			0.95			0.95	
Frt		0.93		1.00	0.85			0.96			1.00	
Flt Protected		1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		3340		1789	3051			3421			3567	
Flt Permitted		1.00		0.75	1.00			1.00			0.94	
Satd. Flow (perm)		3340		1415	3051			3421			3347	
Peak-hour factor, PHF	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95
Adj. Flow (vph)	0	5	4	17	1	60	0	12	5	1	15	0
RTOR Reduction (vph)	0	1	0	0	10	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	8	0	17	51	0	0	12	0	0	16	0
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		74.0		74.0	74.0			4.0			4.0	
Effective Green, g (s)		75.0		75.0	75.0			5.0			5.0	
Actuated g/C Ratio		0.83		0.83	0.83			0.06			0.06	
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)		2783		1179	2542			190			185	
v/s Ratio Prot		0.00			c0.02			0.00				
v/s Ratio Perm				0.01							c0.00	
v/c Ratio		0.00		0.01	0.02			0.06			0.09	
Uniform Delay, d1		1.3		1.3	1.3			40.3			40.3	
Progression Factor		0.00		0.99	1.00			1.00			1.00	
Incremental Delay, d2		0.0		0.0	0.0			0.1			0.2	
Delay (s)		0.0		1.3	1.3			40.4			40.5	
Level of Service		A		A	A			D			D	
Approach Delay (s)		0.0			1.3			40.4			40.5	
Approach LOS		A			A			D			D	

### Intersection Summary

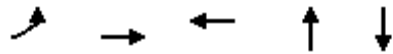
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.02		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

19: Street C & Street D

01/12/2020



Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	1	3	1	9	16
v/c Ratio	0.00	0.00	0.00	0.02	0.04
Control Delay	0.0	0.0	1.0	29.8	33.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.0	0.0	1.0	29.8	33.7
Queue Length 50th (m)	0.0	0.0	0.0	0.4	1.2
Queue Length 95th (m)	0.0	0.0	0.0	2.6	4.2
Internal Link Dist (m)		164.9	120.1	41.0	288.3
Turn Bay Length (m)	65.0				
Base Capacity (vph)	1359	1705	3412	1550	1472
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.00	0.00	0.00	0.01	0.01

Intersection Summary



# HCM Signalized Intersection Capacity Analysis

## 19: Street C & Street D

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↕			↕			↕	
Traffic Volume (vph)	1	2	1	0	1	0	0	6	3	4	10	1
Future Volume (vph)	1	2	1	0	1	0	0	6	3	4	10	1
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			0.95			0.95			0.95	
Frt	1.00	0.95			1.00			0.95			0.99	
Flt Protected	0.95	1.00			1.00			1.00			0.99	
Satd. Flow (prot)	1789	1789			3579			3400			3501	
Flt Permitted	0.76	1.00			1.00			1.00			0.91	
Satd. Flow (perm)	1426	1789			3579			3400			3229	
Peak-hour factor, PHF	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95
Adj. Flow (vph)	1	2	1	0	1	0	0	6	3	4	11	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	1	0
Lane Group Flow (vph)	1	3	0	0	1	0	0	6	0	0	15	0
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	76.0	76.0			76.0			2.0			2.0	
Effective Green, g (s)	77.0	77.0			77.0			3.0			3.0	
Actuated g/C Ratio	0.86	0.86			0.86			0.03			0.03	
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)	1220	1530			3062			113			107	
v/s Ratio Prot		c0.00			0.00			0.00				
v/s Ratio Perm	0.00										c0.00	
v/c Ratio	0.00	0.00			0.00			0.05			0.14	
Uniform Delay, d1	0.9	0.9			0.9			42.1			42.2	
Progression Factor	0.00	0.00			0.59			1.00			1.00	
Incremental Delay, d2	0.0	0.0			0.0			0.2			0.6	
Delay (s)	0.0	0.0			0.6			42.3			42.9	
Level of Service	A	A			A			D			D	
Approach Delay (s)		0.0			0.6			42.3			42.9	
Approach LOS		A			A			D			D	

### Intersection Summary

HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.01		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 20: Queens Plate Dr & Street C

01/12/2020



Lane Group	EBL	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	4	1	1	16	25
v/c Ratio	0.00	0.00	0.00	0.07	0.06
Control Delay	2.2	4.0	0.0	33.0	36.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	2.2	4.0	0.0	33.0	36.0
Queue Length 50th (m)	0.0	0.0	0.0	2.2	1.8
Queue Length 95th (m)	0.8	0.6	0.0	7.9	m5.1
Internal Link Dist (m)				69.8	345.3
Turn Bay Length (m)	45.0	60.0			
Base Capacity (vph)	1293	1293	1549	904	1571
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.00	0.00	0.00	0.02	0.02

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 20: Queens Plate Dr & Street C

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↖	↗	↖	↗			↖↗	
Traffic Volume (vph)	4	0	0	1	0	1	0	13	2	2	16	6
Future Volume (vph)	4	0	0	1	0	1	0	13	2	2	16	6
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		1.00			0.95	
Frt	1.00			1.00		0.85		0.98			0.96	
Flt Protected	0.95			0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1789			1789		1601		1848			3436	
Flt Permitted	0.76			0.76		1.00		1.00			0.93	
Satd. Flow (perm)	1426			1426		1601		1848			3209	
Peak-hour factor, PHF	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95
Adj. Flow (vph)	4	0	0	1	0	1	0	14	2	2	17	6
RTOR Reduction (vph)	0	0	0	0	0	0	0	2	0	0	6	0
Lane Group Flow (vph)	4	0	0	1	0	1	0	14	0	0	19	0
Turn Type	Perm			Perm		Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	74.0			74.0		74.0		4.0			4.0	
Effective Green, g (s)	75.0			75.0		75.0		5.0			5.0	
Actuated g/C Ratio	0.83			0.83		0.83		0.06			0.06	
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)	1188			1188		1334		102			178	
v/s Ratio Prot								c0.01				
v/s Ratio Perm	c0.00			0.00		0.00					0.01	
v/c Ratio	0.00			0.00		0.00		0.14			0.11	
Uniform Delay, d1	1.3			1.3		1.3		40.4			40.4	
Progression Factor	1.00			1.65		1.00		1.00			1.23	
Incremental Delay, d2	0.0			0.0		0.0		0.6			0.3	
Delay (s)	1.3			2.1		1.3		41.1			49.8	
Level of Service	A			A		A		D			D	
Approach Delay (s)		1.3			1.7			41.1			49.8	
Approach LOS		A			A			D			D	

### Intersection Summary

HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.01		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 1: Highway 27 & Belfield Rd

01/12/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	205	427	105	167	344	483	88	1826	225	184	1666	124
v/c Ratio	0.82	0.89	0.07	0.70	0.77	0.31	0.73	0.96	0.32	0.86	0.77	0.18
Control Delay	78.5	74.4	0.1	68.6	65.4	0.5	91.6	52.8	4.7	103.8	21.7	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.5	74.4	0.1	68.6	65.4	0.5	91.6	52.8	4.7	103.8	21.7	0.8
Queue Length 50th (m)	56.3	59.3	0.0	44.6	46.4	0.0	22.5	169.2	0.0	49.7	98.0	0.0
Queue Length 95th (m)	#99.1	#87.9	0.0	71.3	64.2	0.0	#49.8	#205.4	16.3	#88.3	115.0	0.4
Internal Link Dist (m)		253.2			275.1			169.6			234.9	
Turn Bay Length (m)	145.0		65.0	200.0		200.0	140.0		155.0	110.0		75.0
Base Capacity (vph)	253	488	1541	255	477	1570	121	1902	710	218	2171	697
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.88	0.07	0.65	0.72	0.31	0.73	0.96	0.32	0.84	0.77	0.18

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 1: Highway 27 & Belfield Rd

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↔	↗	↘	↔	↗	↘	↕	↗	↘	↕	↗
Traffic Volume (vph)	286	295	97	260	210	444	81	1808	207	175	1533	114
Future Volume (vph)	286	295	97	260	210	444	81	1808	207	175	1533	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.91	0.91	1.00	0.91	0.91	1.00	1.00	*0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.99	1.00	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1567	3022	1541	1582	2957	1570	1521	4995	1498	1738	5092	1432
Flt Permitted	0.95	0.99	1.00	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1567	3022	1541	1582	2957	1570	1521	4995	1498	1738	5092	1432
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.99	0.92	0.95	0.92	0.92
Adj. Flow (vph)	311	321	105	283	228	483	88	1826	225	184	1666	124
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	139	0	0	71
Lane Group Flow (vph)	205	427	105	167	344	483	88	1826	86	184	1666	53
Heavy Vehicles (%)	6%	17%	6%	5%	22%	4%	20%	5%	9%	5%	3%	14%
Turn Type	Split	NA	Free	Split	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4		5	2		1		6
Permitted Phases			Free			Free			2			6
Actuated Green, G (s)	19.7	19.7	130.0	18.6	18.6	130.0	9.3	48.5	48.5	15.2	54.4	54.4
Effective Green, g (s)	20.7	20.7	130.0	19.6	19.6	130.0	10.3	49.5	49.5	16.2	55.4	55.4
Actuated g/C Ratio	0.16	0.16	1.00	0.15	0.15	1.00	0.08	0.38	0.38	0.12	0.43	0.43
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	249	481	1541	238	445	1570	120	1901	570	216	2169	610
v/s Ratio Prot	0.13	c0.14		0.11	c0.12		0.06	c0.37		c0.11	c0.33	
v/s Ratio Perm			0.07			0.31			0.06			0.04
v/c Ratio	0.82	0.89	0.07	0.70	0.77	0.31	0.73	0.96	0.15	0.85	0.77	0.09
Uniform Delay, d1	52.9	53.5	0.0	52.4	53.1	0.0	58.5	39.3	26.4	55.7	31.8	22.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.31	0.59	0.15
Incremental Delay, d2	19.3	17.7	0.1	9.0	8.1	0.5	20.5	13.2	0.6	25.5	2.6	0.3
Delay (s)	72.2	71.2	0.1	61.4	61.2	0.5	79.0	52.5	27.0	98.4	21.4	3.6
Level of Service	E	E	A	E	E	A	E	D	C	F	C	A
Approach Delay (s)		61.4			31.7			50.9			27.4	
Approach LOS		E			C			D			C	

### Intersection Summary

HCM 2000 Control Delay	41.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Unsignalized Intersection Capacity Analysis

## 2: Highway 27 & Bethridge Rd

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕↕↕↕			↕↕
Traffic Volume (veh/h)	0	108	2206	33	0	1546
Future Volume (Veh/h)	0	108	2206	33	0	1546
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	113	2298	34	0	1610
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	3120	783			2332	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3120	783			2332	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	66			100	
cM capacity (veh/h)	9	330			216	
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	113	919	919	494	805	805
Volume Left	0	0	0	0	0	0
Volume Right	113	0	0	34	0	0
cSH	330	1700	1700	1700	1700	1700
Volume to Capacity	0.34	0.54	0.54	0.29	0.47	0.47
Queue Length 95th (m)	11.3	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	21.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	21.5	0.0			0.0	
Approach LOS	C					
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			56.7%		ICU Level of Service	B
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: Highway 27 & Vice Regent Blvd

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↵	↗	↕	↗	↵	↕
Traffic Volume (veh/h)	46	20	2155	158	33	1601
Future Volume (Veh/h)	46	20	2155	158	33	1601
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	48	21	2245	165	34	1668
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)					333	
pX, platoon unblocked	0.82					
vC, conflicting volume	3147	1122			2410	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3180	1122			2410	
tC, single (s)	6.9	6.9			4.4	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.4	
p0 queue free %	0	90			79	
cM capacity (veh/h)	5	203			160	

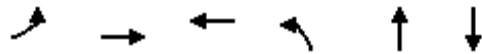
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	48	21	1122	1122	165	34	834	834
Volume Left	48	0	0	0	0	34	0	0
Volume Right	0	21	0	0	165	0	0	0
cSH	5	203	1700	1700	1700	160	1700	1700
Volume to Capacity	9.79	0.10	0.66	0.66	0.10	0.21	0.49	0.49
Queue Length 95th (m)	Err	2.6	0.0	0.0	0.0	5.9	0.0	0.0
Control Delay (s)	Err	24.8	0.0	0.0	0.0	33.5	0.0	0.0
Lane LOS	F	C				D		
Approach Delay (s)	6963.4		0.0		0.7			
Approach LOS	F							

Intersection Summary		
Average Delay	115.2	
Intersection Capacity Utilization	69.6%	ICU Level of Service C
Analysis Period (min)	15	

# Queues

## 4: Highway 27 & Nearctic Dr/Street E

01/12/2020



Lane Group	EBL	EBT	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	61	207	53	182	2012	1521
v/c Ratio	0.48	0.64	0.29	0.52	0.50	0.43
Control Delay	51.0	19.8	41.5	17.5	1.9	3.1
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	51.0	19.9	41.5	17.5	1.9	3.1
Queue Length 50th (m)	16.0	22.0	8.4	6.6	16.9	16.7
Queue Length 95th (m)	m20.1	32.0	20.4	m17.5	m25.3	m19.2
Internal Link Dist (m)		77.8	141.3		184.1	346.1
Turn Bay Length (m)				125.0		
Base Capacity (vph)	376	585	511	466	4063	3541
Starvation Cap Reductn	0	42	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.38	0.10	0.39	0.50	0.43

### Intersection Summary

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



# HCM Signalized Intersection Capacity Analysis

## 4: Highway 27 & Nearctic Dr/Street E

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑↑		↖	↑↑↑	
Traffic Volume (vph)	60	20	185	0	35	18	180	1868	124	0	1450	55
Future Volume (vph)	60	20	185	0	35	18	180	1868	124	0	1450	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		3.5	6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91			0.91	
Frt	1.00	0.86			0.95		1.00	0.99			0.99	
Flt Protected	0.95	1.00			1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1789	1628			1799		1789	4942			5019	
Flt Permitted	0.72	1.00			1.00		0.13	1.00			1.00	
Satd. Flow (perm)	1361	1628			1799		253	4942			5019	
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)	61	20	187	0	35	18	182	1887	125	0	1465	56
RTOR Reduction (vph)	0	169	0	0	16	0	0	3	0	0	2	0
Lane Group Flow (vph)	61	38	0	0	37	0	182	2009	0	0	1519	0
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	5%	7%	0%	4%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.2	11.2			11.2		105.8	105.8			90.8	
Effective Green, g (s)	12.2	12.2			12.2		106.8	106.8			91.8	
Actuated g/C Ratio	0.09	0.09			0.09		0.82	0.82			0.71	
Clearance Time (s)	6.0	6.0			6.0		4.5	7.0			7.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	127	152			168		343	4060			3544	
v/s Ratio Prot		0.02			0.02		0.05	c0.41			0.30	
v/s Ratio Perm	c0.04						c0.39					
v/c Ratio	0.48	0.25			0.22		0.53	0.49			0.43	
Uniform Delay, d1	55.9	54.6			54.5		4.4	3.5			8.0	
Progression Factor	0.76	1.26			1.00		3.96	0.41			0.33	
Incremental Delay, d2	2.1	0.6			0.7		1.3	0.4			0.2	
Delay (s)	44.8	69.6			55.1		18.7	1.8			2.8	
Level of Service	D	E			E		B	A			A	
Approach Delay (s)		63.9			55.1			3.2			2.8	
Approach LOS		E			E			A			A	

### Intersection Summary

HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# Queues

## 5: Highway 27 & Rexdale Boulevard

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	212	1305	174	1356	96	245	1482	271	133	1224	187
v/c Ratio	1.13	0.90	0.96	0.91	0.07	1.00	0.84	0.18	0.78	0.79	0.12
Control Delay	127.6	39.3	94.9	47.7	0.1	103.0	55.6	0.2	85.5	45.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	127.6	39.3	94.9	47.7	0.1	103.0	55.6	0.2	85.5	45.6	0.2
Queue Length 50th (m)	-45.4	116.0	34.1	85.8	0.0	66.6	142.0	0.0	33.6	105.1	0.0
Queue Length 95th (m)	#92.4	#136.4	m#72.1	#120.8	m0.0	#120.0	158.9	0.0	#64.2	122.8	0.0
Internal Link Dist (m)		271.0		242.9			346.1			293.8	
Turn Bay Length (m)	100.0		30.0		80.0	80.0		200.0	110.0		115.0
Base Capacity (vph)	187	1455	181	1484	1471	246	1766	1512	178	1544	1512
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.90	0.96	0.91	0.07	1.00	0.84	0.18	0.75	0.79	0.12

### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 5: Highway 27 & Rexdale Boulevard

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑↑		↗	↑↑↑	↗	↗	↑↑↑	↗	↗	↑↑↑	↗
Traffic Volume (vph)	206	1123	143	169	1315	93	238	1438	263	129	1187	181
Future Volume (vph)	206	1123	143	169	1315	93	238	1438	263	129	1187	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.8	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Total Lost time (s)	5.0	6.0		5.0	6.0	3.0	5.0	7.0	3.0	5.0	7.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1827	4809		1772	4948	1471	1706	5043	1512	1659	4995	1512
Flt Permitted	0.10	1.00		0.10	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	197	4809		191	4948	1471	1706	5043	1512	1659	4995	1512
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)	212	1158	147	174	1356	96	245	1482	271	133	1224	187
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	212	1292	0	174	1356	96	245	1482	271	133	1224	187
Heavy Vehicles (%)	1%	7%	9%	3%	6%	11%	7%	4%	8%	10%	5%	8%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1		6
Permitted Phases	4			8		Free			Free			Free
Actuated Green, G (s)	46.0	38.0		46.0	38.0	130.0	17.8	44.5	130.0	12.5	39.2	130.0
Effective Green, g (s)	48.0	39.0		48.0	39.0	130.0	18.8	45.5	130.0	13.5	40.2	130.0
Actuated g/C Ratio	0.37	0.30		0.37	0.30	1.00	0.14	0.35	1.00	0.10	0.31	1.00
Clearance Time (s)	6.0	7.0		6.0	7.0		6.0	8.0		6.0	8.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	1442		179	1484	1471	246	1765	1512	172	1544	1512
v/s Ratio Prot	c0.08	0.27		0.07	0.27		c0.14	c0.29		0.08	0.25	
v/s Ratio Perm	c0.34			0.29		0.07			0.18			0.12
v/c Ratio	1.15	0.90		0.97	0.91	0.07	1.00	0.84	0.18	0.77	0.79	0.12
Uniform Delay, d1	33.6	43.6		32.6	43.9	0.0	55.6	38.9	0.0	56.8	41.1	0.0
Progression Factor	0.73	0.71		1.47	0.87	1.00	0.88	1.30	1.00	1.00	1.00	1.00
Incremental Delay, d2	107.8	8.3		54.9	9.2	0.1	52.9	4.5	0.2	19.2	4.3	0.2
Delay (s)	132.5	39.3		102.7	47.4	0.1	101.9	55.1	0.2	75.9	45.4	0.2
Level of Service	F	D		F	D	A	F	E	A	E	D	A
Approach Delay (s)		52.3			50.5			53.4			42.5	
Approach LOS		D			D			D			D	

Intersection Summary		
HCM 2000 Control Delay	49.9	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.02	D
Actuated Cycle Length (s)	130.0	Sum of lost time (s)
Intersection Capacity Utilization	92.1%	23.0
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group

# Queues

## 6: Rexdale Boulevard & Queens Plate Drive

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	96	1435	40	1433	290	203	252	133
v/c Ratio	0.58	0.48	0.26	0.47	0.87	0.22	0.77	0.14
Control Delay	19.0	1.2	18.3	13.7	69.5	26.5	58.6	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	1.2	18.3	13.7	69.5	26.5	58.6	16.0
Queue Length 50th (m)	1.6	5.1	4.6	68.7	68.7	15.4	57.6	6.0
Queue Length 95th (m)	m4.9	6.4	13.3	84.2	#108.0	24.3	87.0	13.3
Internal Link Dist (m)		242.9		949.9		173.2		283.9
Turn Bay Length (m)	65.0		45.0		140.0		125.0	
Base Capacity (vph)	166	3015	156	3049	380	1059	372	1071
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.48	0.26	0.47	0.76	0.19	0.68	0.12

### Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 6: Rexdale Boulevard & Queens Plate Drive

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑↑		↗	↑↑↑		↗	↑↑		↗	↑↑	
Traffic Volume (vph)	95	1359	61	40	1193	226	287	99	102	249	35	97
Future Volume (vph)	95	1359	61	40	1193	226	287	99	102	249	35	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.98		1.00	0.92		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1755	4821		1659	4852		1674	3180		1755	3172	
Flt Permitted	0.14	1.00		0.14	1.00		0.67	1.00		0.62	1.00	
Satd. Flow (perm)	266	4821		251	4852		1177	3180		1153	3172	
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)	96	1373	62	40	1205	228	290	100	103	252	35	98
RTOR Reduction (vph)	0	3	0	0	19	0	0	34	0	0	50	0
Lane Group Flow (vph)	96	1432	0	40	1414	0	290	169	0	252	83	0
Heavy Vehicles (%)	4%	8%	10%	10%	6%	3%	9%	2%	10%	4%	9%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	80.2	80.2		80.2	80.2		35.8	35.8		35.8	35.8	
Effective Green, g (s)	81.2	81.2		81.2	81.2		36.8	36.8		36.8	36.8	
Actuated g/C Ratio	0.62	0.62		0.62	0.62		0.28	0.28		0.28	0.28	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	166	3011		156	3030		333	900		326	897	
v/s Ratio Prot		0.30			0.29			0.05			0.03	
v/s Ratio Perm	c0.36			0.16			c0.25			0.22		
v/c Ratio	0.58	0.48		0.26	0.47		0.87	0.19		0.77	0.09	
Uniform Delay, d1	14.3	13.0		10.9	12.9		44.3	35.3		42.8	34.3	
Progression Factor	0.48	0.06		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.9	0.3		3.9	0.5		21.2	0.1		10.8	0.0	
Delay (s)	15.8	1.2		14.8	13.4		65.5	35.4		53.6	34.4	
Level of Service	B	A		B	B		E	D		D	C	
Approach Delay (s)		2.1			13.5			53.1			47.0	
Approach LOS		A			B			D			D	

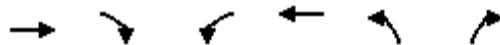
### Intersection Summary

HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Unsignalized Intersection Capacity Analysis

## 7: Street F & Rexdale Boulevard

01/12/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑↑		↗
Traffic Volume (veh/h)	1262	280	0	1734	0	210
Future Volume (Veh/h)	1262	280	0	1734	0	210
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1328	295	0	1825	0	221
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	148			295		
pX, platoon unblocked				0.81	0.84	0.81
vC, conflicting volume				1328	2084	590
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				586	93	0
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				100	100	75
cM capacity (veh/h)				798	752	879

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	531	531	561	608	608	608	221
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	295	0	0	0	221
cSH	1700	1700	1700	1700	1700	1700	879
Volume to Capacity	0.31	0.31	0.33	0.36	0.36	0.36	0.25
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	7.6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.5
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.5
Approach LOS							B

Intersection Summary						
Average Delay	0.6					
Intersection Capacity Utilization	50.3%			ICU Level of Service	A	
Analysis Period (min)	15					

# Queues

## 8: Street D & Rexdale Boulevard

01/12/2020



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1686	167	1667	72	84
v/c Ratio	0.55	0.59	0.45	0.20	0.22
Control Delay	16.4	11.5	12.8	58.8	27.7
Queue Delay	0.4	0.0	0.0	0.0	0.0
Total Delay	16.7	11.5	12.8	58.8	27.7
Queue Length 50th (m)	86.8	14.1	134.4	17.4	0.0
Queue Length 95th (m)	113.8	m15.1	m148.1	33.8	21.9
Internal Link Dist (m)	178.1		124.2	288.3	
Turn Bay Length (m)		130.0			
Base Capacity (vph)	3071	388	3718	440	457
Starvation Cap Reductn	710	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.71	0.43	0.45	0.16	0.18

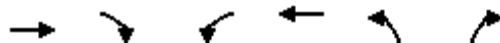
### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 8: Street D & Rexdale Boulevard

01/12/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↵	↑↑↑	↵	↵
Traffic Volume (vph)	1462	140	150	1584	65	80
Future Volume (vph)	1462	140	150	1584	65	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		3.0	5.0	5.0	5.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5075		1789	5142	1789	1601
Flt Permitted	1.00		0.09	1.00	0.95	1.00
Satd. Flow (perm)	5075		174	5142	1789	1601
Peak-hour factor, PHF	0.95	0.95	0.90	0.95	0.90	0.95
Adj. Flow (vph)	1539	147	167	1667	72	84
RTOR Reduction (vph)	7	0	0	0	0	67
Lane Group Flow (vph)	1679	0	167	1667	72	17
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases			6			8
Actuated Green, G (s)	77.5		93.0	93.0	25.0	25.0
Effective Green, g (s)	78.5		94.0	94.0	26.0	26.0
Actuated g/C Ratio	0.60		0.72	0.72	0.20	0.20
Clearance Time (s)	6.0		4.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3064		281	3718	357	320
v/s Ratio Prot	0.33		c0.06	0.32	c0.04	
v/s Ratio Perm			c0.37			0.01
v/c Ratio	0.55		0.59	0.45	0.20	0.05
Uniform Delay, d1	15.2		12.7	7.4	43.3	42.0
Progression Factor	1.00		0.58	1.69	1.31	2.96
Incremental Delay, d2	0.7		1.8	0.2	0.3	0.1
Delay (s)	16.0		9.2	12.7	57.2	124.7
Level of Service	B		A	B	E	F
Approach Delay (s)	16.0			12.4	93.5	
Approach LOS	B			B	F	

### Intersection Summary

HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

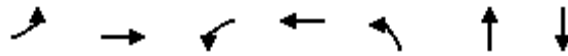
c Critical Lane Group



# Queues

## 9: Rexdale Boulevard & Queens Plate Drive West

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	352	1616	122	1567	138	172	572
v/c Ratio	0.89	0.70	0.51	0.81	0.93	0.22	0.60
Control Delay	46.9	19.3	19.5	29.6	89.6	7.6	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	19.3	19.5	29.6	89.6	7.6	14.7
Queue Length 50th (m)	42.8	79.1	7.8	94.7	22.1	2.5	18.3
Queue Length 95th (m)	#92.4	97.1	#20.1	#125.9	#52.6	9.4	33.3
Internal Link Dist (m)		487.3		178.1		345.3	93.9
Turn Bay Length (m)	120.0		100.0		70.0		
Base Capacity (vph)	413	2318	241	1946	178	909	1073
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.70	0.51	0.81	0.78	0.19	0.53

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 9: Rexdale Boulevard & Queens Plate Drive West

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑↑		↗	↑↑↑		↗	↑↑			↖	
Traffic Volume (vph)	345	1370	214	120	1496	39	135	38	130	102	60	399
Future Volume (vph)	345	1370	214	120	1496	39	135	38	130	102	60	399
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		2.0	6.0		6.0	6.0			6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95			0.95	
Frt	1.00	0.98		1.00	1.00		1.00	0.88			0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1789	4521		1825	4841		1825	2630			3225	
Flt Permitted	0.10	1.00		0.12	1.00		0.30	1.00			0.85	
Satd. Flow (perm)	192	4521		228	4841		575	2630			2756	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	352	1398	218	122	1527	40	138	39	133	104	61	407
RTOR Reduction (vph)	0	22	0	0	3	0	0	98	0	0	232	0
Lane Group Flow (vph)	352	1594	0	122	1564	0	138	74	0	0	340	0
Heavy Vehicles (%)	2%	8%	50%	0%	8%	5%	0%	100%	0%	1%	0%	0%
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)	53.6	44.7		41.1	35.2		22.4	22.4			22.4	
Effective Green, g (s)	54.6	45.7		43.1	36.2		23.4	23.4			23.4	
Actuated g/C Ratio	0.61	0.51		0.48	0.40		0.26	0.26			0.26	
Clearance Time (s)	4.0	7.0		3.0	7.0		7.0	7.0			7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	389	2295		231	1947		149	683			716	
v/s Ratio Prot	c0.15	0.35		0.04	0.32			0.03				
v/s Ratio Perm	c0.39			0.21			c0.24				0.12	
v/c Ratio	0.90	0.69		0.53	0.80		0.93	0.11			0.48	
Uniform Delay, d1	24.3	16.8		13.5	23.8		32.5	25.4			28.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	23.8	1.8		2.2	3.6		51.7	0.1			0.5	
Delay (s)	48.1	18.6		15.7	27.4		84.2	25.4			28.6	
Level of Service	D	B		B	C		F	C			C	
Approach Delay (s)		23.9			26.5			51.6			28.6	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

# Queues

## 10: Private Driveway & Rexdale Boulevard

01/12/2020



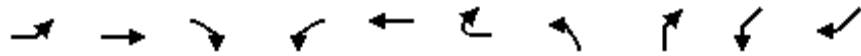
Lane Group	EBT	EBR	WBT	NBL
Lane Group Flow (vph)	1997	402	1889	333
v/c Ratio	0.57	0.33	0.54	0.78
Control Delay	12.8	1.7	12.3	58.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.8	1.7	12.3	58.5
Queue Length 50th (m)	91.3	0.0	83.6	80.2
Queue Length 95th (m)	128.6	11.9	117.8	103.9
Internal Link Dist (m)	26.5		487.3	237.1
Turn Bay Length (m)		150.0		
Base Capacity (vph)	3476	1212	3476	688
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.57	0.33	0.54	0.48

### Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 10: Private Driveway & Rexdale Boulevard

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL	SWR
Lane Configurations		↑↑↑	↑		↑↑↑	↑	↑			
Traffic Volume (vph)	0	1897	382	0	1795	0	300	0	0	0
Future Volume (vph)	0	1897	382	0	1795	0	300	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		5.0			
Lane Util. Factor		0.91	1.00		0.91		1.00			
Frt		1.00	0.85		1.00		1.00			
Flt Protected		1.00	1.00		1.00		0.95			
Satd. Flow (prot)		5142	1601		5142		1789			
Flt Permitted		1.00	1.00		1.00		0.95			
Satd. Flow (perm)		5142	1601		5142		1789			
Peak-hour factor, PHF	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95	0.95
Adj. Flow (vph)	0	1997	402	0	1889	0	333	0	0	0
RTOR Reduction (vph)	0	0	130	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1997	272	0	1889	0	333	0	0	0
Turn Type		NA	Perm		NA	Perm	Prot			
Protected Phases		2			6		8			
Permitted Phases			2			6				
Actuated Green, G (s)		86.9	86.9		86.9		30.1			
Effective Green, g (s)		87.9	87.9		87.9		31.1			
Actuated g/C Ratio		0.68	0.68		0.68		0.24			
Clearance Time (s)		7.0	7.0		7.0		6.0			
Vehicle Extension (s)		3.0	3.0		3.0		3.0			
Lane Grp Cap (vph)		3476	1082		3476		427			
v/s Ratio Prot		c0.39			0.37		c0.19			
v/s Ratio Perm			0.17							
v/c Ratio		0.57	0.25		0.54		0.78			
Uniform Delay, d1		11.1	8.2		10.8		46.2			
Progression Factor		1.00	1.00		1.00		1.00			
Incremental Delay, d2		0.7	0.6		0.6		8.8			
Delay (s)		11.8	8.8		11.4		55.0			
Level of Service		B	A		B		E			
Approach Delay (s)		11.3			11.4		55.0		0.0	
Approach LOS		B			B		E		A	

### Intersection Summary

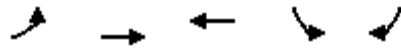
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 11: Rexdale Boulevard & Humberwood Boulevard

01/12/2020



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	262	1979	3117	347	143
v/c Ratio	0.65	0.50	1.16	0.75	0.27
Control Delay	30.0	10.9	104.4	43.8	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	10.9	104.4	43.8	6.3
Queue Length 50th (m)	29.5	53.7	~207.9	61.9	0.9
Queue Length 95th (m)	#86.5	79.1	#230.1	82.4	13.2
Internal Link Dist (m)		361.4	134.8	181.9	
Turn Bay Length (m)	85.0			35.0	
Base Capacity (vph)	405	3919	2687	661	684
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.65	0.50	1.16	0.52	0.21

### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

## 11: Rexdale Boulevard & Humberwood Boulevard

01/12/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	257	1939	2568	487	340	140
Future Volume (vph)	257	1939	2568	487	340	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.86	0.86		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1807	6119	6172		1789	1617
Flt Permitted	0.09	1.00	1.00		0.95	1.00
Satd. Flow (perm)	165	6119	6172		1789	1617
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	262	1979	2620	497	347	143
RTOR Reduction (vph)	0	0	34	0	0	102
Lane Group Flow (vph)	262	1979	3083	0	347	41
Heavy Vehicles (%)	1%	8%	5%	2%	2%	1%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	63.1	63.1	42.0		24.9	24.9
Effective Green, g (s)	64.1	64.1	43.0		25.9	25.9
Actuated g/C Ratio	0.64	0.64	0.43		0.26	0.26
Clearance Time (s)	4.0	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)	402	3922	2653		463	418
v/s Ratio Prot	c0.12	0.32	c0.50		c0.19	
v/s Ratio Perm	0.30					0.03
v/c Ratio	0.65	0.50	1.16		0.75	0.10
Uniform Delay, d1	24.9	9.5	28.5		34.1	28.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.8	0.5	77.5		6.6	0.1
Delay (s)	28.7	10.0	106.0		40.6	28.3
Level of Service	C	A	F		D	C
Approach Delay (s)		12.2	106.0		37.0	
Approach LOS		B	F		D	

### Intersection Summary

HCM 2000 Control Delay	64.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis  
 12: Goreway Dr & Woodbine Entrance/Club House Rd

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations							
Traffic Volume (veh/h)	8	211	1676	111	123	321	
Future Volume (Veh/h)	8	211	1676	111	123	321	
Sign Control	Stop		Free			Free	
Grade	0%		0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	8	222	1764	117	129	338	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type							
Median storage veh							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	2250	940			1881		
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	2250	940			1881		
tC, single (s)	6.8	7.0			4.3		
tC, 2 stage (s)							
tF (s)	3.5	3.3			2.3		
p0 queue free %	59	15			53		
cM capacity (veh/h)	19	261			277		
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	8	222	1176	705	129	169	169
Volume Left	8	0	0	0	129	0	0
Volume Right	0	222	0	117	0	0	0
cSH	19	261	1700	1700	277	1700	1700
Volume to Capacity	0.41	0.85	0.69	0.41	0.47	0.10	0.10
Queue Length 95th (m)	8.8	53.3	0.0	0.0	17.6	0.0	0.0
Control Delay (s)	287.2	65.3	0.0	0.0	28.8	0.0	0.0
Lane LOS	F	F			D		
Approach Delay (s)	73.1		0.0		8.0		
Approach LOS	F						
Intersection Summary							
Average Delay			8.0				
Intersection Capacity Utilization			70.0%		ICU Level of Service		C
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis  
 13: Entrance Road & Woodbine Entrance/Club House Rd

01/12/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	217	17	80	545	91	139
Future Volume (vph)	217	17	80	545	91	139
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	236	18	87	592	99	151

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total (vph)	236	18	679	99	151
Volume Left (vph)	236	0	87	0	0
Volume Right (vph)	0	18	0	0	151
Hadj (s)	0.53	-0.67	0.06	0.03	-0.57
Departure Headway (s)	7.1	5.9	5.0	5.8	3.2
Degree Utilization, x	0.46	0.03	0.95	0.16	0.13
Capacity (veh/h)	501	597	706	596	1121
Control Delay (s)	14.8	7.8	44.6	10.0	6.7
Approach Delay (s)	14.4		44.6	8.0	
Approach LOS	B		E	A	













Intersection Summary					
Delay			30.4		
Level of Service			D		
Intersection Capacity Utilization		58.5%		ICU Level of Service	B
Analysis Period (min)			15		



# HCM Unsignalized Intersection Capacity Analysis

## 14: Carlingview Drive & Entrance Road

01/12/2020

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	42	66	127	172	454	223
Future Volume (vph)	42	66	127	172	454	223
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	45	70	135	183	483	237
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total (vph)	45	70	135	183	483	237
Volume Left (vph)	0	0	135	0	483	0
Volume Right (vph)	0	70	0	0	0	237
Hadj (s)	0.00	-0.55	0.58	0.00	0.52	-0.46
Departure Headway (s)	7.1	6.5	7.3	6.7	6.3	5.4
Degree Utilization, x	0.09	0.13	0.27	0.34	0.85	0.35
Capacity (veh/h)	484	525	469	512	561	655
Control Delay (s)	9.6	9.2	11.8	11.9	33.9	10.0
Approach Delay (s)	9.4		11.9		26.1	
Approach LOS	A		B		D	
Intersection Summary						
Delay			20.5			
Level of Service			C			
Intersection Capacity Utilization			45.5%		ICU Level of Service A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 15: Grandstand Entrance Rd & Entrance Road

01/12/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	341	134	40	632	139	49
Future Volume (Veh/h)	341	134	40	632	139	49
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)	371	146	43	687	151	53
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	607	102	204			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	607	102	204			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	10	84	97			
cM capacity (veh/h)	414	933	1365			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	371	146	272	458	101	103
Volume Left	371	0	43	0	0	0
Volume Right	0	146	0	0	0	53
cSH	414	933	1365	1700	1700	1700
Volume to Capacity	0.90	0.16	0.03	0.27	0.06	0.06
Queue Length 95th (m)	71.3	4.2	0.7	0.0	0.0	0.0
Control Delay (s)	53.8	9.6	1.5	0.0	0.0	0.0
Lane LOS	F	A	A			
Approach Delay (s)	41.3		0.5		0.0	
Approach LOS	E					
Intersection Summary						
Average Delay			15.0			
Intersection Capacity Utilization			52.9%		ICU Level of Service	A
Analysis Period (min)			15			

Queues

16: Grandstand Entrance Rd/Street C & Nearctic Dr

01/12/2020



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	6	284	958	294	337
v/c Ratio	0.03	0.80	0.33	0.69	0.12
Control Delay	45.4	39.5	4.3	17.1	2.0
Queue Delay	0.0	0.2	0.0	0.0	0.0
Total Delay	45.4	39.8	4.3	17.1	2.0
Queue Length 50th (m)	1.4	31.6	27.4	32.7	8.6
Queue Length 95th (m)	m3.0	59.1	51.7	#108.7	4.3
Internal Link Dist (m)	77.8		627.7		138.6
Turn Bay Length (m)					
Base Capacity (vph)	371	483	2880	428	2882
Starvation Cap Reductn	0	19	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.61	0.33	0.69	0.12

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 16: Grandstand Entrance Rd/Street C & Nearctic Dr

01/12/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	270	905	5	265	320
Future Volume (vph)	5	270	905	5	265	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		6.0	5.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1789	1601	3576		1789	3579
Flt Permitted	0.95	1.00	1.00		0.28	1.00
Satd. Flow (perm)	1789	1601	3576		537	3579
Peak-hour factor, PHF	0.90	0.95	0.95	0.95	0.90	0.95
Adj. Flow (vph)	6	284	953	5	294	337
RTOR Reduction (vph)	0	169	0	0	0	0
Lane Group Flow (vph)	6	115	958	0	294	337
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Actuated Green, G (s)	14.3	14.3	103.7		103.7	103.7
Effective Green, g (s)	15.3	15.3	104.7		103.7	104.7
Actuated g/C Ratio	0.12	0.12	0.81		0.80	0.81
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)	210	188	2880		428	2882
v/s Ratio Prot	0.00		0.27			0.09
v/s Ratio Perm		c0.07			c0.55	
v/c Ratio	0.03	0.61	0.33		0.69	0.12
Uniform Delay, d1	50.8	54.5	3.4		5.9	2.7
Progression Factor	1.00	1.31	1.00		0.84	0.59
Incremental Delay, d2	0.1	5.6	0.3		8.6	0.1
Delay (s)	50.6	77.2	3.7		13.6	1.7
Level of Service	D	E	A		B	A
Approach Delay (s)	76.7		3.7			7.2
Approach LOS	E		A			A

### Intersection Summary

HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

## Queues

### 17: Street C & Block 10 East Access

01/12/2020



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	6	153	222	1026	500
v/c Ratio	0.05	0.62	0.29	0.33	0.16
Control Delay	55.4	19.4	2.4	1.7	2.3
Queue Delay	0.0	0.0	0.0	0.1	0.0
Total Delay	55.4	19.4	2.4	1.9	2.3
Queue Length 50th (m)	1.5	0.0	5.2	12.7	1.7
Queue Length 95th (m)	5.7	19.9	12.1	23.4	34.1
Internal Link Dist (m)	336.9			138.6	33.1
Turn Bay Length (m)			100.0		
Base Capacity (vph)	495	553	756	3066	3033
Starvation Cap Reductn	0	0	0	820	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.28	0.29	0.46	0.16

#### Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 17: Street C & Block 10 East Access

01/12/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	145	200	975	440	35
Future Volume (vph)	5	145	200	975	440	35
Ideal Flow (vphpl)	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	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1789	1601	1789	3579	3539	
Flt Permitted	0.95	1.00	0.47	1.00	1.00	
Satd. Flow (perm)	1789	1601	883	3579	3539	
Peak-hour factor, PHF	0.90	0.95	0.90	0.95	0.95	0.95
Adj. Flow (vph)	6	153	222	1026	463	37
RTOR Reduction (vph)	0	143	0	0	2	0
Lane Group Flow (vph)	6	10	222	1026	498	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	7.6	7.6	110.4	110.4	110.4	
Effective Green, g (s)	8.6	8.6	111.4	111.4	111.4	
Actuated g/C Ratio	0.07	0.07	0.86	0.86	0.86	
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)	118	105	756	3066	3032	
v/s Ratio Prot	0.00			c0.29	0.14	
v/s Ratio Perm		c0.01	0.25			
v/c Ratio	0.05	0.10	0.29	0.33	0.16	
Uniform Delay, d1	56.9	57.0	1.8	1.9	1.5	
Progression Factor	1.00	1.00	0.69	0.72	1.35	
Incremental Delay, d2	0.2	0.4	0.9	0.3	0.1	
Delay (s)	57.1	57.5	2.2	1.6	2.2	
Level of Service	E	E	A	A	A	
Approach Delay (s)	57.4			1.7	2.2	
Approach LOS	E			A	A	

### Intersection Summary

HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 18: Street C & Street F

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	6	415	422	631	668	306
v/c Ratio	0.02	0.27	0.61	0.28	0.84	0.30
Control Delay	26.8	15.6	16.0	11.1	45.2	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.8	15.6	16.0	11.1	45.2	23.2
Queue Length 50th (m)	0.8	18.5	58.4	42.8	72.3	15.7
Queue Length 95th (m)	m3.6	31.6	93.2	64.1	87.0	14.0
Internal Link Dist (m)		120.1		212.6	69.4	249.0
Turn Bay Length (m)	60.0		60.0			
Base Capacity (vph)	333	1515	784	2225	954	1244
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.27	0.54	0.28	0.70	0.25

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 18: Street C & Street F

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↷			↷	
Traffic Volume (vph)	5	235	160	380	595	5	180	210	235	5	280	5
Future Volume (vph)	5	235	160	380	595	5	180	210	235	5	280	5
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			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.94		1.00	1.00			0.94			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)	1789	3361		1789	3574			3330			3566	
Flt Permitted	0.41	1.00		0.44	1.00			0.71			0.94	
Satd. Flow (perm)	777	3361		825	3574			2403			3358	
Peak-hour factor, PHF	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95
Adj. Flow (vph)	6	247	168	422	626	5	200	221	247	6	295	5
RTOR Reduction (vph)	0	72	0	0	0	0	0	72	0	0	1	0
Lane Group Flow (vph)	6	343	0	422	631	0	0	596	0	0	305	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	54.9	54.9		79.8	79.8			38.2			38.2	
Effective Green, g (s)	55.9	55.9		80.8	80.8			39.2			39.2	
Actuated g/C Ratio	0.43	0.43		0.62	0.62			0.30			0.30	
Clearance Time (s)	6.0	6.0		4.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	334	1445		675	2221			724			1012	
v/s Ratio Prot		0.10		c0.11	0.18							
v/s Ratio Perm	0.01			c0.28				c0.25			0.09	
v/c Ratio	0.02	0.24		0.63	0.28			0.82			0.30	
Uniform Delay, d1	21.3	23.5		12.6	11.3			42.2			34.9	
Progression Factor	0.89	0.80		0.96	0.88			1.00			0.67	
Incremental Delay, d2	0.1	0.4		1.7	0.3			7.5			0.1	
Delay (s)	19.0	19.2		13.9	10.2			49.7			23.5	
Level of Service	B	B		B	B			D			C	
Approach Delay (s)		19.2			11.7			49.7			23.5	
Approach LOS		B			B			D			C	

### Intersection Summary

HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



# Queues

## 19: Street C & Street D

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	22	263	150	679	248	310
v/c Ratio	0.04	0.19	0.18	0.25	0.41	0.74
Control Delay	3.5	3.4	5.0	4.6	29.8	81.1
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	3.5	3.4	5.0	4.9	29.8	81.1
Queue Length 50th (m)	0.8	10.3	6.7	16.5	17.6	43.7
Queue Length 95th (m)	m2.5	18.6	m18.2	35.2	28.9	41.9
Internal Link Dist (m)		164.9		120.1	41.0	288.3
Turn Bay Length (m)	65.0		60.0			
Base Capacity (vph)	545	1400	849	2711	1287	986
Starvation Cap Reductn	0	0	0	1349	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.19	0.18	0.50	0.19	0.31

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 19: Street C & Street D

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↕			↕			↕	
Traffic Volume (vph)	20	215	35	135	640	5	10	130	95	90	175	25
Future Volume (vph)	20	215	35	135	640	5	10	130	95	90	175	25
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			0.95			0.95	
Frt	1.00	0.98		1.00	1.00			0.94			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.98	
Satd. Flow (prot)	1789	1844		1789	3575			3355			3477	
Flt Permitted	0.38	1.00		0.59	1.00			0.93			0.71	
Satd. Flow (perm)	720	1844		1120	3575			3126			2501	
Peak-hour factor, PHF	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95
Adj. Flow (vph)	22	226	37	150	674	5	11	137	100	100	184	26
RTOR Reduction (vph)	0	2	0	0	0	0	0	84	0	0	8	0
Lane Group Flow (vph)	22	261	0	150	679	0	0	164	0	0	302	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	97.6	97.6		97.6	97.6			20.4			20.4	
Effective Green, g (s)	98.6	98.6		98.6	98.6			21.4			21.4	
Actuated g/C Ratio	0.76	0.76		0.76	0.76			0.16			0.16	
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)	546	1398		849	2711			514			411	
v/s Ratio Prot		0.14			c0.19							
v/s Ratio Perm	0.03			0.13				0.05			c0.12	
v/c Ratio	0.04	0.19		0.18	0.25			0.32			0.74	
Uniform Delay, d1	3.9	4.4		4.4	4.7			47.9			51.6	
Progression Factor	0.70	0.65		0.91	0.87			1.00			1.44	
Incremental Delay, d2	0.1	0.3		0.4	0.2			0.4			6.0	
Delay (s)	2.9	3.1		4.4	4.3			48.2			80.2	
Level of Service	A	A		A	A			D			F	
Approach Delay (s)		3.1			4.3			48.2			80.2	
Approach LOS		A			A			D			F	

### Intersection Summary

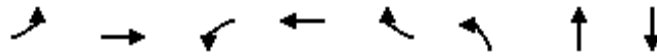
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 20: Queens Plate Dr & Street C

01/12/2020



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	33	253	211	505	5	56	373	416
v/c Ratio	0.06	0.21	0.29	0.40	0.00	0.31	0.79	0.49
Control Delay	10.0	9.3	10.6	11.2	3.2	41.2	54.9	41.1
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	10.0	9.3	10.6	11.6	3.2	41.2	54.9	41.1
Queue Length 50th (m)	2.7	21.2	18.0	43.5	0.0	11.7	86.8	46.8
Queue Length 95th (m)	8.3	41.1	41.5	91.3	m0.5	22.0	110.0	56.0
Internal Link Dist (m)		194.0		164.9			69.8	345.3
Turn Bay Length (m)	45.0		60.0					
Base Capacity (vph)	519	1219	738	1256	1076	286	735	1316
Starvation Cap Reductn	0	0	0	326	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.21	0.29	0.54	0.00	0.20	0.51	0.32

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 20: Queens Plate Dr & Street C

01/12/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	185	55	190	480	5	50	275	80	5	350	40
Future Volume (vph)	30	185	55	190	480	5	50	275	80	5	350	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.97			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1789	1819		1789	1883	1601	1789	1820			3522	
Flt Permitted	0.41	1.00		0.59	1.00	1.00	0.38	1.00			0.93	
Satd. Flow (perm)	777	1819		1108	1883	1601	715	1820			3275	
Peak-hour factor, PHF	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95
Adj. Flow (vph)	33	195	58	211	505	5	56	289	84	6	368	42
RTOR Reduction (vph)	0	6	0	0	0	2	0	10	0	0	8	0
Lane Group Flow (vph)	33	247	0	211	505	3	56	363	0	0	408	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	85.8	85.8		85.8	85.8	85.8	32.2	32.2			32.2	
Effective Green, g (s)	86.8	86.8		86.8	86.8	86.8	33.2	33.2			33.2	
Actuated g/C Ratio	0.67	0.67		0.67	0.67	0.67	0.26	0.26			0.26	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	518	1214		739	1257	1068	182	464			836	
v/s Ratio Prot		0.14			c0.27			c0.20				
v/s Ratio Perm	0.04			0.19		0.00	0.08				0.12	
v/c Ratio	0.06	0.20		0.29	0.40	0.00	0.31	0.78			0.49	
Uniform Delay, d1	7.5	8.3		8.9	9.8	7.2	39.1	45.0			41.2	
Progression Factor	1.00	1.00		0.92	0.92	1.00	1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.4		1.0	0.9	0.0	1.0	8.4			0.5	
Delay (s)	7.7	8.7		9.1	9.9	7.2	40.1	53.5			41.6	
Level of Service	A	A		A	A	A	D	D			D	
Approach Delay (s)		8.6			9.7			51.7			41.6	
Approach LOS		A			A			D			D	

### Intersection Summary

HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# Appendix **E**

## Growth Rate Calculations

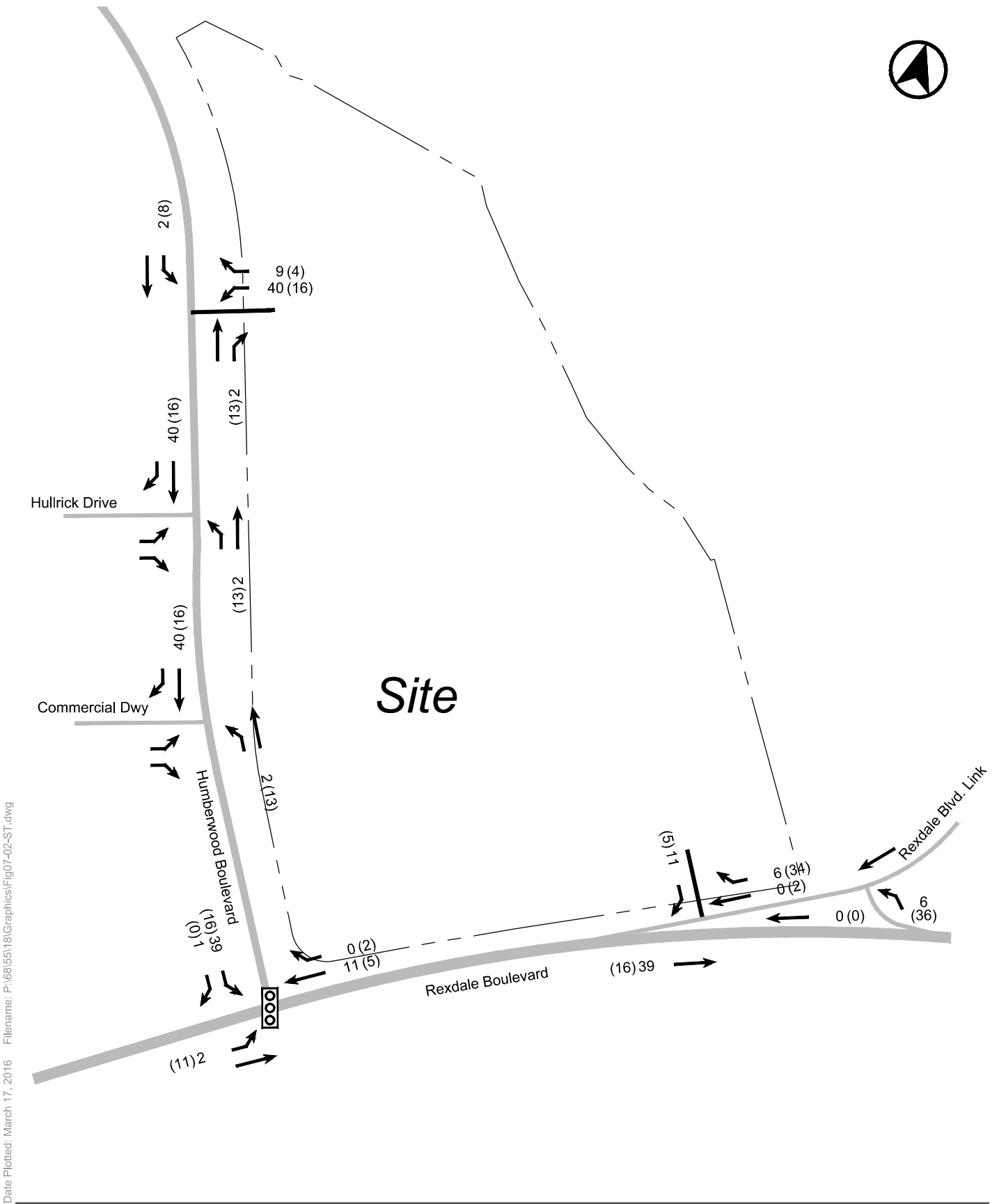


Woodbine Development  
6328-12  
May 10, 2017

Roadway	Section	Direction	PM						Sat					
			2005	2011	2017	Slope	Intercept	Growth Rate (p.a.)	2005	2011	2017	Slope	Intercept	Growth Rate (p.a.)
Rexdale Boulevard	East of Highway 27	Two-Way	2690	2525	2570	-10	22705.0	-0.4%	1825	1590	2050	18.8	-35884.6	1.0%
	West of Highway 27	Two-Way	2930	2670	2660	-22.5	48000.8	-0.8%	2050	1805	2175	10.4	-18937.9	0.5%
Highway 27	North of Rexdale Boulevard	Two-Way	2905	2690	2585	-26.7	56353.3	-1.0%	1995	1570	2210	17.9	-34105.4	0.9%
	South of Rexdale Boulevard	Two-Way	3065	2800	2815	-20.8	44789.2	-0.7%	1860	1395	1995	11.3	-20873.8	0.6%
	North of Belfield Road	Two-Way	3610		3520			-0.2%	1995		1905			-0.4%
	South of Belfield Road	Two-Way	3580		3190			-1.0%	1780		1720			-0.3%
Humberwood Parkway	North of Rexdale Boulevard	Two-Way	830	1040	1045	17.9	-35058.8	1.9%	790	865	935	12.1	-23436.3	1.4%
Highway 427 NB Off-Ramp	South of Rexdale Boulevard	NB	745	710	575	-14.2	29165.8	-2.1%	935	725	945	0.8	-807.5	0.1%
Highway 427 SB Off-Ramp	North of Rexdale Boulevard	SB	525	515	610	7.1	-13694.6	1.3%	430	420	460	2.5	-4590.8	0.6%

# Appendix **F**

## Background Development Volumes



Date Plotted: March 17, 2016 File name: P:\685518\Graphics\Fig07-02-ST.dwg

### SITE TRAFFIC VOLUMES



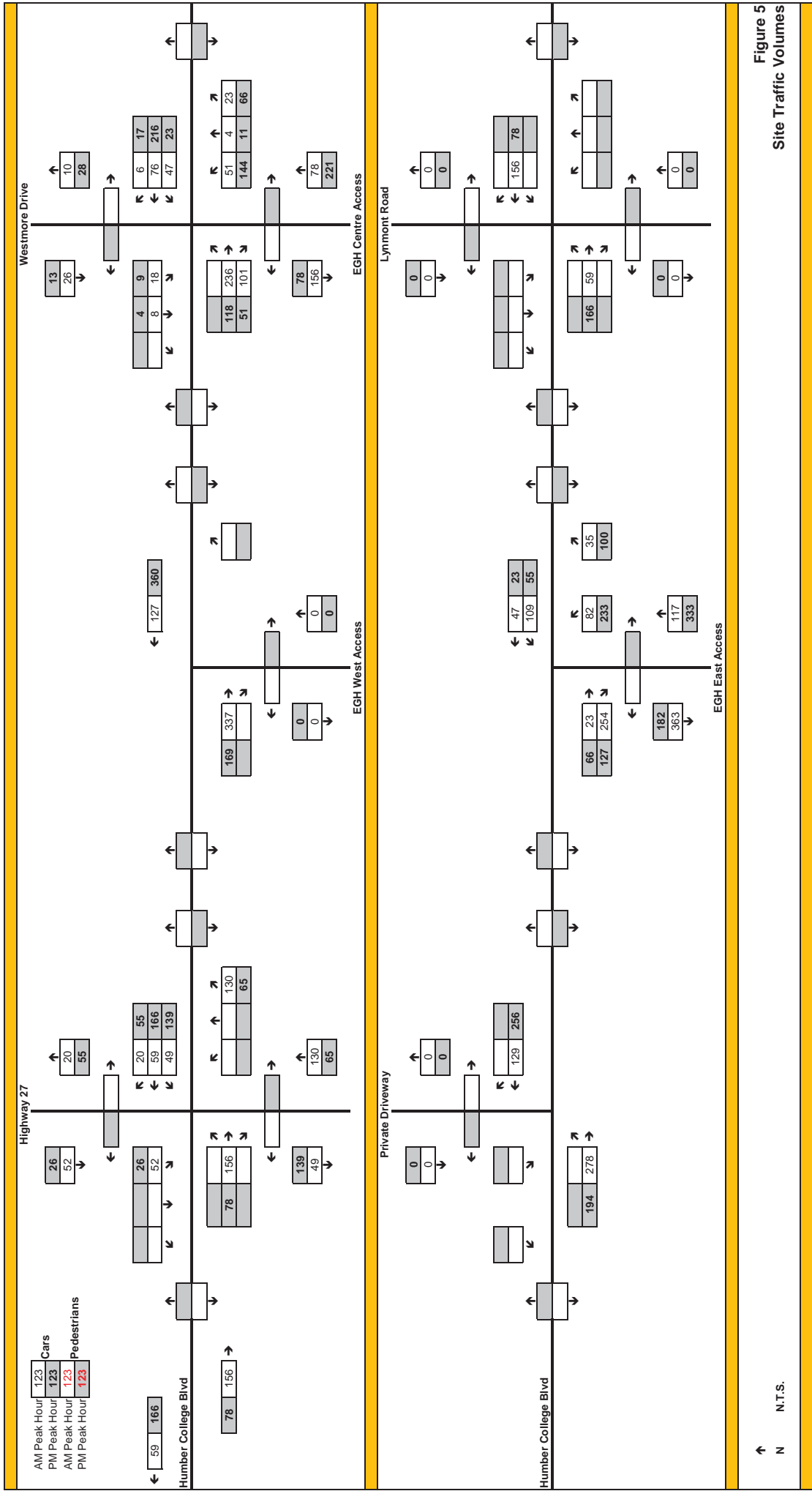
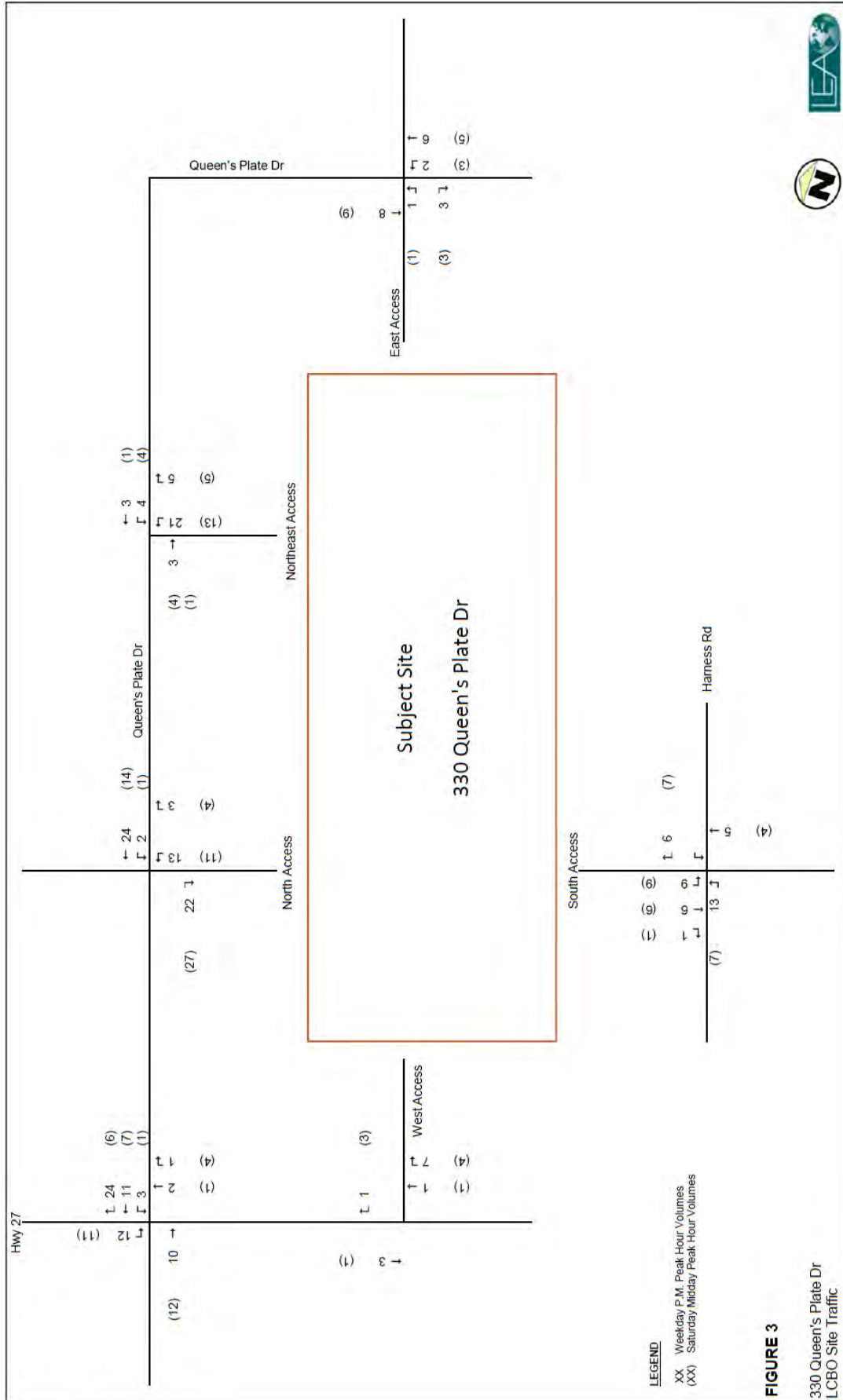
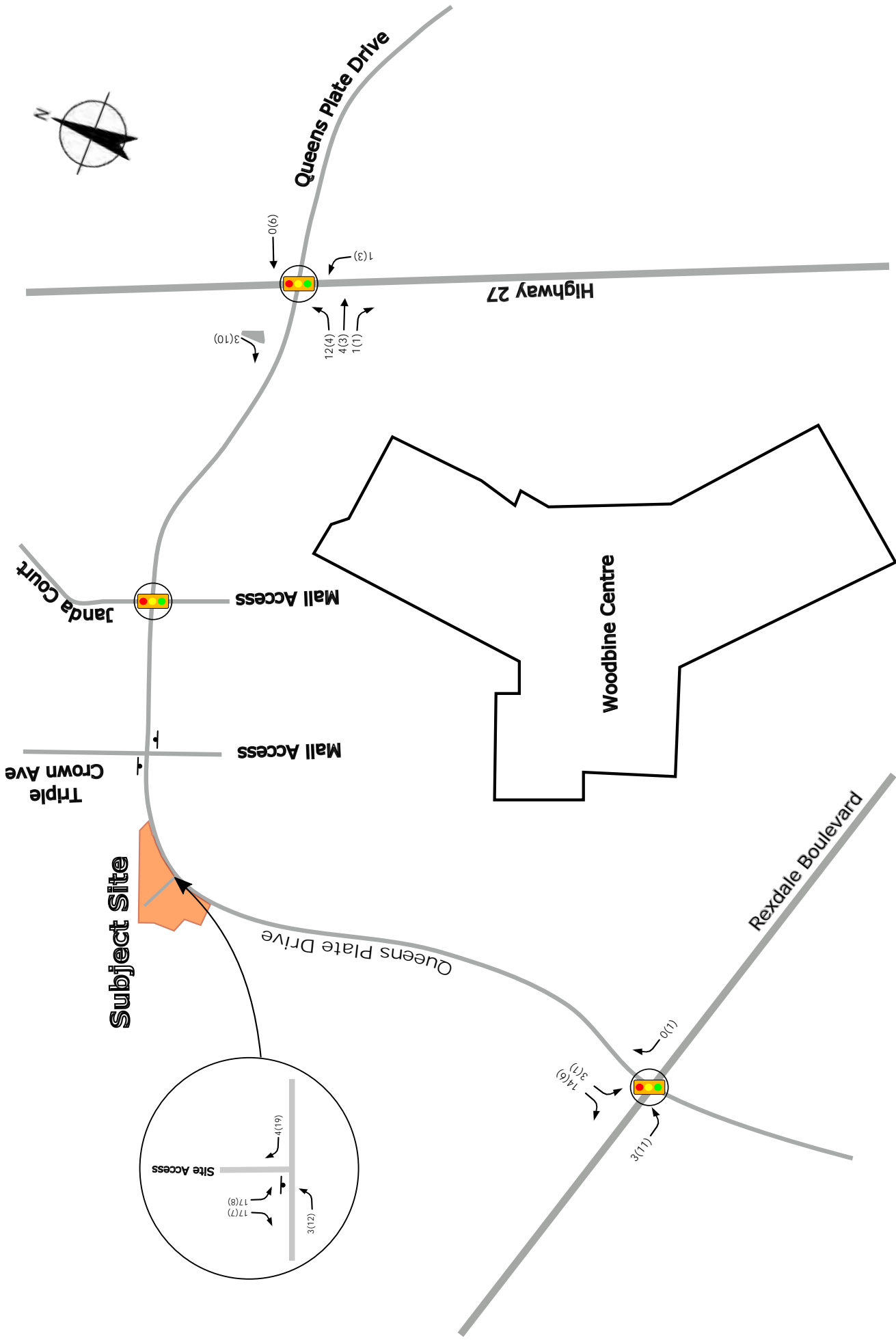


Figure 5  
Site Traffic Volumes



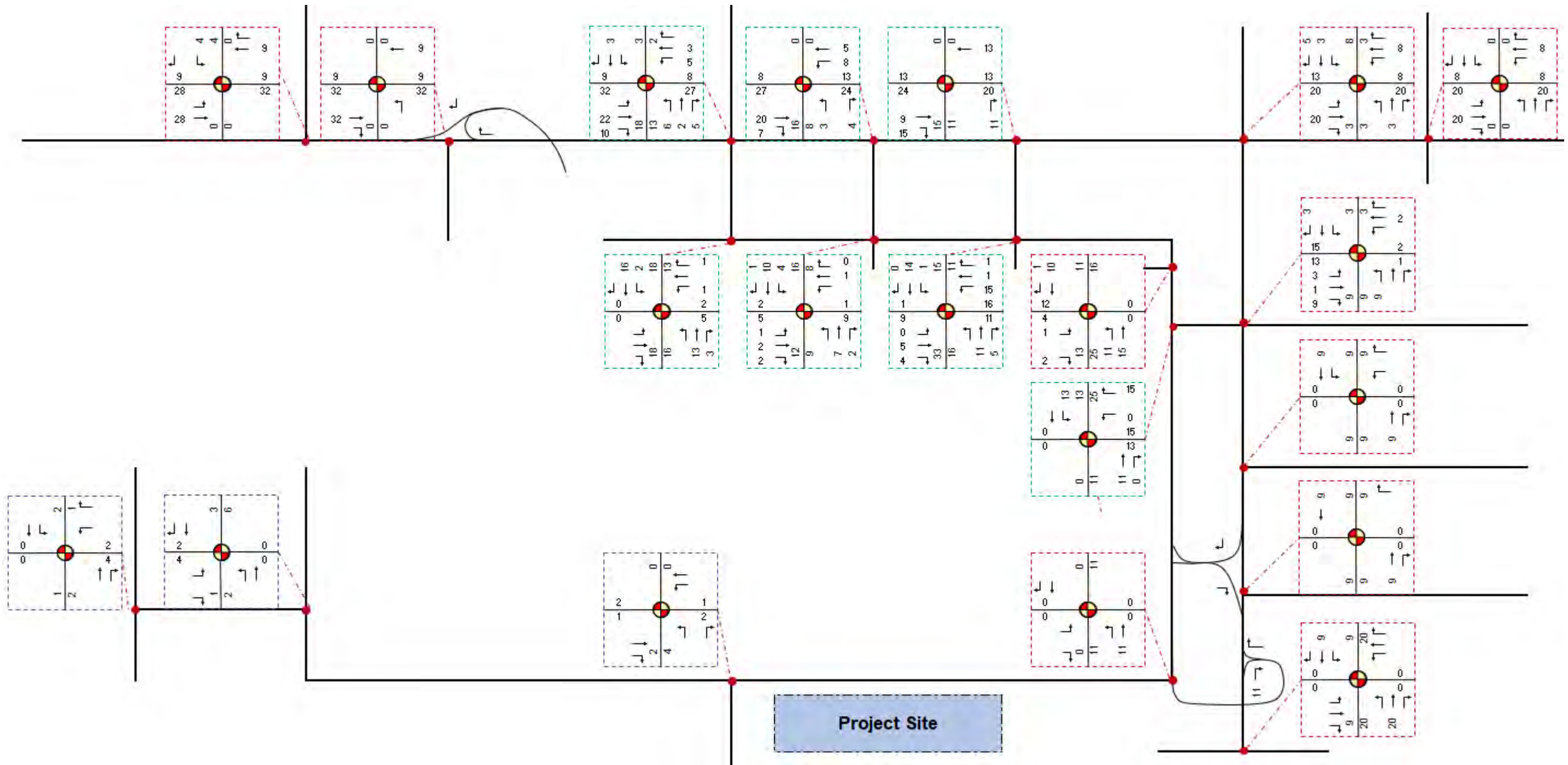


Job Number | 11116972  
 Revision | A  
 Date | Nov 2016

**SITE TRIPS**  
 Royal Grand Woodbine Development  
 840 Queens Plate Drive Residential Development

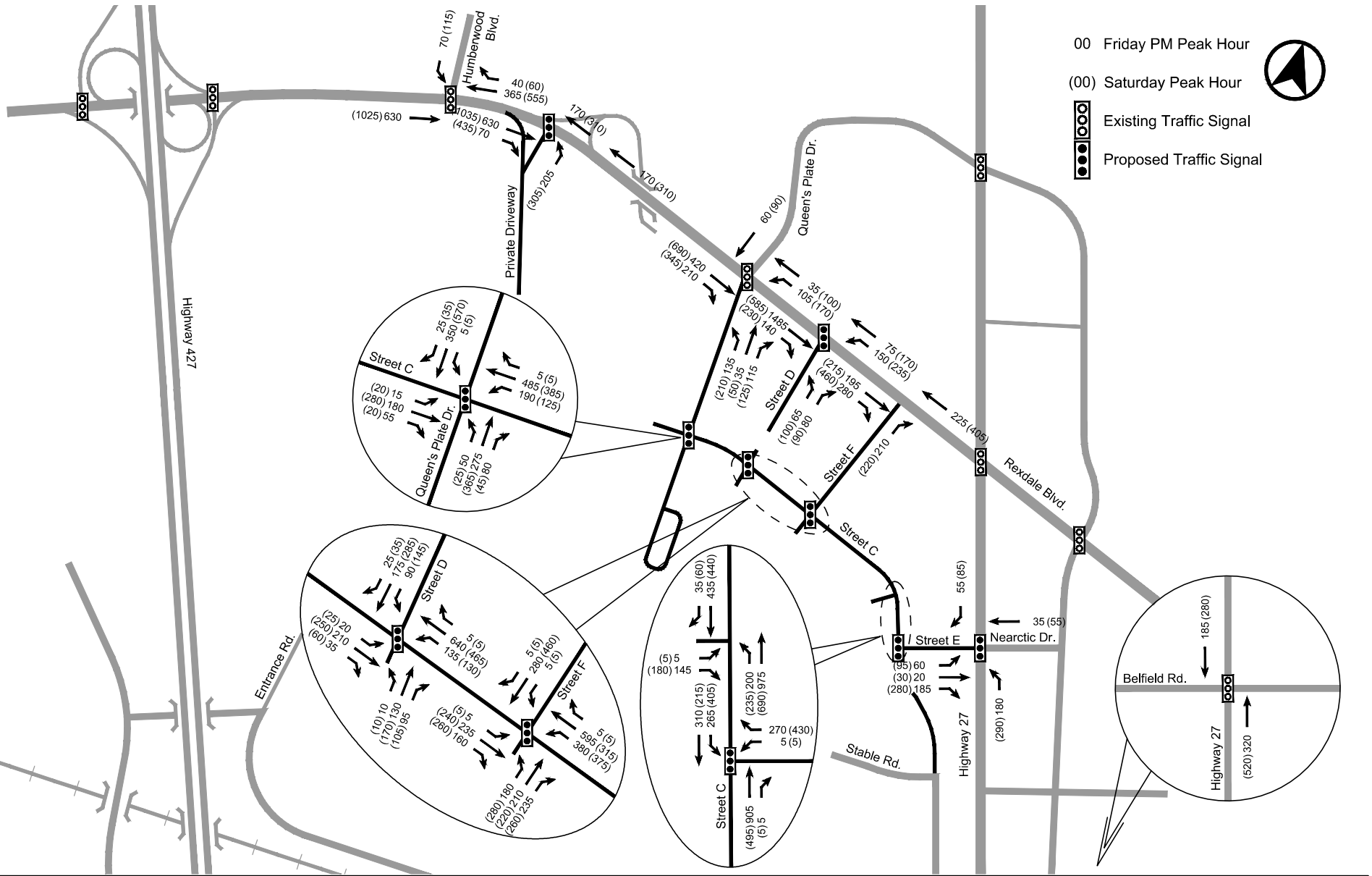


**Figure 7**



2022 Phase 1 Primary Traffic Volumes in the AM Peak Hour

Date Plotted: February 11, 2018 Filename: P:\632812\Graphics\Fig01-01-Ph1A\_PST.dwg



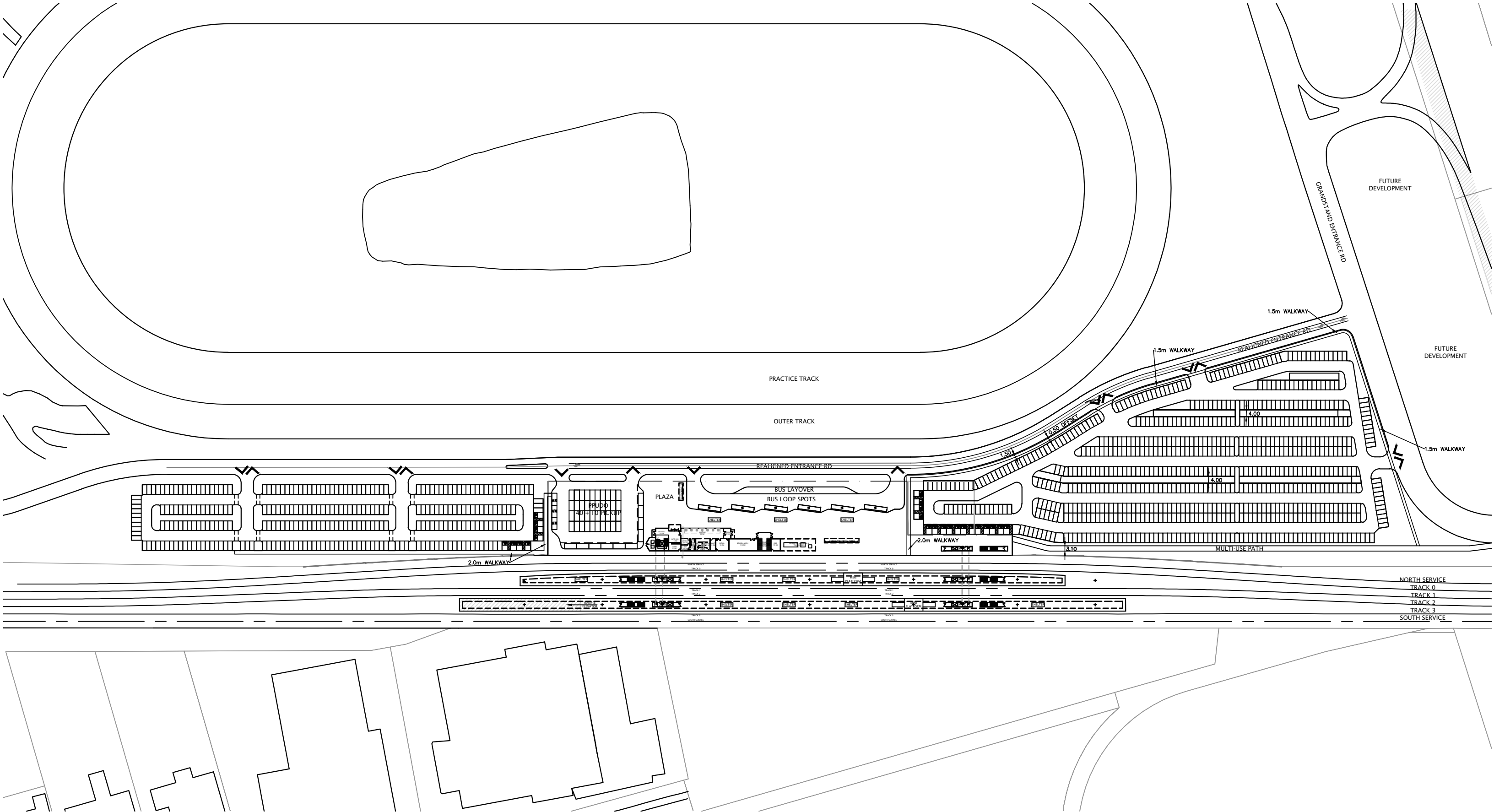
2022 PHASE 1 PRIMARY SITE TRAFFIC VOLUMES



# Appendix **G**

## Project Site Plan - Concept Design

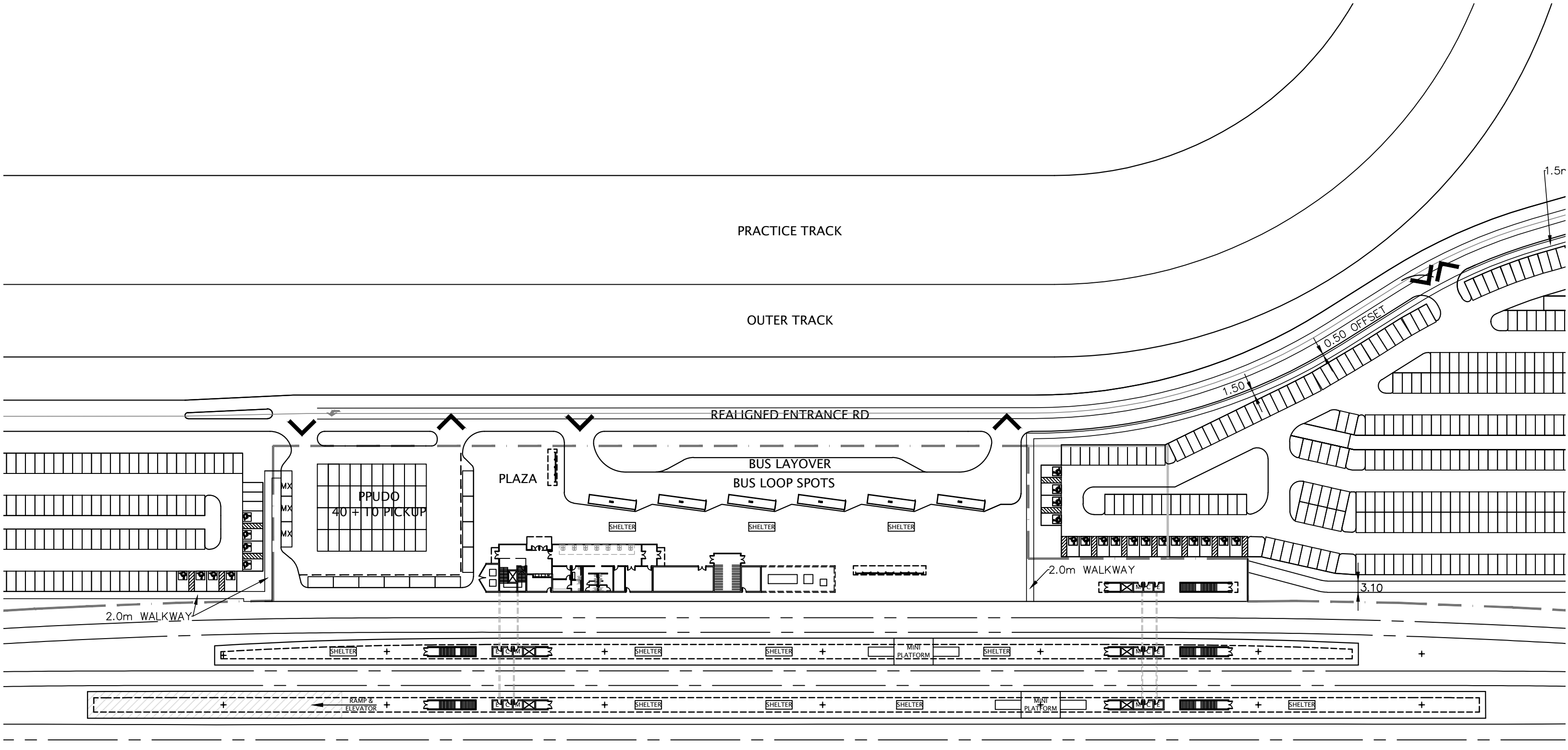




# CONTEXT PLAN

WOODBINE GO STATION  
 CONCEPT DESIGN  
 SEPT 20, 2019





# SITE PLAN

WOODBINE GO STATION  
 CONCEPT DESIGN  
 SEPT 20, 2019

# Appendix **H**

## Traffic Mitigation Measures

# HCM Signalized Intersection Capacity Analysis

## 5: Highway 27 & Rexdale Boulevard

01/15/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑↑		↖	↑↑↑	↗	↖	↑↑↑	↗	↖	↑↑↑	↗
Traffic Volume (vph)	111	1141	147	268	466	116	93	1017	123	123	1140	52
Future Volume (vph)	111	1141	147	268	466	116	93	1017	123	123	1140	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.8	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Total Lost time (s)	5.0	6.0		5.0	6.0	3.0	5.0	7.0	3.0	5.0	7.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1739	4776		1706	4683	1549	1547	4812	1549	1601	4856	1480
Flt Permitted	0.47	1.00		0.09	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	860	4776		170	4683	1549	1547	4812	1549	1601	4856	1480
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	113	1164	150	273	476	118	95	1038	126	126	1163	53
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	113	1301	0	273	476	118	95	1038	126	126	1163	53
Confl. Peds. (#/hr)	5		7	7		5	1		6	6		1
Heavy Vehicles (%)	6%	7%	13%	7%	12%	4%	18%	9%	4%	14%	8%	9%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		Free			Free			Free
Actuated Green, G (s)	42.2	36.2		59.0	47.0	130.0	8.8	40.0	130.0	10.0	41.2	130.0
Effective Green, g (s)	44.2	37.2		60.0	48.0	130.0	9.8	41.0	130.0	11.0	42.2	130.0
Actuated g/C Ratio	0.34	0.29		0.46	0.37	1.00	0.08	0.32	1.00	0.08	0.32	1.00
Clearance Time (s)	6.0	7.0		6.0	7.0		6.0	8.0		6.0	8.0	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	339	1366		288	1729	1549	116	1517	1549	135	1576	1480
v/s Ratio Prot	0.02	0.27		c0.13	0.10		0.06	0.22		c0.08	c0.24	
v/s Ratio Perm	0.10			c0.31		0.08			c0.08			0.04
v/c Ratio	0.33	0.95		0.95	0.28	0.08	0.82	0.68	0.08	0.93	0.74	0.04
Uniform Delay, d1	30.3	45.5		38.7	28.8	0.0	59.2	38.8	0.0	59.1	39.0	0.0
Progression Factor	0.75	0.88		1.00	1.34	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	14.7		37.9	0.4	0.1	32.1	2.4	0.1	56.5	3.1	0.0
Delay (s)	23.0	54.7		76.6	38.8	0.1	91.0	39.6	0.1	115.7	42.1	0.0
Level of Service	C	D		E	D	A	F	D	A	F	D	A
Approach Delay (s)		52.2			45.4			39.5			47.4	
Approach LOS		D			D			D			D	

### Intersection Summary

HCM 2000 Control Delay	46.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	103.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis  
 13: Entrance Road & Woodbine Entrance/Club House Rd

01/15/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	23	106	82	94	135	21
Future Volume (vph)	23	106	82	94	135	21
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	28	131	101	116	167	26

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	28	131	140	77	167	26
Volume Left (vph)	28	0	101	0	0	0
Volume Right (vph)	0	131	0	0	0	26
Hadj (s)	0.50	-0.70	0.40	0.07	0.07	-0.60
Departure Headway (s)	6.0	4.8	5.5	5.1	5.0	3.2
Degree Utilization, x	0.05	0.17	0.21	0.11	0.23	0.02
Capacity (veh/h)	569	706	635	674	685	1121
Control Delay (s)	8.1	7.6	8.7	7.6	9.6	6.3
Approach Delay (s)	7.6		8.3		9.1	
Approach LOS	A		A		A	

Intersection Summary						
Delay			8.4			
Level of Service			A			
Intersection Capacity Utilization			25.4%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 15: Grandstand Entrance Rd & Entrance Road

01/15/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	58	67	216	28	13	223
Future Volume (vph)	58	67	216	28	13	223
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	62	71	230	30	14	237
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	62	71	240	20	9	242
Volume Left (vph)	62	0	230	0	0	0
Volume Right (vph)	0	71	0	0	0	237
Hadj (s)	0.50	-0.48	0.51	0.00	0.14	-0.65
Departure Headway (s)	6.2	5.2	5.6	5.1	5.3	4.5
Degree Utilization, x	0.11	0.10	0.37	0.03	0.01	0.30
Capacity (veh/h)	537	632	626	679	651	773
Control Delay (s)	8.7	7.6	10.7	7.0	7.2	8.2
Approach Delay (s)	8.1		10.4		8.2	
Approach LOS	A		B		A	
Intersection Summary						
Delay			9.1			
Level of Service			A			
Intersection Capacity Utilization			32.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 13: Entrance Road & Woodbine Entrance/Club House Rd

01/15/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	217	17	80	545	91	139
Future Volume (vph)	217	17	80	545	91	139
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	236	18	87	592	99	151

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	236	18	284	395	99	151
Volume Left (vph)	236	0	87	0	0	0
Volume Right (vph)	0	18	0	0	0	151
Hadj (s)	0.53	-0.67	0.19	0.03	0.03	-0.57
Departure Headway (s)	6.9	5.7	5.7	5.6	6.0	3.2
Degree Utilization, x	0.45	0.03	0.45	0.61	0.17	0.13
Capacity (veh/h)	489	587	613	633	566	1121
Control Delay (s)	14.4	7.7	12.2	15.8	10.2	6.7
Approach Delay (s)	13.9		14.3		8.1	
Approach LOS	B		B		A	

Intersection Summary						
Delay			12.9			
Level of Service			B			
Intersection Capacity Utilization			39.4%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 15: Grandstand Entrance Rd & Entrance Road

01/15/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	341	134	40	632	139	49
Future Volume (vph)	341	134	40	632	139	49
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	371	146	43	687	151	53

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	371	146	272	458	101	103
Volume Left (vph)	371	0	43	0	0	0
Volume Right (vph)	0	146	0	0	0	53
Hadj (s)	0.53	-0.67	0.11	0.03	0.03	-0.33
Departure Headway (s)	7.5	6.3	6.8	6.7	7.5	7.1
Degree Utilization, x	0.77	0.25	0.51	0.85	0.21	0.20
Capacity (veh/h)	462	550	510	529	456	478
Control Delay (s)	30.0	10.2	15.4	35.6	11.2	10.7
Approach Delay (s)	24.4		28.0		11.0	
Approach LOS	C		D		B	

Intersection Summary						
Delay			24.4			
Level of Service			C			
Intersection Capacity Utilization			52.9%	ICU Level of Service		A
Analysis Period (min)			15			

# Appendix **I**

## Signal Warrant Analysis





# Results Sheet

[Input Sheet](#)

[Analysis Sheet](#)

[Proposed Collision](#)

[GO TO Justification:](#)

Intersection: Carlingview Road @ Entrance Road

Count Date: 2019

## Summary Results

Justification		Compliance		Signal Justified?	
				YES	NO
1. Minimum Vehicular Volume	A Total Volume	60	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Volume	77	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Delay to Cross Traffic	A Main Road	31	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Road	85	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Combination	A Justificaton 1	60	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Justification 2	31	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. 4-Hr Volume		64	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5. Collision Experience		0	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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6. Pedestrians	A Volume	Justification not met		<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Delay	Justification not met		<input type="checkbox"/>	<input checked="" type="checkbox"/>

# Results Sheet

[Input Sheet](#)

[Analysis Sheet](#)

[Proposed Collision](#)

[GO TO Justification:](#)

Intersection: Grandstand Entrance Road @ Entrance Road

Count Date: 2019

## Summary Results

Justification		Compliance		Signal Justified?	
				YES	NO
1. Minimum Vehicular Volume	A Total Volume	66	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Volume	66	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Delay to Cross Traffic	A Main Road	50	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Road	92	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Combination	A Justificaton 1	66	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Justification 2	50	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. 4-Hr Volume		59	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5. Collision Experience		0	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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6. Pedestrians	A Volume	Justification not met		<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Delay	Justification not met		<input type="checkbox"/>	<input checked="" type="checkbox"/>

# Results Sheet

[Input Sheet](#)

[Analysis Sheet](#)

[Proposed Collision](#)

[GO TO Justification:](#)

Intersection: Entrance Road @ Club House Road

Count Date: 2019

## Summary Results

Justification		Compliance		Signal Justified?	
				YES	NO
1. Minimum Vehicular Volume	A Total Volume	56	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Volume	49	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Delay to Cross Traffic	A Main Road	45	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Road	74	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Combination	A Justificaton 1	49	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Justification 2	45	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. 4-Hr Volume		48	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5. Collision Experience		0	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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6. Pedestrians	A Volume	Justification not met		<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Delay	Justification not met		<input type="checkbox"/>	<input checked="" type="checkbox"/>

# Results Sheet

[Input Sheet](#)

[Analysis Sheet](#)

[Proposed Collision](#)

[GO TO Justification:](#)

Intersection: Goreway Drive @ Club House Road

Count Date: 2017

## Summary Results

Justification		Compliance		Signal Justified?	
				YES	NO
1. Minimum Vehicular Volume	A Total Volume	100	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Volume	39	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Delay to Cross Traffic	A Main Road	94	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Road	43	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Combination	A Justificaton 1	39	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Justification 2	43	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. 4-Hr Volume		54	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5. Collision Experience		0	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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6. Pedestrians	A Volume	Justification not met		<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Delay	Justification not met		<input type="checkbox"/>	<input checked="" type="checkbox"/>

