

TRAFFIC IMPACT STUDY  
CHARLES CORNWALL AVENUE DESIGN  
BRONTE GREEN - OAKVILLE

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# TRAFFIC IMPACT STUDY CHARELS CORNWALL AVENUE DESIGN BRONTE GREEN - OAKVILLE

## 1. INTRODUCTION

The Bronte Green subdivision is approved and under construction. A part of the subdivision is the transfer of a portion of the Halton Region Woodlands Operations Centre site into the subdivision, including the Woodlands Centre private access road. As part of the design of the new public road, which is named Charles Cornwall Avenue, the Region has requested a traffic impact study (TIS) analysis of the proposed usage and design.

Read Voorhees and Associates (RVA) has been retained by the subdivision owner to prepare the TIS in support of the proposed design. The traffic impact study is intended to assess the operation of the planned commercial block on the north side of the road, the continued access to the Woodlands Operations Centre, the access road to the larger Regional complex to the south, and the residential subdivision roads to the north and east.

A TIS dated April 2017 was prepared and submitted in support of the entire subdivision application, and has been used as the background document for the residential traffic generation.

The traffic study area consists of the signalized intersection of Bronte Road and Charles Cornwall Avenue, and all segments of Charles Cornwall Avenue east from Bronte Road to Queens Plate Road.

The analysis periods used for the TIS are existing conditions, and a five year horizon to 2025, at which time all segments of the subdivision are expected to be occupied. In 2025 the capital roads program indicates the widening of Bronte Road to six through lanes.

The hours analyzed for the TIS are the weekday a.m. and p.m. peak hours.

## 2. DEVELOPMENT PLAN

Figure 1 shows the proposed design of the section of Charles Cornwall Avenue from Bronte Road to Queens Plate Road.

Charles Cornwall Avenue is a collector road running east-west from Bronte Road into and serving the residential subdivision. It is a two lane road, and posted speed will be 50 km/h. The basic right-of-way for Charles Cornwall Avenue is 19 metres, but at Bronte Road it is

widened to 22 metres plus daylight triangles to provide two outbound lanes and an inbound lane. The pavement width at Bronte Road is 12.5 metres, and the remainder of the road to the east has a pavement width of 9.5 metres.

Merton Road and Queens Plate Road are local roads with a right-of-way of 17 metres and pavement width of 8.5 metres.

An access driveway to the Woodlands Operations Centre will be maintained, and the access road to the Halton Region office complex will be realigned to intersect with Charles Cornwall Avenue at a 90 degree intersection.

The intersection at Bronte Road and Charles Cornwall Avenue is signalized. Traffic control at all other intersections with Charles Cornwall Avenue will be Stop signs on the minor streets or private driveways intersecting Charles Cornwall Avenue.

There is no final development plan for the proposed commercial block on the north side, but Figure 2 shows the development concept plan under consideration. The floor area is 4,438 m<sup>2</sup> (47,759 ft<sup>2</sup>), one half retail and one half office. Site access for the commercial block is by two driveways, one on Charles Cornwall Avenue opposite the Woodlands Centre driveway, and one on Merton Road.

The access to the Woodlands Operations Centre remains essentially where it is currently, about 45m back from the Stop bar on Charles Cornwall, although the driveway curbs intersecting with Charles Cornwall Avenue are slightly revised.

Merton Road intersects with Charles Cornwall Avenue about 115 metres back from the Stop bar at Bronte Road. Merton Road is located between the commercial block and the Regional storm pond on the east side of the road, and serves the residential blocks to the north.

The access road to the Halton Region office complex will intersect with Charles Cornwall Avenue about 45 metres east of Merton Road.

Queens Plate Road intersects Charles Cornwall Avenue about 30 metres east of the Halton Region access road.

### 3. EXISTING CONDITIONS

#### 3.1 Road System

Bronte Road is a major north-south arterial road under Regional jurisdiction. It is a four lane road, plus a centre left turn lane which is a dedicated left turn lane at signalized intersections. The posted speed is 60 km/h.

The existing access road to the Woodlands Operations Centre is a private road on Halton Region property. It also provides a connection to the Halton Region office complex to the south.

Currently there is a Stop sign on the Woodlands Centre driveway, and also for westbound traffic on the Woodlands access road at the Woodlands Centre driveway. The intersection at Woodlands Centre road and Bronte Road is signalized.

### 3.2 Traffic Volume

Turning movement volumes at the intersections along the Woodlands Operations Centre access road are shown on Figure 3. The Woodlands Operations Centre road volumes are from a count by Read Voorhees on the Woodlands access road and Woodlands driveway in February 2020. The Bronte Road through volumes used in this analysis are based on an all day count on Bronte Road in June 2018.

The Bronte Road volumes are factored up to 2020 by application of a 2% annual increase over the 2018 counts.

The base count data is included in Appendix A of the report.

## 4. TRAFFIC FORECASTS

### 4.1 Background Traffic

Figure 4 shows the intersection volumes for 2025, which is the 5 year horizon. The through volumes on Bronte Road are based on an annual increase of 2%, and the volumes on Charles Cornwall Avenue are based on the residential traffic from the subdivision as forecast in the Bronte Green draft plan of subdivision TIS.

### 4.2 Commercial Site Traffic

Figure 5 shows the intersection turning volumes for 2025 for the proposed commercial block on the north side of Charles Cornwall Avenue. An estimate was made in the subdivision TIS at the draft plan stage, but this has been updated using the latest planning development concept for the commercial block.

The site traffic forecast for the proposed commercial development uses the same hybrid rate used in the draft plan TIS for the retail use, and the ITE Trip Generation Manual for the office use, land use code 710. Total commercial site traffic is shown in Table 1.

**Table 1. Site Traffic for Commercial Block**

Use	Area (ft <sup>2</sup> )	A.M.		P.M.	
		In	Out	In	Out
Retail rate	1,000	1.0	0.5	3.5	3.5
Site traffic	23,880	<b>24</b>	<b>12</b>	<b>84</b>	<b>84</b>
Office rate	1,000	1.36	0.19	0.25	1.24
Site traffic	23,880	<b>32</b>	<b>5</b>	<b>6</b>	<b>30</b>
<b>TOTAL traffic</b>	<b>47,760</b>	<b>56</b>	<b>17</b>	<b>90</b>	<b>114</b>

The retail trips are assumed to be half from the Bronte Green subdivision and half bypass trips from Bronte Road. The office trips are assumed to be 10% from the Bronte Green subdivision and 90% from Bronte Road from elsewhere.

### 4.3 Future Total Traffic

Figure 6 shows total traffic for the 2025 five year horizon period.

## 5. TRAFFIC OPERATIONS

The intersections have been analyzed using the Synchro 7 program, with the parameters at Halton Region intersections as specified in their guidelines for Synchro analysis. The saturation flow rate is 1900 vphg, the peak hour factor varies from 0.92 to 1.0, and lost time for all signalized intersection movements is equal to the clearance time.

The Synchro output data for HCM capacity analysis is included in Appendix B.

### 5.1 Signalized Intersection Operation

Table 2 shows the Synchro analysis results for the signalized intersections, for existing conditions and for the 2025 background and total traffic conditions. Through movements with v/c ratios over 0.85 and individual turning movements with v/c ratios over 1.00 are shown in the summary table.

**Table 2. Signalized Intersection Analysis 2025**

Intersection / Condition	Scenario											
	2020 Existing Traffic			Future Background Traffic 2025 Bronte 4 lanes			Future Total Traffic 2025 Bronte 4 lanes			Future Total Traffic 2025 Bronte 6 lanes		
	Del. (sec)	LOS	v/c ratio	Del. (sec)	LOS	v/c ratio	Del. (sec)	LOS	v/c ratio	Del. (sec)	LOS	v/c ratio
<b>A.M. Peak Hour</b>												
Bronte & Charles Cornwall	9.1	A	0.88	42.1	D	1.05	42.8	D	1.06	14.3	B	0.83
- WB left/thru/right	57.1	E	0.29	80.7	F	0.91	84.1	F	0.94	60.1	E	0.80
- NB thru	5.3	A	0.46	10.8	B	0.57	11.4	B	0.58	10.5	B	0.42
- SB left	1.9	A	0.29	6.6	A	0.43	7.3	A	0.47	5.5	A	0.46
- SB thru/right	10.6	B	0.91	56.2	E	1.08	57.3	E	1.08	13.0	B	0.84
<b>P.M. Peak Hour</b>												
Bronte & Charles Cornwall	11.6	B	0.84	33.2	C	1.01	37.8	D	0.99	15.8	B	0.79
- WB left/thru/right	58.3	E	0.66	60.3	E	0.74	74.0	E	0.69	60.0	E	0.80
- NB thru	12.2	B	0.87	46.6	D	1.04	51.9	D	1.05	15.7	B	0.82
- SB left	7.8	A	0.15	35.6	D	0.36	37.7	D	0.53	22.3	C	0.51
- SB thru/right	4.6	A	0.45	5.4	A	0.50	6.0	A	0.51	5.3	A	0.36



### 5.1.1 Bronte Road and Charles Cornwall Avenue

The Bronte Road and Charles Cornwall Avenue intersection has four through lanes on Bronte Road, plus a separate northbound right turn lane, and northbound and southbound left turn lanes. Existing Woodlands Access Road, and future Charles Cornwall Avenue, have a separate left turn lane and a right lane. There is a driveway access on the west side forming a fourth approach, but the traffic volume using the west side driveway is very minor.

#### 2020 Existing Traffic

The intersection is calculated as presently operating with a v/c ratio of 0.88 in the a.m. peak hour, and 0.84 in the p.m. peak hour. Level of service is level A in the a.m. peak hour and level B in the p.m. peak hour. The westbound traffic in the a.m. peak hour has a v/c ratio of 0.29 for the left turn movement and in the p.m. peak hour has a v/c ratio of 0.66 for the right turn movement.

The overall intersection v/c ratio is primarily influenced by the peak directional volume on Bronte Road of southbound in the a.m. peak and northbound in the p.m. peak. The peak hour factor for these movements are 0.96 in the a.m. and 0.99 in the p.m. These factors are carried through to the 2025 analysis.

#### 2025 Background Traffic

With the 2025 background traffic forecast, the intersection level of service changes to level D in the a.m. peak hour and to level C in the p.m. peak hour. The v/c ratio in the a.m. peak hour increases to 1.05, and in the p.m. peak hour increases to 1.01. The westbound traffic in the a.m. peak hour has a v/c ratio of 0.91 for the left turn movement and in the p.m. peak hour has a v/c ratio of 0.74 for the left turn movement.

#### 2025 Total Traffic

With the proposed commercial development traffic added to the 2025 background volumes, there is marginal change in the intersection operation. The v/c ratio in the a.m. peak hour increases by 0.01 to 1.06, and in the p.m. peak hour actually decreases by 0.02 to 0.99. The p.m. decrease occurs because with the increase in volume in the southbound left turn this movement becomes one of the critical movement and the lost time calculation decreases which decreases the overall v/c ratio.

The road program shows that in 2025 Bronte Road is to be widened to six lanes. With this improvement the intersection capacity increases substantially. The v/c ratio in the a.m. peak hour decreases by 0.23 to 0.83, and in the p.m. peak hour decreases by 0.20 to 0.79. The widening of Bronte Road to six lanes will resolve any capacity deficiency at the intersection.

## 5.2 Site Access Unsignalized Intersection Operation

Table 3 shows the Synchro analysis results for the unsignalized intersections along Charles Cornwall Avenue for existing volumes, the 2025 background volumes, and the 2025 total traffic volumes. The total 2025 volumes represent full development of the residential subdivision and the commercial block.

**Table 3. Unsignalized Intersections – Level of Service**

Intersection	A. M.			P.M.		
	Volume	Delay (sec)	LOS	Volume	Delay (sec)	LOS
<b>2017 EXISTING TRAFFIC</b>						
Woodlands Access Road and Woodlands Driveway						
Overall Intersection		1.8	A		3.3	A
NB left/right	27/5	9.4	A	54/1	9.4	A
EB thru/right	104/26	9.4	A	3/8	9.4	A
WB left/thru	2/5	9.4	A	2/93	9.4	A
<b>2025 BACKGROUND TRAFFIC</b>						
Charles Cornwall and Woodlands Driveway						
Overall Intersection		0.9	A		1.5	A
NB left/right	32	10.9	B	55	12.0	B
Charles Cornwall and Merton Road						
Overall Intersection		1.6	A		1.9	A
SB left/right	48	9.3	A	31	9.4	A
Charles Cornwall and Halton Region Access						
Overall Intersection		0.2	A		3.2	A
NB left/right	7/0	9.9	A	95/0	10.6	B
Charles Cornwall and Queens Plate Road						
Overall Intersection		3.8	A		3.8	A
SB left/right	0/54	8.9	A	0/36	8.7	A
NB left/right	6/0	10.1	B	4/0	10.9	B
<b>2025 TOTAL TRAFFIC</b>						
Charles Cornwall and Woodlands Driveway/Commercial Block Driveway						
Overall Intersection		2.0	A		3.7	A
NB left/thru/right	32	12.7	B	55	17.2	C
SB left/thru/right	11	9.7	A	74	10.2	B
Charles Cornwall and Merton Road						
Overall Intersection		1.6	A		2.1	A
SB left/right	49	9.3	A	10/31	10.2	B
Merton Road and Commercial driveway						
Overall Intersection		0.9	A		2.6	A
EB left/right	6	8.9	A	30/10	9.2	A
Charles Cornwall and Halton Region Access						
Overall Intersection		0.2	A		3.0	A
NB left/right	7/0	10.0	A	95/0	10.8	B
Charles Cornwall and Queens Plate Road						
Overall Intersection		3.9	A		3.8	A
SB left/right	0/56	8.9	A	0/40	8.7	A
NB left/right	7/0	10.2	B	5/0	11.3	B

**5.2.1 Charles Cornwall Avenue and Woodlands/Commercial Block Site Driveway**

The Woodlands Access Road and Woodlands Centre driveway currently operates at level of service A in both the a.m. and p.m. peak hours.

With the subdivision occupied the Charles Cornwall Avenue and Woodlands Driveway intersection would operate with an overall level of service A in both peak hours, and the Woodlands driveway would operate at level of service B in both peak hours. Charles Cornwall Avenue becomes a through street and there is no delay for east-west traffic.

With the Commercial Block developed and a site driveway located opposite the Woodlands Centre driveway, the intersection would continue to operate with an overall level of service A in both peak hours, and the Woodlands driveway would continue to operate at level of service B in the a.m. peak hour and would operate at level C in the p.m. peak hour. The Commercial driveway will operate at level A in the a.m. peak hour and at level B in the p.m. peak hour.

Queues back from Bronte Road could affect the operation at this intersection, and this is discussed in section 5.3.

### **5.2.2 Charles Cornwall Avenue and Merton Road**

With the subdivision occupied the Charles Cornwall Avenue and Merton Road intersection would operate with an overall level of service A in both peak hours, and the Merton Road approach would operate at level of service A in both peak hours. Charles Cornwall Avenue is a through street and there is no delay for east-west traffic.

With the Commercial Block developed and a site driveway located opposite the Woodlands Centre driveway, and on Merton Road, the intersection would continue to operate with an overall level of service A in both peak hours, and the Merton Road approach would continue to operate at level of service A in the a.m. peak hour and would operate at level B in the p.m. peak hour.

### **5.2.3 Merton Road and Commercial Block Driveway**

With the Commercial Block developed and a site driveway located on Merton Road, the Commercial driveway will operate at level A in the a.m. peak hour and at level A in the p.m. peak hour.

### **5.2.4 Charles Cornwall Avenue and Halton Region Access**

With the subdivision occupied the Charles Cornwall Avenue and Halton Region intersection would operate with an overall level of service A in both peak hours, and the Halton Region approach would operate at level of service A in the a.m. peak hour and at level B in the p.m. peak hour. Charles Cornwall Avenue is a through street and there is no delay for east-west traffic.

With the Commercial Block developed, the intersection would continue to operate with an overall level of service A in both peak hours, and the Halton Region approach would continue to operate at level of service A in the a.m. peak hour and at level B in the p.m. peak hour.

### 5.2.5 Charles Cornwall Avenue and Queens Plate Road

With the subdivision occupied the Charles Cornwall Avenue and Queens Plate Road intersection would operate with an overall level of service A in both peak hours, and the north leg of the intersection would operate at level of service A in the a.m. peak hour and at level A in the p.m. peak hour. The south leg of the intersection would operate at level of service B in both the a.m. and p.m. peak hours. Charles Cornwall Avenue is a through street and there is no delay for east-west traffic.

With the Commercial Block developed, the intersection would continue to operate with an overall level of service A in both peak hours, and the north leg of the intersection would continue to operate at level of service A in the a.m. peak hour and at level A in the p.m. peak hour. The south north leg of the intersection would continue to operate at level of service B in both the a.m. and p.m. peak hours.

### 5.3 Queue Analysis

The capacity analysis shows that the Woodlands Centre and the Commercial Block driveways will operate at level of service A or B in the peak hours. However, actual operation can be affected by queues on Charles Cornwall Avenue back from the signal at Bronte Road. The driveways are shown in the design plan to be about 45 metres back from the stop bar at Bronte Road.

Queue lengths in the turn lanes on Charles Cornwall have been calculated using the SimTraffic program, with an average of 5 runs, a seeding time of 10 minutes and a run time of 60 minutes. These are summarized in Table 4. The table shows average queues over the peak hours, and the 95th percentile queues within the peak hours. The 95th percentile queue lengths are used for design purposes.

Bronte Road will be widened to six lanes in 2025, so the queues have been calculated for both conditions, Bronte Road at 4 lanes and 6 lanes.

The queues in the turn lanes on Charles Cornwall will be highest in the p.m. peak hour when commercial block office traffic is leaving the site.

**Table 4. Queue Lengths (metres)**

<b>Charles Cornwall Avenue Traffic</b>				
<b>2025 Volumes with Full Development, Four Lane Bronte Road</b>				
Time	WB left turn lane queue (m)		WB right turn lane queue (m)	
	Average	95 <sup>th</sup> percentile	Average	95 <sup>th</sup> percentile
A.M. peak hour	35	54	19	53
P.M. peak hour	37	56	43	66
<b>2025 Volumes with Full Development, Six Lane Bronte Road</b>				
A.M. peak hour	30	48	16	45
P.M. peak hour	32	50	32	57

The queuing analysis shows that the average queue lengths are relatively short for the 2025 scenario, and are all contained within the 45m distance from the Bronte Road stop bars to the driveways.

The longest average queues on Charles Cornwall Avenue are in the p.m. peak hour, at 37m for the left turn lane and 43m for the right lane, with Bronte Road at 4 lanes. With Bronte Road at 6 lanes, the average queues on Charles Cornwall Avenue in the p.m. peak hour are 32m for the left turn lane and 32m for the right lane. Bronte Road is scheduled to be widened to six lanes in 2025.

The longest 95th percentile queues on Charles Cornwall Avenue are also in the p.m. peak hour, at 56m for the left turn lane and 66m for the right lane, with Bronte Road at 4 lanes. With Bronte Road at 6 lanes, the longest 95th percentile queues on Charles Cornwall Avenue in the p.m. peak hour are 50m for the left turn lane and 57m for the right lane.

With Bronte Road widened to 6 lanes, the 95th percentile queues on Charles Cornwall Avenue in the a.m. peak hour are 48m for the left turn lane and 45m for the right lane,

This means that on 1 to 2 cycles per hour in the a.m. peak hour the queues would extend back to the driveway locations. In the p.m. peak hour the queues would extend back to the driveways on 2 to 3 cycles for the left turn lane and on 3 to 4 cycles for the right turn lane. For the remainder of the peak hours the queues would not extend past the driveways.

Consideration should be given to a relocation of these two driveways further east to beyond the queue lengths.

## 6. CONCLUSIONS

A part of the Bronte Green subdivision includes the transfer of a portion of the Halton Region Woodlands Operations Centre site into the subdivision, including the Woodlands Centre private access road. As part of the design of the new public road, which is named Charles Cornwall Avenue, the Region has requested a traffic impact study (TIS) analysis of the proposed usage and design.

The traffic study area consists of the signalized intersection of Bronte Road and Charles Cornwall Avenue, and all segments of Charles Cornwall Avenue east from Bronte Road to Queens Plate Road.

The horizon year for the TIS is a five year period to 2025, at which time all segments of the subdivision are expected to be occupied. The capital roads program indicates the widening of Bronte Road to six through lanes in 2025.

There is no final development plan for the proposed commercial block on the north side, but the development concept plan under consideration has a floor area of 4,438 m<sup>2</sup> (47,759 ft<sup>2</sup>), one half retail and one half office. Site access for the commercial block is by two driveways,

one on Charles Cornwall Avenue opposite the Woodlands Centre driveway, and one on Merton Road.

#### Signalized Intersection

The Bronte Road and Woodlands Access Road (to be named Charles Cornwall Avenue) intersection is calculated as presently operating with a v/c ratio of 0.88 in the a.m. peak hour, and 0.84 in the p.m. peak hour. Level of service is level A in the a.m. peak hour and level B in the p.m. peak hour.

With the 2025 background traffic forecast, and Bronte Road at the existing four lanes, the intersection level of service changes to level D in the a.m. peak hour and to level C in the p.m. peak hour. The v/c ratio in the a.m. peak hour increases to 1.05, and in the p.m. peak hour increases to 1.01. The overall intersection v/c ratio is primarily influenced by the peak directional volume on Bronte Road of southbound in the a.m. peak and northbound in the p.m. peak.

With the proposed commercial block development traffic added to the 2025 background volumes, there is marginal change in the intersection operation. The v/c ratio in the a.m. peak hour increases by 0.01 to 1.06, and in the p.m. peak hour actually decreases by 0.02 to 0.99. The p.m. decrease occurs because with the increase in volume in the southbound left turn this movement becomes one of the critical movement and the lost time calculation decreases, which decreases the overall v/c ratio.

The road program shows that in 2025 Bronte Road is to be widened to six lanes. With this improvement the intersection capacity increases substantially. The v/c ratio for total traffic in the a.m. peak hour decreases by 0.23 to 0.83, and in the p.m. peak hour decreases by 0.20 to 0.79. The widening of Bronte Road to six lanes will resolve any capacity deficiency at the intersection.

#### Unsignalized Intersections

The Woodlands Access Road and Woodlands Centre driveway currently operates at level of service A in both the a.m. and p.m. peak hours.

With the subdivision occupied the Charles Cornwall Avenue and Woodlands Driveway intersection would operate with an overall level of service A in both peak hours, and the Woodlands driveway would operate at level of service B in both peak hours. Charles Cornwall Avenue becomes a through street and there is no delay for east-west traffic.

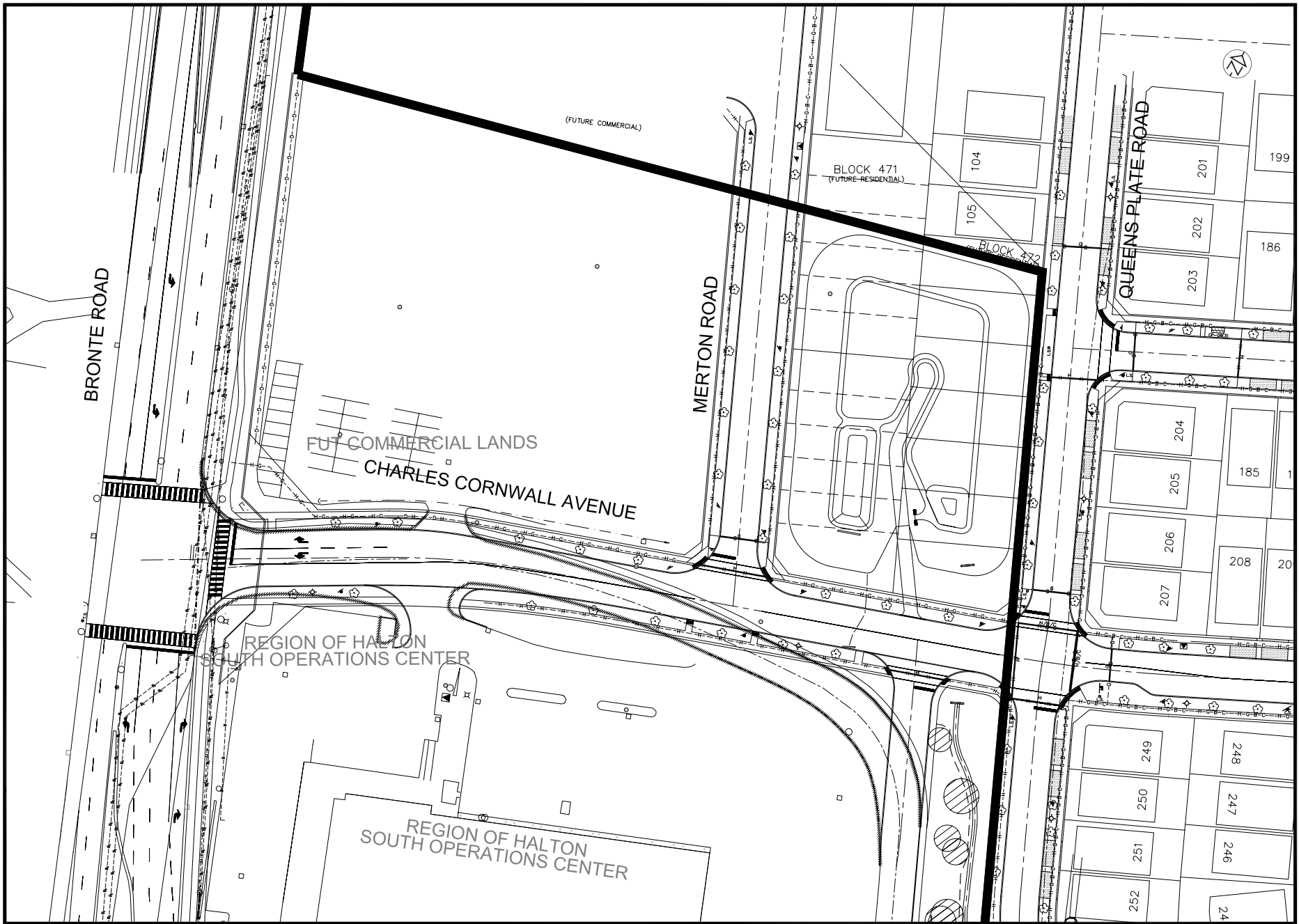
With the Commercial Block developed and a site driveway located opposite the Woodlands Centre driveway, the intersection would continue to operate with an overall level of service A in both peak hours, and the Woodlands driveway would continue to operate at level of service B in the a.m. peak hour and at level C in the p.m. peak hour. The Commercial driveway will operate at level A in the a.m. peak hour and at level B in the p.m. peak hour.

However, actual operation can be affected by queues on Charles Cornwall Avenue back from the signal at Bronte Road. With Bronte Road widened to 6 lanes, the 95th percentile queues on Charles Cornwall Avenue in the a.m. peak hour are 48m for the left turn lane and 45m for

the right lane. The longest 95th percentile queues in the p.m. peak hour are 50m for the left turn lane and 57m for the right lane.

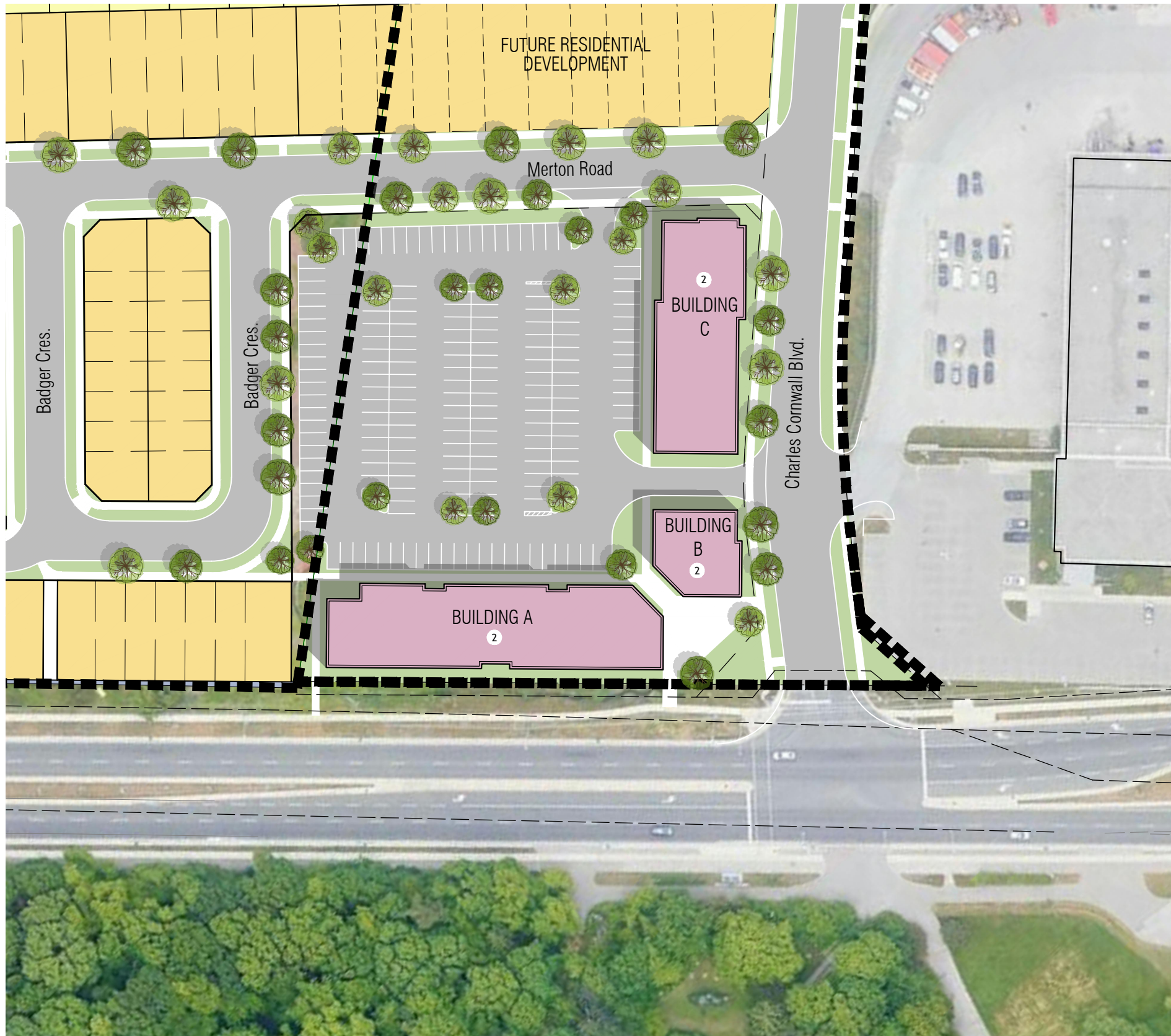
This means that on 1 to 2 cycles per hour in the a.m. peak hour the queues would extend just to the driveway locations. In the p.m. peak hour the queues would extend back to the driveways on 2 to 3 cycles for the left turn lane and on 3 to 4 cycles for the right turn lane. For the remainder of the peak hours the queues would not extend past the driveways.

All other intersections along Charles Cornwall Avenue, with the subdivision occupied and the commercial block developed, will operate with an overall level of service A in both peak hours. Charles Cornwall Avenue is a through street and there is no delay for east-west traffic. All approaches to Charles Cornwall Avenue will operate at level of service A or B in the a.m. and p.m. peak hours.



**CHARLES CORNWALL AVENUE**  
**FIGURE 1**





Building Area	COMMERCIAL GFA*		OFFICE GFA*		TOTAL	
	(m <sup>2</sup> )	(sq.ft)	(m <sup>2</sup> )	(sq.ft)	(m <sup>2</sup> )	(sq.ft)
A	1,112	11,964	1,112	11,964	2,223	23,928
B	292	3,143	292	3,143	584	6,286
C	815	8,773	815	8,773	1,630	17,545
D	0	0	0	0	0	0
<b>TOTAL</b>	<b>2,219</b>	<b>23,880</b>	<b>2,219</b>	<b>23,880</b>	<b>4,437</b>	<b>47,759</b>

### Required Parking

	Parking Space
Commercial (1 parking space per 22 m <sup>2</sup> GFA)	101
Office (1 parking space per 22 m <sup>2</sup> GFA)	101
Potential Parking Reduction**	-41
<b>TOTAL</b>	<b>161</b>

### Provided Parking

	Parking Space
Surface Parking	178
UG Parking	0
<b>TOTAL</b>	<b>178</b>

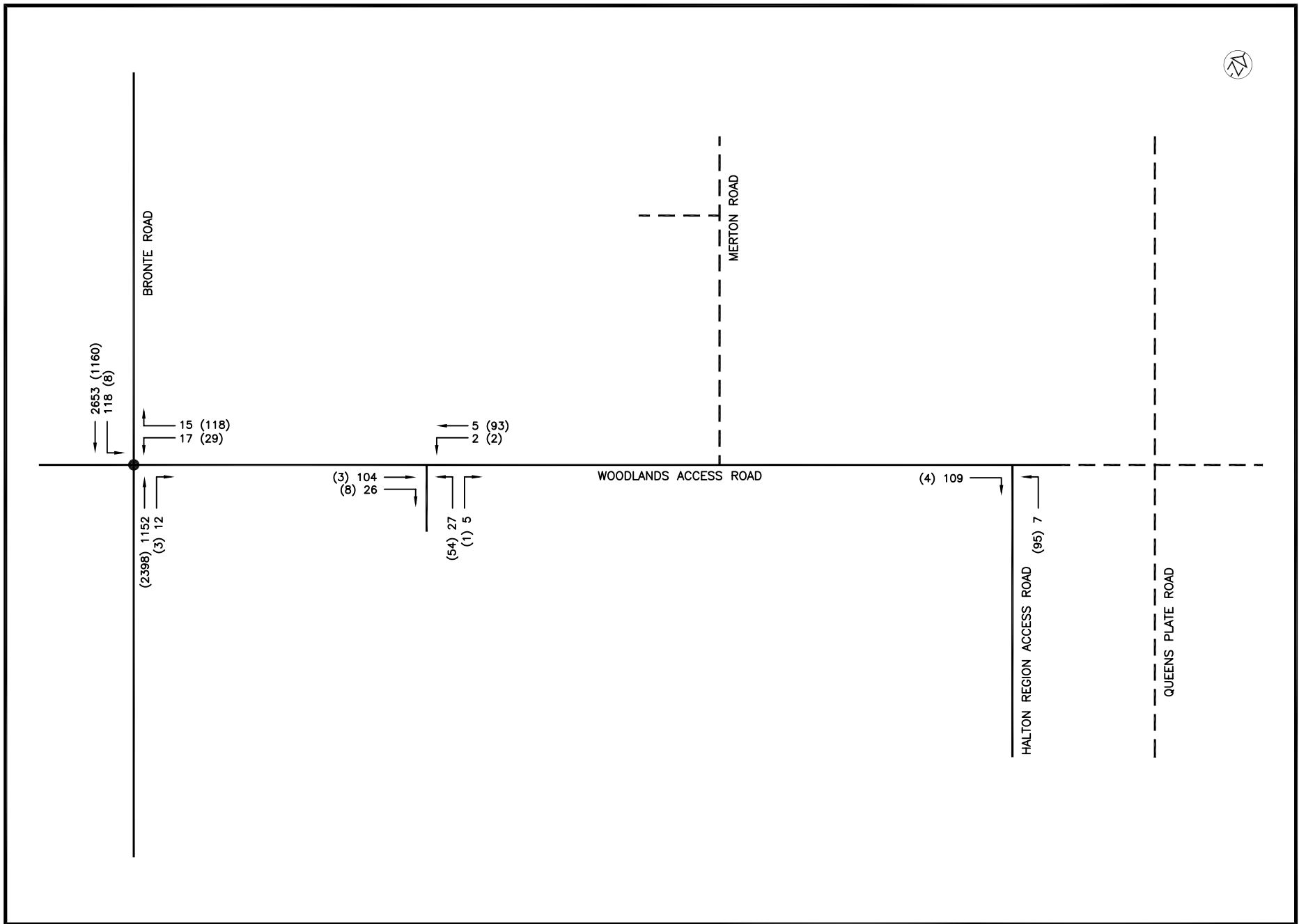
\* GFA based on 90% of the total building area

\*\* See ammended Zoning By-Law no.: Z.1530.07, article 15.376.16-d

**DRAFT**

- All Units In Metric Unless Otherwise Noted.
- Base Information Obtained From Various Sources And Is Approximate.
- Schedule / Plan Information Is Conceptual And Requires Verification by Appropriate Agency.
- Aerial Photo: Google Earth, Approx. Spring 2015

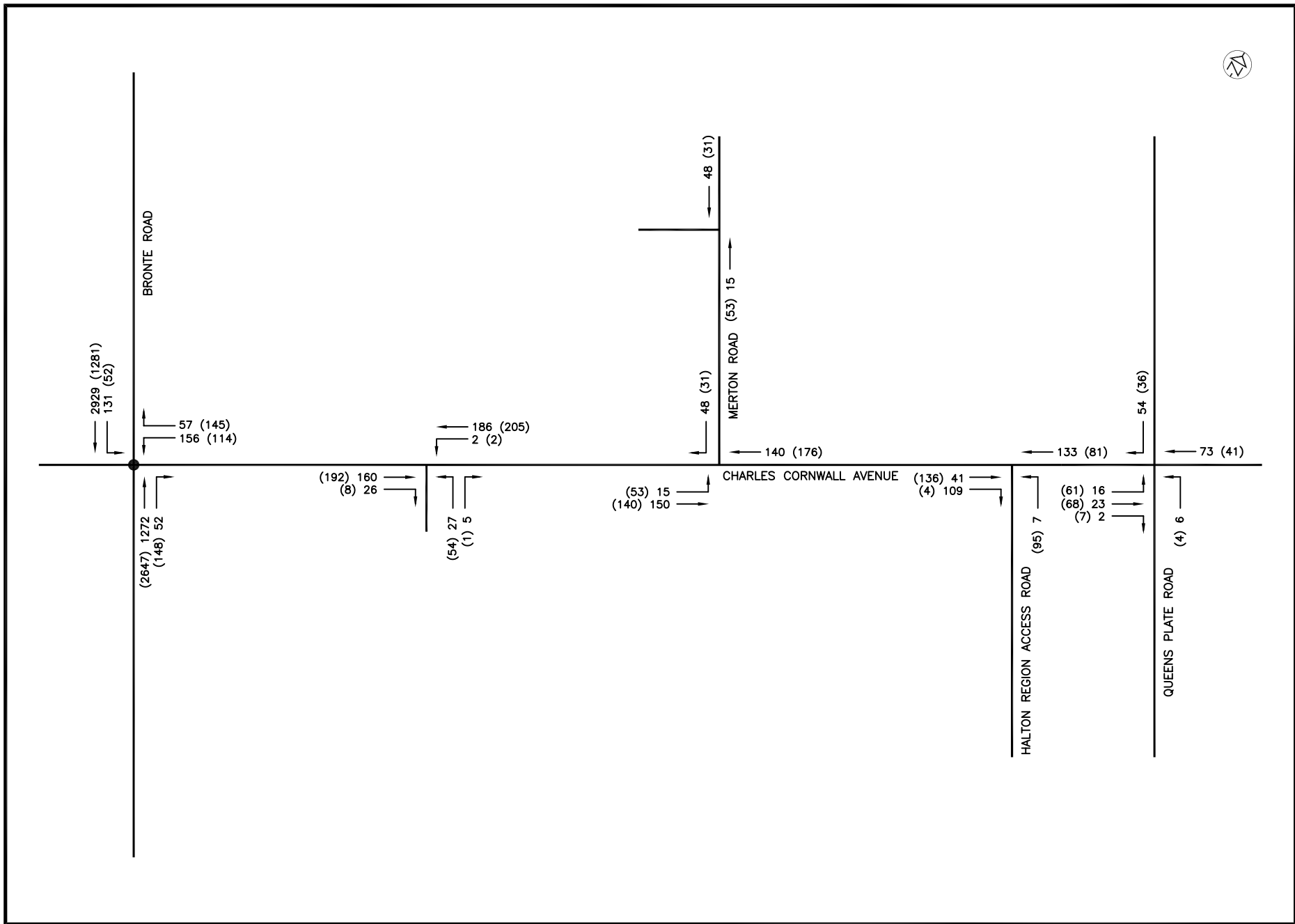




**LEGEND**

- 8 A.M. PEAK HOUR
- (40) P.M. PEAK HOUR
- SIGNALIZED INTERSECTION

**EXISTING TRAFFIC**  
**FIGURE 3**

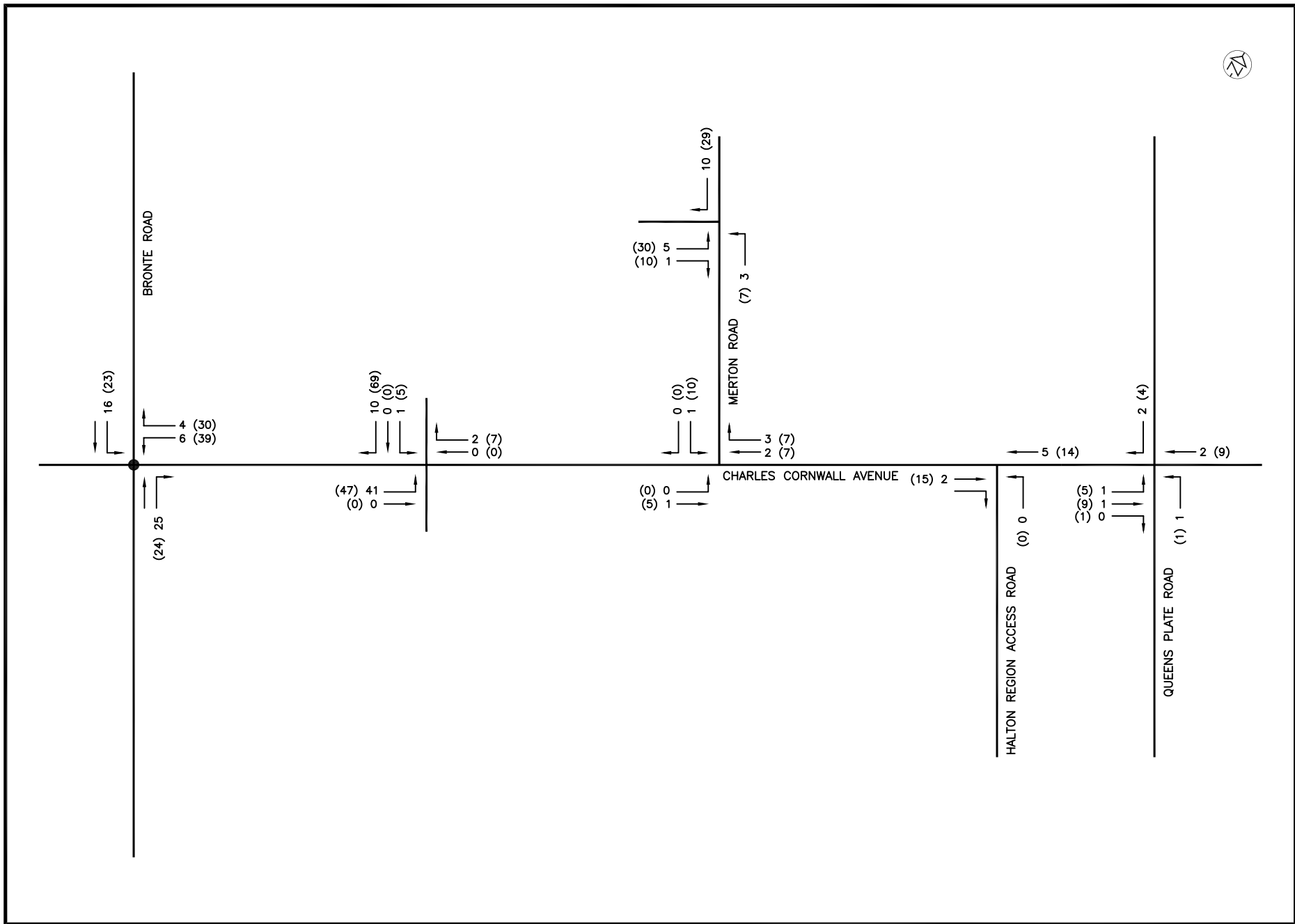


**LEGEND**

- 8 A.M. PEAK HOUR
- (40) P.M. PEAK HOUR
- SIGNALIZED INTERSECTION

**BACKGROUND AND RESIDENTIAL TRAFFIC**

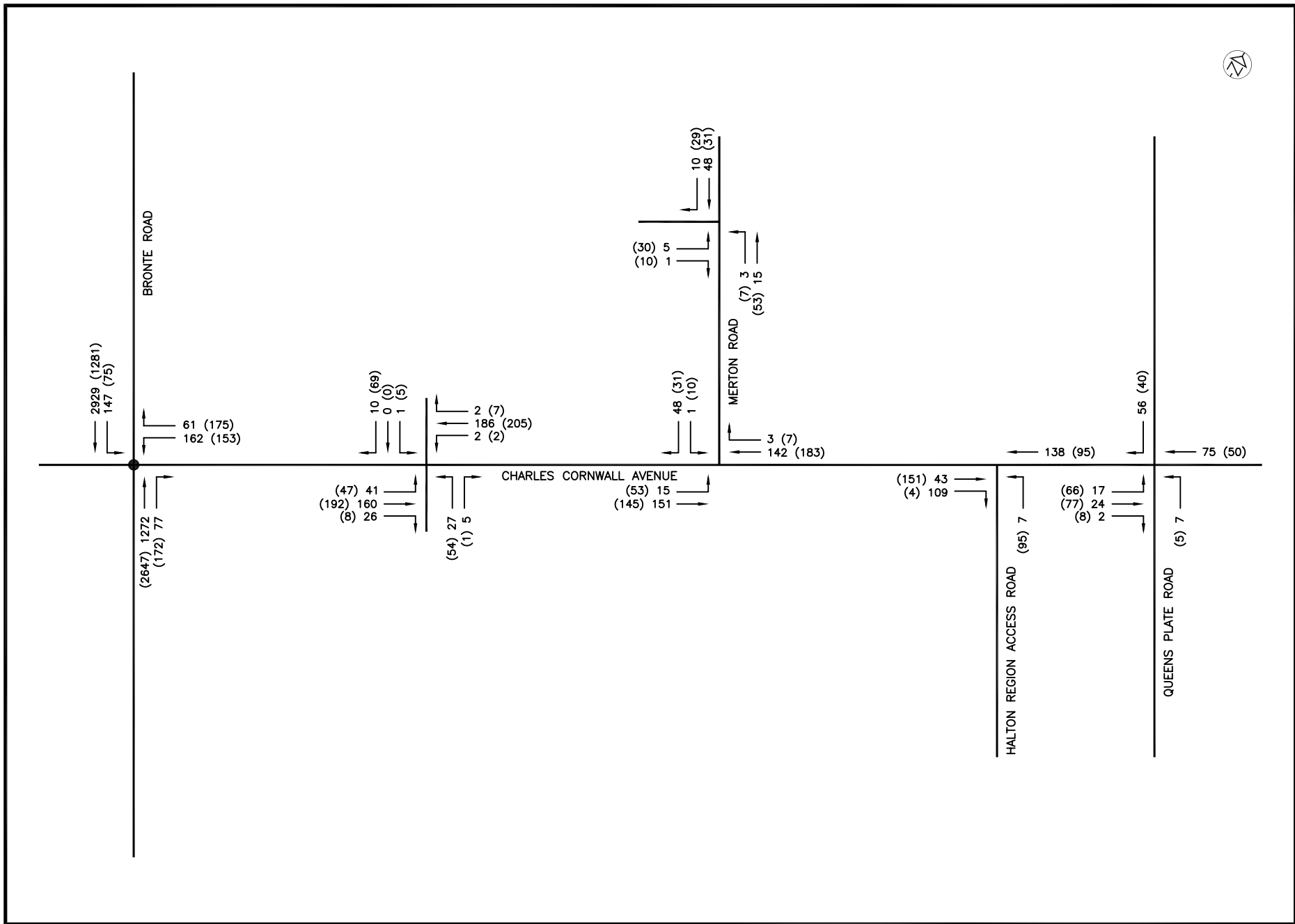
**FIGURE 4**



**LEGEND**

- 8 A.M. PEAK HOUR
- (40) P.M. PEAK HOUR
- SIGNALIZED INTERSECTION

**COMMERCIAL SITE TRAFFIC**  
**FIGURE 5**



**LEGEND**

- 8 A.M. PEAK HOUR
- (40) P.M. PEAK HOUR
- SIGNALIZED INTERSECTION

**TOTAL TRAFFIC**  
**FIGURE 6**

# APPENDIX A

## TRAFFIC VOLUME DATA

# Woodlands Access & Driveway

## Morning Peak Diagram

### Specified Period

**From:** 7:00:00

**To:** 9:00:00

### One Hour Peak

**From:** 8:00:00

**To:** 9:00:00

**Municipality:** Oakville  
**Site #:** 0000001003  
**Intersection:** Woodlands Access & Driveway  
**TFR File #:** 1  
**Count date:** 11-Feb-2020

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

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

**Major Road:** Woodlands Access runs W/E

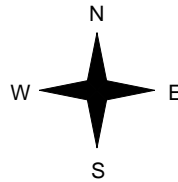
East Leg Total: 116  
 East Entering: 7  
 East Peds: 0  
 Peds Cross: X

Heavys	Trucks	Cars	Totals
1	6	25	32



Woodlands Access

Heavys	Trucks	Cars	Totals
0	0	104	104
2	0	24	26
2	0	128	



Driveway

Cars	Trucks	Heavys	Totals
4	1	0	5
1	1	0	2
5	2	0	



Woodlands Access

Cars	Trucks	Heavys	Totals
108	1	0	109

Peds Cross: X  
 South Peds: 0  
 South Entering: 32  
 South Leg Total: 60

Peds Cross: X  
 West Peds: 0  
 West Entering: 130  
 West Leg Total: 162

Cars	25
Trucks	1
Heavys	2
<b>Totals</b>	<b>28</b>



Cars	21	4	25
Trucks	5	1	6
Heavys	1	0	1
<b>Totals</b>	<b>27</b>	<b>5</b>	

## Comments

# Woodlands Access & Driveway

## Afternoon Peak Diagram

### Specified Period

**From:** 16:00:00

**To:** 18:00:00

### One Hour Peak

**From:** 16:00:00

**To:** 17:00:00

**Municipality:** Oakville  
**Site #:** 0000001003  
**Intersection:** Woodlands Access & Driveway  
**TFR File #:** 1  
**Count date:** 11-Feb-2020

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

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

**Major Road:** Woodlands Access runs W/E

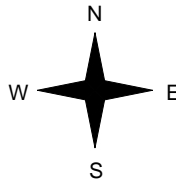
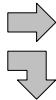
East Leg Total: 99  
 East Entering: 95  
 East Peds: 0  
 Peds Cross: ∅

Heavys	Trucks	Cars	Totals
0	1	146	147



Woodlands Access

Heavys	Trucks	Cars	Totals
0	0	3	3
0	2	6	8
0	2	9	



Driveway

Cars	Trucks	Heavys	Totals
93	0	0	93
2	0	0	2
95	0	0	



Woodlands Access

Cars	Trucks	Heavys	Totals
4	0	0	4

Peds Cross: ∅  
 South Peds: 0  
 South Entering: 55  
 South Leg Total: 65

Peds Cross: ∅  
 West Peds: 0  
 West Entering: 11  
 West Leg Total: 158

Cars	8
Trucks	2
Heavys	0
Totals	10



Cars	53	1	54
Trucks	1	0	1
Heavys	0	0	0
Totals	54	1	

## Comments



# Woodlands Access & Driveway

## Total Count Diagram

**Municipality:** Oakville  
**Site #:** 0000001003  
**Intersection:** Woodlands Access & Driveway  
**TFR File #:** 1  
**Count date:** 11-Feb-2020

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

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

**Major Road:** Woodlands Access runs W/E

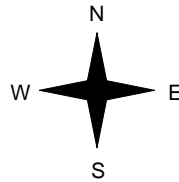
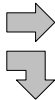
East Leg Total: 318  
 East Entering: 145  
 East Peds: 0  
 Peds Cross: ∞

Heavys	Trucks	Cars	Totals
1	7	225	233



Woodlands Access

Heavys	Trucks	Cars	Totals
0	0	163	163
2	2	78	82
2	2	241	



Driveway

Cars	Trucks	Heavys	Totals
------	--------	--------	--------

137	1	0	138
6	1	0	7
143	2	0	



Woodlands Access

Cars	Trucks	Heavys	Totals
172	1	0	173



Peds Cross: ∞  
 West Peds: 0  
 West Entering: 245  
 West Leg Total: 478

Cars	84
Trucks	3
Heavys	2
<b>Totals</b>	<b>89</b>



Cars	88	9	97
Trucks	6	1	7
Heavys	1	0	1
<b>Totals</b>	<b>95</b>	<b>10</b>	

Peds Cross: ∞  
 South Peds: 0  
 South Entering: 105  
 South Leg Total: 194

### Comments

# Woodlands Access & Driveway Traffic Count Summary

Intersection: Woodlands Access & Driveway						Count Date: 11-Feb-2020		Municipality: Oakville				
North Approach Totals						South Approach Totals						
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds	North/South Total Approaches	Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	0	0	0	0	0	13	8:00:00	10	0	3	13	0
9:00:00	0	0	0	0	0	32	9:00:00	27	0	5	32	0
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	0	0	0	0	0	55	17:00:00	54	0	1	55	0
18:00:00	0	0	0	0	0	5	18:00:00	4	0	1	5	0
<b>Totals:</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>105</b>		<b>95</b>	<b>0</b>	<b>10</b>	<b>105</b>	<b>0</b>
East Approach Totals						West Approach Totals						
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds	East/West Total Approaches	Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	1	2	0	3	0	102	8:00:00	0	52	47	99	0
9:00:00	2	5	0	7	0	137	9:00:00	0	104	26	130	0
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	2	93	0	95	0	106	17:00:00	0	3	8	11	0
18:00:00	2	38	0	40	0	45	18:00:00	0	4	1	5	0
<b>Totals:</b>	<b>7</b>	<b>138</b>	<b>0</b>	<b>145</b>	<b>0</b>	<b>390</b>		<b>0</b>	<b>163</b>	<b>82</b>	<b>245</b>	<b>0</b>
Calculated Values for Traffic Crossing Major Street												
Hours Ending:	7:00	8:00	9:00	16:00		17:00	17:00	18:00	18:00			
Crossing Values:	0	10	27	0		95	54	40	4			

Prepared For: Halton Region  
 Prepared By: *PYRAMID* Traffic Inc.  
 Location: REG. RD. #25 btwn QEW WB & Upper Middle Rd  
 Start Date: Thursday Jun 7, 2018

Site ID: 102501  
 Interval: 15 min.

Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary	Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary
0:15	55	37		12:15	301	278	2183
0:30	49	26		12:30	270	261	2213
0:45	57	22		12:45	233	288	2158
1:00	55	18	319	13:00	277	278	2186
1:15	38	23	288	13:15	252	304	2163
1:30	35	23	271	13:30	264	276	2172
1:45	21	15	228	13:45	263	313	2227
2:00	10	18	183	14:00	291	291	2254
2:15	13	15	150	14:15	289	284	2271
2:30	19	13	124	14:30	338	284	2353
2:45	26	6	120	14:45	321	324	2422
3:00	16	12	120	15:00	323	354	2517
3:15	19	17	128	15:15	389	344	2677
3:30	22	11	129	15:30	384	355	2794
3:45	11	18	126	15:45	376	371	2896
4:00	15	13	126	16:00	453	358	3030
4:15	9	22	121	16:15	523	338	3158
4:30	22	18	128	16:30	538	294	3251
4:45	20	26	145	16:45	530	286	3320
5:00	22	38	177	17:00	569	292	3370
5:15	30	52	228	17:15	582	301	3392
5:30	48	67	303	17:30	584	248	3392
5:45	52	138	447	17:45	570	274	3420
6:00	73	138	598	18:00	482	258	3299
6:15	85	178	779	18:15	418	221	3055
6:30	109	202	975	18:30	424	262	2909
6:45	139	317	1241	18:45	324	238	2627
7:00	191	365	1586	19:00	312	256	2455
7:15	185	414	1922	19:15	254	275	2345
7:30	240	477	2328	19:30	277	242	2178
7:45	237	626	2735	19:45	261	255	2132
8:00	299	641	3119	20:00	235	203	2002
8:15	276	670	3466	20:15	240	210	1923
8:30	264	627	3640	20:30	206	199	1809
8:45	268	612	3657	20:45	194	196	1683
9:00	230	592	3539	21:00	205	160	1610
9:15	239	451	3283	21:15	215	158	1533
9:30	238	422	3052	21:30	162	142	1432
9:45	221	323	2716	21:45	212	126	1380
10:00	225	342	2461	22:00	168	105	1288
10:15	225	277	2273	22:15	150	117	1182
10:30	197	317	2127	22:30	136	112	1126
10:45	218	269	2070	22:45	148	127	1063
11:00	212	284	1999	23:00	131	100	1021
11:15	210	267	1974	23:15	134	82	970
11:30	211	290	1961	23:30	127	95	944
11:45	255	321	2050	23:45	108	71	848
12:00	248	279	2081	0:00	112	78	807

AM Peak: 3657

PM Peak: 3420

24 HR VOLUME: 42147

**APPENDIX B**  
**SYNCHRO OUTPUT**

## SIGNALIZED INTERSECTIONS

HCM Signalized Intersection Capacity Analysis  
3: WOODLANDS driveway & BRONTE

2020 EXISTING  
AM PEAK HOUR



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙	↘		↙	↕	↘	↙	↕	↘
Volume (vph)	2	0	0	17	0	15	0	1152	12	118	2653	0
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	1.0	6.0	
Lane Util. Factor		1.00		1.00	1.00			0.95	1.00	1.00	0.95	
Frt		1.00		1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected		0.95		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1770		1770	1583			3539	1583	1770	3539	
Flt Permitted		0.83		0.83	1.00			1.00	1.00	0.20	1.00	
Satd. Flow (perm)		1552		1552	1583			3539	1583	369	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.92
Adj. Flow (vph)	2	0	0	18	0	16	0	1252	13	128	2764	0
RTOR Reduction (vph)	0	0	0	0	15	0	0	0	3	0	0	0
Lane Group Flow (vph)	0	2	0	18	1	0	0	1252	10	128	2764	0
Turn Type	Perm		Perm		Perm		Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		4.8		4.8	4.8			92.8	92.8	103.2	103.2	
Effective Green, g (s)		4.8		4.8	4.8			92.8	92.8	106.2	103.2	
Actuated g/C Ratio		0.04		0.04	0.04			0.77	0.77	0.88	0.86	
Clearance Time (s)		6.0		6.0	6.0			6.0	6.0	4.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		62		62	63			2737	1224	436	3044	
v/s Ratio Prot					0.00			0.35		0.02	c0.78	
v/s Ratio Perm		0.00		c0.01					0.01	0.24		
v/c Ratio		0.03		0.29	0.01			0.46	0.01	0.29	0.91	
Uniform Delay, d1		55.4		55.9	55.3			4.8	3.1	1.5	5.4	
Progression Factor		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2		2.6	0.1			0.6	0.0	0.4	5.2	
Delay (s)		55.6		58.5	55.4			5.3	3.1	1.9	10.6	
Level of Service		E		E	E			A	A	A	B	
Approach Delay (s)		55.6			57.1			5.3			10.2	
Approach LOS		E			E			A			B	

Intersection Summary

HCM Average Control Delay	9.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	95.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 3: WOODLANDS driveway & BRONTE

2020 EXISTING  
PM PEAK HOUR



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗		↖	↕	↗	↖	↕	↗
Volume (vph)	0	0	0	29	0	118	0	2398	3	8	1160	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0			6.0	6.0	6.0	6.0	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1770	1583			3539	1583	1770	3539	
Flt Permitted				0.76	1.00			1.00	1.00	0.04	1.00	
Satd. Flow (perm)				1410	1583			3539	1583	79	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.99	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	32	0	128	0	2422	3	9	1261	0
RTOR Reduction (vph)	0	0	0	0	13	0	0	0	1	0	0	0
Lane Group Flow (vph)	0	0	0	32	115	0	0	2422	2	9	1261	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2				6
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				13.1	13.1			94.9	94.9	94.9	94.9	
Effective Green, g (s)				13.1	13.1			94.9	94.9	94.9	94.9	
Actuated g/C Ratio				0.11	0.11			0.79	0.79	0.79	0.79	
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)				154	173			2799	1252	62	2799	
v/s Ratio Prot					c0.07			c0.68			0.36	
v/s Ratio Perm				0.02					0.00	0.11		
v/c Ratio				0.21	0.66			0.87	0.00	0.15	0.45	
Uniform Delay, d1				48.7	51.3			8.3	2.6	3.0	4.1	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				0.7	9.2			3.9	0.0	4.9	0.5	
Delay (s)				49.4	60.5			12.2	2.6	7.8	4.6	
Level of Service				D	E			B	A	A	A	
Approach Delay (s)		0.0			58.3			12.2			4.6	
Approach LOS		A			E			B			A	

### Intersection Summary

HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
3: CHARLES CORNWALL & BRONTE

2025 BACKGROUND  
AM PEAK HOUR



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↗	↘		↗	↕	↘	↗	↕	↘
Volume (vph)	0	0	0	156	0	57	0	1272	52	131	2929	0
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	1.0	6.0	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1770	1583			3539	1583	1770	3539	
Flt Permitted				0.76	1.00			1.00	1.00	0.15	1.00	
Satd. Flow (perm)				1410	1583			3539	1583	276	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	1.00	0.92
Adj. Flow (vph)	0	0	0	170	0	62	0	1383	57	142	2929	0
RTOR Reduction (vph)	0	0	0	0	54	0	0	0	18	0	0	0
Lane Group Flow (vph)	0	0	0	170	8	0	0	1383	39	142	2929	0
Turn Type	Perm			Perm			Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				15.8	15.8			82.2	82.2	92.2	92.2	
Effective Green, g (s)				15.8	15.8			82.2	82.2	95.2	92.2	
Actuated g/C Ratio				0.13	0.13			0.68	0.68	0.79	0.77	
Clearance Time (s)				6.0	6.0			6.0	6.0	4.0	6.0	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				186	208			2424	1084	331	2719	
v/s Ratio Prot					0.01			0.39		0.03	c0.83	
v/s Ratio Perm				c0.12					0.02	0.31		
v/c Ratio				0.91	0.04			0.57	0.04	0.43	1.08	
Uniform Delay, d1				51.4	45.5			9.8	6.1	5.7	13.9	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				42.1	0.1			1.0	0.1	0.9	42.3	
Delay (s)				93.6	45.6			10.8	6.2	6.6	56.2	
Level of Service				F	D			B	A	A	E	
Approach Delay (s)		0.0			80.7			10.6			53.9	
Approach LOS		A			F			B			D	

Intersection Summary		
HCM Average Control Delay	42.1	HCM Level of Service D
HCM Volume to Capacity ratio	1.05	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 12.0
Intersection Capacity Utilization	107.9%	ICU Level of Service G
Analysis Period (min)	15	
c	Critical Lane Group	



HCM Signalized Intersection Capacity Analysis  
3: CHARLES CORNWALL & BRONTE

2025 BACKGROUND  
PM PEAK HOUR



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗		↖	↕	↗	↖	↕	↗
Volume (vph)	0	0	0	114	0	145	0	2647	148	52	1281	0
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	1.0	6.0	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1770	1583			3539	1583	1770	3539	
Flt Permitted				0.76	1.00			1.00	1.00	0.04	1.00	
Satd. Flow (perm)				1410	1583			3539	1583	83	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	1.00	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	124	0	158	0	2647	161	57	1392	0
RTOR Reduction (vph)	0	0	0	0	48	0	0	0	29	0	0	0
Lane Group Flow (vph)	0	0	0	124	110	0	0	2647	132	57	1392	0
Turn Type	Perm			Perm			Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				14.2	14.2			86.2	86.2	93.8	93.8	
Effective Green, g (s)				14.2	14.2			86.2	86.2	96.8	93.8	
Actuated g/C Ratio				0.12	0.12			0.72	0.72	0.81	0.78	
Clearance Time (s)				6.0	6.0			6.0	6.0	4.0	6.0	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				167	187			2542	1137	160	2766	
v/s Ratio Prot					0.07			c0.75		0.02	c0.39	
v/s Ratio Perm				c0.09					0.08	0.27		
v/c Ratio				0.74	0.59			1.04	0.12	0.36	0.50	
Uniform Delay, d1				51.1	50.1			16.9	5.2	34.3	4.7	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				16.2	4.6			29.7	0.2	1.4	0.7	
Delay (s)				67.4	54.7			46.6	5.4	35.6	5.4	
Level of Service				E	D			D	A	D	A	
Approach Delay (s)		0.0			60.3			44.3			6.6	
Approach LOS		A			E			D			A	

Intersection Summary			
HCM Average Control Delay	33.2	HCM Level of Service	C
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		
c	Critical Lane Group		





















HCM Signalized Intersection Capacity Analysis  
 3: CHARLES CORNWALL & BRONTE

2025 TOTAL (Bronte 4 lanes)  
 AM PEAK HOUR

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	162	0	61	0	1272	77	147	2929	0
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	1.0	6.0	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1770	1583			3539	1583	1770	3539	
Flt Permitted				0.76	1.00			1.00	1.00	0.15	1.00	
Satd. Flow (perm)				1410	1583			3539	1583	272	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	1.00	0.92
Adj. Flow (vph)	0	0	0	176	0	66	0	1383	84	160	2929	0
RTOR Reduction (vph)	0	0	0	0	57	0	0	0	27	0	0	0
Lane Group Flow (vph)	0	0	0	176	9	0	0	1383	57	160	2929	0
Turn Type	Perm			Perm			Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				16.0	16.0			81.1	81.1	92.0	92.0	
Effective Green, g (s)				16.0	16.0			81.1	81.1	95.0	92.0	
Actuated g/C Ratio				0.13	0.13			0.68	0.68	0.79	0.77	
Clearance Time (s)				6.0	6.0			6.0	6.0	4.0	6.0	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				188	211			2392	1070	339	2713	
v/s Ratio Prot					0.01			0.39		0.04	c0.83	
v/s Ratio Perm				c0.12					0.04	0.33		
v/c Ratio				0.94	0.04			0.58	0.05	0.47	1.08	
Uniform Delay, d1				51.5	45.3			10.3	6.5	6.3	14.0	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				47.2	0.1			1.0	0.1	1.0	43.3	
Delay (s)				98.7	45.4			11.4	6.6	7.3	57.3	
Level of Service				F	D			B	A	A	E	
Approach Delay (s)		0.0			84.1			11.1			54.7	
Approach LOS		A			F			B			D	
<b>Intersection Summary</b>												
HCM Average Control Delay			42.8								HCM Level of Service	D
HCM Volume to Capacity ratio			1.06									
Actuated Cycle Length (s)			120.0							Sum of lost time (s)	12.0	
Intersection Capacity Utilization			108.3%								ICU Level of Service	G
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis  
 3: CHARLES CORNWALL & BRONTE






















2025 TOTAL (Bronte 4 lanes)  
 PM PEAK HOUR

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (vph)	0	0	0	153	0	175	0	2647	172	75	1281	0	
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	1.0	6.0		
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95		
Frt				1.00	0.85			1.00	0.85	1.00	1.00		
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00		
Satd. Flow (prot)				1770	1583			3539	1583	1770	3539		
Flt Permitted				0.76	1.00			1.00	1.00	0.04	1.00		
Satd. Flow (perm)				1410	1583			3539	1583	84	3539		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	1.00	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	166	0	190	0	2647	187	82	1392	0	
RTOR Reduction (vph)	0	0	0	0	48	0	0	0	35	0	0	0	
Lane Group Flow (vph)	0	0	0	166	142	0	0	2647	152	82	1392	0	
Turn Type	Perm			Perm			Perm		Perm	pm+pt			
Protected Phases		4			8			2		1	6		
Permitted Phases	4			8			2		2	6			
Actuated Green, G (s)				15.7	15.7			85.1	85.1	92.3	92.3		
Effective Green, g (s)				15.7	15.7			85.1	85.1	95.3	92.3		
Actuated g/C Ratio				0.13	0.13			0.71	0.71	0.79	0.77		
Clearance Time (s)				6.0	6.0			6.0	6.0	4.0	6.0		
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)				184	207			2510	1123	154	2722		
v/s Ratio Prot					0.09			c0.75		c0.03	0.39		
v/s Ratio Perm				c0.12					0.10	0.40			
v/c Ratio				0.90	0.69			1.05	0.14	0.53	0.51		
Uniform Delay, d1				51.4	49.8			17.5	5.6	34.2	5.3		
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00		
Incremental Delay, d2				39.8	9.1			34.4	0.3	3.5	0.7		
Delay (s)				91.2	58.9			51.9	5.9	37.7	6.0		
Level of Service				F	E			D	A	D	A		
Approach Delay (s)		0.0			74.0			48.9			7.7		
Approach LOS		A			E			D			A		
<b>Intersection Summary</b>													
HCM Average Control Delay			37.8									HCM Level of Service	D
HCM Volume to Capacity ratio			0.99										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	13.0
Intersection Capacity Utilization			94.0%									ICU Level of Service	F
Analysis Period (min)			15										
c	Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 3: CHARLES CORNWALL & BRONTE






















TOTAL (Bronte 6 lanes)  
AM PEAK HOUR

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Volume (vph)	0	0	0	162	0	61	0	1272	77	147	2929	0		
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	1.0	6.0			
Lane Util. Factor				1.00	1.00			0.91	1.00	1.00	0.91			
Frt				1.00	0.85			1.00	0.85	1.00	1.00			
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00			
Satd. Flow (prot)				1770	1583			5085	1583	1770	5085			
Flt Permitted				0.76	1.00			1.00	1.00	0.16	1.00			
Satd. Flow (perm)				1410	1583			5085	1583	294	5085			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	0	0	0	176	0	66	0	1383	84	160	3184	0		
RTOR Reduction (vph)	0	0	0	0	56	0	0	0	29	0	0	0		
Lane Group Flow (vph)	0	0	0	176	10	0	0	1383	55	160	3184	0		
Turn Type	Perm			Perm			Perm			Perm	pm+pt			
Protected Phases		4			8			2		1		6		
Permitted Phases	4			8			2		2	6				
Actuated Green, G (s)				18.8	18.8			78.0	78.0	89.2	89.2			
Effective Green, g (s)				18.8	18.8			78.0	78.0	92.2	89.2			
Actuated g/C Ratio				0.16	0.16			0.65	0.65	0.77	0.74			
Clearance Time (s)				6.0	6.0			6.0	6.0	4.0	6.0			
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)				221	248			3305	1029	351	3780			
v/s Ratio Prot					0.01			0.27		0.04	c0.63			
v/s Ratio Perm				c0.12					0.03	0.31				
v/c Ratio				0.80	0.04			0.42	0.05	0.46	0.84			
Uniform Delay, d1				48.8	43.0			10.1	7.6	4.6	10.6			
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00			
Incremental Delay, d2				17.8	0.1			0.4	0.1	0.9	2.5			
Delay (s)				66.5	43.0			10.5	7.7	5.5	13.0			
Level of Service				E	D			B	A	A	B			
Approach Delay (s)		0.0			60.1			10.3			12.7			
Approach LOS		A			E			B			B			
<b>Intersection Summary</b>														
HCM Average Control Delay			14.3									HCM Level of Service	B	
HCM Volume to Capacity ratio			0.83											
Actuated Cycle Length (s)			120.0								12.0			
Intersection Capacity Utilization			83.9%										ICU Level of Service	E
Analysis Period (min)			15											
c	Critical Lane Group													

# HCM Signalized Intersection Capacity Analysis

## 3: CHARLES CORNWALL & BRONTE

TOTAL (Bronte 6 lanes)  
PM PEAK HOUR

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (vph)	0	0	0	153	0	175	0	2647	172	75	1281	0	
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	1.0	6.0		
Lane Util. Factor				1.00	1.00			0.91	1.00	1.00	0.91		
Frt				1.00	0.85			1.00	0.85	1.00	1.00		
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00		
Satd. Flow (prot)				1770	1583			5085	1583	1770	5085		
Flt Permitted				0.76	1.00			1.00	1.00	0.05	1.00		
Satd. Flow (perm)				1410	1583			5085	1583	86	5085		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	166	0	190	0	2877	187	82	1392	0	
RTOR Reduction (vph)	0	0	0	0	46	0	0	0	44	0	0	0	
Lane Group Flow (vph)	0	0	0	166	144	0	0	2877	143	82	1392	0	
Turn Type	Perm			Perm			Perm		Perm	pm+pt			
Protected Phases		4			8			2		1	6		
Permitted Phases	4			8			2		2	6			
Actuated Green, G (s)				17.7	17.7			82.6	82.6	90.3	90.3		
Effective Green, g (s)				17.7	17.7			82.6	82.6	93.3	90.3		
Actuated g/C Ratio				0.15	0.15			0.69	0.69	0.78	0.75		
Clearance Time (s)				6.0	6.0			6.0	6.0	4.0	6.0		
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)				208	233			3500	1090	161	3826		
v/s Ratio Prot					0.09			c0.57		c0.03	0.27		
v/s Ratio Perm				c0.12					0.09	0.37			
v/c Ratio				0.80	0.62			0.82	0.13	0.51	0.36		
Uniform Delay, d1				49.4	48.0			13.4	6.4	19.7	5.1		
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00		
Incremental Delay, d2				18.9	4.8			2.3	0.2	2.5	0.3		
Delay (s)				68.3	52.8			15.7	6.7	22.3	5.3		
Level of Service				E	D			B	A	C	A		
Approach Delay (s)		0.0			60.0			15.2			6.3		
Approach LOS		A			E			B			A		
<b>Intersection Summary</b>													
HCM Average Control Delay			15.8									HCM Level of Service	B
HCM Volume to Capacity ratio			0.79										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	13.0
Intersection Capacity Utilization			79.5%									ICU Level of Service	D
Analysis Period (min)			15										
c	Critical Lane Group												

## UNSIGNALIZED INTERSECTIONS

HCM Unsignalized Intersection Capacity Analysis  
 6: WOODLANDS ACCESS & WOODLANDS driveway

2020 EXISTING  
 AM PEAK HOUR



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	→
Volume (veh/h)	104	26	2	5	27	5
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)	113	28	2	5	29	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)	69					
pX, platoon unblocked						
vC, conflicting volume			141		137	127
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			141		137	127
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1442		855	923

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	141	8	29	5
Volume Left	0	2	29	0
Volume Right	28	0	0	5
cSH	1700	1442	855	923
Volume to Capacity	0.08	0.00	0.03	0.01
Queue Length 95th (m)	0.0	0.0	0.8	0.1
Control Delay (s)	0.0	2.2	9.4	8.9
Lane LOS		A	A	A
Approach Delay (s)	0.0	2.2	9.3	
Approach LOS			A	

Intersection Summary			
Average Delay		1.8	
Intersection Capacity Utilization		17.1%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis  
 6: WOODLANDS ACCESS & WOODLANDS driveway

2020 EXISTING  
 PM PEAK HOUR



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	↻
Volume (veh/h)	3	8	2	93	54	1
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)	3	9	2	101	59	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	69					
pX, platoon unblocked						
vC, conflicting volume			12		113	8
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			12		113	8
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		93	100
cM capacity (veh/h)			1607		882	1075

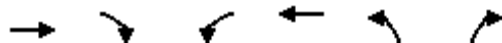
Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	12	103	59	1
Volume Left	0	2	59	0
Volume Right	9	0	0	1
cSH	1700	1607	882	1075
Volume to Capacity	0.01	0.00	0.07	0.00
Queue Length 95th (m)	0.0	0.0	1.6	0.0
Control Delay (s)	0.0	0.2	9.4	8.4
Lane LOS		A	A	A
Approach Delay (s)	0.0	0.2	9.4	
Approach LOS			A	

Intersection Summary			
Average Delay		3.3	
Intersection Capacity Utilization	16.5%		ICU Level of Service A
Analysis Period (min)		15	



HCM Unsignalized Intersection Capacity Analysis  
 6: CHARLES CORNWALL & WOODLANDS driveway

2025 BACKGROUND  
 AM PEAK HOUR



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Volume (veh/h)	160	26	2	186	27	5
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)	174	28	2	202	29	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	69					
pX, platoon unblocked			0.99		0.99	0.99
vC, conflicting volume			202		395	188
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			193		386	178
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		95	99
cM capacity (veh/h)			1371		611	858

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	202	204	35
Volume Left	0	2	29
Volume Right	28	0	5
cSH	1700	1371	640
Volume to Capacity	0.12	0.00	0.05
Queue Length 95th (m)	0.0	0.0	1.3
Control Delay (s)	0.0	0.1	10.9
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	10.9
Approach LOS			B

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		21.4%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis  
 8: CHARLES CORNWALL & MERTON

2025 BACKGROUND  
 AM PEAK HOUR



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	15	150	140	0	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)	16	163	152	0	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)		138				
pX, platoon unblocked						
vC, conflicting volume	152				348	152
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	152				348	152
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	94
cM capacity (veh/h)	1429				642	894

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	179	152	52
Volume Left	16	0	0
Volume Right	0	0	52
cSH	1429	1700	894
Volume to Capacity	0.01	0.09	0.06
Queue Length 95th (m)	0.3	0.0	1.4
Control Delay (s)	0.8	0.0	9.3
Lane LOS	A		A
Approach Delay (s)	0.8	0.0	9.3
Approach LOS			A

Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization	29.4%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis  
 10: CHARLES CORNWALL & REGION ACCESS

2025 BACKGROUND  
 AM PEAK HOUR



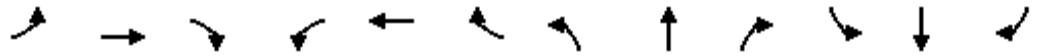
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	41	109	0	133	7	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	45	118	0	145	8	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	183					
pX, platoon unblocked						
vC, conflicting volume			163		248	104
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			163		248	104
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %						
			100		99	100
cM capacity (veh/h)						
			1416		740	951

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	163	145	8
Volume Left	0	0	8
Volume Right	118	0	0
cSH	1700	1416	740
Volume to Capacity	0.10	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.2
Control Delay (s)	0.0	0.0	9.9
Lane LOS	A		
Approach Delay (s)	0.0	0.0	9.9
Approach LOS	A		

Intersection Summary			
Average Delay			0.2
Intersection Capacity Utilization	18.9%	ICU Level of Service	A
Analysis Period (min)			15

HCM Unsignalized Intersection Capacity Analysis  
 12: CHARLES CORNWALL & QUEENS PLATE

2025 BACKGROUND  
 AM PEAK HOUR



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	16	23	2	0	73	0	6	0	0	0	0	54
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	25	2	0	79	0	7	0	0	0	0	59
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		213										
pX, platoon unblocked												
vC, conflicting volume	79			27			199	140	26	140	141	79
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	79			27			199	140	26	140	141	79
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	100	100	100	94
cM capacity (veh/h)	1519			1587			708	742	1050	823	741	981

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	45	79	7	59
Volume Left	17	0	7	0
Volume Right	2	0	0	59
cSH	1519	1587	708	981
Volume to Capacity	0.01	0.00	0.01	0.06
Queue Length 95th (m)	0.3	0.0	0.2	1.4
Control Delay (s)	2.9	0.0	10.1	8.9
Lane LOS	A		B	A
Approach Delay (s)	2.9	0.0	10.1	8.9
Approach LOS			B	A

Intersection Summary			
Average Delay		3.8	
Intersection Capacity Utilization	20.5%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis  
 6: CHARLES CORNWALL & WOODLANDS driveway

2025 BACKGROUND  
 PM PEAK HOUR



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	192	8	2	205	54	1
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)	209	9	2	223	59	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	69					
pX, platoon unblocked						
vC, conflicting volume			217		440	213
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			217		440	213
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		90	100
cM capacity (veh/h)			1352		573	827

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	217	225	60
Volume Left	0	2	59
Volume Right	9	0	1
cSH	1700	1352	577
Volume to Capacity	0.13	0.00	0.10
Queue Length 95th (m)	0.0	0.0	2.6
Control Delay (s)	0.0	0.1	12.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	12.0
Approach LOS			B

Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization	22.4%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis  
 8: CHARLES CORNWALL & MERTON

2025 BACKGROUND  
 PM PEAK HOUR



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	53	140	176	0	0	31
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)	58	152	191	0	0	34
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		138				
pX, platoon unblocked						
vC, conflicting volume	191				459	191
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	191				459	191
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	96
cM capacity (veh/h)	1382				537	850

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	210	191	34
Volume Left	58	0	0
Volume Right	0	0	34
cSH	1382	1700	850
Volume to Capacity	0.04	0.11	0.04
Queue Length 95th (m)	1.0	0.0	0.9
Control Delay (s)	2.4	0.0	9.4
Lane LOS	A		A
Approach Delay (s)	2.4	0.0	9.4
Approach LOS			A

Intersection Summary			
Average Delay		1.9	
Intersection Capacity Utilization		32.9%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis  
 10: CHARLES CORNWALL & REGION ACCESS

2025 BACKGROUND  
 PM PEAK HOUR



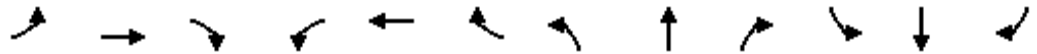
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	
Volume (veh/h)	136	4	0	81	95	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	148	4	0	88	103	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	183					
pX, platoon unblocked						
vC, conflicting volume			152		238	150
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			152		238	150
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		86	100
cM capacity (veh/h)			1429		750	896

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	152	88	103
Volume Left	0	0	103
Volume Right	4	0	0
cSH	1700	1429	750
Volume to Capacity	0.09	0.00	0.14
Queue Length 95th (m)	0.0	0.0	3.6
Control Delay (s)	0.0	0.0	10.6
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.6
Approach LOS			B

Intersection Summary			
Average Delay		3.2	
Intersection Capacity Utilization		19.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis  
 12: CHARLES CORNWALL & QUEENS PLATE

2025 BACKGROUND  
 PM PEAK HOUR



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	61	68	7	0	41	0	4	0	0	0	0	36
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	66	74	8	0	45	0	4	0	0	0	0	39
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		213										
pX, platoon unblocked												
vC, conflicting volume	45			82			294	255	78	255	259	45
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	45			82			294	255	78	255	259	45
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			99	100	100	100	100	96
cM capacity (veh/h)	1564			1516			613	621	983	676	618	1025

















Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	148	45	4	39
Volume Left	66	0	4	0
Volume Right	8	0	0	39
cSH	1564	1516	613	1025
Volume to Capacity	0.04	0.00	0.01	0.04
Queue Length 95th (m)	1.0	0.0	0.2	0.9
Control Delay (s)	3.5	0.0	10.9	8.7
Lane LOS	A		B	A
Approach Delay (s)	3.5	0.0	10.9	8.7
Approach LOS			B	A

Intersection Summary			
Average Delay		3.8	
Intersection Capacity Utilization	24.0%		ICU Level of Service
Analysis Period (min)		15	A



HCM Unsignalized Intersection Capacity Analysis  
 6: CHARLES CORNWALL & COMM driveway

2025 TOTAL (Bronte 4 lanes)  
 AM PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	41	160	26	2	186	2	27	0	5	1	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	45	174	28	2	202	2	29	0	5	1	0	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		69										
pX, platoon unblocked				0.99			0.99	0.99	0.99	0.99	0.99	0.99
vC, conflicting volume	204			202			496	486	188	490	499	203
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	204			186			483	474	172	478	487	203
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			94	100	99	100	100	99
cM capacity (veh/h)	1367			1371			469	467	861	476	459	837
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	247	207	35	12								
Volume Left	45	2	29	1								
Volume Right	28	2	5	11								
cSH	1367	1371	505	783								
Volume to Capacity	0.03	0.00	0.07	0.02								
Queue Length 95th (m)	0.8	0.0	1.7	0.4								
Control Delay (s)	1.6	0.1	12.7	9.7								
Lane LOS	A	A	B	A								
Approach Delay (s)	1.6	0.1	12.7	9.7								
Approach LOS			B	A								
<b>Intersection Summary</b>												
Average Delay			2.0									
Intersection Capacity Utilization			40.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 8: CHARLES CORNWALL & MERTON

2025 TOTAL (Bronte 4 lanes)  
 AM PEAK HOUR



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	15	151	142	3	1	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)	16	164	154	3	1	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)		138				
pX, platoon unblocked						
vC, conflicting volume	158				353	156
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	158				353	156
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	94
cM capacity (veh/h)	1422				638	890

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	180	158	53
Volume Left	16	0	1
Volume Right	0	3	52
cSH	1422	1700	883
Volume to Capacity	0.01	0.09	0.06
Queue Length 95th (m)	0.3	0.0	1.5
Control Delay (s)	0.8	0.0	9.3
Lane LOS	A		A
Approach Delay (s)	0.8	0.0	9.3
Approach LOS			A

Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization	29.8%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis  
 15: COMMERCIAL driveway & MERTON

2025 TOTAL (Bronte 4 lanes)  
 AM PEAK HOUR



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	1	3	15	48	10
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)	5	1	3	16	52	11
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	80	58	63			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	80	58	63			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	920	1009	1540			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	7	20	63			
Volume Left	5	3	0			
Volume Right	1	0	11			
cSH	934	1540	1700			
Volume to Capacity	0.01	0.00	0.04			
Queue Length 95th (m)	0.2	0.0	0.0			
Control Delay (s)	8.9	1.2	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.9	1.2	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			13.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 10: CHARLES CORNWALL & REGION ACCESS

2025 TOTAL (Bronte 4 lanes)  
 AM PEAK HOUR



















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↔	
Volume (veh/h)	43	109	0	138	7	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	118	0	150	8	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	183					
pX, platoon unblocked						
vC, conflicting volume			165		256	106
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			165		256	106
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1413		733	948

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	165	150	8
Volume Left	0	0	8
Volume Right	118	0	0
cSH	1700	1413	733
Volume to Capacity	0.10	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.2
Control Delay (s)	0.0	0.0	10.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	10.0
Approach LOS	A		

Intersection Summary			
Average Delay			0.2
Intersection Capacity Utilization	19.0%	ICU Level of Service	A
Analysis Period (min)			15

















HCM Unsignalized Intersection Capacity Analysis  
 12: CHARLES CORNWALL & QUEENS PLATE

2025 TOTAL (Bronte 4 lanes)  
 AM PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	17	24	2	0	75	0	7	0	0	0	0	56
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	26	2	0	82	0	8	0	0	0	0	61
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		213										
pX, platoon unblocked												
vC, conflicting volume	82			28			207	146	27	146	147	82
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	82			28			207	146	27	146	147	82
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	100	100	100	94
cM capacity (veh/h)	1516			1585			698	737	1048	815	736	978
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	47	82	8	61								
Volume Left	18	0	8	0								
Volume Right	2	0	0	61								
cSH	1516	1585	698	978								
Volume to Capacity	0.01	0.00	0.01	0.06								
Queue Length 95th (m)	0.3	0.0	0.3	1.5								
Control Delay (s)	3.0	0.0	10.2	8.9								
Lane LOS	A		B	A								
Approach Delay (s)	3.0	0.0	10.2	8.9								
Approach LOS			B	A								
<b>Intersection Summary</b>												
Average Delay			3.9									
Intersection Capacity Utilization			21.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 6: CHARLES CORNWALL & COMM driveway

2025 TOTAL (Bronte 4 lanes)  
 PM PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	47	192	8	2	205	7	54	0	1	5	0	69
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	51	209	9	2	223	8	59	0	1	5	0	75
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		69										
pX, platoon unblocked												
vC, conflicting volume	230			217			621	550	213	547	551	227
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	230			217			621	550	213	547	551	227
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			83	100	100	99	100	91
cM capacity (veh/h)	1337			1352			352	425	827	433	425	813
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	268	233	60	80								
Volume Left	51	2	59	5								
Volume Right	9	8	1	75								
cSH	1337	1352	355	767								
Volume to Capacity	0.04	0.00	0.17	0.10								
Queue Length 95th (m)	0.9	0.0	4.5	2.7								
Control Delay (s)	1.8	0.1	17.2	10.2								
Lane LOS	A	A	C	B								
Approach Delay (s)	1.8	0.1	17.2	10.2								
Approach LOS			C	B								
<b>Intersection Summary</b>												
Average Delay			3.7									
Intersection Capacity Utilization			44.2%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 8: CHARLES CORNWALL & MERTON

2025 TOTAL (Bronte 4 lanes)  
 PM PEAK HOUR



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↩	↩		↩	
Volume (veh/h)	53	145	183	7	10	31
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)	58	158	199	8	11	34
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)		138				
pX, platoon unblocked						
vC, conflicting volume	207				476	203
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	207				476	203
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				98	96
cM capacity (veh/h)	1365				525	838

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	215	207	45
Volume Left	58	0	11
Volume Right	0	8	34
cSH	1365	1700	732
Volume to Capacity	0.04	0.12	0.06
Queue Length 95th (m)	1.0	0.0	1.5
Control Delay (s)	2.3	0.0	10.2
Lane LOS	A		B
Approach Delay (s)	2.3	0.0	10.2
Approach LOS			B

Intersection Summary			
Average Delay		2.1	
Intersection Capacity Utilization		34.0%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis  
 15: CMMERCIAL driveway & MERTON

2025 TOTAL (Bronte 4 lanes)  
 PM PEAK HOUR



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	30	10	7	53	31	29
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)	33	11	8	58	34	32
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	122	49	65			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	122	49	65			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	99	100			
cM capacity (veh/h)	869	1019	1537			
<b>Direction, Lane #</b>						
	EB 1	NB 1	SB 1			
Volume Total	43	65	65			
Volume Left	33	8	0			
Volume Right	11	0	32			
cSH	902	1537	1700			
Volume to Capacity	0.05	0.00	0.04			
Queue Length 95th (m)	1.2	0.1	0.0			
Control Delay (s)	9.2	0.9	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.2	0.9	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			2.6			
Intersection Capacity Utilization		18.7%		ICU Level of Service		A
Analysis Period (min)			15			



HCM Unsignalized Intersection Capacity Analysis  
 10: CHARLES CORNWALL & REGION ACCESS

2025 TOTAL (Bronte 4 lanes)  
 PM PEAK HOUR



















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	151	4	0	95	95	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	164	4	0	103	103	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)	183					
pX, platoon unblocked						
vC, conflicting volume			168		270	166
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			168		270	166
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		86	100
cM capacity (veh/h)			1409		720	878

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	168	103	103
Volume Left	0	0	103
Volume Right	4	0	0
cSH	1700	1409	720
Volume to Capacity	0.10	0.00	0.14
Queue Length 95th (m)	0.0	0.0	3.8
Control Delay (s)	0.0	0.0	10.8
Lane LOS	B		
Approach Delay (s)	0.0	0.0	10.8
Approach LOS	B		

Intersection Summary			
Average Delay			3.0
Intersection Capacity Utilization	20.1%		ICU Level of Service
Analysis Period (min)	15		A

HCM Unsignalized Intersection Capacity Analysis  
 12: CHARLES CORNWALL & QUEENS PLATE

2025 TOTAL (Bronte 4 lanes)  
 PM PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	66	77	8	0	50	0	5	0	0	0	0	40
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	84	9	0	54	0	5	0	0	0	0	43
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		213										
pX, platoon unblocked												
vC, conflicting volume	54			92			329	286	88	286	290	54
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	54			92			329	286	88	286	290	54
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			99	100	100	100	100	96
cM capacity (veh/h)	1551			1502			576	595	970	643	591	1013
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	164	54	5	43								
Volume Left	72	0	5	0								
Volume Right	9	0	0	43								
cSH	1551	1502	576	1013								
Volume to Capacity	0.05	0.00	0.01	0.04								
Queue Length 95th (m)	1.1	0.0	0.2	1.0								
Control Delay (s)	3.5	0.0	11.3	8.7								
Lane LOS	A		B	A								
Approach Delay (s)	3.5	0.0	11.3	8.7								
Approach LOS			B	A								
<b>Intersection Summary</b>												
Average Delay			3.8									
Intersection Capacity Utilization			25.7%		ICU Level of Service				A			
Analysis Period (min)			15									