

Valery Homes

1354 Bronte Road



**Transportation
Impact
Study**



Valery Homes 1354 Bronte Road Transportation Impact Study

Prepared for:

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PN: 2021-109

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1 Introduction

This Transportation Impact Study (TIS) has been prepared to support the properties for Valery Homes located at 1354 Bronte Road. Next to this development is the Bronte River development with townhouse and single-detached units. Across from these properties is the Bronte Green development, which is currently under construction east of Bronte Road. The proposed 1354 Bronte development includes 110 condo units within a 6-storey building. Figure 1 illustrates the site context. Figure 2 illustrates the proposed development concept plan.

Figure 1: Site Context



The site currently resides within a Parkway Belt Complementary Use (PB2) zone. It is located next to an Existing Development (ED) zone and a Natural Area (N) zone. The subject property is bordered by Bronte Road and will have a primary access on Saw Whet Boulevard. The scope of this TIS has been confirmed with transportation staff from the Town of Oakville and Halton Region. Email correspondence has been included in Appendix A.

2 Existing Conditions

2.1 Area Road Network

Bronte Road

Bronte Road is a Region of Halton arterial road with a four-lane and divided urban cross-section. The Halton Region Transportation Master Plan (TMP) protects a 47-metre right-of-way for class C4 arterial roads, which includes Bronte Road. Boulevard-separated sidewalks are provided on both sides of the road. Left turn lanes are included at major intersections. A 60 km/h posted speed limit applies. The Region's TMP includes the widening of Bronte Road to six lanes in the future from Speers Road to Highway 407 starting in 2025. Bronte Road will be designated as a transit corridor with two of the lanes implemented as HOV lanes.

Upper Middle Road

Upper Middle Road is a Region of Halton arterial road with a four-lane and divided urban cross-section. The Halton Region Transportation Master Plan protects a 47-metre right-of-way for class C4 arterial roads, which includes Upper Middle Road. Boulevard-separated sidewalks are provided on both sides of the road east of the intersection at Bronte Road and only on the north side west of the intersection. West of the intersection at Bronte Road, the road transitions to two lanes. Left turn lanes are included at major intersections. A 60 km/h posted speed limit applies. The Region's TMP includes the widening of Upper Middle Road to six lanes in the future from Bronte Road to Neyagawa Boulevard starting in 2027.

Charles Cornwall Road

Charles Cornwall Road is a Town of Oakville local road with a two-lane cross section. It provides access to the Woodlands Operations Centre. The right-of-way is measured to be 22 metres. A 20 km/h posted speed limit applies.

2.2 Existing Intersections

Upper Middle Road at Bronte Road

The intersection of Upper Middle Road at Bronte Road is a signalized intersection with two auxiliary left turn lanes on the westbound approach and one auxiliary left turn lane on all other approaches. Right turn lanes are provided on all approaches. Crosswalks and associated pedestrian signal heads and call buttons are provided on the west, north, and east legs of the intersection. There is a multi-use pathway on the west side of Bronte Road and the north side of Upper Middle Road, alongside the sidewalks. Figure 3 illustrates the intersection of Upper Middle Road at Bronte Road.

Figure 3: Upper Middle Road at Bronte Road*Saw Whet Boulevard at Bronte Road*

The Saw Whet Boulevard at Bronte Road intersection is newly constructed. Under the interim conditions as of April 2022, it formed a T-intersection that was stop-controlled on the minor road, Saw Whet Boulevard. The northbound approach consisted of two through lanes, and a dedicated right-turn lane. The southbound approach consists of two through lanes and a dedicated left-turn lane. The westbound approach consisted of one lane and was reserved for right turns only with signage and bollards installed to block the left turns. In late 2022, the bollards were removed, and the westbound approach now consists of a dedicated left turn lane and a shared through / right-turn lane. The intersection becomes a signalized four-leg cross-intersection. The northbound approach consists of a dedicated left-turn lane, two through lanes, and a dedicated right-turn lane. The southbound approach consists of a dedicated left-turn lane, a through lane, and a shared through / right-turn lane. Currently the eastbound approach is a private driveway to a detached residence. A north-south crosswalk is present at the east, north and west legs of the intersection. Figure 4 illustrates the current configuration of the Saw Whet Boulevard at Bronte Road intersection. The intersection will be further developed as the surrounding developments and the eastbound approach are being constructed.

Figure 4: Saw Whet Boulevard at Bronte Road



Charles Cornwall Road at Bronte Road

The signalized intersection to the Halton Regional Centre at Bronte Road includes auxiliary left turn lanes on the north and south approaches. The west approach is a driveway to a few residential properties adjacent to Bronte Road. An exclusive right turn lane and exclusive left turn lane are provided on the east approach. An exclusive right turn lane is provided on the south approach into the Halton Regional Centre Access. The only east-west crosswalk that is provided is present on the north leg of the intersection. Pedestrian signal heads and call buttons are present on the north, west, and east legs of the intersection. Figure 5 illustrates the signalized intersection at Charles Cornwall Road at Bronte Road.

Figure 5: Charles Cornwall Road at Bronte Road



2.3 Cycling and Pedestrian Facilities

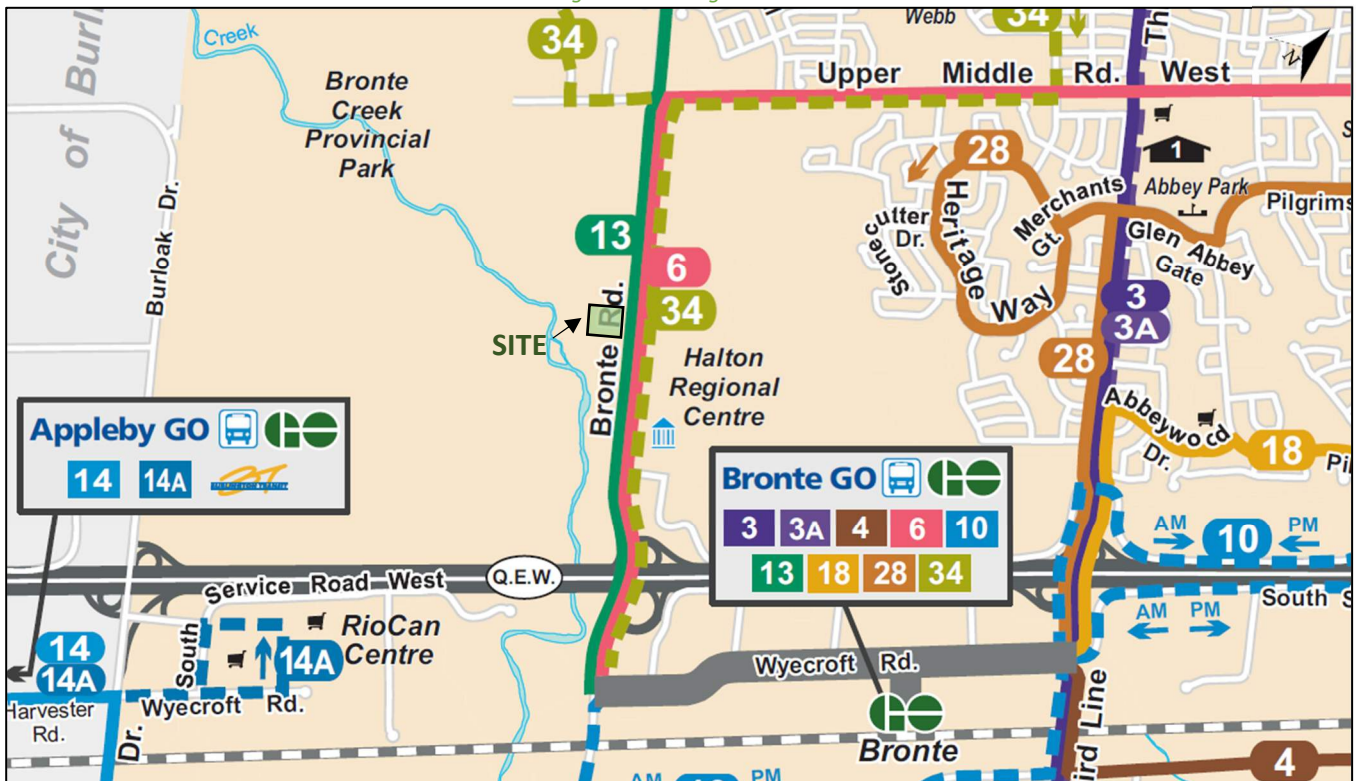
Cycling facilities in the Study Area are currently provided via a boulevard multi-use trail adjacent to the sidewalk along the west side of Bronte Road and the north side of Upper Middle Road. Crosswalks are present at all the Study Area intersections. Sidewalks are provided along both sides of Bronte Road from Upper Middle Road to North Service Road West and Upper Middle Road east of Bronte Road. Sidewalks are provided along the north side of Upper Middle Road east of Bronte. The sidewalk is boulevard-separated on the east side for these extents and on the west side from Upper Middle Road to Charles Cornwall Road. An existing multi-use trail located on the west side of Bronte Road provides north-south active transportation connections and opportunities for additional trails through the protected parkland system along Bronte River.

The Technical Appendix K in the Town of Oakville Active Transportation Master Plan (ATMP) refers to the Halton Region Active Transportation Network and Road Capital Projects. This document outlines proposed bike lanes along Bronte Road and Upper Middle Road. The Halton Region Transportation Development and Non-Development Capital Implementation plan as part of this Appendix notes that these infrastructure changes will have a start year of construction of 2025. For more information on cycling and pedestrian facilities, the Town of Oakville and Halton Region Active Transportation Maps are attached in Appendix B.

2.4 Existing Transit

As of 2023, Oakville Transit Route #13 runs along Bronte Road with eastbound destination of Oakville GO station and westbound destination of Bronte GO station. Routes #6 and #34 also run along Bronte Road as well as Upper Middle Road. The existing Study Area Oakville Transit service is presented in Figure 6.

Figure 6: Existing Transit



Source: www.oakvilletransit.ca Accessed on April 11, 2023

2.5 Existing Peak Hour Travel Demand

To understand the existing AM and PM peak hour traffic volumes turning movement counts for the Study Area intersections have been acquired from Halton Region. Table 1 summarizes the date of the most recent turning movement count at each Study Area intersection.

Table 1: TMC Data Dates

Data Type	Location	Count Date
Turning Movement Counts (TMC)	Charles Cornwall Road at Bronte Road	December 4, 2019
	Upper Middle Road at Bronte Road	October 29, 2019

The turning movement counts were undertaken in 2019, approximately two years prior to the original study horizon of 2021. To reflect a 2021 horizon a compound annual growth rate (CAGR) had been applied to reflect growth outside of the Study Area. The Region proposes a 2% compound annual growth rate for Bronte Road to be applied to the Study Area Traffic Volumes.

This May 2023 update to the transportation impact study considered 2023 as the existing conditions. Typically, more recent turning movement counts would be collected for the purpose of such exercise. However, the traffic volumes in the past few years have been impacted by the travel restrictions imposed due to the COVID-19 pandemic and long-term observation will be required to determine whether the current traffic volumes have converged to a “new normal”. Therefore, the 2019 data were considered to be appropriate as they represent the peak volumes in the recent years, providing a conservative and reliable base year volume. The same 2% CAGR for Bronte Road was applied to the Study Area Traffic Volumes to adjust the volumes to the 2023 level. The low-rise components of the Bronte Green residential development included as part of the future background traffic in the original TIS have been constructed as of 2023. Therefore, the site traffic volumes from these developments are also included in the existing 2023 horizon volumes.

Turning movement count data is included in Appendix C. Figure 7 illustrates the existing 2023 traffic volumes. Figure 8 illustrates the existing pedestrian volumes. Cyclists are assumed to utilize the multi-use pathway along Bronte Road.

Figure 7: 2023 Existing Traffic Volumes

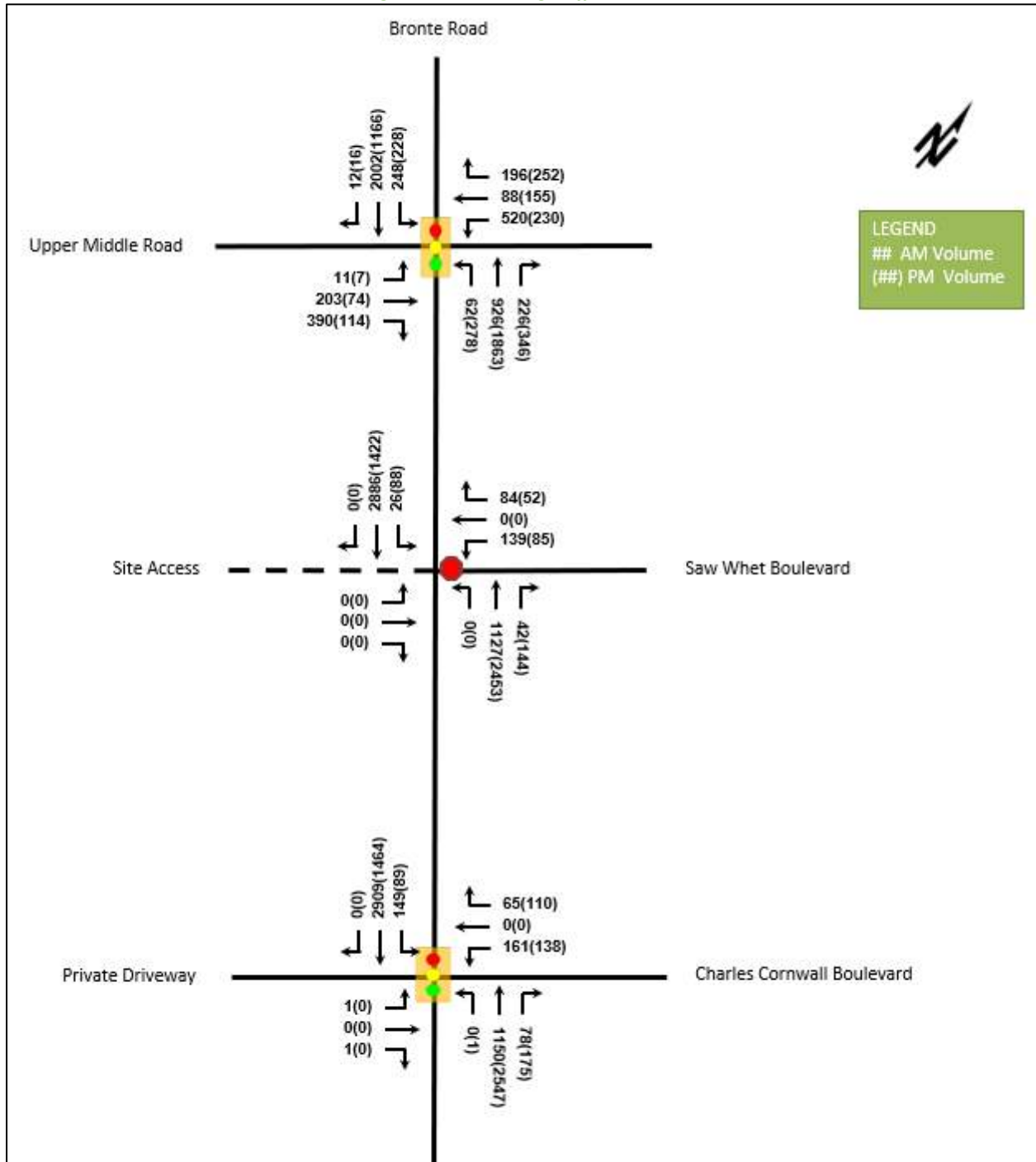
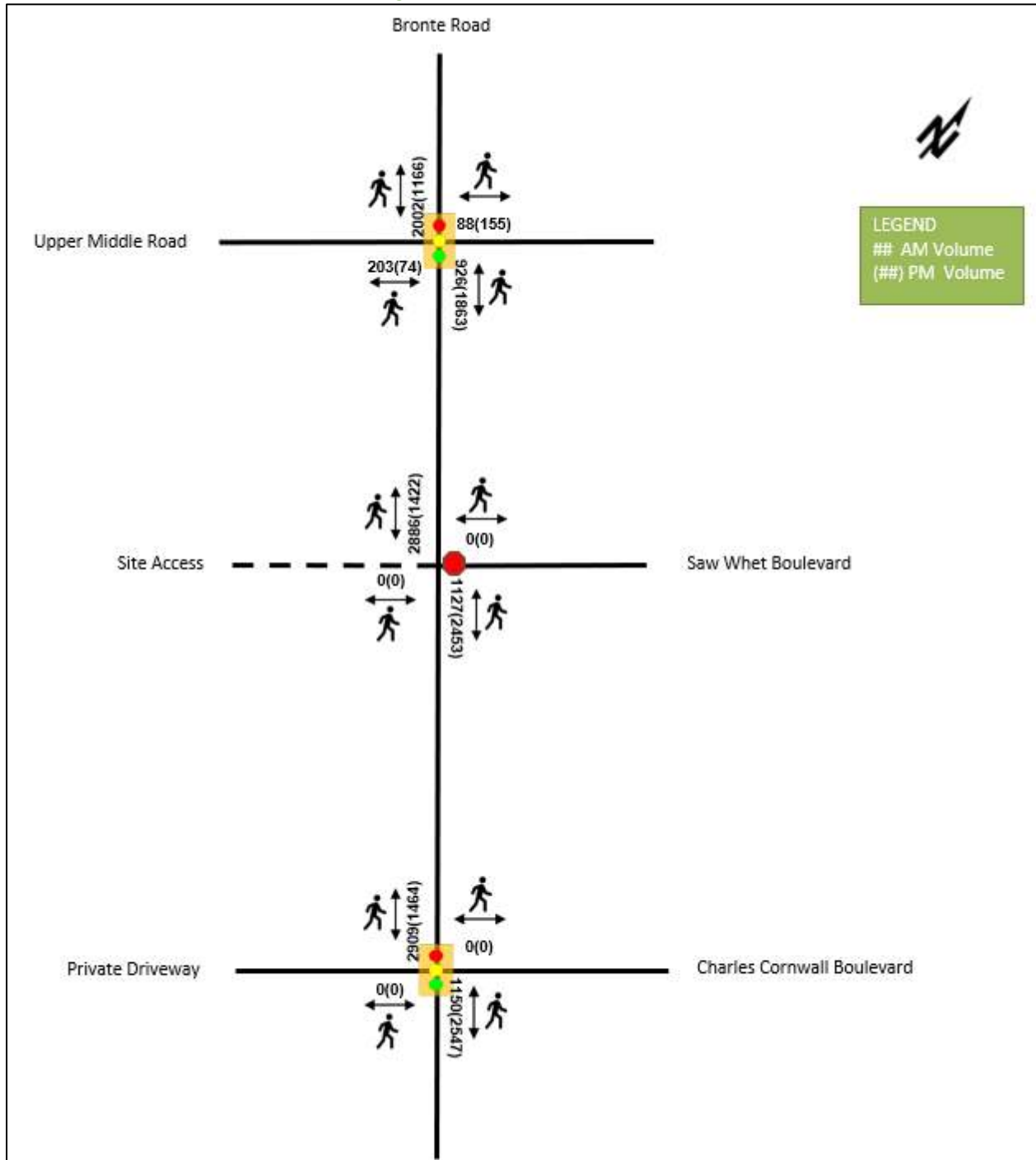


Figure 8: 2023 Pedestrian Volumes



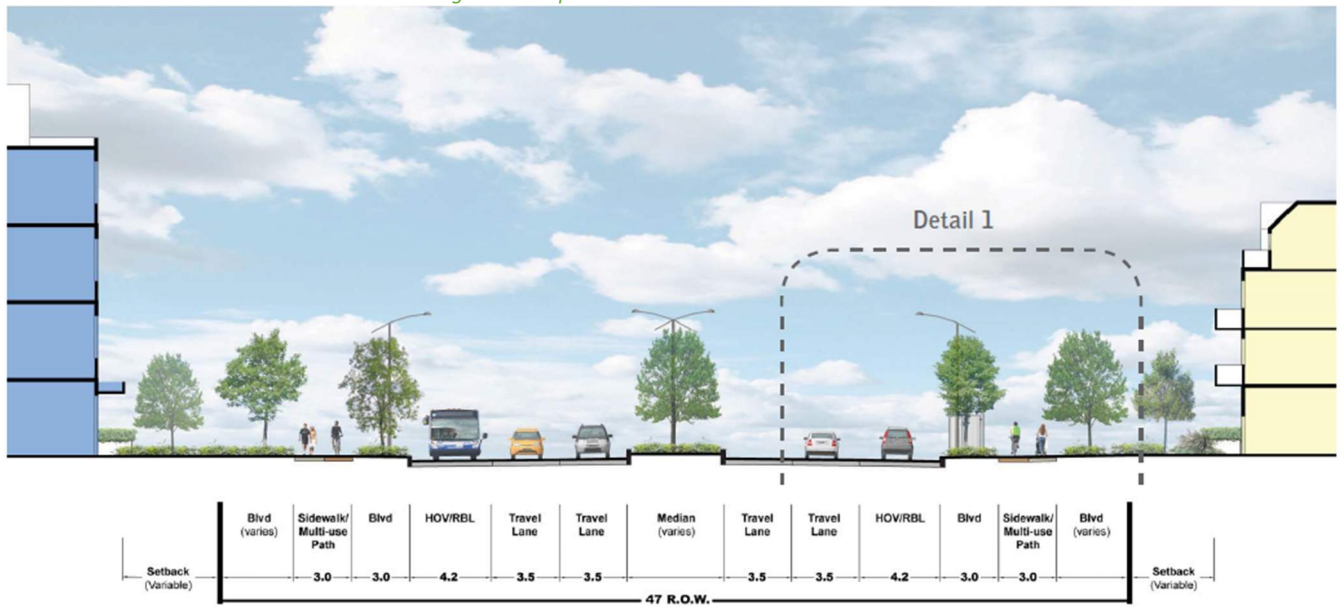
3 Future Background Conditions

3.1 Planned Conditions

3.1.1 Bronte Street HOV / RBL Lanes

Bronte Road is currently a two-lane road in each direction, with all lanes operating as general-purpose traffic lanes with no vehicle restrictions. The widening of Bronte Road from four to six lanes between Speers Road and Highway 407 is planned for 2025. Once widened, the two outer lanes of Bronte Road will be dedicated to high occupancy vehicles including transit as Bronte Road has been identified as a priority bus corridor as part of the Preliminary 2031 Halton Region Transit Priority Network. Additionally, Transit Signal Priority will be implemented throughout the entirety of Bronte Road within the Study Area. The cross-section for 47-metre-wide roadways, proposed as part of the Halton Region Transportation Master Plan, can be seen in Figure 9.

Figure 9: Proposed Bronte Road Cross Section



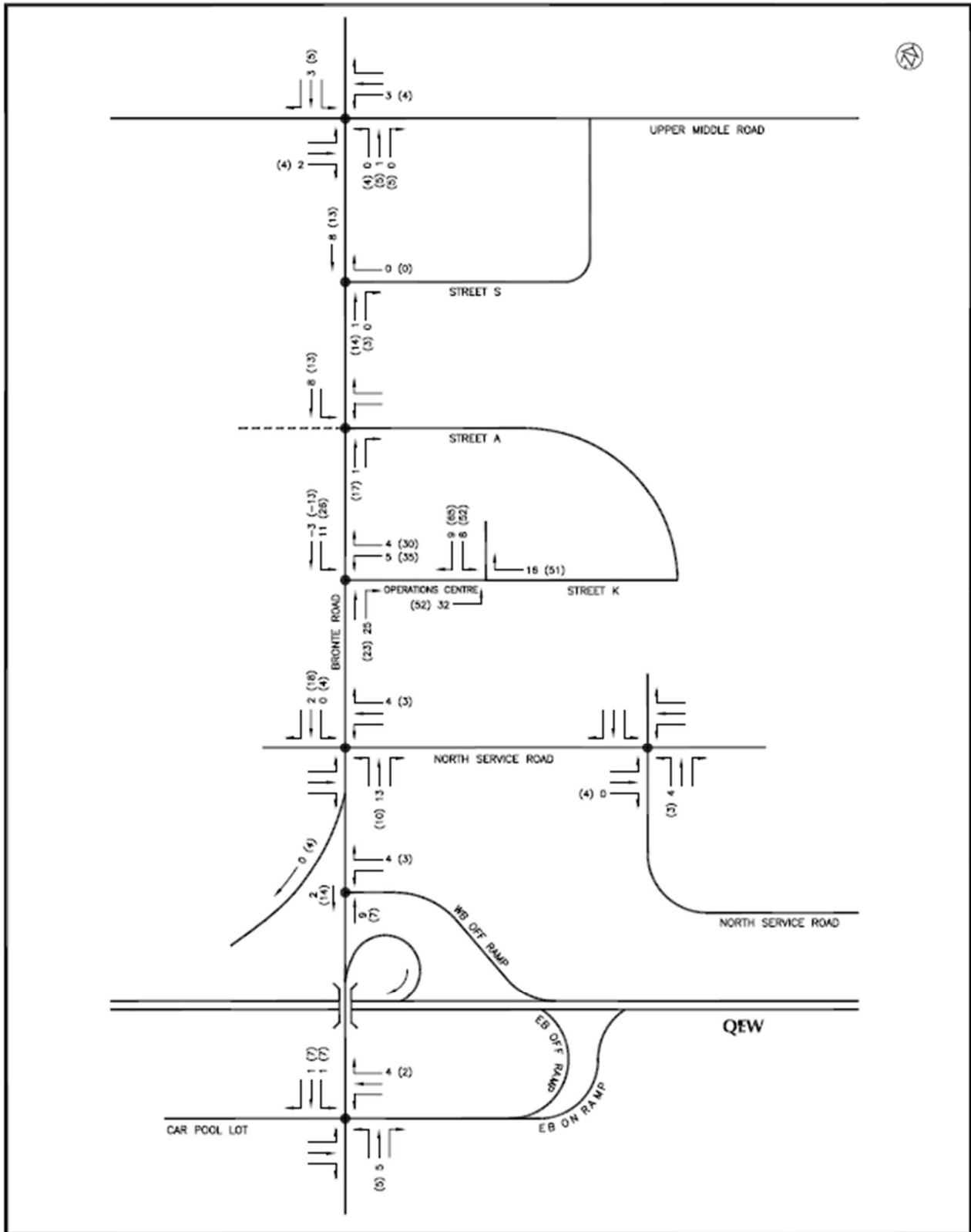
3.1.2 Other Study Area Developments

Adjacent to the 1354 Bronte Road development are the Bronte Green development and the Bronte River development. These developments will share a full-movement access with the subject property via future signalized intersection along Bronte Road at Saw Whet Boulevard.

3.1.2.1 Bronte Green Development

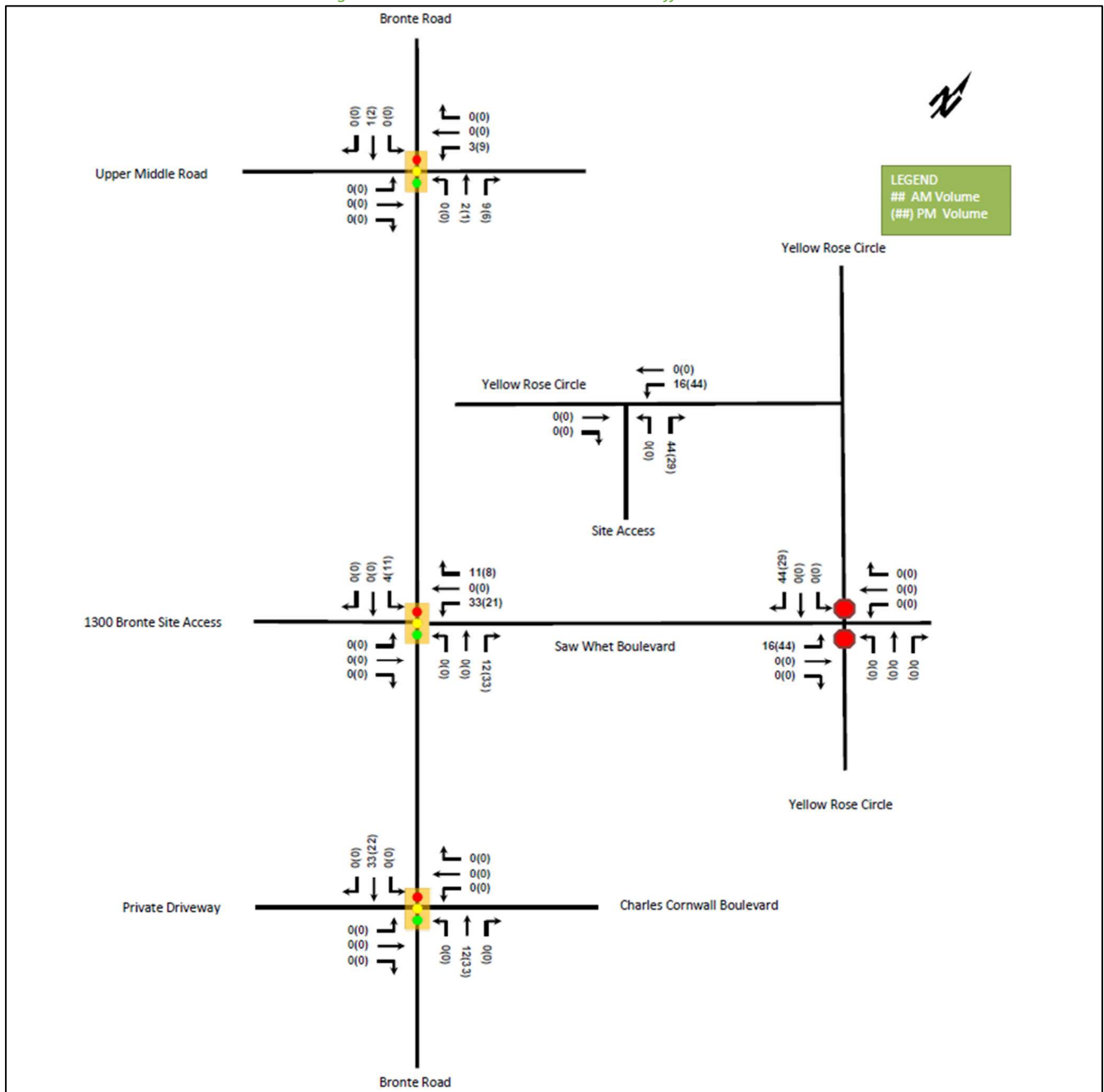
The Bronte Green subdivision is located on the former Saw Whet golf course lands, east of the proposed development. This development includes 164 freehold townhouse units, 443 detached units, 498 units in a residential condominium block, 76 units in a common-elements condominium block, and some future commercial lands at the south end of the property. Adjacent to the central access at Saw Whet Boulevard are two mid-rise residential condominiums. The 2017 TIS update for Bronte Green assumes 270 units between the two developments. One of these developments has since been updated with a new unit count, and as a result, 335 units have been considered for this block. Figure 10 and Figure 11 illustrate the residential and commercial components of traffic generation of the Bronte Green Development in the 2017 update. Figure 12 and Figure 13 illustrate the site trips generated in addition due to the updated unit count in 2026 and 2031, respectively. That study is ongoing and the volumes below have not yet been approved by the Town of Oakville or Halton Region.

Figure 11: Bronte Green TIA Commercial Traffic Generation



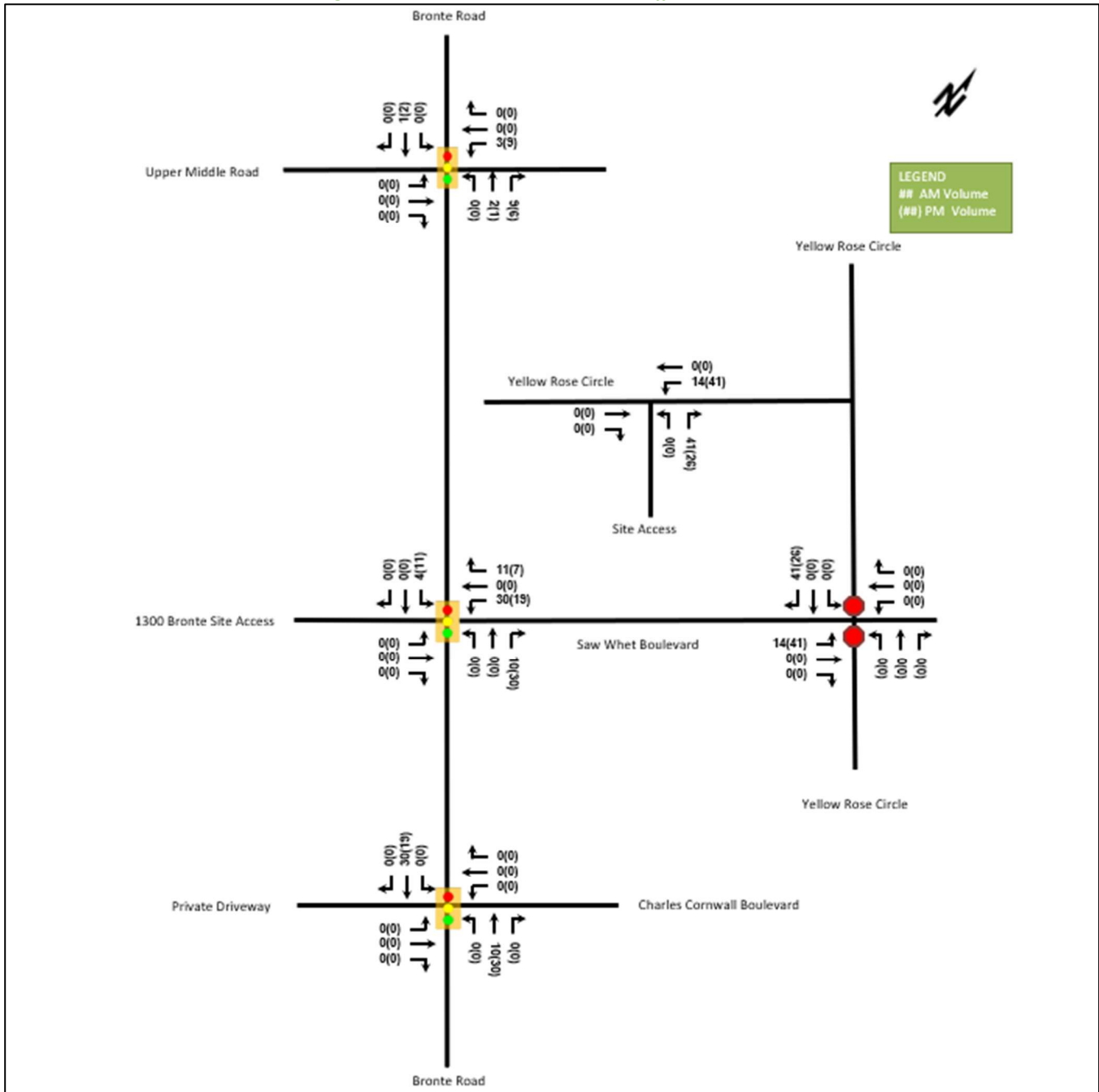
Source: Bronte Green Subdivision Traffic Impact Study; Read, Voorhees & Associates; April 2017

Figure 12: Bronte Green Mid-Rise 2026 Traffic Generation



Source: Valery Homes 1354 Bronte Road Transportation Impact Study; CGH Transportation

Figure 13: Bronte Green Mid-Rise 2031 Traffic Generation

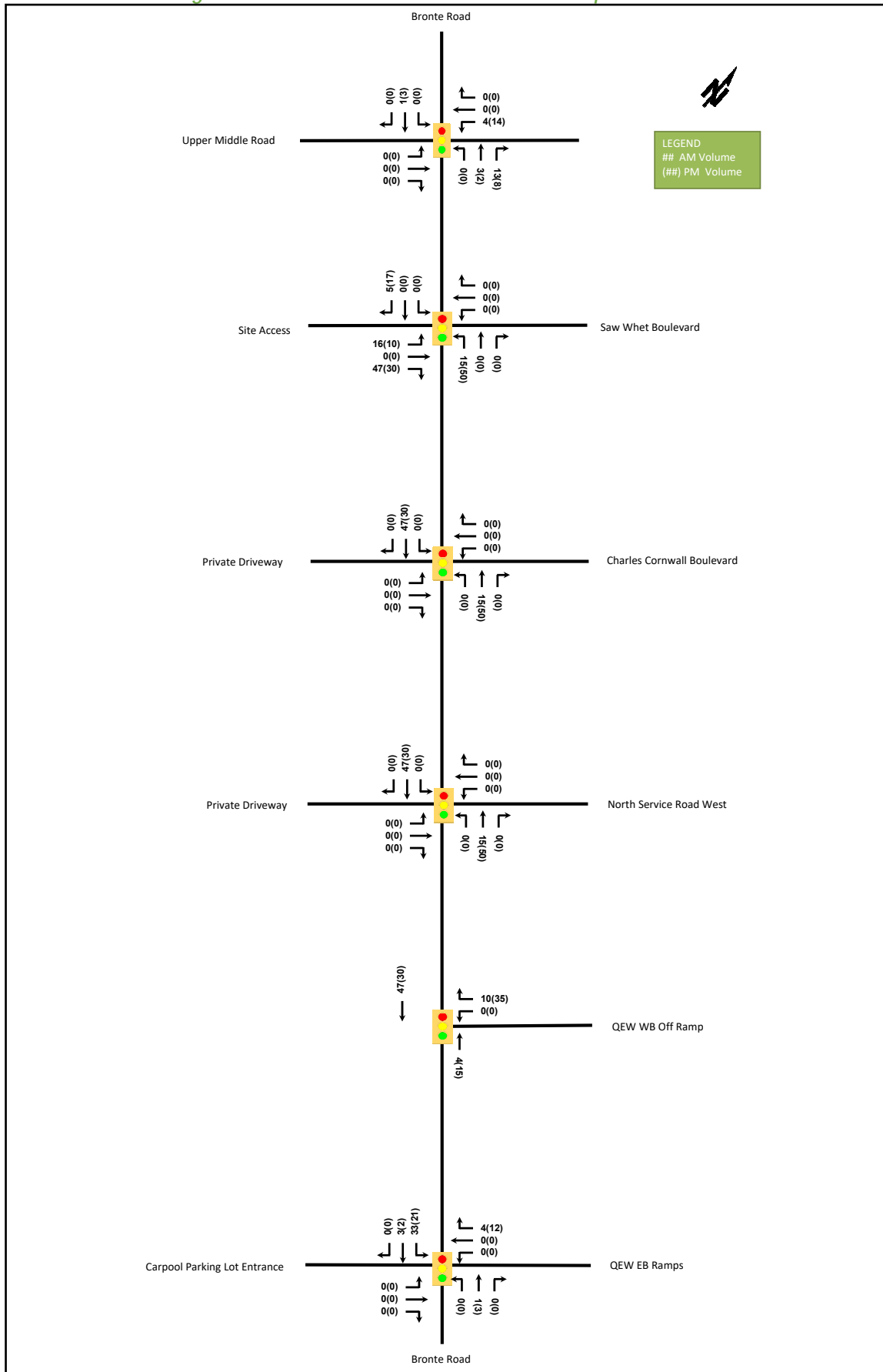


Source: Valery Homes 1354 Bronte Road Transportation Impact Study; CGH Transportation

3.1.2.2 Bronte River Development

South of the proposed development is ARGO’s Bronte River development. This residential development is located at 1300-1350 Bronte Road. It will consist of 86 single detached units and 89 townhouses. It will utilize the Saw Whet Boulevard intersection with Bronte Road to access the arterial road network. Figure 14 illustrate the traffic generation figures for the Bronte River development for 2026 and 2031, respectively. That study is ongoing, and the volumes below have not yet been approved by the Town of Oakville or Halton Region.

Figure 14: Bronte River 2026 and 2031 Site Trip Generation



3.1.3 Background Growth

As discussed in Section 2.5, historical traffic counts have been reviewed to determine the historical growth rate. A 2% compound annual growth rate was selected.

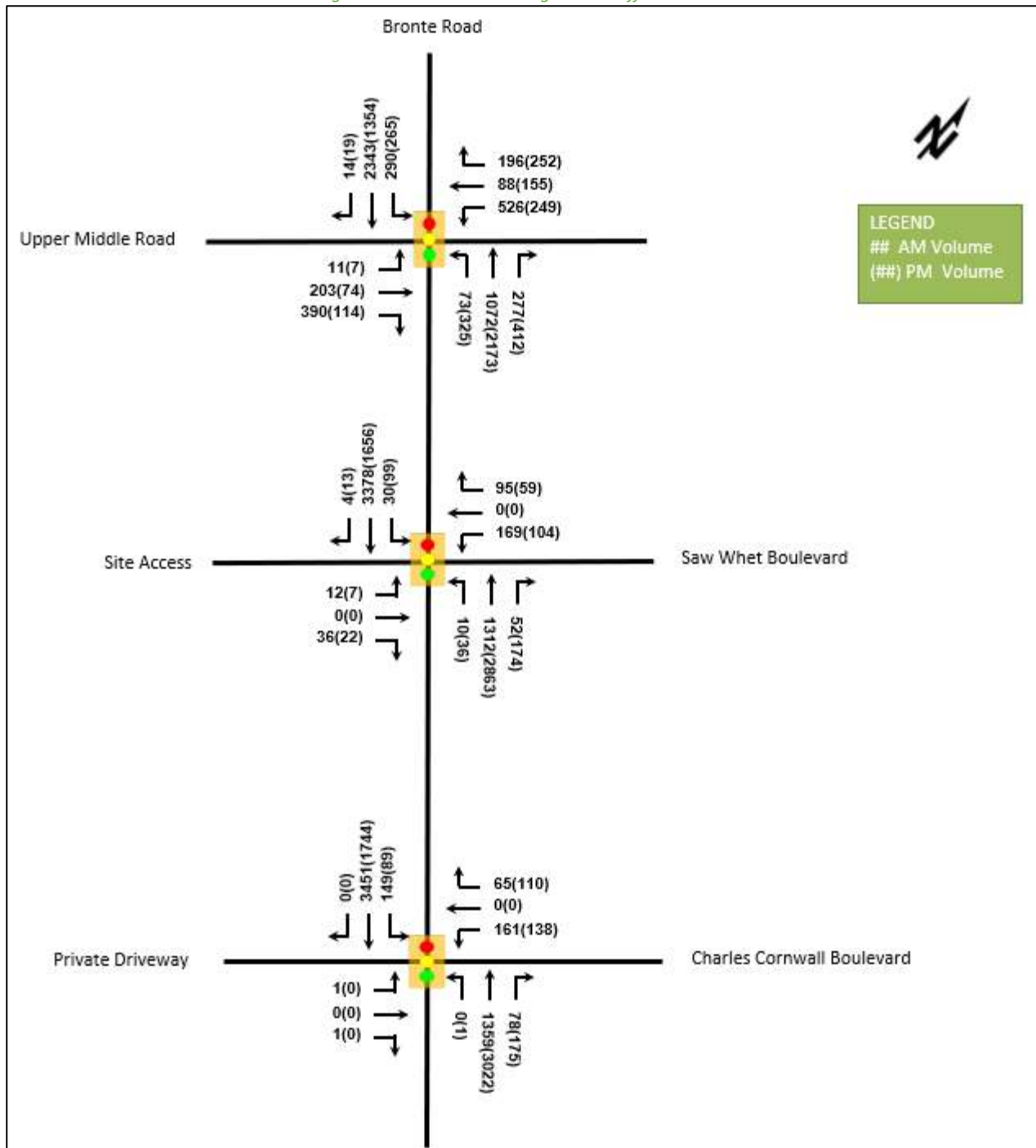
3.1.4 Future Background Traffic Volumes

Combining the background development traffic, the background growth rate, and the existing traffic volumes, the Future Background traffic volumes were projected. Figure 15 illustrates the 2026 Future Background traffic volumes and Figure 16 illustrates the 2031 Future Background traffic volumes.

Figure 15: 2026 Future Background Traffic Volumes



Figure 16: 2031 Future Background Traffic Volumes



4 Forecasting

4.1 Development-Generated Travel Demand

4.1.1 Trip Generation and Mode Shares

The ITE Trip Generation Manual 10th Edition has been reviewed to determine the appropriate trip generation rate equations for the proposed land uses. The rate equations were used to determine appropriate vehicle trip generation rates. The Multifamily Housing (Mid-Rise) land use category is used to estimate trips for townhouses and the Single Family Detached Housing land use category is used to estimate trips for the detached houses. Table 2 summarizes the person trip rates for the proposed land uses.

Table 2: ITE Trip Generation Vehicle Trip Rates

Dwelling Type	ITE Land Use Code	Unit Count	Peak Hour	Vehicle Trip Rate	Method
Multifamily Housing (Mid-Rise)	221	110	AM	0.34	Fitted Curve
			PM	0.44	Fitted Curve

Using the above trip rates, the total trip generation for the Valery Homes development is summarized in Table 3. No synergy or pass-by trip reduction factors have been applied to the trip generation.

Table 3: Total Trip Generation

Land Use	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Total Trips	10	27	37	29	19	48

To determine the appropriate mode shares to be applied to each Study horizon, the existing mode share calculated from 2016 Transportation Tomorrow Survey (TTS) data, mode share targets in Oakville’s TMP, and mode share targets in Halton Region’s TMP have been considered.

The 2016 TTS mode share in the surrounding zones (4042, 4043) for home-based trips during the AM and PM peak periods is 66% auto driver, 10% auto passenger, 11% transit, and 13% active modes. The Halton Region projection for 2031 is 72% auto driver mode share and 20% transit mode share. The mode shares eventually used for the 2031 and 2036 horizons in this Study are the mode share targets achievable under Scenario D outlined in the 2018 Town of Oakville Transportation Master Plan Review, as indicated by the Town staff. Scenario D sees growth in active transportation, transportation demand management, and local transit, and higher growth in inter-regional transit. The 20% transit mode split target identified under the previous TMP is still the goal, however, it is considered to be beyond 2031. It has a lower transit percentage than the Halton Region Transportation Master Plan projections to 2031. The Town’s projections would be considered more relevant in describing the mode share changes in the Town of Oakville, rather than those across the entire Region. The existing and projected mode share percentages during peak hours are summarized in Table 4.

As the Scenario D has been projected for 2031, the mode shares for 2026 would typically be interpolated using the existing and the 2031 projection percentages assuming a linear growth. However, the 2016 TTS mode shares show an auto driver percentage lower than both the Region’s and Town’s projections. This is assumed to be due to the 2006 and 2011 TTS mode shares being used as the base scenarios while developing the Transportation Master Plan, whereas this study has used the more recent 2016 TTS data. The TTS result is justifiable as transit service is available on every arterial road and some residential collectors within these TTS zones and infrastructure such as schools, community centres and commercial blocks are within proximity. These conditions enable the area

to have a lower share of auto mode and results in a higher potential for the subject site to meet the Town’s target earlier. Also, the vehicle trips projected using 80% instead of 76% auto driver mode share will only differ by 4 and 7 trips during AM and PM, respectively, which will not impact the analysis results. Therefore, the 1354 Bronte Road development will generate the same two-way vehicle trips during the AM and PM peak hours in 2026 and 2031. Using the above mode shares and trip rates, the trips by mode have been projected and summarized in Table 5.

Table 4: Mode Share Assumptions

Travel Mode	2016 TTS Mode Share	2031 Regional Projection	2031 Oakville Projection Scenario D	2026 Applied	2031 Applied
Auto Driver	66%	72%	76%	76%	76%
Transit	11%	20%	12%	12%	12%
Active Transportation	13%	5%	6%	6%	6%
TDM	10%	3%	6%	6%	6%
Total	100%	100%	100%	100%	100%

Using the above mode shares and person trip rates, the person trips by mode have been projected. Table 5 summarizes the 2026 and 2031 trip generation by mode.

Table 5: 2026 and 2031 Trip Generation by Mode

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Auto Driver	76%	8	21	28	22	14	36
Transit	12%	1	3	4	3	2	6
Transit	12%	1	3	4	3	2	6
Active Modes	6%	1	2	2	2	1	3
Total	100%	8	23	31	25	16	41

As shown above, the site is projected to generate 20 AM and 27 PM peak hour two-way auto trips in the 2026 and 2031 horizons.

4.1.2 Trip Distribution

To understand the travel patterns of the subject development the Transportation Tomorrow Survey (TTS) has been reviewed to determine the existing travel patterns for Oakville. Table 6 below summarizes the distribution.

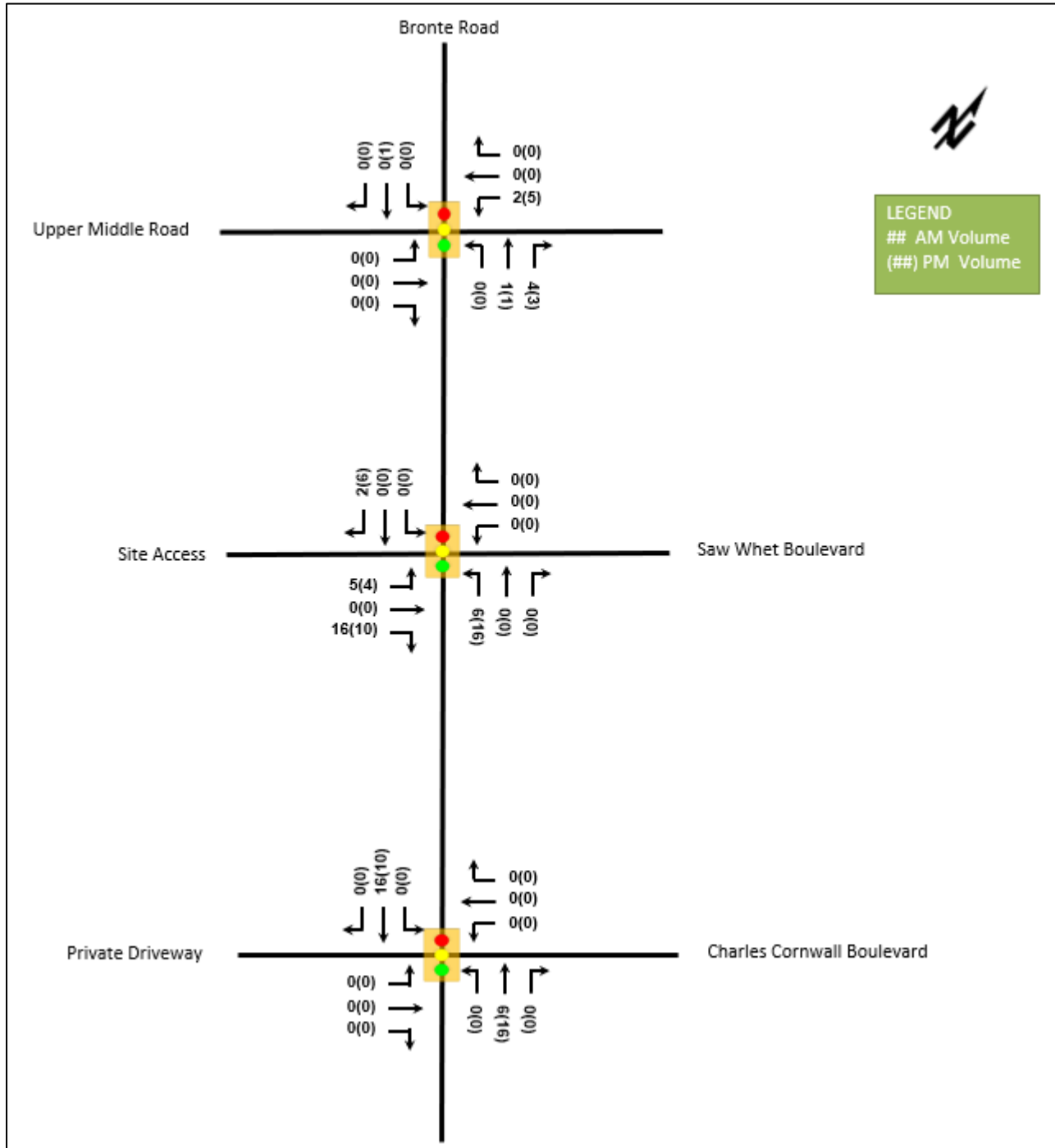
Table 6: 2016 TTS Trip Distribution

To/From	Percent of Trips
North	34%
South	14%
East	47%
West	5%
Total	100%

4.1.3 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the Study Area road network. The intersection at Saw Whet Boulevard and Bronte Road has been assumed to be actuated on the minor approach and coordinated along the Bronte Road corridor. The 2026 and 2031 trip generation are illustrated in Figure 17.

Figure 17: 2026 and 2031 Site Trip Generation



4.1.4 Future Total Travel Demands

The site generated traffic has been combined with the 2026 and 2031 Future Background traffic volumes to estimate the Future Total traffic volumes. Figure 18 illustrates the 2026 Future Total traffic volumes and Figure 19 illustrates the 2031 Future Total traffic volumes.

Figure 18: 2026 Future Total Traffic Volumes

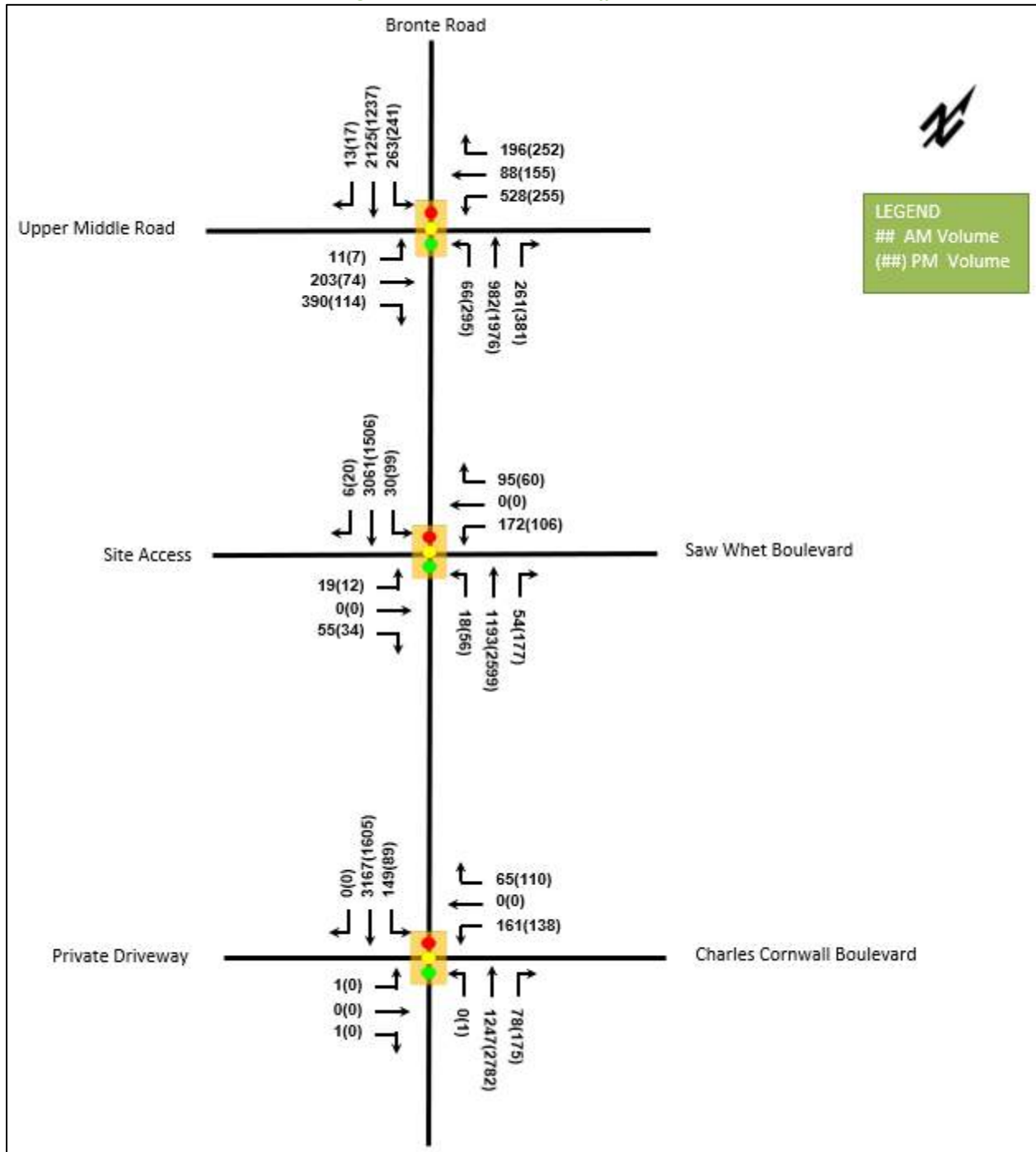
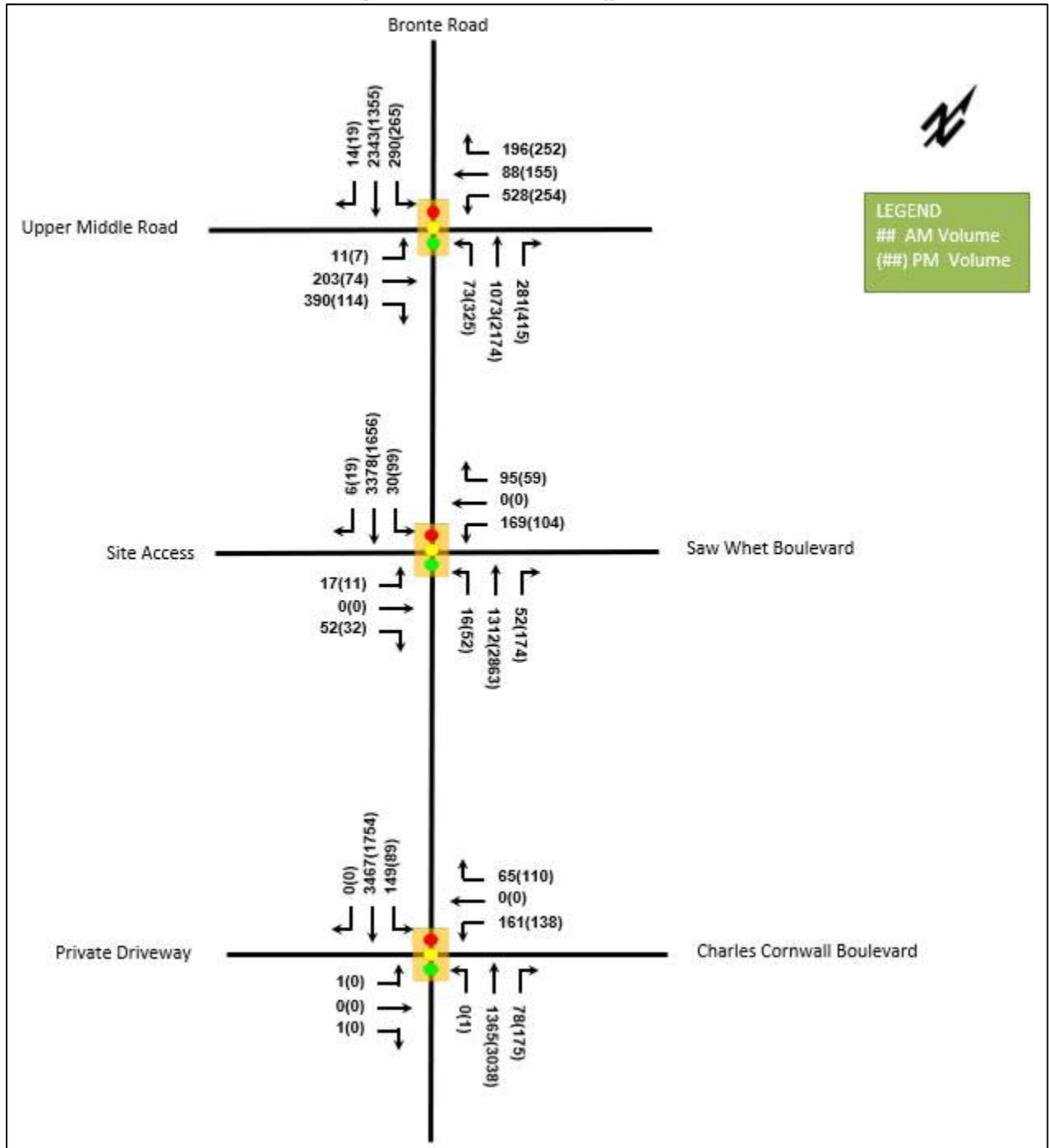


Figure 19: 2031 Future Total Traffic Volumes



5 Development Design

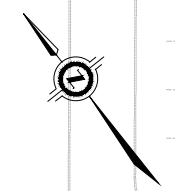
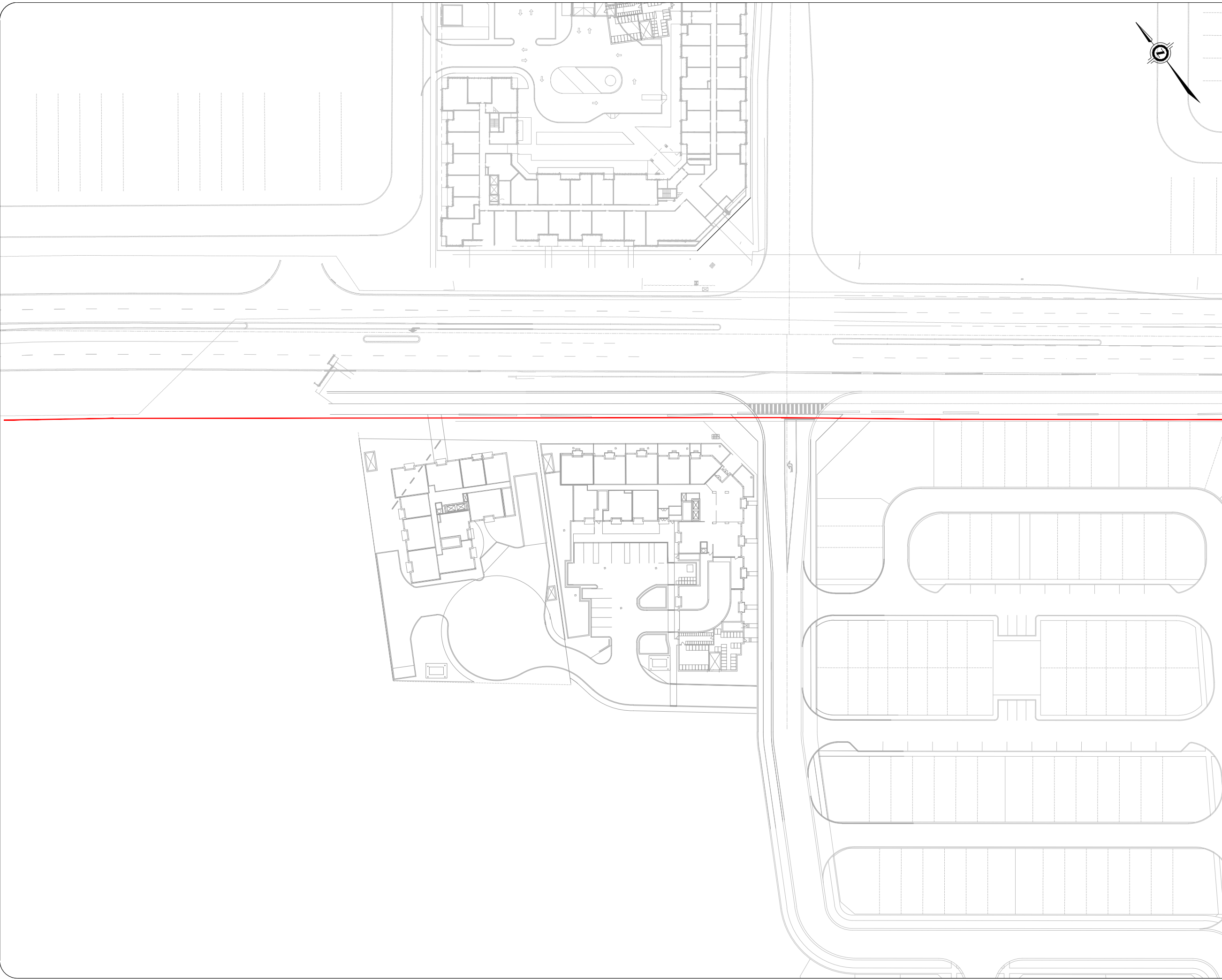
5.1.1 Transportation Demand Management

The proposed development includes mid-rise residential units. In these types of development, one of the most effective Transportation Demand Management (TDM) measures address access and usability of transit, cycling, and pedestrian facilities. To this end, the following plans have been created to illustrate the appropriate cycling (Figure 20), transit (Figure 21), and pedestrian (Figure 22) facilities. Transit stops have been assumed at the intersection of Saw Whet Boulevard and Bronte Road for transit along Bronte Road. As a result, the entire development is within a 400-metre walking distance to transit facilities. In addition, a multi-use pathway on the west side of Bronte Road provides residents with a cycling facility near the proposed development. Sidewalks are provided for site circulation and a direct connection to the Bronte Road corridor.

The following TDM Measures are anticipated to be provided, but the details will be confirmed through the final design and implementation of the site:

- Provide a multimodal travel option information package to new residents
- Offer PRESTO cards preloaded with one monthly transit pass on initial residence purchase/move-in, to encourage residents to use transit (Note: As these would be purchased in bulk it is requested that Town of Oakville provide a bulk purchase rate if this is agreed to)
- Provide visitor and resident bicycle parking in accordance with the Town of Oakville By-law 2014-014

Figure 20: Cycling Concept Plan



Notes:

LEGEND:
— Multipurpose Pathway

03	Issued for Review	AN	2023-07-24
02	Issued for Review	AN	2023-06-20
01	Issued for Review	BB	2021-12-21
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			



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CLIENT: **Valery Homes**
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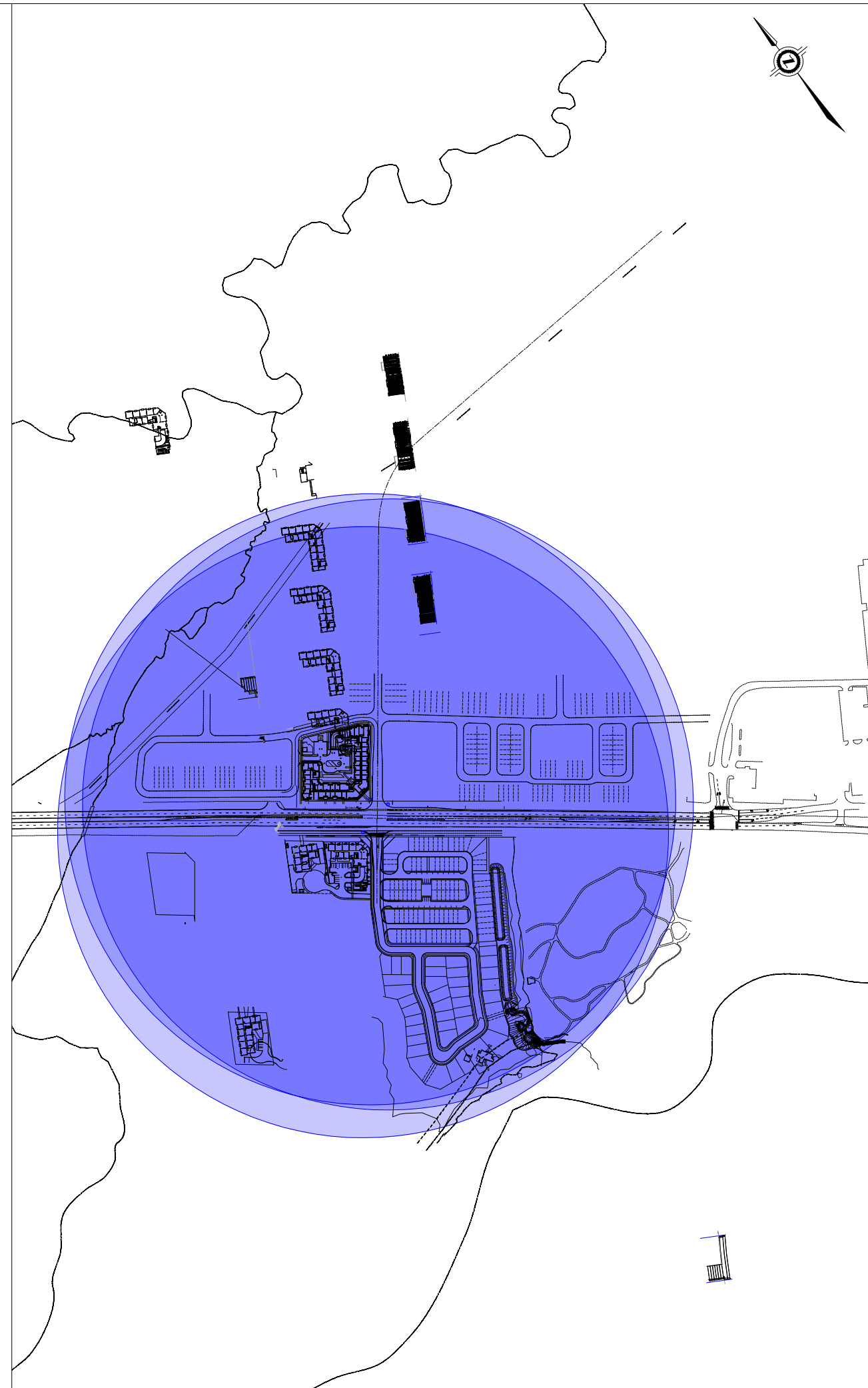
ARCHITECT:

SITE:
1354 Bronte Road

TITLE:
Cycling Facilities

SCALE AT A3: NTS	DATE: 2023-07-24	DRAWN: AN	CHECKED: MC
PROJECT NO: 2021-109	DRAWING NO: 001	REVISION: 03	

Figure 21: Transit Concept Plan



Notes:

LEGEND:
— 400m Transit Walking Distance

03	Issued for Review	AN	2023-07-24
02	Issued for Review	AN	2023-06-20
01	Issued for Review	BB	2021-12-21
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			

CGH Transportation
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CLIENT: **Valery Homes**
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 Hamilton, ON
 L8K 1W6

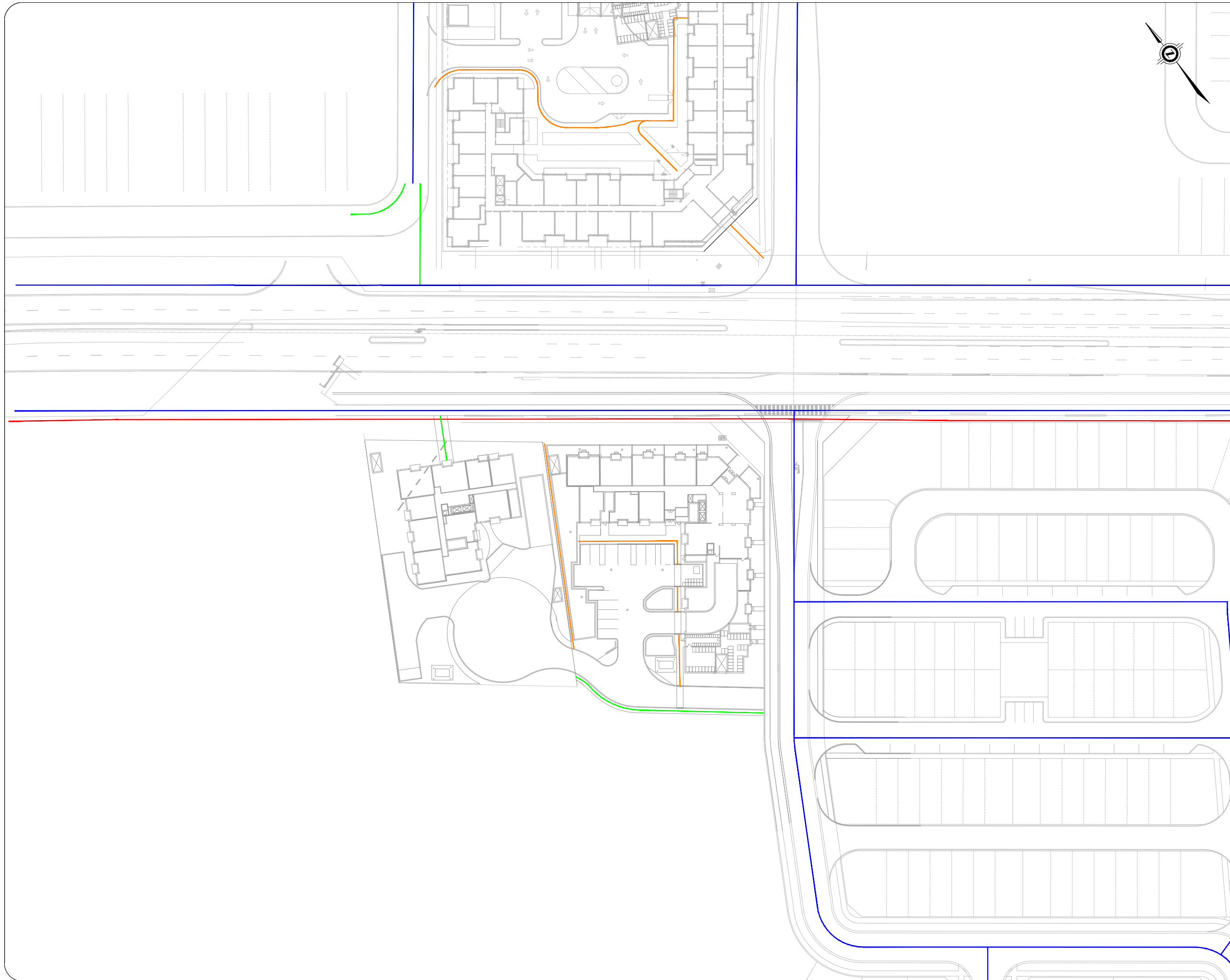
ARCHITECT:

SITE:
1354 Bronte Road

TITLE:
Transit Facilities

SCALE AT A3: NTS	DATE: 2023-07-24	DRAWN: AN	CHECKED: MC
PROJECT NO: 2021-109	DRAWING NO: 003	REVISION: 03	

Figure 22: Pedestrian Concept Plan



Notes:

LEGEND:

- Sidewalk Both Sides
- Site Interior Sidewalk
- Sidewalk One Side
- Multipurpose Pathway

03	Issued for Review	AN	2023-07-24
02	Issued for Review	AN	2023-06-20
01	Issued for Review	BB	2021-12-21
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			



CGH Transportation
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CLIENT: Valery Homes
 2140 King St. E.
 Hamilton, ON
 L8K 1W6

ARCHITECT:

SITE:
1354 Bronte Road

TITLE:
Pedestrian Facilities

SCALE AT A3: NTS	DATE: 2023-07-24	DRAWN: AN	CHECKED: MC
PROJECT NO: 2021-109	DRAWING NO: 002	REVISION: 03	

5.1.2 Parking

A total of 165 parking spaces, including 12 surface parking spaces and 153 underground parking spaces divided between two levels, are proposed. Among them, six (6) are barrier-free parking spaces including three (3) Type A and three (3) Type B spaces.

The parking provisions for the proposed development have been reviewed using the Town of Oakville Zoning By-law 2014-014. Table 7 documents the required parking along with the parking provisions.

Table 7: Vehicle Parking Requirements

Type	GFA (s.m.)/ Units	Parking Rate	Parking Spaces Required	Parking Spaces Provided
Mid-rise	110	Residents: 1.5 spaces/unit	165	165
	110	Visitors: Of the total number of parking spaces required, 0.25 of the parking spaces required per dwelling shall be designated as visitors parking spaces.	110 x 0.25 = 28	28
Total			165 (incl. 28 visitor) minimum	165 (incl. 28 visitor)

As shown in the table above based on the by-law requirements, a total of 165 parking stalls are required. Twenty-eight of the total parking spaces must be dedicated to visitor parking. Since space is limited at-grade, given the location of the garage door access to underground parking, and the need to provide road access to the potential future development to the north from Saw Whet Boulevard, 16 of the visitor parking spaces are accommodated underground. The Zoning By-law requirements have been satisfied.

The provision of barrier-free parking spaces has been reviewed in accordance with Section 5.3 in the Town of Oakville Zoning By-law 2014-014. Table 8 summarizes the barrier-free parking space requirement and provision.

Table 8: Barrier-Free Vehicle Parking Requirements

Parking Spaces Provided	Total Number of Parking Spaces in all Parking Areas on the Lot	Minimum Number of Barrier-free Parking Spaces	Parking Spaces Required	Parking Spaces Provided
165	101 to 200	1, plus 3% of the total number of parking spaces in the parking area	6	6

For 6 barrier-free parking spaces required, an equal number of Type A and Type B barrier-free parking spaces shall be required; thus, there should be a minimum of 3 Type A and 3 Type B barrier-free parking spaces provided on site. The barrier-free parking space provisions meet the zoning requirements.

The bicycle parking provisions for the proposed development have been reviewed using the Town of Oakville By-law 2014-014. Table 9 documents the required parking along with the parking provisions.

Table 9: Bicycle Parking Requirements

Type	GFA (s.m.)/ Units	Parking Rate	Parking Spaces Required	Parking Spaces Provided
Mid-rise (total)	110	Residents: 1.0 space/unit	110	134
	110	Visitors: 0.25 of total spaces for visitor parking	110 x 0.25 = 28	28
Total			110 (incl. 28 visitor) minimum	134 (incl. 28 visitor)

A total of 134 bicycle parking spaces have been proposed, exceeding the by-law requirement of 110 bicycle parking spaces. The visitor bicycle parking space requirement is based on the total spaces mandated by the zoning by-law. The additional bicycle parking can be utilized by both owners and visitors, depending on their needs.

5.1.3 Development Access

Access to the proposed development will be accommodated via a signalized intersection at Saw Whet Boulevard and Bronte Road. Given that access is also required by the Bronte River development as well as the Bronte Green development on the opposing side of Bronte Road, and that these developments will generate considerable traffic, a full movement access is proposed.

Using OTM Book 12 Justification 7, and the volume projections herein, the traffic control signal warrant for this intersection has been assessed in Appendix D for the 2031 Future Total horizon. Although a signal is not warranted for this intersection using Justification 7, it has been proposed to address high V/C ratios and delays. As the intersection is planned to be a signalized access, left turn lanes are provided on each approach. The eastbound left approach requires a 15-metre storage lane. The intersection configuration is included in Appendix E. To ensure lane alignment, there is a 3.5-metre-wide left-turn lane and a 5.0-metre-wide shared through / right-turn lane on the eastbound approach and a 3.5-metre-wide left-turn lane and a 3.5-metre-wide shared through / right-turn lane on the westbound approach. Town Staff have requested that the west side bus bay on Bronte Road be moved to the far-side of the intersection, where it is more accessible by residents on either side of Bronte Road via the signalized intersection. The relocation of the bus stop should be considered in the detailed design stage. During detailed design the current T-intersection will be designed to accommodate a full-moves intersection that is signalized and incorporates the bus stop at the most appropriate location. Concrete bus stop platform infrastructure will be included to ensure accessibility and allow amenities to be installed.

The proposed site plan and access configuration have been reviewed using a heavy single unit truck (HSU) and a Halton Region Garbage Collection truck as design vehicles. The truck will enter via the site access at Saw Whet Boulevard and Bronte Road. The design vehicles will be able to access the garbage pick-up and loading areas by pulling in or backing in. Appendix F includes drawings illustrating the turning paths for the design vehicle. All turning paths are accommodated by the proposed curbs and driveways.

6 Operational Analysis

To understand the operational characteristics of the Study Area intersections, a Synchro model has been created using Trafficware's Synchro (Version 11). The Synchro model has been coded using the existing traffic signal timing, provided by Halton Region. The Heavy Vehicle percentage (HV %) has been calculated for each turning movement at the Study Area intersections. All Heavy Vehicle percentages calculated to be less than 2% were entered into the Synchro model as 2% in order to produce a conservative analysis. These calculations are shown in Appendix G. All other parameters have been coded using accepted best practices and default parameters where applicable.

6.1 2023 Existing Conditions

The existing intersection volumes have been analyzed to establish a baseline condition and determine the impact of the subject development as well as the surrounding background developments on the Study Area road network. The Saw Whet Boulevard at Bronte Road intersection was modelled with the April 2022 interim configuration as described in Section 2.2, as an unsignalized intersection. The configuration modelled with mitigation measures was the configuration after the removal of the bollards, with the signal timing plan optimized for the traffic volumes. The current eastbound approach is a private driveway to a detached residence and was excluded from

the existing conditions operations as it deviates from the final configuration and the volumes to and from the driveway were minimal to impact the intersection. The intersection in future conditions road network will be modelled as a four-leg signalized intersection with the eastbound approach in its final configuration. Table 10 summarizes the operational analysis of the 2023 existing conditions. Appendix H contains the 2023 Existing Conditions Synchro Sheets.

Table 10: 2023 Existing Conditions Operational Analysis

Intersection	Mvmnt	AM Peak Hour				PM Peak Hour				
		LOS	V/C	Del (s)	Q (95 th)	LOS	V/C	Del. (s)	Q (95 th)	
Upper Middle Road and Bronte Road (Signalized)	EBL	D	0.06	50	8	D	0.05	55	6	
	EBT	E	0.81	75	#111	E	0.38	59	39	
	EBR	F	1.26	207	#172	E	0.08	56	19	
	WBL	F	1.40	259	#145	E	0.71	67	41	
	WBT	D	0.22	44	41	D	0.44	50	68	
	WBR	D	0.13	43	23	D	0.38	49	53	
	NBL	D	0.53	50	14	E	0.94	59	m#54	
	NBT	C	0.56	20	135	D	1.06	41	m92	
	NBR	D	0.16	49	29	A	0.33	3	m0	
	SBL	C	0.72	22	40	F	1.01	111	#136	
	SBT	F	1.09	80	#394	C	0.67	26	152	
	SBR	B	0.01	14	0	B	0.01	16	0	
Overall	F	1.15	91	-	D	0.94	42	-		
Saw Whet Boulevard and Bronte Road (Unsignalized)	WBL/R	F	11.98	Err	Err	F	87.72	Err	Err	
	NBT	-	0.36	0	0	-	0.78	0	0	
	NBR	-	0.03	0	0	-	0.09	0	0	
	SBL	B	0.05	1	12	F	0.72	33	82	
	SBT	-	0.92	0	0	-	0.45	0	0	
	Overall	F	-	517	-	E	-	325	-	
	Mitigation Measures: Signalization, protected and permissive WBL and SBL in PM peak									
	WBL	E	0.69	62	61	E	0.59	70	47	
	WBR	D	0.06	49	16	E	0.05	61	15	
	NBT	A	0.46	7	91	C	0.96	24	#490	
	NBR	A	0.04	4	7	A	0.12	4	16	
	SBL	A	0.09	4	4	F	0.85	96	#51	
SBT	E	1.10	64	#568	A	0.51	4	78		
Overall	D	1.13	48	-	B	0.92	19	-		
Charles Cornwall Road and Bronte Road (Signalized)	EBL/T/R	D	0.00	48	0	-	-	-	-	
	WBL	E	0.79	73	69	E	0.73	71	61	
	WBR	D	0.05	48	13	D	0.16	54	23	
	NBL	-	-	-	-	A	0.00	7	1	
	NBT	B	0.53	14	131	E	1.10	73	#540	
	NBR	A	0.07	9	10	A	0.18	8	28	
	SBL	A	0.47	9	m14.8	F	0.56	82	m31	
	SBT/R	F	1.17	90	m#493	A	0.56	5	56	
Overall	E	1.13	66	-	D	1.01	48	-		
Notes:	# - 95% percentile exceeds capacity m - volume for the 95 th percentile queue is metered by an upstream signal									

The above table summarizes the intersection operational analysis of the 2023 projected volumes. The Charles Cornwall Road at Bronte Road intersection operates with acceptable overall LOS and delays, but the rest of the Study Area intersections experience operational constraints. The eastbound right, westbound left, and southbound through movements at Upper Middle Road and Bronte Road during the AM peak period experience v/c ratios above one. The westbound left movement consists of double left turn lanes; thus, the phase is assumed

to be protected. Signal optimization was explored as a mitigation measure for these movements, however, this mitigation measure was not sufficient to reduce the V/C ratios or decrease delays at this intersection. Given that the opposing eastbound through phase is approaching capacity, providing more green time to the westbound left movement would increase the eastbound through movement's V/C ratio, which would exceed 1. It is similar in the case of northbound left and southbound through movements. The green time that can be assigned is also limited by the minimum split for each movement. As both Upper Middle Road and Bronte Road are busy arterial roads with high traffic volumes in competing north-south and east-west directions, high delays during the peak hours may be expected at this intersection. No mitigation measures were proposed for the 2023 existing horizon, but conditions are expected to improve in future analysis horizons given additional lanes on Bronte Road.

At the Saw Whet Boulevard and Bronte Road intersection, the southbound left movement experiences a V/C ratio of 11.98 and 87.72 during the AM and PM peak periods and the delays and queues are shown to be "Err". This indicates that the stop-controlled intersection cannot accommodate the traffic volumes. The high volumes in the northbound and southbound directions restrict the time during which the westbound traffic can turn onto the arterial road, Bronte Road, resulting in severe congestion on the westbound approach. To improve conditions, the intersection is proposed to be signalized and a permissive and protected westbound left and southbound left turn phases would be implemented in the signal timing plan. An exclusive westbound left turn lane has been installed, resulting in V/C ratio reductions to 0.69 and 0.59 during the AM and PM peak periods. After the implementation of the mitigation measures, however, the southbound through movement in the AM peak period still experiences a V/C ratio of 1.13 with a 95th percentile queue that exceeds capacity. This minor overcapacity is acceptable as the intersection will be further modified once the right-of-way from the 1354 Bronte Road property is connected to the existing intersection and the additional lanes on Bronte Road are added in future horizons. With the planned improvements and proposed mitigation measures, the future traffic conditions are expected to improve.

At Charles Cornwall Road and Bronte Road, the southbound shared through/right movement in the AM peak period experiences a V/C ratio of 1.17 with a high delay and a 95th percentile queue that exceeds capacity. In the PM period at this intersection, the northbound through movement experiences a V/C ratio of 1.10 with a high delay and a 95th percentile queue that exceeds capacity. Similarly, the northbound through movement in the PM period at the North Service Road and Bronte Road intersection experiences a V/C ratio of 1.28 with a high delay and a 95th percentile queue that exceeds capacity. Although these movements are experiencing constraints, providing more green time to these movements will reduce the splits for opposing movements below the minimum splits. These conditions are expected to improve in the next future horizon given the additional lanes planned on Bronte Road.

6.2 2026 Future Background Conditions

The 2026 Future Background conditions have been examined to determine the future traffic conditions without the addition of the proposed development. This will isolate the impact of the subject development on the traffic network. This horizon includes existing traffic volumes, background development trips, and growth for 3 years. Table 11 summarizes the operational analysis of 2026 Future Background conditions. Synchro worksheets have been included in Appendix I.

Table 11: 2026 Future Background Conditions Operational Analysis

Intersection	Mvmnt	AM Peak Hour				PM Peak Hour				
		LOS	V/C	Del (s)	Q (95 th)	LOS	V/C	Del. (s)	Q (95 th)	
Upper Middle Road and Bronte Road (Signalized)	EBL	D	0.06	50	8	D	0.05	55	6	
	EBT	E	0.81	75	#111	E	0.38	59	39	
	EBR	F	1.26	207	#172	E	0.08	56	19	
	WBL	F	1.42	267	#147	E	0.75	70	55	
	WBT	D	0.22	44	41	D	0.43	49	68	
	WBR	D	0.13	43	23	D	0.38	49	54	
	NBL	D	0.55	41	16	F	1.08	105	m#55	
	NBT	C	0.59	20	108	E	1.12	79	m#358	
	NBR	D	0.19	49	29	B	0.37	14	m20	
	SBL	C	0.79	29	#46	F	1.09	134	#145	
	SBT	F	1.15	107	#434	C	0.71	27	166	
	SBR	B	0.01	14	0	B	0.01	16	0	
	Overall	F	1.20	102	-	E	0.99	62	-	
	Mitigation Measure: Signal Optimization									
	EBL	D	0.04	43	7	E	0.04	55	6	
	EBT	D	0.53	52	85	E	0.35	60	37	
	EBR	E	0.86	76	#143	E	0.08	57	18	
	WBL	F	1.39	255	#150	F	1.14	168	#78	
	WBT	D	0.16	37	36	D	0.49	55	68	
	WBR	D	0.13	36	20	D	0.28	52	37	
	NBL	D	0.61	43	21	D	0.76	46	#117	
	NBT	D	0.74	40	167	F	1.24	152	#446	
NBR	C	0.23	29	29	C	0.41	26	66		
SBL	D	0.86	48	#84	D	0.67	47	#129		
SBT	F	1.32	184	#492	D	0.80	37	224		
SBR	B	0.01	19	0	C	0.01	20	0		
Overall	F	1.20	125	-	F	1.04	91	-		
Saw Whet Boulevard and Bronte Road (Signalized)	EBL	D	0.08	49	11	D	0.06	55	8	
	EBT/R	D	0.13	50	20	D	0.02	54	3	
	WBL	E	0.82	76	78	E	0.69	70	52	
	WBT/R	D	0.09	49	18	E	0.25	56	26	
	NBL	C	0.30	22	m5	A	0.23	1	m0	
	NBT	A	0.49	10	127	C	1.00	21	m387	
	NBR	A	0.05	7	m11	A	0.15	0	m0	
	SBL	A	0.13	5	m2.4	F	2.04	549	m#78	
	SBT	F	1.27	132	m#472	B	0.58	11	195	
	SBR	D	0.00	41	m0	A	0.01	9	m2	
	Overall	F	1.18	94	-	C	1.84	30	-	
	Mitigation Measures: Signalization, protected and permissive WBL and SBL									
	EBL	E	0.22	70	13	D	0.07	55	9	
	EBT/R	E	0.03	67	0	D	0.02	54	5	
	WBL	F	1.29	237	#125	E	0.69	70	52	
	WBT/R	E	0.07	58	15	D	0.06	55	15	
	NBL	B	0.27	19	7	A	0.30	2	m2	
	NBT	A	0.50	9	100	F	1.18	97	m#434	
	NBR	A	0.04	5	2	A	0.16	1	m3	
	SBL	A	0.11	5	4	C	0.57	34	m32	
SBT	F	1.17	97	#684	B	0.58	15	221		
SBR	A	0.00	3	0	A	0.01	9	m2		
Overall	E	1.26	76	-	E	1.07	63	-		

Intersection	Mvmnt	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Del (s)	Q (95 th)	LOS	V/C	Del. (s)	Q (95 th)
Charles Cornwall Road and Bronte Road (Signalized)	EBL/T/R	D	0.00	49	0	-	-	-	-
	WBL	E	0.82	79	72	E	0.73	71	61
	WBR	D	0.05	49	13	D	0.17	54	24
	NBL	-	-	-	-	A	0.01	7	1
	NBT	B	0.57	14	145	F	1.19	113	#610
	NBR	A	0.07	9	10	A	0.18	8	28
	SBL	A	0.50	5	m3	E	0.56	60	34
	SBT/R	F	1.26	120	m#440	A	0.61	8	138
	Overall	F	1.21	86	-	E	1.08	71	-
Notes:	# - 95% percentile exceeds capacity; m - volume for the 95 th percentile queue is metered by an upstream signal								

With the addition of background traffic growth as well as the nearby background development traffic, the Study Area intersections are experiencing operational constraints. Signal optimization has been attempted at the Upper Middle Road and Bronte Road intersection to reduce the V/C ratios, however, the overall V/C ratios and / or delays increase. Given that the opposing eastbound through phase is approaching capacity, providing more green time to the westbound left movement would increase the eastbound through movement’s V/C ratio, which would exceed 1. It is similar in the case of northbound left and southbound through movements. The green time that can be assigned is also limited by the minimum split for each movement. Another movement with high delays is westbound left during the AM peak, this movement contains a double left turn and protected only phasing. As previously mentioned, given the nature of the two arterial roads at Upper Middle Road and Bronte Road, this high V/C can be expected. Conditions are expected to improve in the 2031 analysis horizon given additional lanes on Bronte Road.

At Saw Whet Boulevard and Bronte Road, the southbound through movement in the AM peak period experiences a V/C ratio of 1.27 with a high delay and a 95th percentile queue that exceeds capacity. In the PM peak period, the southbound left movement experiences a V/C ratio of 2.04. To improve the conditions, protected and permissive westbound left turn and southbound left turn phases have been examined for both peak hours. It is shown that signal optimization is effective in improving the traffic conditions during the PM peak, however, this change is shown to have a negative impact on the operational analysis during the AM peak. Therefore, these changes should only be carried forward in the PM peak hour. The V/C ratio of the southbound left movement reduces to 0.57 with this mitigation measure, but the northbound through movement experiences an increase in V/C ratio from 1.02 to 1.18. This trade-off is acceptable as through traffic conditions are expected to improve in the 2031 horizon of analysis given the additional lanes planned on Bronte Road.

At Charles Cornwall Road and Bronte Road, the southbound shared through/right movement in the AM peak period experiences a V/C ratio of 1.26 with a high delay and a 95th percentile queue that exceeds capacity. In the PM period at this intersection, the northbound through movement experiences a V/C ratio of 1.19 with a high delay and a 95th percentile queue that exceeds capacity. Although these movements are experiencing constraints, providing more green time to these movements will reduce the splits for opposing movements below the minimum splits. However, these conditions are expected to improve in the 2031 horizon of analysis given the additional lanes on Bronte Road.

6.3 2026 Future Total Conditions

The analysis parameters used to analyze the 2026 Future Background conditions have been carried forward as part of the analysis of 2026 Future Total conditions, except that the southbound left phase at the intersection of

Saw Whet Boulevard at Bronte Road is coded as protected and permissive in PM Peak Hour in the Synchro model. The 2026 site-generated volumes have been added. Table 12 summarizes the results of the Synchro Analysis. Synchro worksheets have been included in Appendix J.

Table 12: 2026 Future Total Conditions Operational Analysis

Intersection	Mvmnt	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Del (s)	Q (95 th)	LOS	V/C	Del. (s)	Q (95 th)
Upper Middle Road and Bronte Road (Signalized)	EBL	D	0.04	43	7	D	0.05	55	6
	EBT	D	0.53	52	85	E	0.38	59	39
	EBR	E	0.87	76	#145	E	0.08	56	19
	WBL	F	1.35	237	#148	E	0.76	70	56
	WBT	D	0.16	36	36	D	0.43	49	68
	WBR	D	0.13	36	20	D	0.38	49	54
	NBL	D	0.61	43	21	F	1.08	104	m#63
	NBT	D	0.75	40	167	E	1.12	74	m121
	NBR	C	0.23	29	29	B	0.37	11	m13
	SBL	D	0.86	48	#84	F	1.10	137	#145
	SBT	F	1.32	184	#492	C	0.71	27	166
	SBR	B	0.01	19	0	B	0.01	16	0
Overall	F	1.20	123	-	E	0.99	59	-	
Saw Whet Boulevard and Bronte Road (Signalized)	EBL	D	0.07	49	10	D	0.08	55	10
	EBT/R	D	0.10	49	16	D	0.02	54	6
	WBL	E	0.81	75	78	E	0.69	71	52
	WBT/R	D	0.09	49	18	D	0.06	55	15
	NBL	B	0.25	18	m4	A	0.33	2	m2
	NBT	A	0.49	10	127	F	1.15	86	m#414
	NBR	A	0.04	7	m11	A	0.16	1	m3
	SBL	A	0.13	6	7	C	0.58	35	m30
	SBT	F	1.25	133	#692	B	0.58	15	217
	SBR	A	0.00	4	0	A	0.01	8	m3
Overall	F	1.17	94	-	E	1.05	56	-	
Charles Cornwall Road and Bronte Road (Signalized)	EBL/T/R	D	0.00	49	0	-	-	-	-
	WBL	E	0.82	79	72	E	0.73	71	61
	WBR	D	0.05	49	13	D	0.17	54	24
	NBL	-	-	-	-	A	0.01	7	1
	NBT	B	0.57	14	144	F	1.20	115	#615
	NBR	A	0.07	9	10	A	0.18	8	28
	SBL	A	0.50	5	m3	E	0.56	56	34
	SBT/R	F	1.25	119	m#449	A	0.62	8	133
Overall	F	1.21	85	-	E	1.09	73	-	
Notes:	# - 95% percentile exceeds capacity m - volume for the 95 th percentile queue is metered by an upstream signal								

The projected 2026 Future Total conditions are similar to those projected for the 2026 Future Background conditions, with the north-south through volumes on Bronte Road projected to operate over capacity. At Upper Middle Road and Bronte Road in the AM peak period, the westbound left and southbound through movements are constrained, and given that they are in opposing directions, providing more green time to one movement to reduce its V/C ratio will increase the other movement’s V/C ratio. These constraints are expected given the nature of the two arterial roads at this intersection. Applying signal timing adjustments at Bronte Road intersections at Saw Whet Boulevard and Charles Cornwall Road will reduce splits below minimum splits for movements opposing those that are constrained. However, conditions are expected to improve in the next future horizon of analysis given the additional lanes on Bronte Road.

6.4 2031 Future Background Traffic Conditions

The 2031 Future Background horizon has been examined to determine the future traffic conditions without the addition of the proposed development. This will isolate the impact of the subject development on the traffic network. By 2031, it is anticipated that the outer lanes of Bronte Road will be converted to HOV / Transit lanes. To reflect this, as instructed by Region Staff, a lane utilization factor of 0.80 has been used to estimate the impact of this reduction in north-south vehicle capacity along Bronte Road. The mitigation strategies proposed in the 2023 Existing, 2026 Future Background, and 2026 Future Total conditions have been incorporated into the Synchro model. Table 13 summarizes the operational analysis of 2031 Future Background conditions. Synchro worksheets are included as Appendix K.

Table 13: 2031 Future Background Conditions Operational Analysis

Intersection	Mvmnt	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Del (s)	Q (95 th)	LOS	V/C	Del. (s)	Q (95 th)
Upper Middle Road and Bronte Road (Signalized)	EBL	D	0.04	43	6	E	0.04	55	6
	EBT	D	0.53	52	85	E	0.36	60	37
	EBR	E	0.87	76	#145	E	0.08	57	11
	WBL	F	1.21	177	#141	F	1.03	131	#74
	WBT	C	0.16	35	36	D	0.48	54	68
	WBR	C	0.13	35	19	D	0.17	50	25
	NBL	D	0.60	42	#25	E	0.83	55	#128
	NBT	D	0.72	43	144	F	1.13	105	#363
	NBR	C	0.24	33	28	C	0.45	29	74
	SBL	E	0.90	63	#110	D	0.69	47	#134
	SBT	F	1.20	136	#398	C	0.72	34	187
	SBR	C	0.01	21	0	C	0.01	22	0
	Overall	F	1.12	98	-	E	0.97	71	-
Saw Whet Boulevard and Bronte Road (Signalized)	EBL	D	0.09	49	12	D	0.05	55	7
	EBT/R	D	0.15	50	22	D	0.02	54	1
	WBL	E	0.81	75	77	E	0.68	70	51
	WBT/R	D	0.16	50	24	D	0.06	55	15
	NBL	C	0.32	26	m7	A	0.34	4	m1
	NBT	A	0.42	9	114	B	1.00	13	m#406
	NBR	A	0.04	7	12	A	0.16	1	m1
	SBL	A	0.19	7	8	D	0.57	50	36
	SBT	E	1.09	64	#549	A	0.50	5	91
	SBR	A	0.00	4	1	A	0.01	3	1
	Overall	D	1.04	49	-	B	0.93	13	-
Charles Cornwall Road and Bronte Road (Signalized)	EBL/T/R	D	0.00	49	0	-	-	-	-
	WBL	E	0.82	79	72	E	0.73	71	61
	WBR	D	0.05	49	13	D	0.27	55	31
	NBL	-	-	-	-	A	0.01	7	1
	NBT	B	0.50	13	119	D	1.03	45	#459
	NBR	A	0.07	9	11	A	0.17	8	25
	SBL	B	0.59	13	m2.6	E	0.59	69	#36
	SBT/R	D	1.09	49	m#440	A	0.53	2	40
	Overall	D	1.07	39	-	C	0.95	31	-
Notes:	# - 95% percentile exceeds capacity m - volume for the 95 th percentile queue is metered by an upstream signal								

With the addition of background growth to the 2026 Future Background horizon as well as additional lanes along Bronte Road to project the 2031 Future Background traffic volumes, the operational performance of the Study Area intersections increased, with lower delays and V/C ratios at movements that were previously constrained.

Further, the LOS of all intersections either improved or stayed the same. Several movements exceeded capacity constraints and could not be improved to having V/C ratios below 1, but they are approaching this target.

At the Upper Middle Road and Bronte Road intersection, the southbound through movement during the AM peak and the northbound through movement during the PM peak are still constrained and experience V/C ratios above one, but they have improved from those in 2026 Future Background conditions. Given that the opposing northbound left and southbound left movements are already assigned with the minimum splits, there is no room to provide more green time to the through movements. As previously mentioned, given the nature of the two arterial roads at Upper Middle Road and Bronte Road, these high V/C ratios can be expected.

Similarly at Charles Cornwall Road and Bronte Road intersection, the southbound shared through/right movement in the AM peak period experiences a V/C ratio of 1.09 with a high delay and a 95th percentile queue that exceeds capacity. In the PM period at this intersection, the northbound through movement experiences a V/C ratio of 1.03 with a high delay and a 95th percentile queue that exceeds capacity. Although these movements are experiencing constraints, providing more green time to these movements will reduce the splits for opposing movements below the minimum splits. Given the high volume along Bronte Road, these high V/C ratios can be expected.

At the signalized and optimized Saw Whet Boulevard and Bronte Road intersection, the movements generally operate well without constraints except for the northbound and southbound through movements which has V/C ratios of 1.09 and 1.00 during the worst peak hour, respectively, reflecting the high volumes along Bronte Road.

6.5 2031 Future Total Conditions

The analysis parameters used to analyze the 2031 Future Background conditions have been carried forward as part of the analysis of 2031 Total Future conditions. The 2031 site-generated volumes were added. Table 14 summarizes the results of the Synchro analysis. Synchro worksheets have been included in Appendix L.

Table 14: 2031 Future Total Conditions Operational Analysis

Intersection	Mvmnt	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Del (s)	Q (95 th)	LOS	V/C	Del. (s)	Q (95 th)
Upper Middle Road and Bronte Road (Signalized)	EBL	D	0.04	43	6	E	0.04	55	6
	EBT	D	0.53	52	85	E	0.36	60	37
	EBR	E	0.87	76	#145	E	0.08	57	11
	WBL	F	1.21	178	#141	F	1.05	137	#76
	WBT	C	0.16	35	36	D	0.48	54	68
	WBR	C	0.13	35	19	D	0.17	50	25
	NBL	D	0.59	42	#25	E	0.83	55	#128
	NBT	D	0.72	43	144	F	1.13	105	#363
	NBR	C	0.24	33	28	C	0.45	29	74
	SBL	E	0.89	63	#109	D	0.69	47	#134
	SBT	F	1.20	136	#398	C	0.72	34	188
	SBR	C	0.01	21	0	C	0.01	22	0
	Overall	F	1.12	98	-	E	0.97	71	-

Intersection	Mvmnt	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Del (s)	Q (95 th)	LOS	V/C	Del. (s)	Q (95 th)
Saw Whet Boulevard and Bronte Road (Signalized)	EBL	D	0.11	49	14	D	0.07	55	9
	EBT/R	D	0.19	50	26	D	0.02	54	5
	WBL	E	0.82	76	77	E	0.68	70	51
	WBT/R	D	0.15	50	24	D	0.06	55	15
	NBL	C	0.43	30	#19	A	0.49	7	m3
	NBT	A	0.42	7	78	B	1.01	20	m#415
	NBR	A	0.04	5	7	A	0.16	1	m2
	SBL	A	0.19	7	8	D	0.57	50	36
	SBT	E	1.11	71	#560	A	0.50	5	91
	SBR	A	0.01	4	1	A	0.01	3	2
Overall	D	1.05	53	-	B	0.93	16	-	
Charles Cornwall Road and Bronte Road (Signalized)	EBL/T/R	D	0.00	52	0	-	-	-	-
	WBL	E	0.80	79	73	E	0.73	71	61
	WBR	D	0.05	52	13	D	0.27	55	31
	NBL	-	-	-	-	A	0.01	7	1
	NBT	B	0.50	14	136	D	1.03	46	#460
	NBR	A	0.07	10	12	A	0.17	8	25
	SBL	B	0.59	13	28	D	0.59	50	#33
	SBT/R	E	1.09	66	#585	A	0.53	6	95
Overall	D	1.07	51	-	C	0.95	32	-	
Notes:	# - 95% percentile exceeds capacity m - volume for the 95 th percentile queue is metered by an upstream signal								

The addition of the site generated traffic to the 2031 Future Background volumes at the Study Area intersections along Bronte Road resulted in lower level of service at Upper Middle Road and Saw Whet Boulevard during the PM peak period. This is expected given the 2021 Existing and 2031 Future Background operational performances along the Bronte Road corridor. It should be noted, however, that the proposed development only contributes to slight increases in V/C ratio to previously constrained intersections throughout the corridor.

With the addition of the HOV lanes northbound and southbound on Bronte Road, the southbound and northbound movements continue to operate at or above a V/C ratio of 1.0 in the AM and PM peak periods, respectively. However, the active mode share used in this study is a projection of average expected travel behaviour in Oakville. Within the Study Area, the active mode share in 2016 was 13%, where the Regional projection for future horizons is 5%. As the lands along Bronte Road develop, walking and cycling trips are expected to increase further, as more destinations will be available within one-to-five-kilometer radius. Considering the foregoing, it is likely that the number of active mode trips generated by future phases of the proposed development has been underestimated, resulting in a conservative analysis.

It is important to note that although conservative assumptions were used throughout this report, it is evident from existing conditions operational analysis, and the trips generated by the background developments, that the Study Area will experience capacity constraints northbound and southbound along Bronte Road. In locations with low transit accessibility and where surplus of right-of-way exists, the capacity can be increased to allow the continued growth in single occupant vehicles. However, given the lack of ROW along Bronte Road, as well as the planned intensification, and the Town’s initiative to increase high occupancy vehicle trips along this corridor, the two inner lanes are expected to operate at capacity. Any additional auto trips resulting in a V/C ratio above one will be further incentivized to transfer to alternative routes or modes. As policy around transportation planning transformed in the recent decade, with key performance indicator shifting from vehicle to person trips per hour per kilometer, this trade-off is considered acceptable.

7 Recommendations

The proposed development will fit into the existing road network. The Saw Whet Boulevard access will support the proposed development as well as the surrounding background developments. However, it is noted that, due to the large existing volume northbound in the PM peak hour and southbound in the AM peak hour, the north and south movements through along Bronte Road are projected to operate with capacity constraints. This will be partially alleviated by the proposed widening of Bronte Road that will accommodate HOV lanes. This will also provide additional transit capacity, promoting further transit usage along this corridor as commuters may choose transit or seek out carpooling opportunities to avoid congestion. The proposed intersection of Saw Whet Boulevard at Bronte Road will be a signalized intersection, with auxiliary turn lanes on all approaches, and with a southbound protected/permissive left turn phase.

8 Conclusions

This Transportation Impact Study has examined the trip generation, access requirements, and Study Area road network impact of the proposed 1354 Bronte Road residential development. The TIS has shown the following:

- a) The proposed development analyzed herein will include 110 condo units.
- b) The proposed development will have one access on Saw Whet Boulevard approximately 80 metres to the west of the signalized intersection at Saw Whet Boulevard and Bronte Road. Additionally, the adjacent developments will be connected by internal local and collector streets. It was found that the adjacent developments of Bronte Green, Bronte Green Mid-Rise, and Bronte River, with direct connections between the developments, should be included in the background traffic projections.
- c) Parking requirements for the proposed residential mid-rise will be satisfied with 165 parking spaces provided, including 12 at-grade and 153 underground. The at-grade spaces and 16 of the underground spaces are for visitors due to constraints including garage door location, and the need to provide access to a potential future development north of the site from Saw Whet Boulevard.
- d) With regard to bicycle parking, 134 parking spaces are provided to meet the Zoning By-law requirement of 110 bicycle parking spaces. Among them, 28 are designated for visitor parking.
- e) The Region of Halton proposed a compound annual growth rate of 2% along Bronte Road. This conservative estimate of traffic growth was applied to the Study Area turning movement counts and traffic volumes.
- f) To estimate the impact of the subject development on the Study Area, a person trip generation exercise has been undertaken. The 2016 TTS data and the Town of Oakville's Transportation Master Plan Review document have been used to determine the mode share for the future horizons. The subject development is anticipated to generate 28 AM and 36 PM peak hour two-way auto trips during the 2026 and 2031 horizons.
- g) Using the existing traffic volumes, projected to 2023, an operational analysis of existing conditions was undertaken. Through this analysis, it was determined that the Study Area intersections generally operate with constraints in the northbound and southbound movements due to the high volumes along Bronte Road. Signal optimization was explored as a mitigation measure, which improved conditions for the eastbound right critical movement during the AM peak hour at the Upper Middle Road and Bronte Road intersection. The interim stop-controlled conditions at the intersection of Saw Whet Boulevard at Bronte Road were analyzed. Signalization of the intersection and use of permissive and protected westbound left and southbound left phases were proposed to mitigate operational constraints. All intersections were shown to operate at level of service E or better overall after these measures are applied. Several

movements still experienced capacity constraints and considerable delays, but this is expected at an intersection of two arterial roads with high traffic volumes. Conditions will improve with completion of the Saw Whet Boulevard and Bronte Road intersection and widening of Bronte Road in the future horizons.

- h) The 2026 Future Background traffic volumes, including background growth and the nearby background developments, were analysed. It was found that traffic volumes exceeded theoretical capacity for many movements, especially for through movements along Bronte Road. A protective and permissive phase was assigned to the westbound left-turn and southbound left-turn movements during the PM peak period at the completed Saw Whet Boulevard and Bronte Road intersection with four legs, which resulted in a significant operational improvement for this movement while reducing the service efficiency of the northbound through movement. Signal optimization had been evaluated as a mitigation measure for the intersection of Upper Middle Road and Bronte Road and the results showed that it was not effective in reducing the delays due to the double left turn lanes. Where volumes exceeded capacity, improvements were expected in the future horizon given additional lanes on Bronte Road.
- i) The 2026 Future Total horizon operates similarly to the 2026 Future Background horizon. Some intersections could not be improved through signal timing adjustments due to opposing movements being constrained while already operating at minimum splits. The future road widening at Bronte Road is anticipated to provide extra capacity to relieve the experienced congestion along this corridor.
- j) The traffic operations within the Study Area improve in the 2031 Future Background horizon with the additional capacity along Bronte Road provided by the two additional lanes in the urban cross-section despite an additional five years of 2% compounding annual growth. The level of service of all intersections either improved or stayed the same compared to the 2026 Future Background scenario. Some movements still experienced capacity constraints that could not be improved by implementing signal timing adjustments.
- k) In the 2031 Future Total horizon, several study intersections experienced lower level of services. The proposed development only contributed to slight increases in V/C ratio to previously constrained intersection movements. With the addition of the HOV lanes in this horizon northbound and southbound on Bronte Road, the northbound and southbound movements continue to operate at or slightly above a V/C ratio of 1.0. Despite this, walking and cycling trips are expected to increase in the future, and it is likely that the number of active mode trips generated by future phases of the proposed development has been underestimated, resulting in a conservative analysis.
- l) Given the lack of ROW along Bronte Road, planned intensification, and the Town's initiative to increase high occupancy vehicle trips along this corridor, the two inner lanes of Bronte Road are expected to operate at capacity. Any additional auto trips resulting in a V/C ratio above one will be further incentivized to transfer to alternative routes or modes. As policy around transportation planning transformed in the recent decade, with key performance indicators shifting from vehicle to person trips per hour per kilometer, this trade-off is considered favourable.
- m) TDM measures are proposed to further encourage commuters to shift away from single occupant vehicle trips. For this development, which primarily consists of mid-rise residential units, the most effective measures involve access and usability of transit, cycling and pedestrian facilities. To ensure that the transit, cycling, and pedestrian modes are served appropriately by the proposed development, concept plans have been prepared.

The 1354 Bronte Road development will have a minor impact on the Study Area road network. The proposed accesses will operate with reasonable LOS and delays on the turning movements into and out of the site. The concept plan prepared will provide a good pedestrian and cycling network along with good access to transit

throughout the development. It is recommended that, from a transportation perspective, the proposed development application proceed.

Prepared By:

Reviewed By:



Zhengxuan Lai, E.I.T.

289-834-0646

May.Lai@CGHTransportation.com



Mark Crockford, P. Eng.

905-251-4070

Mark.Crockford@CGHTransportation.com

Appendix A

Scope Confirmation

From: [Pasquini-Smith, Alexandria](#)
To: [Nasteha Abdullahi](#)
Subject: RE: Valery Homes 1354 Bronte Road TIS - Terms of Reference
Date: November 10, 2021 10:49:12 AM
Attachments: [image001.png](#)

Hello Nasteha,

Regional staff have reviewed the provided TIS Terms of Reference and offer the following comments:

The Study must be in accordance to Halton Region's Transportation Impact Study Guidelines (2015), Halton's Access By-Law 32-17 and Halton's Access Management Guidelines (2015). Any proposed development access to a Regional road will only be reviewed as part of the Transportation Impact Study.

As noted in the terms of references, the following intersections will be analyzed:

- Upper Middle Road at Bronte Road
- Charles Cornwall Road at Bronte Road (signalized access to Woodlands Operations Centre)
- Saw Whet Boulevard at Bronte Road
- Site Access on Saw Whet Boulevard

As noted in the terms of references, the Analysis Assumptions will be:

- Horizon years: 2021, 2026 (Buildout), and 2031 (+ 5 years).
- Bronte Road will be analyzed as four general purpose lanes for years 2021 (based on existing conditions) and 2026, and as four lanes plus HOV lane (with assumption that 20% of the lane capacity is assigned to HOV usage by using a 0.8 lane utilization factor) for year 2031.

Note: Currently Bronte Road is scheduled for start of construction for the widening from 4 to 6 lanes in 2025 (Speers Road to Highway 407). As the Municipal Class Environmental Assessment (MCEA) Study has not started to date, the Year 2026 analysis must assume Bronte Road at the existing 4 lanes (as noted in the terms of reference).

For the traffic volume counts and traffic signal timing (from Halton Region), information can be requested from our Road Operations group at trafficdatarequests@halton.ca

The Background Developments must be confirmed and approved by the Town of Oakville.

As noted in the terms of reference, a Halton Region growth rate of 2% for Bronte Road will be utilized.

Transit Mode Splits:

As noted in the term of reference, Halton's Transportation Master Plan 2011 utilizes a transit mode

split of 10% for 2021, 15% for 2026 and 20% for 2031. Assumption of travel via other modes (active transportation i.e.: walk, cycle) should utilize a 5% mode split for 2031. Transportation Demand Management (TDM) assumptions of 3% for 2031 would also be acceptable. Transit mode splits will need to be adjusted from the 2011 TMP assumptions to reasonable percentages based on current year (2021), 2026 and 2031 planned and proposed mode splits (based on existing facilities and service in the area to date (planned &/or proposed). Reasonable assumptions and rationale must be clearly outlined in the Study.

All other items in the terms of references appear acceptable.

Thank you.

Alex

Alexsandria Pasquini-Smith, MCIP, RPP

Intermediate Planner

Planning Services

Legislative & Planning Services

Halton Region

905-825-6000, ext. 7185 | 1-866-442-5866



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From: Nasteha Abdullahi <nasteha.abdullahi@cghtransportation.com>

Sent: Thursday, November 4, 2021 4:58 PM

To: Pasquini-Smith, Alessandria <Alex.Pasquini-Smith@halton.ca>

Subject: Valery Homes 1354 Bronte Road TIS - Terms of Reference

CAUTION: This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe. If you are unsure or need assistance please contact the IT Service Desk.

Good afternoon Alex,

CGH Transportation has been retained by Valery Homes to undertake a Transportation Impact Study for their 1354 Bronte Road development at Saw Whet Boulevard at Bronte Road in Oakville. We have drafted the attached terms of reference for this development for your review. Please let us know if you have any comments or questions.

Thank you,
Nasteha



Nasteha Abdullahi

CGH Transportation Inc.

P: 647-965-2835

E: nasteha.abdullahi@CGHTransportation.com

From: [Syed Rizvi](#)
To: [Nasteha Abdullahi](#)
Cc: [Mark Crockford](#)
Subject: RE: Valery Homes 1354 Bronte Road TIS - Terms of Reference
Date: November 16, 2021 11:29:16 AM
Attachments: [image001.png](#)

Hi Nasteha,

Sorry for delay in response. Transportation staff agree with the proposed study terms of reference. Please add site traffic circulation plan with the surface parking plan showing access to the underground parking levels and all dimensions should be submitted for review and comments by the Transportation staff.

Thanks,
Syed

Syed Rizvi, M.Sc., P. Eng
Transportation Engineer
Transportation and Engineering
Town of Oakville | 905-845-6601, ext.3981 | www.oakville.ca

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From: Nasteha Abdullahi <nasteha.abdullahi@cghtransportation.com>
Sent: November 4, 2021 4:52 PM
To: Syed Rizvi <syed.rizvi@oakville.ca>
Cc: Mark Crockford <mark.crockford@cghtransportation.com>
Subject: Valery Homes 1354 Bronte Road TIS - Terms of Reference

SECURITY CAUTION: This email originated from outside of The Town of Oakville. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good afternoon Syed,

CGH Transportation has been retained by Valery Homes to undertake a Transportation Impact Study for their 1354 Bronte Road development at Saw Whet Boulevard at Bronte Road in Oakville. We have drafted the attached terms of reference for this development for your review. Please let us know if you have any comments or questions.

Thank you,

Nasteha



Nasteha Abdullahi

CGH Transportation Inc.

P: 647-965-2835

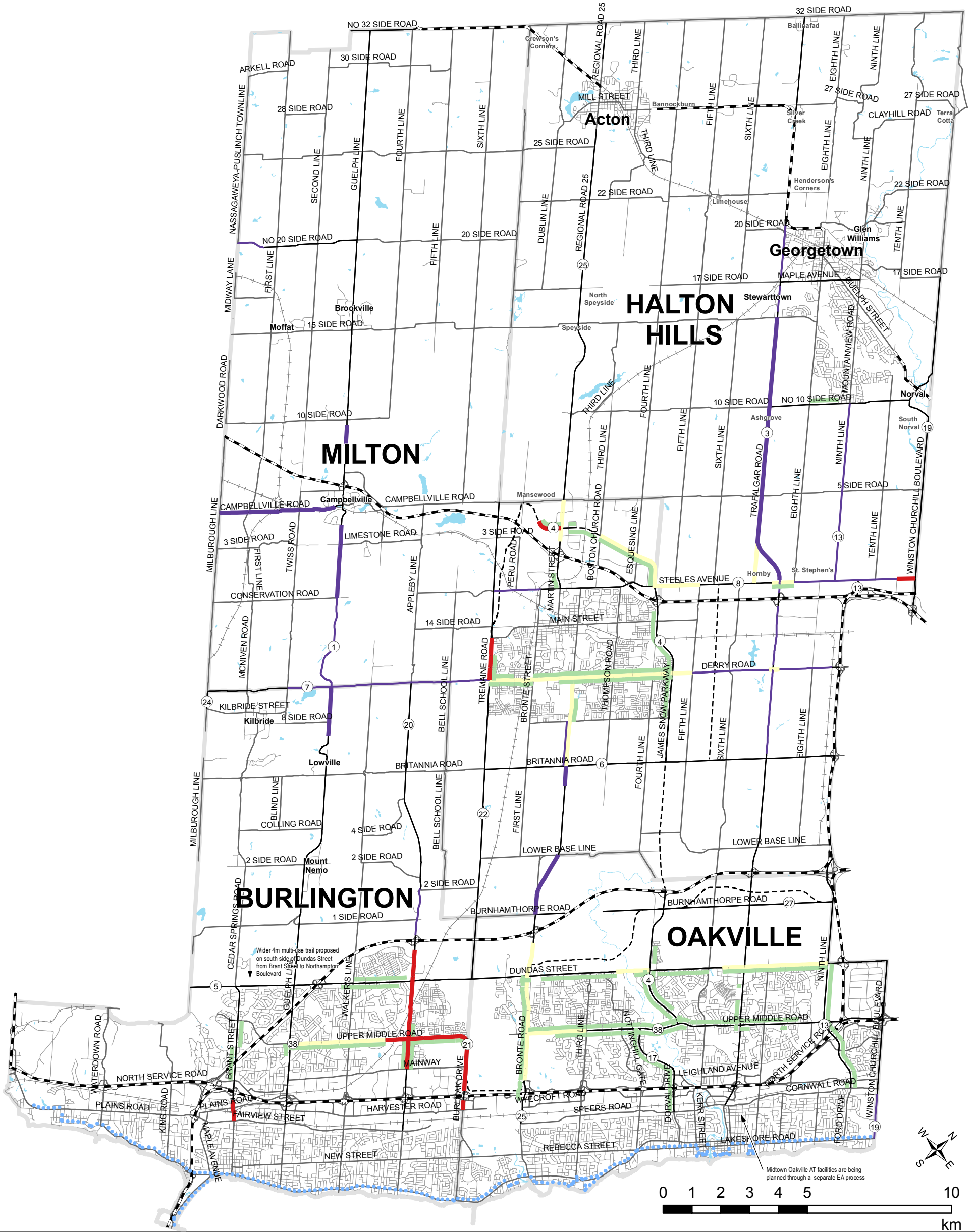
E: nasteha.abdullahi@CGHTransportation.com

Appendix B

Town of Oakville and Halton Region Active Transportation Maps

Appendix H

Existing and Proposed Regional Cycling & Walking Network Maps



Legend

Existing Regional Cycling Network*

- Bike Lanes
- Boulevard Multi-Use Trail
- Wide Shared Use Lane
- Paved Shoulders
- Partially Paved Shoulders
- Waterfront Trail

Regional Road Network*

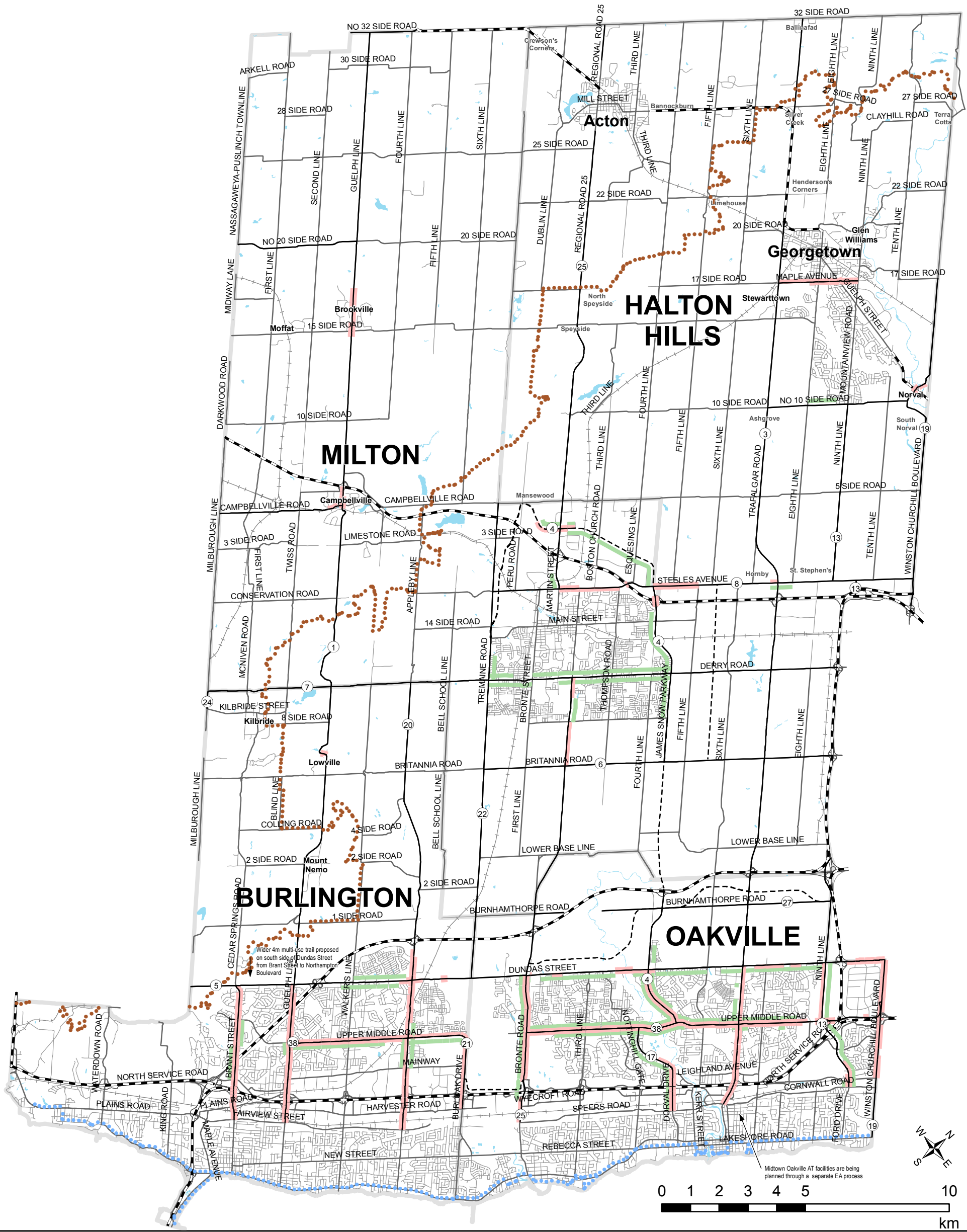
- Existing Regional Road
- - - Proposed Regional Road

Active Transportation Master Plan

MAP 1

Existing Regional Cycling Network

*Note: Existing cycling facilities are shown only for Regional Roads, which are shown in black on the map



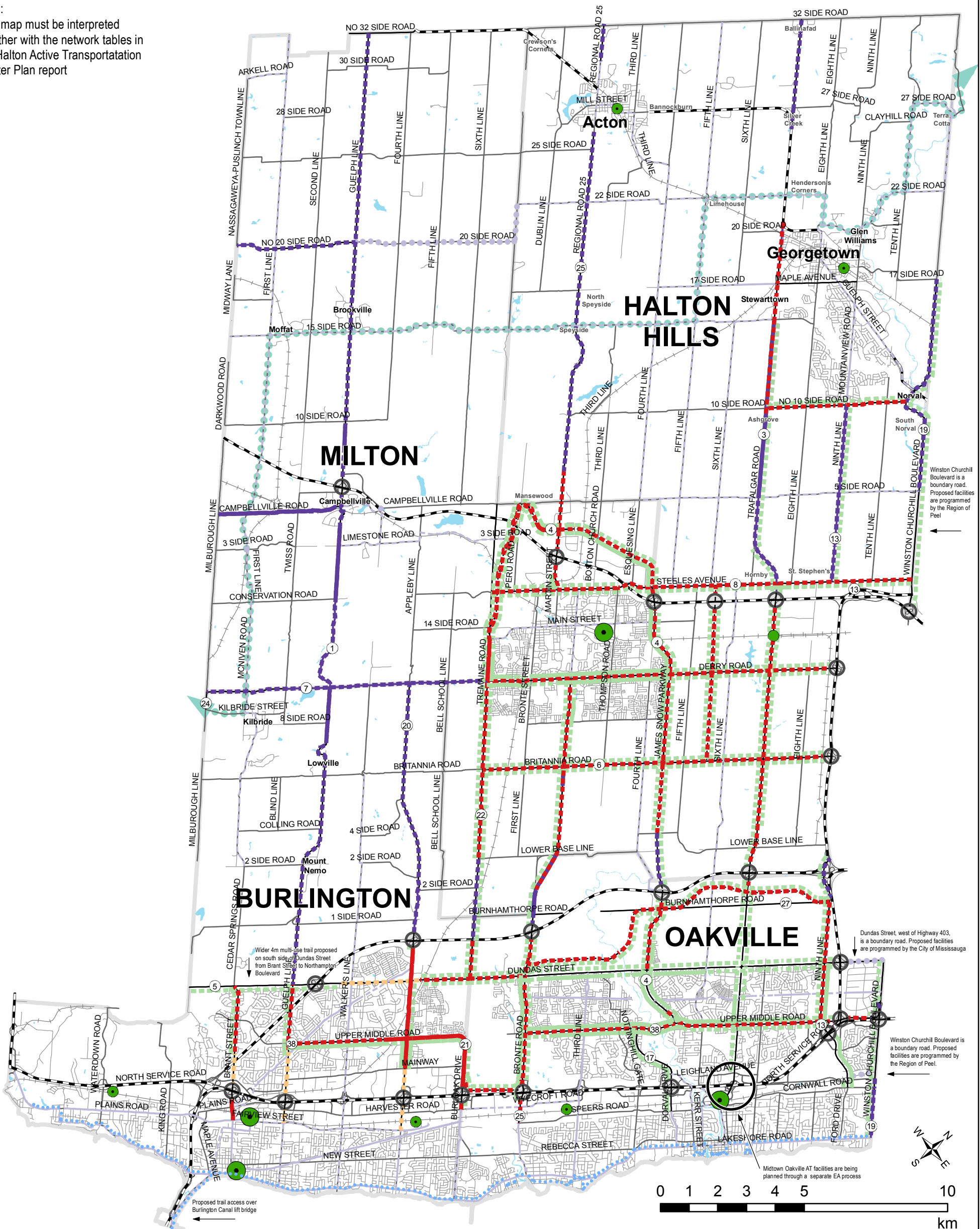
- Legend**
- Existing Regional Walk Network**
- Sidewalk
 - Boulevard Multi-Use Trail
 - Bruce Trail
 - Waterfront Trail

- Regional Road Network**
- Existing Regional Road
 - Proposed Regional Road

Active Transportation Master Plan
MAP 2
Existing Regional Walking Network

Note: Existing walking facilities are shown only for Regional Roads, which are shown in black on the map.

Note:
This map must be interpreted together with the network tables in the Halton Active Transportation Master Plan report



Legend

Proposed Regional Bike Network

- Buffered Bike Lanes
- - - Bike Lanes
- - - Boulevard Multi-Use Trail
- - - Paved Shoulders
- Interchange Improvement*

Routes not on Regional Roads

- Existing Routes that are Regionally Significant
- - - Planned Routes that are Regionally Significant
- - - Proposed Routes that are Regionally Significant
- - - Greenbelt Cycling Route

Existing Regional Bike Network

- Bike Lane
- Boulevard Trail
- - - Waterfront Trail

Existing and Proposed Major Transit Stations**

- Mobility Hub
- Major Transit Stations
- Proposed GO Stations

Active Transportation Master Plan

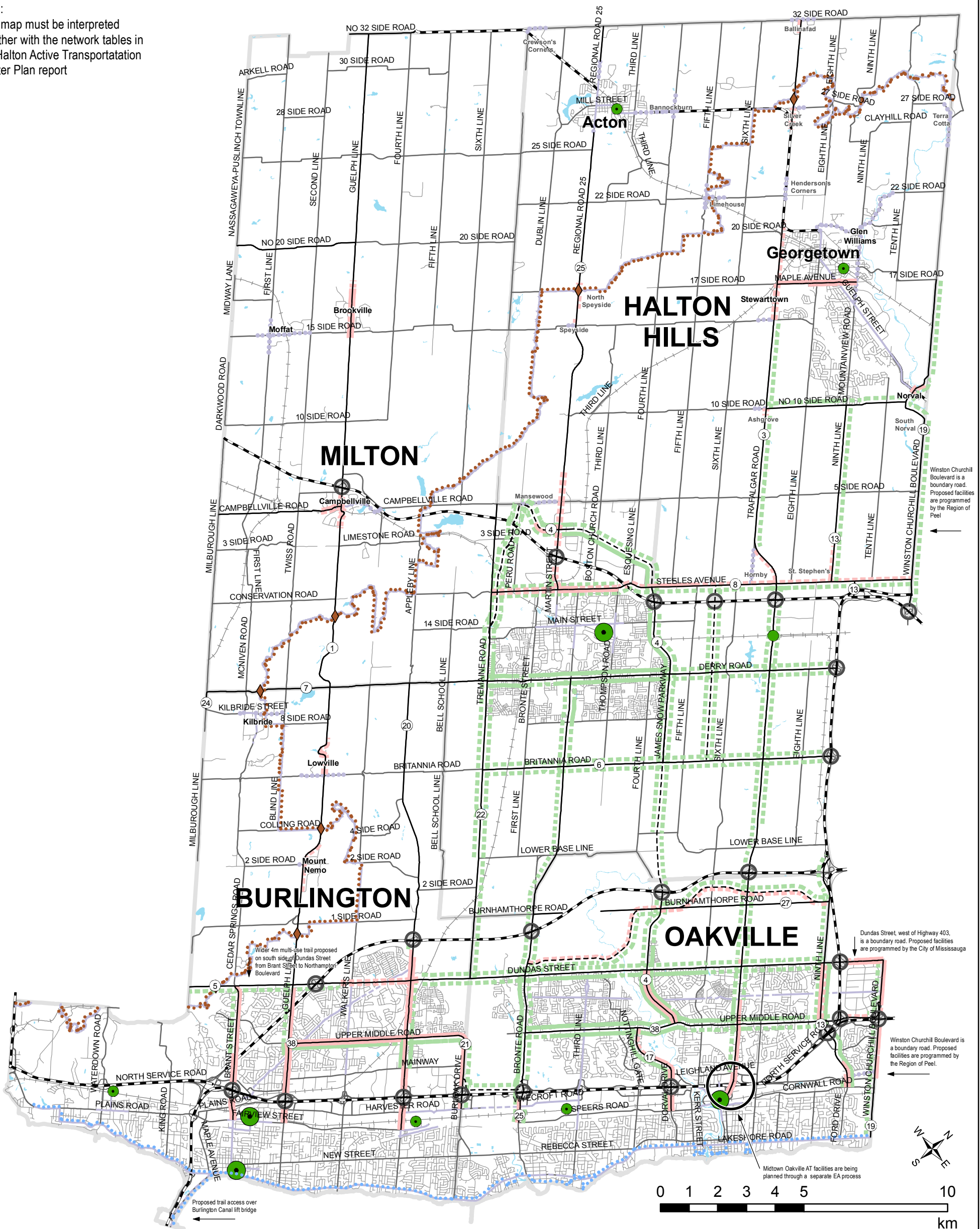
MAP 3

Proposed Regional Cycling Network



*Note active transportation facilities at interchanges to be determined in consultation with the MTO.
**Note that some Routes that are Regionally Significant are located near transit stations. Connections to transit are an important part of the Regional Cycling and Walking Network. Transit stations are shown on the map to provide contextual information.

Note:
This map must be interpreted together with the network tables in the Halton Active Transportation Master Plan report



Legend

Proposed Regional Walk Network

- Sidewalk
- Boulevard Multi-Use Trail
- Interchange Improvement*
- ◆ Bruce Trail Crossing

Routes not on Regional Roads

- Existing Routes that are Regionally Significant
- Planned Routes that are Regionally Significant
- Proposed Routes that are Regionally Significant

Existing Regional Walk Network

- Sidewalk
- Boulevard Multi-Use Trail
- Bruce Trail
- Waterfront Trail

Existing and Proposed Major Transit Stations**

- Mobility Hub
- Existing GO Stations
- Proposed GO Stations

Active Transportation Master Plan

MAP 4

Proposed Regional Walking Network

*Note active transportation facilities at interchanges to be determined in consultation with the MTO.

**Note that some Routes that are Regionally Significant are located near transit stations. Connections to transit are an important part of the Regional Cycling and Walking Network. Transit stations are shown on the map to provide contextual information.

Appendix C

Turning Movement Count Data and Signal Timing Plans

Upper Middle Rd W @ Bronte Rd

Morning Peak Diagram

Specified Period

From: 7:00:00

To: 9:00:00

One Hour Peak

From: 7:45:00

To: 8:45:00

Municipality: Halton Region
Site #: 0000003289
Intersection: Bronte Rd & Upper Middle Rd W
TFR File #: 11
Count date: 29-Oct-2019

Weather conditions:
 Cloudy/Dry
Person(s) who counted:
 Cam

**** Signalized Intersection ****

Major Road: Bronte Rd runs N/S

North Leg Total: 3033
 North Entering: 2059
 North Peds: 11
 Peds Cross: \bowtie

Heavys	2	88	2	92
Trucks	0	19	1	20
Cars	9	1716	222	1947
Totals	11	1823	225	



Heavys	44
Trucks	26
Cars	904
Totals	974

East Leg Total: 1386
 East Entering: 788
 East Peds: 7
 Peds Cross: \bowtie

Heavys	Trucks	Cars	Totals
9	1	146	156

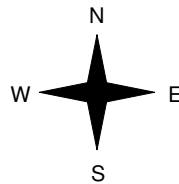


Bronte Rd

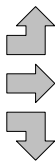
Cars	Trucks	Heavys	Totals
188	1	7	196
83	0	5	88
494	3	7	504
765	4	19	



Upper Middle Rd W



Heavys	Trucks	Cars	Totals
1	0	10	11
0	2	201	203
0	0	388	388
1	2	599	



Upper Middle Rd W



Bronte Rd

Cars	Trucks	Heavys	Totals
581	8	9	598

Peds Cross: \bowtie
 West Peds: 5
 West Entering: 602
 West Leg Total: 758

Cars	2598	Cars	54	706	158	918
Trucks	22	Trucks	1	25	5	31
Heavys	95	Heavys	2	36	7	45
Totals	2715	Totals	57	767	170	



Peds Cross: \bowtie
 South Peds: 0
 South Entering: 994
 South Leg Total: 3709

Comments

Upper Middle Rd W @ Bronte Rd

Mid-day Peak Diagram

Specified Period

From: 11:00:00

To: 14:00:00

One Hour Peak

From: 12:30:00

To: 13:30:00

Municipality: Halton Region
Site #: 0000003289
Intersection: Bronte Rd & Upper Middle Rd W
TFR File #: 11
Count date: 29-Oct-2019

Weather conditions:
 Cloudy/Dry
Person(s) who counted:
 Cam

**** Signalized Intersection ****

Major Road: Bronte Rd runs N/S

North Leg Total: 1932
 North Entering: 968
 North Peds: 2
 Peds Cross: \times

Heavys	0	71	1	72
Trucks	1	19	3	23
Cars	7	745	121	873
Totals	8	835	125	



Heavys 73
 Trucks 17
 Cars 874
 Totals 964

East Leg Total: 651
 East Entering: 349
 East Peds: 0
 Peds Cross: \times

Heavys	0	Trucks	4	Cars	134	Totals	138
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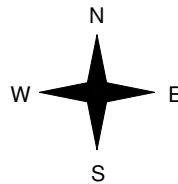


Bronte Rd

Cars	154	Trucks	4	Heavys	4	Totals	162
Cars	43	Trucks	1	Heavys	0	Totals	44
Cars	141	Trucks	0	Heavys	2	Totals	143
Totals	338	5	6				



Upper Middle Rd W



Heavys	0	Trucks	1	Cars	5	Totals	6
Heavys	1	Trucks	2	Cars	33	Totals	36
Heavys	1	Trucks	1	Cars	86	Totals	88
Heavys	2	Trucks	4	Cars	124	Totals	



Bronte Rd

Upper Middle Rd W



Cars	282	Trucks	8	Heavys	12	Totals	302
------	-----	--------	---	--------	----	--------	-----

Peds Cross: \times
 West Peds: 2
 West Entering: 130
 West Leg Total: 268

Cars	972	Cars	84	715	128	927
Trucks	20	Trucks	2	12	3	17
Heavys	74	Heavys	0	69	10	79
Totals	1066	Totals	86	796	141	



Peds Cross: \times
 South Peds: 0
 South Entering: 1023
 South Leg Total: 2089

Comments

Upper Middle Rd W @ Bronte Rd

Afternoon Peak Diagram

Specified Period

From: 15:00:00

To: 18:00:00

One Hour Peak

From: 16:45:00

To: 17:45:00

Municipality: Halton Region
Site #: 0000003289
Intersection: Bronte Rd & Upper Middle Rd W
TFR File #: 11
Count date: 29-Oct-2019

Weather conditions:
 Cloudy/Dry
Person(s) who counted:
 Cam

**** Signalized Intersection ****

Major Road: Bronte Rd runs N/S

North Leg Total: 3126
 North Entering: 1207
 North Peds: 6
 Peds Cross: \bowtie

Heavys	0	31	1	32
Trucks	1	8	0	9
Cars	14	952	200	1166
Totals	15	991	201	



Heavys	30
Trucks	9
Cars	1880
Totals	1919

East Leg Total: 1155
 East Entering: 589
 East Peds: 1
 Peds Cross: \bowtie

Heavys	Trucks	Cars	Totals
3	1	419	423

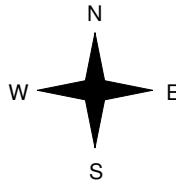


Bronte Rd

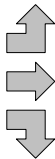
Cars	Trucks	Heavys	Totals
249	2	1	252
154	0	1	155
176	0	6	182
579	2	8	



Upper Middle Rd W



Heavys	Trucks	Cars	Totals
0	0	7	7
0	1	73	74
1	0	109	110
1	1	189	



Upper Middle Rd W



Bronte Rd

Cars	Trucks	Heavys	Totals
560	1	5	566

Peds Cross: \bowtie
 West Peds: 1
 West Entering: 191
 West Leg Total: 614

Cars	1237
Trucks	8
Heavys	38
Totals	1283



Cars	251	1624	287	2162
Trucks	0	7	0	7
Heavys	2	29	4	35
Totals	253	1660	291	

Peds Cross: \bowtie
 South Peds: 0
 South Entering: 2204
 South Leg Total: 3487

Comments

Upper Middle Rd W @ Bronte Rd

Total Count Diagram

Municipality: Halton Region
Site #: 0000003289
Intersection: Bronte Rd & Upper Middle Rd W
TFR File #: 11
Count date: 29-Oct-2019

Weather conditions:
 Cloudy/Dry
Person(s) who counted:
 Cam

**** Signalized Intersection ****

Major Road: Bronte Rd runs N/S

North Leg Total: 19991
 North Entering: 10291
 North Peds: 36
 Peds Cross: \bowtie

Heavys	6	511	32	549
Trucks	4	148	13	165
Cars	74	8178	1325	9577
Totals	84	8837	1370	



Heavys	450
Trucks	140
Cars	9110
Totals	9700

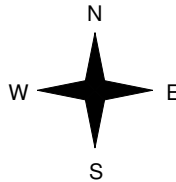
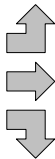
East Leg Total: 7615
 East Entering: 4183
 East Peds: 14
 Peds Cross: \bowtie

Heavys	Trucks	Cars	Totals
43	12	1609	1664



Upper Middle Rd W

Heavys	Trucks	Cars	Totals
2	3	61	66
9	5	600	614
10	5	1206	1221
21	13	1867	



Bronte Rd

Cars	Trucks	Heavys	Totals
1567	15	44	1626
622	3	19	644
1837	17	59	1913
4026	35	122	

Upper Middle Rd W



Cars	Trucks	Heavys	Totals
3317	35	80	3432

Peds Cross: \bowtie
 West Peds: 23
 West Entering: 1901
 West Leg Total: 3565

Cars	11221	Cars	913	7482	1392	9787
Trucks	170	Trucks	5	122	17	144
Heavys	580	Heavys	18	404	39	461
Totals	11971	Totals	936	8008	1448	



Peds Cross: \bowtie
 South Peds: 3
 South Entering: 10392
 South Leg Total: 22363

Comments

Bronte Rd @ Woodlands Entrance

Morning Peak Diagram

Specified Period

From: 7:00:00

To: 9:00:00

One Hour Peak

From: 7:45:00

To: 8:45:00

Municipality: Halton Region
Site #: 0000003340
Intersection: Bronte Rd & Woodlands Entrance
TFR File #: 16
Count date: 4-Dec-2019

Weather conditions:
Overcast/Wet
Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Bronte Rd runs N/S

North Leg Total: 3723
 North Entering: 2687
 North Peds: 0
 Peds Cross: \times

Heavys	0	72	0	72
Trucks	0	29	0	29
Cars	0	2461	125	2586
Totals	0	2562	125	



Heavys	49
Trucks	15
Cars	972
Totals	1036

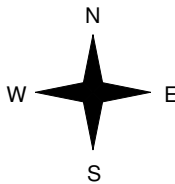
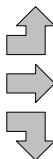
East Leg Total: 171
 East Entering: 36
 East Peds: 0
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
0	0	0	0



Driveway

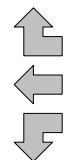
Heavys	Trucks	Cars	Totals
0	0	1	1
0	0	0	0
0	0	1	1
0	0	2	



Bronte Rd



Cars	Trucks	Heavys	Totals
16	2	1	19
0	0	0	0
14	2	1	17
30	4	2	



Woodlands Entrance



Cars	Trucks	Heavys	Totals
134	1	0	135

Peds Cross: \times
 West Peds: 0
 West Entering: 2
 West Leg Total: 2

Cars	2476	Cars	0	955	9	964
Trucks	31	Trucks	0	13	1	14
Heavys	73	Heavys	0	48	0	48
Totals	2580	Totals	0	1016	10	



Peds Cross: \times
 South Peds: 0
 South Entering: 1026
 South Leg Total: 3606

Comments

Bronte Rd @ Woodlands Entrance

Mid-day Peak Diagram

Specified Period

From: 11:00:00
To: 14:00:00

One Hour Peak

From: 11:45:00
To: 12:45:00

Municipality: Halton Region
Site #: 0000003340
Intersection: Bronte Rd & Woodlands Entrance
TFR File #: 16
Count date: 4-Dec-2019

Weather conditions:
Overcast/Wet
Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Bronte Rd runs N/S

North Leg Total: 2106
North Entering: 1137
North Peds: 0
Peds Cross: \times

Heavys	0	101	0	101
Trucks	0	26	0	26
Cars	1	990	19	1010
Totals	1	1117	19	



Heavys 74
Trucks 27
Cars 868
Totals 969

East Leg Total: 73
East Entering: 44
East Peds: 8
Peds Cross: \times

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



Bronte Rd

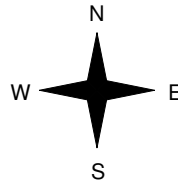
Cars	25	0	0	25
Trucks	0	0	0	0
Heavys	16	2	1	19
Totals	41	2	1	



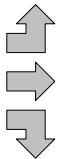
Cars Trucks Heavys Totals



Driveway



Heavys	0	0	1	1
Trucks	0	0	0	0
Cars	0	0	0	0
Totals	0	0	1	



Bronte Rd

Woodlands Entrance



Cars	29	0	0	29
Trucks	0	0	0	0
Heavys	0	0	0	0
Totals	29	0	0	

Peds Cross: \times
West Peds: 1
West Entering: 1
West Leg Total: 3

Cars	1006	Cars	1	842	10	853
Trucks	28	Trucks	0	27	0	27
Heavys	102	Heavys	0	74	0	74
Totals	1136	Totals	1	943	10	



Peds Cross: \times
South Peds: 0
South Entering: 954
South Leg Total: 2090

Comments

Bronte Rd @ Woodlands Entrance

Afternoon Peak Diagram

Specified Period

From: 15:00:00

To: 18:00:00

One Hour Peak

From: 16:45:00

To: 17:45:00

Municipality: Halton Region
Site #: 0000003340
Intersection: Bronte Rd & Woodlands Entrance
TFR File #: 16
Count date: 4-Dec-2019

Weather conditions:
Overcast/Wet
Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Bronte Rd runs N/S

North Leg Total: 3557
 North Entering: 1305
 North Peds: 0
 Peds Cross: \bowtie

Heavys	0	44	0	44
Trucks	0	7	0	7
Cars	0	1235	19	1254
Totals	0	1286	19	



Heavys	52
Trucks	5
Cars	2195
Totals	2252

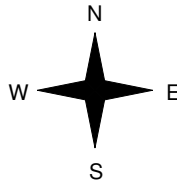
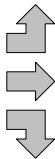
East Leg Total: 97
 East Entering: 71
 East Peds: 0
 Peds Cross: \bowtie

Heavys	0	0	1	Totals	1
--------	---	---	---	--------	---



Driveway

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



Bronte Rd



Cars	53	0	0	Totals	53
Trucks	0	0	0	Totals	0
Heavys	18	0	0	Totals	18
71	0	0			

Woodlands Entrance



Cars	25	1	0	Totals	26
------	----	---	---	--------	----

Peds Cross: \bowtie
 West Peds: 0
 West Entering: 0
 West Leg Total: 1

Cars	1253	Cars	1	2142	6	2149
Trucks	7	Trucks	0	5	1	6
Heavys	44	Heavys	0	52	0	52
Totals	1304	Totals	1	2199	7	



Peds Cross: \bowtie
 South Peds: 0
 South Entering: 2207
 South Leg Total: 3511

Comments

Bronte Rd @ Woodlands Entrance

Total Count Diagram

Municipality: Halton Region
Site #: 0000003340
Intersection: Bronte Rd & Woodlands Entrance
TFR File #: 16
Count date: 4-Dec-2019

Weather conditions:
 Overcast/Wet
Person(s) who counted:
 Cam

**** Signalized Intersection ****

Major Road: Bronte Rd runs N/S

North Leg Total: 22341
 North Entering: 11704
 North Peds: 1
 Peds Cross: \bowtie

Heavys	0	585	1	586
Trucks	0	179	0	179
Cars	1	10637	301	10939
Totals	1	11401	302	



Heavys	472
Trucks	136
Cars	10029
Totals	10637

East Leg Total: 769
 East Entering: 364
 East Peds: 21
 Peds Cross: \bowtie

Heavys	Trucks	Cars	Totals
0	0	7	7



Bronte Rd

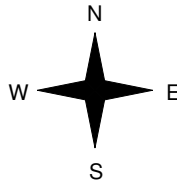
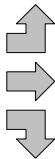
Cars	Trucks	Heavys	Totals
216	3	1	220
0	0	0	0
137	5	2	144
353	8	3	



Woodlands Entrance



Heavys	Trucks	Cars	Totals
0	0	3	3
0	0	0	0
0	0	2	2
0	0	5	



Bronte Rd



Cars	Trucks	Heavys	Totals
396	7	2	405

Peds Cross: \bowtie
 West Peds: 2
 West Entering: 5
 West Leg Total: 12

Cars	10776
Trucks	184
Heavys	587
Totals	11547



Cars	6	9810	95	9911
Trucks	0	133	7	140
Heavys	0	471	1	472
Totals	6	10414	103	

Peds Cross: \bowtie
 South Peds: 0
 South Entering: 10523
 South Leg Total: 22070

Comments

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Configuration Controller Sequence

Phase Ring Sequence and Assignment (MM) 1-1-1

Hardware Alternate Sequence Enable: No

Phase Ring Sequence.....(Note: Sequences identical to the prior one are not printed)

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	B	B	B	B	B											

Sequence 1

Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.

Sequence 2

Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	15	16	.	.	.	.	.	.	.	.

Phases In Use/Exclusive Ped (MM) 1-2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phases In Use	X	X	X	X	X	X	X	X								
Exclusive Ped																

Phase Compatibility (MM) 1-1-2

Phase	
n/a	Barrier Mode

Phase and Overlap Descriptions

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Approach	S	N	W	E	N	S	E	W	N	N	N	N	N	N	N	N
Movement	L	T	L	T	L	T	L	T								
Associated PED																
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Approach	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Movement																

Administration (MM) 1-7-1

Enable Controller/Cabinet No
Interlock CRC

CRC (16 bit)	A0C5
Enable Automatic Backup to Datakey	No

Backup Prevent (MM) 1-1-3

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Timing	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phases	2	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	6	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.
	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	8	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.
	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Simultaneous Gap (MM) 1-1-4

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phase	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Must	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gap	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
With	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phase	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Disable		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Load Switch Assignments (MM) 1-3

	Phase / Overlap	Type	Dimming				Power Up	Auto		Flash Together
			Red	Yellow	Green	Dark		Red	Yellow	
1	1	V				-	Auto	X		
2	2	V				-	Auto	X		X
3	3	V				-	Auto	X		
4	4	V				-	Auto	X		X
5	5	V				+	Auto	X		
6	6	V				+	Auto	X		X
7	7	V				+	Auto	X		
8	8	V				+	Auto	X		X
9	2	P				-	Auto			

10	4	P				-	Auto			
11	6	P				+	Auto			
12	8	P				+	Auto			
13	1	O				-	Auto	X		
14	2	O				+	Auto	X		X
15	3	O				-	Auto	X		
16	4	O				+	Auto	X		X

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Configuration Port 1 (SDLC)**Port 1 SDLC (MM) 1-4-1**

BIU	1	2	3	4	5	6	7	8
Term & Facility	X	X						
Detector Rack	X	X	X					

Enable TS2/MMU Type Cabinet: No
 Enable MMU Extended Status: Yes
 Enable SDLC Stop Time: No
 Enable 3 Critical RFE's Lockup: Yes

MMU Program (MM) 1-4-2

Channel Can Serve With Channel	
Channel 1	Channel 2
1	5
1	6
1	11
2	5
2	6
2	9
2	11
3	7
3	8
3	12
4	7
4	8
4	10
4	12
5	9
6	9
6	11
7	10
8	10
8	12
9	11
10	12

Color Check Enable (MM) 1-4-3

Enable Color Check: Yes

MMU/LS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green	X	X	X	X	X	X	X	X	X		X	X				
Yellow	X	X	X	X	X	X	X	X	X		X	X				
Red	X	X	X	X	X	X	X	X	X		X	X				

Secondary Stations/Tests (MM) 1-4-4

ID	1	2	3	4	5	6	7	8	MMU
Term & Facility									

ID	1	2	3	4	5	6	7	8	Diag
Detector Rack									

Enable SDLC Diagnostic Test: No

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Configuration Communications 1 (SDLC)**Ethernet Port Configuration (MM) 1-5-1**

DHCP Enable: No
 Controller IP: 10.70.10.51
 Subnet Mask: 255.255.255.0
 Default Gateway IP: 10.70.10.1
 Server IP: 10.70.10.1

NTCIP (MM) 1-5-5

NTCIP Backup Time (Sec): 0
 NTCIP UDP Port: 501
 Ethernet Priority: 1
 Port 2 Priority (Port C50S for 2070): 4
 Port 3A Priority (Port C21S for 2070): 2
 Port 3B Priority (Port C22S for 2070): 3

Port Configuration (MM) 1-5-2 to 1-5-4

Port	2 (C50S)	3A (C21S)	3B (C22S)
Comm Module	None	Auto	Auto
Protocol	TERMINAL	NTCIP	ECPIP
Enable	No	No	No
Data Rate (BPS)	9600	19.2K	1200
Data, Parity, Stop	8 N 1	8 N 1	8 N 1
Address	0	0	0
Telemetry Response Delay	0.0	0.0	0.9
Duplex - Half or Full	Half	Full	Full
Flow Control	Yes	Yes	Yes
Group Address	0	0	0
Single Flag Enable	Yes	Yes	Yes
RTS to CTS Delay	n/a	n/a	14.0
RTS Turn Off Delay	n/a	n/a	2.0
Dropout Time	10	10	10
Early RTS	n/a	n/a	No
Telemetry Mode	n/a	n/a	FSK
ATCS Railroad	0	n/a	n/a
ATCS Railroad Line	0	n/a	n/a
ATCS Group	0	n/a	n/a
Wayside Device	0	n/a	n/a
ATC Device	0	n/a	n/a
Wayside Subnode	0	n/a	n/a
ATC Subnode	0	n/a	n/a

ECPIP (MM) 1-5-6

Controller Address: 0
 Expanded System Detector Address:0

**System Detector
Assignment**

System Detector	Local Detector
----------------------------	---------------------------

Wireless Configuration (MM) 1-5-7

Wireless Channel Number: 6

Wireless Access Code: 327723274

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Configuration Logging / Display**Event Logging (MM) 1-6-1**

Critical RFE's (MMU/TF)	Yes	3 Critical Errors Within 24 Hours	Yes
MMU Flash Faults	Yes	Local Flash Fault	Yes
Non-Critical RFE's (Det/Test)	No	Detector Errors	No
Coordination Errors	No	Controller Download	No
Preemption Events	Yes	TSP Events	No
Power On/Off	Yes	Low Battery	Yes
Access	Yes	Data Change	No
Online / Offline	Yes		

Alarm Event	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable Logging	X															

Display Options (MM) 1-7-2

Key Click Enable:	Yes
Switch to Graphics Mode:	No
LED Mode:	Auto
Display Mode:	Basic
Trans Mode Pop-Up Disable:	No

Sign On (MM) 8-5

Sign On Message Line 1: Solutions that Move the World

Sign On Message Line 2:

Software Modules (MM) 8-7

Application Version: 32.66.10

OS (Boot) Version: 06.07.00

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Logic Processor Page 1**Logic Statement Control (MM) 1-8-1**

Logic #	Statement Control
1	E
2	E
3	E
4	E
5	E
6	E
7	E
8	E

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Logic Processor Page 2

Logic Statements (MM) 1-8-2

Logic #: 1 - ""

If:

	Peer T/F	Assignment	#	State
IF	--	F	CTR ON PHASE CALL	3 IS On

Then:

Assignment	#	State
DET SET VEH 1-16	16	On

Logic #: 2 - ""

If:

	Peer T/F	Assignment	#	State
IF	--	F	VEH GREEN ON PH	4 IS On

Then:

Assignment	#	State
DET SET VEH 1-16	16	Off

Logic #: 3 - ""

If:

	Peer T/F	Assignment	#	State
IF	--	F	DET	33 IS On

Then:

Assignment	#	State
DET SET PED	2	On

Logic #: 4 - ""

If:

	Peer T/F	Assignment	#	State
IF	--	F	DET	35 IS On

Then:

Assignment	#	State
DET SET PED	6	On

Logic #: 5 - ""

If:

Peer T/F	Assignment	#	State
IF -- F	DET	36	IS On

Then:

Assignment	#	State
DET SET PED	8	On

Logic #: 6 - ""

If:

Peer T/F	Assignment	#	State
IF -- F	DET FAIL ON DET	33	IS On

Then:

Assignment	#	State
DET SET PED	2	On

Logic #: 7 - ""

If:

Peer T/F	Assignment	#	State
IF -- F	DET FAIL ON DET	35	IS On

Then:

Assignment	#	State
DET SET PED	6	On

Logic #: 8 - ""

If:

Peer T/F	Assignment	#	State
IF -- F	DET FAIL ON DET	36	IS On

Then:

Assignment	#	State
DET SET PED	8	On

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Controller Timing Plan (MM) 2-1

Plan 1 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Min Green	6	20	6	10	6	20	6	10	0	0	0	0	0	0	0	0
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	7	0	7	0	7	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	23	0	23	0	23	0	23	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	15	70	15	26	15	70	15	26	35	35	35	35	35	35	35	35
Max2	7	70	7	26	7	70	7	26	40	40	40	40	40	40	40	40
Max3	7	40	7	26	7	40	7	26	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.7	3.0	3.7	3.0	3.7	3.0	3.7	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	2.8	1.0	3.0	1.0	2.8	1.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 2 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 3 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 4 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Controller Overlaps**Vehicle Overlaps (MM) 2-2**

Overlap	Type	Lag Green	Yellow	Red	Adv. Green
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Phases

Overlap	Phase	Included	Protect	Ped Protect	Not Overlap	Modifier	Lag X Phases	Lag 2 Phases	Flash Green
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PPLT FYA

Overlap	Protected Phase (Left Turn)	Permissive Phase (Opposing Thru)	Flashing Arrow Output	Flashing Arrow Output CH	Delay Start of FYA	Delay Start of Clearance	Action Plan SF Bit Disable	Ped Protected Enable
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Guaranteed Minimum Time Data (MM) 2-4

Phase	Min Green	Walk	Ped Clear	Yellow	Red Clear	Overlap Green
A01	5	0	7	3.0	0.0	5
B02	5	0	7	3.0	0.0	5
C03	5	0	7	3.0	0.0	5
D04	5	0	7	3.0	0.0	5
E05	5	0	7	3.0	0.0	5
F06	5	0	7	3.0	0.0	5
G07	5	0	7	3.0	0.0	5
H08	5	0	7	3.0	0.0	5
I09	5	0	7	3.0	0.0	5
J10	5	0	7	3.0	0.0	5
K11	5	0	7	3.0	0.0	5
L12	5	0	7	3.0	0.0	5
M13	5	0	7	3.0	0.0	5
N14	5	0	7	3.0	0.0	5
O15	5	0	7	3.0	0.0	5
P16	5	0	7	3.0	0.0	5

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MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Controller Pedestrian Overlaps
Vehicle / Pedestrian Overlaps (MM) 2-3

Included	Pedestrian Overlaps
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MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Controller Start / Flash Data (MM) 2-5**Start Up**

Phase	Phase Setting
1	.
2	Y
3	.
4	.
5	.
6	Y
7	.
8	.
9	.
10	.
11	.
12	.
13	.
14	.
15	.
16	.

Overlap

Flash Thru Mon: No
Flash Time: 0
All Red: 0
Power Start Seq: 1
MUTCD Enabled: No
Y->G: n/a

Automatic Flash

Entry
2
6

Exit
2
6

Overlap Exit

Flash Thru Mon: Yes

Exit Flash: W
Minimum Flash: 8
Minimum Recall: No
Cycle Through Phase: No

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MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Controller Options

Controller Options (MM) 2-6-1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Flashing Grn Ph	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Guar Passage																
Non-Act I	X				X											
Non-Act II																
Dual Entry	X	X	X	X	X											
Cond Service																
Cond Reservice																
Ped Re-Service	X				X											
Rest In Walk																
Flashing Walk																
Ped Clr-Yel																
Ped Clr-Red																
IGRN + Veh Ext																

Ped Clear Protect: Off Unit Red Revert: 2.0 MUTCD 3 Seconds Don't Walk: No

Pre-Timed Mode (MM) 2-7

Enable Pre-Timed Mode: No Free Input Disables Pre-Timed: No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pre-Timed																

Phase Recall Options (MM) 2-8

Plan # 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector																
Vehicle Recall		X				X										
Ped Recall																
Max Recall																
Soft Recall																
No Rest																
AI Calc																

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MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Coordination Options**Options (MM) 3-1**

Manual Pattern	Auto	ECPI Coord	Yes
System Source	TBC	System Format	STD
Splits In	Percent	Offsets In	Percent
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Float
Offset Reference	Lead	Use Ped Time	Yes
Ped Recall	No	Ped Reservice	Yes
Local Zero	Yes	FO Added Ini	No
Override		Green	
Re-sync Count	0	Multisync	No

Auto Perm Minimum Green (Seconds) (MM) 3-4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Split Demand (MM) 3-5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Coordination Pattern Data

Coordinator Pattern Data (MM) 3-2

Coordinator Pattern # 1

Split Pattern	1	TS2 (Pat-Off)	0-1	Splits In	Percent
Cycle	140	Std (COS)	9	Offsets In	Percent
Offset Value	59%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	0		
Actuated Walk Rest	No	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Splits (Split Pat 1)	12	57	14	17	8	61	8	23	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data			
Veh Perm 1	0	Veh Perm 2	0
Veh Perm 2 Disp	0	Veh Perm 2	0
Split Demand Pat 1	0	Split Demand Pat 2	0
Crossing Arterial Pat	0		

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 2

Split Pattern	2	TS2 (Pat-Off)	0-2	Splits In	Percent
Cycle	105	Std (COS)	17	Offsets In	Percent
Offset Value	99%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	0		
Actuated Walk Rest	No	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Splits (Split Pat 2)	10	37	15	38	10	37	12	41	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 3

Split Pattern	3	TS2 (Pat-Off)	0-3	Splits In	Percent
Cycle	140	Std (COS)	25	Offsets In	Percent
Offset Value	25%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	0		
Actuated Walk Rest	No	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Splits (Split Pat 3)	9	60	14	17	9	60	8	23	0	0	0	0	0	0	0	0

Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data

Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0
 Split Demand 0 Split Demand 0 Crossing Arterial 0
 Pat 1 Pat 2 Pat

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 4

Split Pattern	4	TS2 (Pat-Off)	1-1	Splits In	Percent
Cycle	100	Std (COS)	33	Offsets In	Percent
Offset Value	5%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	0		
Actuated Walk Rest	No	Sequence	0		
Phase					
Reservice	No	Action Plan	0		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Splits (Split Pat 4)	0	45	15	40	0	45	11	44	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase	X				X				X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 5

Split Pattern	5	TS2 (Pat-Off)	1-2	Splits In	Percent
Cycle	105	Std (COS)	41	Offsets In	Percent
Offset Value	99%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	No	Sequence	0		
Phase					
Reservice	No	Action Plan	0		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Splits (Split Pat 5)	10	37	18	35	10	37	11	42	0	0	0	0	0	0	0	0

Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data

Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0
 Split Demand 0 Split Demand 0 Crossing Arterial 0
 Pat 1 Pat 2 Pat

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 10

Split Pattern	10	TS2 (Pat-Off)	3-1	Splits In	Percent
Cycle	120	Std (COS)	105	Offsets In	Percent
Offset Value	70%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Splits (Split Pat 10)	10	45	23	22	10	45	11	34	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 11

Split Pattern	11	TS2 (Pat-Off)	3-2	Splits In	Percent
Cycle	100	Std (COS)	137	Offsets In	Percent
Offset Value	68%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N

Splits (Split Pat 11)	12	41	11	36	12	41	11	36	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data
 Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0
 Split Demand Pat 1 0 Split Demand Pat 2 0 Crossing Arterial Pat 0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 12

Split Pattern	12	TS2 (Pat-Off)	3-3	Splits In	Percent
Cycle	120	Std (COS)	145	Offsets In	Percent
Offset Value	48%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Splits (Split Pat 12)	12	48	21	19	10	50	10	30	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 13

Split Pattern	13	TS2 (Pat-Off)	4-1	Splits In	Percent
Cycle	100	Std (COS)	153	Offsets In	Percent
Offset Value	68%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N

Splits (Split Pat 13)	12	41	11	36	12	41	11	36	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data
 Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0
 Split Demand Pat 1 0 Split Demand Pat 2 0 Crossing Arterial Pat 0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Coordination Split Pattern
Split Pattern Data (MM) 3-3
Split Pattern # 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Split (percent)	12	57	14	17	8	61	8	23	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Split (percent)	10	37	15	38	10	37	12	41	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Split (percent)	9	60	14	17	9	60	8	23	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Split (percent)	0	45	15	40	0	45	11	44	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase	X				X				X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Split (percent)	10	37	18	35	10	37	11	42	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 10

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Split (percent)	10	45	23	22	10	45	11	34	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 11

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Description	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Split (percent)	12	41	11	36	12	41	11	36	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 12

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Split (percent)	12	48	21	19	10	50	10	30	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 13

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	W-L	E-T	N-L	S-T	E-L	W-T	N	N	N	N	N	N	N	N
Split (percent)	12	41	11	36	12	41	11	36	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Preempt Plan

Preempt Plan (MM) 4-1

Preempt Plan 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	.	X	.	.	.	X	.	.	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases				X				X								
Exit Calls																
Special Function																

Enable	Yes	Preempt Override	Yes	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	No	Duration	10	CLR > GRN	No
Term Ovlp Asap	No	PC Through Yel	Yes	Terminate Phase	Yes
Ped Dark	No	Track Clear Rsrv	No	Dwell Flash	Off
Linked Pmt	0	FL Exit Color	Grn	Exit Options	Off
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	7	3	4.0	2.0
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	4.0	1.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	0	0.0	0	4.0	1.0

Preemption Active On Out
 Other - Priority Preempt Off
 Inhibit Extension Time 0.0
 Veh Priority Return Off
 Conditional Delay Off

Preempt Act Dwell
 Non-Priority Pmt Off
 Ped Priority Return Off
 Queue Delay Off

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Preempt Plan 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	.	.	.	X	.	.	.	X	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases																
Exit Calls																
Special Function																

Enable Yes Preempt Override Yes Interlock Enable No
 Det Lock Yes Delay 0 Inhibit 0
 Override Flash No Duration 10 CLR > GRN No
 Term Ovlp Asap No PC Through Yel Yes Terminate Phase No
 Ped Dark No Track Clear Rsrv No Dwell Flash Off
 Linked Pmt 0 FL Exit Color Grn Exit Options Off
 Exit Timing Plan 0 Reservice 0 Fault Type Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	7	3	4.0	1.0
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	4.0	1.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red

Dwell / Cycle-Exit	0	0.0	0	4.0	1.0
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Preemption Active On Preempt Act No
 Out Dwell
 Other - Priority Off Non-Priority Pmt Off
 Preempt
 Inhibit Extension 0.0 Ped Priority Off
 Time Return
 Veh Priority Off Queue Delay Off
 Return
 Conditional Delay Off

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Preempt Plan 5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	.	.	X	.	.	.	.	X	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases		X				X										
Exit Calls																
Special Function																

Enable Yes Preempt Override Yes Interlock Enable No
 Det Lock Yes Delay 0 Inhibit 0
 Override Flash No Duration 10 CLR > GRN No
 Term Ovlp No PC Through Yel Yes Terminate Phase No
 Ped Dark No Track Clear Rsrv No Dwell Flash Off
 Linked Pmt 0 FL Exit Color Grn Exit Options Off
 Exit Timing Plan 0 Reservice 0 Fault Type Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	7	2	4.0	2.0
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	4.0	1.0
				Yellow	Red

	Min Dwell	Pmt Ext	Max Time		
Dwell / Cycle-Exit	0	0.0	0	4.0	1.0

Preemption Active On
 Out Preempt Act No
 Dwell
 Other - Priority Off
 Preempt Non-Priority Pmt Off
 Inhibit Extension 0.0
 Time Ped Priority Off
 Return
 Veh Priority Off
 Return Queue Delay Off
 Conditional Delay Off

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Preempt Plan 6

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	.	.	.	X	.	.	X	.	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases																
Exit Calls																
Special Function																

Enable Yes Preempt Override Yes Interlock Enable No
 Det Lock Yes Delay 0 Inhibit 0
 Override Flash No Duration 10 CLR > GRN No
 Term Ovp No PC Through Yes Terminate No
 Asap Yel Phase
 Ped Dark No Track Clear No Dwell Flash Off
 Rsrv
 Linked Pmt 0 FL Exit Color Grn Exit Options Off
 Exit Timing 0 Reservice 0 Fault Type Hard
 Plan

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	7	2	4.0	2.0
	Min Grn	Ext Grn	Max Grn	Yellow	Red

Track Clear	0	0	0	4.0	1.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	0	0.0	0	4.0	1.0

Preemption Active On Preempt Act No
 Out Dwell

Other - Priority Off Non-Priority Pmt Off
 Preempt

Inhibit Extension 0.0 Ped Priority Off
 Time Return

Veh Priority Off Queue Delay Off
 Return

Conditional Delay Off

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Preempt Preempt Filtering
Enable Preempt Filtering &
TSP/SCP (MM) 4-2

Input	Solid	Pulsing
1	...BYPASSED...	...BYPASSED...
2	...BYPASSED...	...BYPASSED...
3	PREEMPTION 3	PREEMPTION 7
4	PREEMPTION 4	PREEMPTION 8
5	PREEMPTION 5	PREEMPTION 9
6	PREEMPTION 6	PREEMPTION 10
7	...BYPASSED...	...BYPASSED...
8	...BYPASSED...	...BYPASSED...
9	...BYPASSED...	...BYPASSED...
10	...BYPASSED...	...BYPASSED...

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Preempt TSP/SCP Plan and Split

TSP / SCP Plan (MM) 4-3

TSP/SCP Plan	Enable Option	Signal Type	Det Lock	Delay Time	Max Presence	PMT Enables Reservice	No Delay in TSP	Action SF Inhibit	Reservice Cycles	Bus Heading
1	No	Solid	No	0	0	No	False	0	0	NB
2	No	Solid	No	0	0	No	False	0	0	SB
3	No	Solid	No	0	0	No	False	0	0	EB
4	No	Solid	No	0	0	No	False	0	0	WB
5	No	Solid	No	0	0	No	False	0	0	.
6	No	Solid	No	0	0	No	False	0	0	.

Mode: TSP

Free Default Pattern: 120

Headway Allowance: 100

TSP/SCP Plan	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1
2
3
4
5
6

TSP / SCP Split Pattern (MM) 4-4

TSP/SCP Split Pattern	Max Type	Phase															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
4	Max Reduction	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Time Base Clock/Calendar**Clock/Calendar Data (MM) 5-1**

Manual Action Plan: 0
SYNC Reference Time: 03:15
SYNC Reference: Reference Time
Day Light Savings: No
Time Reset Input Set Time: 3:30:00
Standard Time From GMT: 0

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Time Base Action Plan
Action Plan (MM) 5-2

Action Plan - 1 - "1"

Pattern	1	Override Sys	No
Timing Plan	0	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)								
-----------------	--	--	--	--	--	--	--	--

Aux Func (1-3)			
----------------	--	--	--

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	E	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30
LP 31-45
LP 46-60
LP 61-75
LP 76-90
LP 91-100

Action Plan - 2 - "2"

Pattern 2 Override Sys No
 Timing Plan 0 Sequence 0
 Veh Detector Plan 0 Det Log None
 Flash No Red Rest No
 Veh Det Diag Plan 0 Ped Det Diag 0
 Dimming Enable No Pmt Veh Priority Ret No
 Pmt Ped Priority Ret No Pmt Queue Delay No
 Pmt Cond Delay No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)									
-----------------	--	--	--	--	--	--	--	--	--

Aux Func (1-3)			
----------------	--	--	--

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15
LP 16-30
LP 31-45
LP 46-60
LP 61-75
LP 76-90
LP 91-100

Action Plan - 3 - "3"

Pattern 3 Override Sys No
 Timing Plan 0 Sequence 0
 Veh Detector Plan 0 Det Log None
 Flash No Red Rest No
 Veh Det Diag Plan 0 Ped Det Diag 0
 Dimming Enable No Pmt Veh Priority Ret No
 Pmt Ped Priority Ret No Pmt Queue Delay No
 Pmt Cond Delay No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	
LP 16-30	
LP 31-45	
LP 46-60	
LP 61-75	
LP 76-90	
LP 91-100	

Action Plan - 4 - "4"

Pattern 4 Override Sys No
 Timing Plan 0 Sequence 0
 Veh Detector Plan 0 Det Log None
 Flash No Red Rest No
 Veh Det Diag Plan 0 Ped Det Diag 0
 Dimming Enable No Pmt Veh Priority Ret No
 Pmt Ped Priority Ret No Pmt Queue Delay No
 Pmt Cond Delay No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)																
-----------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Aux Func (1-3)			
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15
LP 16-30
LP 31-45
LP 46-60
LP 61-75
LP 76-90
LP 91-100

Action Plan - 5 - "5"

Pattern 5 Override Sys No
 Timing Plan 0 Sequence 0
 Veh Detector Plan 0 Det Log None
 Flash No Red Rest No
 Veh Det Diag Plan 0 Ped Det Diag 0
 Dimming Enable No Pmt Veh Priority Ret No
 Pmt Ped Priority Ret No Pmt Queue Delay No
 Pmt Cond Delay No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	
LP 16-30	
LP 31-45	
LP 46-60	
LP 61-75	
LP 76-90	
LP 91-100	

Action Plan - 10 - "10"

Pattern 10 Override Sys Yes
 Timing Plan 0 Sequence 0
 Veh Detector Plan 0 Det Log None
 Flash No Red Rest No
 Veh Det Diag Plan 0 Ped Det Diag 0
 Dimming Enable No Pmt Veh Priority Ret No
 Pmt Ped Priority Ret No Pmt Queue Delay No
 Pmt Cond Delay No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)									
-----------------	--	--	--	--	--	--	--	--	--

Aux Func (1-3)			
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15
LP 16-30
LP 31-45
LP 46-60
LP 61-75
LP 76-90
LP 91-100

Action Plan - 11 - "11"

Pattern 11 Override Sys Yes
 Timing Plan 0 Sequence 0
 Veh Detector Plan 0 Det Log None
 Flash No Red Rest No
 Veh Det Diag Plan 0 Ped Det Diag 0
 Dimming Enable No Pmt Veh Priority Ret No
 Pmt Ped Priority Ret No Pmt Queue Delay No
 Pmt Cond Delay No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	
LP 16-30	
LP 31-45	
LP 46-60	
LP 61-75	
LP 76-90	
LP 91-100	

Action Plan - 12 - "12"

Pattern 12 Override Sys No
 Timing Plan 0 Sequence 0
 Veh Detector Plan 0 Det Log None
 Flash No Red Rest No
 Veh Det Diag Plan 0 Ped Det Diag 0
 Dimming Enable No Pmt Veh Priority Ret No
 Pmt Ped Priority Ret No Pmt Queue Delay No
 Pmt Cond Delay No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	
LP 16-30	
LP 31-45	
LP 46-60	
LP 61-75	
LP 76-90	
LP 91-100	

Action Plan - 13 - "13"

Pattern 13 Override Sys No
 Timing Plan 0 Sequence 0
 Veh Detector Plan 0 Det Log None
 Flash No Red Rest No
 Veh Det Diag Plan 0 Ped Det Diag 0
 Dimming Enable No Pmt Veh Priority Ret No
 Pmt Ped Priority Ret No Pmt Queue Delay No
 Pmt Cond Delay No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	
LP 16-30	
LP 31-45	
LP 46-60	
LP 61-75	
LP 76-90	
LP 91-100	

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Time Base Day Plan/Schedule**Day Plan (MM) 5-3****Day Plan #1 - "1"**

Event	Action Plan	Start Time
1	1	06:00
2	2	10:00
3	3	15:15
4	2	19:00
5	4	20:30
6	6	22:00

Day Plan #2 - "2"

Event	Action Plan	Start Time
1	5	08:00
2	6	20:00

Schedule (MM) 5-4**Schedule Number - 1**

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
		X	X	X	X	X	

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Schedule Number - 2

Day Plan No.: 2

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X						X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Schedule Number - 3

Day Plan No.: 3

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT

--	--	--	--	--	--	--	--	--	--	--	--	--

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
	23	24	25	26	27	28	29	30	31		

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Time Base Exceptions**Exception Day Program (MM) 5-5**

Excep Day	Float/Fixed	Mon/Mon	DOW/DOM	WOM/Year	Day Plan
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Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Detectors**Detectors - Pg 1****Veh Det Phase Assignment (MM) 6-1****Vehicle Detector Plan Number - 1**

Veh Detector	Assigned Phase	Called Phase	Type
1	2		N
2	2		N
3	2		N
4	6		N
5	6		N
6	6		N
7	8		N
8	8		N
9	8		N
10	5		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	4		N
17	1		N
19	3		N
20	4		N
21	2		N
23	7		N
24	8		N
33	9		N
34	10		N
35	11		N
36	12		N

Vehicle Detector Plan Number - 2

Veh Detector	Assigned Phase	Called Phase	Type
1	1		N
2	2		N
3	3		N
4	4		N
5	5		N
6	6		N
7	7		N
8	8		N

9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Plan Number - 3

Veh Detector	Assigned Phase	Called Phase	Type
1	1		N
2	2		N
3	3		N
4	4		N
5	5		N
6	6		N
7	7		N
8	8		N
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Plan Number - 4

Veh Detector	Assigned Phase	Called Phase	Type
1	1		N
2	2		N
3	3		N
4	4		N
5	5		N
6	6		N
7	7		N
8	8		N
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Setup (MM) 6-2

Veh Detector	Type	TS2 Detector	Description
1	N-NTCIP	Yes	

2	N-NTCIP	Yes	
3	N-NTCIP	Yes	
4	N-NTCIP	Yes	
5	N-NTCIP	Yes	
6	N-NTCIP	Yes	
7	N-NTCIP	Yes	
8	N-NTCIP	Yes	
9	N-NTCIP	No	
10	N-NTCIP	No	
11	N-NTCIP	No	
12	N-NTCIP	No	
13	N-NTCIP	No	
14	N-NTCIP	No	
15	N-NTCIP	No	
16	N-NTCIP	No	
17	N-NTCIP	Yes	
18	N-NTCIP	Yes	
19	N-NTCIP	Yes	
20	N-NTCIP	Yes	
21	N-NTCIP	Yes	
22	N-NTCIP	Yes	
23	N-NTCIP	Yes	
24	N-NTCIP	Yes	
25	N-NTCIP	Yes	
26	N-NTCIP	Yes	
27	N-NTCIP	Yes	
28	N-NTCIP	Yes	
29	N-NTCIP	Yes	
30	N-NTCIP	Yes	
31	N-NTCIP	Yes	
32	N-NTCIP	Yes	
33	N-NTCIP	Yes	
34	N-NTCIP	Yes	
35	N-NTCIP	Yes	
36	N-NTCIP	Yes	
37	N-NTCIP	Yes	
38	N-NTCIP	Yes	
39	N-NTCIP	Yes	
40	N-NTCIP	Yes	
41	N-NTCIP	Yes	
42	N-NTCIP	Yes	
43	N-NTCIP	Yes	
44	N-NTCIP	Yes	
45	N-NTCIP	Yes	
46	N-NTCIP	Yes	
47	N-NTCIP	Yes	
48	N-NTCIP	Yes	
49	N-NTCIP	Yes	
50	N-NTCIP	Yes	
51	N-NTCIP	Yes	
52	N-NTCIP	Yes	

53	N-NTCIP	Yes	
54	N-NTCIP	Yes	
55	N-NTCIP	Yes	
56	N-NTCIP	Yes	
57	N-NTCIP	Yes	
58	N-NTCIP	Yes	
59	N-NTCIP	Yes	
60	N-NTCIP	Yes	
61	N-NTCIP	Yes	
62	N-NTCIP	Yes	
63	N-NTCIP	Yes	
64	N-NTCIP	Yes	

Vehicle Detector Plan Number - 1

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	4	No	Yes	0.0	Passage	0.0	0	No	0	Red	No	No	No
17	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
19	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
20	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
21	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
23	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
24	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
33	9	No	No	0.0	None	0.0	0	No	0	None	No	No	No
34	10	No	No	0.0	None	0.0	0	No	0	None	No	No	No
35	11	No	No	0.0	None	0.0	0	No	0	None	No	No	No
36	12	No	No	0.0	None	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 2

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 3

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 4

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

**Ped Detector Phase
Assignment (MM) 6-3**

Mode: NTCIP

Called Phase	Detector
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG1202 - Bronte Rd @ Upper Middle Rd - Econolite Type - Cobalt

Detectors**Detectors - Pg 2****Log - Speed Detector Setup (MM) 6-4**

NTCIP Log ECPI Log Length Unit:
 Period: 60 Period: 0 Inches

Speed Detector	Local Detector	One/Two Detector	Vehicle Length	Trap length	Enable Log
1	0	1	0	0	No
2	0	1	0	0	No
3	0	1	0	0	No
4	0	1	0	0	No
5	0	1	0	0	No
6	0	1	0	0	No
7	0	1	0	0	No
8	0	1	0	0	No
9	0	1	0	0	No
10	0	1	0	0	No
11	0	1	0	0	No
12	0	1	0	0	No
13	0	1	0	0	No
14	0	1	0	0	No
15	0	1	0	0	No
16	0	1	0	0	No

Vehicle Detector Diagnostics (MM) 6-5**Veh Diagnostic Plan Number - 1**

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 2

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 3

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 4

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay
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Pedestrian Detector Diagnostics (MM) 6-6**Ped Diagnostic Plan Number - 1**

Det	Counts	Act	Pres	Multiplier
-----	--------	-----	------	------------

Ped Diagnostic Plan Number - 2

Det	Counts	Act	Pres	Multiplier
-----	--------	-----	------	------------

Ped Diagnostic Plan Number - 3

Det	Counts	Act	Pres	Multiplier
-----	--------	-----	------	------------

Ped Diagnostic Plan Number - 4

Det	Counts	Act	Pres	Multiplier
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MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Configuration Controller Sequence

Phase Ring Sequence and Assignment (MM) 1-1-1

Hardware Alternate Sequence Enable: No

Phase Ring Sequence.....(Note: Sequences identical to the prior one are not printed)

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	B	B	B	B	B											
Sequence 1																
Ring 1	| 1	2 | 3	4 | 9	10 | 13	14 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 7	8 | 11	12 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 2																
Ring 1	| 2	1 | 3	4 | 10	9 | 13	14 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 7	8 | 11	12 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 3																
Ring 1	| 1	2 | 4	3 | 9	10 | 14	13 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 7	8 | 11	12 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 4																
Ring 1	| 2	1 | 4	3 | 10	9 | 14	13 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 7	8 | 11	12 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 5																
Ring 1	| 1	2 | 3	4 | 9	10 | 13	14 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 6	5 | 7	8 | 12	11 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 6																
Ring 1	| 2	1 | 3	4 | 10	9 | 13	14 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 6	5 | 7	8 | 12	11 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 7																
Ring 1	| 1	2 | 4	3 | 9	10 | 14	13 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 6	5 | 7	8 | 12	11 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 8																
Ring 1	| 2	1 | 4	3 | 10	9 | 14	13 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 6	5 | 7	8 | 12	11 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 9																
Ring 1	| 1	2 | 3	4 | 9	10 | 13	14 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 8	7 | 11	12 | 16	15 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 10																
Ring 1	| 2	1 | 3	4 | 10	9 | 13	14 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 8	7 | 11	12 | 16	15 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 11																
Ring 1	| 1	2 | 4	3 | 9	10 | 14	13 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 8	7 | 11	12 | 16	15 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 12																
Ring 1	| 2	1 | 4	3 | 10	9 | 14	13 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 8	7 | 11	12 | 16	15 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .

Sequence 13

Ring 1	| 1	2	| 3	4	| 9	10	| 13	14	| .	.	.	.	.	.	.	.
Ring 2	| 6	5	| 8	7	| 12	11	| 16	15	| .	.	.	.	.	.	.	.

Sequence 14

Ring 1	| 2	1	| 3	4	| 10	9	| 13	14	| .	.	.	.	.	.	.	.
Ring 2	| 6	5	| 8	7	| 12	11	| 16	15	| .	.	.	.	.	.	.	.

Sequence 15

Ring 1	| 1	2	| 4	3	| 9	10	| 14	13	| .	.	.	.	.	.	.	.
Ring 2	| 6	5	| 8	7	| 12	11	| 16	15	| .	.	.	.	.	.	.	.

Sequence 16

Ring 1	| 2	1	| 4	3	| 10	9	| 14	13	| .	.	.	.	.	.	.	.
Ring 2	| 6	5	| 8	7	| 12	11	| 16	15	| .	.	.	.	.	.	.	.

Phases In Use/Exclusive Ped (MM) 1-2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phases In Use	X	X		X		X		X								
Exclusive Ped																

Phase Compatibility (MM) 1-1-2

Phase	
n/a	Barrier Mode

Phase and Overlap Descriptions

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Description																

Administration (MM) 1-7-1

Enable Controller/Cabinet Interlock CRC No
 CRC (16 bit) 41D1
 Enable Automatic Backup to Datakey No

Backup Prevent (MM) 1-1-3

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Timing	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phases	2	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	6	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.
	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	8	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.
	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Simultaneous Gap (MM) 1-1-4

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phase	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Must	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gap	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
With	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phase	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Disable		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Load Switch Assignments (MM) 1-3

	Phase / Overlap	Type	Dimming				Power Up	Auto		Flash Together
			Red	Yellow	Green	Dark		Red	Yellow	
1	1	V				-	Auto	X		
2	2	V				-	Auto	X		X
3	3	V				-	Auto	X		
4	4	V				-	Auto	X		X
5	5	V				+	Auto	X		
6	6	V				+	Auto	X		X
7	7	V				+	Auto	X		
8	8	V				+	Auto	X		X
9	2	P				-	Auto			

10	4	P				-	Auto			
11	6	P				+	Auto			
12	8	P				+	Auto			
13	1	O				-	Auto	X		
14	2	O				+	Auto	X		X
15	3	O				-	Auto	X		
16	4	O				+	Auto	X		X

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MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Configuration Port 1 (SDLC)**Port 1 SDLC (MM) 1-4-1**

BIU	1	2	3	4	5	6	7	8
Term & Facility	X	X						
Detector Rack	X	X	X					

Enable TS2/MMU Type Cabinet: No
 Enable MMU Extended Status: Yes
 Enable SDLC Stop Time: No
 Enable 3 Critical RFE's Lockup: Yes

MMU Program (MM) 1-4-2

Channel Can Serve With Channel	
Channel 1	Channel 2
1	5
1	6
1	11
2	5
2	6
2	9
2	11
3	7
3	8
3	12
4	7
4	8
4	10
4	12
5	9
6	9
6	11
7	10
8	10
8	12
9	11
10	12

Color Check Enable (MM) 1-4-3

Enable Color Check: Yes

MMU/LS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green	X	X		X		X		X								
Yellow	X	X		X		X		X								
Red	X	X		X		X		X								

Secondary Stations/Tests (MM) 1-4-4

ID	1	2	3	4	5	6	7	8	MMU
Term & Facility									

ID	1	2	3	4	5	6	7	8	Diag
Detector Rack									

Enable SDLC Diagnostic Test: No

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MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Configuration Communications 1 (SDLC)**Ethernet Port Configuration (MM) 1-5-1**

Controller IP: 172.16.2.9
 Subnet Mask: 255.255.0.0
 Default Gateway IP: 10.104.0.1
 Server IP: 172.16.1.254

NTCIP (MM) 1-5-5

NTCIP Backup Time (Sec): 0
 NTCIP UDP Port: 501
 Ethernet Priority: 1
 Port 2 Priority (Port C50S for 2070): 4
 Port 3A Priority (Port C21S for 2070): 2
 Port 3B Priority (Port C22S for 2070): 3

Port Configuration (MM) 1-5-2 to 1-5-4

Port	2 (C50S)	3A (C21S)	3B (C22S)
Protocol	NTCIP	ECPIP	ECPIP
Enable	No	Yes	No
Data Rate (BPS)	9600	9600	1200
Data, Parity, Stop	8 N 1	8 N 1	8 O 1
Address	1	4	4
Telemetry Response Delay	0.0	1.0	1.0
Duplex - Half or Full	Half	Full	Full
Flow Control	Yes	No	Yes
Group Address	0	0	0
Single Flag Enable	Yes	Yes	Yes
RTS to CTS Delay	n/a	n/a	3.0
RTS Turn Off Delay	n/a	n/a	2.0
Dropout Time	10	10	300
Early RTS	n/a	n/a	No
Telemetry Mode	n/a	n/a	FSK
ATCS Railroad	0	n/a	n/a
ATCS Railroad Line	0	n/a	n/a
ATCS Group	0	n/a	n/a
Wayside Device	0	n/a	n/a
ATC Device	0	n/a	n/a
Wayside Subnode	0	n/a	n/a
ATC Subnode	0	n/a	n/a

ECPIP (MM) 1-5-6

Controller Address: 4
 Expanded System Detector Address: 0

**System Detector
Assignment**

System Detector	Local Detector
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Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Configuration Logging / Display**Event Logging (MM) 1-6-1**

Critical RFE's (MMU/TF)	Yes	3 Critical Errors Within 24 Hours	Yes
MMU Flash Faults	Yes	Local Flash Fault	Yes
Non-Critical RFE's (Det/Test)	No	Detector Errors	Yes
Coordination Errors	No	Controller Download	Yes
Preemption Events	Yes	TSP Events	Yes
Power On/Off	Yes	Low Battery	Yes
Access	Yes	Data Change	Yes
Online / Offline	Yes		

Alarm Event	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable Logging	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Display Options (MM) 1-7-2

Key Click Enable:	No
Backlight Enable:	Yes
LED Mode:	Auto
Display Mode:	Basic
Screen Format:	Advanced
Trans Mode Pop-Up Disable:	No

Sign On (MM) 8-5

Sign On Message Line 1: Solutions that Move the World

Sign On Message Line 2:

Software Modules (MM) 8-7

Application Version: 02.64.00

OS (Boot) Version: 01.14.03

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MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Logic Processor Page 1**Logic Statement Control (MM) 1-8-1**

Logic #	Statement Control
1	E
2	E
3	E
4	E
5	E
6	E

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MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Logic Processor Page 2

Logic Statements (MM) 1-8-2

Logic #: 1

If:

	Assignment	#	State
IF	DET	33	IS On

Then:

	Assignment	#	State
DET	SET PED	2	On

Logic #: 2

If:

	Assignment	#	State
IF	DET	35	IS On

Then:

	Assignment	#	State
DET	SET PED	6	On

Logic #: 3

If:

	Assignment	#	State
IF	DET	36	IS On

Then:

	Assignment	#	State
DET	SET PED	8	On

Logic #: 4

If:

	Assignment	#	State
IF	DET FAIL ON DET	33	IS On

Then:

	Assignment	#	State
DET	SET PED	2	On

Logic #: 5

If:

	Assignment	#	State
IF	DET FAIL ON DET	35	IS On

Then:

Assignment	#	State
DET SET PED	6	On

Logic #: 6

If:

Assignment	#	State
IF DET FAIL ON DET	36 IS	On

Then:

Assignment	#	State
DET SET PED	8	On

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MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Controller Timing Plan (MM) 2-1

Plan 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction																
Min Green	5	15	0	10	0	15	0	10	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	7	0	7	0	7	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	22	0	22	0	22	0	22	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	3.6	5.0	0.0	5.0	3.6	5.0	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	15	60	0	10	0	60	0	40	35	35	35	35	35	35	35	35
Max2	10	60	0	10	0	60	0	20	40	40	40	40	40	40	40	40
Max3	20	60	0	10	0	60	0	25	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.7	3.0	3.1	3.0	3.7	3.0	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	2.2	1.0	3.1	1.0	2.2	1.0	3.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction																
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction																
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction																
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Controller Overlaps**Vehicle Overlaps (MM) 2-2**

Overlap	Type	Lag Green	Yellow	Red	Adv. Green
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Phases

Overlap	Phase	Included	Protect	Ped Protect	Not Overlap	Modifier	Lag X Phases	Lag 2 Phases	Flash Green
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PPLT FYA

Overlap	Protected Phase (Left Turn)	Permissive Phase (Opposing Thru)	Flashing Arrow Output	Flashing Arrow Output CH	Delay Start of FYA	Delay Start of Clearance	Action Plan SF Bit Disable	Ped Protected Enable
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Guaranteed Minimum Time Data (MM) 2-4

Phase	Min Green	Walk	Ped Clear	Yellow	Red Clear	Overlap Green
A01	5	0	7	3.0	0.0	5
B02	5	0	7	3.0	0.0	5
C03	5	0	7	3.0	0.0	5
D04	5	0	7	3.0	0.0	5
E05	5	0	7	3.0	0.0	5
F06	5	0	7	3.0	0.0	5
G07	5	0	7	3.0	0.0	5
H08	5	0	7	3.0	0.0	5
I09	5	0	7	3.0	0.0	5
J10	5	0	7	3.0	0.0	5
K11	5	0	7	3.0	0.0	5
L12	5	0	7	3.0	0.0	5
M13	5	0	7	3.0	0.0	5
N14	5	0	7	3.0	0.0	5
O15	5	0	7	3.0	0.0	5
P16	5	0	7	3.0	0.0	5

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MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Controller Pedestrian Overlaps
Vehicle / Pedestrian Overlaps (MM) 2-3

Included	Pedestrian Overlaps
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MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Controller Start / Flash Data (MM) 2-5**Start Up**

Phase	Phase Setting
1	.
2	.
3	.
4	Y
5	.
6	.
7	.
8	Y
9	.
10	.
11	.
12	.
13	.
14	.
15	.
16	.

Overlap
A
B
C
D

Flash Thru Mon: No
Flash Time: 0
All Red: 0
Power Start Seq: 1
MUTCD Enabled: No
Y->G: n/a

Automatic Flash

Entry
2
6

Exit
2
6

Overlap Exit
A
B
C
D

Flash Thru Mon: No
Exit Flash: W
Minimum Flash: 8
Minimum Recall: No
Cycle Through Phase: No

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MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Controller Options

Controller Options (MM) 2-6-1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Flashing Grn Ph	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Guar Passage																
Non-Act I	X				X											
Non-Act II			X				X									
Dual Entry	X	X	X	X	X											
Cond Service																
Cond Reservice																
Ped Re-Service	X				X											
Rest In Walk																
Flashing Walk																
Ped Clr-Yel																
Ped Clr-Red																
IGRN + Veh Ext																

Ped Clear Protect: Off Unit Red Revert: 2.0 MUTCD 3 Seconds Don't Walk: No

Pre-Timed Mode (MM) 2-7

Enable Pre-Timed Mode: No Free Input Disables Pre-Timed: No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pre-Timed																

Phase Recall Options (MM) 2-8

Plan # 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector																
Vehicle Recall		X					X									
Ped Recall																
Max Recall																
Soft Recall																
No Rest																
AI Calc																

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MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Coordination Options**Options (MM) 3-1**

Manual Pattern	Auto	ECPI Coord	Yes
System Source	TBC	System Format	STD
Splits In	Percent	Offsets In	Percent
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Float
Offset Reference	Lead	Use Ped Time	Yes
Ped Recall	No	Ped Reservice	Yes
Local Zero Override	No	FO Added Ini Green	No
Re-sync Count	0	Multisync	No

Auto Perm Minimum Green (Seconds) (MM) 3-4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Split Demand (MM) 3-5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Coordination Pattern Data

Coordinator Pattern Data (MM) 3-2

Coordinator Pattern # 1

Split Pattern	1	TS2 (Pat-Off)	0-1	Splits In	Percent
Cycle	140	Std (COS)	0	Offsets In	Percent
Offset Value	92%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	0		
Actuated Walk Rest	No	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Splits (Split Pat 1)	8	63	0	29	0	71	0	29	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data			
Veh Perm 1	0	Veh Perm 2	0
Veh Perm 2 Disp	0	Veh Perm 2	0
Split Demand Pat 1	0	Split Demand Pat 2	0
Crossing Arterial Pat	0		

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall		X				X										
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 2

Split Pattern	2	TS2 (Pat-Off)	0-2	Splits In	Percent
Cycle	110	Std (COS)	0	Offsets In	Percent
Offset Value	87%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	0		
Actuated Walk Rest	No	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Splits (Split Pat 2)	12	53	0	35	0	65	0	35	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall		X				X										
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 3

Split Pattern	3	TS2 (Pat-Off)	0-3	Splits In	Percent
Cycle	140	Std (COS)	0	Offsets In	Percent
Offset Value	74%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	0		
Actuated Walk Rest	No	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Splits (Split Pat 3)	8	63	0	29	0	71	0	29	0	0	0	0	0	0	0	0

Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data

Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0
 Split Demand Pat 1 0 Split Demand Pat 2 0 Crossing Arterial Pat 0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall		X				X										
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 4

Split Pattern	4	TS2 (Pat-Off)	1-1	Splits In	Percent
Cycle	100	Std (COS)	0	Offsets In	Percent
Offset Value	58%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	0		
Actuated Walk Rest	No	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Splits (Split Pat 4)	0	62	0	38	0	62	0	38	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data
 Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0
 Split Demand 0 Split Demand 0 Crossing Arterial 0
 Pat 1 Pat 2 Pat

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall		X				X										
Pedestrian Recall																
Recall to Max. Time																
Omit Phase	X								X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 5

Split Pattern	5	TS2 (Pat-Off)	1-2	Splits In	Percent
Cycle	110	Std (COS)	41	Offsets In	Percent
Offset Value	87%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	No	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Splits (Split Pat 5)	12	53	0	35	0	65	0	35	0	0	0	0	0	0	0	0

Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data

Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0
 Split Demand Pat 1 0 Split Demand Pat 2 0 Crossing Arterial Pat 0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall		X				X										
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 10

Split Pattern	10	TS2 (Pat-Off)	3-1	Splits In	Percent
Cycle	120	Std (COS)	105	Offsets In	Percent
Offset Value	28%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Splits (Split Pat 10)	10	58	0	32	0	68	0	32	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 11

Split Pattern	11	TS2 (Pat-Off)	3-2	Splits In	Percent
Cycle	100	Std (COS)	137	Offsets In	Percent
Offset Value	10%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																

Splits (Split Pat 11)	11	50	0	39	0	61	0	39	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data
 Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0
 Split Demand Pat 1 0 Split Demand Pat 2 0 Crossing Arterial Pat 0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 12

Split Pattern	12	TS2 (Pat-Off)	3-3	Splits In	Percent
Cycle	120	Std (COS)	145	Offsets In	Percent
Offset Value	92%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Splits (Split Pat 12)	9	59	0	32	0	68	0	32	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data
 Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0
 Split Demand Pat 1 0 Split Demand Pat 2 0 Crossing Arterial Pat 0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 13

Split Pattern	13	TS2 (Pat-Off)	4-1	Splits In	Percent
Cycle	100	Std (COS)	153	Offsets In	Percent
Offset Value	10%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																

Splits (Split Pat 13)	11	50	0	39	0	61	0	39	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data
 Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0
 Split Demand Pat 1 0 Split Demand Pat 2 0 Crossing Arterial Pat 0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

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MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Coordination Split Pattern
Split Pattern Data (MM) 3-3
Split Pattern # 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Split (percent)	8	63	0	29	0	71	0	29	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall		X				X										
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Split (percent)	12	53	0	35	0	65	0	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall		X				X										
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Split (percent)	8	63	0	29	0	71	0	29	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall		X				X										
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Split (percent)	0	62	0	38	0	62	0	38	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall		X				X										
Pedestrian Recall																
Recall to Max. Time																
Omit Phase	X								X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Split (percent)	12	53	0	35	0	65	0	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall		X				X										
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 10

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Split (percent)	10	58	0	32	0	68	0	32	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 11

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Description																	
Split (percent)	11	50	0	39	0	61	0	39	0	0	0	0	0	0	0	0	0
Coord Phase		X				X											
Vehicle Recall																	
Pedestrian Recall		X				X											
Recall to Max. Time																	
Omit Phase									X	X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 12

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Split (percent)	9	59	0	32	0	68	0	32	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 13

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Split (percent)	11	50	0	39	0	61	0	39	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

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MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Preempt Plan

Preempt Plan (MM) 4-1

Preempt Plan 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	.	X	.	.	.	X	.	.	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases		X				X										
Exit Calls																
Special Function																

Enable	Yes	Preempt Override	Yes	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	No	Duration	10	CLR > GRN	No
Term Ovlp Asap	No	PC Through Yel	Yes	Terminate Phase	No
Ped Dark	No	Track Clear Rsrv	No	Dwell Flash	Off
Linked Pmt	0	FL Exit Color	Grn	Exit Options	Off
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	7	5	4.0	2.0
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	4.0	1.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	0	0.0	0	4.0	1.0

Preemption Active On Out
 Preempt Act Dwell No
 Other - Priority Off
 Preempt Non-Priority Pmt Off
 Inhibit Extension 0.0
 Time Ped Priority Off
 Return
 Veh Priority Off
 Return Queue Delay Off
 Conditional Delay Off

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Preempt Preempt Filtering
Enable Preempt Filtering &
TSP/SCP (MM) 4-2

Input	Solid	Pulsing
1	...BYPASSED...	...BYPASSED...
2	...BYPASSED...	...BYPASSED...
3	PREEMPTION 3	PREEMPTION 7
4	PREEMPTION 4	PREEMPTION 8
5	PREEMPTION 5	PREEMPTION 9
6	PREEMPTION 6	PREEMPTION 10
7	...BYPASSED...	...BYPASSED...
8	...BYPASSED...	...BYPASSED...
9	...BYPASSED...	...BYPASSED...
10	...BYPASSED...	...BYPASSED...

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MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Preempt TSP/SCP Plan and Split

TSP / SCP Plan (MM) 4-3

TSP/SCP Plan	Enable Option	Signal Type	Det Lock	Delay Time	Max Presence	PMT Enables Reservice	No Delay in TSP	Action SF Inhibit	Reservice Cycles	Bus Heading
1	No	Solid	No	0	0	No	False	0	0	NB
2	No	Solid	No	0	0	No	False	0	0	SB
3	No	Solid	No	0	0	No	False	0	0	EB
4	No	Solid	No	0	0	No	False	0	0	WB
5	No	Solid	No	0	0	No	False	0	0	.
6	No	Solid	No	0	0	No	False	0	0	.

Mode: TSP
 Free Default Pattern: 120
 Headway Allowance: 0

TSP/SCP Plan	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1
2
3
4
5
6

TSP / SCP Split Pattern (MM) 4-4

TSP/SCP Split Pattern	Max Type	Phase															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
4	Max Reduction	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255

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MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Time Base Clock/Calendar**Clock/Calendar Data (MM) 5-1**

Manual Action Plan: 0
SYNC Reference Time: 03:15
SYNC Reference: Reference Time
Day Light Savings: No
Time Reset Input Set Time: 3:30:00
Standard Time From GMT: 0

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MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Time Base Action Plan
Action Plan (MM) 5-2

Action Plan - 1

Pattern	1	Override Sys	No
Timing Plan	0	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)								
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Aux Func (1-3)			
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15
LP 16-30
LP 31-45
LP 46-60
LP 61-75
LP 76-90
LP 91-100

Action Plan - 2

Pattern 2 Override Sys No
 Timing Plan 0 Sequence 0
 Veh Detector Plan 0 Det Log None
 Flash No Red Rest No
 Veh Det Diag Plan 0 Ped Det Diag 0
 Dimming Enable No Pmt Veh Priority Ret No
 Pmt Ped Priority Ret No Pmt Queue Delay No
 Pmt Cond Delay No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)									
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Aux Func (1-3)			
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15
LP 16-30
LP 31-45
LP 46-60
LP 61-75
LP 76-90
LP 91-100

Action Plan - 3

Pattern 3 Override Sys No
 Timing Plan 0 Sequence 0
 Veh Detector Plan 0 Det Log None
 Flash No Red Rest No
 Veh Det Diag Plan 0 Ped Det Diag 0
 Dimming Enable No Pmt Veh Priority Ret No
 Pmt Ped Priority Ret No Pmt Queue Delay No
 Pmt Cond Delay No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	
LP 16-30	
LP 31-45	
LP 46-60	
LP 61-75	
LP 76-90	
LP 91-100	

Action Plan - 4

Pattern 4 Override Sys No
 Timing Plan 0 Sequence 0
 Veh Detector Plan 0 Det Log None
 Flash No Red Rest No
 Veh Det Diag Plan 0 Ped Det Diag 0
 Dimming Enable No Pmt Veh Priority Ret No
 Pmt Ped Priority Ret No Pmt Queue Delay No
 Pmt Cond Delay No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)									
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Aux Func (1-3)			
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15
LP 16-30
LP 31-45
LP 46-60
LP 61-75
LP 76-90
LP 91-100

Action Plan - 5

Pattern 5 Override Sys No
 Timing Plan 0 Sequence 0
 Veh Detector Plan 0 Det Log None
 Flash No Red Rest No
 Veh Det Diag Plan 0 Ped Det Diag 0
 Dimming Enable No Pmt Veh Priority Ret No
 Pmt Ped Priority Ret No Pmt Queue Delay No
 Pmt Cond Delay No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	
LP 16-30	
LP 31-45	
LP 46-60	
LP 61-75	
LP 76-90	
LP 91-100	

Action Plan - 10

Pattern 10 Override Sys No
 Timing Plan 0 Sequence 0
 Veh Detector Plan 0 Det Log None
 Flash No Red Rest No
 Veh Det Diag 0 Ped Det Diag 0
 Plan Plan
 Dimming Enable No Pmt Veh Priority No
 Ret
 Pmt Ped Priority No Pmt Queue Delay No
 Ret
 Pmt Cond Delay No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)									
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Aux Func (1-3)			
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15
LP 16-30
LP 31-45
LP 46-60
LP 61-75
LP 76-90
LP 91-100

Action Plan - 11

Pattern 11 Override Sys No
 Timing Plan 0 Sequence 0
 Veh Detector Plan 0 Det Log None
 Flash No Red Rest No
 Veh Det Diag 0 Ped Det Diag 0
 Plan Plan
 Dimming Enable No Pmt Veh Priority No
 Ret
 Pmt Ped Priority No Pmt Queue Delay No
 Ret
 Pmt Cond Delay No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	
LP 16-30	
LP 31-45	
LP 46-60	
LP 61-75	
LP 76-90	
LP 91-100	

Action Plan - 12

Pattern 12 Override Sys No
 Timing Plan 0 Sequence 0
 Veh Detector Plan 0 Det Log None
 Flash No Red Rest No
 Veh Det Diag Plan 0 Ped Det Diag Plan 0
 Dimming Enable No Pmt Veh Priority Ret No
 Pmt Ped Priority Ret No Pmt Queue Delay No
 Pmt Cond Delay No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)																
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Aux Func (1-3)																
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15
LP 16-30
LP 31-45
LP 46-60
LP 61-75
LP 76-90
LP 91-100

Action Plan - 13

Pattern 13 Override Sys No
 Timing Plan 0 Sequence 0
 Veh Detector Plan 0 Det Log None
 Flash No Red Rest No
 Veh Det Diag Plan 0 Ped Det Diag Plan 0
 Dimming Enable No Pmt Veh Priority Ret No
 Pmt Ped Priority Ret No Pmt Queue Delay No
 Pmt Cond Delay No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	
LP 16-30	
LP 31-45	
LP 46-60	
LP 61-75	
LP 76-90	
LP 91-100	

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MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Time Base Day Plan/Schedule**Day Plan (MM) 5-3****Day Plan #1**

Event	Action Plan	Start Time
1	1	06:00
2	2	10:00
3	3	15:15
4	2	19:00
5	4	20:30
6	6	22:00

Day Plan #2

Event	Action Plan	Start Time
1	5	08:00
2	6	20:00
3	0	00:15

Schedule (MM) 5-4**Schedule Number - 1**

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
		X	X	X	X	X	

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Schedule Number - 2

Day Plan No.: 2

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X						X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Schedule Number - 3

Day Plan No.: 3

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT

--	--	--	--	--	--	--	--	--	--	--	--	--

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
	23	24	25	26	27	28	29	30	31		

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Time Base Exceptions

Exception Day Program (MM) 5-5

Excep Day	Float/Fixed	Mon/Mon	DOW/DOM	WOM/Year	Day Plan
--------------	-------------	---------	---------	----------	-------------

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Detectors**Detectors - Pg 1****Veh Det Phase Assignment (MM) 6-1****Vehicle Detector Plan Number - 1**

Veh Detector	Assigned Phase	Called Phase	Type
1	2		N
2	2		N
4	4	8	N
5	6		N
6	6		N
17	1		N
22	6		N
24	8		N
32	8		N
33	9		N
35	11		N
36	12		N

Vehicle Detector Plan Number - 2

Veh Detector	Assigned Phase	Called Phase	Type
1	1		N
2	2		N
3	3		N
4	4		N
5	5		N
6	6		N
7	7		N
8	8		N
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Plan Number - 3

Veh Detector	Assigned Phase	Called Phase	Type
1	1		N
2	2		N
3	3		N

4	4		N
5	5		N
6	6		N
7	7		N
8	8		N
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Plan Number - 4

Veh Detector	Assigned Phase	Called Phase	Type
1	1		N
2	2		N
3	3		N
4	4		N
5	5		N
6	6		N
7	7		N
8	8		N
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Setup (MM) 6-2

Veh Detector	Type	TS2 Detector	Description
1	N-NTCIP	No	
2	N-NTCIP	Yes	
3	N-NTCIP	No	
4	N-NTCIP	Yes	
5	N-NTCIP	No	
6	N-NTCIP	No	
7	N-NTCIP	No	
8	N-NTCIP	No	
9	N-NTCIP	No	
10	N-NTCIP	No	
11	N-NTCIP	No	
12	N-NTCIP	No	
13	N-NTCIP	No	
14	N-NTCIP	No	
15	N-NTCIP	No	

16	N-NTCIP	No	
17	N-NTCIP	Yes	
18	N-NTCIP	Yes	
19	N-NTCIP	Yes	
20	N-NTCIP	Yes	
21	N-NTCIP	Yes	
22	N-NTCIP	Yes	
23	N-NTCIP	Yes	
24	N-NTCIP	Yes	
25	N-NTCIP	Yes	
26	N-NTCIP	Yes	
27	N-NTCIP	Yes	
28	N-NTCIP	Yes	
29	N-NTCIP	Yes	
30	N-NTCIP	Yes	
31	N-NTCIP	Yes	
32	N-NTCIP	Yes	
33	N-NTCIP	Yes	
34	N-NTCIP	Yes	
35	N-NTCIP	Yes	
36	N-NTCIP	Yes	
37	N-NTCIP	Yes	
38	N-NTCIP	Yes	
39	N-NTCIP	Yes	
40	N-NTCIP	Yes	
41	N-NTCIP	Yes	
42	N-NTCIP	Yes	
43	N-NTCIP	Yes	
44	N-NTCIP	Yes	
45	N-NTCIP	Yes	
46	N-NTCIP	Yes	
47	N-NTCIP	Yes	
48	N-NTCIP	Yes	
49	N-NTCIP	Yes	
50	N-NTCIP	Yes	
51	N-NTCIP	Yes	
52	N-NTCIP	Yes	
53	N-NTCIP	Yes	
54	N-NTCIP	Yes	
55	N-NTCIP	Yes	
56	N-NTCIP	Yes	
57	N-NTCIP	Yes	
58	N-NTCIP	Yes	
59	N-NTCIP	Yes	
60	N-NTCIP	Yes	
61	N-NTCIP	Yes	
62	N-NTCIP	Yes	
63	N-NTCIP	Yes	
64	N-NTCIP	Yes	

Vehicle Detector Plan Number - 1

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	5.0	Passage	0.0	0	No	0	None	No	No	No
5	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
17	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
20	0	No	Yes	5.0	None	0.0	0	No	0	None	No	No	No
22	6	No	No	0.0	None	0.0	0	No	0	None	No	No	No
24	8	No	Yes	5.0	Passage	0.0	0	No	0	None	No	No	No
32	8	No	Yes	5.0	Passage	0.0	0	No	0	None	No	No	No
33	9	No	No	0.0	None	0.0	0	No	0	None	No	No	No
35	11	No	No	0.0	None	0.0	0	No	0	None	No	No	No
36	12	No	No	0.0	None	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 2

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 3

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 4

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Ped Detector Phase Assignment (MM) 6-3

Mode: NTCIP

Called Phase	Detector
1	1

Called Phase	Detector
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16

Town of Oakville, ON



MOVING TRAFFIC FORWARD

REG0618 - Bronte Rd @ Woodlands Ops Center - Econolite Type - ASC/3

Detectors**Detectors - Pg 2****Log - Speed Detector Setup (MM) 6-4**

NTCIP Log ECPI Log Length Unit:
 Period: 60 Period: 0 Inches

Speed Detector	Local Detector	One/Two Detector	Vehicle Length	Trap length	Enable Log
1	0	1	0	0	No
2	0	1	0	0	No
3	0	1	0	0	No
4	0	1	0	0	No
5	0	1	0	0	No
6	0	1	0	0	No
7	0	1	0	0	No
8	0	1	0	0	No
9	0	1	0	0	No
10	0	1	0	0	No
11	0	1	0	0	No
12	0	1	0	0	No
13	0	1	0	0	No
14	0	1	0	0	No
15	0	1	0	0	No
16	0	1	0	0	No

Vehicle Detector Diagnostics (MM) 6-5**Veh Diagnostic Plan Number - 1**

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 2

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 3

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 4

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay
-----	--------	-----	------	------------	-------------	-------------------

Pedestrian Detector Diagnostics (MM) 6-6**Ped Diagnostic Plan Number - 1**

Det	Counts	Act	Pres	Multiplier
-----	--------	-----	------	------------

Ped Diagnostic Plan Number - 2

Det	Counts	Act	Pres	Multiplier
-----	--------	-----	------	------------

Ped Diagnostic Plan Number - 3

Det	Counts	Act	Pres	Multiplier
-----	--------	-----	------	------------

Ped Diagnostic Plan Number - 4

Det	Counts	Act	Pres	Multiplier
-----	--------	-----	------	------------

Appendix D

Traffic Control Signal Warrant

Saw Whet Boulevard @ Bronte Road
 2031 Future Total

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance			Signal
		1 Lane Highway		2 or More Lanes		Sectional		Entire %	
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	2549	283%	79%	No
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	135	79%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	2414	268%	122%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	91	122%		

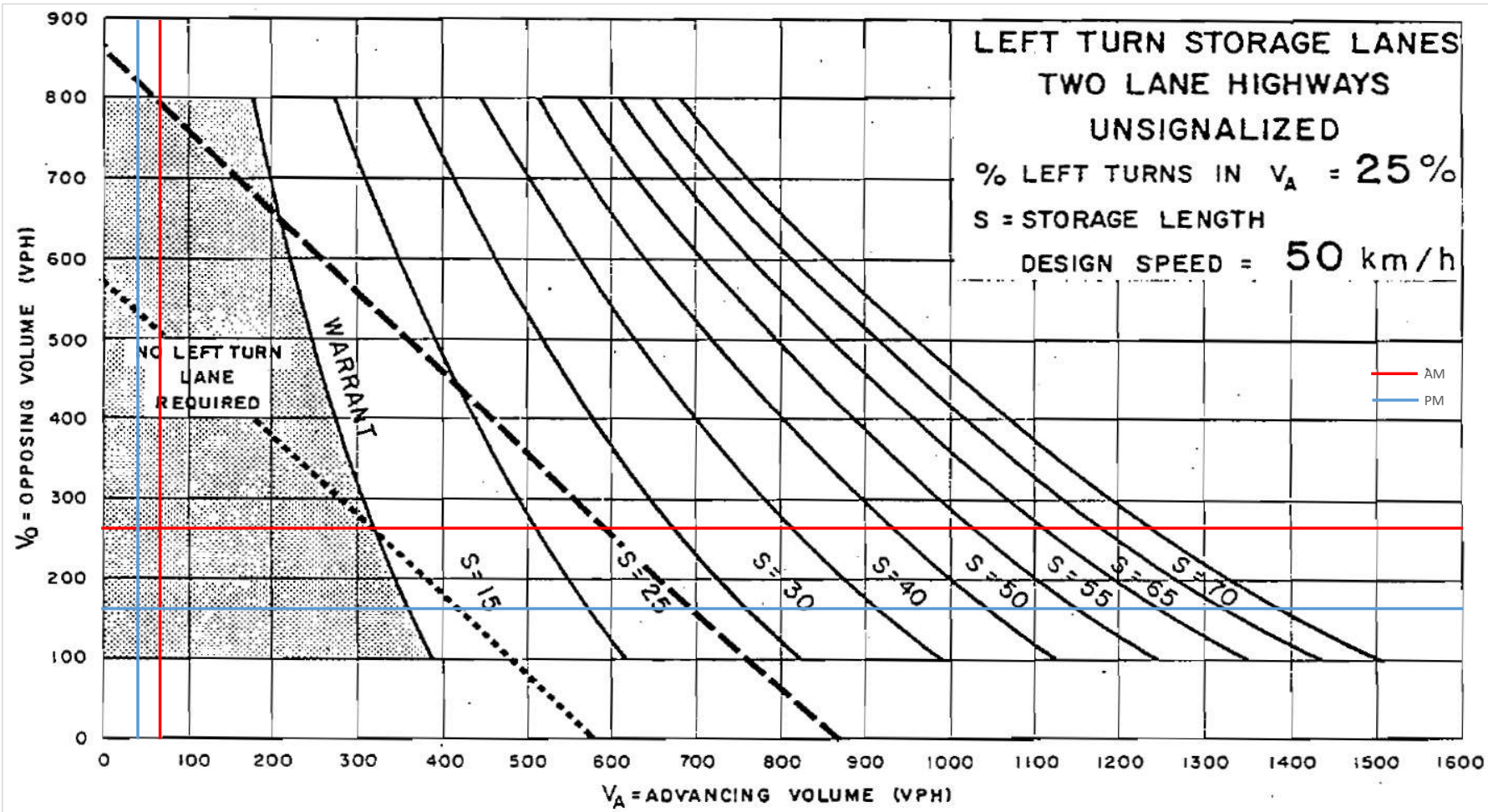
Notes

1. Refer to OTM Book 12, pg 92, Mar 2012
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, $AHV = PM/2$ or $(AM + PM) / 4$, including amplification factors
4. T-intersection factor corrected, applies only to 1B

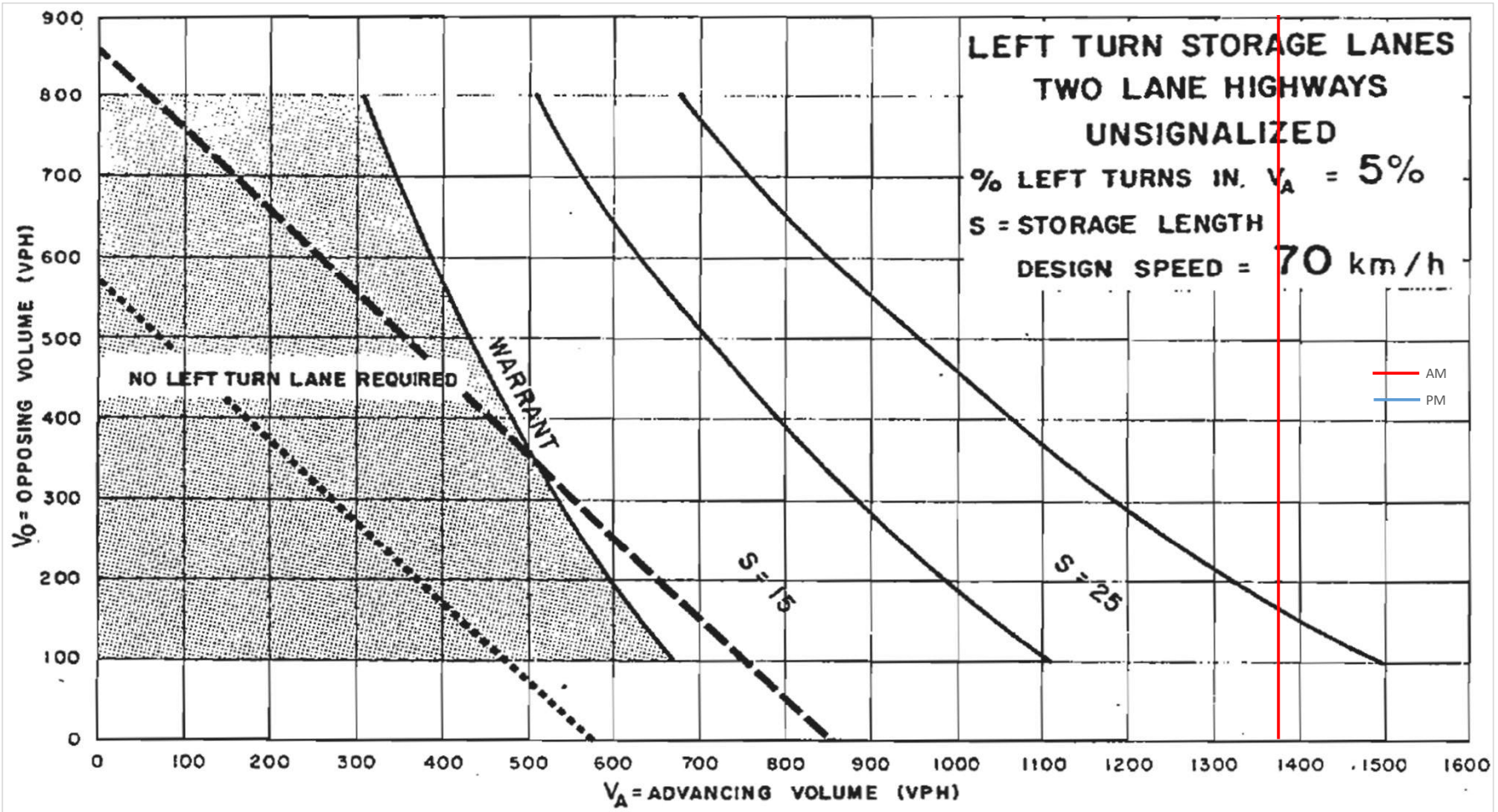
Appendix E

Left Turn Lane Warrant

Design Speed	Eastbound Left	Yes													%Left Turn	Volume Advancing	Volume Opposing
50 km/h		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
	AM	17	0	52	169	0	95	16	1312	52	30	3378	6	24.6%	69	264	
	PM	11	0	32	104	0	59	52	2863	174	99	1656	19	25.6%	43	163	



Design Speed 70 km/h	Northbound Left													%Left Turn	Volume Advancing	Volume Opposing
	EBL	EBT	EBR	WBL	WBT	WBR	Yes NBL	NBT	NBR	SBL	SBT	SBR				
AM	17	0	52	169	0	95	16	1312	52	30	3378	6	1.2%	1380	3414	
PM	11	0	32	104	0	59	52	2863	174	99	1656	19	1.7%	3089	1774	

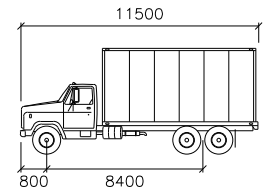


Appendix F

Turning Template Drawings



Notes:



HSU

	mm
Width	: 2600
Track	: 2600
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

03	Issued for Review	AN	2023-07-24
02	Issued for Review	AN	2023-06-20
01	Issued for Review	AN	2022-12-01
REV.	DESCRIPTION	BY:	DATE:
STATUS:			

CGH Transportation
 628 Haines Road
 Newmarket, ON
 L3Y 6V5
 (905) 251-4070

CLIENT: Valery Homes

ARCHITECT:

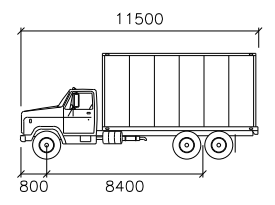
SITE:
1354 Bronte Road

TITLE: Turning Movement Analysis
HSU In-bound Movements

SCALE AT AS:	DATE:	DRAWN:	CHECKED:
NIS	2023-07-24	AN	MC
PROJECT NO:	DRAWING NO:	REVISION:	
2021-119	001	03	



Notes:



HSU

mm

Width : 2600
 Track : 2600
 Lock to Lock Time : 6.0
 Steering Angle : 40.0

03	Issued for Review	AN	2023-07-24
02	Issued for Review	AN	2023-06-20
01	Issued for Review	AN	2022-12-01
REV.	DESCRIPTION	BY:	DATE:
STATUS:			

CGH Transportation
 628 Haines Road
 Newmarket, ON
 L3Y 6V5
 (905) 251-4070

CLIENT: Valery Homes

ARCHITECT:

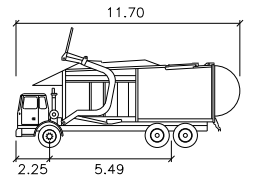
SITE: 1354 Bronte Road

TITLE: Turning Movement Analysis
 HSU Out-bound Movements

SCALE AT AS:	DATE:	DRAWN:	CHECKED:
NIS	2023-07-24	AN	MC
PROJECT NO:	DRAWING NO:	REVISION:	
2021-119	002	03	



Notes:



Halton Region Collection
meters

Width : 3.20
Track : 3.20
Lock to Lock Time : 6.0
Steering Angle : 28.8

03	Issued for Review	AN	2023-07-24
02	Issued for Review	AN	2023-06-20
01	Issued for Review	AN	2022-12-01
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			

CGH Transportation
 628 Haines Road
 Newmarket, ON
 L3Y 6V5
 (905) 251-4070

CLIENT: Valery Homes

ARCHITECT:

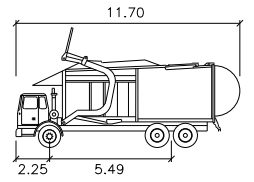
SITE:
1354 Bronte Road

TITLE: Turning Movement Analysis
Garbage In-bound Movements

SCALE AT AS:	DATE:	DRAWN:	CHECKED:
NIS	2023-07-24	AN	MC
PROJECT NO:	DRAWING NO:	REVISION:	
2021-119	003	03	



Notes:



Halton Region Collection
meters

- Width : 3.20
- Track : 3.20
- Lock to Lock Time : 6.0
- Steering Angle : 28.8

03	Issued for Review	AN	2023-07-24
02	Issued for Review	AN	2023-06-20
01	Issued for Review	AN	2022-12-01
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			

CGH Transportation
 628 Haines Road
 Newmarket, ON
 L3Y 6V5
 (905) 251-4070

CLIENT: Valery Homes

ARCHITECT:

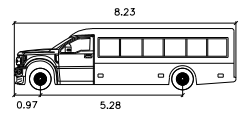
SITE:
1354 Bronte Road

TITLE: Turning Movement Analysis
Garbage Out-bound Movements

SCALE AT AS:	DATE:	DRAWN:	CHECKED:
NIS	2023-07-24	AN	MC
PROJECT NO:	DRAWING NO:	REVISION:	
2021-119	004	03	



Notes:



AllStar Ford F-550 (2015)
Type 6

Width	: 2.44	meters
Track	: 2.20	
Lock to Lock Time	: 6.0	
Steering Angle	: 33.5	

03	Issued for Review	AN	2023-07-24
02	Issued for Review	AN	2023-06-20
01	Issued for Review	AN	2022-12-01
REV.	DESCRIPTION:	BY:	DATE:
STATUS:			



CGH Transportation
628 Haines Road
Newmarket, ON
L3Y 6V5
(905) 251-4070

CLIENT: Valery Homes

ARCHITECT:

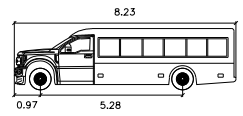
SITE: 1354 Bronte Road

TITLE: Turning Movement Analysis
HSU In-bound Movements

SCALE AT AS:	DATE:	DRAWN:	CHECKED:
NIS	2023-07-24	AN	MC
PROJECT NO:	DRAWING NO:	REVISION:	
2021-119	005	03	



Notes:



AllStar Ford F-550 (2015)
Type 6

Width	: 2.44	meters
Track	: 2.20	
Lock to Lock Time	: 6.0	
Steering Angle	: 33.5	

03	Issued for Review	AN	2023-07-24
02	Issued for Review	AN	2023-06-20
01	Issued for Review	AN	2022-12-01
REV.	DESCRIPTION:	BY:	DATE:
STATUS:			

CGH Transportation
 628 Haines Road
 Newmarket, ON
 L3Y 6V5
 (905) 251-4070

CLIENT: Valery Homes

ARCHITECT:

SITE: 1354 Bronte Road

TITLE: Turning Movement Analysis
 HSU In-bound Movements

SCALE AT AS:	DATE:	DRAWN:	CHECKED:
NIS	2023-07-24	AN	MC
PROJECT NO:	DRAWING NO:	REVISION:	
2021-119	006	03	

Appendix G

Heavy Vehicle Percent Calculations

AM/PM Intersection

1 Upper Middle Road/Bronte Road

AM
verify results after output
PM
verify results after output

	NBL	NBT	NBR	WBL	WBT	WBR	SBL	SBT	SBR	EBL	EBT	EBR
AM	3	61	12	10	5	8	3	107	2	1	2	0
PM	2	36	4	6	1	3	1	39	1	0	1	1
SAT												
	5%(2%)	8%(2%)	7%(2%)	2%(3%)	6%(2%)	4%(2%)	2%(2%)	6%(4%)	18%(7%)	9%(2%)	2%(2%)	2%(2%)

2 Saw Whet Boulevard Road/Bronte Road

	NBL	NBT	NBR	WBL	WBT	WBR	SBL	SBT	SBR	EBL	EBT	EBR
AM												
PM												
SAT												
	2%(2%)	2%(2%)	2%(2%)	2%(2%)	2%(2%)	2%(2%)	2%(2%)	2%(2%)	2%(2%)	2%(2%)	2%(2%)	2%(2%)

3 Charles Cornwall Road/Bronte Road

























	NBL	NBT	NBR	WBL	WBT	WBR	SBL	SBT	SBR	EBL	EBT	EBR
AM	0	61	1	3	0	3	0	101	0	0	0	0
PM	0	57	1	0	0	0	0	51	0	0	0	0
SAT												
	2%(2%)	6%(3%)	10%(14%)	18%(2%)	2%(2%)	16%(2%)	2%(2%)	4%(4%)	2%(2%)	2%(2%)	2%(2%)	2%(2%)

Appendix H

2023 Existing Conditions Synchro Worksheets

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2023 Existing AM Peak Hour
1354 Bronte

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	203	390	520	88	196	62	926	226	248	2002	12
Future Volume (vph)	11	203	390	520	88	196	62	926	226	248	2002	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	70.0		70.0	140.0		0.0	135.0		80.0	180.0		50.0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (m)	65.0			100.0			70.0			70.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99		0.98			0.97			0.96	1.00		0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1863	1583	3433	1792	1553	1719	3343	1485	1770	3406	1336
Flt Permitted	0.698			0.950			0.056			0.205		
Satd. Flow (perm)	1200	1863	1550	3433	1792	1502	101	3343	1427	381	3406	1289
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			152			202			233			122
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		296.6			291.2			741.2			120.4	
Travel Time (s)		17.8			17.5			44.5			7.2	
Confl. Peds. (#/hr)	11					11	5		7	7		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	9%	2%	2%	2%	6%	4%	5%	8%	7%	2%	6%	18%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6
Adj. Flow (vph)	11	209	402	536	91	202	64	955	233	256	2064	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	209	402	536	91	202	64	955	233	256	2064	12
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.00	1.00	1.03
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2023 Existing AM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	20.0	20.0	6.0	20.0	20.0
Minimum Split (s)	10.5	36.7	36.7	10.5	36.7	36.7	10.5	36.5	36.5	10.5	36.5	36.5
Total Split (s)	11.2	23.8	23.8	19.6	32.2	32.2	11.2	79.8	79.8	16.8	85.4	85.4
Total Split (%)	8.0%	17.0%	17.0%	14.0%	23.0%	23.0%	8.0%	57.0%	57.0%	12.0%	61.0%	61.0%
Maximum Green (s)	7.2	17.1	17.1	15.6	25.5	25.5	7.2	73.3	73.3	12.8	78.9	78.9
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	2.8	2.8	1.0	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					23.0	23.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)					11	11		7	7		5	5
Act Effct Green (s)	26.2	17.1	17.1	15.6	32.3	32.3	83.4	74.1	74.1	92.6	81.2	81.2
Actuated g/C Ratio	0.19	0.12	0.12	0.11	0.23	0.23	0.60	0.53	0.53	0.66	0.58	0.58
v/c Ratio	0.04	0.92	1.25	1.40	0.22	0.40	0.46	0.54	0.27	0.69	1.04	0.02
Control Delay	37.6	102.6	165.3	240.4	47.3	8.8	31.2	19.2	6.1	19.6	62.6	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	0.0
Total Delay	37.6	102.6	165.3	240.4	47.3	8.8	31.2	19.2	6.1	19.6	62.6	0.0
LOS	D	F	F	F	D	A	C	B	A	B	E	A
Approach Delay		141.9			162.8			17.4			57.5	
Approach LOS		F			F			B			E	
Queue Length 50th (m)	2.3	61.1	~104.7	~107.4	20.8	0.0	4.0	113.2	22.7	27.6	~351.4	0.0
Queue Length 95th (m)	7.5	#110.8	#172.2	#144.8	40.6	22.7	14.4	134.6	29.2	40.1	#394.3	0.0
Internal Link Dist (m)		272.6			267.2			717.2			96.4	
Turn Bay Length (m)	70.0		70.0	140.0			135.0		80.0	180.0		50.0
Base Capacity (vph)	254	227	322	382	413	501	143	1768	864	378	1976	799
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	0.04	0.92	1.25	1.40	0.22	0.40	0.45	0.54	0.27	0.68	1.04	0.02

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 82.6 (59%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
 1: Bronte Road & Upper Middle Road

2023 Existing AM Peak Hour
 1354 Bronte

Maximum v/c Ratio: 1.40

Intersection Signal Delay: 75.3 Intersection LOS: E

Intersection Capacity Utilization 108.7% ICU Level of Service G

Analysis Period (min) 15

~ 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.

Splits and Phases: 1: Bronte Road & Upper Middle Road



HCM Signalized Intersection Capacity Analysis
1: Bronte Road & Upper Middle Road

2023 Existing AM Peak Hour
1354 Bronte

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	203	390	520	88	196	62	926	226	248	2002	12
Future Volume (vph)	11	203	390	520	88	196	62	926	226	248	2002	12
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.96	1.00	1.00	0.97
Flpb, ped/bikes	0.99	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	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1641	1863	1552	3433	1792	1504	1719	3343	1426	1769	3406	1289
Flt Permitted	0.70	1.00	1.00	0.95	1.00	1.00	0.06	1.00	1.00	0.20	1.00	1.00
Satd. Flow (perm)	1205	1863	1552	3433	1792	1504	101	3343	1426	381	3406	1289
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)	11	209	402	536	91	202	64	955	233	256	2064	12
RTOR Reduction (vph)	0	0	131	0	0	155	0	0	114	0	0	5
Lane Group Flow (vph)	11	209	271	536	91	47	64	955	119	256	2064	7
Confl. Peds. (#/hr)	11						11	5		7	7	5
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	9%	2%	2%	2%	6%	4%	5%	8%	7%	2%	6%	18%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Actuated Green, G (s)	22.3	19.5	19.5	15.6	32.3	32.3	77.4	71.7	71.7	87.7	78.0	78.0
Effective Green, g (s)	22.3	19.5	19.5	15.6	32.3	32.3	77.4	71.7	71.7	87.7	78.0	78.0
Actuated g/C Ratio	0.16	0.14	0.14	0.11	0.23	0.23	0.55	0.51	0.51	0.63	0.56	0.56
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	200	259	216	382	413	346	121	1712	730	357	1897	718
v/s Ratio Prot	0.00	0.11		c0.16	0.05		0.02	0.29		c0.06	c0.61	
v/s Ratio Perm	0.01		c0.17			0.03	0.27		0.08	0.39		0.01
v/c Ratio	0.06	0.81	1.26	1.40	0.22	0.13	0.53	0.56	0.16	0.72	1.09	0.01
Uniform Delay, d1	49.8	58.4	60.2	62.2	43.6	42.8	31.5	23.3	18.2	15.2	31.0	13.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.47	0.82	2.66	1.00	1.00	1.00
Incremental Delay, d2	0.1	16.6	147.0	196.6	0.3	0.2	3.7	1.2	0.4	6.7	49.1	0.0
Delay (s)	49.9	75.0	207.2	258.8	43.9	42.9	50.0	20.3	48.8	21.9	80.1	13.8
Level of Service	D	E	F	F	D	D	D	C	D	C	F	B
Approach Delay (s)		160.0			182.6			27.1			73.4	
Approach LOS		F			F			C			E	
Intersection Summary												
HCM 2000 Control Delay			90.6								HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.15									
Actuated Cycle Length (s)			140.0							21.2		
Intersection Capacity Utilization			108.7%								ICU Level of Service	G
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

2023 Existing AM Peak Hour
1354 Bronte

















Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	139	84	1127	42	26	2886
Future Volume (vph)	139	84	1127	42	26	2886
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		15.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	0.949			0.850		
Flt Protected	0.970				0.950	
Satd. Flow (prot)	1715	0	3539	1583	1770	3539
Flt Permitted	0.970				0.950	
Satd. Flow (perm)	1715	0	3539	1583	1770	3539
Link Speed (k/h)	50		60			60
Link Distance (m)	150.8		448.7			741.2
Travel Time (s)	10.9		26.9			44.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	151	91	1225	46	28	3137
Shared Lane Traffic (%)						
Lane Group Flow (vph)	242	0	1225	46	28	3137
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	99.3%
ICU Level of Service	F
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
2: Bronte Road & Saw Whet Boulevard

2023 Existing AM Peak Hour
1354 Bronte

								
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations			 		 	 		
Traffic Volume (veh/h)	139	84	1127	42	26	2886		
Future Volume (Veh/h)	139	84	1127	42	26	2886		
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)	151	91	1225	46	28	3137		
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	2850	612			1271			
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	2850	612			1271			
tC, single (s)	6.8	6.9			4.1			
tC, 2 stage (s)								
tF (s)	3.5	3.3			2.2			
p0 queue free %	0	79			95			
cM capacity (veh/h)	13	436			542			
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	
Volume Total	242	612	612	46	28	1568	1568	
Volume Left	151	0	0	0	28	0	0	
Volume Right	91	0	0	46	0	0	0	
cSH	20	1700	1700	1700	542	1700	1700	
Volume to Capacity	11.98	0.36	0.36	0.03	0.05	0.92	0.92	
Queue Length 95th (m)	Err	0.0	0.0	0.0	1.3	0.0	0.0	
Control Delay (s)	Err	0.0	0.0	0.0	12.0	0.0	0.0	
Lane LOS	F			B				
Approach Delay (s)	Err	0.0			0.1			
Approach LOS	F							
Intersection Summary								
Average Delay			517.3					
Intersection Capacity Utilization			99.3%			ICU Level of Service		F
Analysis Period (min)	15							

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

2023 Existing AM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↖		↖	↖	↕	↖	↖	↕	
Traffic Volume (vph)	1	0	1	161	0	65	0	1150	78	149	2909	0
Future Volume (vph)	1	0	1	161	0	65	0	1150	78	149	2909	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		40.0	35.0		30.0	70.0		0.0
Storage Lanes	0		0	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			20.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor		0.99				0.98			0.98			
Frt		0.932				0.850			0.850			
Flt Protected		0.976		0.950						0.950		
Satd. Flow (prot)	0	1680	0	1530	0	1392	1863	3406	1439	1770	3471	0
Flt Permitted		0.976		0.757						0.178		
Satd. Flow (perm)	0	1680	0	1219	0	1369	1863	3406	1406	332	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		54				67			56			
Link Speed (k/h)		20			20			60			60	
Link Distance (m)		78.7			109.0			218.2			448.7	
Travel Time (s)		14.2			19.6			13.1			26.9	
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	18%	2%	16%	2%	6%	10%	2%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6
Adj. Flow (vph)	1	0	1	166	0	67	0	1186	80	154	2999	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2	0	166	0	67	0	1186	80	154	2999	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1		1	1	2	1	1	2	
Detector Template	Left	Thru		Left		Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0		2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0		2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

2023 Existing AM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	4	4		8		8	2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0	15.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	24.2	24.2		35.2		35.2	34.9	34.9	34.9	9.5	34.9	
Total Split (s)	40.6	40.6		40.6		40.6	88.2	88.2	88.2	11.2	99.4	
Total Split (%)	29.0%	29.0%		29.0%		29.0%	63.0%	63.0%	63.0%	8.0%	71.0%	
Maximum Green (s)	34.4	34.4		34.4		34.4	82.3	82.3	82.3	7.2	93.5	
Yellow Time (s)	3.1	3.1		3.1		3.1	3.7	3.7	3.7	3.0	3.7	
All-Red Time (s)	3.1	3.1		3.1		3.1	2.2	2.2	2.2	1.0	2.2	
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.2		6.2		6.2	5.9	5.9	5.9	4.0	5.9	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.6	3.6	3.6	3.0	3.6	
Recall Mode	None	None		None		None	C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)				7.0		7.0	7.0	7.0	7.0		7.0	
Flash Dont Walk (s)				22.0		22.0	22.0	22.0	22.0		22.0	
Pedestrian Calls (#/hr)				0		0	0	0	0		0	
Act Effct Green (s)		24.3		24.3		24.3		91.4	91.4	105.5	103.6	
Actuated g/C Ratio		0.17		0.17		0.17		0.65	0.65	0.75	0.74	
v/c Ratio		0.01		0.79		0.23		0.53	0.09	0.46	1.17	
Control Delay		0.0		79.2		11.5		15.1	4.6	6.6	93.9	
Queue Delay		0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Total Delay		0.0		79.2		11.5		15.1	4.6	6.6	93.9	
LOS		A		E		B		B	A	A	F	
Approach Delay					59.7			14.4			89.7	
Approach LOS					E			B			F	
Queue Length 50th (m)		0.0		46.8		0.0		91.8	2.4	12.5	~545.3	
Queue Length 95th (m)		0.0		68.8		12.8		131.3	10.3	m14.8m#	492.7	
Internal Link Dist (m)		54.7			85.0			194.2			424.7	
Turn Bay Length (m)						40.0			30.0	70.0		
Base Capacity (vph)		453		299		386		2224	937	335	2568	
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		0.00		0.56		0.17		0.53	0.09	0.46	1.17	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 128.8 (92%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.17

Lanes, Volumes, Timings
 3: Bronte Road & Driveway/Charles Cornwall Road

2023 Existing AM Peak Hour
 1354 Bronte

Intersection Signal Delay: 67.7 Intersection LOS: E
 Intersection Capacity Utilization 121.7% ICU Level of Service H
 Analysis Period (min) 15

~ 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.

Splits and Phases: 3: Bronte Road & Driveway/Charles Cornwall Road

 Ø1 11.2 s	 Ø2 (R) 88.2 s	 Ø4 40.6 s
 Ø6 99.4 s	 Ø8 40.6 s	













HCM Signalized Intersection Capacity Analysis
 3: Bronte Road & Driveway/Charles Cornwall Road

2023 Existing AM Peak Hour
 1354 Bronte

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	1	161	0	65	0	1150	78	149	2909	0
Future Volume (vph)	1	0	1	161	0	65	0	1150	78	149	2909	0
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2		6.2		6.2		5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		1.00		1.00		0.95	1.00	1.00	0.95	
Frbp, ped/bikes		0.99		1.00		0.98		1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00		1.00		1.00		1.00	1.00	1.00	1.00	
Frt		0.93		1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected		0.98		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1679		1530		1367		3406	1406	1770	3471	
Flt Permitted		0.98		0.76		1.00		1.00	1.00	0.18	1.00	
Satd. Flow (perm)		1679		1218		1367		3406	1406	332	3471	
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)	1	0	1	166	0	67	0	1186	80	154	2999	0
RTOR Reduction (vph)	0	2	0	0	0	55	0	0	19	0	0	0
Lane Group Flow (vph)	0	0	0	166	0	12	0	1186	61	154	2999	0
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	2%	2%	18%	2%	16%	2%	6%	10%	2%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		24.3		24.3		24.3		91.4	91.4	103.6	103.6	
Effective Green, g (s)		24.3		24.3		24.3		91.4	91.4	103.6	103.6	
Actuated g/C Ratio		0.17		0.17		0.17		0.65	0.65	0.74	0.74	
Clearance Time (s)		6.2		6.2		6.2		5.9	5.9	4.0	5.9	
Vehicle Extension (s)		3.0		3.0		3.0		3.6	3.6	3.0	3.6	
Lane Grp Cap (vph)		291		211		237		2223	917	329	2568	
v/s Ratio Prot								0.35		0.03	c0.86	
v/s Ratio Perm		0.00		c0.14		0.01			0.04	0.32		
v/c Ratio		0.00		0.79		0.05		0.53	0.07	0.47	1.17	
Uniform Delay, d1		47.8		55.4		48.2		12.9	8.8	8.3	18.2	
Progression Factor		1.00		1.00		1.00		1.00	1.00	1.11	0.79	
Incremental Delay, d2		0.0		17.4		0.1		0.9	0.1	0.1	76.0	
Delay (s)		47.8		72.7		48.3		13.9	9.0	9.3	90.4	
Level of Service		D		E		D		B	A	A	F	
Approach Delay (s)		47.8			65.7			13.6			86.4	
Approach LOS		D			E			B			F	
Intersection Summary												
HCM 2000 Control Delay			65.5									E
HCM 2000 Volume to Capacity ratio			1.13									
Actuated Cycle Length (s)			140.0							16.1		
Intersection Capacity Utilization			121.7%									H
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

2023 Existing AM Peak Hour Optimized
1354 Bronte

							
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø7
Lane Configurations							
Traffic Volume (vph)	139	84	1127	42	26	2886	
Future Volume (vph)	139	84	1127	42	26	2886	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (m)	15.0	0.0		15.0	15.0		
Storage Lanes	1	1		1	1		
Taper Length (m)	7.5				7.5		
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		0.850		0.850			
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539	
Flt Permitted	0.950				0.187		
Satd. Flow (perm)	1770	1583	3539	1583	348	3539	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		91		12			
Link Speed (k/h)	50		60			60	
Link Distance (m)	150.8		448.7			741.2	
Travel Time (s)	10.9		26.9			44.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	151	91	1225	46	28	3137	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	151	91	1225	46	28	3137	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(m)	3.6		3.6			3.6	
Link Offset(m)	0.0		0.0			0.0	
Crosswalk Width(m)	4.8		4.8			4.8	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (k/h)	25	15		15	25		
Number of Detectors	1	1	2	1	1	2	
Detector Template	Left	Right	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)			9.4			9.4	
Detector 2 Size(m)			0.6			0.6	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type	pm+pt	Perm	NA	Perm	pm+pt	NA	
Protected Phases	3		2		1	6	7
Permitted Phases	7	8		2	6		



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø7
Detector Phase	3	8	2	2	1	6	
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	45.0	22.5	95.4	95.4	9.6	105.0	22.5
Total Split (%)	30.0%	15.0%	63.6%	63.6%	6.4%	70.0%	15%
Maximum Green (s)	40.5	18.0	90.9	90.9	5.1	100.5	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag		Lag	Lag	Lag	Lead		Lead
Lead-Lag Optimize?		Yes	Yes	Yes	Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	None	Max	None
Walk Time (s)	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0		0	0
Act Effct Green (s)	15.9	15.9	95.0	95.0	100.7	100.7	
Actuated g/C Ratio	0.13	0.13	0.76	0.76	0.80	0.80	
v/c Ratio	0.67	0.33	0.46	0.04	0.08	1.11	
Control Delay	67.4	12.7	7.3	4.5	3.7	69.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	67.4	12.7	7.3	4.5	3.7	69.2	
LOS	E	B	A	A	A	E	
Approach Delay	46.8		7.2			68.6	
Approach LOS	D		A			E	
Queue Length 50th (m)	38.0	0.0	62.4	2.2	1.2	~488.3	
Queue Length 95th (m)	61.1	15.6	91.0	6.7	3.9	#568.2	
Internal Link Dist (m)	126.8		424.7			717.2	
Turn Bay Length (m)	15.0			15.0	15.0		
Base Capacity (vph)	571	315	2677	1200	336	2836	
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	0.26	0.29	0.46	0.04	0.08	1.11	

Intersection Summary

Area Type:	Other
Cycle Length:	150
Actuated Cycle Length:	125.6
Natural Cycle:	150
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.11
Intersection Signal Delay:	50.8
Intersection LOS:	D
Intersection Capacity Utilization:	95.0%
ICU Level of Service:	F
Analysis Period (min):	15
~ 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.

Splits and Phases: 2: Bronte Road & Saw Whet Boulevard

↙ Ø1	↑ Ø2			↙ Ø3		
9.6 s	95.4 s			45 s		
↓ Ø6				↙ Ø7	↖ Ø8	
105 s				22.5 s	22.5 s	



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	139	84	1127	42	26	2886
Future Volume (vph)	139	84	1127	42	26	2886
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
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	0.95	1.00	1.00	1.00	0.19	1.00
Satd. Flow (perm)	1770	1583	3539	1583	349	3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	151	91	1225	46	28	3137
RTOR Reduction (vph)	0	80	0	3	0	0
Lane Group Flow (vph)	151	11	1225	43	28	3137
Turn Type	pm+pt	Perm	NA	Perm	pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases	7	8		2	6	
Actuated Green, G (s)	15.9	15.9	95.0	95.0	102.5	102.5
Effective Green, g (s)	15.9	15.9	95.0	95.0	102.5	102.5
Actuated g/C Ratio	0.12	0.12	0.75	0.75	0.80	0.80
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	220	197	2638	1180	314	2847
v/s Ratio Prot	c0.09		0.35		0.00	c0.89
v/s Ratio Perm		0.01		0.03	0.07	
v/c Ratio	0.69	0.06	0.46	0.04	0.09	1.10
Uniform Delay, d1	53.4	49.1	6.3	4.2	3.8	12.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.6	0.1	0.6	0.1	0.1	51.9
Delay (s)	61.9	49.3	6.9	4.3	4.0	64.3
Level of Service	E	D	A	A	A	E
Approach Delay (s)	57.2		6.8			63.8
Approach LOS	E		A			E

























Intersection Summary

HCM 2000 Control Delay	48.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	127.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	95.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2023 Existing PM Peak Hour
1354 Bronte

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	74	114	230	155	252	278	1863	346	228	1166	16
Future Volume (vph)	7	74	114	230	155	252	278	1863	346	228	1166	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	70.0		70.0	140.0		0.0	135.0		80.0	180.0		50.0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (m)	65.0			100.0			70.0			70.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99		0.98			0.97	1.00		0.97			0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	3400	1863	1583	1770	3539	1558	1770	3471	1473
Flt Permitted	0.653			0.950			0.131			0.054		
Satd. Flow (perm)	1208	1863	1550	3400	1863	1542	244	3539	1518	101	3471	1435
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			121			186			224			122
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		296.6			291.2			741.2			120.4	
Travel Time (s)		17.8			17.5			44.5			7.2	
Confl. Peds. (#/hr)	6						6	1		1	1	1
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	4%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6
Adj. Flow (vph)	7	79	121	245	165	268	296	1982	368	243	1240	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	79	121	245	165	268	296	1982	368	243	1240	17
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.00	1.00	1.03
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2023 Existing PM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	20.0	20.0	6.0	20.0	20.0
Minimum Split (s)	10.5	36.7	36.7	10.5	36.7	36.7	10.5	36.5	36.5	10.5	36.5	36.5
Total Split (s)	11.2	23.8	23.8	19.6	32.2	32.2	12.6	84.0	84.0	12.6	84.0	84.0
Total Split (%)	8.0%	17.0%	17.0%	14.0%	23.0%	23.0%	9.0%	60.0%	60.0%	9.0%	60.0%	60.0%
Maximum Green (s)	7.2	17.1	17.1	15.6	25.5	25.5	8.6	77.5	77.5	8.6	77.5	77.5
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	2.8	2.8	1.0	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)				7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)				23.0	23.0			23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)				6	6			1	1		1	1
Act Effct Green (s)	21.2	12.3	12.3	14.3	28.4	28.4	94.8	77.5	77.5	94.8	77.5	77.5
Actuated g/C Ratio	0.15	0.09	0.09	0.10	0.20	0.20	0.68	0.55	0.55	0.68	0.55	0.55
v/c Ratio	0.03	0.48	0.49	0.71	0.44	0.58	0.91	1.01	0.39	1.00	0.65	0.02
Control Delay	39.0	70.3	16.5	72.4	52.9	21.3	39.2	24.2	0.9	97.2	23.7	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	0.0
Total Delay	39.0	70.3	16.5	72.4	52.9	21.3	39.2	24.2	0.9	97.2	23.7	0.1
LOS	D	E	B	E	D	C	D	C	A	F	C	A
Approach Delay		37.8			47.5			22.6			35.3	
Approach LOS		D			D			C			D	
Queue Length 50th (m)	1.6	22.5	0.0	35.8	41.6	19.9	39.4	~266.0	6.6	53.9	127.5	0.0
Queue Length 95th (m)	5.6	38.7	19.3	50.8	67.8	53.2	m#54.4	m#92.2	m#0.0	#136.4	151.5	0.0
Internal Link Dist (m)		272.6			267.2			717.2			96.4	
Turn Bay Length (m)	70.0		70.0	140.0			135.0		80.0	180.0		50.0
Base Capacity (vph)	220	227	295	378	378	461	326	1959	940	244	1921	848
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	0.03	0.35	0.41	0.65	0.44	0.58	0.91	1.01	0.39	1.00	0.65	0.02

Intersection Summary

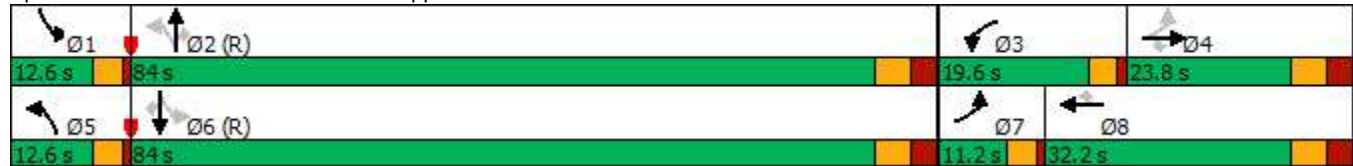
Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 35 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
 1: Bronte Road & Upper Middle Road

2023 Existing PM Peak Hour
 1354 Bronte

























Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 30.4	Intersection LOS: C
Intersection Capacity Utilization 93.8%	ICU Level of Service F
Analysis Period (min) 15	
~ 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.	

Splits and Phases: 1: Bronte Road & Upper Middle Road



HCM Signalized Intersection Capacity Analysis
1: Bronte Road & Upper Middle Road












2023 Existing PM Peak Hour
1354 Bronte

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	74	114	230	155	252	278	1863	346	228	1166	16
Future Volume (vph)	7	74	114	230	155	252	278	1863	346	228	1166	16
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.97
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	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1762	1863	1548	3400	1863	1543	1770	3539	1518	1770	3471	1435
Flt Permitted	0.65	1.00	1.00	0.95	1.00	1.00	0.13	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1211	1863	1548	3400	1863	1543	245	3539	1518	100	3471	1435
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	7	79	121	245	165	268	296	1982	368	243	1240	17
RTOR Reduction (vph)	0	0	108	0	0	148	0	0	105	0	0	8
Lane Group Flow (vph)	7	79	13	245	165	120	296	1982	263	243	1240	9
Confl. Peds. (#/hr)	6					6	1		1	1		1
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	4%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Actuated Green, G (s)	16.9	15.5	15.5	14.3	28.4	28.4	89.0	74.2	74.2	89.0	74.2	74.2
Effective Green, g (s)	16.9	15.5	15.5	14.3	28.4	28.4	89.0	74.2	74.2	89.0	74.2	74.2
Actuated g/C Ratio	0.12	0.11	0.11	0.10	0.20	0.20	0.64	0.53	0.53	0.64	0.53	0.53
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	151	206	171	347	377	313	316	1875	804	240	1839	760
v/s Ratio Prot	0.00	0.04		c0.07	c0.09		0.10	c0.56		c0.11	0.36	
v/s Ratio Perm	0.01		0.01			0.08	0.50		0.17	0.53		0.01
v/c Ratio	0.05	0.38	0.08	0.71	0.44	0.38	0.94	1.06	0.33	1.01	0.67	0.01
Uniform Delay, d1	54.3	57.8	55.8	60.8	48.8	48.2	27.0	32.9	18.7	49.2	24.1	15.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.99	0.42	0.13	1.00	1.00	1.00
Incremental Delay, d2	0.1	1.2	0.2	6.4	0.8	0.8	5.6	27.2	0.1	61.3	2.0	0.0
Delay (s)	54.5	59.0	56.0	67.2	49.6	49.0	59.4	41.1	2.5	110.5	26.1	15.6
Level of Service	D	E	E	E	D	D	E	D	A	F	C	B
Approach Delay (s)		57.1			55.7			37.8			39.6	
Approach LOS		E			E			D			D	
Intersection Summary												
HCM 2000 Control Delay			41.5									D
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			140.0							21.2		
Intersection Capacity Utilization			93.8%									F
Analysis Period (min)			15									

c Critical Lane Group












Lanes, Volumes, Timings
2: Bronte Road

2023 Existing PM Peak Hour
1354 Bronte

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	85	52	2453	144	88	1422
Future Volume (vph)	85	52	2453	144	88	1422
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	0.948			0.850		
Flt Protected	0.970				0.950	
Satd. Flow (prot)	1713	0	3539	1583	1770	3539
Flt Permitted	0.970				0.950	
Satd. Flow (perm)	1713	0	3539	1583	1770	3539
Link Speed (k/h)	50		60			60
Link Distance (m)	122.2		448.7			741.2
Travel Time (s)	8.8		26.9			44.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	57	2666	157	96	1546
Shared Lane Traffic (%)						
Lane Group Flow (vph)	149	0	2666	157	96	1546
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		7.2			7.2
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	87.7%			ICU Level of Service E		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
2: Bronte Road

2023 Existing PM Peak Hour
1354 Bronte

							
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations							
Traffic Volume (veh/h)	85	52	2453	144	88	1422	
Future Volume (Veh/h)	85	52	2453	144	88	1422	
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)	92	57	2666	157	96	1546	
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	3631	1333				2823	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	3631	1333				2823	
tC, single (s)	6.8	6.9				4.1	
tC, 2 stage (s)							
tF (s)	3.5	3.3				2.2	
p0 queue free %	0	60				28	
cM capacity (veh/h)	1	144				133	
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	149	1333	1333	157	96	773	773
Volume Left	92	0	0	0	96	0	0
Volume Right	57	0	0	157	0	0	0
cSH	2	1700	1700	1700	133	1700	1700
Volume to Capacity	87.72	0.78	0.78	0.09	0.72	0.45	0.45
Queue Length 95th (m)	Err	0.0	0.0	0.0	32.9	0.0	0.0
Control Delay (s)	Err	0.0	0.0	0.0	81.9	0.0	0.0
Lane LOS	F				F		
Approach Delay (s)	Err	0.0				4.8	
Approach LOS	F						
Intersection Summary							
Average Delay			324.6				
Intersection Capacity Utilization			87.7%	ICU Level of Service	E		
Analysis Period (min)			15				

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

2023 Existing PM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↔		↖		↗	↖	↕↕	↗	↖	↕↔	
Traffic Volume (vph)	0	0	0	138	0	110	1	2547	175	89	1464	0
Future Volume (vph)	0	0	0	138	0	110	1	2547	175	89	1464	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		40.0	35.0		30.0	70.0		0.0
Storage Lanes	0		0	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			20.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor						0.98			0.98			
Frt						0.850			0.850			
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	1863	0	1770	0	1583	1770	3505	1388	1770	3471	0
Flt Permitted				0.757			0.161			0.040		
Satd. Flow (perm)	0	1863	0	1410	0	1557	300	3505	1356	75	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						90			56			
Link Speed (k/h)		20			20			60			60	
Link Distance (m)		78.7			109.0			218.2			448.7	
Travel Time (s)		14.2			19.6			13.1			26.9	
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	14%	2%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6
Adj. Flow (vph)	0	0	0	142	0	113	1	2626	180	92	1509	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	142	0	113	1	2626	180	92	1509	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1		1	1	2	1	1	2	
Detector Template	Left	Thru		Left		Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0		2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0		2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

2023 Existing PM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type				Perm		Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	4	4		8		8	2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0	15.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	24.2	24.2		35.2		35.2	34.9	34.9	34.9	9.5	34.9	
Total Split (s)	40.6	40.6		40.6		40.6	88.2	88.2	88.2	11.2	99.4	
Total Split (%)	29.0%	29.0%		29.0%		29.0%	63.0%	63.0%	63.0%	8.0%	71.0%	
Maximum Green (s)	34.4	34.4		34.4		34.4	82.3	82.3	82.3	7.2	93.5	
Yellow Time (s)	3.1	3.1		3.1		3.1	3.7	3.7	3.7	3.0	3.7	
All-Red Time (s)	3.1	3.1		3.1		3.1	2.2	2.2	2.2	1.0	2.2	
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.2		6.2		6.2	5.9	5.9	5.9	4.0	5.9	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.6	3.6	3.6	3.0	3.6	
Recall Mode	None	None		None		None	C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)				7.0		7.0	7.0	7.0	7.0		7.0	
Flash Dont Walk (s)				22.0		22.0	22.0	22.0	22.0		22.0	
Pedestrian Calls (#/hr)				0		0	0	0	0		0	
Act Effct Green (s)				19.4		19.4	95.7	95.7	95.7	110.4	108.5	
Actuated g/C Ratio				0.14		0.14	0.68	0.68	0.68	0.79	0.78	
v/c Ratio				0.73		0.39	0.00	1.10	0.19	0.56	0.56	
Control Delay				77.9		18.5	10.0	73.7	7.1	50.6	5.5	
Queue Delay				0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay				77.9		18.5	10.0	73.7	7.1	50.6	5.5	
LOS				E		B	A	E	A	D	A	
Approach Delay					51.5			69.4			8.1	
Approach LOS					D			E			A	
Queue Length 50th (m)				40.2		5.9	0.1	~451.6	11.4	14.1	44.2	
Queue Length 95th (m)				61.0		23.4	0.9	#539.8	27.7	m30.6	56.0	
Internal Link Dist (m)		54.7			85.0			194.2			424.7	
Turn Bay Length (m)						40.0	35.0		30.0	70.0		
Base Capacity (vph)				346		450	205	2396	944	169	2689	
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				0.41		0.25	0.00	1.10	0.19	0.54	0.56	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 103.6 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.10

Lanes, Volumes, Timings
 3: Bronte Road & Driveway/Charles Cornwall Road

2023 Existing PM Peak Hour
 1354 Bronte

Intersection Signal Delay: 47.4 Intersection LOS: D

Intersection Capacity Utilization 89.9% ICU Level of Service E

Analysis Period (min) 15

~ 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.

Splits and Phases: 3: Bronte Road & Driveway/Charles Cornwall Road

















HCM Signalized Intersection Capacity Analysis
 3: Bronte Road & Driveway/Charles Cornwall Road

2023 Existing PM Peak Hour
 1354 Bronte

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	0	0	0	138	0	110	1	2547	175	89	1464	0		
Future Volume (vph)	0	0	0	138	0	110	1	2547	175	89	1464	0		
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Total Lost time (s)				6.2		6.2	5.9	5.9	5.9	4.0	5.9			
Lane Util. Factor				1.00		1.00	1.00	0.95	1.00	1.00	0.95			
Frbp, ped/bikes				1.00		0.98	1.00	1.00	0.98	1.00	1.00			
Flpb, ped/bikes				1.00		1.00	1.00	1.00	1.00	1.00	1.00			
Frt				1.00		0.85	1.00	1.00	0.85	1.00	1.00			
Flt Protected				0.95		1.00	0.95	1.00	1.00	0.95	1.00			
Satd. Flow (prot)				1770		1552	1770	3505	1357	1770	3471			
Flt Permitted				0.76		1.00	0.16	1.00	1.00	0.04	1.00			
Satd. Flow (perm)				1410		1552	299	3505	1357	75	3471			
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97		
Adj. Flow (vph)	0	0	0	142	0	113	1	2626	180	92	1509	0		
RTOR Reduction (vph)	0	0	0	0	0	78	0	0	18	0	0	0		
Lane Group Flow (vph)	0	0	0	142	0	35	1	2626	162	92	1509	0		
Confl. Bikes (#/hr)			5			5			5			5		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	14%	2%	4%	2%		
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6		
Turn Type				Perm		Perm	Perm	NA	Perm	pm+pt	NA			
Protected Phases		4						2		1		6		
Permitted Phases	4			8		8	2		2	6				
Actuated Green, G (s)				19.4		19.4	95.7	95.7	95.7	108.5	108.5			
Effective Green, g (s)				19.4		19.4	95.7	95.7	95.7	108.5	108.5			
Actuated g/C Ratio				0.14		0.14	0.68	0.68	0.68	0.78	0.78			
Clearance Time (s)				6.2		6.2	5.9	5.9	5.9	4.0	5.9			
Vehicle Extension (s)				3.0		3.0	3.6	3.6	3.6	3.0	3.6			
Lane Grp Cap (vph)				195		215	204	2395	927	164	2690			
v/s Ratio Prot								c0.75		0.04	c0.43			
v/s Ratio Perm				c0.10		0.02	0.00		0.12	0.40				
v/c Ratio				0.73		0.16	0.00	1.10	0.18	0.56	0.56			
Uniform Delay, d1				57.8		53.2	7.0	22.1	8.0	42.6	6.3			
Progression Factor				1.00		1.00	1.00	1.00	1.00	1.86	0.69			
Incremental Delay, d2				12.7		0.4	0.0	50.7	0.4	3.6	0.7			
Delay (s)				70.5		53.5	7.1	72.9	8.4	82.6	5.0			
Level of Service				E		D	A	E	A	F	A			
Approach Delay (s)		0.0			63.0			68.7			9.5			
Approach LOS		A			E			E			A			
Intersection Summary														
HCM 2000 Control Delay			48.1									HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio			1.01											
Actuated Cycle Length (s)			140.0								16.1			
Intersection Capacity Utilization			89.9%										ICU Level of Service	E
Analysis Period (min)			15											
c Critical Lane Group														

Lanes, Volumes, Timings
2: Bronte Road

2023 Existing PM Peak Hour Optimized
1354 Bronte

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (vph)	85	52	2453	144	88	1422
Future Volume (vph)	85	52	2453	144	88	1422
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0	0.0		15.0	15.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.034	
Satd. Flow (perm)	1770	1583	3539	1583	63	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		55		32		
Link Speed (k/h)	50		60			60
Link Distance (m)	122.2		448.7			741.2
Travel Time (s)	8.8		26.9			44.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	57	2666	157	96	1546
Shared Lane Traffic (%)						
Lane Group Flow (vph)	92	57	2666	157	96	1546
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	2.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	pm+pt	Perm	NA	Perm	pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases	8	8		2	6	






















Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	3	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	117.9	117.9	9.6	127.5
Total Split (%)	15.0%	15.0%	78.6%	78.6%	6.4%	85.0%
Maximum Green (s)	18.0	18.0	113.4	113.4	5.1	123.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0		11.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effct Green (s)	12.7	12.7	113.5	113.5	123.1	123.1
Actuated g/C Ratio	0.09	0.09	0.78	0.78	0.85	0.85
v/c Ratio	0.59	0.30	0.96	0.13	0.85	0.51
Control Delay	79.2	19.6	25.0	3.5	79.4	3.8
Queue Delay	0.0	0.0	0.9	0.0	0.0	0.0
Total Delay	79.2	19.6	25.9	3.5	79.4	3.8
LOS	E	B	C	A	E	A
Approach Delay	56.4		24.7			8.2
Approach LOS	E		C			A
Queue Length 50th (m)	27.2	0.6	320.4	7.6	12.7	50.5
Queue Length 95th (m)	46.6	14.8	#490.0	15.5	#50.8	77.9
Internal Link Dist (m)	98.2		424.7			717.2
Turn Bay Length (m)	15.0			15.0	15.0	
Base Capacity (vph)	220	245	2773	1247	113	3008
Starvation Cap Reductn	0	0	29	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	0.42	0.23	0.97	0.13	0.85	0.51

Intersection Summary

Area Type:	Other
Cycle Length:	150
Actuated Cycle Length:	144.8
Natural Cycle:	150
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.96
Intersection Signal Delay:	19.9
Intersection LOS:	B
Intersection Capacity Utilization:	85.3%
ICU Level of Service:	E
Analysis Period (min):	15
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 2: Bronte Road

 Ø1 9.6 s	 Ø2 117.9 s	 Ø3 22.5 s
 Ø6 127.5 s	 Ø8 22.5 s	

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (vph)	85	52	2453	144	88	1422
Future Volume (vph)	85	52	2453	144	88	1422
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
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	0.95	1.00	1.00	1.00	0.03	1.00
Satd. Flow (perm)	1770	1583	3539	1583	63	3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	57	2666	157	96	1546
RTOR Reduction (vph)	0	50	0	7	0	0
Lane Group Flow (vph)	92	7	2666	150	96	1546
Turn Type	pm+pt	Perm	NA	Perm	pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases	8	8		2	6	
Actuated Green, G (s)	12.7	12.7	113.5	113.5	123.1	123.1
Effective Green, g (s)	12.7	12.7	113.5	113.5	123.1	123.1
Actuated g/C Ratio	0.09	0.09	0.78	0.78	0.85	0.85
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	155	138	2774	1240	113	3008
v/s Ratio Prot	c0.05		c0.75		c0.03	0.44
v/s Ratio Perm		0.00		0.09	0.69	
v/c Ratio	0.59	0.05	0.96	0.12	0.85	0.51
Uniform Delay, d1	63.6	60.5	13.7	3.7	54.6	2.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.0	0.1	10.1	0.2	41.5	0.6
Delay (s)	69.5	60.7	23.9	3.9	96.1	3.5
Level of Service	E	E	C	A	F	A
Approach Delay (s)	66.1		22.8			8.9
Approach LOS	E		C			A
Intersection Summary						
HCM 2000 Control Delay			19.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.92			
Actuated Cycle Length (s)			144.8		Sum of lost time (s)	13.5
Intersection Capacity Utilization			85.3%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

Appendix I

2026 Future Background Conditions Synchro Worksheets

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2026 Future Background AM Peak Hour
1354 Bronte

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	203	390	527	88	196	65	982	259	262	2125	12
Future Volume (vph)	11	203	390	527	88	196	65	982	259	262	2125	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	70.0		70.0	140.0		0.0	135.0		80.0	180.0		50.0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (m)	65.0			100.0			70.0			70.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99		0.98			0.97			0.96	1.00		0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1863	1583	3433	1792	1553	1719	3343	1485	1770	3406	1336
Flt Permitted	0.698			0.950			0.056			0.184		
Satd. Flow (perm)	1200	1863	1550	3433	1792	1502	101	3343	1427	342	3406	1289
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			152			202			267			122
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		296.6			291.2			731.4			120.4	
Travel Time (s)		17.8			17.5			43.9			7.2	
Confl. Peds. (#/hr)	11						11	5		7	7	5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	9%	2%	2%	2%	6%	4%	5%	8%	7%	2%	6%	18%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6
Adj. Flow (vph)	11	209	402	543	91	202	67	1012	267	270	2191	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	209	402	543	91	202	67	1012	267	270	2191	12
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.00	1.00	1.03
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2026 Future Background AM Peak Hour
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	20.0	20.0	6.0	20.0	20.0
Minimum Split (s)	10.5	36.7	36.7	10.5	36.7	36.7	10.5	36.5	36.5	10.5	36.5	36.5
Total Split (s)	11.2	23.8	23.8	19.6	32.2	32.2	11.2	79.8	79.8	16.8	85.4	85.4
Total Split (%)	8.0%	17.0%	17.0%	14.0%	23.0%	23.0%	8.0%	57.0%	57.0%	12.0%	61.0%	61.0%
Maximum Green (s)	7.2	17.1	17.1	15.6	25.5	25.5	7.2	73.3	73.3	12.8	78.9	78.9
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	2.8	2.8	1.0	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					23.0	23.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)					11	11		7	7		5	5
Act Effct Green (s)	26.2	17.1	17.1	15.6	32.3	32.3	83.1	73.8	73.8	92.6	81.2	81.2
Actuated g/C Ratio	0.19	0.12	0.12	0.11	0.23	0.23	0.59	0.53	0.53	0.66	0.58	0.58
v/c Ratio	0.04	0.92	1.25	1.42	0.22	0.40	0.48	0.57	0.30	0.77	1.11	0.02
Control Delay	37.6	102.6	165.3	247.7	47.3	8.8	28.1	18.9	5.9	25.8	86.1	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	0.0
Total Delay	37.6	102.6	165.3	247.7	47.3	8.8	28.1	18.9	5.9	25.8	86.1	0.0
LOS	D	F	F	F	D	A	C	B	A	C	F	A
Approach Delay		141.9			168.1			16.8			79.1	
Approach LOS		F			F			B			E	
Queue Length 50th (m)	2.3	61.1	~104.7	~109.6	20.8	0.0	4.2	101.1	25.8	29.3	~391.8	0.0
Queue Length 95th (m)	7.5	#110.8	#172.2	#147.0	40.6	22.7	16.3	107.5	29.2	#45.7	#433.8	0.0
Internal Link Dist (m)		272.6			267.2			707.4			96.4	
Turn Bay Length (m)	70.0		70.0	140.0			135.0		80.0	180.0		50.0
Base Capacity (vph)	254	227	322	382	413	501	143	1761	878	356	1976	799
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	0.04	0.92	1.25	1.42	0.22	0.40	0.47	0.57	0.30	0.76	1.11	0.02

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 82.6 (59%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.42

Intersection Signal Delay: 84.7 Intersection LOS: F

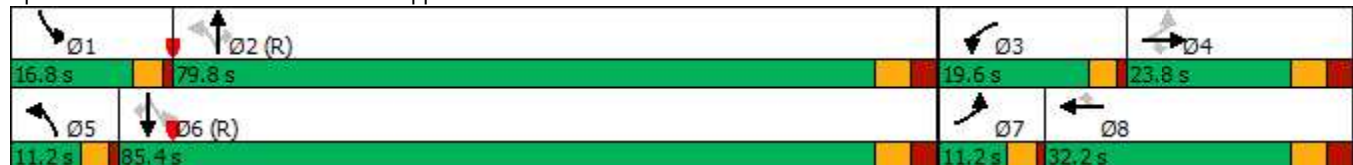
Intersection Capacity Utilization 112.3% ICU Level of Service H

Analysis Period (min) 15

~ 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.

























Splits and Phases: 1: Bronte Road & Upper Middle Road



HCM Signalized Intersection Capacity Analysis
1: Bronte Road & Upper Middle Road

2026 Future Background AM Peak Hour

1354 Bronte

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	203	390	527	88	196	65	982	259	262	2125	12
Future Volume (vph)	11	203	390	527	88	196	65	982	259	262	2125	12
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.96	1.00	1.00	0.97
Flpb, ped/bikes	0.99	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	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1641	1863	1552	3433	1792	1504	1719	3343	1426	1769	3406	1289
Flt Permitted	0.70	1.00	1.00	0.95	1.00	1.00	0.06	1.00	1.00	0.18	1.00	1.00
Satd. Flow (perm)	1205	1863	1552	3433	1792	1504	101	3343	1426	343	3406	1289
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)	11	209	402	543	91	202	67	1012	267	270	2191	12
RTOR Reduction (vph)	0	0	131	0	0	155	0	0	131	0	0	5
Lane Group Flow (vph)	11	209	271	543	91	47	67	1012	136	270	2191	7
Confl. Peds. (#/hr)	11						11	5	7	7		5
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	9%	2%	2%	2%	6%	4%	5%	8%	7%	2%	6%	18%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Actuated Green, G (s)	22.3	19.5	19.5	15.6	32.3	32.3	77.1	71.4	71.4	87.7	78.0	78.0
Effective Green, g (s)	22.3	19.5	19.5	15.6	32.3	32.3	77.1	71.4	71.4	87.7	78.0	78.0
Actuated g/C Ratio	0.16	0.14	0.14	0.11	0.23	0.23	0.55	0.51	0.51	0.63	0.56	0.56
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	200	259	216	382	413	346	121	1704	727	340	1897	718
v/s Ratio Prot	0.00	0.11		c0.16	0.05		0.02	0.30		c0.07	c0.64	
v/s Ratio Perm	0.01		c0.17			0.03	0.28		0.10	0.43		0.01
v/c Ratio	0.06	0.81	1.26	1.42	0.22	0.13	0.55	0.59	0.19	0.79	1.15	0.01
Uniform Delay, d1	49.8	58.4	60.2	62.2	43.6	42.8	31.6	24.1	18.6	16.6	31.0	13.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.14	0.77	2.63	1.00	1.00	1.00
Incremental Delay, d2	0.1	16.6	147.0	204.4	0.3	0.2	4.9	1.4	0.5	12.0	76.2	0.0
Delay (s)	49.9	75.0	207.2	266.6	43.9	42.9	40.9	20.0	49.4	28.6	107.2	13.8
Level of Service	D	E	F	F	D	D	D	C	D	C	F	B
Approach Delay (s)		160.0			188.3			26.9			98.2	
Approach LOS		F			F			C			F	
Intersection Summary												
HCM 2000 Control Delay			101.6									F
HCM 2000 Volume to Capacity ratio			1.20									
Actuated Cycle Length (s)			140.0							21.2		
Intersection Capacity Utilization			112.3%									H
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

2026 Future Background AM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	0	47	172	0	95	15	1193	54	30	3100	5
Future Volume (vph)	16	0	47	172	0	95	15	1193	54	30	3100	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	15.0		0.0	15.0		15.0	15.0		15.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1583	0	1770	1583	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.645			0.724			0.038			0.181		
Satd. Flow (perm)	1201	1583	0	1349	1583	0	71	3539	1583	337	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			96				22			19
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		42.5			50.2			458.5			731.4	
Travel Time (s)		3.1			3.6			27.5			43.9	
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
Adj. Flow (vph)	17	0	51	187	0	103	16	1297	59	33	3370	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	51	0	187	103	0	16	1297	59	33	3370	5
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

2026 Future Background AM Peak Hour

1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	35.5	35.5		35.5	35.5		35.5	35.5	35.5	35.5	35.5	35.5
Total Split (s)	35.5	35.5		35.5	35.5		104.5	104.5	104.5	104.5	104.5	104.5
Total Split (%)	25.4%	25.4%		25.4%	25.4%		74.6%	74.6%	74.6%	74.6%	74.6%	74.6%
Maximum Green (s)	30.0	30.0		30.0	30.0		99.0	99.0	99.0	99.0	99.0	99.0
Yellow Time (s)	3.3	3.3		3.3	3.3		3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.2	2.2		2.2	2.2		1.8	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0		23.0	23.0		23.0	23.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	23.8	23.8		23.8	23.8		105.2	105.2	105.2	105.2	105.2	105.2
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.75	0.75	0.75	0.75	0.75	0.75
v/c Ratio	0.08	0.18		0.82	0.30		0.30	0.49	0.05	0.13	1.27	0.00
Control Delay	46.9	33.2		81.6	12.3		31.7	10.4	6.2	7.4	138.9	0.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	33.2		81.6	12.3		31.7	10.4	6.2	7.4	138.9	0.8
LOS	D	C		F	B		C	B	A	A	F	A
Approach Delay		36.6			57.0			10.5			137.4	
Approach LOS		D			E			B			F	
Queue Length 50th (m)	4.2	7.9		52.8	1.7		1.4	71.0	2.5	2.9	~652.4	0.0
Queue Length 95th (m)	11.1	19.8		78.4	17.7		m4.8	127.2	m11.2	m3.3	m#532.8	m0.0
Internal Link Dist (m)		18.5			26.2			434.5			707.4	
Turn Bay Length (m)	15.0			15.0			15.0		15.0	15.0		15.0
Base Capacity (vph)	257	354		289	414		53	2658	1194	253	2658	1193
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.14		0.65	0.25		0.30	0.49	0.05	0.13	1.27	0.00

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 85 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.27
 Intersection Signal Delay: 97.6
 Intersection LOS: F
 Intersection Capacity Utilization 111.1%
 ICU Level of Service H
 Analysis Period (min) 15

~ 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.

Splits and Phases: 2: Bronte Road & Saw Whet Boulevard



HCM Signalized Intersection Capacity Analysis
2: Bronte Road & Saw Whet Boulevard

2026 Future Background AM Peak Hour
1354 Bronte

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	0	47	172	0	95	15	1193	54	30	3100	5
Future Volume (vph)	16	0	47	172	0	95	15	1193	54	30	3100	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.85		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		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1583		1770	3539	1583	1770	3539	1583
Flt Permitted	0.65	1.00		0.72	1.00		0.04	1.00	1.00	0.18	1.00	1.00
Satd. Flow (perm)	1202	1583		1348	1583		71	3539	1583	337	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	0	51	187	0	103	16	1297	59	33	3370	5
RTOR Reduction (vph)	0	16	0	0	80	0	0	0	5	0	0	1
Lane Group Flow (vph)	17	35	0	187	23	0	16	1297	54	33	3370	4
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	23.8	23.8		23.8	23.8		105.2	105.2	105.2	105.2	105.2	105.2
Effective Green, g (s)	23.8	23.8		23.8	23.8		105.2	105.2	105.2	105.2	105.2	105.2
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.75	0.75	0.75	0.75	0.75	0.75
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5
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)	204	269		229	269		53	2659	1189	253	2659	1189
v/s Ratio Prot		0.02			0.01			0.37			c0.95	
v/s Ratio Perm	0.01			c0.14			0.23		0.03	0.10		0.00
v/c Ratio	0.08	0.13		0.82	0.09		0.30	0.49	0.05	0.13	1.27	0.00
Uniform Delay, d1	48.9	49.3		56.0	48.9		5.6	6.8	4.5	4.8	17.4	4.3
Progression Factor	1.00	1.00		1.00	1.00		1.82	1.32	1.62	1.16	0.75	4.29
Incremental Delay, d2	0.2	0.2		19.7	0.1		12.0	0.5	0.1	0.1	120.6	0.0
Delay (s)	49.1	49.5		75.7	49.1		22.2	9.6	7.3	5.6	133.6	18.6
Level of Service	D	D		E	D		C	A	A	A	F	B
Approach Delay (s)		49.4			66.2			9.6			132.2	
Approach LOS		D			E			A			F	
Intersection Summary												
HCM 2000 Control Delay			94.6									F
HCM 2000 Volume to Capacity ratio			1.18									
Actuated Cycle Length (s)			140.0								11.0	
Intersection Capacity Utilization			111.1%									H
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

2026 Future Background AM Peak Hour

1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖		↗	↖	↗	↕	↖	↗	↕
Traffic Volume (vph)	1	0	1	161	0	65	0	1244	78	149	3159	0
Future Volume (vph)	1	0	1	161	0	65	0	1244	78	149	3159	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		40.0	35.0		30.0	70.0		0.0
Storage Lanes	0		0	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			20.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor		0.99				0.98			0.98			
Frt		0.932				0.850			0.850			
Flt Protected		0.976		0.950						0.950		
Satd. Flow (prot)	0	1680	0	1530	0	1392	1863	3406	1439	1770	3471	0
Flt Permitted		0.976		0.757						0.155		
Satd. Flow (perm)	0	1680	0	1219	0	1368	1863	3406	1406	289	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		54				67			56			
Link Speed (k/h)		20			20			60			60	
Link Distance (m)		78.7			109.0			218.2			458.5	
Travel Time (s)		14.2			19.6			13.1			27.5	
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	18%	2%	16%	2%	6%	10%	2%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6
Adj. Flow (vph)	1	0	1	166	0	67	0	1282	80	154	3257	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2	0	166	0	67	0	1282	80	154	3257	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1		1	1	2	1	1	2	
Detector Template	Left	Thru		Left		Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0		2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0		2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

2026 Future Background AM Peak Hour

1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	4	4		8		8	2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0	15.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	24.2	24.2		35.2		35.2	34.9	34.9	34.9	9.5	34.9	
Total Split (s)	35.2	35.2		35.2		35.2	88.2	88.2	88.2	16.6	104.8	
Total Split (%)	25.1%	25.1%		25.1%		25.1%	63.0%	63.0%	63.0%	11.9%	74.9%	
Maximum Green (s)	29.0	29.0		29.0		29.0	82.3	82.3	82.3	12.6	98.9	
Yellow Time (s)	3.1	3.1		3.1		3.1	3.7	3.7	3.7	3.0	3.7	
All-Red Time (s)	3.1	3.1		3.1		3.1	2.2	2.2	2.2	1.0	2.2	
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.2		6.2		6.2	5.9	5.9	5.9	4.0	5.9	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.6	3.6	3.6	3.0	3.6	
Recall Mode	None	None		None		None	C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)				7.0		7.0	7.0	7.0	7.0		7.0	
Flash Dont Walk (s)				22.0		22.0	22.0	22.0	22.0		22.0	
Pedestrian Calls (#/hr)				0		0	0	0	0		0	
Act Effct Green (s)		23.3		23.3		23.3		91.8	91.8	106.5	104.6	
Actuated g/C Ratio		0.17		0.17		0.17		0.66	0.66	0.76	0.75	
v/c Ratio		0.01		0.82		0.24		0.57	0.09	0.49	1.26	
Control Delay		0.0		85.8		12.2		15.6	4.5	3.3	128.1	
Queue Delay		0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Total Delay		0.0		85.8		12.2		15.6	4.5	3.3	128.1	
LOS		A		F		B		B	A	A	F	
Approach Delay					64.6			15.0			122.4	
Approach LOS					E			B			F	
Queue Length 50th (m)		0.0		46.9		0.0		103.3	2.3	3.0	~626.8	
Queue Length 95th (m)		0.0		71.9		13.4		144.8	10.1	m2.6 m#	440.5	
Internal Link Dist (m)		54.7			85.0			194.2			434.5	
Turn Bay Length (m)						40.0			30.0	70.0		
Base Capacity (vph)		390		252		336		2232	940	353	2594	
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		0.01		0.66		0.20		0.57	0.09	0.44	1.26	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 128.8 (92%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.26

Lanes, Volumes, Timings
 3: Bronte Road & Driveway/Charles Cornwall Road

2026 Future Background AM Peak Hour

1354 Bronte

Intersection Signal Delay: 90.5 Intersection LOS: F

Intersection Capacity Utilization 128.6% ICU Level of Service H

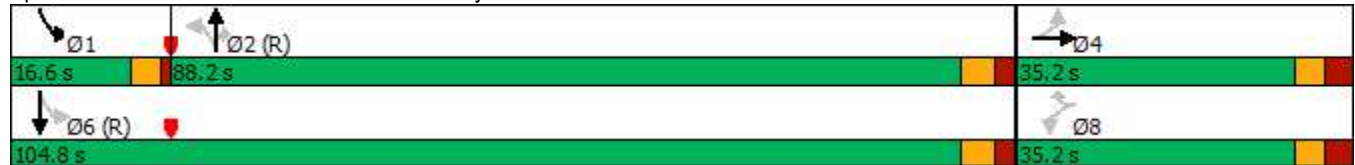
Analysis Period (min) 15

~ 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.

Splits and Phases: 3: Bronte Road & Driveway/Charles Cornwall Road



HCM Signalized Intersection Capacity Analysis
3: Bronte Road & Driveway/Charles Cornwall Road

2026 Future Background AM Peak Hour
1354 Bronte



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↖		↗	↖	↗	↕	↖	↗	↕
Traffic Volume (vph)	1	0	1	161	0	65	0	1244	78	149	3159	0
Future Volume (vph)	1	0	1	161	0	65	0	1244	78	149	3159	0
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2		6.2		6.2		5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		1.00		1.00		0.95	1.00	1.00	0.95	
Frbp, ped/bikes		0.99		1.00		0.98		1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00		1.00		1.00		1.00	1.00	1.00	1.00	
Frt		0.93		1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected		0.98		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1679		1530		1366		3406	1406	1770	3471	
Flt Permitted		0.98		0.76		1.00		1.00	1.00	0.16	1.00	
Satd. Flow (perm)		1679		1218		1366		3406	1406	289	3471	
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)	1	0	1	166	0	67	0	1282	80	154	3257	0
RTOR Reduction (vph)	0	2	0	0	0	56	0	0	19	0	0	0
Lane Group Flow (vph)	0	0	0	166	0	11	0	1282	61	154	3257	0
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	2%	2%	18%	2%	16%	2%	6%	10%	2%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		23.3		23.3		23.3		91.7	91.7	104.6	104.6	
Effective Green, g (s)		23.3		23.3		23.3		91.7	91.7	104.6	104.6	
Actuated g/C Ratio		0.17		0.17		0.17		0.66	0.66	0.75	0.75	
Clearance Time (s)		6.2		6.2		6.2		5.9	5.9	4.0	5.9	
Vehicle Extension (s)		3.0		3.0		3.0		3.6	3.6	3.0	3.6	
Lane Grp Cap (vph)		279		202		227		2230	920	310	2593	
v/s Ratio Prot								0.38		0.03	c0.94	
v/s Ratio Perm		0.00		c0.14		0.01			0.04	0.34		
v/c Ratio		0.00		0.82		0.05		0.57	0.07	0.50	1.26	
Uniform Delay, d1		48.6		56.3		49.0		13.4	8.7	9.1	17.7	
Progression Factor		1.00		1.00		1.00		1.00	1.00	0.55	0.27	
Incremental Delay, d2		0.0		22.8		0.1		1.1	0.1	0.1	115.5	
Delay (s)		48.7		79.1		49.1		14.4	8.8	5.1	120.4	
Level of Service		D		E		D		B	A	A	F	
Approach Delay (s)		48.7			70.5			14.1			115.2	
Approach LOS		D			E			B			F	

























Intersection Summary

HCM 2000 Control Delay	85.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.1
Intersection Capacity Utilization	128.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2026 Future Background AM Peak Hour Optimized

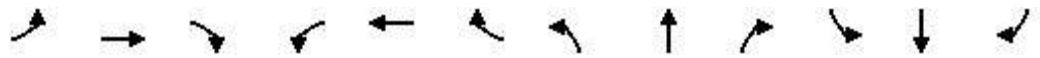
1354 Bronte

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	203	390	526	88	196	66	981	257	263	2125	13
Future Volume (vph)	11	203	390	526	88	196	66	981	257	263	2125	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	70.0		70.0	140.0		0.0	135.0		80.0	180.0		50.0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (m)	65.0			100.0			70.0			70.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99		0.98			0.97			0.96			0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1863	1583	3433	1792	1553	1719	3343	1485	1770	3406	1336
Flt Permitted	0.698			0.950			0.068			0.132		
Satd. Flow (perm)	1200	1863	1556	3433	1792	1504	123	3343	1424	246	3406	1288
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			202			224			122
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		296.6			291.2			731.4			120.4	
Travel Time (s)		17.8			17.5			43.9			7.2	
Confl. Peds. (#/hr)	11					11	5		7	7		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	9%	2%	2%	2%	6%	4%	5%	8%	7%	2%	6%	18%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6
Adj. Flow (vph)	11	209	402	542	91	202	68	1011	265	271	2191	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	209	402	542	91	202	68	1011	265	271	2191	13
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.00	1.00	1.03
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2026 Future Background AM Peak Hour Optimized

1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	5.0	10.0	10.0	6.0	20.0	20.0	6.0	20.0	20.0
Minimum Split (s)	10.5	36.7	36.7	9.5	36.7	36.7	10.5	36.5	36.5	10.5	36.5	36.5
Total Split (s)	10.5	36.7	36.7	21.0	47.2	47.2	10.5	63.3	63.3	24.0	76.8	76.8
Total Split (%)	7.2%	25.3%	25.3%	14.5%	32.6%	32.6%	7.2%	43.7%	43.7%	16.6%	53.0%	53.0%
Maximum Green (s)	6.5	30.0	30.0	16.5	40.5	40.5	6.5	56.8	56.8	20.0	70.3	70.3
Yellow Time (s)	3.0	3.7	3.7	3.5	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	2.8	2.8	1.0	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.7	6.7	4.5	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					23.0	23.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)					11	11		7	7		5	5
Act Effct Green (s)	37.1	28.2	28.2	16.5	45.0	45.0	70.4	61.4	61.4	85.1	74.1	74.1
Actuated g/C Ratio	0.26	0.19	0.19	0.11	0.31	0.31	0.49	0.42	0.42	0.59	0.51	0.51
v/c Ratio	0.03	0.58	0.95	1.39	0.16	0.33	0.52	0.71	0.36	0.83	1.26	0.02
Control Delay	30.1	59.5	68.7	235.9	38.1	6.5	34.7	39.1	7.4	44.5	153.3	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	0.0
Total Delay	30.1	59.5	68.7	235.9	38.1	6.5	34.7	39.1	7.4	44.5	153.3	0.1
LOS	C	E	E	F	D	A	C	D	A	D	F	A
Approach Delay		64.9			158.9			32.6			140.6	
Approach LOS		E			F			C			F	
Queue Length 50th (m)	2.1	57.0	79.6	~112.0	18.8	0.0	8.8	137.9	7.6	43.8	~450.4	0.0
Queue Length 95th (m)	6.6	84.6	#143.2	#150.1	36.4	19.5	20.8	167.4	28.7	#84.1	#492.3	0.0
Internal Link Dist (m)		272.6			267.2			707.4			96.4	
Turn Bay Length (m)	70.0		70.0	140.0			135.0		80.0	180.0		50.0
Base Capacity (vph)	329	385	440	390	555	605	132	1415	732	354	1740	718
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	0.03	0.54	0.91	1.39	0.16	0.33	0.52	0.71	0.36	0.77	1.26	0.02

Intersection Summary

Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.39

Intersection Signal Delay: 107.0 Intersection LOS: F

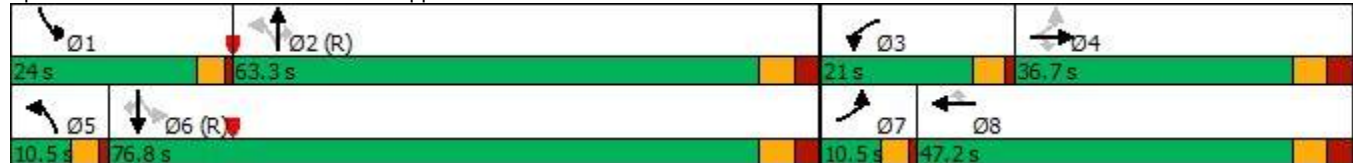
Intersection Capacity Utilization 112.6% ICU Level of Service H

Analysis Period (min) 15

~ 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.

Splits and Phases: 1: Bronte Road & Upper Middle Road

























HCM Signalized Intersection Capacity Analysis 2026 Future Background AM Peak Hour Optimized
 1: Bronte Road & Upper Middle Road 1354 Bronte

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	203	390	526	88	196	66	981	257	263	2125	13
Future Volume (vph)	11	203	390	526	88	196	66	981	257	263	2125	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.5	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.96	1.00	1.00	0.96
Flpb, ped/bikes	0.99	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	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1640	1863	1556	3433	1792	1505	1719	3343	1424	1770	3406	1288
Flt Permitted	0.70	1.00	1.00	0.95	1.00	1.00	0.07	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	1205	1863	1556	3433	1792	1505	123	3343	1424	246	3406	1288
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)	11	209	402	542	91	202	68	1011	265	271	2191	13
RTOR Reduction (vph)	0	0	118	0	0	139	0	0	133	0	0	7
Lane Group Flow (vph)	11	209	284	542	91	63	68	1011	132	271	2191	6
Confl. Peds. (#/hr)	11						11	5		7	7	5
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	9%	2%	2%	2%	6%	4%	5%	8%	7%	2%	6%	18%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Actuated Green, G (s)	33.2	30.6	30.6	16.5	45.0	45.0	64.3	59.0	59.0	80.2	70.9	70.9
Effective Green, g (s)	33.2	30.6	30.6	16.5	45.0	45.0	64.3	59.0	59.0	80.2	70.9	70.9
Actuated g/C Ratio	0.23	0.21	0.21	0.11	0.31	0.31	0.44	0.41	0.41	0.55	0.49	0.49
Clearance Time (s)	4.0	6.7	6.7	4.5	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	283	393	328	390	556	467	112	1360	579	316	1665	629
v/s Ratio Prot	0.00	0.11		c0.16	0.05		0.02	0.30		c0.10	c0.64	
v/s Ratio Perm	0.01		c0.18			0.04	0.25		0.09	0.37		0.00
v/c Ratio	0.04	0.53	0.86	1.39	0.16	0.13	0.61	0.74	0.23	0.86	1.32	0.01
Uniform Delay, d1	43.4	50.8	55.2	64.2	36.3	36.0	34.2	36.6	28.1	28.0	37.0	19.0
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	0.1	1.4	20.4	190.5	0.1	0.1	9.0	3.7	0.9	19.9	146.5	0.0
Delay (s)	43.4	52.2	75.6	254.8	36.5	36.1	43.2	40.3	29.0	47.9	183.6	19.1
Level of Service	D	D	E	F	D	D	D	D	C	D	F	B
Approach Delay (s)		67.2			178.1			38.2			167.9	
Approach LOS		E			F			D			F	
Intersection Summary												
HCM 2000 Control Delay			124.6									F
HCM 2000 Volume to Capacity ratio			1.20									
Actuated Cycle Length (s)			145.0							21.7		
Intersection Capacity Utilization			112.6%									H
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

2026 Future Background AM Peak Hour Optimized
1354 Bronte

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	0	39	172	0	95	12	1193	54	30	3061	4
Future Volume (vph)	14	0	39	172	0	95	12	1193	54	30	3061	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	15.0		0.0	15.0		15.0	15.0		15.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1583	0	1770	1583	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.690			0.467			0.036			0.171		
Satd. Flow (perm)	1285	1583	0	870	1583	0	67	3539	1583	319	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		84			116				84			51
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		42.5			50.2			458.5			731.4	
Travel Time (s)		3.1			3.6			27.5			43.9	
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
Adj. Flow (vph)	15	0	42	187	0	103	13	1297	59	33	3327	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	15	42	0	187	103	0	13	1297	59	33	3327	4
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8			2		2	6		6

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

2026 Future Background AM Peak Hour Optimized
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8		2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		15.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	35.5	35.5		9.5	35.5		35.5	35.5	35.5	9.5	35.5	35.5
Total Split (s)	35.5	35.5		9.5	45.0		95.4	95.4	95.4	9.6	105.0	105.0
Total Split (%)	23.7%	23.7%		6.3%	30.0%		63.6%	63.6%	63.6%	6.4%	70.0%	70.0%
Maximum Green (s)	30.0	30.0		5.0	39.5		89.9	89.9	89.9	5.1	99.5	99.5
Yellow Time (s)	3.3	3.3		3.5	3.3		3.7	3.7	3.7	3.5	3.7	3.7
All-Red Time (s)	2.2	2.2		1.0	2.2		1.8	1.8	1.8	1.0	1.8	1.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		4.5	5.5		5.5	5.5	5.5	4.5	5.5	5.5
Lead/Lag	Lag	Lag		Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0			7.0		7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	23.0	23.0			23.0		23.0	23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0		0	0
Act Effct Green (s)	10.0	10.0		18.6	17.6		112.9	112.9	112.9	122.4	121.4	121.4
Actuated g/C Ratio	0.07	0.07		0.12	0.12		0.75	0.75	0.75	0.82	0.81	0.81
v/c Ratio	0.18	0.23		1.30	0.36		0.26	0.49	0.05	0.10	1.16	0.00
Control Delay	71.3	2.9		223.6	10.7		22.3	8.7	0.5	3.6	94.8	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.3	2.9		223.6	10.7		22.3	8.7	0.5	3.6	94.8	0.0
LOS	E	A		F	B		C	A	A	A	F	A
Approach Delay		20.9			148.0			8.5			93.8	
Approach LOS		C			F			A			F	
Queue Length 50th (m)	4.5	0.0		~70.9	0.0		1.3	83.9	0.0	1.8	~655.0	0.0
Queue Length 95th (m)	12.6	0.3		#125.0	14.6		6.9	99.7	2.0	3.9	#684.4	0.0
Internal Link Dist (m)		18.5			26.2			434.5			707.4	
Turn Bay Length (m)	15.0			15.0			15.0		15.0	15.0		15.0
Base Capacity (vph)	257	383		144	502		50	2662	1212	318	2864	1290
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.11		1.30	0.21		0.26	0.49	0.05	0.10	1.16	0.00

Intersection Summary

Area Type:	Other
Cycle Length:	150
Actuated Cycle Length:	150
Offset:	140.4 (94%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	150
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.30
Intersection Signal Delay:	73.1
Intersection LOS:	E
Intersection Capacity Utilization:	110.0%
ICU Level of Service:	H
Analysis Period (min):	15

~ 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.

Splits and Phases: 2: Bronte Road & Saw Whet Boulevard



HCM Signalized Intersection Capacity Analysis 2026 Future Background AM Peak Hour Optimized
 2: Bronte Road & Saw Whet Boulevard 1354 Bronte



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↑↑	↔	↔	↑↑	↔
Traffic Volume (vph)	14	0	39	172	0	95	12	1193	54	30	3061	4
Future Volume (vph)	14	0	39	172	0	95	12	1193	54	30	3061	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		4.5	5.5		5.5	5.5	5.5	4.5	5.5	5.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.85		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		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1583		1770	3539	1583	1770	3539	1583
Flt Permitted	0.69	1.00		0.47	1.00		0.04	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)	1286	1583		870	1583		67	3539	1583	318	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	0	42	187	0	103	13	1297	59	33	3327	4
RTOR Reduction (vph)	0	40	0	0	90	0	0	0	15	0	0	1
Lane Group Flow (vph)	15	2	0	187	13	0	13	1297	44	33	3327	3
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	8.0	8.0		18.7	18.7		110.9	110.9	110.9	120.3	120.3	120.3
Effective Green, g (s)	8.0	8.0		18.7	18.7		110.9	110.9	110.9	120.3	120.3	120.3
Actuated g/C Ratio	0.05	0.05		0.12	0.12		0.74	0.74	0.74	0.80	0.80	0.80
Clearance Time (s)	5.5	5.5		4.5	5.5		5.5	5.5	5.5	4.5	5.5	5.5
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)	68	84		145	197		49	2616	1170	302	2838	1269
v/s Ratio Prot		0.00		c0.05	0.01			0.37		0.00	c0.94	
v/s Ratio Perm	0.01			c0.11			0.19		0.03	0.08		0.00
v/c Ratio	0.22	0.03		1.29	0.07		0.27	0.50	0.04	0.11	1.17	0.00
Uniform Delay, d1	68.0	67.3		65.1	57.9		6.3	8.0	5.2	4.9	14.9	2.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.1		172.2	0.1		12.8	0.7	0.1	0.2	81.6	0.0
Delay (s)	69.7	67.4		237.3	58.1		19.1	8.7	5.3	5.1	96.5	2.9
Level of Service	E	E		F	E		B	A	A	A	F	A
Approach Delay (s)		68.0			173.7			8.7			95.5	
Approach LOS		E			F			A			F	

Intersection Summary		
HCM 2000 Control Delay	76.2	HCM 2000 Level of Service E
HCM 2000 Volume to Capacity ratio	1.26	
Actuated Cycle Length (s)	150.0	Sum of lost time (s) 20.0
Intersection Capacity Utilization	110.0%	ICU Level of Service H
Analysis Period (min)	15	

c Critical Lane Group

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2026 Future Background PM Peak Hour
1300 Bronte Enns

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	74	114	250	155	252	295	1975	378	241	1236	17
Future Volume (vph)	7	74	114	250	155	252	295	1975	378	241	1236	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	70.0		70.0	140.0		0.0	135.0		80.0	180.0		50.0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (m)	65.0			100.0			70.0			70.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99		0.98			0.97			0.97			0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	3400	1863	1583	1770	3539	1558	1770	3471	1473
Flt Permitted	0.653			0.950			0.112			0.054		
Satd. Flow (perm)	1208	1863	1550	3400	1863	1542	209	3539	1518	101	3471	1435
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			121			185			230			122
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		296.6			291.2			731.4			120.4	
Travel Time (s)		17.8			17.5			43.9			7.2	
Confl. Peds. (#/hr)	6						6	1		1	1	1
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	4%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6
Adj. Flow (vph)	7	79	121	266	165	268	314	2101	402	256	1315	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	79	121	266	165	268	314	2101	402	256	1315	18
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.00	1.00	1.03
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2026 Future Background PM Peak Hour
1300 Bronte Enns



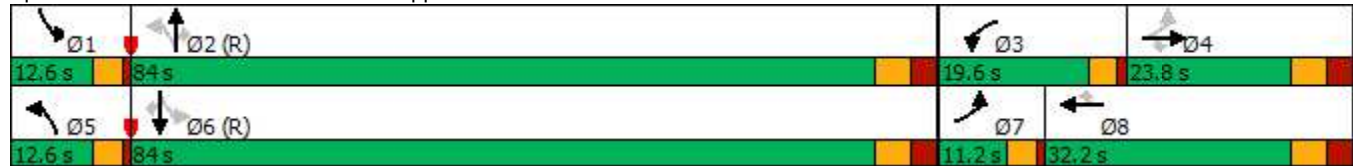
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	20.0	20.0	6.0	20.0	20.0
Minimum Split (s)	10.5	36.7	36.7	10.5	36.7	36.7	10.5	36.5	36.5	10.5	36.5	36.5
Total Split (s)	11.2	23.8	23.8	19.6	32.2	32.2	12.6	84.0	84.0	12.6	84.0	84.0
Total Split (%)	8.0%	17.0%	17.0%	14.0%	23.0%	23.0%	9.0%	60.0%	60.0%	9.0%	60.0%	60.0%
Maximum Green (s)	7.2	17.1	17.1	15.6	25.5	25.5	8.6	77.5	77.5	8.6	77.5	77.5
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	2.8	2.8	1.0	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)				7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)				23.0	23.0			23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)				6	6			1	1		1	1
Act Effct Green (s)	21.2	12.3	12.3	14.6	28.7	28.7	94.4	77.5	77.5	94.4	77.5	77.5
Actuated g/C Ratio	0.15	0.09	0.09	0.10	0.20	0.20	0.67	0.55	0.55	0.67	0.55	0.55
v/c Ratio	0.03	0.48	0.49	0.75	0.43	0.58	1.04	1.07	0.43	1.07	0.68	0.02
Control Delay	39.0	70.3	16.5	74.6	52.6	21.3	76.5	59.4	5.5	116.8	24.8	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	0.0
Total Delay	39.0	70.3	16.5	74.6	52.6	21.3	76.5	59.4	5.5	116.8	24.8	0.1
LOS	D	E	B	E	D	C	E	E	A	F	C	A
Approach Delay		37.8			49.0			53.6			39.3	
Approach LOS		D			D			D			D	
Queue Length 50th (m)	1.6	22.5	0.0	39.1	41.5	20.1	~64.3	~355.7	17.2	~64.5	140.0	0.0
Queue Length 95th (m)	5.6	38.7	19.3	54.9	67.8	53.5	m#55.1	m#357.7	m20.2	#145.0	165.6	0.0
Internal Link Dist (m)		272.6			267.2			707.4			96.4	
Turn Bay Length (m)	70.0		70.0	140.0			135.0		80.0	180.0		50.0
Base Capacity (vph)	220	227	295	378	382	463	301	1959	943	239	1921	848
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	0.03	0.35	0.41	0.70	0.43	0.58	1.04	1.07	0.43	1.07	0.68	0.02

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 35 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated

























Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 48.1	Intersection LOS: D
Intersection Capacity Utilization 98.1%	ICU Level of Service F
Analysis Period (min) 15	
~ 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.	

Splits and Phases: 1: Bronte Road & Upper Middle Road



HCM Signalized Intersection Capacity Analysis
1: Bronte Road & Upper Middle Road

2026 Future Background PM Peak Hour
1300 Bronte Enns

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	7	74	114	250	155	252	295	1975	378	241	1236	17	
Future Volume (vph)	7	74	114	250	155	252	295	1975	378	241	1236	17	
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.97	
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	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1762	1863	1548	3400	1863	1543	1770	3539	1518	1770	3471	1435	
Flt Permitted	0.65	1.00	1.00	0.95	1.00	1.00	0.11	1.00	1.00	0.05	1.00	1.00	
Satd. Flow (perm)	1211	1863	1548	3400	1863	1543	208	3539	1518	100	3471	1435	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Adj. Flow (vph)	7	79	121	266	165	268	314	2101	402	256	1315	18	
RTOR Reduction (vph)	0	0	108	0	0	147	0	0	108	0	0	8	
Lane Group Flow (vph)	7	79	13	266	165	121	314	2101	294	256	1315	10	
Confl. Peds. (#/hr)	6						6	1		1		1	
Confl. Bikes (#/hr)			5			5			5			5	
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	4%	7%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases	4		4			8	2		2	6		6	
Actuated Green, G (s)	16.9	15.5	15.5	14.6	28.7	28.7	88.7	74.3	74.3	88.7	74.3	74.3	
Effective Green, g (s)	16.9	15.5	15.5	14.6	28.7	28.7	88.7	74.3	74.3	88.7	74.3	74.3	
Actuated g/C Ratio	0.12	0.11	0.11	0.10	0.20	0.20	0.63	0.53	0.53	0.63	0.53	0.53	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	151	206	171	354	381	316	292	1878	805	235	1842	761	
v/s Ratio Prot	0.00	0.04		c0.08	c0.09		0.11	c0.59		c0.11	0.38		
v/s Ratio Perm	0.01		0.01			0.08	0.57		0.19	0.58		0.01	
v/c Ratio	0.05	0.38	0.08	0.75	0.43	0.38	1.08	1.12	0.37	1.09	0.71	0.01	
Uniform Delay, d1	54.3	57.8	55.8	60.9	48.6	48.0	33.1	32.9	19.1	49.1	24.8	15.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.66	0.72	0.71	1.00	1.00	1.00	
Incremental Delay, d2	0.1	1.2	0.2	8.7	0.8	0.8	50.1	55.8	0.3	84.6	2.4	0.0	
Delay (s)	54.5	59.0	56.0	69.6	49.3	48.8	105.1	79.3	14.0	133.7	27.2	15.5	
Level of Service	D	E	E	E	D	D	F	E	B	F	C	B	
Approach Delay (s)		57.1			56.9			72.9			44.2		
Approach LOS		E			E			E			D		
Intersection Summary													
HCM 2000 Control Delay			61.6		HCM 2000 Level of Service				E				
HCM 2000 Volume to Capacity ratio			0.99										
Actuated Cycle Length (s)			140.0		Sum of lost time (s)				21.2				
Intersection Capacity Utilization			98.1%		ICU Level of Service				F				
Analysis Period (min)			15										

c Critical Lane Group

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

2026 Future Background PM Peak Hour
1300 Bronte Enns



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	24	106	0	60	40	2599	177	99	1506	14
Future Volume (vph)	8	0	24	106	0	60	40	2599	177	99	1506	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	15.0		0.0	15.0		15.0	15.0		15.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1583	0	1770	1583	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.715			0.740			0.124			0.036		
Satd. Flow (perm)	1332	1583	0	1378	1583	0	231	3539	1583	67	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		49			19				33			19
Link Speed (k/h)		50			50			60				60
Link Distance (m)		42.5			50.2			458.5				731.4
Travel Time (s)		3.1			3.6			27.5				43.9
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
Adj. Flow (vph)	9	0	26	115	0	65	43	2825	192	108	1637	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	26	0	115	65	0	43	2825	192	108	1637	15
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2				6
Permitted Phases	4			8			2		2	6		6

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

2026 Future Background PM Peak Hour
1300 Bronte Enns



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	35.5	35.5		35.5	35.5		35.5	35.5	35.5	35.5	35.5	35.5
Total Split (s)	35.5	35.5		35.5	35.5		104.5	104.5	104.5	104.5	104.5	104.5
Total Split (%)	25.4%	25.4%		25.4%	25.4%		74.6%	74.6%	74.6%	74.6%	74.6%	74.6%
Maximum Green (s)	30.0	30.0		30.0	30.0		99.0	99.0	99.0	99.0	99.0	99.0
Yellow Time (s)	3.3	3.3		3.3	3.3		3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.2	2.2		2.2	2.2		1.8	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0		23.0	23.0		23.0	23.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	17.0	17.0		17.0	17.0		112.0	112.0	112.0	112.0	112.0	112.0
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.80	0.80	0.80	0.80	0.80	0.80
v/c Ratio	0.06	0.11		0.69	0.31		0.23	1.00	0.15	2.04	0.58	0.01
Control Delay	51.6	4.5		78.8	42.7		1.0	21.4	0.4	536.3	12.6	4.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.6	4.5		78.8	42.7		1.0	21.4	0.4	536.3	12.6	4.2
LOS	D	A		E	D		A	C	A	F	B	A
Approach Delay		16.6			65.8			19.8			44.7	
Approach LOS		B			E			B			D	
Queue Length 50th (m)	2.4	0.0		32.6	12.3		0.8	461.4	2.5	~44.2	128.5	0.3
Queue Length 95th (m)	7.8	3.2		51.9	26.2		m0.1	m387.4	m0.0	m#77.5	195.4	m1.5
Internal Link Dist (m)		18.5			26.2			434.5			707.4	
Turn Bay Length (m)	15.0			15.0			15.0		15.0	15.0		15.0
Base Capacity (vph)	285	377		295	354		184	2831	1273	53	2831	1270
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.07		0.39	0.18		0.23	1.00	0.15	2.04	0.58	0.01

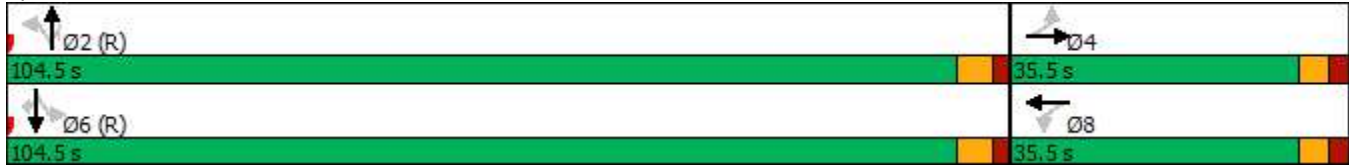
Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 2.04
 Intersection Signal Delay: 30.1
 Intersection LOS: C
 Intersection Capacity Utilization 104.0%
 ICU Level of Service G
 Analysis Period (min) 15

~ 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.

Splits and Phases: 2: Bronte Road & Saw Whet Boulevard



HCM Signalized Intersection Capacity Analysis
2: Bronte Road & Saw Whet Boulevard

2026 Future Background PM Peak Hour
1300 Bronte Enns



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↘		↗	↘		↗	↑↑	↗	↗	↑↑	↗
Traffic Volume (vph)	8	0	24	106	0	60	40	2599	177	99	1506	14
Future Volume (vph)	8	0	24	106	0	60	40	2599	177	99	1506	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.85		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		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1583		1770	3539	1583	1770	3539	1583
Flt Permitted	0.71	1.00		0.74	1.00		0.12	1.00	1.00	0.04	1.00	1.00
Satd. Flow (perm)	1331	1583		1379	1583		230	3539	1583	67	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	0	26	115	0	65	43	2825	192	108	1637	15
RTOR Reduction (vph)	0	23	0	0	17	0	0	0	7	0	0	3
Lane Group Flow (vph)	9	3	0	115	48	0	43	2825	185	108	1637	12
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2				6
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	17.0	17.0		17.0	17.0		112.0	112.0	112.0	112.0	112.0	112.0
Effective Green, g (s)	17.0	17.0		17.0	17.0		112.0	112.0	112.0	112.0	112.0	112.0
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.80	0.80	0.80	0.80	0.80	0.80
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5
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)	161	192		167	192		184	2831	1266	53	2831	1266
v/s Ratio Prot		0.00			0.03			0.80				0.46
v/s Ratio Perm	0.01			c0.08			0.19		0.12	c1.62		0.01
v/c Ratio	0.06	0.02		0.69	0.25		0.23	1.00	0.15	2.04	0.58	0.01
Uniform Delay, d1	54.4	54.1		59.0	55.7		3.4	13.9	3.2	14.0	5.2	2.8
Progression Factor	1.00	1.00		1.00	1.00		0.15	1.17	0.13	2.55	2.05	3.15
Incremental Delay, d2	0.1	0.0		11.2	0.7		0.3	4.6	0.0	513.1	0.7	0.0
Delay (s)	54.5	54.2		70.2	56.4		0.8	20.8	0.4	548.8	11.3	8.9
Level of Service	D	D		E	E		A	C	A	F	B	A
Approach Delay (s)		54.3			65.2			19.2			44.3	
Approach LOS		D			E			B			D	

Intersection Summary		
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	1.84	
Actuated Cycle Length (s)	140.0	Sum of lost time (s) 11.0
Intersection Capacity Utilization	104.0%	ICU Level of Service G
Analysis Period (min)	15	

c Critical Lane Group

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

2026 Future Background PM Peak Hour
1300 Bronte Enns



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↔		↖		↖	↖	↕↕	↖	↖	↕↔	
Traffic Volume (vph)	0	0	0	138	0	110	1	2766	175	89	1595	0
Future Volume (vph)	0	0	0	138	0	110	1	2766	175	89	1595	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		40.0	35.0		30.0	70.0		0.0
Storage Lanes	0		0	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			20.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor						0.98			0.98			
Frt						0.850			0.850			
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	1863	0	1770	0	1583	1770	3505	1388	1770	3471	0
Flt Permitted				0.757			0.133			0.040		
Satd. Flow (perm)	0	1863	0	1410	0	1557	248	3505	1356	75	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						89			56			
Link Speed (k/h)		20			20			60			60	
Link Distance (m)		78.7			109.0			218.2			458.5	
Travel Time (s)		14.2			19.6			13.1			27.5	
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	14%	2%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6
Adj. Flow (vph)	0	0	0	142	0	113	1	2852	180	92	1644	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	142	0	113	1	2852	180	92	1644	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1		1	1	2	1	1	2	
Detector Template	Left	Thru		Left		Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0		2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0		2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
 3: Bronte Road & Driveway/Charles Cornwall Road

2026 Future Background PM Peak Hour
 1300 Bronte Enns



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0						0.0				0.0
Turn Type				Perm		Perm	Perm	NA	Perm	pm+pt		NA
Protected Phases		4						2		1		6
Permitted Phases	4			8		8	2		2	6		
Detector Phase	4	4		8		8	2	2	2	1		6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0	15.0	15.0	15.0	5.0		15.0
Minimum Split (s)	24.2	24.2		35.2		35.2	34.9	34.9	34.9	9.5		34.9
Total Split (s)	40.6	40.6		40.6		40.6	88.2	88.2	88.2	11.2		99.4
Total Split (%)	29.0%	29.0%		29.0%		29.0%	63.0%	63.0%	63.0%	8.0%		71.0%
Maximum Green (s)	34.4	34.4		34.4		34.4	82.3	82.3	82.3	7.2		93.5
Yellow Time (s)	3.1	3.1		3.1		3.1	3.7	3.7	3.7	3.0		3.7
All-Red Time (s)	3.1	3.1		3.1		3.1	2.2	2.2	2.2	1.0		2.2
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)		6.2		6.2		6.2	5.9	5.9	5.9	4.0		5.9
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.6	3.6	3.6	3.0		3.6
Recall Mode	None	None		None		None	C-Max	C-Max	C-Max	None		C-Max
Walk Time (s)				7.0		7.0	7.0	7.0	7.0			7.0
Flash Dont Walk (s)				22.0		22.0	22.0	22.0	22.0			22.0
Pedestrian Calls (#/hr)				0		0	0	0	0			0
Act Effct Green (s)				19.4		19.4	95.7	95.7	95.7	110.4		108.5
Actuated g/C Ratio				0.14		0.14	0.68	0.68	0.68	0.79		0.78
v/c Ratio				0.73		0.39	0.01	1.19	0.19	0.56		0.61
Control Delay				77.9		18.8	10.0	113.5	7.1	39.1		9.0
Queue Delay				0.0		0.0	0.0	0.0	0.0	0.0		0.0
Total Delay				77.9		18.8	10.0	113.5	7.1	39.1		9.0
LOS				E		B	A	F	A	D		A
Approach Delay					51.7			107.2				10.6
Approach LOS					D			F				B
Queue Length 50th (m)				40.2		6.2	0.1	~523.6	11.4	14.3		50.8
Queue Length 95th (m)				61.0		23.7	0.9	#609.5	27.7	34.2		137.8
Internal Link Dist (m)		54.7			85.0			194.2				434.5
Turn Bay Length (m)						40.0	35.0		30.0	70.0		
Base Capacity (vph)				346		449	169	2396	944	169		2689
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				0.41		0.25	0.01	1.19	0.19	0.54		0.61

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 103.6 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.19

Intersection Signal Delay: 71.0 Intersection LOS: E
 Intersection Capacity Utilization 94.9% ICU Level of Service F
 Analysis Period (min) 15

- ~ 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.

Splits and Phases: 3: Bronte Road & Driveway/Charles Cornwall Road



HCM Signalized Intersection Capacity Analysis
 3: Bronte Road & Driveway/Charles Cornwall Road

























2026 Future Background PM Peak Hour
 1300 Bronte Enns



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↕		↙		↗	↙	↕	↗	↙	↕	↗		
Traffic Volume (vph)	0	0	0	138	0	110	1	2766	175	89	1595	0		
Future Volume (vph)	0	0	0	138	0	110	1	2766	175	89	1595	0		
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Total Lost time (s)				6.2		6.2	5.9	5.9	5.9	4.0	5.9			
Lane Util. Factor				1.00		1.00	1.00	0.95	1.00	1.00	0.95			
Frbp, ped/bikes				1.00		0.98	1.00	1.00	0.98	1.00	1.00			
Flpb, ped/bikes				1.00		1.00	1.00	1.00	1.00	1.00	1.00			
Frt				1.00		0.85	1.00	1.00	0.85	1.00	1.00			
Flt Protected				0.95		1.00	0.95	1.00	1.00	0.95	1.00			
Satd. Flow (prot)				1770		1552	1770	3505	1357	1770	3471			
Flt Permitted				0.76		1.00	0.13	1.00	1.00	0.04	1.00			
Satd. Flow (perm)				1410		1552	248	3505	1357	75	3471			
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97		
Adj. Flow (vph)	0	0	0	142	0	113	1	2852	180	92	1644	0		
RTOR Reduction (vph)	0	0	0	0	0	77	0	0	18	0	0	0		
Lane Group Flow (vph)	0	0	0	142	0	36	1	2852	162	92	1644	0		
Confl. Bikes (#/hr)			5			5			5			5		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	14%	2%	4%	2%		
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6		
Turn Type				Perm		Perm	Perm	NA	Perm	pm+pt	NA			
Protected Phases		4						2		1		6		
Permitted Phases	4			8		8	2		2	6				
Actuated Green, G (s)				19.4		19.4	95.7	95.7	95.7	108.5	108.5			
Effective Green, g (s)				19.4		19.4	95.7	95.7	95.7	108.5	108.5			
Actuated g/C Ratio				0.14		0.14	0.68	0.68	0.68	0.78	0.78			
Clearance Time (s)				6.2		6.2	5.9	5.9	5.9	4.0	5.9			
Vehicle Extension (s)				3.0		3.0	3.6	3.6	3.6	3.0	3.6			
Lane Grp Cap (vph)				195		215	169	2395	927	164	2690			
v/s Ratio Prot								c0.81		0.04	c0.47			
v/s Ratio Perm				c0.10		0.02	0.00		0.12	0.40				
v/c Ratio				0.73		0.17	0.01	1.19	0.18	0.56	0.61			
Uniform Delay, d1				57.8		53.2	7.0	22.1	8.0	42.6	6.7			
Progression Factor				1.00		1.00	1.00	1.00	1.00	1.31	1.08			
Incremental Delay, d2				12.7		0.4	0.1	90.3	0.4	3.6	0.9			
Delay (s)				70.5		53.6	7.1	112.5	8.4	59.5	8.2			
Level of Service				E		D	A	F	A	E	A			
Approach Delay (s)		0.0			63.0			106.3			10.9			
Approach LOS		A			E			F			B			
Intersection Summary														
HCM 2000 Control Delay			71.1									HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio			1.08											
Actuated Cycle Length (s)			140.0								16.1			
Intersection Capacity Utilization			94.9%										ICU Level of Service	F
Analysis Period (min)			15											
c Critical Lane Group														

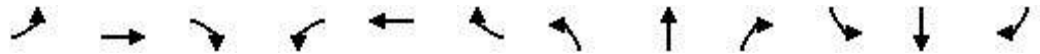
Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2026 Future Background PM Peak Hour Optimized
1300 Bronte Enns

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	74	114	250	155	252	295	1975	378	241	1236	17
Future Volume (vph)	7	74	114	250	155	252	295	1975	378	241	1236	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	70.0		70.0	140.0		0.0	135.0		80.0	180.0		50.0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (m)	65.0			100.0			70.0			70.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99		0.98			0.97			0.97			0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	3400	1863	1583	1770	3539	1558	1770	3471	1473
Flt Permitted	0.653			0.950			0.082			0.058		
Satd. Flow (perm)	1208	1863	1556	3400	1863	1543	153	3539	1517	108	3471	1434
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			121			233			197			118
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		296.6			291.2			731.4			120.4	
Travel Time (s)		17.8			17.5			43.9			7.2	
Confl. Peds. (#/hr)	6						6	1		1	1	1
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	4%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6
Adj. Flow (vph)	7	79	121	266	165	268	314	2101	402	256	1315	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	79	121	266	165	268	314	2101	402	256	1315	18
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.00	1.00	1.03
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2026 Future Background PM Peak Hour Optimized
1300 Bronte Enns



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	20.0	20.0	6.0	20.0	20.0
Minimum Split (s)	10.5	36.7	36.7	10.5	36.7	36.7	10.5	36.5	36.5	10.5	36.5	36.5
Total Split (s)	10.5	36.7	36.7	14.0	40.2	40.2	25.6	78.3	78.3	16.0	68.7	68.7
Total Split (%)	7.2%	25.3%	25.3%	9.7%	27.7%	27.7%	17.7%	54.0%	54.0%	11.0%	47.4%	47.4%
Maximum Green (s)	6.5	30.0	30.0	10.0	33.5	33.5	21.6	71.8	71.8	12.0	62.2	62.2
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	2.8	2.8	1.0	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					23.0	23.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)					6	6		1	1		1	1
Act Effct Green (s)	23.1	14.3	14.3	10.0	26.2	26.2	101.9	72.6	72.6	100.6	71.6	71.6
Actuated g/C Ratio	0.16	0.10	0.10	0.07	0.18	0.18	0.70	0.50	0.50	0.69	0.49	0.49
v/c Ratio	0.03	0.43	0.46	1.14	0.49	0.57	0.75	1.19	0.47	0.67	0.77	0.02
Control Delay	41.4	67.2	14.6	158.6	58.4	14.6	45.5	123.5	13.2	46.0	34.6	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	0.0
Total Delay	41.4	67.2	14.6	158.6	58.4	14.6	45.5	123.5	13.2	46.0	34.6	0.1
LOS	D	E	B	F	E	B	D	F	B	D	C	A
Approach Delay		35.6			79.7			99.1			36.0	
Approach LOS		D			E			F			D	
Queue Length 50th (m)	1.7	23.4	0.0	~48.0	45.7	9.0	61.2	~394.8	36.7	52.6	164.2	0.0
Queue Length 95th (m)	5.6	37.0	18.1	#78.4	67.7	36.8	#117.1	#446.3	66.2	#129.2	223.9	0.0
Internal Link Dist (m)		272.6			267.2			707.4			96.4	
Turn Bay Length (m)	70.0		70.0	140.0			135.0		80.0	180.0		50.0
Base Capacity (vph)	220	385	417	234	430	535	418	1771	857	383	1714	768
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	0.03	0.21	0.29	1.14	0.38	0.50	0.75	1.19	0.47	0.67	0.77	0.02

Intersection Summary

Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.19

Intersection Signal Delay: 75.2 Intersection LOS: E

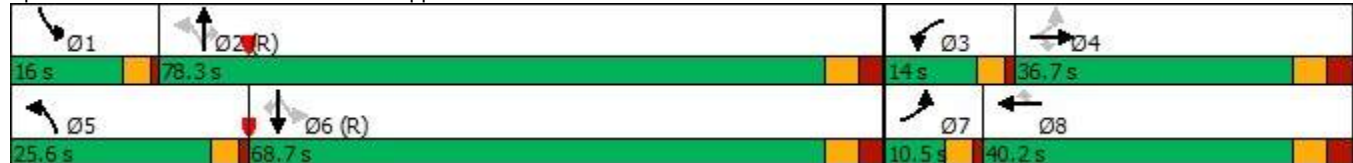
Intersection Capacity Utilization 98.1% ICU Level of Service F

Analysis Period (min) 15

~ 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.

Splits and Phases: 1: Bronte Road & Upper Middle Road



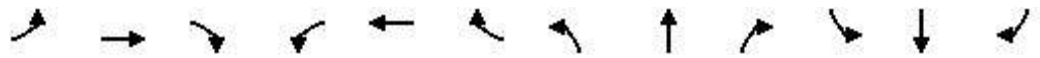
HCM Signalized Intersection Capacity Analysis 2026 Future Background PM Peak Hour Optimized
 1: Bronte Road & Upper Middle Road 1300 Bronte Enns

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	7	74	114	250	155	252	295	1975	378	241	1236	17	
Future Volume (vph)	7	74	114	250	155	252	295	1975	378	241	1236	17	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.97	
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	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1762	1863	1550	3400	1863	1541	1770	3539	1517	1770	3471	1434	
Flt Permitted	0.65	1.00	1.00	0.95	1.00	1.00	0.08	1.00	1.00	0.06	1.00	1.00	
Satd. Flow (perm)	1210	1863	1550	3400	1863	1541	152	3539	1517	109	3471	1434	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Adj. Flow (vph)	7	79	121	266	165	268	314	2101	402	256	1315	18	
RTOR Reduction (vph)	0	0	106	0	0	191	0	0	103	0	0	10	
Lane Group Flow (vph)	7	79	15	266	165	77	314	2101	299	256	1315	8	
Confl. Peds. (#/hr)	6						6	1		1		1	
Confl. Bikes (#/hr)			5			5			5			5	
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	4%	7%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases	4		4			8	2		2	6		6	
Actuated Green, G (s)	18.8	17.5	17.5	10.0	26.2	26.2	97.2	69.3	69.3	95.4	68.4	68.4	
Effective Green, g (s)	18.8	17.5	17.5	10.0	26.2	26.2	97.2	69.3	69.3	95.4	68.4	68.4	
Actuated g/C Ratio	0.13	0.12	0.12	0.07	0.18	0.18	0.67	0.48	0.48	0.66	0.47	0.47	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	161	224	187	234	336	278	413	1691	725	381	1637	676	
v/s Ratio Prot	0.00	0.04		c0.08	c0.09		c0.15	c0.59		0.13	0.38		
v/s Ratio Perm	0.01		0.01			0.05	0.36		0.20	0.32		0.01	
v/c Ratio	0.04	0.35	0.08	1.14	0.49	0.28	0.76	1.24	0.41	0.67	0.80	0.01	
Uniform Delay, d1	55.1	58.5	56.6	67.5	53.4	51.2	38.3	37.9	24.6	42.3	32.6	20.4	
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	0.1	1.0	0.2	100.6	1.1	0.5	8.0	114.3	1.7	4.6	4.3	0.0	
Delay (s)	55.2	59.5	56.8	168.1	54.5	51.8	46.3	152.2	26.3	46.9	36.9	20.4	
Level of Service	E	E	E	F	D	D	D	F	C	D	D	C	
Approach Delay (s)		57.8			96.7			122.4			38.3		
Approach LOS		E			F			F			D		
Intersection Summary													
HCM 2000 Control Delay			91.3		HCM 2000 Level of Service					F			
HCM 2000 Volume to Capacity ratio			1.04										
Actuated Cycle Length (s)			145.0	Sum of lost time (s)						21.2			
Intersection Capacity Utilization			98.1%	ICU Level of Service					F				
Analysis Period (min)			15										

c Critical Lane Group

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

2026 Future Background PM Peak Hour Optimized
1300 Bronte Enns



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	24	106	0	60	40	2599	177	99	1506	14
Future Volume (vph)	8	0	24	106	0	60	40	2599	177	99	1506	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	15.0		0.0	15.0		15.0	15.0		15.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1583	0	1770	1583	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.715			0.423			0.146			0.037		
Satd. Flow (perm)	1332	1583	0	788	1583	0	272	3539	1583	69	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		84			59				84			51
Link Speed (k/h)		50			50			60				60
Link Distance (m)		42.5			50.2			458.5				731.4
Travel Time (s)		3.1			3.6			27.5				43.9
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
Adj. Flow (vph)	9	0	26	115	0	65	43	2825	192	108	1637	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	26	0	115	65	0	43	2825	192	108	1637	15
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8			2		1		6
Permitted Phases	4			8			2		2	6		6

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

2026 Future Background PM Peak Hour Optimized
1300 Bronte Enns



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8		2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		15.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	35.5	35.5		9.5	35.5		35.5	35.5	35.5	9.5	35.5	35.5
Total Split (s)	35.5	35.5		9.5	45.0		95.5	95.5	95.5	9.5	105.0	105.0
Total Split (%)	23.7%	23.7%		6.3%	30.0%		63.7%	63.7%	63.7%	6.3%	70.0%	70.0%
Maximum Green (s)	30.0	30.0		5.0	39.5		90.0	90.0	90.0	5.0	99.5	99.5
Yellow Time (s)	3.3	3.3		3.5	3.3		3.7	3.7	3.7	3.5	3.7	3.7
All-Red Time (s)	2.2	2.2		1.0	2.2		1.8	1.8	1.8	1.0	1.8	1.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		4.5	5.5		5.5	5.5	5.5	4.5	5.5	5.5
Lead/Lag	Lag	Lag		Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0			7.0		7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	23.0	23.0			23.0		23.0	23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0		0	0
Act Effct Green (s)	10.0	10.0		16.7	15.7		105.9	105.9	105.9	124.3	123.3	123.3
Actuated g/C Ratio	0.07	0.07		0.11	0.10		0.71	0.71	0.71	0.83	0.82	0.82
v/c Ratio	0.10	0.14		0.85	0.30		0.23	1.13	0.17	0.53	0.56	0.01
Control Delay	68.8	1.6		108.0	19.6		12.8	88.0	5.0	37.8	5.7	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.8	1.6		108.0	19.6		12.8	88.0	5.0	37.8	5.7	0.0
LOS	E	A		F	B		B	F	A	D	A	A
Approach Delay		18.9			76.1			81.7			7.6	
Approach LOS		B			E			F			A	
Queue Length 50th (m)	2.7	0.0		33.7	1.7		4.7	~552.4	10.7	16.0	87.4	0.0
Queue Length 95th (m)	9.1	0.0		#69.7	16.7		12.4	#598.5	21.3	37.0	101.3	0.0
Internal Link Dist (m)		18.5			26.2			434.5			707.4	
Turn Bay Length (m)	15.0			15.0			15.0		15.0	15.0		15.0
Base Capacity (vph)	266	383		136	460		191	2497	1142	203	2909	1310
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.07		0.85	0.14		0.23	1.13	0.17	0.53	0.56	0.01

Intersection Summary

Area Type:	Other
Cycle Length:	150
Actuated Cycle Length:	150
Offset:	0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	150
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.13
Intersection Signal Delay:	55.2
Intersection LOS:	E
Intersection Capacity Utilization:	102.8%
ICU Level of Service:	G
Analysis Period (min):	15

~ 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.

Splits and Phases: 2: Bronte Road & Saw Whet Boulevard



HCM Signalized Intersection Capacity Analysis 2026 Future Background PM Peak Hour Optimized
 2: Bronte Road & Saw Whet Boulevard 1300 Bronte Enns



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑	↗	↖	↑↑	↗
Traffic Volume (vph)	8	0	24	106	0	60	40	2599	177	99	1506	14
Future Volume (vph)	8	0	24	106	0	60	40	2599	177	99	1506	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		4.5	5.5		5.5	5.5	5.5	4.5	5.5	5.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.85		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		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1583		1770	3539	1583	1770	3539	1583
Flt Permitted	0.71	1.00		0.42	1.00		0.15	1.00	1.00	0.04	1.00	1.00
Satd. Flow (perm)	1331	1583		788	1583		271	3539	1583	69	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	0	26	115	0	65	43	2825	192	108	1637	15
RTOR Reduction (vph)	0	25	0	0	52	0	0	0	26	0	0	3
Lane Group Flow (vph)	9	1	0	115	13	0	43	2825	166	108	1637	12
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	6.0	6.0		17.9	17.9		103.7	103.7	103.7	121.1	121.1	121.1
Effective Green, g (s)	6.0	6.0		17.9	17.9		103.7	103.7	103.7	121.1	121.1	121.1
Actuated g/C Ratio	0.04	0.04		0.12	0.12		0.69	0.69	0.69	0.81	0.81	0.81
Clearance Time (s)	5.5	5.5		4.5	5.5		5.5	5.5	5.5	4.5	5.5	5.5
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)	53	63		142	188		187	2446	1094	201	2857	1278
v/s Ratio Prot		0.00		c0.04	0.01			c0.80		0.05	c0.46	
v/s Ratio Perm	0.01			c0.06			0.16		0.10	0.39		0.01
v/c Ratio	0.17	0.02		0.81	0.07		0.23	1.15	0.15	0.54	0.57	0.01
Uniform Delay, d1	69.6	69.2		63.2	58.7		8.5	23.1	8.0	49.4	5.2	2.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	0.1		27.7	0.2		2.9	74.8	0.3	2.8	0.8	0.0
Delay (s)	71.1	69.3		90.9	58.8		11.3	98.0	8.3	52.2	6.0	2.8
Level of Service	E	E		F	E		B	F	A	D	A	A
Approach Delay (s)		69.7			79.3			91.1			8.8	
Approach LOS		E			E			F			A	

Intersection Summary		
HCM 2000 Control Delay	61.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.09	E
Actuated Cycle Length (s)	150.0	Sum of lost time (s)
Intersection Capacity Utilization	102.8%	20.0
Analysis Period (min)	15	ICU Level of Service
		G

























c Critical Lane Group

Appendix J

2026 Future Total Conditions Synchro Worksheets

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2026 Future Total AM Peak Hour
1354 Bronte

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	203	390	526	88	196	66	981	257	263	2125	13
Future Volume (vph)	11	203	390	526	88	196	66	981	257	263	2125	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	70.0		70.0	140.0		0.0	135.0		80.0	180.0		50.0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (m)	65.0			100.0			70.0			70.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99		0.98			0.97			0.96			0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1863	1583	3433	1792	1553	1719	3343	1485	1770	3406	1336
Flt Permitted	0.698			0.950			0.068			0.132		
Satd. Flow (perm)	1200	1863	1556	3433	1792	1504	123	3343	1424	246	3406	1288
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			147			202			224			118
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		296.6			291.2			731.4			120.4	
Travel Time (s)		17.8			17.5			43.9			7.2	
Confl. Peds. (#/hr)	11					11	5		7	7		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	9%	2%	2%	2%	6%	4%	5%	8%	7%	2%	6%	18%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6
Adj. Flow (vph)	11	209	402	542	91	202	68	1011	265	271	2191	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	209	402	542	91	202	68	1011	265	271	2191	13
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.00	1.00	1.03
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2026 Future Total AM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	20.0	20.0	6.0	20.0	20.0
Minimum Split (s)	10.5	36.7	36.7	10.5	36.7	36.7	10.5	36.5	36.5	10.5	36.5	36.5
Total Split (s)	10.5	36.7	36.7	21.0	47.2	47.2	10.5	63.3	63.3	24.0	76.8	76.8
Total Split (%)	7.2%	25.3%	25.3%	14.5%	32.6%	32.6%	7.2%	43.7%	43.7%	16.6%	53.0%	53.0%
Maximum Green (s)	6.5	30.0	30.0	17.0	40.5	40.5	6.5	56.8	56.8	20.0	70.3	70.3
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	2.8	2.8	1.0	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					23.0	23.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)					11	11		7	7		5	5
Act Effct Green (s)	37.2	28.3	28.3	17.0	45.1	45.1	70.2	61.2	61.2	85.0	74.0	74.0
Actuated g/C Ratio	0.26	0.20	0.20	0.12	0.31	0.31	0.48	0.42	0.42	0.59	0.51	0.51
v/c Ratio	0.03	0.58	0.95	1.35	0.16	0.33	0.52	0.72	0.36	0.83	1.26	0.02
Control Delay	30.1	59.3	69.6	219.1	38.1	6.5	34.9	39.2	7.4	44.6	154.0	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	0.0
Total Delay	30.1	59.3	69.6	219.1	38.1	6.5	34.9	39.2	7.4	44.6	154.0	0.1
LOS	C	E	E	F	D	A	C	D	A	D	F	A
Approach Delay		65.4			148.0			32.7			141.3	
Approach LOS		E			F			C			F	
Queue Length 50th (m)	2.1	57.0	80.7	~110.1	18.8	0.0	8.8	137.9	7.6	43.8	~450.4	0.0
Queue Length 95th (m)	6.6	84.6	#144.7	#148.2	36.4	19.5	20.8	167.4	28.7	#84.1	#492.3	0.0
Internal Link Dist (m)		272.6			267.2			707.4			96.4	
Turn Bay Length (m)	70.0		70.0	140.0			135.0		80.0	180.0		50.0
Base Capacity (vph)	330	385	438	402	557	607	132	1411	730	354	1738	715
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	0.03	0.54	0.92	1.35	0.16	0.33	0.52	0.72	0.36	0.77	1.26	0.02

Intersection Summary

Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
 1: Bronte Road & Upper Middle Road

2026 Future Total AM Peak Hour
 1354 Bronte

Maximum v/c Ratio: 1.35

Intersection Signal Delay: 105.7 Intersection LOS: F

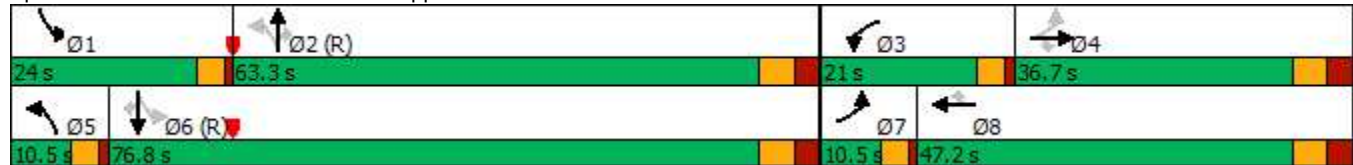
Intersection Capacity Utilization 112.2% ICU Level of Service H

Analysis Period (min) 15

~ 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.

Splits and Phases: 1: Bronte Road & Upper Middle Road



HCM Signalized Intersection Capacity Analysis
 1: Bronte Road & Upper Middle Road

2026 Future Total AM Peak Hour
 1354 Bronte

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	203	390	526	88	196	66	981	257	263	2125	13
Future Volume (vph)	11	203	390	526	88	196	66	981	257	263	2125	13
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.96	1.00	1.00	0.96
Flpb, ped/bikes	0.99	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	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1640	1863	1556	3433	1792	1505	1719	3343	1424	1770	3406	1288
Flt Permitted	0.70	1.00	1.00	0.95	1.00	1.00	0.07	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	1205	1863	1556	3433	1792	1505	123	3343	1424	246	3406	1288
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)	11	209	402	542	91	202	68	1011	265	271	2191	13
RTOR Reduction (vph)	0	0	116	0	0	139	0	0	133	0	0	7
Lane Group Flow (vph)	11	209	286	542	91	63	68	1011	132	271	2191	6
Confl. Peds. (#/hr)	11						11	5		7	7	5
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	9%	2%	2%	2%	6%	4%	5%	8%	7%	2%	6%	18%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Actuated Green, G (s)	33.3	30.7	30.7	17.0	45.1	45.1	64.2	58.9	58.9	80.1	70.8	70.8
Effective Green, g (s)	33.3	30.7	30.7	17.0	45.1	45.1	64.2	58.9	58.9	80.1	70.8	70.8
Actuated g/C Ratio	0.23	0.21	0.21	0.12	0.31	0.31	0.44	0.41	0.41	0.55	0.49	0.49
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	284	394	329	402	557	468	112	1357	578	316	1663	628
v/s Ratio Prot	0.00	0.11		c0.16	0.05		0.02	0.30		c0.10	c0.64	
v/s Ratio Perm	0.01		c0.18			0.04	0.25		0.09	0.37		0.00
v/c Ratio	0.04	0.53	0.87	1.35	0.16	0.13	0.61	0.75	0.23	0.86	1.32	0.01
Uniform Delay, d1	43.3	50.7	55.2	64.0	36.3	35.9	34.2	36.7	28.2	28.2	37.1	19.1
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	0.1	1.4	20.9	172.5	0.1	0.1	9.0	3.8	0.9	19.9	147.2	0.0
Delay (s)	43.4	52.1	76.1	236.5	36.4	36.0	43.2	40.4	29.1	48.1	184.3	19.1
Level of Service	D	D	E	F	D	D	D	D	C	D	F	B
Approach Delay (s)		67.5			166.2			38.3			168.5	
Approach LOS		E			F			D			F	
Intersection Summary												
HCM 2000 Control Delay			123.1					HCM 2000 Level of Service		F		
HCM 2000 Volume to Capacity ratio			1.20									
Actuated Cycle Length (s)			145.0					Sum of lost time (s)		21.2		
Intersection Capacity Utilization			112.2%					ICU Level of Service		H		
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

2026 Future Total AM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	0	39	172	0	95	12	1193	54	30	3061	4
Future Volume (vph)	14	0	39	172	0	95	12	1193	54	30	3061	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	15.0		0.0	15.0		15.0	15.0		15.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1583	0	1770	1583	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.645			0.730			0.038			0.181		
Satd. Flow (perm)	1201	1583	0	1360	1583	0	71	3539	1583	337	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			96				22			19
Link Speed (k/h)		50			50			60				60
Link Distance (m)		42.5			50.2			458.5				731.4
Travel Time (s)		3.1			3.6			27.5				43.9
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
Adj. Flow (vph)	15	0	42	187	0	103	13	1297	59	33	3327	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	15	42	0	187	103	0	13	1297	59	33	3327	4
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

2026 Future Total AM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	35.5	35.5		35.5	35.5		35.5	35.5	35.5	35.5	35.5	35.5
Total Split (s)	35.5	35.5		35.5	35.5		104.5	104.5	104.5	104.5	104.5	104.5
Total Split (%)	25.4%	25.4%		25.4%	25.4%		74.6%	74.6%	74.6%	74.6%	74.6%	74.6%
Maximum Green (s)	30.0	30.0		30.0	30.0		99.0	99.0	99.0	99.0	99.0	99.0
Yellow Time (s)	3.3	3.3		3.3	3.3		3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.2	2.2		2.2	2.2		1.8	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0		23.0	23.0		23.0	23.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	23.7	23.7		23.7	23.7		105.3	105.3	105.3	105.3	105.3	105.3
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.75	0.75	0.75	0.75	0.75	0.75
v/c Ratio	0.07	0.15		0.81	0.30		0.25	0.49	0.05	0.13	1.25	0.00
Control Delay	46.7	30.6		81.2	12.3		25.4	10.3	6.1	7.4	136.5	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.7	30.6		81.2	12.3		25.4	10.3	6.1	7.4	136.5	0.0
LOS	D	C		F	B		C	B	A	A	F	A
Approach Delay		34.8			56.7			10.3			135.1	
Approach LOS		C			E			B			F	
Queue Length 50th (m)	3.7	5.7		52.8	1.7		1.0	70.5	2.5	2.4	~638.0	0.0
Queue Length 95th (m)	10.1	16.2		78.2	17.7		m3.9	126.9	m11.1	7.3	#692.4	0.0
Internal Link Dist (m)		18.5			26.2			434.5			707.4	
Turn Bay Length (m)	15.0			15.0			15.0		15.0	15.0		15.0
Base Capacity (vph)	257	354		291	414		53	2661	1195	253	2661	1195
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.12		0.64	0.25		0.25	0.49	0.05	0.13	1.25	0.00

Intersection Summary

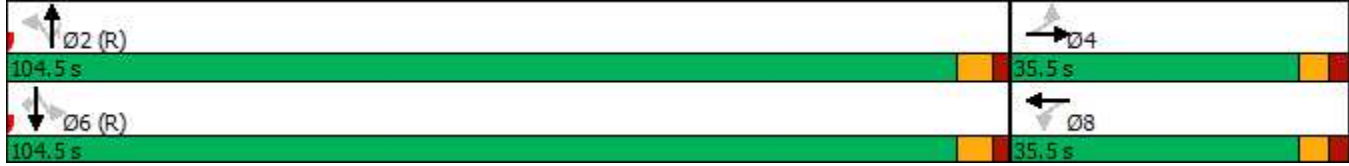
Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 85 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.25
 Intersection Signal Delay: 95.9
 Intersection Capacity Utilization 110.0%
 Analysis Period (min) 15

Intersection LOS: F
 ICU Level of Service H

~ 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.

Splits and Phases: 2: Bronte Road & Saw Whet Boulevard



HCM Signalized Intersection Capacity Analysis
2: Bronte Road & Saw Whet Boulevard

2026 Future Total AM Peak Hour
1354 Bronte

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	0	39	172	0	95	12	1193	54	30	3061	4
Future Volume (vph)	14	0	39	172	0	95	12	1193	54	30	3061	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.85		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		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1583		1770	3539	1583	1770	3539	1583
Flt Permitted	0.65	1.00		0.73	1.00		0.04	1.00	1.00	0.18	1.00	1.00
Satd. Flow (perm)	1202	1583		1359	1583		71	3539	1583	337	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	0	42	187	0	103	13	1297	59	33	3327	4
RTOR Reduction (vph)	0	16	0	0	80	0	0	0	5	0	0	1
Lane Group Flow (vph)	15	26	0	187	23	0	13	1297	54	33	3327	3
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	23.7	23.7		23.7	23.7		105.3	105.3	105.3	105.3	105.3	105.3
Effective Green, g (s)	23.7	23.7		23.7	23.7		105.3	105.3	105.3	105.3	105.3	105.3
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.75	0.75	0.75	0.75	0.75	0.75
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5
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)	203	267		230	267		53	2661	1190	253	2661	1190
v/s Ratio Prot		0.02			0.01			0.37			c0.94	
v/s Ratio Perm	0.01			c0.14			0.18		0.03	0.10		0.00
v/c Ratio	0.07	0.10		0.81	0.09		0.25	0.49	0.04	0.13	1.25	0.00
Uniform Delay, d1	48.9	49.1		56.0	49.0		5.3	6.8	4.5	4.8	17.4	4.3
Progression Factor	1.00	1.00		1.00	1.00		1.73	1.32	1.62	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2		19.3	0.1		9.1	0.5	0.1	1.1	115.9	0.0
Delay (s)	49.1	49.3		75.3	49.2		18.3	9.5	7.3	5.8	133.3	4.3
Level of Service	D	D		E	D		B	A	A	A	F	A
Approach Delay (s)		49.2			66.0			9.5			131.9	
Approach LOS		D			E			A			F	
Intersection Summary												
HCM 2000 Control Delay			94.2									F
HCM 2000 Volume to Capacity ratio			1.17									
Actuated Cycle Length (s)			140.0								11.0	
Intersection Capacity Utilization			110.0%									H
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

2026 Future Total AM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖		↗	↖	↗	↗	↖	↕	↗
Traffic Volume (vph)	1	0	1	161	0	65	0	1241	78	149	3151	0
Future Volume (vph)	1	0	1	161	0	65	0	1241	78	149	3151	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		40.0	35.0		30.0	70.0		0.0
Storage Lanes	0		0	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			20.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor		0.99				0.98			0.98			
Frt		0.932				0.850			0.850			
Flt Protected		0.976		0.950						0.950		
Satd. Flow (prot)	0	1680	0	1530	0	1392	1863	3406	1439	1770	3471	0
Flt Permitted		0.976		0.757						0.156		
Satd. Flow (perm)	0	1680	0	1219	0	1368	1863	3406	1406	291	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		54				67			56			
Link Speed (k/h)		20			20			60			60	
Link Distance (m)		78.7			109.0			218.2			458.5	
Travel Time (s)		14.2			19.6			13.1			27.5	
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	18%	2%	16%	2%	6%	10%	2%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6
Adj. Flow (vph)	1	0	1	166	0	67	0	1279	80	154	3248	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2	0	166	0	67	0	1279	80	154	3248	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1		1	1	2	1	1		2
Detector Template	Left	Thru		Left		Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0		2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0		2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

2026 Future Total AM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	4	4		8		8	2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0	15.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	24.2	24.2		35.2		35.2	34.9	34.9	34.9	9.5	34.9	
Total Split (s)	35.2	35.2		35.2		35.2	88.2	88.2	88.2	16.6	104.8	
Total Split (%)	25.1%	25.1%		25.1%		25.1%	63.0%	63.0%	63.0%	11.9%	74.9%	
Maximum Green (s)	29.0	29.0		29.0		29.0	82.3	82.3	82.3	12.6	98.9	
Yellow Time (s)	3.1	3.1		3.1		3.1	3.7	3.7	3.7	3.0	3.7	
All-Red Time (s)	3.1	3.1		3.1		3.1	2.2	2.2	2.2	1.0	2.2	
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.2		6.2		6.2	5.9	5.9	5.9	4.0	5.9	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.6	3.6	3.6	3.0	3.6	
Recall Mode	None	None		None		None	C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)				7.0		7.0	7.0	7.0	7.0		7.0	
Flash Dont Walk (s)				22.0		22.0	22.0	22.0	22.0		22.0	
Pedestrian Calls (#/hr)				0		0	0	0	0		0	
Act Effct Green (s)		23.3		23.3		23.3		91.8	91.8	106.5	104.6	
Actuated g/C Ratio		0.17		0.17		0.17		0.66	0.66	0.76	0.75	
v/c Ratio		0.01		0.82		0.24		0.57	0.09	0.49	1.25	
Control Delay		0.0		85.8		12.2		15.6	4.5	3.1	126.4	
Queue Delay		0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Total Delay		0.0		85.8		12.2		15.6	4.5	3.1	126.4	
LOS		A		F		B		B	A	A	F	
Approach Delay					64.6			14.9			120.9	
Approach LOS					E			B			F	
Queue Length 50th (m)		0.0		46.9		0.0		103.0	2.3	2.9	~624.4	
Queue Length 95th (m)		0.0		71.9		13.4		144.1	10.1	m2.6 m#	449.2	
Internal Link Dist (m)		54.7			85.0			194.2			434.5	
Turn Bay Length (m)						40.0			30.0	70.0		
Base Capacity (vph)		390		252		336		2232	940	354	2594	
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		0.01		0.66		0.20		0.57	0.09	0.44	1.25	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 128.8 (92%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.25

Lanes, Volumes, Timings
 3: Bronte Road & Driveway/Charles Cornwall Road

2026 Future Total AM Peak Hour
 1354 Bronte

Intersection Signal Delay: 89.4 Intersection LOS: F

Intersection Capacity Utilization 128.4% ICU Level of Service H

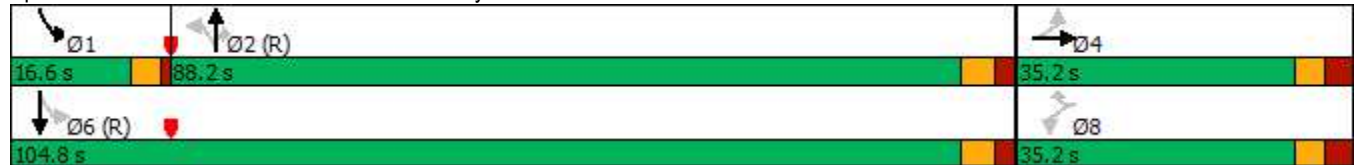
Analysis Period (min) 15

~ 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.

Splits and Phases: 3: Bronte Road & Driveway/Charles Cornwall Road



HCM Signalized Intersection Capacity Analysis
3: Bronte Road & Driveway/Charles Cornwall Road

2026 Future Total AM Peak Hour
1354 Bronte



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↗		↗	↗	↕	↗	↗	↕	↕
Traffic Volume (vph)	1	0	1	161	0	65	0	1241	78	149	3151	0
Future Volume (vph)	1	0	1	161	0	65	0	1241	78	149	3151	0
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2		6.2		6.2		5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		1.00		1.00		0.95	1.00	1.00	0.95	
Frbp, ped/bikes		0.99		1.00		0.98		1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00		1.00		1.00		1.00	1.00	1.00	1.00	
Frt		0.93		1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected		0.98		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1679		1530		1366		3406	1406	1770	3471	
Flt Permitted		0.98		0.76		1.00		1.00	1.00	0.16	1.00	
Satd. Flow (perm)		1679		1218		1366		3406	1406	290	3471	
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)	1	0	1	166	0	67	0	1279	80	154	3248	0
RTOR Reduction (vph)	0	2	0	0	0	56	0	0	19	0	0	0
Lane Group Flow (vph)	0	0	0	166	0	11	0	1279	61	154	3248	0
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	2%	2%	18%	2%	16%	2%	6%	10%	2%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		23.3		23.3		23.3		91.7	91.7	104.6	104.6	
Effective Green, g (s)		23.3		23.3		23.3		91.7	91.7	104.6	104.6	
Actuated g/C Ratio		0.17		0.17		0.17		0.66	0.66	0.75	0.75	
Clearance Time (s)		6.2		6.2		6.2		5.9	5.9	4.0	5.9	
Vehicle Extension (s)		3.0		3.0		3.0		3.6	3.6	3.0	3.6	
Lane Grp Cap (vph)		279		202		227		2230	920	310	2593	
v/s Ratio Prot								0.38		0.03	c0.94	
v/s Ratio Perm		0.00		c0.14		0.01			0.04	0.34		
v/c Ratio		0.00		0.82		0.05		0.57	0.07	0.50	1.25	
Uniform Delay, d1		48.6		56.3		49.0		13.3	8.7	9.1	17.7	
Progression Factor		1.00		1.00		1.00		1.00	1.00	0.52	0.27	
Incremental Delay, d2		0.0		22.8		0.1		1.1	0.1	0.1	114.0	
Delay (s)		48.7		79.1		49.1		14.4	8.8	4.8	118.8	
Level of Service		D		E		D		B	A	A	F	
Approach Delay (s)		48.7			70.5			14.1			113.6	
Approach LOS		D			E			B			F	
Intersection Summary												
HCM 2000 Control Delay			84.5									F
HCM 2000 Volume to Capacity ratio			1.21									
Actuated Cycle Length (s)			140.0							16.1		
Intersection Capacity Utilization			128.4%									H
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2026 Future Total PM Peak Hour
1354 Bronte

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	74	114	255	155	252	295	1976	381	241	1237	17
Future Volume (vph)	7	74	114	255	155	252	295	1976	381	241	1237	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	70.0		70.0	140.0		0.0	135.0		80.0	180.0		50.0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (m)	65.0			100.0			70.0			70.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99		0.98			0.97			0.97			0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	3400	1863	1583	1770	3539	1558	1770	3471	1473
Flt Permitted	0.653			0.950			0.112			0.054		
Satd. Flow (perm)	1208	1863	1550	3400	1863	1542	209	3539	1518	101	3471	1435
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			121			185			232			122
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		296.6			291.2			731.4			120.4	
Travel Time (s)		17.8			17.5			43.9			7.2	
Confl. Peds. (#/hr)	6						6	1		1	1	1
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	4%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6
Adj. Flow (vph)	7	79	121	271	165	268	314	2102	405	256	1316	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	79	121	271	165	268	314	2102	405	256	1316	18
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.00	1.00	1.03
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2026 Future Total PM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	20.0	20.0	6.0	20.0	20.0
Minimum Split (s)	10.5	36.7	36.7	10.5	36.7	36.7	10.5	36.5	36.5	10.5	36.5	36.5
Total Split (s)	11.2	23.8	23.8	19.6	32.2	32.2	12.6	84.0	84.0	12.6	84.0	84.0
Total Split (%)	8.0%	17.0%	17.0%	14.0%	23.0%	23.0%	9.0%	60.0%	60.0%	9.0%	60.0%	60.0%
Maximum Green (s)	7.2	17.1	17.1	15.6	25.5	25.5	8.6	77.5	77.5	8.6	77.5	77.5
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	2.8	2.8	1.0	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)				7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)				23.0	23.0			23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)				6	6			1	1		1	1
Act Effct Green (s)	21.2	12.3	12.3	14.7	28.8	28.8	94.3	77.5	77.5	94.3	77.5	77.5
Actuated g/C Ratio	0.15	0.09	0.09	0.10	0.21	0.21	0.67	0.55	0.55	0.67	0.55	0.55
v/c Ratio	0.03	0.48	0.49	0.76	0.43	0.58	1.05	1.07	0.43	1.08	0.69	0.02
Control Delay	39.0	70.3	16.5	75.2	52.5	21.2	70.3	54.2	4.2	118.2	24.8	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	0.0
Total Delay	39.0	70.3	16.5	75.2	52.5	21.2	70.3	54.2	4.2	118.2	24.8	0.1
LOS	D	E	B	E	D	C	E	D	A	F	C	A
Approach Delay		37.8			49.3			48.8			39.6	
Approach LOS		D			D			D			D	
Queue Length 50th (m)	1.6	22.5	0.0	39.9	41.5	20.1	~64.3	~353.6	15.2	~64.5	140.1	0.0
Queue Length 95th (m)	5.6	38.7	19.3	55.8	67.8	53.5	m#62.7	m120.8	m13.1	#145.0	166.0	0.0
Internal Link Dist (m)		272.6			267.2			707.4			96.4	
Turn Bay Length (m)	70.0		70.0	140.0			135.0		80.0	180.0		50.0
Base Capacity (vph)	220	227	295	378	383	464	300	1959	943	238	1921	848
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	0.03	0.35	0.41	0.72	0.43	0.58	1.05	1.07	0.43	1.08	0.69	0.02

Intersection Summary

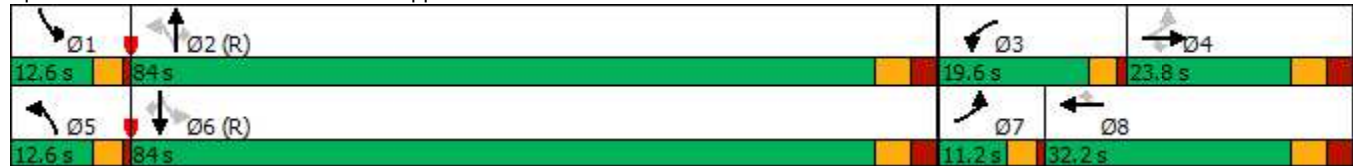
Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 35 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
 1: Bronte Road & Upper Middle Road

2026 Future Total PM Peak Hour
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






















Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 45.7	Intersection LOS: D
Intersection Capacity Utilization 98.3%	ICU Level of Service F
Analysis Period (min) 15	
~ 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.	

Splits and Phases: 1: Bronte Road & Upper Middle Road



HCM Signalized Intersection Capacity Analysis
1: Bronte Road & Upper Middle Road

2026 Future Total PM Peak Hour
1354 Bronte

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	7	74	114	255	155	252	295	1976	381	241	1237	17	
Future Volume (vph)	7	74	114	255	155	252	295	1976	381	241	1237	17	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.97	
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	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1762	1863	1548	3400	1863	1543	1770	3539	1518	1770	3471	1435	
Flt Permitted	0.65	1.00	1.00	0.95	1.00	1.00	0.11	1.00	1.00	0.05	1.00	1.00	
Satd. Flow (perm)	1211	1863	1548	3400	1863	1543	208	3539	1518	100	3471	1435	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Adj. Flow (vph)	7	79	121	271	165	268	314	2102	405	256	1316	18	
RTOR Reduction (vph)	0	0	108	0	0	147	0	0	109	0	0	8	
Lane Group Flow (vph)	7	79	13	271	165	121	314	2102	296	256	1316	10	
Confl. Peds. (#/hr)	6					6	1		1	1		1	
Confl. Bikes (#/hr)			5			5			5			5	
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	4%	7%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases	4		4			8	2		2	6		6	
Actuated Green, G (s)	16.9	15.5	15.5	14.7	28.8	28.8	88.6	74.3	74.3	88.6	74.3	74.3	
Effective Green, g (s)	16.9	15.5	15.5	14.7	28.8	28.8	88.6	74.3	74.3	88.6	74.3	74.3	
Actuated g/C Ratio	0.12	0.11	0.11	0.10	0.21	0.21	0.63	0.53	0.53	0.63	0.53	0.53	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	151	206	171	357	383	317	291	1878	805	233	1842	761	
v/s Ratio Prot	0.00	0.04		c0.08	c0.09		0.11	c0.59		c0.11	0.38		
v/s Ratio Perm	0.01		0.01			0.08	0.57		0.20	0.58		0.01	
v/c Ratio	0.05	0.38	0.08	0.76	0.43	0.38	1.08	1.12	0.37	1.10	0.71	0.01	
Uniform Delay, d1	54.3	57.8	55.8	60.9	48.5	47.9	33.1	32.9	19.2	49.0	24.8	15.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.87	0.59	0.56	1.00	1.00	1.00	
Incremental Delay, d2	0.1	1.2	0.2	9.0	0.8	0.8	42.0	54.5	0.1	87.9	2.4	0.0	
Delay (s)	54.5	59.0	56.0	69.9	49.2	48.7	103.8	73.9	10.9	136.9	27.2	15.5	
Level of Service	D	E	E	E	D	D	F	E	B	F	C	B	
Approach Delay (s)		57.1			57.0			68.2			44.8		
Approach LOS		E			E			E			D		
Intersection Summary													
HCM 2000 Control Delay			59.3		HCM 2000 Level of Service				E				
HCM 2000 Volume to Capacity ratio			0.99										
Actuated Cycle Length (s)			140.0		Sum of lost time (s)				21.2				
Intersection Capacity Utilization			98.3%		ICU Level of Service				F				
Analysis Period (min)			15										

c Critical Lane Group

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

2026 Future Total PM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	0	34	106	0	60	56	2599	177	99	1506	20
Future Volume (vph)	12	0	34	106	0	60	56	2599	177	99	1506	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	15.0		0.0	15.0		15.0	15.0		15.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1583	0	1770	1583	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.715			0.733			0.143			0.039		
Satd. Flow (perm)	1332	1583	0	1365	1583	0	266	3539	1583	73	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		55			60				55			19
Link Speed (k/h)		50			50			60				60
Link Distance (m)		42.5			50.2			458.5				731.4
Travel Time (s)		3.1			3.6			27.5				43.9
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
Adj. Flow (vph)	13	0	37	115	0	65	61	2825	192	108	1637	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	37	0	115	65	0	61	2825	192	108	1637	22
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1		6
Permitted Phases	4			8			2		2	6		6

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

2026 Future Total PM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	35.5	35.5		35.5	35.5		35.5	35.5	35.5	9.5	35.5	35.5
Total Split (s)	35.5	35.5		35.5	35.5		95.0	95.0	95.0	9.5	104.5	104.5
Total Split (%)	25.4%	25.4%		25.4%	25.4%		67.9%	67.9%	67.9%	6.8%	74.6%	74.6%
Maximum Green (s)	30.0	30.0		30.0	30.0		89.5	89.5	89.5	5.0	99.0	99.0
Yellow Time (s)	3.3	3.3		3.3	3.3		3.7	3.7	3.7	3.5	3.7	3.7
All-Red Time (s)	2.2	2.2		2.2	2.2		1.8	1.8	1.8	1.0	1.8	1.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	4.5	5.5	5.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	23.0	23.0		23.0	23.0		23.0	23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0		0	0
Act Effct Green (s)	17.1	17.1		17.1	17.1		96.7	96.7	96.7	112.9	111.9	111.9
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.69	0.69	0.69	0.81	0.80	0.80
v/c Ratio	0.08	0.15		0.69	0.26		0.33	1.16	0.17	0.57	0.58	0.02
Control Delay	52.3	7.0		79.0	16.4		3.2	89.4	1.1	27.4	16.3	5.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.3	7.0		79.0	16.4		3.2	89.4	1.1	27.4	16.3	5.0
LOS	D	A		E	B		A	F	A	C	B	A
Approach Delay		18.8			56.4			82.2			16.8	
Approach LOS		B			E			F			B	
Queue Length 50th (m)	3.4	0.0		32.6	1.3		3.4	~526.8	5.9	16.4	165.0	1.4
Queue Length 95th (m)	9.8	6.0		51.9	15.0		m1.8 m#4	13.8	m2.5	m30.1	216.9	m2.8
Internal Link Dist (m)		18.5			26.2			434.5			707.4	
Turn Bay Length (m)	15.0			15.0			15.0		15.0	15.0		15.0
Base Capacity (vph)	285	382		292	386		183	2445	1110	188	2828	1268
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.10		0.39	0.17		0.33	1.16	0.17	0.57	0.58	0.02

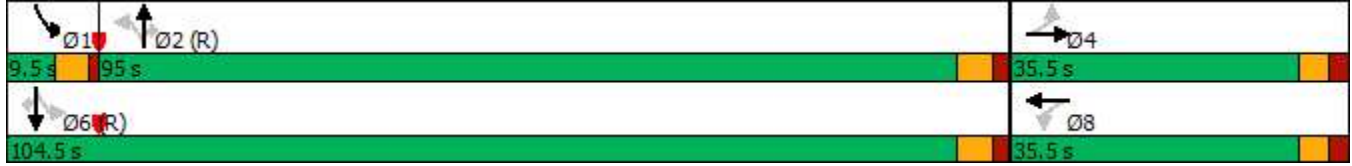
Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.16
 Intersection Signal Delay: 57.9
 Intersection LOS: E
 Intersection Capacity Utilization 102.8%
 ICU Level of Service G
 Analysis Period (min) 15

~ 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.

Splits and Phases: 2: Bronte Road & Saw Whet Boulevard



HCM Signalized Intersection Capacity Analysis
2: Bronte Road & Saw Whet Boulevard

2026 Future Total PM Peak Hour
1354 Bronte



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑	↗	↖	↑↑	↗
Traffic Volume (vph)	12	0	34	106	0	60	56	2599	177	99	1506	20
Future Volume (vph)	12	0	34	106	0	60	56	2599	177	99	1506	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	4.5	5.5	5.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.85		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		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1583		1770	3539	1583	1770	3539	1583
Flt Permitted	0.71	1.00		0.73	1.00		0.14	1.00	1.00	0.04	1.00	1.00
Satd. Flow (perm)	1331	1583		1365	1583		266	3539	1583	74	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	0	37	115	0	65	61	2825	192	108	1637	22
RTOR Reduction (vph)	0	32	0	0	53	0	0	0	17	0	0	4
Lane Group Flow (vph)	13	5	0	115	12	0	61	2825	175	108	1637	18
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	17.1	17.1		17.1	17.1		96.8	96.8	96.8	111.9	111.9	111.9
Effective Green, g (s)	17.1	17.1		17.1	17.1		96.8	96.8	96.8	111.9	111.9	111.9
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.69	0.69	0.69	0.80	0.80	0.80
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	4.5	5.5	5.5
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)	162	193		166	193		183	2446	1094	187	2828	1265
v/s Ratio Prot		0.00			0.01			c0.80		0.04	c0.46	
v/s Ratio Perm	0.01			c0.08			0.23		0.11	0.42		0.01
v/c Ratio	0.08	0.02		0.69	0.06		0.33	1.15	0.16	0.58	0.58	0.01
Uniform Delay, d1	54.5	54.1		58.9	54.4		8.7	21.6	7.5	45.8	5.2	2.9
Progression Factor	1.00	1.00		1.00	1.00		0.23	0.73	0.17	0.69	2.65	2.82
Incremental Delay, d2	0.2	0.0		11.8	0.1		0.4	70.2	0.0	3.3	0.7	0.0
Delay (s)	54.7	54.1		70.7	54.5		2.4	86.1	1.3	34.8	14.6	8.1
Level of Service	D	D		E	D		A	F	A	C	B	A
Approach Delay (s)		54.3			64.9			79.1			15.7	
Approach LOS		D			E			E			B	

Intersection Summary

HCM 2000 Control Delay	56.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	102.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

2026 Future Total PM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖		↗	↖	↗	↗	↖	↕	↗
Traffic Volume (vph)	0	0	0	138	0	110	1	2782	175	89	1605	0
Future Volume (vph)	0	0	0	138	0	110	1	2782	175	89	1605	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		40.0	35.0		30.0	70.0		0.0
Storage Lanes	0		0	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			20.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor						0.98			0.98			
Frt						0.850			0.850			
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	1863	0	1770	0	1583	1770	3505	1388	1770	3471	0
Flt Permitted				0.757			0.131			0.040		
Satd. Flow (perm)	0	1863	0	1410	0	1557	244	3505	1356	75	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						89			56			
Link Speed (k/h)		20			20			60				60
Link Distance (m)		78.7			109.0			218.2				458.5
Travel Time (s)		14.2			19.6			13.1				27.5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	14%	2%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6
Adj. Flow (vph)	0	0	0	142	0	113	1	2868	180	92	1655	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	142	0	113	1	2868	180	92	1655	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1		1	1	2	1	1		2
Detector Template	Left	Thru		Left		Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0		2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0		2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4						9.4				9.4
Detector 2 Size(m)		0.6						0.6				0.6
Detector 2 Type		Cl+Ex						Cl+Ex				Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

2026 Future Total PM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type				Perm		Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	4	4		8		8	2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0	15.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	24.2	24.2		35.2		35.2	34.9	34.9	34.9	9.5	34.9	
Total Split (s)	40.6	40.6		40.6		40.6	88.2	88.2	88.2	11.2	99.4	
Total Split (%)	29.0%	29.0%		29.0%		29.0%	63.0%	63.0%	63.0%	8.0%	71.0%	
Maximum Green (s)	34.4	34.4		34.4		34.4	82.3	82.3	82.3	7.2	93.5	
Yellow Time (s)	3.1	3.1		3.1		3.1	3.7	3.7	3.7	3.0	3.7	
All-Red Time (s)	3.1	3.1		3.1		3.1	2.2	2.2	2.2	1.0	2.2	
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.2		6.2		6.2	5.9	5.9	5.9	4.0	5.9	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.6	3.6	3.6	3.0	3.6	
Recall Mode	None	None		None		None	C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)				7.0		7.0	7.0	7.0	7.0		7.0	
Flash Dont Walk (s)				22.0		22.0	22.0	22.0	22.0		22.0	
Pedestrian Calls (#/hr)				0		0	0	0	0		0	
Act Effct Green (s)				19.4		19.4	95.7	95.7	95.7	110.4	108.5	
Actuated g/C Ratio				0.14		0.14	0.68	0.68	0.68	0.79	0.78	
v/c Ratio				0.73		0.39	0.01	1.20	0.19	0.56	0.62	
Control Delay				77.9		18.8	10.0	116.4	7.1	37.2	8.8	
Queue Delay				0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay				77.9		18.8	10.0	116.4	7.1	37.2	8.8	
LOS				E		B	A	F	A	D	A	
Approach Delay					51.7			109.9			10.3	
Approach LOS					D			F			B	
Queue Length 50th (m)				40.2		6.2	0.1	~528.6	11.4	14.7	50.4	
Queue Length 95th (m)				61.0		23.7	0.9	#615.0	27.7	34.0	132.8	
Internal Link Dist (m)		54.7			85.0			194.2			434.5	
Turn Bay Length (m)						40.0	35.0		30.0	70.0		
Base Capacity (vph)				346		449	166	2396	944	169	2689	
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				0.41		0.25	0.01	1.20	0.19	0.54	0.62	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 103.6 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.20

Lanes, Volumes, Timings
 3: Bronte Road & Driveway/Charles Cornwall Road

2026 Future Total PM Peak Hour
 1354 Bronte



















Intersection Signal Delay: 72.5	Intersection LOS: E
Intersection Capacity Utilization 95.3%	ICU Level of Service F
Analysis Period (min) 15	
~ 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.	

Splits and Phases: 3: Bronte Road & Driveway/Charles Cornwall Road

Ø1 Ø2 (R)	Ø4
11.2 s | 88.2 s	40.6 s
Ø6 (R)	Ø8
99.4 s	40.6 s

HCM Signalized Intersection Capacity Analysis
 3: Bronte Road & Driveway/Charles Cornwall Road

2026 Future Total PM Peak Hour
 1354 Bronte

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	0	0	0	138	0	110	1	2782	175	89	1605	0		
Future Volume (vph)	0	0	0	138	0	110	1	2782	175	89	1605	0		
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Total Lost time (s)				6.2		6.2	5.9	5.9	5.9	4.0	5.9			
Lane Util. Factor				1.00		1.00	1.00	0.95	1.00	1.00	0.95			
Frbp, ped/bikes				1.00		0.98	1.00	1.00	0.98	1.00	1.00			
Flpb, ped/bikes				1.00		1.00	1.00	1.00	1.00	1.00	1.00			
Frt				1.00		0.85	1.00	1.00	0.85	1.00	1.00			
Flt Protected				0.95		1.00	0.95	1.00	1.00	0.95	1.00			
Satd. Flow (prot)				1770		1552	1770	3505	1357	1770	3471			
Flt Permitted				0.76		1.00	0.13	1.00	1.00	0.04	1.00			
Satd. Flow (perm)				1410		1552	245	3505	1357	75	3471			
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97		
Adj. Flow (vph)	0	0	0	142	0	113	1	2868	180	92	1655	0		
RTOR Reduction (vph)	0	0	0	0	0	77	0	0	18	0	0	0		
Lane Group Flow (vph)	0	0	0	142	0	36	1	2868	162	92	1655	0		
Confl. Bikes (#/hr)			5			5			5			5		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	14%	2%	4%	2%		
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6		
Turn Type				Perm		Perm	Perm	NA	Perm	pm+pt	NA			
Protected Phases		4						2		1		6		
Permitted Phases	4			8		8	2		2	6				
Actuated Green, G (s)				19.4		19.4	95.7	95.7	95.7	108.5	108.5			
Effective Green, g (s)				19.4		19.4	95.7	95.7	95.7	108.5	108.5			
Actuated g/C Ratio				0.14		0.14	0.68	0.68	0.68	0.78	0.78			
Clearance Time (s)				6.2		6.2	5.9	5.9	5.9	4.0	5.9			
Vehicle Extension (s)				3.0		3.0	3.6	3.6	3.6	3.0	3.6			
Lane Grp Cap (vph)				195		215	167	2395	927	164	2690			
v/s Ratio Prot								c0.82		0.04	c0.48			
v/s Ratio Perm				c0.10		0.02	0.00		0.12	0.40				
v/c Ratio				0.73		0.17	0.01	1.20	0.18	0.56	0.62			
Uniform Delay, d1				57.8		53.2	7.0	22.1	8.0	42.6	6.8			
Progression Factor				1.00		1.00	1.00	1.00	1.00	1.22	1.04			
Incremental Delay, d2				12.7		0.4	0.1	93.2	0.4	3.6	0.9			
Delay (s)				70.5		53.6	7.1	115.4	8.4	55.7	7.9			
Level of Service				E		D	A	F	A	E	A			
Approach Delay (s)		0.0			63.0			109.0				10.4		
Approach LOS		A			E			F				B		
Intersection Summary														
HCM 2000 Control Delay			72.6									HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio			1.09											
Actuated Cycle Length (s)			140.0								16.1			
Intersection Capacity Utilization			95.3%										ICU Level of Service	F
Analysis Period (min)			15											
c Critical Lane Group														

























Appendix K

2031 Future Background Conditions Synchro Worksheets

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2031 Future Background AM Peak Hour

1354 Bronte

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	203	390	528	88	196	73	1073	281	290	2343	14
Future Volume (vph)	11	203	390	528	88	196	73	1073	281	290	2343	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	70.0		70.0	140.0		0.0	135.0		80.0	180.0		50.0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (m)	65.0			100.0			70.0			70.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Ped Bike Factor	0.99		0.98			0.97			0.96	1.00		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1863	1583	3433	1792	1553	1719	4222	1485	1770	4302	1336
Flt Permitted	0.698			0.950			0.076			0.101		
Satd. Flow (perm)	1200	1863	1556	3433	1792	1504	138	4222	1423	188	4302	1288
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			147			202			264			118
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		296.6			291.2			731.4			120.4	
Travel Time (s)		17.8			17.5			43.9			7.2	
Confl. Peds. (#/hr)	11					11	5		7	7		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	9%	2%	2%	2%	6%	4%	5%	8%	7%	2%	6%	18%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6
Adj. Flow (vph)	11	209	402	544	91	202	75	1106	290	299	2415	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	209	402	544	91	202	75	1106	290	299	2415	14
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.00	1.00	1.03
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2031 Future Background AM Peak Hour
1354 Bronte



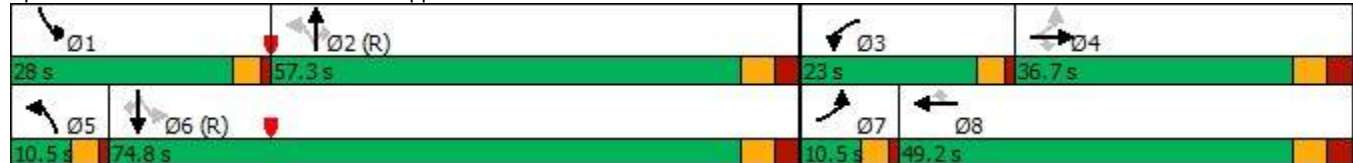
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	20.0	20.0	6.0	20.0	20.0
Minimum Split (s)	10.5	36.7	36.7	10.5	36.7	36.7	10.5	36.5	36.5	10.5	36.5	36.5
Total Split (s)	10.5	36.7	36.7	23.0	49.2	49.2	10.5	57.3	57.3	28.0	74.8	74.8
Total Split (%)	7.2%	25.3%	25.3%	15.9%	33.9%	33.9%	7.2%	39.5%	39.5%	19.3%	51.6%	51.6%
Maximum Green (s)	6.5	30.0	30.0	19.0	42.5	42.5	6.5	50.8	50.8	24.0	68.3	68.3
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	2.8	2.8	1.0	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					23.0	23.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)					11	11		7	7		5	5
Act Effct Green (s)	37.2	28.3	28.3	19.0	47.1	47.1	64.1	55.1	55.1	83.0	70.0	70.0
Actuated g/C Ratio	0.26	0.20	0.20	0.13	0.32	0.32	0.44	0.38	0.38	0.57	0.48	0.48
v/c Ratio	0.03	0.58	0.95	1.21	0.16	0.32	0.57	0.69	0.41	0.88	1.16	0.02
Control Delay	29.0	59.3	69.6	165.7	36.6	6.2	39.8	41.5	7.2	58.4	114.1	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	0.0
Total Delay	29.0	59.3	69.6	165.7	36.6	6.2	39.8	41.5	7.2	58.4	114.1	0.1
LOS	C	E	E	F	D	A	D	D	A	E	F	A
Approach Delay		65.4			113.2			34.7			107.4	
Approach LOS		E			F			C			F	
Queue Length 50th (m)	2.1	57.0	80.7	~103.0	18.3	0.0	10.1	122.4	5.2	63.2	~366.1	0.0
Queue Length 95th (m)	6.4	84.6	#144.7	#141.2	35.6	19.1	#25.4	143.5	28.3	#110.1	#397.7	0.0
Internal Link Dist (m)		272.6			267.2			707.4			96.4	
Turn Bay Length (m)	70.0		70.0	140.0			135.0		80.0	180.0		50.0
Base Capacity (vph)	330	385	438	449	582	625	132	1603	704	369	2076	682
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	0.03	0.54	0.92	1.21	0.16	0.32	0.57	0.69	0.41	0.81	1.16	0.02

Intersection Summary

Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.21	
Intersection Signal Delay: 84.7	Intersection LOS: F
Intersection Capacity Utilization 98.8%	ICU Level of Service F
Analysis Period (min) 15	
* User Entered Value	
~ 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.	

Splits and Phases: 1: Bronte Road & Upper Middle Road



HCM Signalized Intersection Capacity Analysis
1: Bronte Road & Upper Middle Road

2031 Future Background AM Peak Hour
1354 Bronte

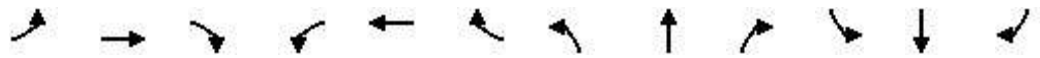
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	11	203	390	528	88	196	73	1073	281	290	2343	14	
Future Volume (vph)	11	203	390	528	88	196	73	1073	281	290	2343	14	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.96	1.00	1.00	0.96	
Flpb, ped/bikes	0.99	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	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1640	1863	1556	3433	1792	1505	1719	4222	1423	1769	4302	1288	
Flt Permitted	0.70	1.00	1.00	0.95	1.00	1.00	0.08	1.00	1.00	0.10	1.00	1.00	
Satd. Flow (perm)	1205	1863	1556	3433	1792	1505	137	4222	1423	189	4302	1288	
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)	11	209	402	544	91	202	75	1106	290	299	2415	14	
RTOR Reduction (vph)	0	0	116	0	0	136	0	0	168	0	0	7	
Lane Group Flow (vph)	11	209	286	544	91	66	75	1106	122	299	2415	7	
Confl. Peds. (#/hr)	11						11	5	7	7		5	
Confl. Bikes (#/hr)			5			5			5			5	
Heavy Vehicles (%)	9%	2%	2%	2%	6%	4%	5%	8%	7%	2%	6%	18%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases	4		4			8	2		2	6		6	
Actuated Green, G (s)	33.3	30.7	30.7	19.0	47.1	47.1	59.2	52.7	52.7	78.1	67.6	67.6	
Effective Green, g (s)	33.3	30.7	30.7	19.0	47.1	47.1	59.2	52.7	52.7	78.1	67.6	67.6	
Actuated g/C Ratio	0.23	0.21	0.21	0.13	0.32	0.32	0.41	0.36	0.36	0.54	0.47	0.47	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	284	394	329	449	582	488	126	1534	517	334	2005	600	
v/s Ratio Prot	0.00	0.11		c0.16	0.05		0.03	0.26		c0.13	c0.56		
v/s Ratio Perm	0.01		c0.18			0.04	0.21		0.09	0.35		0.01	
v/c Ratio	0.04	0.53	0.87	1.21	0.16	0.13	0.60	0.72	0.24	0.90	1.20	0.01	
Uniform Delay, d1	43.3	50.7	55.2	63.0	34.8	34.6	35.1	39.8	32.1	38.2	38.7	20.8	
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	0.1	1.4	20.9	114.3	0.1	0.1	7.4	3.0	1.1	24.8	97.0	0.0	
Delay (s)	43.4	52.1	76.1	177.3	34.9	34.7	42.4	42.8	33.2	63.0	135.7	20.8	
Level of Service	D	D	E	F	C	C	D	D	C	E	F	C	
Approach Delay (s)		67.5			127.4			40.9			127.2		
Approach LOS		E			F			D			F		
Intersection Summary													
HCM 2000 Control Delay			98.2		HCM 2000 Level of Service				F				
HCM 2000 Volume to Capacity ratio			1.12										
Actuated Cycle Length (s)			145.0		Sum of lost time (s)				21.2				
Intersection Capacity Utilization			98.8%		ICU Level of Service				F				
Analysis Period (min)			15										

c Critical Lane Group

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	0	52	169	0	95	16	1312	52	30	3378	6
Future Volume (vph)	17	0	52	169	0	95	16	1312	52	30	3378	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	15.0		0.0	15.0		15.0	15.0		15.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1583	0	1770	1583	0	1770	4471	1583	1770	4471	1583
Flt Permitted	0.645			0.720			0.038			0.127		
Satd. Flow (perm)	1201	1583	0	1341	1583	0	71	4471	1583	237	4471	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			74				24			19
Link Speed (k/h)		50			50			60				60
Link Distance (m)		42.5			50.2			458.5				731.4
Travel Time (s)		3.1			3.6			27.5				43.9
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
Adj. Flow (vph)	18	0	57	184	0	103	17	1426	57	33	3672	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	57	0	184	103	0	17	1426	57	33	3672	7
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

2031 Future Background AM Peak Hour

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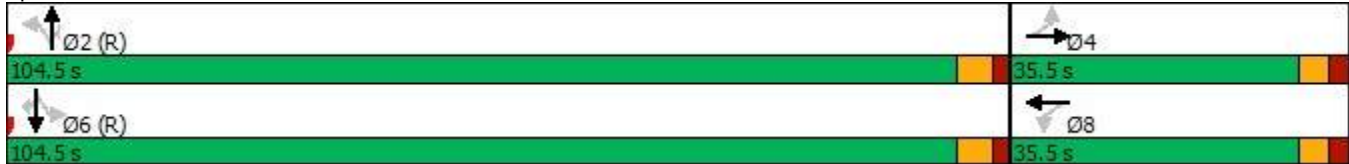
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	35.5	35.5		35.5	35.5		35.5	35.5	35.5	35.5	35.5	35.5
Total Split (s)	35.5	35.5		35.5	35.5		104.5	104.5	104.5	104.5	104.5	104.5
Total Split (%)	25.4%	25.4%		25.4%	25.4%		74.6%	74.6%	74.6%	74.6%	74.6%	74.6%
Maximum Green (s)	30.0	30.0		30.0	30.0		99.0	99.0	99.0	99.0	99.0	99.0
Yellow Time (s)	3.3	3.3		3.3	3.3		3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.2	2.2		2.2	2.2		1.8	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0		23.0	23.0		23.0	23.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	23.7	23.7		23.7	23.7		105.3	105.3	105.3	105.3	105.3	105.3
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.75	0.75	0.75	0.75	0.75	0.75
v/c Ratio	0.09	0.20		0.81	0.31		0.32	0.42	0.05	0.19	1.09	0.01
Control Delay	47.1	34.8		81.5	19.0		37.6	9.4	5.9	9.2	66.3	0.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	34.8		81.5	19.0		37.6	9.4	5.9	9.2	66.3	0.7
LOS	D	C		F	B		D	A	A	A	E	A
Approach Delay		37.7			59.1			9.6			65.7	
Approach LOS		D			E			A			E	
Queue Length 50th (m)	4.5	9.5		51.9	7.2		1.5	57.2	2.3	2.5	~504.3	0.0
Queue Length 95th (m)	11.6	21.8		77.1	23.5		m7.4	113.9	12.1	8.2	#548.7	0.6
Internal Link Dist (m)		18.5			26.2			434.5			707.4	
Turn Bay Length (m)	15.0			15.0			15.0		15.0	15.0		15.0
Base Capacity (vph)	257	354		287	397		53	3362	1196	178	3362	1195
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.16		0.64	0.26		0.32	0.42	0.05	0.19	1.09	0.01

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.09
 Intersection Signal Delay: 49.9
 Intersection Capacity Utilization 90.5%
 Analysis Period (min) 15
 * User Entered Value

- ~ 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.























Splits and Phases: 2: Bronte Road & Saw Whet Boulevard



HCM Signalized Intersection Capacity Analysis
2: Bronte Road & Saw Whet Boulevard

2031 Future Background AM Peak Hour

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	0	52	169	0	95	16	1312	52	30	3378	6
Future Volume (vph)	17	0	52	169	0	95	16	1312	52	30	3378	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.85		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		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1583		1770	4471	1583	1770	4471	1583
Flt Permitted	0.65	1.00		0.72	1.00		0.04	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	1202	1583		1341	1583		71	4471	1583	236	4471	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	0	57	184	0	103	17	1426	57	33	3672	7
RTOR Reduction (vph)	0	16	0	0	61	0	0	0	6	0	0	2
Lane Group Flow (vph)	18	41	0	184	42	0	17	1426	51	33	3672	5
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2		6		6
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	23.7	23.7		23.7	23.7		105.3	105.3	105.3	105.3	105.3	105.3
Effective Green, g (s)	23.7	23.7		23.7	23.7		105.3	105.3	105.3	105.3	105.3	105.3
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.75	0.75	0.75	0.75	0.75	0.75
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5
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)	203	267		227	267		53	3362	1190	177	3362	1190
v/s Ratio Prot		0.03			0.03			0.32			c0.82	
v/s Ratio Perm	0.01			c0.14			0.24		0.03	0.14		0.00
v/c Ratio	0.09	0.15		0.81	0.16		0.32	0.42	0.04	0.19	1.09	0.00
Uniform Delay, d1	49.0	49.6		56.0	49.6		5.7	6.3	4.4	5.0	17.4	4.3
Progression Factor	1.00	1.00		1.00	1.00		2.13	1.33	1.64	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.3		19.3	0.3		13.7	0.4	0.1	2.3	47.1	0.0
Delay (s)	49.2	49.9		75.3	49.9		25.7	8.7	7.3	7.3	64.4	4.3
Level of Service	D	D		E	D		C	A	A	A	E	A
Approach Delay (s)		49.7			66.1			8.9			63.8	
Approach LOS		D			E			A			E	
Intersection Summary												
HCM 2000 Control Delay			49.0				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			11.0		
Intersection Capacity Utilization			90.5%				ICU Level of Service			E		
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙		↗	↙	↗	↗	↙	↗	↗
Traffic Volume (vph)	1	0	1	161	0	65	0	1365	78	149	3467	0
Future Volume (vph)	1	0	1	161	0	65	0	1365	78	149	3467	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		40.0	35.0		30.0	70.0		0.0
Storage Lanes	0		0	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			20.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	0.91
Ped Bike Factor		0.99				0.98			0.98			
Frt		0.932				0.850			0.850			
Flt Protected		0.976		0.950						0.950		
Satd. Flow (prot)	0	1680	0	1530	0	1392	1863	4302	1439	1770	4385	0
Flt Permitted		0.976		0.757						0.113		
Satd. Flow (perm)	0	1680	0	1219	0	1368	1863	4302	1405	210	4385	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		54				67			56			
Link Speed (k/h)		20			20			60			60	
Link Distance (m)		78.7			109.0			218.2			458.5	
Travel Time (s)		14.2			19.6			13.1			27.5	
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	18%	2%	16%	2%	6%	10%	2%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6
Adj. Flow (vph)	1	0	1	166	0	67	0	1407	80	154	3574	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2	0	166	0	67	0	1407	80	154	3574	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1		1	1	2	1	1	2	
Detector Template	Left	Thru		Left		Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0		2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0		2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

2031 Future Background AM Peak Hour

1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	4	4		8		8	2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0	15.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	24.2	24.2		35.2		35.2	34.9	34.9	34.9	9.5	34.9	
Total Split (s)	35.2	35.2		35.2		35.2	86.8	86.8	86.8	18.0	104.8	
Total Split (%)	25.1%	25.1%		25.1%		25.1%	62.0%	62.0%	62.0%	12.9%	74.9%	
Maximum Green (s)	29.0	29.0		29.0		29.0	80.9	80.9	80.9	14.0	98.9	
Yellow Time (s)	3.1	3.1		3.1		3.1	3.7	3.7	3.7	3.0	3.7	
All-Red Time (s)	3.1	3.1		3.1		3.1	2.2	2.2	2.2	1.0	2.2	
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.2		6.2		6.2	5.9	5.9	5.9	4.0	5.9	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.6	3.6	3.6	3.0	3.6	
Recall Mode	None	None		None		None	C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)				7.0		7.0	7.0	7.0	7.0		7.0	
Flash Dont Walk (s)				22.0		22.0	22.0	22.0	22.0		22.0	
Pedestrian Calls (#/hr)				0		0	0	0	0		0	
Act Effct Green (s)		23.3		23.3		23.3		91.3	91.3	106.5	104.6	
Actuated g/C Ratio		0.17		0.17		0.17		0.65	0.65	0.76	0.75	
v/c Ratio		0.01		0.82		0.24		0.50	0.09	0.58	1.09	
Control Delay		0.0		85.8		12.2		14.4	4.7	11.0	53.1	
Queue Delay		0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Total Delay		0.0		85.8		12.2		14.4	4.7	11.0	53.1	
LOS		A		F		B		B	A	B	D	
Approach Delay					64.6			13.9			51.4	
Approach LOS					E			B			D	
Queue Length 50th (m)		0.0		46.9		0.0		83.3	2.3	0.0	~502.8	
Queue Length 95th (m)		0.0		71.9		13.4		119.0	10.6	m2.7	m#450.4	
Internal Link Dist (m)		54.7			85.0			194.2			434.5	
Turn Bay Length (m)						40.0			30.0	70.0		
Base Capacity (vph)		390		252		336		2804	935	315	3277	
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		0.01		0.66		0.20		0.50	0.09	0.49	1.09	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 48.8 (35%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.09

Lanes, Volumes, Timings
 3: Bronte Road & Driveway/Charles Cornwall Road

2031 Future Background AM Peak Hour

1354 Bronte

Intersection Signal Delay: 41.7 Intersection LOS: D

Intersection Capacity Utilization 108.2% ICU Level of Service G

Analysis Period (min) 15

* User Entered Value

~ Volume exceeds capacity, queue is theoretically infinite.

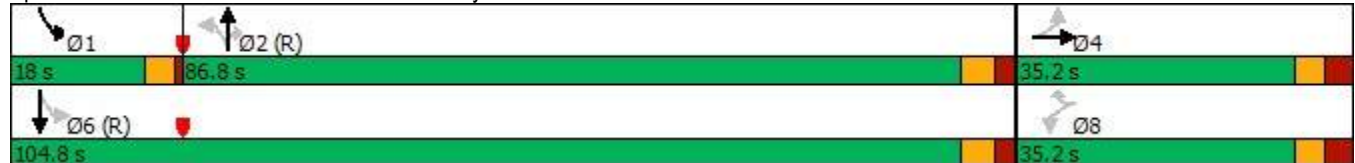
Queue shown is maximum after two cycles.

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.

Splits and Phases: 3: Bronte Road & Driveway/Charles Cornwall Road



HCM Signalized Intersection Capacity Analysis
3: Bronte Road & Driveway/Charles Cornwall Road

2031 Future Background AM Peak Hour
1354 Bronte



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙		↗	↙	↑↑↑	↗	↙	↑↑↑	
Traffic Volume (vph)	1	0	1	161	0	65	0	1365	78	149	3467	0
Future Volume (vph)	1	0	1	161	0	65	0	1365	78	149	3467	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2		6.2		6.2		5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		1.00		1.00		*0.80	1.00	1.00	*0.80	
Frbp, ped/bikes		0.99		1.00		0.98		1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00		1.00		1.00		1.00	1.00	1.00	1.00	
Frt		0.93		1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected		0.98		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1679		1530		1366		4302	1406	1770	4385	
Flt Permitted		0.98		0.76		1.00		1.00	1.00	0.11	1.00	
Satd. Flow (perm)		1679		1218		1366		4302	1406	210	4385	
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)	1	0	1	166	0	67	0	1407	80	154	3574	0
RTOR Reduction (vph)	0	2	0	0	0	56	0	0	20	0	0	0
Lane Group Flow (vph)	0	0	0	166	0	11	0	1407	60	154	3574	0
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	2%	2%	18%	2%	16%	2%	6%	10%	2%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		23.3		23.3		23.3		91.2	91.2	104.6	104.6	
Effective Green, g (s)		23.3		23.3		23.3		91.2	91.2	104.6	104.6	
Actuated g/C Ratio		0.17		0.17		0.17		0.65	0.65	0.75	0.75	
Clearance Time (s)		6.2		6.2		6.2		5.9	5.9	4.0	5.9	
Vehicle Extension (s)		3.0		3.0		3.0		3.6	3.6	3.0	3.6	
Lane Grp Cap (vph)		279		202		227		2802	915	261	3276	
v/s Ratio Prot								0.33		0.04	c0.82	
v/s Ratio Perm		0.00		c0.14		0.01			0.04	0.40		
v/c Ratio		0.00		0.82		0.05		0.50	0.07	0.59	1.09	
Uniform Delay, d1		48.6		56.3		49.0		12.6	8.9	8.8	17.7	
Progression Factor		1.00		1.00		1.00		1.00	1.00	1.48	0.44	
Incremental Delay, d2		0.0		22.8		0.1		0.6	0.1	0.3	41.5	
Delay (s)		48.7		79.1		49.1		13.3	9.0	13.4	49.3	
Level of Service		D		E		D		B	A	B	D	
Approach Delay (s)		48.7			70.5			13.1			47.8	
Approach LOS		D			E			B			D	
Intersection Summary												
HCM 2000 Control Delay			39.3								HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			1.07									
Actuated Cycle Length (s)			140.0							16.1		
Intersection Capacity Utilization			108.2%								ICU Level of Service	G
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

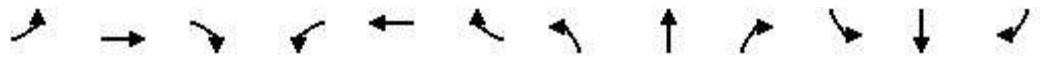
2031 Future Background PM Peak Hour

1354 Bronte

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	74	114	249	155	252	325	2173	412	265	1354	19
Future Volume (vph)	7	74	114	249	155	252	325	2173	412	265	1354	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	70.0		70.0	140.0		0.0	135.0		80.0	180.0		50.0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (m)	65.0			100.0			70.0			70.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Ped Bike Factor	0.99		0.98			0.97			0.97			0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	3400	1863	1583	1770	4471	1558	1770	4385	1473
Flt Permitted	0.653			0.950			0.071			0.060		
Satd. Flow (perm)	1208	1863	1556	3400	1863	1544	132	4471	1517	112	4385	1433
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			147			268			233			148
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		296.6			291.2			731.4			120.4	
Travel Time (s)		17.8			17.5			43.9			7.2	
Confl. Peds. (#/hr)	6					6	1		1	1		1
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	4%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6
Adj. Flow (vph)	7	79	121	265	165	268	346	2312	438	282	1440	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	79	121	265	165	268	346	2312	438	282	1440	20
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.00	1.00	1.03
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2031 Future Background PM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	20.0	20.0	6.0	20.0	20.0
Minimum Split (s)	10.5	36.7	36.7	10.5	36.7	36.7	10.5	36.5	36.5	10.5	36.5	36.5
Total Split (s)	10.5	36.7	36.7	15.0	41.2	41.2	30.0	74.3	74.3	19.0	63.3	63.3
Total Split (%)	7.2%	25.3%	25.3%	10.3%	28.4%	28.4%	20.7%	51.2%	51.2%	13.1%	43.7%	43.7%
Maximum Green (s)	6.5	30.0	30.0	11.0	34.5	34.5	26.0	67.8	67.8	15.0	56.8	56.8
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	2.8	2.8	1.0	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					23.0	23.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)					6	6		1	1		1	1
Act Effct Green (s)	22.9	14.1	14.1	11.0	27.0	27.0	99.7	69.6	69.6	99.7	69.7	69.7
Actuated g/C Ratio	0.16	0.10	0.10	0.08	0.19	0.19	0.69	0.48	0.48	0.69	0.48	0.48
v/c Ratio	0.03	0.44	0.43	1.03	0.48	0.53	0.83	1.08	0.52	0.69	0.68	0.03
Control Delay	41.1	67.8	8.6	128.1	57.4	9.4	55.8	80.6	13.7	47.0	32.6	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	0.0
Total Delay	41.1	67.8	8.6	128.1	57.4	9.4	55.8	80.6	13.7	47.0	32.6	0.1
LOS	D	E	A	F	E	A	E	F	B	D	C	A
Approach Delay		32.3			65.8			68.4			34.6	
Approach LOS		C			E			E			C	
Queue Length 50th (m)	1.7	23.4	0.0	~43.9	45.3	0.0	76.4	~315.9	38.9	59.9	136.2	0.0
Queue Length 95th (m)	5.6	37.3	11.2	#74.0	67.7	25.1	#127.7	#363.0	73.6	#134.1	187.2	0.0
Internal Link Dist (m)		272.6			267.2			707.4			96.4	
Turn Bay Length (m)	70.0		70.0	140.0			135.0		80.0	180.0		50.0
Base Capacity (vph)	219	385	438	257	443	571	427	2145	849	410	2107	765
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	0.03	0.21	0.28	1.03	0.37	0.47	0.81	1.08	0.52	0.69	0.68	0.03

Intersection Summary

Area Type: Other

Cycle Length: 145

Actuated Cycle Length: 145

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
 1: Bronte Road & Upper Middle Road

2031 Future Background PM Peak Hour

1354 Bronte

Maximum v/c Ratio: 1.08

Intersection Signal Delay: 56.5 Intersection LOS: E

Intersection Capacity Utilization 86.8% ICU Level of Service E

Analysis Period (min) 15

* User Entered Value

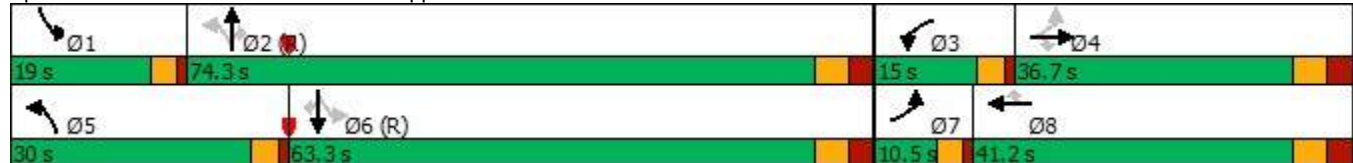
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Bronte Road & Upper Middle Road



HCM Signalized Intersection Capacity Analysis
1: Bronte Road & Upper Middle Road

2031 Future Background PM Peak Hour
1354 Bronte

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	7	74	114	249	155	252	325	2173	412	265	1354	19	
Future Volume (vph)	7	74	114	249	155	252	325	2173	412	265	1354	19	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.97	
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	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1762	1863	1550	3400	1863	1542	1770	4471	1517	1770	4385	1434	
Flt Permitted	0.65	1.00	1.00	0.95	1.00	1.00	0.07	1.00	1.00	0.06	1.00	1.00	
Satd. Flow (perm)	1210	1863	1550	3400	1863	1542	132	4471	1517	112	4385	1434	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Adj. Flow (vph)	7	79	121	265	165	268	346	2312	438	282	1440	20	
RTOR Reduction (vph)	0	0	107	0	0	218	0	0	126	0	0	11	
Lane Group Flow (vph)	7	79	14	265	165	50	346	2312	312	282	1440	9	
Confl. Peds. (#/hr)	6					6	1		1	1		1	
Confl. Bikes (#/hr)			5			5			5			5	
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	4%	7%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases	4		4			8	2		2	6		6	
Actuated Green, G (s)	18.6	17.3	17.3	11.0	27.0	27.0	95.4	66.3	66.3	95.6	66.4	66.4	
Effective Green, g (s)	18.6	17.3	17.3	11.0	27.0	27.0	95.4	66.3	66.3	95.6	66.4	66.4	
Actuated g/C Ratio	0.13	0.12	0.12	0.08	0.19	0.19	0.66	0.46	0.46	0.66	0.46	0.46	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	160	222	184	257	346	287	415	2044	693	407	2008	656	
v/s Ratio Prot	0.00	0.04		c0.08	c0.09		c0.17	c0.52		0.14	0.33		
v/s Ratio Perm	0.01		0.01			0.03	0.38		0.21	0.32		0.01	
v/c Ratio	0.04	0.36	0.08	1.03	0.48	0.17	0.83	1.13	0.45	0.69	0.72	0.01	
Uniform Delay, d1	55.3	58.7	56.8	67.0	52.7	49.6	41.6	39.4	26.9	42.1	31.7	21.4	
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	0.1	1.0	0.2	64.4	1.0	0.3	13.4	65.8	2.1	5.0	2.2	0.0	
Delay (s)	55.4	59.7	56.9	131.4	53.7	49.9	55.0	105.2	29.0	47.1	34.0	21.5	
Level of Service	E	E	E	F	D	D	E	F	C	D	C	C	
Approach Delay (s)		57.9			81.8			88.8			35.9		
Approach LOS		E			F			F			D		
Intersection Summary													
HCM 2000 Control Delay			70.8		HCM 2000 Level of Service				E				
HCM 2000 Volume to Capacity ratio			0.97										
Actuated Cycle Length (s)			145.0		Sum of lost time (s)				21.2				
Intersection Capacity Utilization			86.8%		ICU Level of Service				E				
Analysis Period (min)			15										

c Critical Lane Group

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	0	22	104	0	59	36	2863	174	99	1656	13
Future Volume (vph)	7	0	22	104	0	59	36	2863	174	99	1656	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	15.0		0.0	15.0		15.0	15.0		15.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1583	0	1770	1583	0	1770	4471	1583	1770	4471	1583
Flt Permitted	0.715			0.742			0.090			0.039		
Satd. Flow (perm)	1332	1583	0	1382	1583	0	168	4471	1583	73	4471	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		55			59				55			19
Link Speed (k/h)		50			50			60				60
Link Distance (m)		42.5			50.2			458.5				731.4
Travel Time (s)		3.1			3.6			27.5				43.9
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
Adj. Flow (vph)	8	0	24	113	0	64	39	3112	189	108	1800	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	24	0	113	64	0	39	3112	189	108	1800	14
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1		6
Permitted Phases	4			8			2		2	6		6

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

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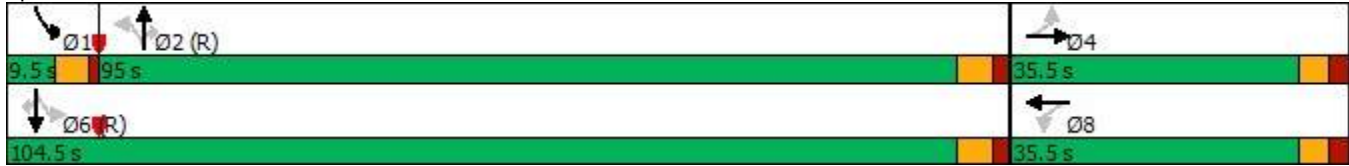
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	35.5	35.5		35.5	35.5		35.5	35.5	35.5	9.5	35.5	35.5
Total Split (s)	35.5	35.5		35.5	35.5		95.0	95.0	95.0	9.5	104.5	104.5
Total Split (%)	25.4%	25.4%		25.4%	25.4%		67.9%	67.9%	67.9%	6.8%	74.6%	74.6%
Maximum Green (s)	30.0	30.0		30.0	30.0		89.5	89.5	89.5	5.0	99.0	99.0
Yellow Time (s)	3.3	3.3		3.3	3.3		3.7	3.7	3.7	3.5	3.7	3.7
All-Red Time (s)	2.2	2.2		2.2	2.2		1.8	1.8	1.8	1.0	1.8	1.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	4.5	5.5	5.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	23.0	23.0		23.0	23.0		23.0	23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0		0	0
Act Effct Green (s)	16.8	16.8		16.8	16.8		96.9	96.9	96.9	113.2	112.2	112.2
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.69	0.69	0.69	0.81	0.80	0.80
v/c Ratio	0.05	0.10		0.68	0.27		0.34	1.01	0.17	0.57	0.50	0.01
Control Delay	51.7	1.2		78.5	16.7		5.3	16.8	0.9	38.0	5.6	1.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.7	1.2		78.5	16.7		5.3	16.8	0.9	38.0	5.6	1.2
LOS	D	A		E	B		A	B	A	D	A	A
Approach Delay		13.8			56.2			15.7			7.4	
Approach LOS		B			E			B			A	
Queue Length 50th (m)	2.1	0.0		32.1	1.3		0.8	~32.7	0.0	13.8	60.9	0.0
Queue Length 95th (m)	7.3	1.0		51.4	15.0		m1.0	m#405.6	m0.6	36.2	90.9	1.4
Internal Link Dist (m)		18.5			26.2			434.5			707.4	
Turn Bay Length (m)	15.0			15.0			15.0		15.0	15.0		15.0
Base Capacity (vph)	285	382		296	385		116	3095	1113	189	3582	1272
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.06		0.38	0.17		0.34	1.01	0.17	0.57	0.50	0.01

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	127 (91%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	145
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.01
Intersection Signal Delay:	14.1
Intersection LOS:	B
Intersection Capacity Utilization:	86.1%
ICU Level of Service:	E
Analysis Period (min):	15
* User Entered Value	

- ~ 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.

Splits and Phases: 2: Bronte Road & Saw Whet Boulevard



HCM Signalized Intersection Capacity Analysis
2: Bronte Road & Saw Whet Boulevard






















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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	0	22	104	0	59	36	2863	174	99	1656	13
Future Volume (vph)	7	0	22	104	0	59	36	2863	174	99	1656	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	4.5	5.5	5.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.85		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		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1583		1770	4471	1583	1770	4471	1583
Flt Permitted	0.72	1.00		0.74	1.00		0.09	1.00	1.00	0.04	1.00	1.00
Satd. Flow (perm)	1332	1583		1381	1583		168	4471	1583	73	4471	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	0	24	113	0	64	39	3112	189	108	1800	14
RTOR Reduction (vph)	0	21	0	0	52	0	0	0	17	0	0	3
Lane Group Flow (vph)	8	3	0	113	12	0	39	3112	172	108	1800	11
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	16.8	16.8		16.8	16.8		97.0	97.0	97.0	112.2	112.2	112.2
Effective Green, g (s)	16.8	16.8		16.8	16.8		97.0	97.0	97.0	112.2	112.2	112.2
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.69	0.69	0.69	0.80	0.80	0.80
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	4.5	5.5	5.5
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)	159	189		165	189		116	3097	1096	188	3583	1268
v/s Ratio Prot		0.00			0.01			c0.70		0.04	c0.40	
v/s Ratio Perm	0.01			c0.08			0.23		0.11	0.41		0.01
v/c Ratio	0.05	0.02		0.68	0.06		0.34	1.00	0.16	0.57	0.50	0.01
Uniform Delay, d1	54.5	54.3		59.1	54.6		8.6	21.5	7.4	45.9	4.6	2.8
Progression Factor	1.00	1.00		1.00	1.00		0.23	0.16	0.13	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0		11.2	0.1		2.3	10.0	0.1	4.2	0.5	0.0
Delay (s)	54.7	54.3		70.2	54.8		4.3	13.4	1.0	50.1	5.1	2.8
Level of Service	D	D		E	D		A	B	A	D	A	A
Approach Delay (s)		54.4			64.6			12.6			7.6	
Approach LOS		D			E			B			A	
Intersection Summary												
HCM 2000 Control Delay			12.8				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			15.5			
Intersection Capacity Utilization			86.1%			ICU Level of Service			E			
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

2031 Future Background PM Peak Hour
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	138	0	110	1	3022	175	89	1744	0
Future Volume (vph)	0	0	0	138	0	110	1	3022	175	89	1744	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		40.0	35.0		30.0	70.0		0.0
Storage Lanes	0		0	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			20.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	0.91
Ped Bike Factor						0.98			0.98			
Fr _t						0.850			0.850			
Fl _t Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	1863	0	1770	0	1583	1770	4427	1388	1770	4385	0
Fl _t Permitted				0.757			0.086			0.040		
Satd. Flow (perm)	0	1863	0	1410	0	1556	160	4427	1357	75	4385	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						64			56			
Link Speed (k/h)		20			20			60			60	
Link Distance (m)		78.7			109.0			218.2			458.5	
Travel Time (s)		14.2			19.6			13.1			27.5	
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	14%	2%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6
Adj. Flow (vph)	0	0	0	142	0	113	1	3115	180	92	1798	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	142	0	113	1	3115	180	92	1798	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1		1	1	2	1	1	2	
Detector Template	Left	Thru		Left		Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0		2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0		2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

2031 Future Background PM Peak Hour

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0						0.0				0.0
Turn Type				Perm		Perm	Perm	NA	Perm	pm+pt		NA
Protected Phases		4						2		1		6
Permitted Phases	4			8		8	2		2	6		
Detector Phase	4	4		8		8	2	2	2	1		6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0	15.0	15.0	15.0	5.0		15.0
Minimum Split (s)	24.2	24.2		35.2		35.2	34.9	34.9	34.9	9.5		34.9
Total Split (s)	35.2	35.2		35.2		35.2	95.3	95.3	95.3	9.5		104.8
Total Split (%)	25.1%	25.1%		25.1%		25.1%	68.1%	68.1%	68.1%	6.8%		74.9%
Maximum Green (s)	29.0	29.0		29.0		29.0	89.4	89.4	89.4	5.5		98.9
Yellow Time (s)	3.1	3.1		3.1		3.1	3.7	3.7	3.7	3.0		3.7
All-Red Time (s)	3.1	3.1		3.1		3.1	2.2	2.2	2.2	1.0		2.2
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)		6.2		6.2		6.2	5.9	5.9	5.9	4.0		5.9
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.6	3.6	3.6	3.0		3.6
Recall Mode	None	None		None		None	C-Max	C-Max	C-Max	None		C-Max
Walk Time (s)				7.0		7.0	7.0	7.0	7.0			7.0
Flash Dont Walk (s)				22.0		22.0	22.0	22.0	22.0			22.0
Pedestrian Calls (#/hr)				0		0	0	0	0			0
Act Effct Green (s)				19.3		19.3	96.4	96.4	96.4	110.5		108.6
Actuated g/C Ratio				0.14		0.14	0.69	0.69	0.69	0.79		0.78
v/c Ratio				0.73		0.42	0.01	1.02	0.19	0.58		0.53
Control Delay				78.3		28.9	9.0	44.6	6.6	40.4		6.3
Queue Delay				0.0		0.0	0.0	0.0	0.0	0.0		0.0
Total Delay				78.3		28.9	9.0	44.6	6.6	40.4		6.3
LOS				E		C	A	D	A	D		A
Approach Delay					56.4			42.6				7.9
Approach LOS					E			D				A
Queue Length 50th (m)				40.2		12.9	0.1	~403.2	11.6	12.1		65.3
Queue Length 95th (m)				61.1		30.9	0.9	#455.9	24.5	#35.1		86.2
Internal Link Dist (m)		54.7				85.0		194.2				434.5
Turn Bay Length (m)						40.0	35.0		30.0	70.0		
Base Capacity (vph)				292		373	110	3048	951	158		3400
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				0.49		0.30	0.01	1.02	0.19	0.58		0.53

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 103.6 (74%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02

Lanes, Volumes, Timings
 3: Bronte Road & Driveway/Charles Cornwall Road

2031 Future Background PM Peak Hour

1354 Bronte

Intersection Signal Delay: 31.2 Intersection LOS: C

Intersection Capacity Utilization 82.5% ICU Level of Service E

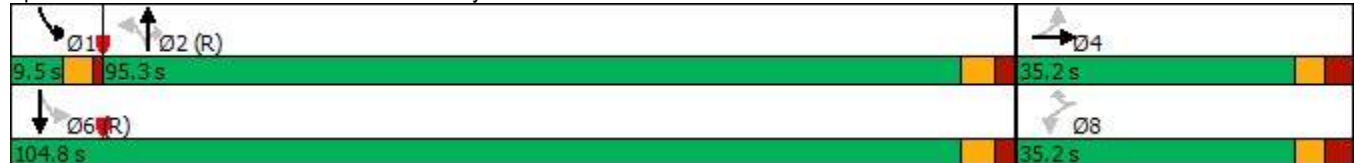
Analysis Period (min) 15

* User Entered Value

~ 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.

Splits and Phases: 3: Bronte Road & Driveway/Charles Cornwall Road



HCM Signalized Intersection Capacity Analysis
3: Bronte Road & Driveway/Charles Cornwall Road

2031 Future Background PM Peak Hour
1354 Bronte

























														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	0	0	0	138	0	110	1	3022	175	89	1744	0		
Future Volume (vph)	0	0	0	138	0	110	1	3022	175	89	1744	0		
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Total Lost time (s)				6.2		6.2	5.9	5.9	5.9	4.0	5.9			
Lane Util. Factor				1.00		1.00	1.00	*0.80	1.00	1.00	*0.80			
Frbp, ped/bikes				1.00		0.98	1.00	1.00	0.98	1.00	1.00			
Flpb, ped/bikes				1.00		1.00	1.00	1.00	1.00	1.00	1.00			
Frt				1.00		0.85	1.00	1.00	0.85	1.00	1.00			
Flt Protected				0.95		1.00	0.95	1.00	1.00	0.95	1.00			
Satd. Flow (prot)				1770		1552	1770	4427	1357	1770	4385			
Flt Permitted				0.76		1.00	0.09	1.00	1.00	0.04	1.00			
Satd. Flow (perm)				1410		1552	161	4427	1357	74	4385			
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97		
Adj. Flow (vph)	0	0	0	142	0	113	1	3115	180	92	1798	0		
RTOR Reduction (vph)	0	0	0	0	0	55	0	0	17	0	0	0		
Lane Group Flow (vph)	0	0	0	142	0	58	1	3115	163	92	1798	0		
Confl. Bikes (#/hr)			5			5			5			5		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	14%	2%	4%	2%		
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6		
Turn Type				Perm		Perm	Perm	NA	Perm	pm+pt	NA			
Protected Phases		4						2		1	6			
Permitted Phases	4			8		8	2		2	6				
Actuated Green, G (s)				19.3		19.3	96.4	96.4	96.4	108.6	108.6			
Effective Green, g (s)				19.3		19.3	96.4	96.4	96.4	108.6	108.6			
Actuated g/C Ratio				0.14		0.14	0.69	0.69	0.69	0.78	0.78			
Clearance Time (s)				6.2		6.2	5.9	5.9	5.9	4.0	5.9			
Vehicle Extension (s)				3.0		3.0	3.6	3.6	3.6	3.0	3.6			
Lane Grp Cap (vph)				194		213	110	3048	934	156	3401			
v/s Ratio Prot								c0.70		0.03	c0.41			
v/s Ratio Perm				c0.10		0.04	0.01		0.12	0.42				
v/c Ratio				0.73		0.27	0.01	1.02	0.17	0.59	0.53			
Uniform Delay, d1				57.9		54.1	6.8	21.8	7.7	43.2	6.0			
Progression Factor				1.00		1.00	1.00	1.00	1.00	1.24	0.88			
Incremental Delay, d2				13.3		0.7	0.2	22.2	0.4	5.0	0.5			
Delay (s)				71.2		54.7	7.0	44.0	8.1	58.4	5.8			
Level of Service				E		D	A	D	A	E	A			
Approach Delay (s)		0.0			63.9			42.0			8.3			
Approach LOS		A			E			D			A			
Intersection Summary														
HCM 2000 Control Delay			31.3									HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio			0.95											
Actuated Cycle Length (s)			140.0								16.1			
Intersection Capacity Utilization			82.5%										ICU Level of Service	E
Analysis Period (min)			15											
c	Critical Lane Group													

Appendix L

2031 Future Total Conditions Synchro Worksheets

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2031 Future Total AM Peak Hour
1354 Bronte

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	203	390	529	88	196	72	1075	284	289	2343	13
Future Volume (vph)	11	203	390	529	88	196	72	1075	284	289	2343	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	70.0		70.0	140.0		0.0	135.0		80.0	180.0		50.0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (m)	65.0			100.0			70.0			70.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Ped Bike Factor	0.99		0.98			0.97			0.96	1.00		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1863	1583	3433	1792	1553	1719	4222	1485	1770	4302	1336
Flt Permitted	0.698			0.950			0.076			0.101		
Satd. Flow (perm)	1200	1863	1556	3433	1792	1504	138	4222	1423	188	4302	1288
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			147			202			267			118
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		296.6			291.2			731.4			120.4	
Travel Time (s)		17.8			17.5			43.9			7.2	
Confl. Peds. (#/hr)	11					11	5		7	7		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	9%	2%	2%	2%	6%	4%	5%	8%	7%	2%	6%	18%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6
Adj. Flow (vph)	11	209	402	545	91	202	74	1108	293	298	2415	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	209	402	545	91	202	74	1108	293	298	2415	13
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.00	1.00	1.03
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2031 Future Total AM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	20.0	20.0	6.0	20.0	20.0
Minimum Split (s)	10.5	36.7	36.7	10.5	36.7	36.7	10.5	36.5	36.5	10.5	36.5	36.5
Total Split (s)	10.5	36.7	36.7	23.0	49.2	49.2	10.5	57.4	57.4	27.9	74.8	74.8
Total Split (%)	7.2%	25.3%	25.3%	15.9%	33.9%	33.9%	7.2%	39.6%	39.6%	19.2%	51.6%	51.6%
Maximum Green (s)	6.5	30.0	30.0	19.0	42.5	42.5	6.5	50.9	50.9	23.9	68.3	68.3
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	2.8	2.8	1.0	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					23.0	23.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)					11	11		7	7		5	5
Act Effct Green (s)	37.2	28.3	28.3	19.0	47.1	47.1	64.2	55.2	55.2	83.0	70.0	70.0
Actuated g/C Ratio	0.26	0.20	0.20	0.13	0.32	0.32	0.44	0.38	0.38	0.57	0.48	0.48
v/c Ratio	0.03	0.58	0.95	1.21	0.16	0.32	0.56	0.69	0.42	0.88	1.16	0.02
Control Delay	29.0	59.3	69.6	166.5	36.6	6.2	39.3	41.5	7.1	58.4	114.1	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	0.0
Total Delay	29.0	59.3	69.6	166.5	36.6	6.2	39.3	41.5	7.1	58.4	114.1	0.1
LOS	C	E	E	F	D	A	D	D	A	E	F	A
Approach Delay		65.4			113.7			34.5			107.4	
Approach LOS		E			F			C			F	
Queue Length 50th (m)	2.1	57.0	80.7	~103.4	18.3	0.0	9.9	122.5	5.2	62.8	~366.1	0.0
Queue Length 95th (m)	6.4	84.6	#144.7	#141.2	35.6	19.1	#25.3	143.7	28.4	#109.1	#397.7	0.0
Internal Link Dist (m)		272.6			267.2			707.4			96.4	
Turn Bay Length (m)	70.0		70.0	140.0			135.0		80.0	180.0		50.0
Base Capacity (vph)	330	385	438	449	582	625	132	1606	706	368	2076	682
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	0.03	0.54	0.92	1.21	0.16	0.32	0.56	0.69	0.42	0.81	1.16	0.02

Intersection Summary

Area Type: Other

Cycle Length: 145

Actuated Cycle Length: 145

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
 1: Bronte Road & Upper Middle Road

2031 Future Total AM Peak Hour
 1354 Bronte

























Maximum v/c Ratio: 1.21	
Intersection Signal Delay: 84.8	Intersection LOS: F
Intersection Capacity Utilization 98.8%	ICU Level of Service F
Analysis Period (min) 15	
* User Entered Value	
~ 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.	

Splits and Phases: 1: Bronte Road & Upper Middle Road



HCM Signalized Intersection Capacity Analysis
1: Bronte Road & Upper Middle Road

2031 Future Total AM Peak Hour
1354 Bronte

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	203	390	529	88	196	72	1075	284	289	2343	13
Future Volume (vph)	11	203	390	529	88	196	72	1075	284	289	2343	13
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.96	1.00	1.00	0.96
Flpb, ped/bikes	0.99	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	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1640	1863	1556	3433	1792	1505	1719	4222	1423	1769	4302	1288
Flt Permitted	0.70	1.00	1.00	0.95	1.00	1.00	0.08	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)	1205	1863	1556	3433	1792	1505	137	4222	1423	188	4302	1288
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)	11	209	402	545	91	202	74	1108	293	298	2415	13
RTOR Reduction (vph)	0	0	116	0	0	136	0	0	170	0	0	7
Lane Group Flow (vph)	11	209	286	545	91	66	74	1108	123	298	2415	6
Confl. Peds. (#/hr)	11						11	5	7	7		5
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	9%	2%	2%	2%	6%	4%	5%	8%	7%	2%	6%	18%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Actuated Green, G (s)	33.3	30.7	30.7	19.0	47.1	47.1	59.3	52.8	52.8	78.1	67.6	67.6
Effective Green, g (s)	33.3	30.7	30.7	19.0	47.1	47.1	59.3	52.8	52.8	78.1	67.6	67.6
Actuated g/C Ratio	0.23	0.21	0.21	0.13	0.32	0.32	0.41	0.36	0.36	0.54	0.47	0.47
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	284	394	329	449	582	488	126	1537	518	333	2005	600
v/s Ratio Prot	0.00	0.11		c0.16	0.05		0.03	0.26		c0.13	c0.56	
v/s Ratio Perm	0.01		c0.18			0.04	0.21		0.09	0.35		0.00
v/c Ratio	0.04	0.53	0.87	1.21	0.16	0.13	0.59	0.72	0.24	0.89	1.20	0.01
Uniform Delay, d1	43.3	50.7	55.2	63.0	34.8	34.6	35.0	39.7	32.1	38.2	38.7	20.8
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	0.1	1.4	20.9	115.2	0.1	0.1	6.8	3.0	1.1	24.9	97.0	0.0
Delay (s)	43.4	52.1	76.1	178.2	34.9	34.7	41.9	42.7	33.2	63.0	135.7	20.8
Level of Service	D	D	E	F	C	C	D	D	C	E	F	C
Approach Delay (s)		67.5			128.1			40.8			127.2	
Approach LOS		E			F			D			F	
Intersection Summary												
HCM 2000 Control Delay			98.3									F
HCM 2000 Volume to Capacity ratio			1.12									
Actuated Cycle Length (s)			145.0							21.2		
Intersection Capacity Utilization			98.8%									F
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

2031 Future Total AM Peak Hour
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	0	63	169	0	95	21	1311	52	30	3421	7
Future Volume (vph)	21	0	63	169	0	95	21	1311	52	30	3421	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	15.0		0.0	15.0		15.0	15.0		15.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1583	0	1770	1583	0	1770	4471	1583	1770	4471	1583
Flt Permitted	0.645			0.713			0.038			0.127		
Satd. Flow (perm)	1201	1583	0	1328	1583	0	71	4471	1583	237	4471	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			74				24			19
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		42.5			50.2			458.5			731.4	
Travel Time (s)		3.1			3.6			27.5			43.9	
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
Adj. Flow (vph)	23	0	68	184	0	103	23	1425	57	33	3718	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	68	0	184	103	0	23	1425	57	33	3718	8
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

2031 Future Total AM Peak Hour
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	35.5	35.5		35.5	35.5		35.5	35.5	35.5	35.5	35.5	35.5
Total Split (s)	35.5	35.5		35.5	35.5		104.5	104.5	104.5	104.5	104.5	104.5
Total Split (%)	25.4%	25.4%		25.4%	25.4%		74.6%	74.6%	74.6%	74.6%	74.6%	74.6%
Maximum Green (s)	30.0	30.0		30.0	30.0		99.0	99.0	99.0	99.0	99.0	99.0
Yellow Time (s)	3.3	3.3		3.3	3.3		3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.2	2.2		2.2	2.2		1.8	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0		23.0	23.0		23.0	23.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	23.8	23.8		23.8	23.8		105.2	105.2	105.2	105.2	105.2	105.2
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.75	0.75	0.75	0.75	0.75	0.75
v/c Ratio	0.11	0.24		0.81	0.31		0.43	0.42	0.05	0.19	1.11	0.01
Control Delay	47.7	36.9		82.0	18.9		39.1	7.3	3.7	9.2	72.6	0.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	36.9		82.0	18.9		39.1	7.3	3.7	9.2	72.6	0.9
LOS	D	D		F	B		D	A	A	A	E	A
Approach Delay		39.6			59.4			7.6			71.9	
Approach LOS		D			E			A			E	
Queue Length 50th (m)	5.7	12.3		51.9	7.2		2.2	57.3	2.2	2.5	~516.7	0.0
Queue Length 95th (m)	13.8	25.8		77.2	23.5		#19.3	78.2	6.9	8.2	#560.1	0.8
Internal Link Dist (m)		18.5			26.2			434.5			707.4	
Turn Bay Length (m)	15.0			15.0			15.0		15.0	15.0		15.0
Base Capacity (vph)	257	354		284	397		53	3359	1195	177	3359	1194
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.19		0.65	0.26		0.43	0.42	0.05	0.19	1.11	0.01

Intersection Summary

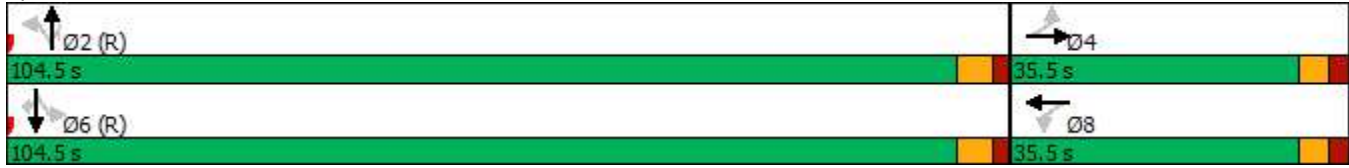
Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	85 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	150
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.11
Intersection Signal Delay:	53.6
Intersection LOS:	D
Intersection Capacity Utilization:	91.3%
ICU Level of Service:	F
Analysis Period (min):	15
* User Entered Value	

Lanes, Volumes, Timings
 2: Bronte Road & Saw Whet Boulevard

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 1354 Bronte

- ~ 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.

Splits and Phases: 2: Bronte Road & Saw Whet Boulevard



HCM Signalized Intersection Capacity Analysis
2: Bronte Road & Saw Whet Boulevard

2031 Future Total AM Peak Hour
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	0	63	169	0	95	21	1311	52	30	3421	7
Future Volume (vph)	21	0	63	169	0	95	21	1311	52	30	3421	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.85		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		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1583		1770	4471	1583	1770	4471	1583
Flt Permitted	0.65	1.00		0.71	1.00		0.04	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	1202	1583		1328	1583		71	4471	1583	236	4471	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	0	68	184	0	103	23	1425	57	33	3718	8
RTOR Reduction (vph)	0	16	0	0	61	0	0	0	6	0	0	2
Lane Group Flow (vph)	23	52	0	184	42	0	23	1425	51	33	3718	6
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	23.8	23.8		23.8	23.8		105.2	105.2	105.2	105.2	105.2	105.2
Effective Green, g (s)	23.8	23.8		23.8	23.8		105.2	105.2	105.2	105.2	105.2	105.2
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.75	0.75	0.75	0.75	0.75	0.75
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5
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)	204	269		225	269		53	3359	1189	177	3359	1189
v/s Ratio Prot		0.03			0.03			0.32			c0.83	
v/s Ratio Perm	0.02			c0.14			0.32		0.03	0.14		0.00
v/c Ratio	0.11	0.19		0.82	0.15		0.43	0.42	0.04	0.19	1.11	0.01
Uniform Delay, d1	49.2	49.9		56.0	49.5		6.4	6.3	4.5	5.0	17.4	4.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.4		20.1	0.3		23.8	0.4	0.1	2.3	53.1	0.0
Delay (s)	49.4	50.2		76.1	49.8		30.2	6.7	4.5	7.3	70.5	4.3
Level of Service	D	D		E	D		C	A	A	A	E	A
Approach Delay (s)		50.0			66.6			7.0			69.8	
Approach LOS		D			E			A			E	
Intersection Summary												
HCM 2000 Control Delay			52.6				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			1.05									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)				11.0	
Intersection Capacity Utilization			91.3%				ICU Level of Service				F	
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

2031 Future Total AM Peak Hour
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↔		↖		↗	↖	↗↗↗	↗	↖	↗↗↗	
Traffic Volume (vph)	1	0	1	161	0	65	0	1369	78	149	3479	0
Future Volume (vph)	1	0	1	161	0	65	0	1369	78	149	3479	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		40.0	35.0		30.0	70.0		0.0
Storage Lanes	0		0	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			20.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	0.91
Ped Bike Factor		0.99				0.98			0.98			
Frt		0.932				0.850			0.850			
Flt Protected		0.976		0.950						0.950		
Satd. Flow (prot)	0	1676	0	1530	0	1392	1863	4302	1439	1770	4385	0
Flt Permitted		0.976		0.950						0.118		
Satd. Flow (perm)	0	1676	0	1530	0	1369	1863	4302	1405	220	4385	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		83				67			85			
Link Speed (k/h)		20			20			60			60	
Link Distance (m)		78.7			109.0			218.2			458.5	
Travel Time (s)		14.2			19.6			13.1			27.5	
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	18%	2%	16%	2%	6%	10%	2%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6
Adj. Flow (vph)	1	0	1	166	0	67	0	1411	80	154	3587	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2	0	166	0	67	0	1411	80	154	3587	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1		1	1	2	1	1	2	
Detector Template	Left	Thru		Left		Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0		2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0		2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

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1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA		Prot		Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4		3				2		1	6	
Permitted Phases	4			3		8	2		2	6		
Detector Phase	4	4		3		8	2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0		10.0	15.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	24.2	24.2		9.5		35.2	34.9	34.9	34.9	9.5	34.9	
Total Split (s)	24.2	24.2		18.0		42.2	88.4	88.4	88.4	19.4	107.8	
Total Split (%)	16.1%	16.1%		12.0%		28.1%	58.9%	58.9%	58.9%	12.9%	71.9%	
Maximum Green (s)	18.0	18.0		13.5		36.0	82.5	82.5	82.5	15.4	101.9	
Yellow Time (s)	3.1	3.1		3.5		3.1	3.7	3.7	3.7	3.0	3.7	
All-Red Time (s)	3.1	3.1		1.0		3.1	2.2	2.2	2.2	1.0	2.2	
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.2		4.5		6.2	5.9	5.9	5.9	4.0	5.9	
Lead/Lag	Lag	Lag		Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.6	3.6	3.6	3.0	3.6	
Recall Mode	None	None		None		None	C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)						7.0	7.0	7.0	7.0		7.0	
Flash Dont Walk (s)						22.0	22.0	22.0	22.0		22.0	
Pedestrian Calls (#/hr)						0	0	0	0		0	
Act Effct Green (s)		10.0		13.5		15.0		109.4	109.4	124.8	122.9	
Actuated g/C Ratio		0.07		0.09		0.10		0.73	0.73	0.83	0.82	
v/c Ratio		0.01		1.21		0.34		0.45	0.08	0.55	1.00	
Control Delay		0.0		199.2		16.5		9.8	1.9	11.4	28.5	
Queue Delay		0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Total Delay		0.0		199.2		16.5		9.8	1.9	11.4	28.5	
LOS		A		F		B		A	A	B	C	
Approach Delay					146.6			9.4			27.8	
Approach LOS					F			A			C	
Queue Length 50th (m)		0.0		~63.1		0.0		58.5	0.0	6.0	328.3	
Queue Length 95th (m)		0.0		#113.1		14.2		118.3	6.4	21.1	#556.2	
Internal Link Dist (m)		54.7			85.0			194.2			434.5	
Turn Bay Length (m)						40.0			30.0	70.0		
Base Capacity (vph)		274		137		379		3136	1047	341	3591	
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		0.01		1.21		0.18		0.45	0.08	0.45	1.00	

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.21

Lanes, Volumes, Timings
 3: Bronte Road & Driveway/Charles Cornwall Road

2031 Future Total AM Peak Hour
 1354 Bronte

Intersection Signal Delay: 27.8 Intersection LOS: C

Intersection Capacity Utilization 108.5% ICU Level of Service G

Analysis Period (min) 15

* User Entered Value

~ 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.

Splits and Phases: 3: Bronte Road & Driveway/Charles Cornwall Road

Ø1 Ø2 (R)	Ø3 Ø4
19.4 s | 88.4 s	18 s | 24.2 s
Ø5 (R)	Ø8
107.8 s	42.2 s

HCM Signalized Intersection Capacity Analysis
 3: Bronte Road & Driveway/Charles Cornwall Road

2031 Future Total AM Peak Hour
 1354 Bronte



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↖		↗	↖	↑↑↑	↗	↖	↑↑↑	
Traffic Volume (vph)	1	0	1	161	0	65	0	1369	78	149	3479	0
Future Volume (vph)	1	0	1	161	0	65	0	1369	78	149	3479	0
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2		4.5		6.2		5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		1.00		1.00		*0.80	1.00	1.00	*0.80	
Frbp, ped/bikes		0.95		1.00		0.98		1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00		1.00		1.00		1.00	1.00	1.00	1.00	
Frt		0.93		1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected		0.98		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1614		1530		1364		4302	1406	1770	4385	
Flt Permitted		0.98		0.95		1.00		1.00	1.00	0.12	1.00	
Satd. Flow (perm)		1614		1530		1364		4302	1406	220	4385	
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)	1	0	1	166	0	67	0	1411	80	154	3587	0
RTOR Reduction (vph)	0	2	0	0	0	58	0	0	24	0	0	0
Lane Group Flow (vph)	0	0	0	166	0	9	0	1411	56	154	3587	0
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	2%	2%	18%	2%	16%	2%	6%	10%	2%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6
Turn Type	Perm	NA		Prot		Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4		3				2		1	6	
Permitted Phases	4			3		8	2		2	6		
Actuated Green, G (s)		2.0		13.5		20.0		104.4	104.4	117.9	117.9	
Effective Green, g (s)		2.0		13.5		20.0		104.4	104.4	117.9	117.9	
Actuated g/C Ratio		0.01		0.09		0.13		0.70	0.70	0.79	0.79	
Clearance Time (s)		6.2		4.5		6.2		5.9	5.9	4.0	5.9	
Vehicle Extension (s)		3.0		3.0		3.0		3.6	3.6	3.0	3.6	
Lane Grp Cap (vph)		21		137		181		2994	978	271	3446	
v/s Ratio Prot				c0.11				0.33		0.04	c0.82	
v/s Ratio Perm		0.00				c0.01			0.04	0.41		
v/c Ratio		0.00		1.21		0.05		0.47	0.06	0.57	1.04	
Uniform Delay, d1		73.0		68.2		56.7		10.3	7.2	6.9	16.0	
Progression Factor		1.00		1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0		144.7		0.1		0.5	0.1	2.7	27.4	
Delay (s)		73.0		213.0		56.8		10.8	7.3	9.7	43.4	
Level of Service		E		F		E		B	A	A	D	
Approach Delay (s)		73.0			168.1			10.7			42.0	
Approach LOS		E			F			B			D	
Intersection Summary												
HCM 2000 Control Delay			38.8								HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			1.08									
Actuated Cycle Length (s)			150.0							20.6		
Intersection Capacity Utilization			108.5%								ICU Level of Service	G
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2031 Future Total PM Peak Hour
1354 Bronte

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	74	114	254	155	252	325	2174	415	265	1355	19
Future Volume (vph)	7	74	114	254	155	252	325	2174	415	265	1355	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	70.0		70.0	140.0		0.0	135.0		80.0	180.0		50.0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (m)	65.0			100.0			70.0			70.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Ped Bike Factor	0.99		0.98			0.97			0.97			0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	3400	1863	1583	1770	4471	1558	1770	4385	1473
Flt Permitted	0.653			0.950			0.071			0.060		
Satd. Flow (perm)	1208	1863	1556	3400	1863	1544	132	4471	1517	112	4385	1433
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			147			268			235			148
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		296.6			291.2			731.4			120.4	
Travel Time (s)		17.8			17.5			43.9			7.2	
Confl. Peds. (#/hr)	6						6	1		1	1	1
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	4%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6
Adj. Flow (vph)	7	79	121	270	165	268	346	2313	441	282	1441	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	79	121	270	165	268	346	2313	441	282	1441	20
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.00	1.00	1.03
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

Lanes, Volumes, Timings
1: Bronte Road & Upper Middle Road

2031 Future Total PM Peak Hour
1354 Bronte



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	20.0	20.0	6.0	20.0	20.0
Minimum Split (s)	10.5	36.7	36.7	10.5	36.7	36.7	10.5	36.5	36.5	10.5	36.5	36.5
Total Split (s)	10.5	36.7	36.7	15.0	41.2	41.2	30.0	74.3	74.3	19.0	63.3	63.3
Total Split (%)	7.2%	25.3%	25.3%	10.3%	28.4%	28.4%	20.7%	51.2%	51.2%	13.1%	43.7%	43.7%
Maximum Green (s)	6.5	30.0	30.0	11.0	34.5	34.5	26.0	67.8	67.8	15.0	56.8	56.8
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	2.8	2.8	1.0	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					23.0	23.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)					6	6		1	1		1	1
Act Effct Green (s)	22.9	14.1	14.1	11.0	27.0	27.0	99.7	69.6	69.6	99.7	69.7	69.7
Actuated g/C Ratio	0.16	0.10	0.10	0.08	0.19	0.19	0.69	0.48	0.48	0.69	0.48	0.48
v/c Ratio	0.03	0.44	0.43	1.05	0.48	0.53	0.83	1.08	0.52	0.69	0.68	0.03
Control Delay	41.1	67.8	8.6	132.5	57.4	9.4	55.8	80.8	13.7	47.0	32.6	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	0.0
Total Delay	41.1	67.8	8.6	132.5	57.4	9.4	55.8	80.8	13.7	47.0	32.6	0.1
LOS	D	E	A	F	E	A	E	F	B	D	C	A
Approach Delay		32.3			68.0			68.4			34.6	
Approach LOS		C			E			E			C	
Queue Length 50th (m)	1.7	23.4	0.0	~45.5	45.3	0.0	76.4	~316.2	39.2	59.9	136.4	0.0
Queue Length 95th (m)	5.6	37.3	11.2	#76.2	67.7	25.1	#127.7	#363.2	73.9	#134.1	187.5	0.0
Internal Link Dist (m)		272.6			267.2			707.4			96.4	
Turn Bay Length (m)	70.0		70.0	140.0			135.0		80.0	180.0		50.0
Base Capacity (vph)	219	385	438	257	443	571	427	2145	850	410	2107	765
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	0.03	0.21	0.28	1.05	0.37	0.47	0.81	1.08	0.52	0.69	0.68	0.03

Intersection Summary

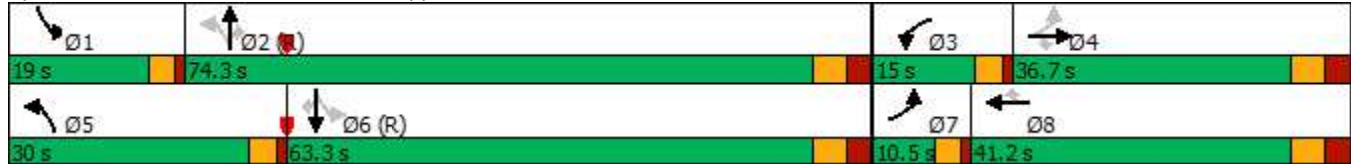
Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
 1: Bronte Road & Upper Middle Road

2031 Future Total PM Peak Hour
 1354 Bronte

























Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 56.8	Intersection LOS: E
Intersection Capacity Utilization 86.9%	ICU Level of Service E
Analysis Period (min) 15	
* User Entered Value	
~ 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.	

Splits and Phases: 1: Bronte Road & Upper Middle Road



HCM Signalized Intersection Capacity Analysis
1: Bronte Road & Upper Middle Road

2031 Future Total PM Peak Hour
1354 Bronte

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	7	74	114	254	155	252	325	2174	415	265	1355	19	
Future Volume (vph)	7	74	114	254	155	252	325	2174	415	265	1355	19	
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.97	
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	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1762	1863	1550	3400	1863	1542	1770	4471	1517	1770	4385	1434	
Flt Permitted	0.65	1.00	1.00	0.95	1.00	1.00	0.07	1.00	1.00	0.06	1.00	1.00	
Satd. Flow (perm)	1210	1863	1550	3400	1863	1542	132	4471	1517	112	4385	1434	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Adj. Flow (vph)	7	79	121	270	165	268	346	2313	441	282	1441	20	
RTOR Reduction (vph)	0	0	107	0	0	218	0	0	128	0	0	11	
Lane Group Flow (vph)	7	79	14	270	165	50	346	2313	313	282	1441	9	
Confl. Peds. (#/hr)	6					6	1		1	1		1	
Confl. Bikes (#/hr)			5			5			5			5	
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	4%	7%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	6	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases	4		4			8	2		2	6		6	
Actuated Green, G (s)	18.6	17.3	17.3	11.0	27.0	27.0	95.4	66.3	66.3	95.6	66.4	66.4	
Effective Green, g (s)	18.6	17.3	17.3	11.0	27.0	27.0	95.4	66.3	66.3	95.6	66.4	66.4	
Actuated g/C Ratio	0.13	0.12	0.12	0.08	0.19	0.19	0.66	0.46	0.46	0.66	0.46	0.46	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.5	6.5	4.0	6.5	6.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	160	222	184	257	346	287	415	2044	693	407	2008	656	
v/s Ratio Prot	0.00	0.04		c0.08	c0.09		c0.17	c0.52		0.14	0.33		
v/s Ratio Perm	0.01		0.01			0.03	0.38		0.21	0.32		0.01	
v/c Ratio	0.04	0.36	0.08	1.05	0.48	0.17	0.83	1.13	0.45	0.69	0.72	0.01	
Uniform Delay, d1	55.3	58.7	56.8	67.0	52.7	49.6	41.6	39.4	26.9	42.1	31.7	21.4	
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	0.1	1.0	0.2	70.0	1.0	0.3	13.4	66.0	2.1	5.0	2.2	0.0	
Delay (s)	55.4	59.7	56.9	137.0	53.7	49.9	55.1	105.4	29.1	47.1	34.0	21.5	
Level of Service	E	E	E	F	D	D	E	F	C	D	C	C	
Approach Delay (s)		57.9			84.3			88.9			36.0		
Approach LOS		E			F			F			D		
Intersection Summary													
HCM 2000 Control Delay			71.2		HCM 2000 Level of Service				E				
HCM 2000 Volume to Capacity ratio			0.97										
Actuated Cycle Length (s)			145.0		Sum of lost time (s)				21.2				
Intersection Capacity Utilization			86.9%		ICU Level of Service				E				
Analysis Period (min)			15										

c Critical Lane Group

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

2031 Future Total PM Peak Hour
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	32	104	0	59	52	2863	174	99	1656	19
Future Volume (vph)	11	0	32	104	0	59	52	2863	174	99	1656	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	15.0		0.0	15.0		15.0	15.0		15.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1583	0	1770	1583	0	1770	4471	1583	1770	4471	1583
Flt Permitted	0.715			0.734			0.090			0.039		
Satd. Flow (perm)	1332	1583	0	1367	1583	0	168	4471	1583	73	4471	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		55			59				55			19
Link Speed (k/h)		50			50			60				60
Link Distance (m)		42.5			50.2			458.5				731.4
Travel Time (s)		3.1			3.6			27.5				43.9
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
Adj. Flow (vph)	12	0	35	113	0	64	57	3112	189	108	1800	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	35	0	113	64	0	57	3112	189	108	1800	21
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1		6
Permitted Phases	4			8			2		2	6		6

Lanes, Volumes, Timings
2: Bronte Road & Saw Whet Boulevard

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	35.5	35.5		35.5	35.5		35.5	35.5	35.5	9.5	35.5	35.5
Total Split (s)	35.5	35.5		35.5	35.5		95.0	95.0	95.0	9.5	104.5	104.5
Total Split (%)	25.4%	25.4%		25.4%	25.4%		67.9%	67.9%	67.9%	6.8%	74.6%	74.6%
Maximum Green (s)	30.0	30.0		30.0	30.0		89.5	89.5	89.5	5.0	99.0	99.0
Yellow Time (s)	3.3	3.3		3.3	3.3		3.7	3.7	3.7	3.5	3.7	3.7
All-Red Time (s)	2.2	2.2		2.2	2.2		1.8	1.8	1.8	1.0	1.8	1.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	4.5	5.5	5.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	23.0	23.0		23.0	23.0		23.0	23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0		0	0
Act Effct Green (s)	16.9	16.9		16.9	16.9		96.9	96.9	96.9	113.1	112.1	112.1
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.69	0.69	0.69	0.81	0.80	0.80
v/c Ratio	0.07	0.15		0.69	0.26		0.49	1.01	0.17	0.57	0.50	0.02
Control Delay	52.5	6.2		79.0	16.7		9.2	22.0	0.5	38.1	5.6	1.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.5	6.2		79.0	16.7		9.2	22.0	0.5	38.1	5.6	1.7
LOS	D	A		E	B		A	C	A	D	A	A
Approach Delay		18.0			56.5			20.5			7.4	
Approach LOS		B			E			C			A	
Queue Length 50th (m)	3.2	0.0		32.1	1.3		1.5	~403.7	1.4	13.8	61.2	0.1
Queue Length 95th (m)	9.3	5.2		51.4	15.0		m2.5 m#4	15.0	m1.8	36.2	91.2	2.2
Internal Link Dist (m)		18.5			26.2			434.5			707.4	
Turn Bay Length (m)	15.0			15.0			15.0		15.0	15.0		15.0
Base Capacity (vph)	285	382		292	385		116	3094	1112	189	3580	1271
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.09		0.39	0.17		0.49	1.01	0.17	0.57	0.50	0.02

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 17.1
 Intersection Capacity Utilization 86.1%
 Analysis Period (min) 15
 * User Entered Value

Intersection LOS: B
 ICU Level of Service E

- ~ 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.

Splits and Phases: 2: Bronte Road & Saw Whet Boulevard



HCM Signalized Intersection Capacity Analysis
2: Bronte Road & Saw Whet Boulevard

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↑↑↑	↔	↔	↑↑↑	↔
Traffic Volume (vph)	11	0	32	104	0	59	52	2863	174	99	1656	19
Future Volume (vph)	11	0	32	104	0	59	52	2863	174	99	1656	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	4.5	5.5	5.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.85		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		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1583		1770	4471	1583	1770	4471	1583
Flt Permitted	0.72	1.00		0.73	1.00		0.09	1.00	1.00	0.04	1.00	1.00
Satd. Flow (perm)	1332	1583		1368	1583		168	4471	1583	73	4471	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	0	35	113	0	64	57	3112	189	108	1800	21
RTOR Reduction (vph)	0	31	0	0	52	0	0	0	17	0	0	4
Lane Group Flow (vph)	12	4	0	113	12	0	57	3112	172	108	1800	17
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	16.9	16.9		16.9	16.9		96.9	96.9	96.9	112.1	112.1	112.1
Effective Green, g (s)	16.9	16.9		16.9	16.9		96.9	96.9	96.9	112.1	112.1	112.1
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.69	0.69	0.69	0.80	0.80	0.80
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	4.5	5.5	5.5
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)	160	191		165	191		116	3094	1095	188	3579	1267
v/s Ratio Prot		0.00			0.01			c0.70		0.04	c0.40	
v/s Ratio Perm	0.01			c0.08			0.34		0.11	0.41		0.01
v/c Ratio	0.07	0.02		0.68	0.06		0.49	1.01	0.16	0.57	0.50	0.01
Uniform Delay, d1	54.6	54.3		59.0	54.5		10.1	21.5	7.4	45.8	4.7	2.8
Progression Factor	1.00	1.00		1.00	1.00		0.30	0.44	0.06	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0		11.2	0.1		4.2	10.1	0.1	4.2	0.5	0.0
Delay (s)	54.8	54.3		70.2	54.7		7.3	19.6	0.6	50.0	5.2	2.8
Level of Service	D	D		E	D		A	B	A	D	A	A
Approach Delay (s)		54.4			64.6			18.4			7.6	
Approach LOS		D			E			B			A	

Intersection Summary

HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙		↗	↙	↕	↗	↙	↕	↗
Traffic Volume (vph)	0	0	0	138	0	110	1	3038	175	89	1754	0
Future Volume (vph)	0	0	0	138	0	110	1	3038	175	89	1754	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		40.0	35.0		30.0	70.0		0.0
Storage Lanes	0		0	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			20.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	0.91
Ped Bike Factor						0.98			0.98			
Frt						0.850			0.850			
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	1863	0	1770	0	1583	1770	4427	1388	1770	4385	0
Flt Permitted				0.757			0.085			0.040		
Satd. Flow (perm)	0	1863	0	1410	0	1556	158	4427	1357	75	4385	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						64			56			
Link Speed (k/h)		20			20			60			60	
Link Distance (m)		78.7			109.0			218.2			458.5	
Travel Time (s)		14.2			19.6			13.1			27.5	
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	14%	2%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6
Adj. Flow (vph)	0	0	0	142	0	113	1	3132	180	92	1808	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	142	0	113	1	3132	180	92	1808	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1		1	1	2	1	1	2	
Detector Template	Left	Thru		Left		Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0		2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0		2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
3: Bronte Road & Driveway/Charles Cornwall Road

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type				Perm		Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	4	4		8		8	2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0	15.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	24.2	24.2		35.2		35.2	34.9	34.9	34.9	9.5	34.9	
Total Split (s)	35.2	35.2		35.2		35.2	95.3	95.3	95.3	9.5	104.8	
Total Split (%)	25.1%	25.1%		25.1%		25.1%	68.1%	68.1%	68.1%	6.8%	74.9%	
Maximum Green (s)	29.0	29.0		29.0		29.0	89.4	89.4	89.4	5.5	98.9	
Yellow Time (s)	3.1	3.1		3.1		3.1	3.7	3.7	3.7	3.0	3.7	
All-Red Time (s)	3.1	3.1		3.1		3.1	2.2	2.2	2.2	1.0	2.2	
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.2		6.2		6.2	5.9	5.9	5.9	4.0	5.9	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.6	3.6	3.6	3.0	3.6	
Recall Mode	None	None		None		None	C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)				7.0		7.0	7.0	7.0	7.0		7.0	
Flash Dont Walk (s)				22.0		22.0	22.0	22.0	22.0		22.0	
Pedestrian Calls (#/hr)				0		0	0	0	0		0	
Act Effct Green (s)				19.3		19.3	96.4	96.4	96.4	110.5	108.6	
Actuated g/C Ratio				0.14		0.14	0.69	0.69	0.69	0.79	0.78	
v/c Ratio				0.73		0.42	0.01	1.03	0.19	0.58	0.53	
Control Delay				78.3		28.9	9.0	46.4	6.6	36.3	6.5	
Queue Delay				0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay				78.3		28.9	9.0	46.4	6.6	36.3	6.5	
LOS				E		C	A	D	A	D	A	
Approach Delay					56.4			44.2			7.9	
Approach LOS					E			D			A	
Queue Length 50th (m)				40.2		12.9	0.1	~407.5	11.6	11.7	65.9	
Queue Length 95th (m)				61.1		30.9	0.9	#459.9	24.5	#33.1	95.3	
Internal Link Dist (m)		54.7			85.0			194.2			434.5	
Turn Bay Length (m)						40.0	35.0		30.0	70.0		
Base Capacity (vph)				292		373	108	3048	951	158	3400	
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				0.49		0.30	0.01	1.03	0.19	0.58	0.53	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 103.6 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.03

Lanes, Volumes, Timings
 3: Bronte Road & Driveway/Charles Cornwall Road

2031 Future Total PM Peak Hour
 1354 Bronte






















Intersection Signal Delay: 32.2	Intersection LOS: C
Intersection Capacity Utilization 82.9%	ICU Level of Service E
Analysis Period (min) 15	
* User Entered Value	
~ 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.	

Splits and Phases: 3: Bronte Road & Driveway/Charles Cornwall Road



HCM Signalized Intersection Capacity Analysis
 3: Bronte Road & Driveway/Charles Cornwall Road

2031 Future Total PM Peak Hour
 1354 Bronte

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	0	0	0	138	0	110	1	3038	175	89	1754	0		
Future Volume (vph)	0	0	0	138	0	110	1	3038	175	89	1754	0		
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Total Lost time (s)				6.2		6.2	5.9	5.9	5.9	4.0	5.9			
Lane Util. Factor				1.00		1.00	1.00	*0.80	1.00	1.00	*0.80			
Frbp, ped/bikes				1.00		0.98	1.00	1.00	0.98	1.00	1.00			
Flpb, ped/bikes				1.00		1.00	1.00	1.00	1.00	1.00	1.00			
Frt				1.00		0.85	1.00	1.00	0.85	1.00	1.00			
Flt Protected				0.95		1.00	0.95	1.00	1.00	0.95	1.00			
Satd. Flow (prot)				1770		1552	1770	4427	1357	1770	4385			
Flt Permitted				0.76		1.00	0.08	1.00	1.00	0.04	1.00			
Satd. Flow (perm)				1410		1552	158	4427	1357	74	4385			
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97		
Adj. Flow (vph)	0	0	0	142	0	113	1	3132	180	92	1808	0		
RTOR Reduction (vph)	0	0	0	0	0	55	0	0	17	0	0	0		
Lane Group Flow (vph)	0	0	0	142	0	58	1	3132	163	92	1808	0		
Confl. Bikes (#/hr)			5			5			5			5		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	14%	2%	4%	2%		
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	6		
Turn Type				Perm		Perm	Perm	NA	Perm	pm+pt	NA			
Protected Phases		4						2		1	6			
Permitted Phases	4			8		8	2		2	6				
Actuated Green, G (s)				19.3		19.3	96.4	96.4	96.4	108.6	108.6			
Effective Green, g (s)				19.3		19.3	96.4	96.4	96.4	108.6	108.6			
Actuated g/C Ratio				0.14		0.14	0.69	0.69	0.69	0.78	0.78			
Clearance Time (s)				6.2		6.2	5.9	5.9	5.9	4.0	5.9			
Vehicle Extension (s)				3.0		3.0	3.6	3.6	3.6	3.0	3.6			
Lane Grp Cap (vph)				194		213	108	3048	934	156	3401			
v/s Ratio Prot								c0.71		0.03	c0.41			
v/s Ratio Perm				c0.10		0.04	0.01		0.12	0.42				
v/c Ratio				0.73		0.27	0.01	1.03	0.17	0.59	0.53			
Uniform Delay, d1				57.9		54.1	6.8	21.8	7.7	43.2	6.0			
Progression Factor				1.00		1.00	1.00	1.00	1.00	1.05	0.90			
Incremental Delay, d2				13.3		0.7	0.2	23.9	0.4	5.0	0.5			
Delay (s)				71.2		54.7	7.0	45.7	8.1	50.2	5.9			
Level of Service				E		D	A	D	A	D	A			
Approach Delay (s)		0.0			63.9			43.6			8.1			
Approach LOS		A			E			D			A			
Intersection Summary														
HCM 2000 Control Delay			32.2									HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio			0.95											
Actuated Cycle Length (s)			140.0							16.1				
Intersection Capacity Utilization			82.9%										ICU Level of Service	E
Analysis Period (min)			15											
c	Critical Lane Group													