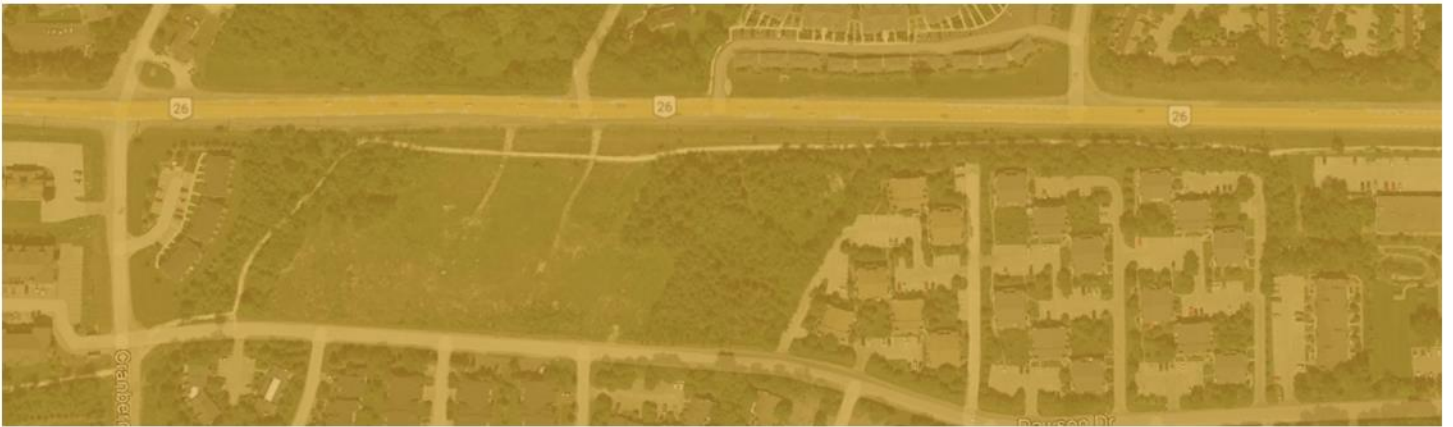




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# 11283 Highway 26

**TRAFFIC IMPACT BRIEF**

1655570 Ontario Inc.

# Document Control

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# Document Contents

- 1 Introduction ..... 1**
- 2 Existing Conditions..... 2**
  - 2.1 Road Network ..... 2
  - 2.2 Transit Network ..... 3
  - 2.3 Active Transportation Network..... 3
  - 2.4 Traffic Volumes ..... 4
  - 2.5 Traffic Operations ..... 5
- 3 Proposed Development ..... 8**
  - 3.1 Location & Land-Use ..... 8
  - 3.2 Site Access..... 8
  - 3.3 Site Circulation..... 9
  - 3.4 Site Parking ..... 10
  - 3.5 Site Traffic..... 11
- 4 Future Conditions ..... 13**
  - 4.1 Road Network ..... 13
  - 4.2 Traffic Volumes ..... 13
  - 4.3 Traffic Operations ..... 14
  - 4.4 Turn Lane Requirements ..... 17
- 5 Summary..... 18**



**Tables**

Table 1: 2022 Road Section Operations ..... 5

Table 2: 2022 Intersection Operations..... 6

Table 3: Sight Line Assessment ..... 9

Table 4: Trip Rates ..... 11

Table 5: Trip Estimates..... 11

Table 6: 2026 Road Section Operations ..... 14

Table 7: 2031 Road Section Operations ..... 15

Table 8: 2026 Intersection Operations..... 16

Table 9: 2031 Intersection Operations..... 16

**Figures**

Figure 1: Site Location ..... 19

Figure 2: Area Road Network ..... 21

Figure 3: Area Transit Network ..... 25

Figure 4: Area Trails Network ..... 26

Figure 5: 2019 Traffic Volumes ..... 27

Figure 6: 2022 Traffic Volumes ..... 28

Figure 7: Site Plan ..... 29

Figure 8: Site Access Sight Lines..... 30

Figure 9: Site Traffic Volumes..... 31

Figure 10: 2026 Traffic Volumes ..... 32

Figure 11: 2031 Traffic Volumes ..... 33

**Appendices**

- Appendix A: Traffic Counts
- Appendix B: Level of Service Definitions
- Appendix C: 2022 Intersection Operations
- Appendix D: Collingwood Transportation Study Update Excerpts
- Appendix E: 2026 Intersection Operations
- Appendix F: 2031 Intersection Operations



# 1 Introduction

Tatham Engineering Limited was retained by 1655570 Ontario Inc to prepare a Traffic Impact Brief in support of the proposed townhouse condominium development in the Town of Collingwood. The location of the development site is illustrated in Figure 1.

Recognizing that the trip generation associated with the proposed development will not be significant, the scope of the study has been limited to a traffic impact brief with a focus on the following:

- existing conditions, including a description of the study area road network, traffic volumes, operations and planned/proposed improvements;
- details of the proposed development and anticipated trip generation;
- on-site circulation and parking provision; and
- transportation impacts associated with the proposed development.



## 2 Existing Conditions

This chapter will describe the road network, traffic volumes and operations for the existing conditions.

### 2.1 ROAD NETWORK

The road network to be addressed by this study consists of Highway 26, Dawson Drive, Cranberry Trail East, Keith Avenue and Harbour Street West, and their respective intersections. Photographs of the road system are provided in Figure 2.

#### 2.1.1 Road Sections

##### Highway 26

Highway 26 is a provincial highway providing a major travel corridor to/from and through the Town of Collingwood. Despite being a highway, Highway 26 is under the jurisdiction of the Town within the Town limits. Through the study area, the number of travel lanes varies with the general arrangements as follows (for the purpose of this study, Highway 26 is considered to be oriented north-south through the study area):

- 4 lanes (2 per direction) from south of Harbour Street West to approximately 130 metres north of Harbour Street West;
- 2 lanes (1 per direction) from 130 metres north of Harbour Street West to Trott Boulevard; and
- 3 lanes (1 per direction + a centre turn lane) from Trott Boulevard to beyond Cranberry Trail East.

Highway 26 has a posted speed limit of 60 km/h and as an arterial road, has a planning capacity of 900 vehicles per hour per lane (vphpl) as per the *Collingwood Transportation Study Update*<sup>1</sup>.

##### Harbour Street West

Harbour Street West is a collector road as per the Town of Collingwood's *Official Plan*. It provides 1 lane per direction within a semi-urban cross-section. The capacity of Harbour Street West, given its collector status, is 700 vphpl as per the *Collingwood Transportation Study Update*. The speed limit on Harbour Street West is assumed 50 km/h as it is not otherwise posted (within the

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<sup>1</sup> *Collingwood Transportation Study Update*. RJ Burnside & Associates Limited, August 2019.



Town limit, speed limits are 50 km/h unless otherwise posted). An orientation of east-west is referenced in this report.

### **Cranberry Trail East, Dawson Drive & Keith Avenue**

Cranberry Trail East, Dawson Drive and Keith Avenue are all local roads as per the Town's *Official Plan* (albeit it is noted that Cranberry Trail East is identified as a future collector, subject to its continued extension and connection with Cranberry Trail West). They each provide 1 lane per direction within a semi-urban or rural cross-section (no curb and gutter). Cranberry Trail East has a 50 km/h posted speed limit, whereas Dawson Drive and Keith Avenue are posted 40 km/h. As local roads, the assumed capacities are 400 vphpl for each.

#### **2.1.2 Intersections**

The respective intersections and their configurations are illustrated in Figure 2. All intersections operate under stop control with the exception of the Harbour Street West/Balsam Street intersection with Highway 26 which operates under signal control. It is noted that the Harbour Street and Balsam Street approaches were recently reconstructed to include a left turn lane and through-right lane on each approach which are not otherwise captured in the noted figure.

## **2.2 TRANSIT NETWORK**

In the area of the subject site, the Town of Collingwood (Colltrans) operates the Crosstown route along Highway 26 (northbound direction) and Dawson Drive (southbound direction) as illustrated in Figure 3. Bus stops are provided at the following locations:

- on Highway 26 at Trott Boulevard for northbound service (approximately 225 metre walking distance from the centre of the development); and
- on Dawson Drive at the south leg of Oxbow Crescent for southbound service (approximately 300 metre walking distance from the centre of the development).

The Crosstown route provides service throughout the Town, including connections to the remaining transit routes serving the Town and immediate areas (including Wasaga Beach and Blue Mountain) via the Main Terminal. In consideration of this, and the proximity of the noted bus stops, the proposed site is considered to be well served by the existing area transit system.

## **2.3 ACTIVE TRANSPORTATION NETWORK**

As evident in the aerial photograph of Figure 2 and the excerpt of the Collingwood Trails map provided in Figure 4, there is a multi-use trail along the west side of Highway 26 with runs parallel to the road, extending from Harbour Street West to Cranberry Trail East (the trail deviates from Highway 26 towards Dawson Drive approximately 120 metres south of Cranberry Trail East).



Beyond Cranberry Trail East to the north, the trail continues through the Cranberry development lands, with connections to the broader Town-wide trail system. Likewise, to the south of Harbour Street, the trail continues (albeit on the east side of Highway 26) providing access to the built area of the Town and areas beyond through the Town trail and sidewalk system).

There are no existing sidewalks with the exception of Harbour Street West, which has a sidewalk on its south side that was recently constructed as part of the Balmoral Place development. There are also paved shoulders delineated on approximately 700 metres of Dawson Drive, which constitutes approximately 70% of its 1000 metre length. Both Dawson Drive and Harbour Street West are designated as on-road bicycle routes (refer to Figure 4).

Given the extent of active transportation facilities within the immediate area, residents of the subject development will be afforded ample opportunities.

## 2.4 TRAFFIC VOLUMES

In consideration of the scope of work, new traffic counts through the study area were not undertaken. Rather, 2019 traffic volumes, reflective of summer conditions, were obtained from the *Collingwood Transportation Study Update*<sup>2</sup> which included consideration for the intersections of Highway 26 with Harbour Street West and Cranberry Trail East (it is noted that traffic counts were completed in December 2018 and subsequently increased by 5% to reflect 2019 summer conditions). The corresponding 2019 summer AM and PM weekday peak hour traffic volumes are illustrated in Figure 5 with additional count details provided in Appendix A.

Traffic projections for the 2022 horizon (representative of existing conditions) at the Harbour Street West and Cranberry Trail East intersections have been established in consideration of the 2019 and 2031 projections as employed in the *Collingwood Transportation Study Update* and assuming a constant and uniform growth rate over the respective 12 year period (ie. the 2022 volumes were interpolated from the 2019 and 2031 volumes). As traffic counts/data were not available for the intersection of Highway 26 with Keith Avenue (and new counts were not deemed necessary given the time of year and scope of study), such were estimated based on the volumes at the adjacent upstream and downstream intersections, and ensuring the volumes along Highway 26 remain balanced. The resulting 2022 traffic volumes are illustrated in Figure 6.

The remaining study area intersections (namely Dawson Drive with Cranberry Trail East, Keith Avenue and Harbour Street West) are minor intersections, serving local traffic, and thus have not been considered in context of the traffic volumes that they serve. Furthermore, as addressed in

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<sup>2</sup> *Collingwood Transportation Study Update*. RJ Burnside and Associates Limited, August 2019.





Section 3.5, the additional volumes to be generated by the subject development that will travel through these intersections will be limited.

## 2.5 TRAFFIC OPERATIONS

### 2.5.1 Road Section Operations

As previously noted, the following lane capacities have been assumed for the adjacent road network for the purpose of this study:

- Highway 26 – 900 vphpl (arterial road);
- Harbour Street West – 700 vphpl (collector road); and
- Cranberry Trail East – 400 vphpl (local road).

The existing road section operations are summarized in Table 1, reflective of the peak directional volumes during each of the noted peak hours. For Highway 26, the assessment considers the critical highway section through which 1 lane per direction is provided (ie. from Trott Boulevard to north of Harbour Street West); a centre turn lane is provided north of Trott Boulevard whereas 2 lanes per direction are provided in the area of Harbour Street West and to the south.

**Table 1: 2022 Road Section Operations**

ROAD SECTION & LANES PER DIRECTION		CAPACITY <sup>1</sup>		TRAFFIC VOLUMES		VOLUME TO CAPACITY	
		NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
Highway 26	1	900	900	806	729	0.90	0.81
Harbour Street West	1	700	700	185	137	0.26	0.20
Cranberry Trail East	1	400	400	75	81	0.19	0.20

<sup>1</sup> capacity is noted as vehicles per hour per direction

As indicated, Highway 26 is currently operating at 90% of its available capacity through the 2-lane section, whereas Harbour Street West and Cranberry Trail East are operating at less than 30% capacity. In context of this, no improvements are required to address capacity under existing conditions.

### 2.5.2 Intersection Operations

The operations of the Highway 26 intersections have also been reviewed based on:

- the 2022 traffic volumes;
- the existing intersection configuration and control; and



- procedures outlined in the *2000 Highway Capacity Manual*<sup>3</sup> (using Synchro v.10 software).

The review considers the following metrics (for each approach and the overall intersection for signalized intersections and for the stop controlled movements at unsignalized intersections):

- average delay (measured in seconds);
- level of service (LOS) - level of service 'A' corresponds to the best operating condition with minimal delays whereas level of service 'F' corresponds to poor operations resulting from high intersection delays (level of service definitions are provided in Appendix B); and
- volume to capacity (v/c) ratios - a v/c ratio of less than 1.0 indicates the intersection movement/approach is operating at less than capacity while v/c of 1.0 indicates capacity has been reached.

Results of the operations assessment are summarized in Table 2; whereas detailed operations worksheets for the existing traffic conditions are included in Appendix C.

**Table 2: 2022 Intersection Operations**

INTERSECTION, CONTROL & MOVEMENT			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Highway 26 & Harbour Street W	signal	SB	13	B	0.59	11	B	0.50
		NB	14	B	0.70	18	B	0.84
		EB	10	B	0.08	15	B	0.13
		WB	10	B	0.11	16	B	0.25
	overall	13	B	0.43	15	B	0.64	
Highway 26 & Keith Avenue	stop	EB LR	40	E	0.41	<b>127</b>	<b>F</b>	0.88
Highway 26 & Cranberry Trail E	stop	EB LTR	16	C	0.22	18	C	0.22
	stop	WB LTR	18	C	0.10	23	C	0.16

L left lane    T through lane    R right lane    LT left-through    TR through-right    LTR left-through-right

<sup>3</sup> *Highway Capacity Manual*. Transportation Research Board. Washington DC, 2000.



As shown, the signalized intersection of Highway 26 with Harbour Street West will provide good levels of service (B) with minimal delays (18 seconds or less) during both the AM and PM peak hours.

Similarly, good operations are provided at the Cranberry Trail East intersection (level of service C) during both peak hours, with the stop controlled movements operating at 22% of available capacity or less.

At the intersection of Keith Avenue with Highway 26, acceptable operations are provided in the AM peak hour. However, during the PM peak, a level of service F will result (which is typically considered unacceptable). This occurs primarily due to the increased volumes on Highway 26 and the difficulty in completing left turns from Keith Avenue. During this period, left turning motorists can utilize the adjacent intersections of Harbour Street West or Cranberry Trail East (both of which have excess capacity) to access Highway 26, improving operations at Keith Avenue. In this regard, no improvements are considered necessary (while traffic signals would ensure improved operations, such would not be considered given the proximity to the Harbour Street West traffic signals).



## 3 Proposed Development

This section will provide additional details with respect to the proposed development, including its location, the projected site generated traffic volumes and the assignment of such to the adjacent road network.

### 3.1 LOCATION & LAND-USE

The subject site is located at 11283 Highway 26 in the Town of Collingwood (as per Figure 1). The property is bound by:

- Highway 26 to the east;
- Dawson Drive to the west;
- the Waterstone development to the north (68 condominium townhouse units); and
- existing residential development to the south.

The proposed development will consist of 33 townhouse residential units as detailed in the site plan provided in Figure 7. Full build-out is assumed by 2026.

### 3.2 SITE ACCESS

#### 3.2.1 Access Location & Configuration

The site will be served by a 7.2 metre wide condominium road with access to Dawson Drive; no access to Highway 26 is proposed. The access will be located approximately 65 metres south of the intersection of Dawson Drive with Fairway Crescent/Winters Crescent (both private condo roads on the west and east side of Dawson Drive respectively) and 80 metres north of the Oxbow Crescent intersection (measured centreline to centreline).

As per the Town's zoning By-law, the entrance width for group or cluster dwellings, including a private road for a plan of condominium, shall be a minimum of 7.5 metres (as measured at the property line). As per the site plan, the condominium road widens from 7.2 to 7.5 metres upon approach to Dawson Drive to satisfy the noted requirement.

#### 3.2.2 Access Spacing

Along a local road, the Transportation Association of Canada's (TAC) *Geometric Design Guide for Canadian Roads* suggests a spacing of 15 metres between a driveway/laneway and an existing intersection (measured edge of driveway/laneway to edge of intersection). The guidelines further suggest a spacing of 40 metres between adjacent T intersections and 60 metres



between standard intersections (should the site access be considered an intersection as opposed to a driveway). In all cases, the spacing as proposed meets the TAC guidelines.

### 3.2.3 Access Sightlines

An analysis of the available sight lines at the site access has been undertaken considering both minimum stopping sight distance and intersection sight distance as per TAC guidelines and defined below.

- Minimum stopping sight distance provides sufficient distance for an approaching motorist to observe a hazard in the road and bring their vehicle to a complete stop prior to the hazard.
- Intersection sight distance allows a vehicle to enter a main road from a side street (or site access) and attain the appropriate operating speed without significantly impacting the operating speed of an approaching vehicle.

The corresponding sight distance requirements are provided in Table 3, corresponding to a design speed of 50 km/h (10 km/h over the posted speed of 40 km/h on Dawson Drive). Similarly, the available sight distances are also noted (and further evident in the photos of Figure 8). As Dawson Drive is relatively straight and flat through to the north, the sight lines extend to Cranberry Trail East, a distance of approximately 300 metres. To the south, there is a slight S bend in the road, which limits visibility to approximately 150 metres. In both directions, the available sight lines exceed the requirements for a design speed of 50 km/h (in fact, they meet the requirements for a design speed in excess of 80 km/h). In this regard, the site access location is considered appropriate without the need for sight line improvements.

**Table 3: Sight Line Assessment**

ACCESS	DESIGN SPEED	STOPPING SIGHT DISTANCE	INTERSECTION SIGHT DISTANCE		SIGHT DISTANCE TO/FROM	
			Left Turn	Right Turn	North	South
Site Access	50 km/h	65 m	105 m	95 m	>300 m	150 m

## 3.3 SITE CIRCULATION

### 3.3.1 Vehicle Circulation

As noted, the internal road system will have a width of 7.2 metres which will readily accommodate travel in both directions. The road will have a number of branches, each with a dead-end. While dedicated turnaround facilities (eg. cul-de-sac or hammerhead) are not proposed at the end of each branch, passenger vehicles can complete a 3-point turn as required within the road width. As the development will be a private condominium development with no connection to adjacent



properties, there will be no through traffic and minimal traffic not otherwise associated with residents.

Circulation by emergency and refuse collection vehicles will also be accommodated within the site; vehicles can use the internal intersections to complete any required turn manoeuvres. A Molok refuse collection system will be utilized (as noted on the site plan in Figure 7) which provides flexibility with respect to the manner in which waste is loaded into the vehicle (such does not require front or rear loading access).

### **3.3.2 Pedestrian & Bicycle Circulation**

As evident in the site plan (Figure 7) a 1.5 metre sidewalk will be provided along the south side of the internal access road and around the visitor parking area to accommodate pedestrian travel through the site. Further connections will be provided to a series of internal paths/courtyard system serving all but the 5 units with frontage on Dawson Drive (these units will have direct pedestrian access to the proposed sidewalk to be constructed along the east side of Dawson Drive. There will also be 2 points of connection to the existing Cranberry Trail along the west side of Highway 26, one at each end of the development site.

Cyclists are expected to utilize the internal road system and pathway system for access to Dawson Drive (paved shoulders) or the Cranberry Inn Trail. Bicycle parking will also be provided at 3 designated locations within the site, accommodating a total of 18 bicycles.

### **3.4 SITE PARKING**

As per the Town's zoning by-law, a residential townhouse must provide 2 parking spaces per unit. When considering a group or cluster of residential units (defined as 2 or more detached residential buildings on the same lot), an additional 0.25 parking spaces per unit are required for visitor parking.

Each residential unit will be provided with 2 parking spaces integral to each townhouse unit. In addition, 9 visitor parking spaces will be provided to address the associated requirements ( $33 \text{ units} \times 0.25 \text{ spaces/unit} = 8.25 \text{ spaces}$  which is rounded up to 9 spaces). One space will be designated as an accessible parking space. For a parking supply of 9 spaces, the Town's zoning by-law requires a minimum of 1 accessible space (which is satisfied).

All standard parking spaces are to be 2.8 x 6.0 metres, as per the zoning by-law. The accessible space will be 4.9 x 7.0 metres, thus exceeding the municipal requirement of 4.5 x 7.0 metres.



### 3.5 SITE TRAFFIC

#### 3.5.1 Trip Generation

The number of vehicle trips to be generated by the proposed development for the weekday AM and PM peak hours has been determined based on type of use, development size and trip generation rates as per the *ITE Trip Generation Manual, 10<sup>th</sup> Edition*. Based on the proposed development, trip rates for the following ITE land use category has been employed:

- *multifamily housing -low-rise (1 or 2 storey) - ITE code 220.*

The associated trip rates and trip estimates are provided in Table 4 and Table 5 respectively. As indicated, the proposed development is expected to generate 15 trips during the AM peak hour and 19 trips during the PM peak hour, which is considered minor.

**Table 4: Trip Rates**

LAND USE	VARIABLE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		In	Out	Total	In	Out	Total
multifamily housing - low-rise (ITE 220)	units	0.11	0.35	0.46	0.35	0.21	0.56

**Table 5: Trip Estimates**

LAND USE	UNITS	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		In	Out	Total	In	Out	Total
Townhouses	33 units	3	12	15	12	7	19

#### 3.5.2 Trip Distribution & Assignment

Given the proximity of the development to the Town of Collingwood, and in consideration of other urban areas in proximity to the site, it is assumed that the majority of travel will be oriented to/from south (ie. into Town). For purposes of this assessment, the following distribution has been assumed:

- 25% to/from the north via Highway 26; and
- 75% to/from the south via Highway 26.

For travel to/from the north, all traffic is expected to use the Cranberry Trail East intersection with Highway 26. For travel to/from the south, traffic can utilize either Keith Avenue or Harbour Street West (as the latter operates under signal control, it may be favoured to some).



The resulting site generated traffic assigned to the road network is illustrated in Figure 9. As evident, an equal utilization of Keith Avenue and Harbour Street West for travel to/from the south has been assumed (given the projected volumes, should all traffic use one intersection or the other, the change in volumes will be relatively minor).





## 4 Future Conditions

This chapter will address the resulting impacts of the proposed development on the adjacent road system. The following areas are to be addressed:

- operations at the study area road system and site access; and
- potential improvements to the study area road network, if necessary.

For the purpose of this study, 2026 and 2031 horizons have been considered to assess the impact of the development on the road network - 2026 represents assumed full build-out of the site, whereas 2031 reflects a further 5-year horizon (also coinciding with a future horizon year as considered in the *Collingwood Transportation Study Update*).

### 4.1 ROAD NETWORK

The *Collingwood Transportation Study Update* identifies the need for the following road system improvements:

- Cranberry Trail East & Highway 26
  - addition of traffic signals and left turn lanes on Cranberry Trail East and Gun Club Road for the medium term (2031)
- Harbour Street West & Highway 26
  - addition of left turn lanes on Highway 26 in both directions for the long term (2041)
- Highway 26
  - widening of Highway 26 to provide 2 lanes per direction plus a centre turn lane from Harbour Street West to the west Town limits for the long term (2041)

While the traffic signals at the Cranberry Trail East intersection have been identified within the time horizon considered for this study, such has not been considered unless otherwise dictated by the traffic operations (ie. signals will only be considered if unacceptable operations will result under the existing stop controlled intersection control). The other improvements are outside of the horizon year for this study and thus have not been considered.

### 4.2 TRAFFIC VOLUMES

Traffic volumes for the 2026 and 2031 horizon years have been determined from volume projections as provided in the *Collingwood Transportation Study Update*, which considered the following:



- an annual background growth rate of 0.5%; and
- development specific growth associated with approximately 90 planned and proposed developments within the Town (relevant excerpts are provided in Appendix D).

Based on the provided excerpts from the *Collingwood Transportation Study Update*, the future traffic projections consider the subject site and the adjacent Waterstone development (located immediately to the north of the subject site) as a single development entity with a total of 57 townhouse units. As previously noted, there are 33 units proposed within the subject site and 68 units proposed within the Waterstone site, which amount to 101 units (an additional 44 units). In this regard, traffic volumes associated with 44 additional townhouse units have therefore been added to the future traffic projections (the corresponding trip estimates follow the same methodology outlined in Section 3.5).

As the *Collingwood Transportation Study Update* did not provide traffic projections specifically for the 2026 horizon, such were interpolated from the 2019 and 2031 volumes, assuming a constant growth over the corresponding planning horizon (considering both background and development growth). Full development of the subject site and the Waterstone development have been assumed for 2026 and thus considered in the corresponding projections.

The total traffic volumes for the 2026 and 2031 horizons are provided in Figure 10 and Figure 11 respectively.

### 4.3 TRAFFIC OPERATIONS

#### 4.3.1 Road Section Operations

The operations of the study area road network were again investigated considering the 2026 and 2031 traffic volumes, summaries of which are provided in Table 6 and Table 7.

**Table 6: 2026 Road Section Operations**

ROAD SECTION & LANES PER DIRECTION		CAPACITY <sup>1</sup>		TRAFFIC VOLUMES		VOLUME TO CAPACITY	
		NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
Highway 26	1	900	900	916	808	<b>1.02</b>	0.90
Harbour Street West	1	700	700	217	172	0.31	0.25
Cranberry Trail East	1	400	400	88	95	0.22	0.24

<sup>1</sup> Capacity is denoted as vehicles per hour per direction



**Table 7: 2031 Road Section Operations**

ROAD SECTION & LANES PER DIRECTION		CAPACITY <sup>1</sup>		TRAFFIC VOLUMES		VOLUME TO CAPACITY	
		NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
Highway 26	1	900	900	1046	904	<b>1.16</b>	<b>1.00</b>
Harbour Street West	1	700	700	253	209	0.36	0.30
Cranberry Trail East	1	400	400	99	106	0.25	0.26

<sup>1</sup> Capacity is denoted as vehicles per hour per direction

As noted, during the 2026 horizon, Highway 26 is expected to operate at 90 to 102% of its available capacity, whereas during the 2031 horizon, the theoretical planning capacity will be exceeded (thus resulting in a v/c ratio of 1.16). It is noted that this operating level was acknowledged in the *Collingwood Transportation Study Update* which concluded that given the centre turn lane provided north of Trott Boulevard, the highway capacity will increase and thus overall operations are considered reasonable under 2031 total conditions. It was recommended that the Town monitor traffic levels on the highway segment to determine if, or when, expansion options may need to be considered (a widening to 5 lanes was otherwise recommended for the 2041 horizon).

The projected volumes on Harbour Street West and Cranberry Trail East will continue to operate below their planning capacities and thus no issues are expected.

#### 4.3.2 Intersection Operations

The operations of the Highway 26 intersections were again reviewed based on the peak 2026 and 2031 traffic volumes and considering the existing intersection configurations and controls. Summaries of the intersection operations are provided in Table 8 and Table 9 whereas detailed operations worksheets are included in Appendix E and Appendix F.

As indicated, acceptable operations will continue to be provided at the intersections of Harbour Street West and Cranberry Trail East with Highway 26 during both the AM and PM peak hours, despite the increased traffic volumes.

Unacceptable operations (level of service F with increased delays) will continue at the Keith Avenue intersection with Highway 26 (as was the case under the existing 2022 PM peak hour horizon). While the volumes on Keith Avenue have not increased considerably (in comparing the 2022 volumes with the 2026 and 2031 projections), the increased volumes on Highway 26 further exacerbate the situation. As previously noted, motorists can use the adjacent intersection to access Highway 26 (right turns from Keith Avenue can be readily accommodate). It is also noted



**Table 8: 2026 Intersection Operations**

INTERSECTION, CONTROL & MOVEMENT			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Highway 26 & Harbour Street	signal	SB	12	B	0.60	10	A	0.50
		NB	15	B	0.74	27	C	0.94
		EB	12	B	0.10	18	B	0.15
		WB	12	B	0.12	21	C	0.31
	overall	13	B	0.49	20	B	0.76	
Highway 26 & Keith Avenue	stop	EB LR	<b>69</b>	<b>F</b>	0.60	<b>588</b>	<b>F</b>	<b>1.90</b>
Highway 26 & Cranberry Trail E	stop	EB LTR	19	C	0.29	21	C	0.29
	stop	WB LTR	21	C	0.12	28	D	0.20

L left lane T through lane R right lane LT left-through TR through-right LTR left-through-right

**Table 9: 2031 Intersection Operations**

INTERSECTION, CONTROL & MOVEMENT			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Highway 26 & Harbour Street	signal	SB	12	B	0.63	8	A	0.46
		NB	17	B	0.82	26	C	0.95
		EB	14	B	0.13	30	C	0.20
		WB	14	B	0.15	45	D	0.62
	overall	15	B	0.57	20	C	0.89	
Highway 26 & Keith Avenue	stop	EB LR	<b>147</b>	<b>F</b>	0.87	<b>err</b>	<b>F</b>	<b>12.64</b>
Highway 26 & Cranberry Trail E	stop	EB LTR	24	C	0.38	26	D	0.36
	stop	WB LTR	27	D	0.16	37	E	0.26

L left lane T through lane R right lane LT left-through TR through-right LTR left-through-right



that the traffic signals at Harbour Street West will also create gaps in the Highway 26 flows, thus providing further opportunity for left turns (gap opportunities will further increase with signalization of the Highway 26 and Cranberry Trail East intersection, should such occur as recommended in the *Collingwood Transportation Study Update*). As per the traffic volumes presented in Figure 9, the subject site will contribute minimal volumes to the Keith Avenue intersection and thus does not contribute to the worsening conditions (ie. such are not attributed to the subject development).

#### **4.3.3 Site Access Operations**

As traffic volumes were not established along Dawson Drive, the site access operations were not specifically addressed. Suffice to say, given the minimal volumes entering/exiting the site, and the limited volumes on Dawson Drive given its local road nature (serving only the adjacent residential developments), the site access will provide excellent operations under both the 2026 and 2031 horizons.

#### **4.4 TURN LANE REQUIREMENTS**

Right turn lanes are generally warranted where right turn volumes exceed 60 vehicles per hour and/or impede through traffic. In considering this threshold, an eastbound right turn lane on Dawson Drive to serve the site access is not required.

As the lefts turn associated with the site are minimal (less than 10 per hour) and the volumes on Dawson Drive are limited, a left turn lane on Dawson Drive is not required to serve the site.



## 5 Summary

Given the limited traffic volume to be generated by the development of the site and in considering the traffic volumes on the road system, such will not have any significant operational impacts on the operations of Highway 26 and the area road system. While operational deficiencies will occur at the Keith Avenue intersection with Highway 26, such are not precipitated by the subject development. The adjacent intersections have sufficient additional reserve capacity (particularly the Cranberry Trail East intersection should it be signalized in the future), to accommodate any change in travel patterns through the local road system.

The proposed location for the site access was reviewed to ensure the provision of adequate spacing between the site access and adjacent intersections. In consideration of the projected traffic volumes and the Transportation Association of Canada's driveway spacing guidelines for accesses onto a local road, the proposed location for the site access is considered appropriate.

Given the minimal volumes to be generated by the site, neither a left turn lane nor a right turn lane are considered necessary on Dawson Drive at the site access.

The available sight lines on Dawson Drive to the north and south of the site access exceed the minimum sight distance requirements and thus vehicles manoeuvring to and from the site can do so in a safe and efficient manner. No further improvements are therefore required to address sight line constraints.

Given the site location, residents will have ready access to Collingwood transit which operates on Dawson Drive and Highway 26 (Crosstown route) and provides service through the town with connections to other transit routes via the Main Terminal. The site will also provide connections to the trail system along Highway 26 to the east (including provisions for bicycle parking) and the paved shoulders along Dawson Drive to the west, for use by pedestrians and cyclists alike. In this regard, the development will foster opportunity for active transportation.







**11283 HIGHWAY 26**  
Figure 1A: Site Location







source: Simcoe County Maps

**11283 HIGHWAY 26**

Figure 1B: Site Location







**11283 HIGHWAY 26**  
Figure 2A: Area Road Network







Dawson Drive & Harbour Street West



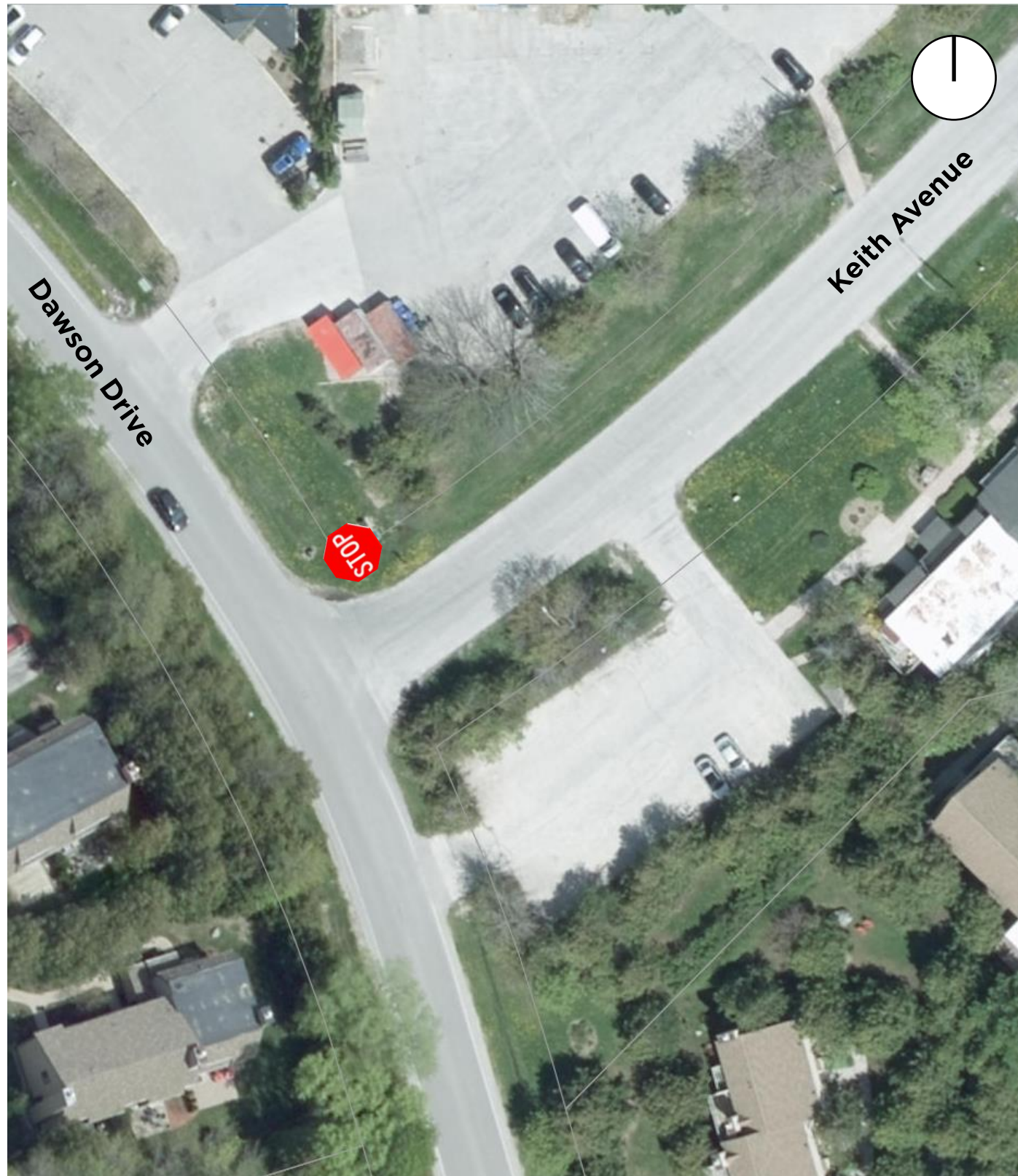
Highway 26 & Harbour Street West

Note: Harbour Street West/Balsam Street was recently reconstructed to introduce left turn lanes on each approach.

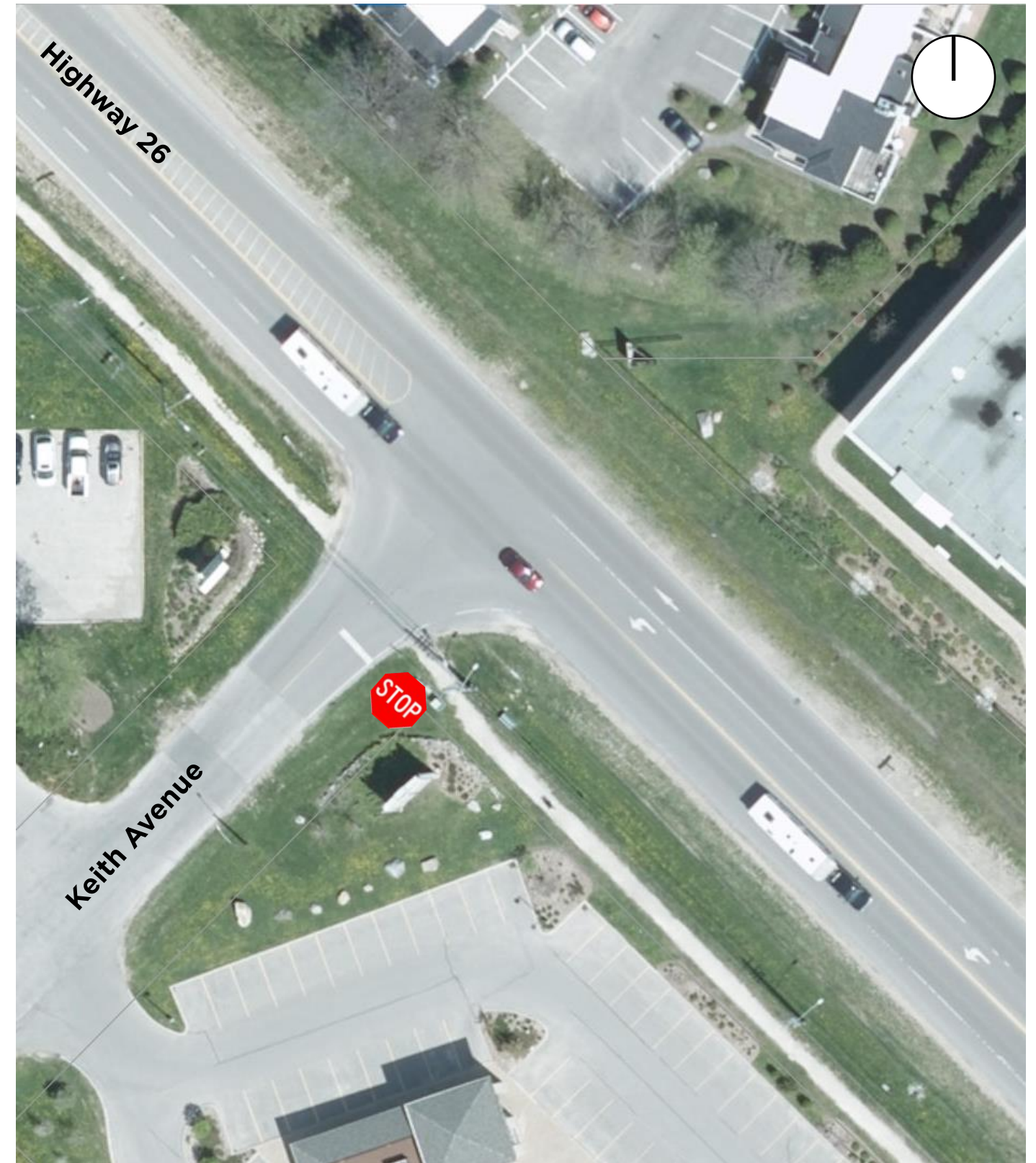
source: Simcoe County Maps







Dawson Drive & Keith Avenue



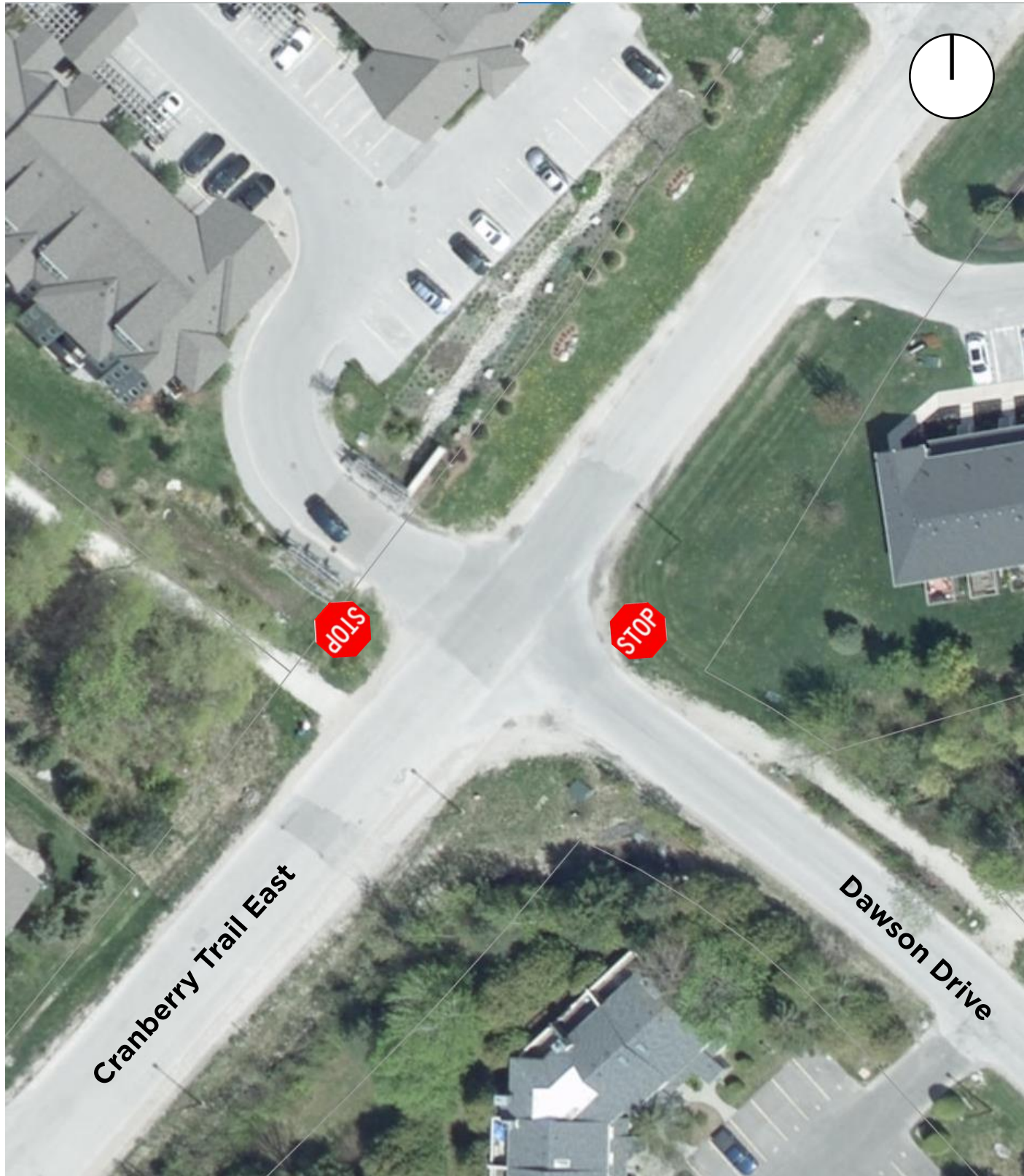
Highway 26 & Keith Avenue

source: Simcoe County Maps

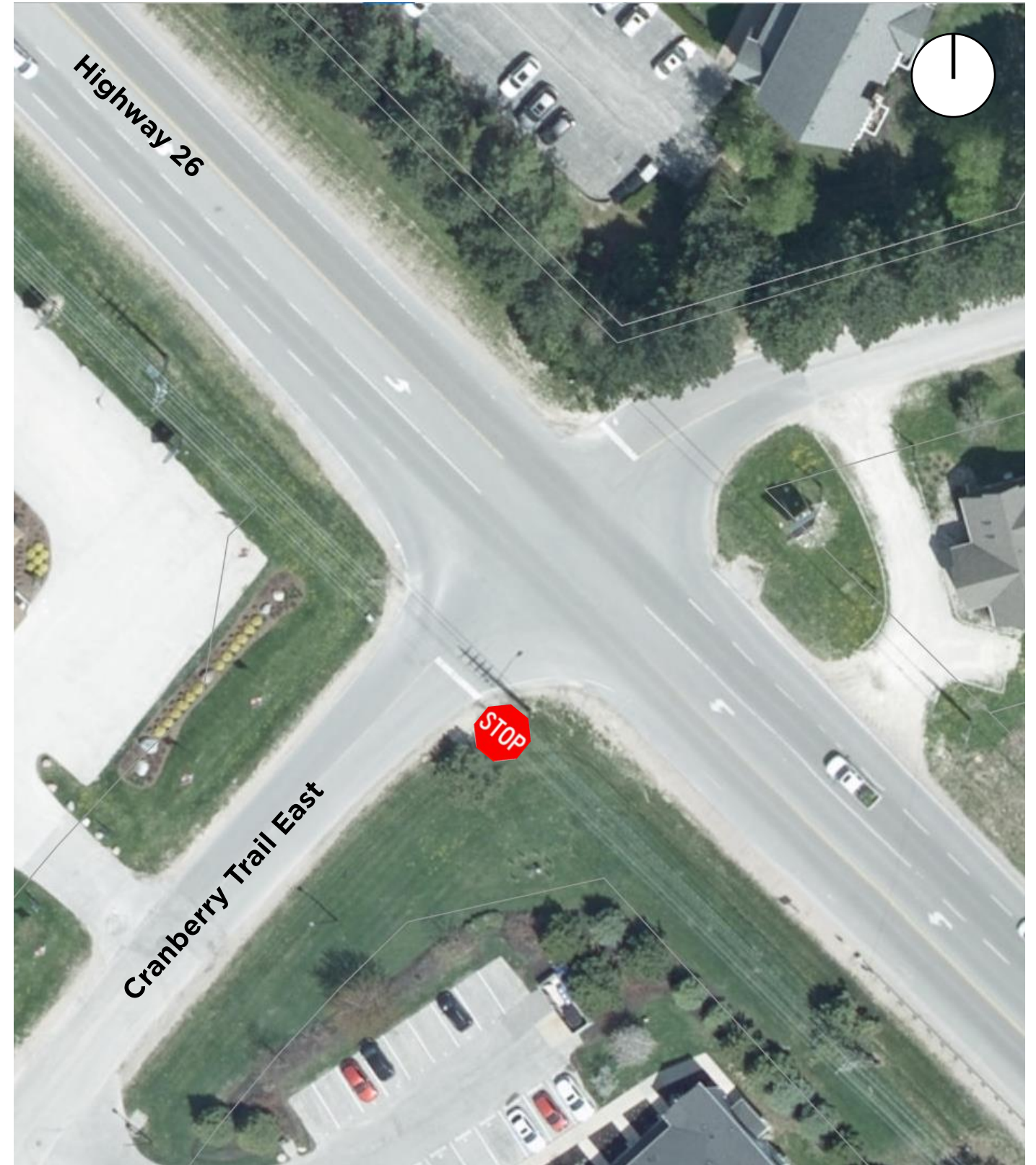
**11283 HIGHWAY 26**  
Figure 2C: Area Road Network







Dawson Drive & Cranberry Trail East

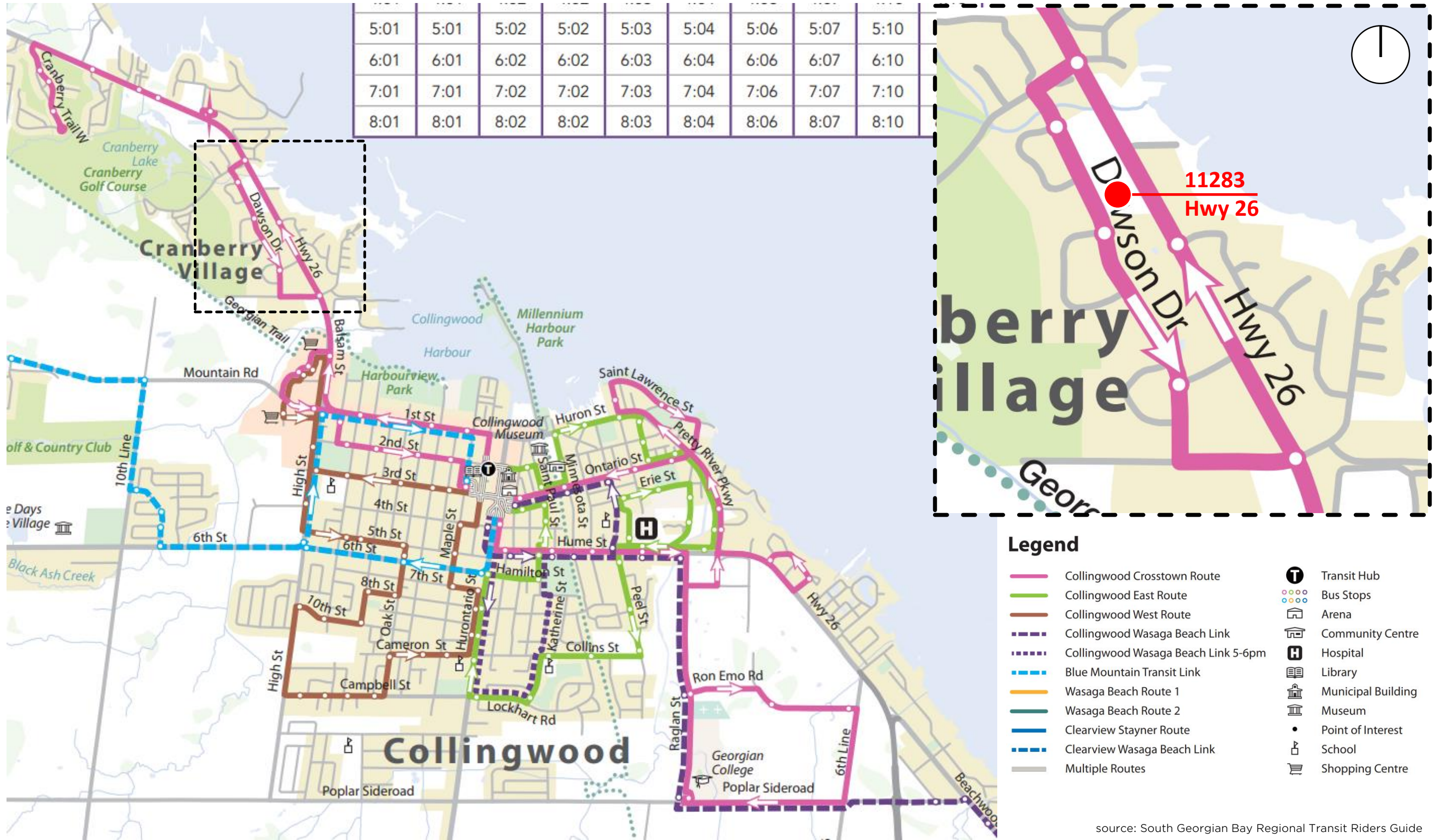


Highway 26 & Cranberry Trail East

source: Simcoe County Maps





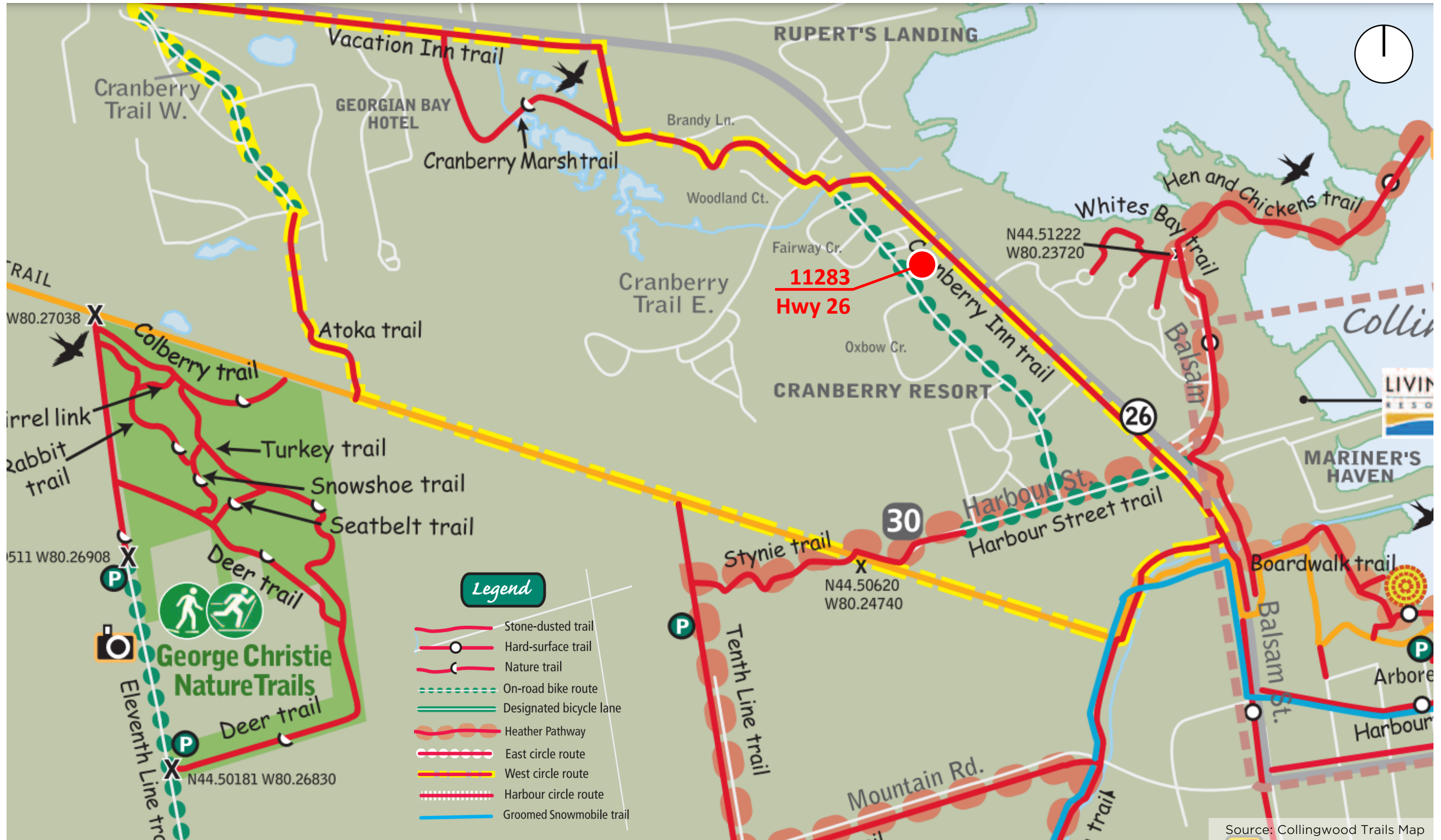


**11283 HIGHWAY 26**  
 Figure 3: Area Transit Network

source: South Georgian Bay Regional Transit Riders Guide

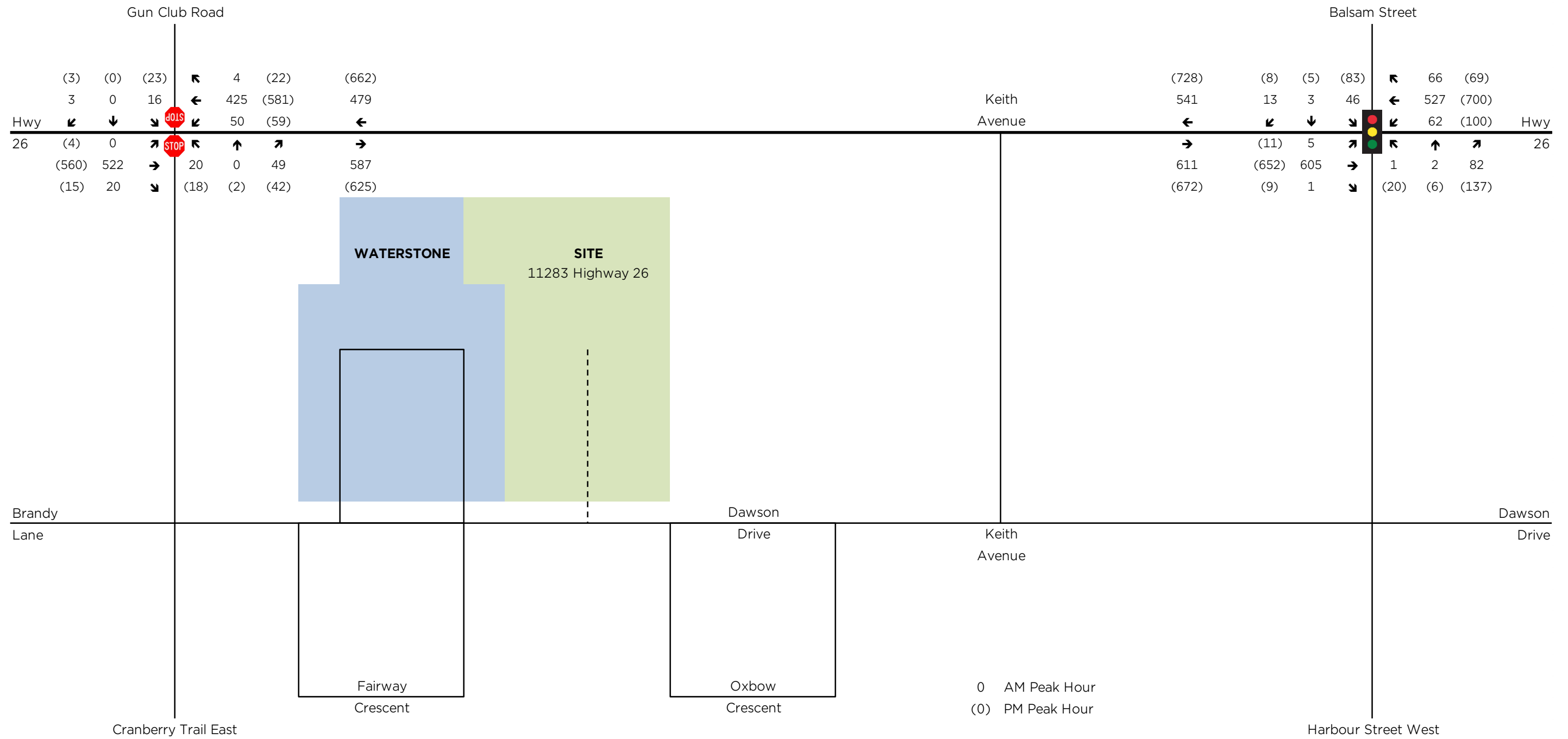
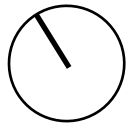






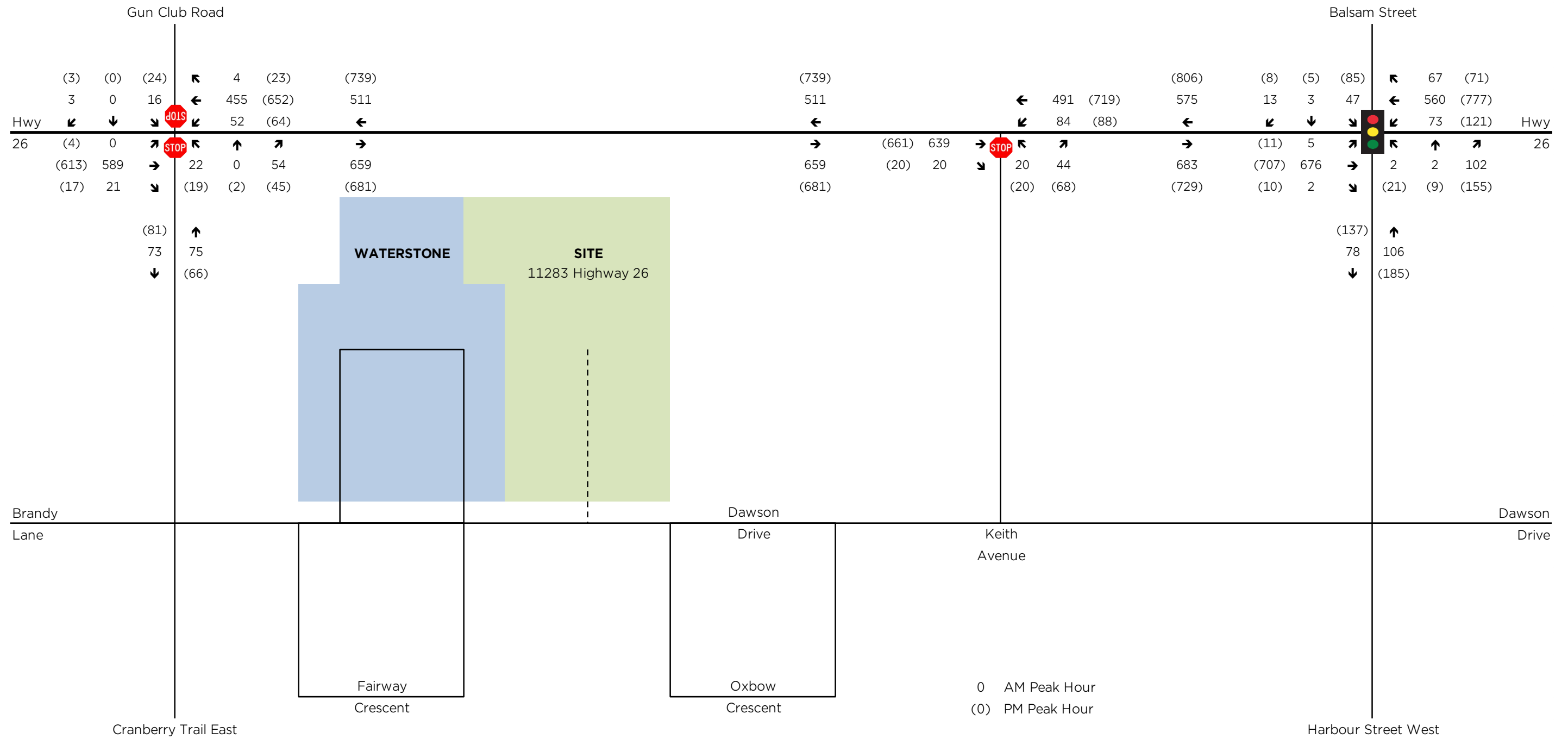
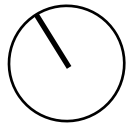
**11283 HIGHWAY 26**  
 Figure 4: Area Trails Network





**11283 HIGHWAY 26**  
 Figure 5: 2019 Traffic Volumes

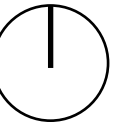





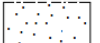
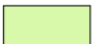
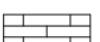

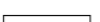





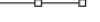
**11283 HIGHWAY 26**  
**Figure 6: 2022 Traffic Volumes**







LEGEND:

-  PROPOSED BUILDING
-  PROPOSED AMENITY SPACE
-  PROPOSED SOFT LANDSCAPING
-  EXISTING/PROPOSED WOOD FINISH
-  PROPOSED SOFT LANDSCAPING
-  PROPOSED BIKE RING (STORAGE FOR 2 BIKES)
-  PARKING SPACES WITHIN GROUND FLOOR UNITS
-  PROPOSED BOLLARDS
-  PROPERTY LINE
-  PROPOSED NOISE FENCE
-  PROPOSED ORNAMENTAL FENCE
-  PROPOSED RETAINING WALL

11283 HIGHWAY 26  
Figure 7: Site Plan







Looking north along Dawson Drive at the proposed site access

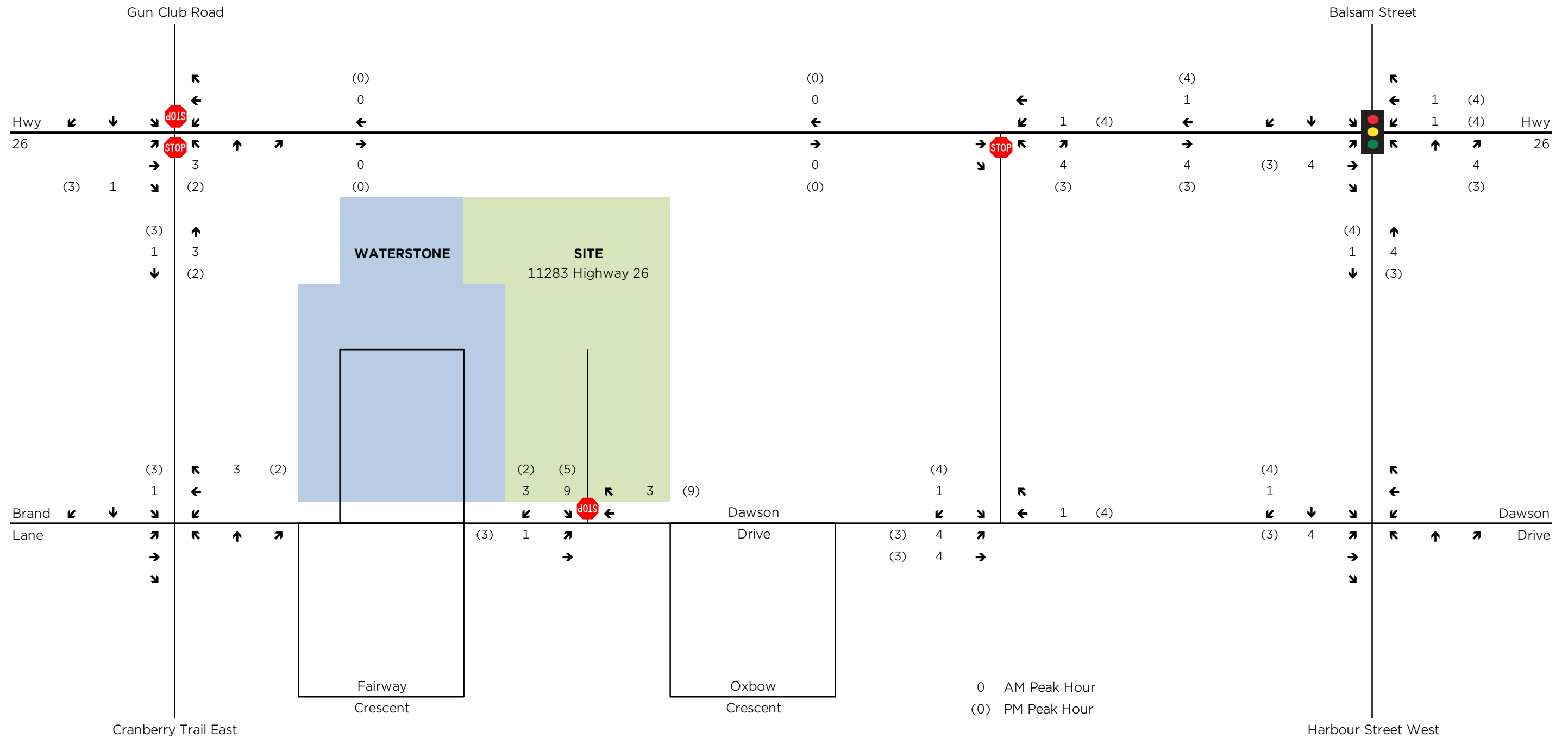
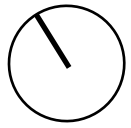


Looking south along Dawson Drive at the proposed site access

source: Google Streetview

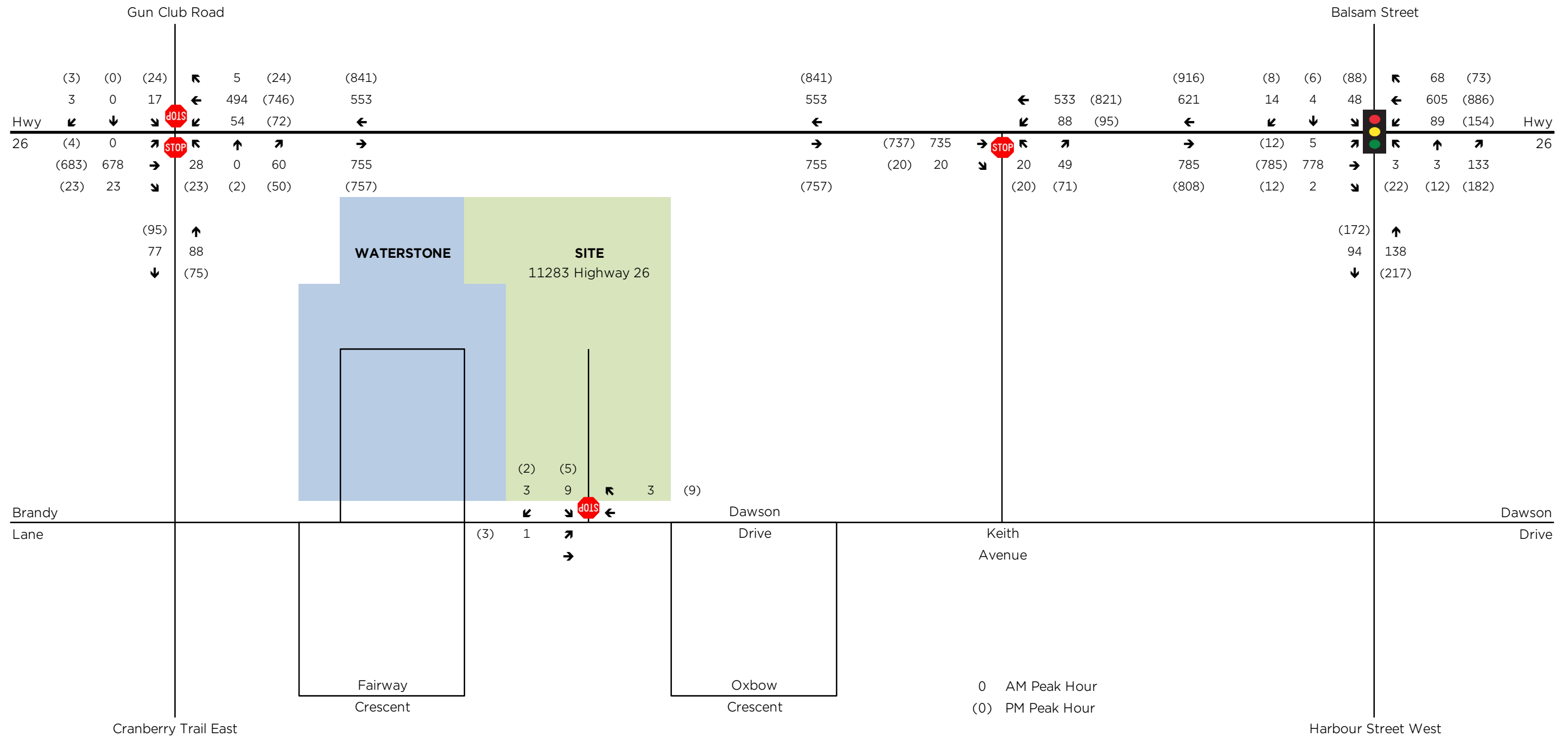
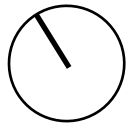






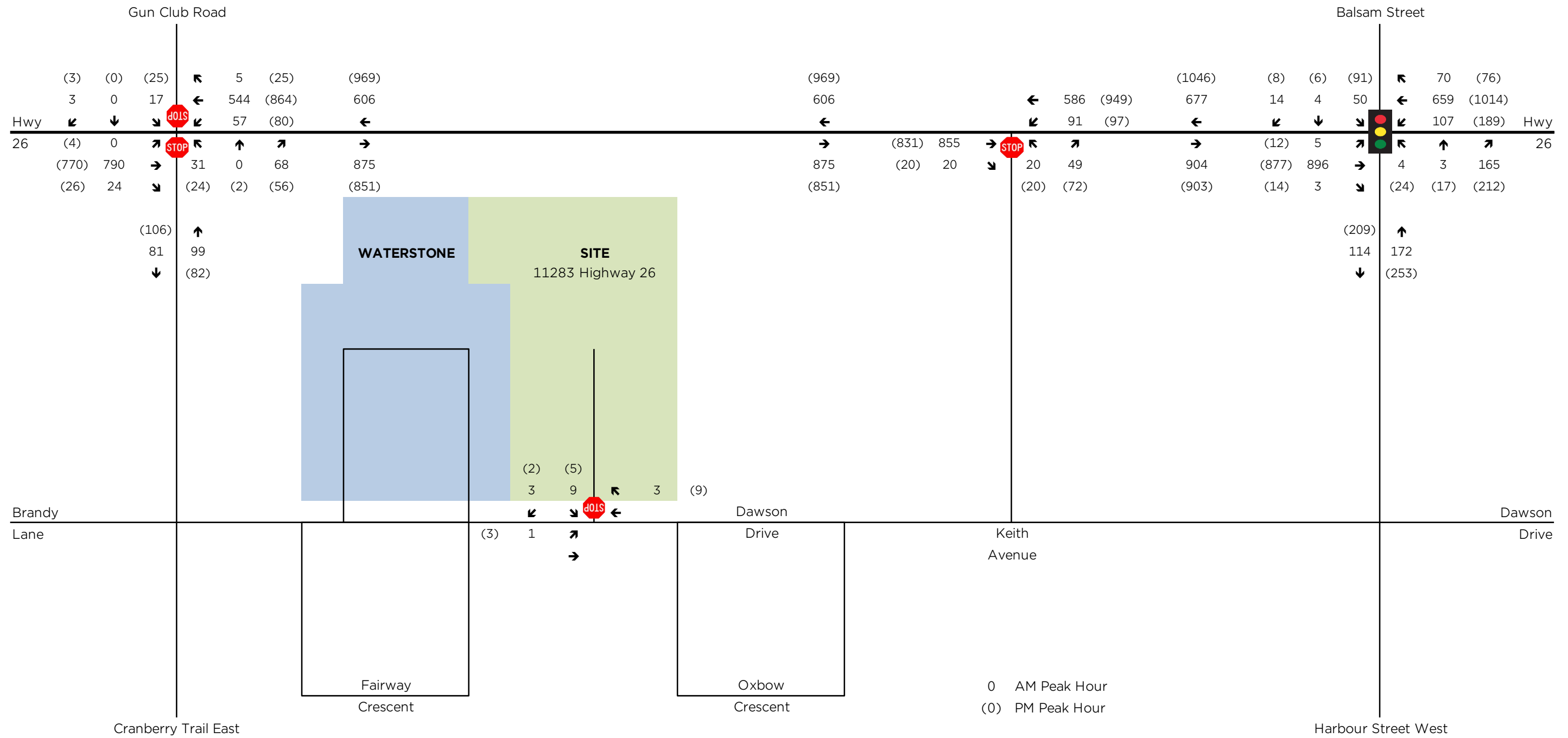
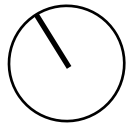
**11283 HIGHWAY 26**  
**Figure 9: Site Traffic Volumes**





**11283 HIGHWAY 26**  
 Figure 10: 2026 Traffic Volumes





**11283 HIGHWAY 26**  
 Figure 11: 2031 Traffic Volumes



# Appendix A: Traffic Counts

# Ontario Traffic Inc.

## Morning Peak Diagram

### Specified Period

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

### One Hour Peak

**From:** 8:00:00  
**To:** 9:00:00

**Municipality:** Collingwood  
**Site #:** 1842000002  
**Intersection:** Hwy 26 W & Harbour St W-Balsam  
**TFR File #:** 1  
**Count date:** 12-Dec-18

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

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

**Major Road:** Hwy 26 W runs N/S

North Leg Total: 1097  
North Entering: 582  
North Peds: 0  
Peds Cross:  $\times$

Heavys	0	6	0	6
Trucks	0	12	0	12
Cars	1	558	5	564
Totals	1	576	5	



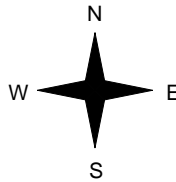
Heavys	4
Trucks	15
Cars	496
Totals	515

East Leg Total: 129  
East Entering: 59  
East Peds: 0  
Peds Cross:  $\times$

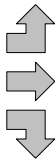
Heavys	Trucks	Cars	Totals
2	2	59	63



Balsam St



Heavys	Trucks	Cars	Totals
0	0	1	1
0	0	2	2
2	1	75	78
2	1	78	



Hwy 26 W



Cars	Trucks	Heavys	Totals
12	0	0	12
2	0	1	3
43	0	1	44
57	0	2	



Harbour St W



Cars	Trucks	Heavys	Totals
70	0	0	70

Peds Cross:  $\times$   
West Peds: 0  
West Entering: 81  
West Leg Total: 144

Cars	676	Cars	56	483	63	602
Trucks	13	Trucks	2	15	0	17
Heavys	9	Heavys	1	4	0	5
Totals	698	Totals	59	502	63	



Peds Cross:  $\times$   
South Peds: 1  
South Entering: 624  
South Leg Total: 1322

## Comments

# Ontario Traffic Inc.

## Afternoon Peak Diagram

### Specified Period

**From:** 15:00:00

**To:** 18:00:00

### One Hour Peak

**From:** 16:00:00

**To:** 17:00:00

**Municipality:** Collingwood  
**Site #:** 1842000002  
**Intersection:** Hwy 26 W & Harbour St W-Balsam  
**TFR File #:** 1  
**Count date:** 12-Dec-18

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

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

**Major Road:** Hwy 26 W runs N/S

North Leg Total: 1334  
 North Entering: 640  
 North Peds: 0  
 Peds Cross:  $\times$

Heavys	0	3	0	3
Trucks	0	17	0	17
Cars	9	601	10	620
<b>Totals</b>	<b>9</b>	<b>621</b>	<b>10</b>	



Heavys	1
Trucks	10
Cars	683
<b>Totals</b>	<b>694</b>

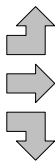
East Leg Total: 174  
 East Entering: 92  
 East Peds: 0  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
1	0	108	109

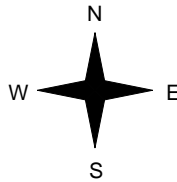


Balsam St

Heavys	Trucks	Cars	Totals
0	1	18	19
0	0	6	6
1	0	129	130
1	1	153	



Hwy 26 W



Cars	Trucks	Heavys	Totals
8	0	0	8
4	0	1	5
79	0	0	79
91	0	1	

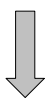
Harbour St W



Cars	Trucks	Heavys	Totals
82	0	0	82

Peds Cross:  $\times$   
 West Peds: 2  
 West Entering: 155  
 West Leg Total: 264

Cars	809	Cars	95	657	66	818
Trucks	17	Trucks	0	9	0	9
Heavys	4	Heavys	0	1	0	1
<b>Totals</b>	<b>830</b>	<b>Totals</b>	<b>95</b>	<b>667</b>	<b>66</b>	



Peds Cross:  $\times$   
 South Peds: 5  
 South Entering: 828  
 South Leg Total: 1658

## Comments



# Ontario Traffic Inc.

## Morning Peak Diagram

### Specified Period

**From:** 7:00:00

**To:** 9:00:00

### One Hour Peak

**From:** 8:00:00

**To:** 9:00:00

**Municipality:** Collingwood  
**Site #:** 1842000001  
**Intersection:** Hwy 26 W & Cranberry Trail E-Gun  
**TFR File #:** 1  
**Count date:** 12-Dec-18

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

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

**Major Road:** Hwy 26 W runs N/S

North Leg Total: 943  
 North Entering: 516  
 North Peds: 0  
 Peds Cross:  $\times$

Heavys	3	3	0	6
Trucks	7	12	0	19
Cars	9	482	0	491
<b>Totals</b>	<b>19</b>	<b>497</b>	<b>0</b>	



Heavys	3
Trucks	14
Cars	410
<b>Totals</b>	<b>427</b>

East Leg Total: 22  
 East Entering: 18  
 East Peds: 0  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
3	9	55	67

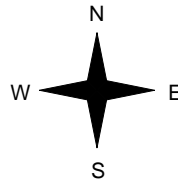


Hwy 26 W

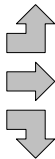
Cars	Trucks	Heavys	Totals
3	0	0	3
0	0	0	0
15	0	0	15
<b>18</b>	<b>0</b>	<b>0</b>	



Cranberry Trail E



Heavys	Trucks	Cars	Totals
0	0	19	19
0	0	0	0
1	2	44	47
<b>1</b>	<b>2</b>	<b>63</b>	



Hwy 26 W



Gun Club Rd



Cars	Trucks	Heavys	Totals
4	0	0	4

Peds Cross:  $\times$   
 West Peds: 0  
 West Entering: 66  
 West Leg Total: 133

Cars	541	Cars	46	388	4	438
Trucks	14	Trucks	2	14	0	16
Heavys	4	Heavys	0	3	0	3
<b>Totals</b>	<b>559</b>	<b>Totals</b>	<b>48</b>	<b>405</b>	<b>4</b>	



Peds Cross:  $\times$   
 South Peds: 0  
 South Entering: 457  
 South Leg Total: 1016

## Comments

# Ontario Traffic Inc.

## Afternoon Peak Diagram

### Specified Period

**From:** 15:00:00

**To:** 18:00:00

### One Hour Peak

**From:** 16:00:00

**To:** 17:00:00

**Municipality:** Collingwood  
**Site #:** 1842000001  
**Intersection:** Hwy 26 W & Cranberry Trail E-Gun  
**TFR File #:** 1  
**Count date:** 12-Dec-18

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

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

**Major Road:** Hwy 26 W runs N/S

North Leg Total: 1124  
 North Entering: 551  
 North Peds: 2  
 Peds Cross:  $\bowtie$

Heavys	2	2	0	4
Trucks	0	20	0	20
Cars	12	511	4	527
<b>Totals</b>	<b>14</b>	<b>533</b>	<b>4</b>	



Heavys 1  
 Trucks 13  
 Cars 559  
 Totals 573

East Leg Total: 52  
 East Entering: 25  
 East Peds: 0  
 Peds Cross:  $\bowtie$

Heavys	Trucks	Cars	Totals
2	0	68	70



Hwy 26 W

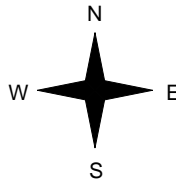
Cars	Trucks	Heavys	Totals
3	0	0	3
0	0	0	0
22	0	0	22
<b>25</b>	<b>0</b>	<b>0</b>	



Gun Club Rd



Heavys	Trucks	Cars	Totals
0	0	17	17
0	0	2	2
1	1	38	40
<b>1</b>	<b>1</b>	<b>57</b>	



Hwy 26 W



Cars	Trucks	Heavys	Totals
27	0	0	27

Peds Cross:  $\bowtie$   
 West Peds: 0  
 West Entering: 59  
 West Leg Total: 129

Cars	571	Cars	56	539	21	616
Trucks	21	Trucks	0	13	0	13
Heavys	3	Heavys	0	1	0	1
<b>Totals</b>	<b>595</b>	<b>Totals</b>	<b>56</b>	<b>553</b>	<b>21</b>	



Peds Cross:  $\bowtie$   
 South Peds: 0  
 South Entering: 630  
 South Leg Total: 1225

## Comments

## **Appendix B: Level of Service Definitions**

# Level of Service - Unsignalized Intersections

Level of Service (LOS) for unsignalized intersections is defined in terms of control delay for each critical lane. Control delay include initial deceleration, queue move-up time, stopped delay, and final acceleration delay, and is a function of the service rate or capacity of the approach and degree of saturation.

The following table describes in detail the characteristics of each level:

LOS	Description of Traffic Operations	Delay (sec/veh)
A	Little or no delays	$0 < d \leq 10$
B	Short traffic delays	$10 < d \leq 15$
C	Average traffic delays	$15 < d \leq 25$
D	Long traffic delays	$25 < d \leq 35$
E	Very long traffic delays	$35 < d \leq 50$
F	Extreme delays with queuing which may cause congestion affecting other traffic movements in the intersection	$d > 50$

source: 2010 Highway Capacity Manual

## Level of Service - Signalized Intersections

Level of Service (LOS) for signalized intersections is defined in terms of delay, which is made up of a number of factors that relate to control, geometrics, traffic, and incidents. Only the portion of total delay attributed to the control facility is quantified. This control delay includes initial deceleration, queue move-up time, stopped delay, and final acceleration delay.

The following table describes in detail the characteristics of each level:

LOS	Description of Traffic Operations	Delay (sec/veh)
A	Describes operations with very low control delay, up to 10 seconds/vehicle. This level of service occurs when progression is extremely favourable and most vehicles arrive during the green phase. Most vehicles do not stop at all at this LOS. Short cycle lengths may also contribute to low delay.	$d \leq 10$
B	Describes operations with control delay greater than 10 seconds and up to 20 seconds/vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop at this level than at LOS A, causing longer average delays.	$10 < d \leq 20$
C	Describes operations with control delay greater than 20 seconds and up to 35 seconds/vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.	$20 < d \leq 35$
D	Describes operations with control delay greater than 35 seconds and up to 55 seconds/vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavourable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures become noticeable.	$35 < d \leq 55$
E	Describes operations with control delay greater than 55 seconds and up to 80 seconds/vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.	$55 < d \leq 80$
F	LOS F describes operations with control delay in excess of 80 seconds/vehicle. This oversaturation, considered to be unacceptable to most drivers, occurs when arrival flow rates exceed the design capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such high delay levels.	$d > 80$





















source: 2010 Highway Capacity Manual

# **Appendix C: 2022 Intersection Operations**














1: Hwy 26 & Harbour St W/Balsam St

2022 AM Peak Hour





















													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	5	5	102	47	5	13	73	560	67	5	676	5	
Future Volume (vph)	5	5	102	47	5	13	73	560	67	5	676	5	
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0		
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95	1.00		0.95		
Frt	1.00	0.86		1.00	0.90			1.00	0.85		1.00		
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		1.00		
Satd. Flow (prot)	1789	1615		1789	1686			3558	1601		3573		
Flt Permitted	0.74	1.00		0.68	1.00			0.74	1.00		0.95		
Satd. Flow (perm)	1402	1615		1282	1686			2663	1601		3389		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	6	6	113	52	6	14	81	622	74	6	751	6	
RTOR Reduction (vph)	0	71	0	0	9	0	0	0	46	0	1	0	
Lane Group Flow (vph)	6	48	0	52	11	0	0	703	28	0	762	0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA		
Protected Phases		2			6		3	8				4	
Permitted Phases	2			6			8		8	4			
Actuated Green, G (s)	18.2	18.2		18.2	18.2			18.4	18.4		18.4		
Effective Green, g (s)	18.2	18.2		18.2	18.2			18.4	18.4		18.4		
Actuated g/C Ratio	0.37	0.37		0.37	0.37			0.38	0.38		0.38		
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0		
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0		
Lane Grp Cap (vph)	525	604		480	631			1008	606		1283		
v/s Ratio Prot		0.03			0.01								
v/s Ratio Perm	0.00			c0.04				c0.26	0.02		0.22		
v/c Ratio	0.01	0.08		0.11	0.02			0.70	0.05		0.59		
Uniform Delay, d1	9.5	9.8		9.9	9.6			12.7	9.6		12.1		
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00		
Incremental Delay, d2	0.0	0.3		0.5	0.1			2.1	0.0		0.7		
Delay (s)	9.6	10.1		10.4	9.6			14.9	9.6		12.9		
Level of Service	A	B		B	A			B	A		B		
Approach Delay (s)		10.0			10.2			14.4			12.9		
Approach LOS		B			B			B			B		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			13.2									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.43										
Actuated Cycle Length (s)			48.6									Sum of lost time (s)	14.0
Intersection Capacity Utilization			60.9%									ICU Level of Service	B
Analysis Period (min)			15										

c Critical Lane Group

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	44	84	491	639	20
Future Volume (Veh/h)	20	44	84	491	639	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	49	93	546	710	22
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)	303					
pX, platoon unblocked	0.78					
vC, conflicting volume	1442	710	732			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1425	710	732			
tC, single (s)	6.9	6.7	4.6			
tC, 2 stage (s)						
tF (s)	4.0	3.8	2.7			
p0 queue free %	72	86	87			
cM capacity (veh/h)	79	362	690			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	71	93	546	710	22	
Volume Left	22	93	0	0	0	
Volume Right	49	0	0	0	22	
cSH	171	690	1700	1700	1700	
Volume to Capacity	0.41	0.13	0.32	0.42	0.01	
Queue Length 95th (m)	14.1	3.5	0.0	0.0	0.0	
Control Delay (s)	40.1	11.0	0.0	0.0	0.0	
Lane LOS	E	B				
Approach Delay (s)	40.1	1.6		0.0		
Approach LOS	E					
<b>Intersection Summary</b>						
Average Delay	2.7					
Intersection Capacity Utilization	52.1%			ICU Level of Service	A	
Analysis Period (min)	15					

### 3: Hwy 26 & Cranberry Trail E/Gun Club Rd

2022 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	5	54	16	6	6	52	455	5	5	589	21
Future Volume (Veh/h)	22	5	54	16	6	6	52	455	5	5	589	21
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	24	6	60	18	7	7	58	506	6	6	654	23
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1298	1294	654	1351	1311	506	677			512		
vC1, stage 1 conf vol	666	666		622	622							
vC2, stage 2 conf vol	632	628		729	689							
vCu, unblocked vol	1298	1294	654	1351	1311	506	677			512		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	98	87	93	98	99	94			99		
cM capacity (veh/h)	323	340	467	257	317	566	915			1053		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	90	32	58	506	6	6	654	23				
Volume Left	24	18	58	0	0	6	0	0				
Volume Right	60	7	0	0	6	0	0	23				
cSH	408	306	915	1700	1700	1053	1700	1700				
Volume to Capacity	0.22	0.10	0.06	0.30	0.00	0.01	0.38	0.01				
Queue Length 95th (m)	6.3	2.6	1.5	0.0	0.0	0.1	0.0	0.0				
Control Delay (s)	16.3	18.1	9.2	0.0	0.0	8.4	0.0	0.0				
Lane LOS	C	C	A			A						
Approach Delay (s)	16.3	18.1	0.9			0.1						
Approach LOS	C	C										
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			49.3%		ICU Level of Service				A			
Analysis Period (min)			15									

1: Hwy 26 & Harbour St W/Balsam St

2022 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	9	155	85	5	8	121	771	71	11	707	10
Future Volume (vph)	21	9	155	85	5	8	121	771	71	11	707	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95	1.00		0.95	
Frt	1.00	0.86		1.00	0.91			1.00	0.85		1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		1.00	
Satd. Flow (prot)	1789	1616		1789	1714			3555	1601		3569	
Flt Permitted	0.75	1.00		0.64	1.00			0.68	1.00		0.94	
Satd. Flow (perm)	1408	1616		1210	1714			2418	1601		3340	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	10	172	94	6	9	134	857	79	12	786	11
RTOR Reduction (vph)	0	119	0	0	6	0	0	0	34	0	1	0
Lane Group Flow (vph)	23	63	0	94	9	0	0	991	45	0	808	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	18.1	18.1		18.1	18.1			28.4	28.4		28.4	
Effective Green, g (s)	18.1	18.1		18.1	18.1			28.4	28.4		28.4	
Actuated g/C Ratio	0.31	0.31		0.31	0.31			0.49	0.49		0.49	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	435	499		374	530			1173	777		1621	
v/s Ratio Prot		0.04			0.01							
v/s Ratio Perm	0.02			c0.08				c0.41	0.03		0.24	
v/c Ratio	0.05	0.13		0.25	0.02			0.84	0.06		0.50	
Uniform Delay, d1	14.2	14.5		15.1	14.0			13.1	8.0		10.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.2	0.5		1.6	0.1			5.7	0.0		0.2	
Delay (s)	14.4	15.0		16.7	14.1			18.9	8.0		10.5	
Level of Service	B	B		B	B			B	A		B	
Approach Delay (s)		15.0			16.4			18.1			10.5	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	58.5	Sum of lost time (s)	14.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

2: Keith Ave & Hwy 26





















2022 PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	68	88	719	661	20
Future Volume (Veh/h)	20	68	88	719	661	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	76	98	799	734	22
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)	303					
pX, platoon unblocked	0.64					
vC, conflicting volume	1729	734	756			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1859	734	756			
tC, single (s)	6.9	6.7	4.6			
tC, 2 stage (s)						
tF (s)	4.0	3.8	2.7			
p0 queue free %	33	78	85			
cM capacity (veh/h)	33	350	674			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>	
Volume Total	98	98	799	734	22	
Volume Left	22	98	0	0	0	
Volume Right	76	0	0	0	22	
cSH	111	674	1700	1700	1700	
Volume to Capacity	0.88	0.15	0.47	0.43	0.01	
Queue Length 95th (m)	40.3	3.9	0.0	0.0	0.0	
Control Delay (s)	127.4	11.2	0.0	0.0	0.0	
Lane LOS	F	B				
Approach Delay (s)	127.4	1.2		0.0		
Approach LOS	F					
<b>Intersection Summary</b>						
Average Delay	7.8					
Intersection Capacity Utilization	55.0%			ICU Level of Service	A	
Analysis Period (min)	15					

3: Hwy 26 & Cranberry Trail E/Gun Club Rd

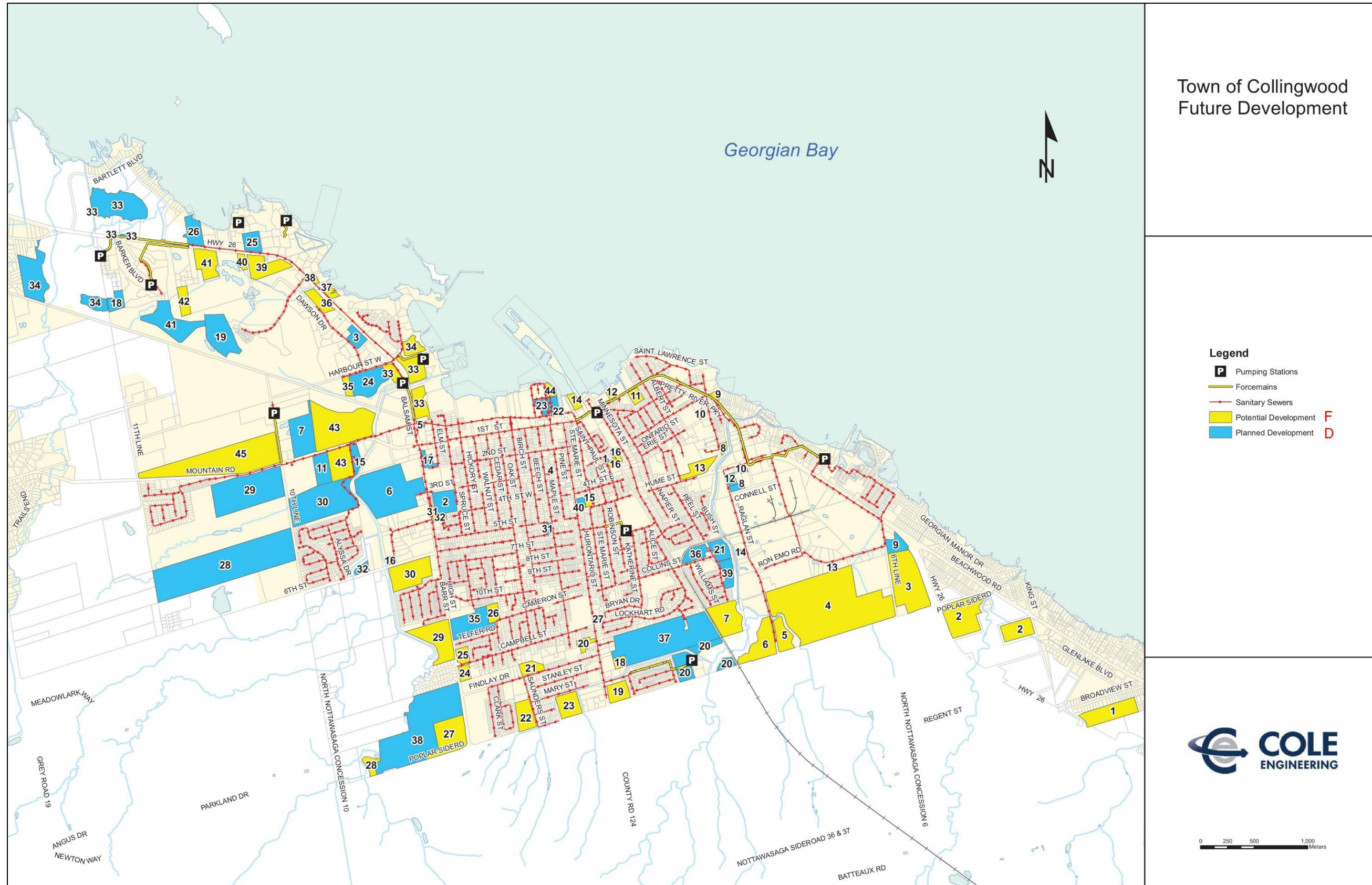
2022 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	5	45	24	5	5	64	652	23	5	613	17
Future Volume (Veh/h)	19	5	45	24	5	5	64	652	23	5	613	17
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	21	6	50	27	6	6	71	724	26	6	681	19
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1568	1585	681	1612	1578	724	700			750		
vC1, stage 1 conf vol	693	693		866	866							
vC2, stage 2 conf vol	875	892		746	712							
vCu, unblocked vol	1568	1585	681	1612	1578	724	700			750		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	98	89	88	98	99	92			99		
cM capacity (veh/h)	252	272	450	217	261	426	897			859		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	77	39	71	724	26	6	681	19				
Volume Left	21	27	71	0	0	6	0	0				
Volume Right	50	6	0	0	26	0	0	19				
cSH	356	241	897	1700	1700	859	1700	1700				
Volume to Capacity	0.22	0.16	0.08	0.43	0.02	0.01	0.40	0.01				
Queue Length 95th (m)	6.2	4.3	2.0	0.0	0.0	0.2	0.0	0.0				
Control Delay (s)	17.9	22.8	9.4	0.0	0.0	9.2	0.0	0.0				
Lane LOS	C	C	A			A						
Approach Delay (s)	17.9	22.8	0.8			0.1						
Approach LOS	C	C										
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			51.9%		ICU Level of Service				A			
Analysis Period (min)			15									

**Appendix D:  
Collingwood Transportation  
Study Update Excerpts**



Figure 10: Town of Collingwood Future Development Map (Cole Engineering)



**Table 15: Town of Collingwood Medium-Term Developments (Horizon Year 2031)**

ID	Name	Land Use	Area (HA)	Number of Residential Units	ICI Development	Estimated Residential Population	Estimated Occupancy 2018	Forecasted Occupancy 2031	Forecasted Occupancy 2041
7F	King (452 Raglan)	Residential	7.44	57 - singles, 205 townhouses		657		100%	
11F	Parkridge	Office	1.40		40,000 sq.ft. commercial			100%	
14F	Duncap Waterfront Hotel	Residential and Hotel	1.15	80 apartments	40 hotel rooms	152		100%	
20F	Blackmoor Gate Property	Residential	1.35	34 - singles and semis		99		100%	
30F	580 Sixth Street and adjacent property	Residential	8.42	114 - townhouses, 128 apartments		517		50%	100%
39F	Silvercreek Development	Residential	5.57	267 apartments		507		100%	
43F	Mountain Street Industrial Property	Commercial / Industrial	24.16		9,097 sq.m. commercial / industrial			100%	
44F	Huronic Village	Residential		13 - townhouses		31		100%	
45F-A	Panorama North	Residential	20.10	122 - singles, 580 - townhouses, 219 - apartments		2162		50%	100%
1D	Ambulance Station	Community Services	0.15					100%	
2D	Mountainview Public School	Community Services	4.11					100%	
3D	Cranberry Inn extension	Commercial	2.20					100%	
4D	Third Street	Commercial	0.06					100%	
5D	10 Balsam Commercial Plaza	Commercial	0.40					100%	
6D	Regional Commercial District	Commercial	21.07					100%	
7D	Van Dolder's	Industrial	8.09		12,806 sq.m commercial / industrial		20%	100%	
8D	Ace Cabs	Industrial	0.78					100%	
9D	BMC Automotive	Industrial	2.50					100%	
10D	Collingwood Service Station	Industrial	0.38					100%	
11D	Georgian Bay Biomed	Industrial	4.00		8,700 sq.m. marijuana grow-op			100%	
12D	Dunn Hotel	Industrial	0.88					100%	
13D	Isowater	Industrial	0.41					100%	
14D	360 Raglan	Industrial	0.40					100%	
15D	100 Mountain Road	Commercial / Industrial	2.12		1,784 sq.m. commercial / industrial			100%	
16D	Stewart Road Reservoir	Other	0.50					100%	
17D	Affordable Housing Project	Residential	1.32	147 - apartments		279		100%	
18D	Silver Glen	Residential	2.27	50 - townhouses		120		100%	
19D	Blue Fairways	Residential	8.49	262 - townhouses		629	80%	100%	
20D	Pretty River Estates Phase 2	Residential	7.19	21 - singles and semis, 152 - townhouses		426		100%	
21D	Riverside Midrise	Residential	2.85	156 - townhouses		374		100%	
22D	Shipyards Condo E	Residential	1.48	28 - townhouses		67		100%	
23D	Mackinaw Village	Residential	1.21	28 - townhouses		67	15%	100%	
24D	Balmoral	Residential and Commercial	6.95	54 - semis, 199 townhouses	2,800 sq.m.	624	50%	100%	
28D	Linksvew	Residential and School	40.68	439 - singles, 8 - townhouses, 190 - apartments	School	1653		80%	100%
29D	Mair Mills Village	Residential	19.70	127 - singles, 192 - apartments	1,130 sq.m. commercial	733		100%	
30D	Red Maple (Consar Development)	Residential	17.89	131 - singles and semis, 147 - townhouses		733		100%	
33D	The Preserve at Georgian Bay (Bridgewater)	Residential	37.16	539 - townhouses, 116 - apartments		1514		100%	
36D	Riverside Townhomes	Residential	2.54	57 - townhouses		137		100%	
37D	Eden Oak McNabb	Residential	27.00	256 - singles and semis, 120 - townhouses		1,030		100%	
38D	Summitview Phases 1 and 2	Residential	31.58	233 - singles and semis, 173 - townhouses		1,091		100%	
39D	Harmony Living	Residential	2.45	80 - townhouses		192		100%	
40D	Monaco	Residential and Commercial	0.76	260 - condo apartments	2,600 sq.m.	494		100%	
42D	Mountaincroft Residential (Final Phase)	Residential		69 singles		200		100%	
43D	410 Raglan Street	Industrial	2.21		6,689 sq.m. warehouse			100%	
*	Windfall Medium Density	Residential		242 condo units				100%	
*	Windfall	Residential		571 - singles and townhouse units				100%	
*	Second Nature	Residential		236 - singles and townhouse units				100%	
*	Nederand Development	Residential		121 - singles				100%	

\* Known Town of The Blue Mountains developments in close proximity to Collingwood that were specifically considered in the traffic projections and analysis in this study.

Table 16: Town of Collingwood Long-Term Developments (Horizon Year 2041)

ID	Name	Land Use	Area (HA)	Number of Residential Units	ICI Development	Estimated Residential Population	Estimated Occupancy 2018	Forecasted Occupancy 2031	Forecasted Occupancy 2041
1F	Braeside	Residential	7.26	15 - singles		44		0%	100%
2F	Batteaux Creek Subdivision (Beachwood Estates)	Residential	15.28	20 - singles		58		0%	100%
3F	2906 Sixth Street and 7026 Poplar Sideroad	Industrial	14.99					0%	100%
4F	Eden Oaks Industrial	Industrial	50.73					0%	100%
6F	Poplar and Raglan	Industrial	7.29					0%	100%
8F	Memory Care Facility	Hospital	0.61			72		0%	100%
9F	500 Ontario Street	Residential	0.64	60 - townhouses		144		0%	100%
10F	Legion Redevelopment	Residential	0.44			70		0%	100%
12F	Courthouse	Residential	0.57	68 - townhouses		163		0%	100%
13F	Hospital	Hospital	3.00					0%	100%
15F	282 Ste. Marie Street	Residential and Commercial	0.48	69 - condominiums	929 sq.m commercial	168		0%	100%
16F	Reinhart Warehouse	Residential	1.19	23 - singles and semis		67		0%	100%
18F	Church Severance	Residential	1.16	44 - singles and semis		128		0%	100%
19F	Poplar and Hurontario	Highway Commercial	3.26					0%	100%
21F	Findlay Property	Residential	2.20	22 - singles and semis		64		0%	100%
22F	50 Saunders Drive	Residential	4.17	74 - singles and semis		215		0%	100%
23F	Old Organic Farm	Residential	4.32	76 - singles and semis		221		0%	100%
24F	Collingwood Nursing Home	Residential	1.41	47 - singles and semis		136		0%	100%
25F	197 Campbell Street	Residential	1.62	32 - singles and semis		93		0%	100%
26F	Property adjacent to Helen Court Homes	Residential	1.84	59 - singles and semis		171		0%	100%
27F	Northwest corner of Poplar and High Street (Summitview Phase 3)	Residential	8.94	340 - singles and semis		986		0%	100%
28F	8070 Poplar Sideroad	Residential	1.56	30 - singles and semis		87		0%	100%
29F	Fumo property located on the west side of High Street	Residential	8.86	300 - singles and semis		870		0%	100%
31F	115 High Street	Residential	0.21	15 - townhouses		36		0%	100%
32F	121 High Street	Residential	0.75	6 - townhouses		15		0%	100%
33F	Commercial / hotel development	Commercial	9.63						
34F	Living Waters	Hotel	2.34	253 - hotel units (apartments)		481		0%	100%
35F	16 Harbour Street or Law property	Residential	1.18	23 - singles and semis		67		0%	100%
36F	Dawson Drive East property	Residential	2.46	48 - singles and semis		139		0%	100%
37F	White Street property	Residential	1.02	20 - singles and semis		58		0%	100%
38F	#38F - Gunn Club Road	Residential	0.49	10 - singles and semis		29		0%	100%
40F	Griffith's property	Residential	1.02	30 - singles and semis		87		0%	100%
41F	Greentree property	Residential	4.93	88 - singles and semis		255		0%	100%
42F	Georgian Manor Resorts	Residential	2.49	150 apartments		285		0%	100%
45F-B	Remainder of Mair Mills North	Residential	7.00	Assume same density as Panorama North development		750		0%	50%
25D	Harhay	Residential	2.81	154 - townhouses		370		0%	100%
27D	655 Hurontario Street Apartments	Residential	0.42	32 - apartments		77		0%	100%
31D	Victoria Annex	Residential	0.60	19 - townhouses		46		0%	100%
32D	Georgian Meadows	Residential	1.01	25 - townhouses		60		0%	100%
34D	Huntingwood	Residential	11.82	92 - singles and semis, 62 - townhouses		416		0%	100%
35D	Helen Court Homes	Residential	7.56	66 - singles and semis, 189 - townhouses		645		0%	100%
41D	Cranberry	Residential	9.14	314 - townhouses		754		0%	100%

## 5.2 Development Traffic Generation

The Town provided numerous transportation impact study (TIS) reports for various proposed developments. Where available, Burnside applied traffic generation and distribution projections from available reports in the total traffic scenarios in this study. Where TIS reports were not available, the size (for industrial, commercial, and institutional developments) or number of units (for residential developments) were used, in conjunction with trip rate information contained in the *Trip Generation Manual 10<sup>th</sup> Edition* (Institute of Transportation Engineers [ITE], September 2017), in order to estimate the volume of vehicles travelling to/from each development during the AM and PM peak hours. Estimated trip generation volumes for each development were distributed based on existing travel patterns and origin/destination considerations.

Table 17 below provides a summary of the trip generation volumes applied for each development, in addition to the source of the trip generation estimates (i.e., either from TIS reports received from the Town or ITE trip generation rates) and the percentage of the development traffic applied in the 2031 and/or 2041 total traffic scenarios. The total development traffic volumes that were applied in the 2031 and 2041 total traffic scenarios are summarized at the bottom of Table 17.

**Table 17: Proposed Development Trip Generations Estimates**

Map ID	Development Name	TIS or ITE	AM Peak Hour			PM Peak Hour			Assumed Occupancy	
			In	Out	Tot.	In	Out	Tot.	2031	2041
7F	King (452 Raglan)	TIS	33	106	139	108	63	171	100%	
11F	Parkridge	TIS	80	10	90	14	82	96	100%	
14F	Duncap Waterfront Hotel	ITE	19	29	48	34	26	60	100%	
20F	Blackmoor Gate Property	TIS	9	26	35	25	14	39	100%	
30F	580 Sixth Street and adjacent property	TIS	37	115	152	114	70	184	50%	100%
39F	Silvercreek Development	ITE	25	71	96	71	46	117	100%	
43F	Mountain Street Industrial Property	ITE	45	21	66	94	113	207	100%	
44F	Huronic Village	ITE	2	5	7	6	4	10	100%	
45F-A	Panorama North	TIS	144	453	597	431	286	717	50%	100%
2D	Mountainview Public School	ITE	36	31	67	8	9	17	100%	
3D	Cranberry Inn extension	ITE	5	4	9	6	6	12	100%	
6D	Regional Commercial District	TIS	213	130	343	685	742	1427	100%	
7D	Van Dolder's	TIS	97	15	112	16	102	119	100%	
8D	Ace Cabs	TIS	163	77	240	98	165	263	100%	
10D	Collingwood Service Station									
12D	Dunn Hotel									
9D	BMC Automotive	ITE	57	12	69	17	62	79	100%	
11D	Georgian Bay Biomed	TIS	23	13	36	14	24	38	100%	
13D	Isowater	ITE	14	3	17	5	17	22	100%	
14D	360 Raglan	ITE	14	3	17	4	17	21	100%	
15D	100 Mountain Road	ITE	9	4	13	19	22	41	100%	
17D	Affordable Housing Project	TIS	31	34	65	37	40	77	100%	

Collingwood Transportation Study Update  
August 2019

Map ID	Development Name	TIS or ITE	AM Peak Hour			PM Peak Hour			Assumed Occupancy	
			In	Out	Tot.	In	Out	Tot.	2031	2041
18D	Silver Glen	ITE	6	19	25	20	12	32	100%	
19D	Blue Fairways	ITE	28	93	121	93	54	147	100%	
20D	Pretty River Estates Phase 2	ITE	18	62	80	61	36	97	100%	
21D	Riverside Midrise	TIS	12	35	47	37	24	61	100%	
22D	Shipyards Condo E	ITE	3	11	14	12	7	19	100%	
23D	Mackinaw Village	ITE	3	11	14	12	7	19	100%	
24D	Balmoral	TIS	78	147	225	151	118	269	100%	
28D	Linksvie	TIS	104	391	495	404	217	621	80%	100%
29D	Mair Mills Village	TIS	40	144	184	150	84	234	100%	
30D	Red Maple (Consar Development)	TIS	37	130	167	137	75	212	100%	
33D	The Preserve at Georgian Bay (Bridgewater)	TIS	64	212	276	198	118	316	100%	
36D	Riverside Townhomes	ITE	6	22	28	23	13	36	100%	
37D	Eden Oak McNabb	TIS	68	208	276	218	133	351	100%	
38D	Summitview Phases 1 and 2	TIS	67	201	268	216	132	348	100%	
39D	Hamony Living	ITE	9	30	39	30	18	48	100%	
40D	Monaco	TIS	30	70	100	75	65	140	100%	
42D	Mountaincroft Residential (Final Phase)	TIS	71	209	280	243	135	378	100%	
43D	410 Raglan Street	TIS	26	8	34	10	27	37	100%	
*	Windfall Medium Density	TIS	27	5	32	12	25	37	100%	
*	Windfall	TIS	96	32	128	64	109	173	100%	
*	Second Nature	TIS	27	9	36	18	31	49	100%	
*	Nederand Development	TIS	35	11	46	21	38	59	100%	
1F	Braeside	ITE	4	11	15	10	6	16	0%	100%
2F	Batteaux Creek Subdivision (Beachwood Estates)	ITE	5	14	19	14	8	22	0%	100%
3F	2906 Sixth Street and 7026 Poplar Sideroad	ITE	233	48	281	60	227	287	0%	100%
4F	Eden Oaks Industrial	ITE	603	124	727	145	546	691	0%	100%
6F	Poplar and Raglan	ITE	133	27	160	36	135	171	0%	100%
8F	Memory Care Facility	ITE	6	2	8	2	6	8	0%	100%
9F	500 Ontario Street	ITE	6	16	22	16	11	27	0%	100%
10F	Legion Redevelopment	ITE	3	8	11	9	5	14	0%	100%
12F	Courthouse	ITE	6	18	24	19	12	31	0%	100%
13F	Hospital	ITE	20	7	27	8	20	28	0%	100%
15F	282 Ste. Marie Street	TIS	17	38	55	42	36	78	0%	100%
18F	Church Severance	ITE	9	27	36	29	17	46	0%	100%
19F	Poplar and Hurontario	ITE	43	39	82	49	46	95	0%	100%
21F	Findlay Property	ITE	5	15	20	15	9	24	0%	100%
22F	50 Saunders Drive	ITE	14	43	57	48	28	76	0%	100%
23F	Old Organic Farm	ITE	15	44	59	49	29	78	0%	100%
24F	Collingwood Nursing Home	ITE	10	28	38	31	18	49	0%	100%
25F	197 Campbell Street	ITE	7	21	28	21	13	34	0%	100%
26F	Property adjacent to Helen Court Homes	ITE	12	35	47	38	23	61	0%	100%
27F	Northwest corner of Poplar and High Street (Summitview Phase 3)	ITE	63	189	252	212	125	337	0%	100%
28F	8070 Poplar Sideroad	ITE	7	19	26	20	12	32	0%	100%



Collingwood Transportation Study Update  
August 2019

Map ID	Development Name	TIS or ITE	AM Peak Hour			PM Peak Hour			Assumed Occupancy	
			In	Out	Tot.	In	Out	Tot.	2031	2041
29F	Fumo property located on the west side of High Street	ITE	56	166	222	187	110	297	0%	100%
31F	115 High Street	ITE	2	6	8	7	4	11	0%	100%
32F	121 High Street	ITE	1	2	3	3	2	5	0%	100%
33F	Commercial / hotel development	ITE	76	46	122	153	173	326	0%	100%
34F	Living Waters	ITE	71	50	121	62	59	121	0%	100%
35F	16 Harbour Street or Law property	ITE	5	16	21	16	9	25	0%	100%
36F	Dawson Drive East property	ITE	10	29	39	32	18	50	0%	100%
37F	White Street property	ITE	5	14	19	14	8	22	0%	100%
38F	#38F - Gunn Club Road	ITE	3	9	12	7	4	11	0%	100%
40F	Griffith's property	ITE	7	19	26	20	12	32	0%	100%
41F	Greentree property	ITE	17	50	67	57	33	90	0%	100%
42F	Georgian Manor Resorts	ITE	14	40	54	40	26	66	0%	100%
45F-B	Remainder of Mair Mills North	TIS	72	227	299	216	143	359	0%	100%
25D	Harhay	ITE	14	41	55	41	27	68	0%	100%
27D	655 Hurontario Street Apartments	ITE	3	9	12	9	6	15	0%	100%
31D	Victoria Annex	ITE	2	5	7	5	3	8	0%	100%
32D	Georgian Meadows	ITE	3	10	13	11	6	17	0%	100%
34D	Huntingwood	ITE	25	74	99	84	49	133	0%	100%
35D	Helen Court Homes	ITE	33	106	139	110	64	174	0%	100%
41D	Cranberry	ITE	33	111	144	111	65	176	0%	100%
-			AM Peak Hour			PM Peak Hour				
			In	Out	Tot.	In	Out	Tot.		
<b>2031 Total Development Traffic**</b>			1,800	2,861	4,661	3,658	3,167	6,825		
<b>2041 Total Development Traffic**</b>			3,584	5,025	8,609	6,069	5,541	11,610		

\* Town of The Blue Mountains developments in close proximity to Collingwood that were specifically considered in the traffic projections and analysis in this study.

\*\* Includes 2031 Total Development Traffic amounts.

As shown in Table 17, planned developments in the Town of Collingwood are forecast to generate a total of 4,661 and 6,825 trips during the 2031 weekday AM and PM peak hours, respectively, assuming the occupancy percentages outlined in Table 17 are realized by horizon year 2031. By horizon year 2041, assuming full occupancy of all developments outlined in Table 17, the total number of trips to be generated are 8,609 and 11,610 trips during the 2041 weekday AM and PM peak hours, respectively.

Note that the turning movement counts (TMCs) conducted in December 2018 have captured traffic from some of the developments outlined in Table 17 that have already been partially built-out and occupied at the time the TMCs were conducted. Any developments that were partially occupied and captured in the December 2018 TMCs were adjusted accordingly for analysis purposes (e.g., if a specific development was 40% occupied in December 2018, then 60% of the traffic volume amounts shown in Table 17 were applied in the total traffic scenarios in this study).

Collingwood Transportation Study Update  
August 2019

For developments that TIS reports were not available, traffic volumes were distributed amongst the Study Area intersections according to the logical routing of vehicles to/from various locations within and outside of the Town (e.g., Stayner). Traffic volumes were primarily distributed on arterial and collector roads near a proposed development, with some traffic being distributed to local/collector roads not reviewed in this study. In general, traffic volumes were reduced as distances increased between the traffic generator and any particular intersection, due to overall dispersal of traffic throughout the network.






















The total development traffic, that was added to the road network in the total traffic scenarios considered later in this study, are illustrated in Figure 11 and Figure 12 for the medium-term (2031) and long-term (2041) horizons, respectively.



## **Appendix E: 2026 Intersection Operations**

1: Hwy 26 & Harbour St W/Balsam St

2026 AM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	5	5	133	48	5	14	89	605	68	5	778	5	
Future Volume (vph)	5	5	133	48	5	14	89	605	68	5	778	5	
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0		
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95	1.00		0.95		
Frt	1.00	0.86		1.00	0.89			1.00	0.85		1.00		
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		1.00		
Satd. Flow (prot)	1789	1612		1789	1678			3556	1601		3574		
Flt Permitted	0.74	1.00		0.66	1.00			0.68	1.00		0.95		
Satd. Flow (perm)	1399	1612		1242	1678			2441	1601		3392		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	6	6	148	53	6	16	99	672	76	6	864	6	
RTOR Reduction (vph)	0	97	0	0	10	0	0	0	44	0	1	0	
Lane Group Flow (vph)	6	57	0	53	12	0	0	771	32	0	875	0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA		
Protected Phases		2			6		3	8				4	
Permitted Phases	2			6			8		8	4			
Actuated Green, G (s)	18.2	18.2		18.2	18.2			22.5	22.5		22.5		
Effective Green, g (s)	18.2	18.2		18.2	18.2			22.5	22.5		22.5		
Actuated g/C Ratio	0.35	0.35		0.35	0.35			0.43	0.43		0.43		
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0		
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0		
Lane Grp Cap (vph)	483	556		428	579			1042	683		1448		
v/s Ratio Prot		0.04			0.01								
v/s Ratio Perm	0.00			c0.04				c0.32	0.02		0.26		
v/c Ratio	0.01	0.10		0.12	0.02			0.74	0.05		0.60		
Uniform Delay, d1	11.3	11.7		11.8	11.4			12.6	8.8		11.7		
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00		
Incremental Delay, d2	0.0	0.4		0.6	0.1			2.8	0.0		0.7		
Delay (s)	11.4	12.1		12.4	11.4			15.4	8.9		12.4		
Level of Service	B	B		B	B			B	A		B		
Approach Delay (s)		12.1			12.1			14.9			12.4		
Approach LOS		B			B			B			B		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			13.4								HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.49										
Actuated Cycle Length (s)			52.7								Sum of lost time (s)	14.0	
Intersection Capacity Utilization			73.8%								ICU Level of Service	D	
Analysis Period (min)			15										

c Critical Lane Group

2: Keith Ave & Hwy 26





















2026 AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	49	88	553	735	20
Future Volume (Veh/h)	20	49	88	553	735	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	54	98	614	817	22
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)				303		
pX, platoon unblocked	0.76					
vC, conflicting volume	1627	817	839			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1668	817	839			
tC, single (s)	6.9	6.7	4.6			
tC, 2 stage (s)						
tF (s)	4.0	3.8	2.7			
p0 queue free %	57	83	84			
cM capacity (veh/h)	52	312	623			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	76	98	614	817	22	
Volume Left	22	98	0	0	0	
Volume Right	54	0	0	0	22	
cSH	127	623	1700	1700	1700	
Volume to Capacity	0.60	0.16	0.36	0.48	0.01	
Queue Length 95th (m)	23.1	4.2	0.0	0.0	0.0	
Control Delay (s)	68.8	11.9	0.0	0.0	0.0	
Lane LOS	F	B				
Approach Delay (s)	68.8	1.6		0.0		
Approach LOS	F					
<b>Intersection Summary</b>						
Average Delay	3.9					
Intersection Capacity Utilization	57.7%			ICU Level of Service	B	
Analysis Period (min)	15					

### 3: Hwy 26 & Cranberry Trail E/Gun Club Rd

2026 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	5	60	17	5	5	54	494	5	5	678	23
Future Volume (Veh/h)	28	5	60	17	5	5	54	494	5	5	678	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	31	6	67	19	6	6	60	549	6	6	753	26
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL				TWLTL
Median storage veh								2				2
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1443	1440	753	1504	1460	549	779			555		
vC1, stage 1 conf vol	765	765		669	669							
vC2, stage 2 conf vol	678	675		835	791							
vCu, unblocked vol	1443	1440	753	1504	1460	549	779			555		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	98	84	91	98	99	93			99		
cM capacity (veh/h)	289	308	410	211	281	535	838			1015		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	104	31	60	549	6	6	753	26				
Volume Left	31	19	60	0	0	6	0	0				
Volume Right	67	6	0	0	6	0	0	26				
cSH	358	252	838	1700	1700	1015	1700	1700				
Volume to Capacity	0.29	0.12	0.07	0.32	0.00	0.01	0.44	0.02				
Queue Length 95th (m)	9.0	3.1	1.8	0.0	0.0	0.1	0.0	0.0				
Control Delay (s)	19.1	21.2	9.6	0.0	0.0	8.6	0.0	0.0				
Lane LOS	C	C	A			A						
Approach Delay (s)	19.1	21.2	0.9			0.1						
Approach LOS	C	C										
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			54.6%		ICU Level of Service				A			
Analysis Period (min)			15									



1: Hwy 26 & Harbour St W/Balsam St

2026 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	22	12	182	88	6	8	154	886	73	12	785	12	
Future Volume (vph)	22	12	182	88	6	8	154	886	73	12	785	12	
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0		
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95	1.00		0.95		
Frt	1.00	0.86		1.00	0.92			1.00	0.85		1.00		
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		1.00		
Satd. Flow (prot)	1789	1618		1789	1725			3552	1601		3568		
Flt Permitted	0.75	1.00		0.61	1.00			0.64	1.00		0.93		
Satd. Flow (perm)	1407	1618		1150	1725			2273	1601		3327		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	24	13	202	98	7	9	171	984	81	13	872	13	
RTOR Reduction (vph)	0	146	0	0	7	0	0	0	27	0	1	0	
Lane Group Flow (vph)	24	69	0	98	9	0	0	1155	54	0	897	0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA		
Protected Phases		2			6		3	8			4		
Permitted Phases	2			6			8		8	4			
Actuated Green, G (s)	18.0	18.0		18.0	18.0			35.0	35.0		35.0		
Effective Green, g (s)	18.0	18.0		18.0	18.0			35.0	35.0		35.0		
Actuated g/C Ratio	0.28	0.28		0.28	0.28			0.54	0.54		0.54		
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0		
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0		
Lane Grp Cap (vph)	389	448		318	477			1223	862		1791		
v/s Ratio Prot		0.04			0.01								
v/s Ratio Perm	0.02			c0.09				c0.51	0.03		0.27		
v/c Ratio	0.06	0.15		0.31	0.02			0.94	0.06		0.50		
Uniform Delay, d1	17.3	17.7		18.6	17.1			14.1	7.2		9.5		
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00		
Incremental Delay, d2	0.3	0.7		2.5	0.1			14.4	0.0		0.2		
Delay (s)	17.6	18.5		21.1	17.2			28.4	7.2		9.7		
Level of Service	B	B		C	B			C	A		A		
Approach Delay (s)		18.4			20.5			27.1			9.7		
Approach LOS		B			C			C			A		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			19.7									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.76										
Actuated Cycle Length (s)			65.0									Sum of lost time (s)	14.0
Intersection Capacity Utilization			88.2%									ICU Level of Service	E
Analysis Period (min)			15										





















c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	71	95	821	737	20
Future Volume (Veh/h)	20	71	95	821	737	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	79	106	912	819	22
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)	303					
pX, platoon unblocked	0.54					
vC, conflicting volume	1943	819	841			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2315	819	841			
tC, single (s)	6.9	6.7	4.6			
tC, 2 stage (s)						
tF (s)	4.0	3.8	2.7			
p0 queue free %	0	75	83			
cM capacity (veh/h)	13	311	622			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>	
Volume Total	101	71	947	819	22	
Volume Left	22	71	35	0	0	
Volume Right	79	0	0	0	22	
cSH	53	622	622	1700	1700	
Volume to Capacity	1.90	0.17	0.17	0.48	0.01	
Queue Length 95th (m)	74.7	4.6	4.6	0.0	0.0	
Control Delay (s)	587.9	12.0	4.7	0.0	0.0	
Lane LOS	F	B	A			
Approach Delay (s)	587.9	5.2		0.0		
Approach LOS	F					
<b>Intersection Summary</b>						
Average Delay			33.0			
Intersection Capacity Utilization			73.5%	ICU Level of Service	D	
Analysis Period (min)			15			

3: Hwy 26 & Cranberry Trail E/Gun Club Rd

2026 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	5	50	24	5	5	72	746	24	5	683	23
Future Volume (Veh/h)	23	5	50	24	5	5	72	746	24	5	683	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	26	6	56	27	6	6	80	829	27	6	759	26
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLT			TWLT	
Median storage veh								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1769	1787	759	1819	1786	829	785			856		
vC1, stage 1 conf vol	771	771		989	989							
vC2, stage 2 conf vol	998	1016		830	797							
vCu, unblocked vol	1769	1787	759	1819	1786	829	785			856		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	97	86	85	97	98	90			99		
cM capacity (veh/h)	211	234	406	175	222	370	834			784		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	88	39	80	829	27	6	759	26				
Volume Left	26	27	80	0	0	6	0	0				
Volume Right	56	6	0	0	27	0	0	26				
cSH	307	197	834	1700	1700	784	1700	1700				
Volume to Capacity	0.29	0.20	0.10	0.49	0.02	0.01	0.45	0.02				
Queue Length 95th (m)	8.8	5.4	2.4	0.0	0.0	0.2	0.0	0.0				
Control Delay (s)	21.4	27.7	9.8	0.0	0.0	9.6	0.0	0.0				
Lane LOS	C	D	A			A						
Approach Delay (s)	21.4	27.7	0.8			0.1						
Approach LOS	C	D										
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			57.1%		ICU Level of Service				B			
Analysis Period (min)			15									

## **Appendix F: 2031 Intersection Operations**



1: Hwy 26 & Harbour St W/Balsam St

2031 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	5	165	50	5	14	107	659	70	5	896	5
Future Volume (vph)	5	5	165	50	5	14	107	659	70	5	896	5
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95	1.00		0.95	
Frt	1.00	0.85		1.00	0.89			1.00	0.85		1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		1.00	
Satd. Flow (prot)	1789	1610		1789	1678			3554	1601		3574	
Flt Permitted	0.74	1.00		0.64	1.00			0.62	1.00		0.95	
Satd. Flow (perm)	1399	1610		1203	1678			2210	1601		3395	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	6	183	56	6	16	119	732	78	6	996	6
RTOR Reduction (vph)	0	125	0	0	11	0	0	0	40	0	1	0
Lane Group Flow (vph)	6	64	0	56	11	0	0	851	38	0	1007	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	18.1	18.1		18.1	18.1			26.7	26.7		26.7	
Effective Green, g (s)	18.1	18.1		18.1	18.1			26.7	26.7		26.7	
Actuated g/C Ratio	0.32	0.32		0.32	0.32			0.47	0.47		0.47	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	445	513		383	534			1038	752		1595	
v/s Ratio Prot		0.04			0.01							
v/s Ratio Perm	0.00			c0.05				c0.39	0.02		0.30	
v/c Ratio	0.01	0.13		0.15	0.02			0.82	0.05		0.63	
Uniform Delay, d1	13.2	13.7		13.8	13.3			13.0	8.2		11.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.1	0.5		0.8	0.1			5.2	0.0		0.8	
Delay (s)	13.3	14.2		14.6	13.3			18.1	8.2		12.2	
Level of Service	B	B		B	B			B	A		B	
Approach Delay (s)		14.2			14.3			17.3			12.2	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	56.8	Sum of lost time (s)	14.0
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

2: Keith Ave & Hwy 26





















2031 AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	49	91	586	855	20
Future Volume (Veh/h)	20	49	91	586	855	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	54	101	651	950	22
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)	303					
pX, platoon unblocked	0.73					
vC, conflicting volume	1803	950	972			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1913	950	972			
tC, single (s)	6.9	6.7	4.6			
tC, 2 stage (s)						
tF (s)	4.0	3.8	2.7			
p0 queue free %	34	79	82			
cM capacity (veh/h)	33	258	549			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>	
Volume Total	76	101	651	950	22	
Volume Left	22	101	0	0	0	
Volume Right	54	0	0	0	22	
cSH	88	549	1700	1700	1700	
Volume to Capacity	0.87	0.18	0.38	0.56	0.01	
Queue Length 95th (m)	35.5	5.1	0.0	0.0	0.0	
Control Delay (s)	146.6	13.0	0.0	0.0	0.0	
Lane LOS	F	B				
Approach Delay (s)	146.6	1.7		0.0		
Approach LOS	F					
<b>Intersection Summary</b>						
Average Delay	6.9					
Intersection Capacity Utilization	64.2%			ICU Level of Service	C	
Analysis Period (min)	15					

3: Hwy 26 & Cranberry Trail E/Gun Club Rd

2031 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	5	68	17	5	5	57	544	5	5	790	24
Future Volume (Veh/h)	31	5	68	17	5	5	57	544	5	5	790	24
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	34	6	76	19	6	6	63	604	6	6	878	27
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1629	1626	878	1699	1647	604	905			610		
vC1, stage 1 conf vol	890	890		730	730							
vC2, stage 2 conf vol	739	736		969	917							
vCu, unblocked vol	1629	1626	878	1699	1647	604	905			610		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	98	78	88	98	99	92			99		
cM capacity (veh/h)	249	271	347	156	240	498	752			969		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	116	31	63	604	6	6	878	27				
Volume Left	34	19	63	0	0	6	0	0				
Volume Right	76	6	0	0	6	0	0	27				
cSH	307	195	752	1700	1700	969	1700	1700				
Volume to Capacity	0.38	0.16	0.08	0.36	0.00	0.01	0.52	0.02				
Queue Length 95th (m)	12.9	4.2	2.1	0.0	0.0	0.1	0.0	0.0				
Control Delay (s)	23.6	26.9	10.2	0.0	0.0	8.7	0.0	0.0				
Lane LOS	C	D	B			A						
Approach Delay (s)	23.6	26.9	1.0			0.1						
Approach LOS	C	D										
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization			60.3%		ICU Level of Service				B			
Analysis Period (min)			15									

1: Hwy 26 & Harbour St W/Balsam St

2031 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	17	212	91	6	8	189	1014	76	12	877	14
Future Volume (vph)	24	17	212	91	6	8	189	1014	76	12	877	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95	1.00		0.95	
Frt	1.00	0.86		1.00	0.92			1.00	0.85		1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		1.00	
Satd. Flow (prot)	1789	1622		1789	1725			3551	1601		3568	
Flt Permitted	0.75	1.00		0.42	1.00			0.60	1.00		0.93	
Satd. Flow (perm)	1407	1622		793	1725			2157	1601		3317	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	27	19	236	101	7	9	210	1127	84	13	974	16
RTOR Reduction (vph)	0	187	0	0	7	0	0	0	18	0	1	0
Lane Group Flow (vph)	27	68	0	101	9	0	0	1337	66	0	1002	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	18.1	18.1		18.1	18.1			57.2	57.2		57.2	
Effective Green, g (s)	18.1	18.1		18.1	18.1			57.2	57.2		57.2	
Actuated g/C Ratio	0.21	0.21		0.21	0.21			0.66	0.66		0.66	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	291	336		164	357			1413	1048		2173	
v/s Ratio Prot		0.04			0.01							
v/s Ratio Perm	0.02			c0.13				c0.62	0.04		0.30	
v/c Ratio	0.09	0.20		0.62	0.02			0.95	0.06		0.46	
Uniform Delay, d1	28.0	28.6		31.4	27.6			13.7	5.4		7.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.6	1.4		16.1	0.1			13.1	0.0		0.2	
Delay (s)	28.6	30.0		47.5	27.7			26.8	5.4		7.6	
Level of Service	C	C		D	C			C	A		A	
Approach Delay (s)		29.8			44.8			25.5			7.6	
Approach LOS		C			D			C			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			20.4									C
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			87.3								14.0	
Intersection Capacity Utilization			97.6%									F
Analysis Period (min)			15									
c Critical Lane Group												



2: Keith Ave & Hwy 26





















2031 PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	72	97	949	831	20
Future Volume (Veh/h)	20	72	97	949	831	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	80	108	1054	923	22
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)	303					
pX, platoon unblocked	0.38					
vC, conflicting volume	2193	923	945			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3326	923	945			
tC, single (s)	6.9	6.7	4.6			
tC, 2 stage (s)						
tF (s)	4.0	3.8	2.7			
p0 queue free %	0	70	81			
cM capacity (veh/h)	2	268	564			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>	
Volume Total	102	108	1054	923	22	
Volume Left	22	108	0	0	0	
Volume Right	80	0	0	0	22	
cSH	8	564	1700	1700	1700	
Volume to Capacity	12.64	0.19	0.62	0.54	0.01	
Queue Length 95th (m)	Err	5.3	0.0	0.0	0.0	
Control Delay (s)	Err	12.9	0.0	0.0	0.0	
Lane LOS	F	B				
Approach Delay (s)	Err	1.2		0.0		
Approach LOS	F					
<b>Intersection Summary</b>						
Average Delay			462.3			
Intersection Capacity Utilization			64.7%	ICU Level of Service	C	
Analysis Period (min)			15			

### 3: Hwy 26 & Cranberry Trail E/Gun Club Rd

2031 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	5	56	25	5	5	80	864	25	5	770	26
Future Volume (Veh/h)	24	5	56	25	5	5	80	864	25	5	770	26
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	27	6	62	28	6	6	89	960	28	6	856	29
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL				TWLTL
Median storage veh								2				2
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	2015	2034	856	2071	2035	960	885			988		
vC1, stage 1 conf vol	868	868		1138	1138							
vC2, stage 2 conf vol	1147	1166		933	897							
vCu, unblocked vol	2015	2034	856	2071	2035	960	885			988		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	97	83	79	97	98	88			99		
cM capacity (veh/h)	170	195	357	132	182	311	765			699		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	95	40	89	960	28	6	856	29				
Volume Left	27	28	89	0	0	6	0	0				
Volume Right	62	6	0	0	28	0	0	29				
cSH	262	151	765	1700	1700	699	1700	1700				
Volume to Capacity	0.36	0.26	0.12	0.56	0.02	0.01	0.50	0.02				
Queue Length 95th (m)	12.1	7.7	3.0	0.0	0.0	0.2	0.0	0.0				
Control Delay (s)	26.4	37.2	10.3	0.0	0.0	10.2	0.0	0.0				
Lane LOS	D	E	B			B						
Approach Delay (s)	26.4	37.2	0.9			0.1						
Approach LOS	D	E										
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			63.7%		ICU Level of Service				B			
Analysis Period (min)			15									