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Summit View Residential Subdivision, Phase 3

TRAFFIC IMPACT STUDY

Poplar Developments I Inc.

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	 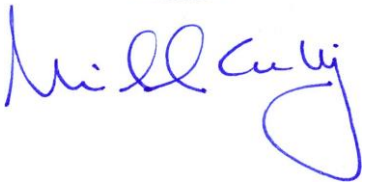
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1 Introduction

Tatham Engineering Limited was retained by Poplar Developments I Inc. to address the traffic impacts associated with the proposed Summit View – Phase 3 residential development located at the northwest corner of Poplar Sideroad (County Road 32) and High Street in the Town of Collingwood. The location of the development site is illustrated in Figure 1.

It is noted that Phases 1 and 2 of the Summit View development were previously addressed in the *Charleston Homes Residential Development Traffic Impact Study*[1] completed in 2015. The current Phase 3 lands were also addressed in the noted study, albeit they were not part of the Summit View development and thus were considered as part of the background development review. The lands have subsequently been incorporated into the overall Summit View development, an updated study for which is warranted given that the initial study was completed in 2015.

1.1 STUDY PURPOSE

The purpose of this study is to revisit the initial traffic impact study and update it specific to the Phase 3 lands and the potential transportation impacts of such on the area road network. In doing so, the report will address the requirements of the Town of Collingwood and the County of Simcoe given the respective jurisdictions of the fronting roads. In particular, the following will be discussed:

- the operations of the study area road system prior to the proposed development;
- the growth in the traffic volumes not otherwise attributed to the development (i.e. from overall growth in the area and/or other developments);
- the number of new trips the proposed development is likely to generate;
- the operations of the study area road system upon the completion of the proposed development; and
- the resulting impacts and need for mitigating measures (if required) to ensure acceptable overall road operations, including during the construction of the proposed development.

[1] *Charleston Homes Residential Development Traffic Impact Study.* C.C. Tatham & Associates Ltd., December 2015.

1.2 STUDY STRUCTURE

The report is structured as follows:

- Chapter 1: introduction and study purpose;
- Chapter 2: existing conditions, detailing the road system and corresponding traffic operations;
- Chapter 3: future conditions, prior to the completion of the proposed development (referred to as future background conditions), and the expected growth in traffic levels and the resulting operating conditions;
- Chapter 4: proposed development and associated details including land use, access, traffic volumes and parking;
- Chapter 5: future conditions, with completion of the proposed development (referred to as future total conditions); and
- Chapter 6: summary of the report and key findings.

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 High Street, Poplar Sideroad (County Road 32), Plewes Drive/Findlay Drive, Campbell Street, Rowland Street, Hurontario Street (County Road 124) and the following intersections:

- Hurontario Street and Poplar Sideroad
- High Street and Poplar Sideroad (roundabout);
- High Street and Plewes Drive/Findlay Drive;
- High Street and Campbell Street; and
- Rowland Street and Poplar Sideroad.

Photographs of the road system are provided in Figure 2.

2.1.1 Road Sections

High Street

As per the *Town of Collingwood Official Plan*, High Street is designated as an arterial road. The road is oriented north-south through the study area and has a 2-lane rural cross-section (i.e. 1 lane of travel per direction with gravel shoulders and open ditches). The posted speed limit is 50 km/h and hence a design of 70 km/h has been assumed (posted speed limit + 20 km/h). As an arterial road, High Street has an assumed planning capacity of 900 vehicles per hour per lane (vphpl). The road maintains a straight and flat alignment through the study area. It is noted that High Street has a 30-metre right-of-way that can accommodate a future 4-lane profile.

Poplar Sideroad/County Road 32

Poplar Sideroad, also known as County Road 32, is a primary arterial road under the jurisdiction of the County, as per the *County of Simcoe Official Plan*. The road is oriented east-west and has a 2-lane profile. Poplar Sideroad is urbanized (curb and gutter) from Rowland Street (approximately 415 metres west of High Street) through to Hurontario Street/County Road 124. The road has a posted speed limit of 60 km/h and an assumed design speed of 80 km/h. As a primary arterial road in the County road network, Poplar Sideroad has an assumed planning

capacity in the order of 900 to 1,100 vphpl. The road is relatively flat and straight through the study area.

Hurontario Street/County Road 124

County Road 124 is a north-south primary arterial road under the jurisdiction of the County of Simcoe. The road has a 2-lane rural cross section and a posted speed limit of 70 km/h through the study area. As a primary arterial road, County Road 124 has an assumed planning capacity in the order of 900 to 1,100 vphpl.

North of Poplar Sideroad, County Road 124 is within the Town of Collingwood and thus under the jurisdiction of the Town and known locally as Hurontario Street. In the immediate area, the general characteristics remains consistent with those of County Road 124 (i.e. rural cross section with 1 travel lane per direction). The speed limit on Hurontario Street is 60 km/h.

Local Roads

Campbell Street, Plewes Drive, Findlay Drive and Rowland Street are all local roads within the study area. Each consist of a 2-lane cross section providing one lane of travel per direction with a speed limit of 50 km/h. As local roads, a planning capacity of 400 vphpl has been assumed.

2.1.2 Intersections

Hurontario Street/County Road 124 & Poplar Sideroad/County Road 32

The intersection of Poplar Sideroad and Hurontario Street/County Road 124 is a signalized 4-leg intersection. The north and west approaches provide an exclusive left turn lane and a shared through-right turn lane, whereas the south and east approaches consist of an exclusive left, through and right turn lanes. The signal timing plan include an advance green for the northbound, eastbound and westbound left turn movement.

Poplar Sideroad & High Street

The intersection of High Street with Poplar Sideroad is a 3-leg roundabout. As a roundabout, each approach operates under yield control. The north leg (High Street) flares to a 2-lane approach in advance of the roundabout to accommodate an exclusive left turn lane and an exclusive right turn lane. The north leg has a single lane departure. The east and west legs each have a 2-lane approach (flared from a 1-lane in advance of the roundabout) and a 2-lane departure configuration. The 2-lane departures to the east and west taper back down to a single lane to match the existing cross-section on Poplar Sideroad (i.e. two-lanes are carried through the roundabout in the east-west direction).

High Street & Plewes Drive/Findlay Drive

The intersection of High Street and Plewes Drive/Findlay Drive is a 4-leg intersection with stop control on the minor street (Plewes Drive/Findlay Drive). The north approach consists of an exclusive left turn lane, a through lane and a right turn taper, whereas the south approach consists of an exclusive left turn lane and a shared through-right turn lane. The east and west approaches each provide a single shared left-through-right turn lane.

High Street & Campbell Street

The intersection of Campbell Street with High Street is a 3-leg intersection with stop control on all approaches (i.e. 3-way stop). The north approach consists of an exclusive left turn lane and a through lane, whereas the south approach consists of a shared through-right turn lane. The east approach (Campbell Street) provides a shared left-right turn lane.

Rowland Street & Poplar Sideroad

The intersection of Rowland Street with Poplar Sideroad is a 3-leg intersection with stop control on Rowland Street. The north approach consist of a shared left-right lane, whereas the east and west approaches consist of a shared through-right lane and shared left-through turn lane, respectively.

2.2 TRANSIT NETWORK

There are several transit services/routes operating within the Town of Collingwood including several Town routes (west, East and Crosstown) and services linking Collingwood to Blue Mountain and Wasaga Beach. Notwithstanding, there are currently no transit routes operating on the frontage roads of the subject site or operating in the immediate area. The closest services are provided along High Street (north of Campbell Street) and Campbell Street to the north (approximately 780 metres walking distance). Refer to Figure 3 for an excerpt from the *South Georgian Bay Regional Transit Riders Guide* illustrating the subject site and the area transit services.

2.3 ACTIVE TRANSPORTATION NETWORK

A number of sidewalks and trails are provided in the immediate area as evident in the aerial photographs of Figure 2 and the excerpt of the Collingwood Trails map provided in Figure 4. These include:

- the Heather Pathway (3.0 gravel trail) which runs along the west side of High Steet and the north side of Poplar Sideroad in the immediate area;
- on-road bicycle routes along Campbell Street, Findlay Drive and Clark Street; and

- standard sidewalk systems throughout Summit View Phases 1 and 2 (under construction) and the adjacent Mountaincroft residential subdivision to the east.

Immediately adjacent to the site, there is the following (as evident in Figure 5):

- 3.0 metre gravel trail along the west side of High Street;
- a 1.5 metre paved boulevard on the north side of Poplar Sideroad/County Road 32 (immediately behind the curb); and
- a 0.5 metre paved boulevard on the south side of Poplar Sideroad/County Road 32 (immediately behind the curb).

2.4 TRAFFIC VOLUMES

To determine existing traffic volumes on the study area road network, traffic counts were conducted on Wednesday January 18, 2023 (7:00 to 10:00 and 15:00 to 18:00) at the intersections along High Street and at the intersection of Hurontario Street/County Road 124 with Poplar Sideroad. A peak hour traffic count was also conducted at the intersection of Rowland Street with Poplar Sideroad on Tuesday January 31, 2023 (8:15 to 9:15 and 15:45 to 16:45, reflective of the peak hour periods observed at the Poplar Sideroad/High Street roundabout). The observed volumes are illustrated in Figure 6, whereas count details are provided in Appendix A.

2.5 TRAFFIC OPERATIONS

The assessment of existing conditions provides the baseline from which the future traffic operations (both with and without the subject development) can be assessed from. As the capacity and hence operations, of a road system is effectively governed by its intersections, the traffic operations of the existing conditions has focused on the exiting intersections. The analysis is based on the following:

- the 2023 traffic volumes;
- the existing intersection configurations and controls;
- procedures outlined in the *2000 Highway Capacity Manual*[2] (using Synchro v.11 software) for signalized and unsignalized intersections; and
- ARCADY roundabout software for analysis of the roundabout.

For each intersection, the analysis considers:

- the average delay (measured in seconds);

[2] *Highway Capacity Manual.* Transportation Research Board, Washington DC, 2000.

- level of service (LOS); and
- volume to capacity (v/c) for each movement if signalized, or for critical movements only if unsignalized.

With respect to the noted metrics:

- 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 (additional details regarding Level of Service definitions are provided in Appendix B); and
- a v/c ratio of less than 1.0 indicates the intersection movement is operating at less than capacity while v/c of 1.0 indicates capacity has been reached.

A summary of the analysis provided in Table 1; detailed operations worksheets are included in Appendix C.

Based on the existing volumes, intersection configuration and control, all of the intersections provide acceptable overall levels of service (LOS C or better) with average delays during both peak hours. No individual movement operates below LOS D. As such, no intersection improvements are required to support the existing conditions.

Table 1: Intersection Operations – 2023 Existing

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Hurontario Street & Poplar Sideroad	EB L	signal	16	B	0.22	16	B	0.12
	EB TR	signal	24	C	0.69	37	D	0.87
	WB L	signal	17	B	0.11	16	B	0.24
	WB T	signal	26	C	0.72	19	B	0.53
	WB R	signal	18	B	0.10	16	B	0.11
	NB L	signal	10	A	0.31	11	B	0.25
	NB T	signal	10	A	0.22	11	B	0.20
	NB R	signal	8	A	0.04	10	A	0.03
	SB L	signal	18	B	0.42	23	C	0.54
	SB TR	signal	15	B	0.23	20	C	0.48
	overall	signal	19	B	0.51	23	C	0.63
Poplar Sideroad & High Street	EB	roundabout	2	A	0.10	3	A	0.17
	WB	roundabout	2	A	0.25	2	A	0.19
	SB	roundabout	2	A	0.09	2	A	0.12
High Street & Plewes Drive/ Findlay Drive	EB LTR	stop	19	C	0.24	21	C	0.21
	WB LTR	stop	11	B	0.17	11	B	0.10
High Street & Campbell Street	WB	stop	9	A	0.17	10	A	0.16
	NB	stop	13	B	0.53	12	B	0.46
	SB	stop	10	A	0.39	13	B	0.59
Rowland Street & Poplar Sideroad	SB LR	stop	11	B	0.04	11	B	0.04

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

3 Future Background Conditions

This chapter will describe the road network and background traffic volumes expected for the following horizon years:

- 2030 to reflect full build-out of the proposed Phase 3 development;
- 2035 which corresponds to 5 years beyond build-out; and
- 2040 which corresponds to 10 years beyond build-out.

The latter horizons (+5 and +10 years) are required to address Simcoe County requirements.

3.1 ROAD NETWORK

As per the *Collingwood Transportation Study Update*[3], the following improvements have been recommended for the study area road network:

- traffic signals or roundabout at the intersection of Campbell Street with High Street (2031); and
- widen High Street to 4 lanes from Tenth Street (where it is currently 4 lanes) to Poplar Sideroad (2041).

In addition, the study identified the following improvement options for the intersection of Campbell Street with High Street:

- Option 1: widen the east approach (Campbell Street) to accommodate exclusive left and right turn lanes, widen the south approach to include a northbound right-turn lane and add traffic signals; and.
- Option 2: construct a 2 lane roudabout.

The *Collingwood Transportation Study* did not identify a preferred solution but rather recommends further studies and cost-benefit analyses be conducted in order to determine the preferred option.

In completing the operational analysis under future conditions, the above noted improvements will only be considered if the traffic operations dictate.

[3] *Collingwood Transportation Study Update*. R.J. Burnside & Associates Limited, August 2019.

3.2 TRANSIT NETWORK

The Town of Collingwood commissioned a transit service review study in 2021[4], through which a number of service options were considered including:

- fixed routes that would be similar to the existing service but with modifications to the Town routes to better serve newer and future developments, including provision of services along High Street (to Findlay Drive) and Findlay Drive that would serve the Summit View site;
- on-demand service that would cover the entire town and be responsive to user needs; and
- hybrid service that would include 2 fixed routes through the core of the Town (including along High Street (to Findlay Drive) and Findlay Drive in addition to on-demand service within the west and east limits of the Town.

The recommended service strategy under the 5-year service plan is to implement the on-demand transit service option beginning in 2022 (which has yet to be implemented). Given the nature of this service, and recognizing that buses would operate according to the trip requests of its users, it is expected to provide appropriate service to/from the subject site.

3.3 ACTIVE TRANSPORTATION NETWORK

The *Town of Collingwood Active Transportation Framework 2017* and the *Collingwood Active Transportation Plan 2012-2017* identify Poplar Sideroad/County Road 32 as a possible future corridor for a trail system to support both recreational and active transportation uses, albeit they provide no recommendations or directions with respect to facility type or timing.

3.4 TRAFFIC VOLUMES

Background traffic volumes expected for the 2030, 2035 and 2040 horizon years for the study area have been determined based on the existing traffic volumes, historical and projected growth, and additional increases in volumes due to other development within the immediate area (apart from the subject development).

3.4.1 Background Growth

Population Growth

Based on the Census data for the years 2006 and 2021, the population of the Town of Collingwood increased from 17,290 to 24,811 persons, which translates to an annual growth of 2.4%.

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[4] *Collingwood Transit Service Review.* IBI Group, September 29, 2021.

As per the *2021 Community Profile*[5], the Town's 2030 population is estimated at 29,866, which translates to 2.1% annual growth over the 9-year period 2021 to 2030. As per the County of Simcoe's *Growth Forecast and Land Needs Assessment*[6], the Town of Collingwood has been allocated a population of 42,690 by 2051. In considering a 2021 population of 24,811, an annual growth rate of 1.8% is anticipated for the period 2021 to 2051.

The corresponding population figures are provided in Table 2.

Table 2: Town of Collingwood Population

STATISTIC	2001	2006	2011	2016	2021	2030	2051
Population	16,039	17,290	19,241	21,793	24,811	29,866	42,690
Annual Growth		2006 to 2021 - 2.4%			2021 to 2051 – 1.8%		

Traffic Growth

In order to establish historical growth on the road network, the 2023 peak hour volumes observed on High Street (at Campbell Street and at Poplar Sideroad) and on Poplar Sideroad (at High Street) were compared with traffic counts conducted at the same intersections in November 2015. The following growth was realized:

- High Street at Poplar Sideroad: -1.3% per annum
- High Street at Campbell Street: +4.0% per annum
- Poplar Sideroad at High Street: +1.2%

The resulting growth rates on High Street are likely impacted by the connection of Findlay Drive to High Street, which occurred after the 2015 counts were conducted. The Findlay Drive connection adds volumes to High Street north of Findlay Drive (i.e. it provides a new east-west connection between High Street and Hurontario Street) while also reducing volumes on High Street south of Findlay Drive (local traffic accessing the Mountaincroft development and surrounding developments no longer have to travel along Poplar Sideroad to access High Street). The 2023 counts also captured development volumes associated with the fully built-out Mountaincroft development and those associated with Summit View Phases 1 and 2. In this respect the 4% annual growth does not reflect typical growth, nor does the 1.3% decrease identified south at Poplar Sideroad.

[5] *2021 Community Profile.* Town of Collingwood, May 2021.
[6] *Growth Forecast and Land Needs Assessment.* March 31, 2022. Hemson for the County of Simcoe.

Other Studies

Background growth rates have been considered as employed in several other studies as follows:

- the 2015 *Charleston Homes Residential Development Traffic Impact Study* employed a background growth rate of 1% per annum on the area road system;
- the 2017 *Eden Oak Homes – Proposed Residential Development Traffic Impact Study Update*[7] (Eden Oak is the residential development just north and east of the of the Hurontario Street/Poplar Sideroad intersection) employed a background growth rate of 1% per annum for both Poplar Sideroad/County Road 32 and Hurontario Street/County Road 124 in estimating future traffic volumes; and
- the 2019 *Collingwood Transportation Study Update* employed a 0.5% background growth rate, applied to all Town roads considered in the assessment.

Overall Background Growth

In consideration of the noted population and traffic growth rates, an annual background growth rate of 2.0% has been assumed.

3.4.2 Development Growth

Other planned developments within the immediate study area were identified through a review of the Town of Collingwood's online development map. The following developments have been identified for consideration in the establishment of future background volumes:

- Trails of Collingwood;
- 50 Saunders Street; and
- Summit View - Phase 2.

The locations of the above noted background developments are illustrated in Appendix D, with additional details provided below.

Trails of Collingwood

The Trails of Collingwood Subdivision site is located on the east side of High Street, approximately 300 metres north of Campbell Street. As per the *Trails of Collingwood Subdivision Traffic Impact Study*[8], the proposed development is to consist of 34 single detached units, 32 semi-detached units, 78 townhouse units and 111 apartment units, for a total of 255 units.

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[7] *Eden Oak Homes – Proposed Residential Development Traffic Impact Study Update.* Cole Engineering, September 2017.

[8] *Trails of Collingwood Subdivision Traffic Impact Study.* R.J. Burnside & Associates Ltd. June 2007.

Revisions to the draft plan of subdivision were proposed in 2017 and subsequently approved. The current draft plan of subdivision consists of 34 single detached units, 32 semi-detached units, 46 townhouse units and 125 apartment units, for a total of 237 units (18 fewer units than considered in the initial TIS). Regardless, the site generated traffic provided in the original TIS has been maintained to ensure a conservative approach.

There is currently no development activity on the site. For the purpose of this study, full build-out has been assumed by 2030. The site generated traffic, as presented in the respective traffic impact study, has been carried through the study area road network based on the trip distribution assumptions provided in Section 4.5.2. The assignment of trips through the road network is illustrate in Figure 7.

50 Saunders Street

The 50 Saunders Street residential development is to be located on the northwest corner of the intersection of Saunders Street with Poplar Sideroad. Upon completion, it will consist of 64 single family units and is expected to generate in the order of 51 to 66 new peak hour trips upon full build-out (as noted in the *50 Saunders Street Traffic Impact Brief*[9]). Full build-out has been assumed by 2030.

The site generated traffic, as presented in the respective traffic impact study, has been carried through the study area road network based on the trip distribution assumptions provided in Section 4.5.2. The assignment of trips through the road network is illustrate in Figure 8.

Summit View – Phase 2

Summit View Phases 1 and 2 are located immediately north and west of the proposed Phase 3 lands. Upon full build-out, Phases 1 and 2 will consist of a combined 406 residential units. A summary of the units by phase is provide below:

- Phase 1 – 213 units (82 singles, 44 semis and 87 towns) and
- Phase 2 – 193 units (151 singles and 42 semis)

Phase 1 is complete, and Phase 2 is approximately 45% built-out (86 units were complete at the time of the traffic counts). As such, 107 units remain to be built in Phase 2. Full build-out is anticipated by 2025.

Recognizing that the traffic counts captured the traffic associated with the existing level of build-out, only the trip generation for the remaining 107 units has been considered in establishing the

[9] *50 Saunders Street Traffic Impact Brief.* Tatham Engineering Limited. December 3, 2019.

future background volumes. The trip generation for the remaining units it Phase 2 has been established based on trip rates provided in the ITE *Trip Generation Manual*[10]*, 11th Edition*. For the purpose of this assessment (and to ensure a conservative approach) it is assumed that the 107 units to be constructed are single detached units. The ITE trip generation rates for the *single family detached* (ITE code 210) land use and the resulting trip estimates for the remaining Phase 2 units are summarized in Table 3.

Table 3: Trip Generation - Summit View Phase 2 Remaining Units

LAND USE	VARIABLE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		In	Out	Total	In	Out	Total
single family detached (ITE 210)	units	0.18	0.52	0.70	0.59	0.35	0.94
Phase 2 remaining units	107	19	55	74	63	37	100

As noted, the remaining units in Phase 2 are expected to generate 74 new trips during the AM peak hour and 100 trips during the PM peak hour upon full build-out. The noted Phase 2 trips have been assigned to the study area road network based on the trip distribution/assignment assumptions provided in Section 4.5.2. The assignment of trips through the road network is illustrate in Figure 9.

3.4.3 Background Traffic Volumes

The future background traffic volumes for the 2030, 2035 and 2040 horizon years are illustrated in Figure 10 through Figure 12 and reflect the following:

- the 2023 traffic volumes as per Figure 6;
- the noted annual background growth rate; and
- the additional traffic volumes associated with the background developments.

3.4.4 Collingwood Transportation Study Update

The future background traffic volumes considered in this study are greater than the background volumes considered in the *Collingwood Transportation Study Update,* but significantly lower than the future total volumes considered therein. It is noted that the background volumes provided in the *Collingwood Transportation Study Update* only considered nominal background growth

[10] *Trip Generation Manual, 11th Edition.* Institute of Transportation Engineers. September 2021.

(0.5% per annum with no development specific growth), whereas the future total volumes were comprehensive with respect to the inclusion of both planned and potential development. The study assumed all development built-out by the 2041 horizon – resulting in an estimated increase in population of 22,815 persons. In considering the 2021 census of 24,811, this results in an ultimate population of 47,626 by 2041. As previously noted, the County's *Growth Forecast and Land Needs Assessment* allocates the Town a population of 42,690 by 2051. Thus, the traffic projections contained within the study reflect a conservative scenario.

For the purpose of this study, the background traffic volumes provided in Figure 10 through Figure 12 (based on the 2023 volumes with 2% background growth and the additional traffic volumes associated with noted background developments) have been considered in the assessment. The improvements recommended in the *Collingwood Transportation Study Update* have not been incorporated, unless otherwise dictated by the resulting traffic operations.

Notwithstanding the above, a sensitivity analysis has also been conducted under the 2040 horizon to consider the future total traffic volumes considered in the *Collingwood Transportation Study Update* and the impact of such on intersections of High Street with Plewes Drive/Findlay Drive and High Street with the Summit View Phase 3 access. The sensitivity analysis is provided in Section 5.4.

3.5 TRAFFIC OPERATIONS

The intersection operations were again analyzed for each horizon year given the projected background volumes and maintaining the existing intersection configuration and controls. As previously noted, the identified future road system improvements (widening of High Street to 4 lanes and intersection improvements at High Street and Campbell Street will only be considered if improvements are warranted by the traffic operations). The results of the operational assessment are summarized in Table 4 through Table 6; corresponding detailed worksheets are provided in Appendix E.

With the exception of High Street and Plewes Drive/ Findlay Drive, the study area intersections provide acceptable overall levels of service (LOS E or better) with average delays during both peak hours. Notwithstanding the southbound movement at the intersection of High Street and Campbell Street (LOS E), all other individual movements experience LOS D or better.

At the intersection of High Street with Plewes Drive/Findlay Drive, poor operations (LOS F) are experienced by the westbound movement under both AM and PM conditions in 2040. It is noted that the intersection does not warrant traffic signals based on the projected traffic volumes in that the minimum volume thresholds are not satisfied (a signal warrant analysis is provided in Appendix F). Regardless, traffic signals are recommended by 2040 to address the poor operating conditions at the subject intersection associated with the background traffic conditions.

Table 4: Intersection Operations – 2030 Background

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Hurontario Street & Poplar Sideroad	EB L	signal	16	B	0.26	16	B	0.15
	EB TR	signal	27	C	0.82	45	D	0.93
	WB L	signal	16	B	0.15	18	B	0.31
	WB T	signal	27	C	0.76	22	C	0.60
	WB R	signal	17	B	0.12	17	B	0.13
	NB L	signal	11	B	0.40	13	B	0.35
	NB T	signal	11	B	0.27	13	B	0.23
	NB R	signal	9	A	0.04	11	B	0.03
	SB L	signal	25	C	0.59	28	C	0.62
	SB TR	signal	18	B	0.32	23	C	0.54
	overall	signal	21	C	0.64	27	C	0.73
Poplar Sideroad & High Street	EB	roundabout	2	A	0.13	3	A	0.22
	WB	roundabout	2	A	0.30	2	A	0.25
	SB	roundabout	2	A	0.12	2	A	0.16
High Street & Plewes Drive/ Findlay Drive	EB LTR	stop	34	D	0.50	34	D	0.42
	WB LTR	stop	12	B	0.21	12	B	0.15
High Street & Campbell Street	WB	stop	10	B	0.21	11	B	0.21
	NB	stop	18	C	0.68	16	C	0.60
	SB	stop	12	B	0.51	20	C	0.76
Rowland Street & Poplar Sideroad	SB LR	stop	12	B	0.08	12	B	0.07

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

Table 5: Intersection Operations – 2035 Background

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Hurontario Street & Poplar Sideroad	EB L	signal	16	B	0.31	17	B	0.15
	EB TR	signal	30	C	0.82	43	D	0.91
	WB L	signal	16	B	0.17	20	C	0.36
	WB T	signal	29	C	0.80	22	C	0.56
	WB R	signal	17	B	0.13	18	B	0.14
	NB L	signal	12	B	0.45	18	B	0.44
	NB T	signal	12	B	0.30	17	B	0.27
	NB R	signal	10	A	0.05	14	B	0.03
	SB L	signal	29	C	0.66	39	D	0.73
	SB TR	signal	19	B	0.35	31	C	0.63
	overall	signal	22	C	0.71	29	C	0.78
Poplar Sideroad & High Street	EB	roundabout	2	A	0.14	3	A	0.24
	WB	roundabout	3	A	0.33	2	A	0.27
	SB	roundabout	2	A	0.14	2	A	0.17
High Street & Plewes Drive/ Findlay Drive	EB LTR	stop	45	E	0.59	45	E	0.50
	WB LTR	stop	13	B	0.25	13	B	0.18
High Street & Campbell Street	WB	stop	11	B	0.25	11	B	0.25
	NB	stop	22	C	0.76	18	C	0.67
	SB	stop	13	B	0.57	25	D	0.84
Rowland Street & Poplar Sideroad	SB LR	stop	13	B	0.09	13	B	0.07

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

Table 6: Intersection Operations – 2040 Background

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Hurontario Street & Poplar Sideroad	EB L	signal	17	B	0.35	16	B	0.18
	EB TR	signal	30	C	0.81	54	D	0.97
	WB L	signal	18	B	0.20	22	C	0.40
	WB T	signal	32	C	0.81	24	C	0.62
	WB R	signal	18	B	0.14	18	B	0.16
	NB L	signal	15	B	0.52	21	C	0.57
	NB T	signal	14	B	0.33	18	B	0.30
	NB R	signal	12	B	0.05	15	B	0.04
	SB L	signal	33	C	0.70	48	D	0.83
	SB TR	signal	21	C	0.37	34	C	0.71
	overall	signal	24	C	0.74	34	C	0.86
Poplar Sideroad & High Street	EB	roundabout	3	A	0.16	3	A	0.27
	WB	roundabout	3	A	0.36	2	A	0.30
	SB	roundabout	2	A	0.15	2	A	0.19
High Street & Plewes Drive/ Findlay Drive	EB LTR	stop	**67**	**F**	0.71	**63**	**F**	0.60
	WB LTR	stop	13	B	0.29	14	B	0.20
High Street & Campbell Street	WB	stop	12	B	0.28	12	B	0.27
	NB	stop	30	D	0.85	23	C	0.75
	SB	stop	15	C	0.63	37	E	0.93
Rowland Street & Poplar Sideroad	SB LR	stop	13	B	0.08	14	B	0.09

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

The intersection of High Street with Plewes Drive/Findlay Drive has been re-assessed to consider the recommended traffic signals for the 2040 horizon, a summary of which is provided in Table 7 (detailed worksheets provided in Appendix E). As expected, the implementation of traffic signals will ensure excellent operations during the peak hours.

Table 7: Intersection Operations – 2040 Background (signals at High/Plewes/Findlay)

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
High Street & Plewes Drive/ Findlay Drive	EB LTR	signal	22	C	0.52	21	C	0.37
	WB LTR	signal	18	B	0.14	20	B	0.11
	NB L	signal	3	A	0.02	3	A	0.02
	NB TR	signal	4	A	029	4	A	0.27
	SB L	signal	4	A	0.19	4	A	0.21
	SB T	signal	4	A	0.22	4	A	0.30
	SB R	signal	3	A	0.03	3	A	0.07
	overall	signal	8	A	0.33	6	A	0.31

It is noted that Plewes Drive/Findlay Drive is approximately 480 metres north of the Poplar Sideroad road and thus there will be no concerns with respect to queuing at the recommended traffic signals impacting roundabout operations (the projected 95th percentile northbound queues at the traffic signals are less than 30 metres).

4 Proposed Development

This chapter provides additional details with respect to the proposed Summit View - Phase 3 development, including its location, the projected site generated traffic volumes and the assignment of such to the adjacent road network.

4.1 LOCATION

The subject site is located on the north-west corner of the intersection of High Street and Poplar Sideroad in the Town of Collingwood (as per Figure 1).

4.2 LAND USE & PHASING

The proposed residential development will consist of:

- 38 semi- detached units;
- 97 townhouse units; and
- 135 total units.

A single phase has been considered with full build-out assumed by 2030. A site plan is provided in Figure 13.

4.3 ACCESS

4.3.1 Location

As evident in the site plan of Figure 13, access to the Phase 3 lands will be provided via the following:

- a new municipal road connection to High Street (referred to as Street B); and
- 2 internal connections to the existing road network serving Summit View Phases 1 and 2, which in turn will provide access to Plewes Drive and Rowland Street.

The proposed Street B access to High Street is located approximately 285 metres south of Plewes Drive and 180 metres north of Poplar Sideroad. As per the Transportation Association of Canada *Geometric Design Guide for Canadian Roads,* a minimum intersection spacing of 200 metres is recommended on arterial roads, which is sufficient to accommodate back-to-back storage for left turning vehicles at the adjacent intersections. While the proposed separation between Street B and the roundabout at Poplar Sideroad does not satisfy the recommended 200 metre separation, it is not considered problematic in that:

- Street B will serve relatively low volumes (particularly northbound left turns); and

- given the roundabout at Poplar Sideroad, there will be no need for back-to-back left turn lanes.

In this respect, the proposed 180 metre separation is considered acceptable.

4.3.2 Configuration

As noted, the Street B access to High Street will be constructed as a municipal road and thus will provide 1 inbound lane and 1 outbound lane (shared left-right lane) operating under stop control at High Street.

4.3.3 Sight Lines

The sight lines along High Street at Street B have been reviewed in context of the minimum stopping sight distance and intersection sight distance requirements as per the Transportation Association of Canada (TAC) *Geometric Design Guide for Canadian Roads*[11], which are further explained 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.

Table 8 summarizes the sight distance requirements for a design speed of 70 km/h, reflective of the posted speed of 50 km/h on High Street. The available sight lines along High Street at Street B are also summarized in Table 8.

Table 8: Site Access Sight Line Assessment

LOCATION	DESIGN SPEED	STOPPING SIGHT DISTANCE	INTERSECTION SIGHT DISTANCE		AVAILABLE SIGHT DISTANCES TO/FROM	
			Left Turn	Right Turn	South	North
Street B	70 km/h	105 m	150 m	130 m	180 m	>200 m

As indicated, the minimum stopping and intersection sight distance requirements for a 70 km/h design speed are satisfied in all instances.

[11] *Geometric Design Guide for Canadian Roads, Chapter 9.* Transportation Association of Canada. June 2017.

4.4 ACTIVE TRANSPORTATION

The overall Summit View development includes a comprehensive sidewalk network and internal walkways which will provide internal connectivity within the site. This connectivity will be extended through Phase 3. The site is also well connected to the Town's trail network, including direct connection to the existing trail on the west side of High Street.

4.5 TRAFFIC

4.5.1 Trip Generation

The number of vehicle trips to be generated by the proposed development has been determined based on the type of use, development size, and ITE trip generation rates (as per *ITE Trip Generation Manual, 11th Edition*) for the *single family attached* (ITE code 215) land use. The associated trip rates and trip estimates are provided in Table 9. Overall, the proposed development is expected to generate 65 trips during the weekday AM peak hour and 77 trips during the weekday PM peak hour (total of inbound and outbound trips).

Table 9: Trip Generation – Summit View Phase 3

LAND USE	VARIABLE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		In	Out	Total	In	Out	Total
single family attached (ITE 215)	trips/unit	0.15	0.33	0.48	0.32	0.25	0.57
semi-detached units	38	6	13	18	12	9	22
townhouse units	97	14	32	47	32	24	55
Totals	**135**	**20**	**45**	**65**	**44**	**33**	**77**

4.5.2 Trip Distribution

The distribution of the site generated trips has been developed based on the results of the *Transportation Tomorrow Survey* (TTS) conducted in 2016 . The TTS is a comprehensive travel survey conducted in the Greater Golden Horseshoe area once every five years (the 2021 survey was pre-empted by the COVID pandemic and is currently being conducted). As per the *TTS 2016 Data Guide,* the development site resides in Traffic Boundary Zone 8606; however, as this traffic zone had limited development at the time of the 2016 TTS, the data for Traffic Zone 8567 (which is bounded by High Street, First Street, Poplar Sideroad and Minnesota Street/Collingwood Loop Trail corridor and encompasses most of the built-up area of Collingwood) was utilized. Trip data

was filtered to consider trips to, from and internal to the respective traffic zone. The following distribution was established:

- to/from Toronto/Barrie/Springwater 4%;
- to/from Clearwater 13%;
- to/from Grey County 5%;
- to/from Wasaga Beach 9%;
- to/from other locations outside of Collingwood 4%; and
- to/from locations within Collingwood 65%.

As indicated, 65% of the trips remain wholly within the Town of Collingwood, whereas 35% originate from, or are destined to, areas outside of the Town. With respect to the trips that remain within Collingwood, a majority of these trips will travel to/from the north and northeast areas of the Town given the location of the site at the southwest limits of the Town.

Based on the above, with consideration given to anticipated travel routes, the following distribution/assignment has been assumed:

- to/from the north via High Street 50%;
- to/from the south via County Road 124 10%;
- to/from the west via Poplar Sideroad 10%;
- to/from the east via Poplar Sideroad 15%
- to/from the east via Campbell Street 10%; and
- to/from the east via Findlay Drive 5%.

4.5.3 Trip Assignment

It has been assumed that some traffic assigned to Campbell Street and Findlay Drive will ultimately travel north to the downtown area. Similarly, traffic assigned to/from the east on Poplar Sideroad will ultimately travel south on Highway 26.

With respect to the assignment of trips to the site access points, with the exception of trips distributed to/from the west along Poplar Sideroad (which are assumed to access the wider road network via Rowland Street at Poplar Sideroad), all site traffic has been assigned to the High Street access (Street B).

The resulting assignment of site traffic to the road network is illustrated in Figure 14.

5 Future Total 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 key intersections and the Street B site access; and
- potential improvements to the study area road network, if necessary.

5.1 TRAFFIC VOLUMES

5.1.1 Re-Distribution of Summit View Phases 1 & 2 Traffic

Recognizing that the completion of Phase 3 will include new internal street connections to Phases 1 and 2, it is expected that some existing traffic will divert through Phase 3 to access High Street. While the re-distribution of traffic is not expected to be significant given the layout of the internal road network serving the Summit View development, a minor traffic diversion has been considered.

For the purpose of this assessment, it has been assumed that 10% of the traffic generated by Phases 1 and 2 that is otherwise distributed to/from the north, south and east has been re-assigned through to Street B. It has been assumed that internal traffic travelling to/from the west will continue to do so via Rowland Street. The resulting re-distribution of the Phase 1 and 2 traffic is provided in Figure 15.

5.1.2 Total Traffic Volumes

To assess the impacts of the increased traffic volumes resulting from the proposed development, the site generated traffic was combined with the 2030, 2035 and 2040 background traffic volumes, with consideration given to the noted re-distribution of Summit View Phases 1 and 2 traffic. The resulting future total traffic volumes are presented in Figure 16 to Figure 18.

5.2 TRAFFIC OPERATIONS

The operations of the key intersections were again investigated considering the total traffic volumes for each horizon year. The operations of the proposed intersection of Street B with High Street have also been reviewed, assuming a shared left/right turn lane configuration on Street B operating under stop control. The traffic signals recommended for the intersection of High Street with Plewes Drive/Findlay Drive have been maintained under 2040 conditions. The results of the operational review are provided in Table 10 through Table 12, whereas detailed worksheets are provided in Appendix G.

Table 10: Intersection Operations – 2030 Total

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Hurontario Street & Poplar Sideroad	EB L	signal	15	B	0.26	16	B	0.15
	EB TR	signal	28	C	0.79	46	D	0.94
	WB L	signal	16	B	0.15	18	B	0.31
	WB T	signal	27	C	0.76	22	C	0.60
	WB R	signal	17	B	0.11	17	B	0.13
	NB L	signal	11	B	0.39	14	B	0.37
	NB T	signal	11	B	0.27	13	B	0.23
	NB R	signal	10	A	0.04	11	B	0.03
	SB L	signal	25	C	0.58	28	C	0.62
	SB TR	signal	18	B	0.31	23	C	0.54
	overall	signal	21	C	0.65	27	C	0.73
Poplar Sideroad & High Street	EB	roundabout	2	A	0.14	3	A	0.24
	WB	roundabout	3	A	0.33	2	A	0.27
	SB	roundabout	2	A	0.14	2	A	0.18
High Street & Plewes Drive/ Findlay Drive	EB LTR	stop	37	E	0.50	38	E	0.42
	WB LTR	stop	12	B	0.23	13	B	0.16
High Street & Campbell Street	WB	stop	11	B	0.22	11	B	0.22
	NB	stop	20	C	0.73	17	C	0.65
	SB	stop	12	B	0.53	23	C	0.20
Rowland Street & Poplar Sideroad	SB LR	stop	12	B	0.08	12	B	0.07
High Street & Street B	EB LR	stop	12	B	0.12	14	B	0.10

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

Table 11: Intersection Operations – 2035 Total

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Hurontario Street & Poplar Sideroad	EB L	signal	16	B	0.30	17	B	0.16
	EB TR	signal	28	C	0.81	44	D	0.92
	WB L	signal	16	B	0.17	20	C	0.36
	WB T	signal	27	C	0.76	22	C	0.57
	WB R	signal	17	B	0.13	18	B	0.14
	NB L	signal	13	B	0.46	18	B	0.46
	NB T	signal	13	B	0.30	17	B	0.27
	NB R	signal	11	B	0.05	15	B	0.03
	SB L	signal	30	C	0.66	39	D	0.74
	SB TR	signal	20	B	0.35	31	C	0.63
	overall	signal	22	C	0.70	30	C	0.78
Poplar Sideroad & High Street	EB	roundabout	2	A	0.14	3	A	0.24
	WB	roundabout	3	A	0.33	2	A	0.27
	SB	roundabout	2	A	0.14	2	A	0.18
High Street & Plewes Drive/ Findlay Drive	EB LTR	stop	49	E	0.59	**50**	**F**	0.51
	WB LTR	stop	13	B	0.27	15	B	0.20
High Street & Campbell Street	WB	stop	11	B	0.25	11	B	0.25
	NB	stop	26	D	0.81	21	C	0.72
	SB	stop	14	B	0.59	31	D	0.22
Rowland Street & Poplar Sideroad	SB LR	stop	12	B	0.08	13	B	0.07
High Street & Street B	EB LR	stop	13	B	0.12	15	B	0.11

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

Table 12: Intersection Operations – 2040 Total

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Hurontario Street & Poplar Sideroad	EB L	signal	16	B	0.33	16	B	0.17
	EB TR	signal	30	C	0.82	54	D	0.97
	WB L	signal	18	B	0.20	22	C	0.39
	WB T	signal	30	C	0.80	23	C	0.62
	WB R	signal	18	B	0.14	18	B	0.16
	NB L	signal	16	B	0.54	23	C	0.61
	NB T	signal	15	B	0.34	19	B	0.31
	NB R	signal	12	B	0.05	16	B	0.04
	SB L	signal	36	D	0.73	51	D	0.85
	SB TR	signal	22	C	0.39	35	D	0.72
	overall	signal	24	C	0.76	35	C	0.87
Poplar Sideroad & High Street	EB	roundabout	2	A	0.13	3	A	0.22
	WB	roundabout	2	A	0.30	2	A	0.25
	SB	roundabout	2	A	0.13	2	A	0.16
High Street & Plewes Drive/ Findlay Drive	EB LTR	signal	21	C	0.50	22	C	0.36
	WB LTR	signal	18	B	0.15	21	C	0.13
	NB L	signal	3	A	0.02	3	A	0.02
	NB TR	signal	4	A	0.32	4	A	0.29
	SB L	signal	4	A	0.20	4	A	0.22
	SB T	signal	4	A	0.23	4	A	0.33
	SB R	signal	3	A	0.03	3	A	0.06
	overall	signal	8	A	0.35	6	A	0.33

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
High Street & Campbell Street	WB	stop	12	B	0.29	20	B	0.28
	NB	stop	37	E	0.90	26	D	0.80
	SB	stop	16	C	0.66	46	E	0.98
Rowland Street & Poplar Sideroad	SB LR	stop	13	B	0.09	13	B	0.08
High Street & Street B	EB LR	stop	14	B	0.13	15	C	0.12

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

As indicated, the study area intersections will provide acceptable operations through the 2040 horizon. While the intersection of High Street with Plewes Drive/Findlay Drive does experience poor operations (LOS F) during the PM peak hour in 2035, the delay (50 seconds) is not such that would necessarily require the acceleration of the traffic signals recommended in 2040 under background conditions. It is noted that the LOS F delay threshold is 50 seconds.

5.3 TURN LANE REQUIREMENTS

Despite the otherwise good operations provided at the site access, the need for exclusive turn lanes on High Street at Street B has been reviewed based on the following:

- MTO guidelines for auxiliary lanes at unsignalized intersections;
- a design speed of 70 km/h (reflective of the 50 km/h speed limit); and
- the projected 2040 total volumes (critical condition).

5.3.1 Right Turn Lanes

With respect to right turn lanes, as per MTO standards, such are generally warranted where right turn volumes exceed 60 vehicles per hour and/or impede through traffic. As the right turn volumes on High Street at Street B are in the order of 20 to 40 vehicles per hour, an exclusive right tun lane is not required.

5.3.2 Left Turn Lanes

In considering the need for an exclusive left turn lane, MTO warrants for auxiliary left turn lanes on 2-lane, undivided highways were considered. The warrants are based on design speed,

advancing volume (i.e. traffic travelling in the same direction as the left-turning traffic), opposing volume (i.e. traffic travelling in the opposite direction as the left-turning traffic) and percentage of left turns in the advancing volume. The left turn volumes are in the order of 3 to 5% of the advancing volume during the peak periods. As such, the warrants for 5% left turns in the advancing volume were assessed for the 2040 horizon.

The completed warrants are provided in Appendix H. Based on the results of the assessment, a left turn lane on High Street at Street B is not warranted.

5.4 SENSITIVITY ANALYSIS

As previously noted, the *Collingwood Transportation Study Update* was comprehensive in its consideration of all planned and potential development within the Town. It adopted a conservative approach to the assessment, assuming all planned and potential developments were built-out by the 2041 horizon. Consideration for the build-out of all development (planned and potential) within the Town by 2041 is beyond the scope of a typical traffic impact study, which is intended to focus on development specific impacts within the immediate study area. As such, the assessment contained herein did not consider developments located outside of the study area, nor did it consider the potential developments.

A sensitivity analysis has been conducted to consider the 2041 total volumes provided in the *Collingwood Transportation Study Update,* to identify any additional improvements that may be required should the development schedule provided in the Collingwood study unfold as assumed. Within the study area, 2041 traffic projections were only provided at the intersection of High Street with Campbell Street. As such the volumes on High Street were subsequently extended through the intersections of Plewes Drive/Findlay Drive and Street B. The resulting 2041 volumes are illustrated in Figure 19 (the volumes on High Street immediately south of Campbell Street are 50 to 100% greater than the 2040 projections developed for this study).

The sensitivity analysis has only considered the intersections of High Street with Plewes Drive/Findlay Drive and High Street with Street B, as these intersections were not assessed in the Collingwood study. The assessment considers the following:

- the widening of High Street to a 4-lane cross-section as recommended in the *Collingwood Transportation Study Update*; and
- traffic signals at the intersection of High Street with Plewes Drive/Findlay Drive, as recommended herein.

The result of the sensitivity analysis are provided in Table 13 with detailed worksheets provided in Appendix I.

Table 13: Intersection Operations – 2041 Volumes (Sensitivity Analysis)

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
High Street & Plewes Drive/ Findlay Drive	EB LTR	signal	24	C	0.55	23	C	0.37
	WB LTR	signal	20	B	0.15	21	C	0.13
	NB LTR	signal	4	A	0.31	4	A	0.39
	SB LTR	signal	4	A	0.41	6	A	0.64
	overall	signal	7	A	0.43	7	A	0.60
High Street & Street B	EB LR	stop	18	C	0.19	33	D	0.27

Despite the increased volumes on High Street as projected in the *Collingwood Transportation Study Update,* the subject intersections will continue to provide acceptable operations. In this regard, should the future traffic volumes exceed the projections developed in this study, such can be accommodated without additional road system improvements.

6 Summary

Proposed Development

This study has addressed the transportation impacts associated with the Summit View - Phase 3 residential development located at the northwest corner of Poplar Sideroad and High Street in the Town of Collingwood. Upon completion, the development is expected to generate 65 trips during the AM peak hour and 77 trips during the PM peak hour.

Transportation Assessment

In addressing the study area traffic operations, the key intersections were analysed under existing (2023) and future (2030, 2035 and 2040) horizon periods. The site access (Street B) on High Street was also assessed under total conditions for the future horizons.

The intersection of High Street with Plewes Drive/Findlay Drive will experience poor operations (LOS F) in 2040 under background conditions. While traffic signals area not warranted based on traffic signal justification criteria, such are nonetheless recommended to address the poor operating conditions, which result largely due to the increased volumes on High Street. Recognizing the benefits that signalization of this intersection will provide to both the future background and future total traffic volumes, and understanding that such is recommended to serve the future background volumes (i.e. without the Phase 3 development), the associated costs should be addressed in conjunction with the widening of High Street through the Town's development charges.

The remaining study area intersections will provide acceptable operations through the 2040 horizon under both background and total conditions. Similarly, the intersection of High Street with Street B will also provide acceptable operations through 2040.

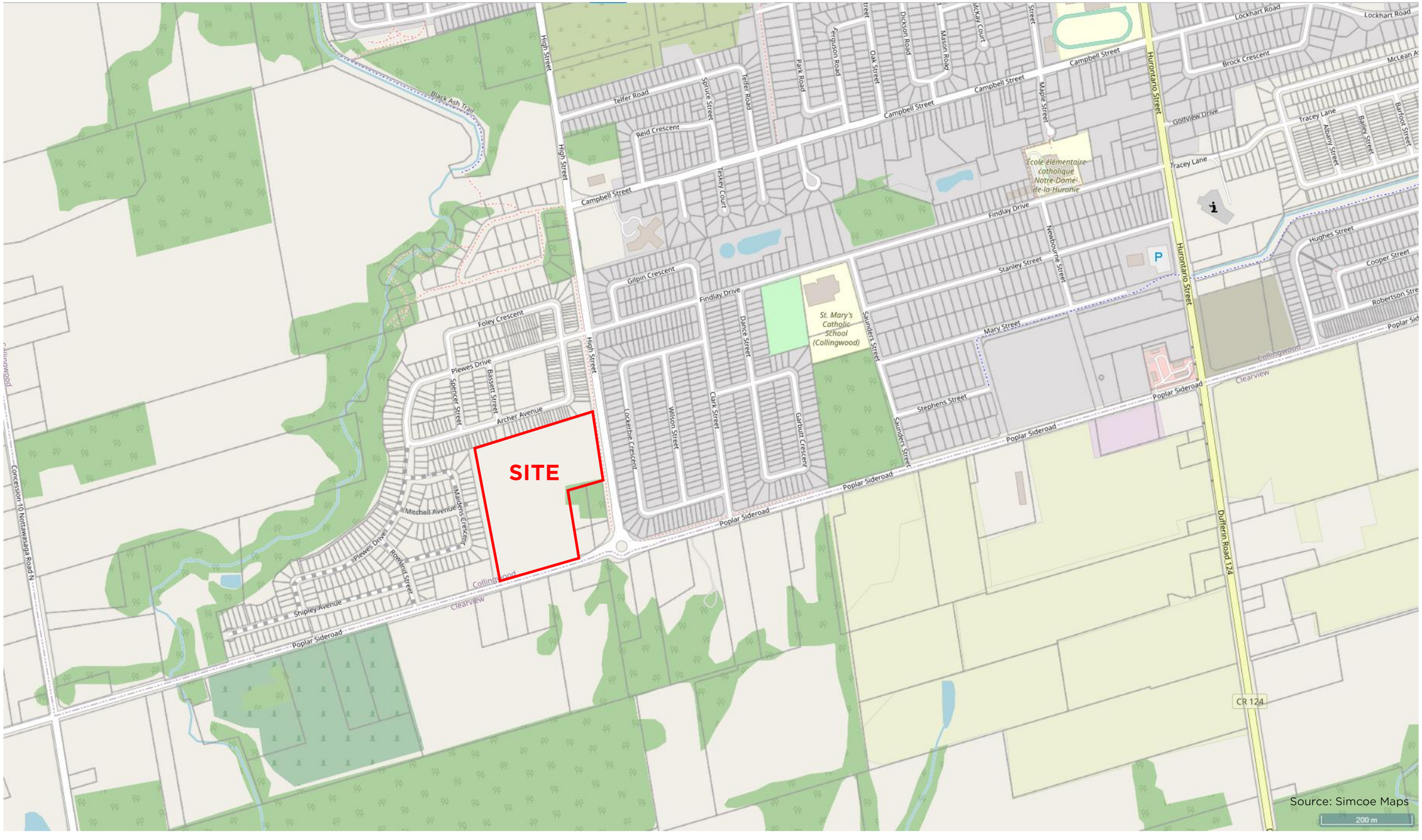
A sensitivity analysis was conducted to consider the 2041 traffic projections provided in the *Collingwood Transportation Study Update,* which was comprehensive in its consideration of planned and potential development within the Town. The sensitivity analysis focused on the intersection operations at High Street with Plewes Drive/Findlay Drive and at High Street with Street B, as these intersections were not included in the *Collingwood Transportation Study Update.* The assessment considered the 4-lane widening of High Street by 2041 (as recommended in the Collingwood Study) and the implementation of traffic signals at High Street with Plewes Drive/Findlay Drive (as recommended herein under the 2040 background conditions). The sensitivity analysis indicates that both intersections will provide acceptable operations and no further improvements are required to accommodate the 2041 projections provided in the *Collingwood Transportation Study Update.*

Turn Lane Requirements

The need for exclusive right and left turn lanes on High Street at Street B were reviewed in context of MTO warrant criteria. Based on the project volumes on High Street and the turning volumes accessing the site, exclusive turn lanes are not warranted.

Sight Line Assessment

The available sight lines along High Street at Street B were reviewed and are considered acceptable in consideration of TAC design guidelines for minimum stopping and intersection sight distances.

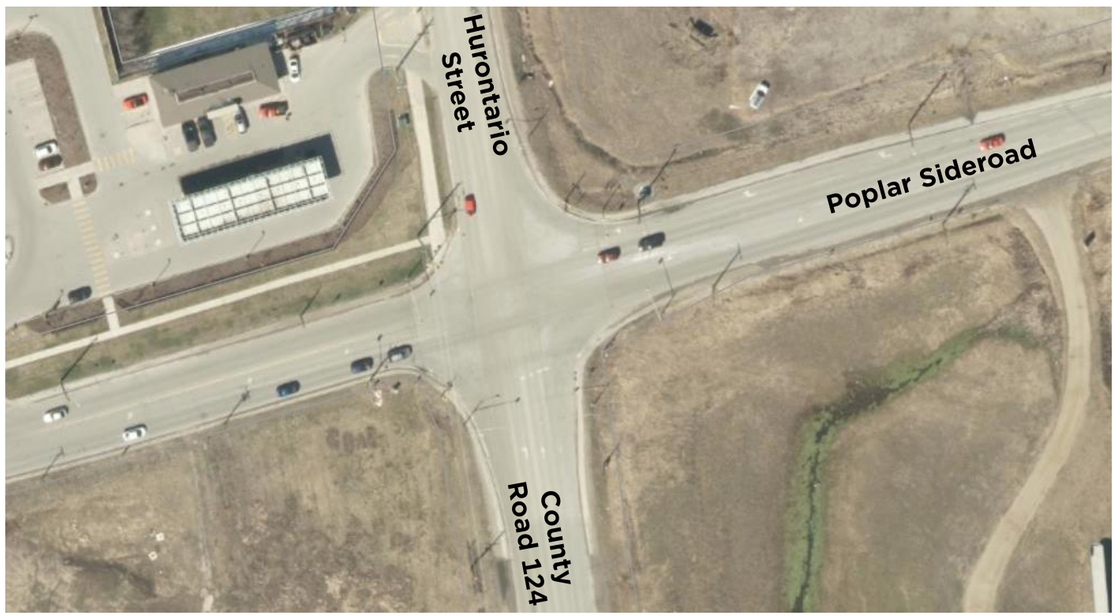


SUMMIT VIEW – PHASE 3

Figure 1: Site Location

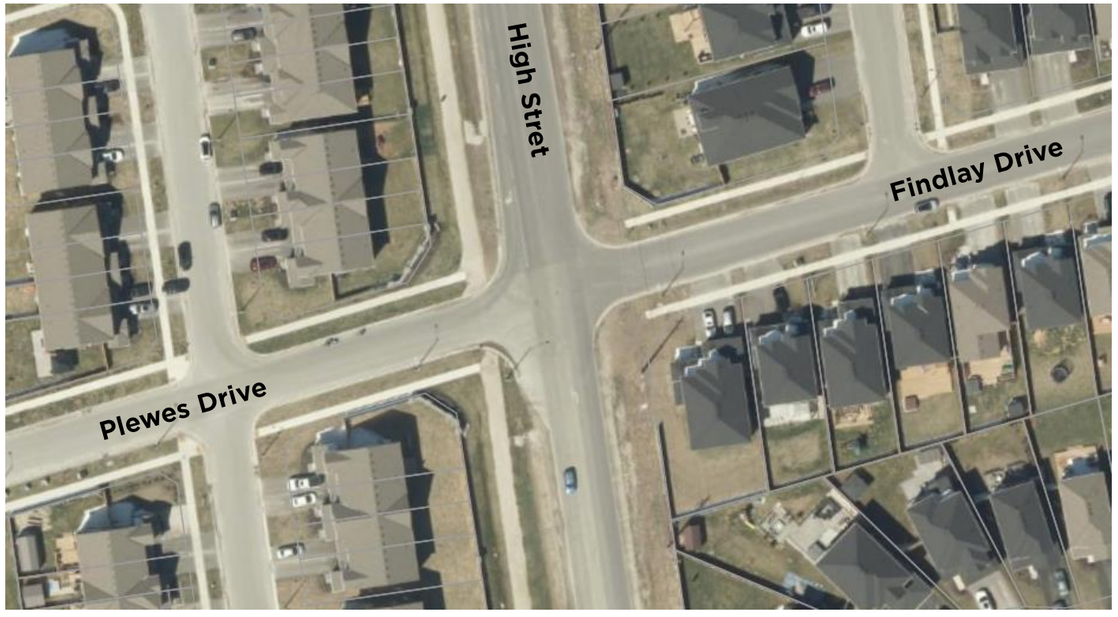
SUMMIT VIEW – PHASE 3

Figure 2A: Area Road Network



Hurontario Street/County Road 124 & Poplar Sideroad/County Road 32

Poplar Sideroad & High Street



High Street & Plewes Drive/Findlay Drive

High Street & Campbell Street

SUMMIT VIEW – PHASE 3

Figure 2B: Area Road Network

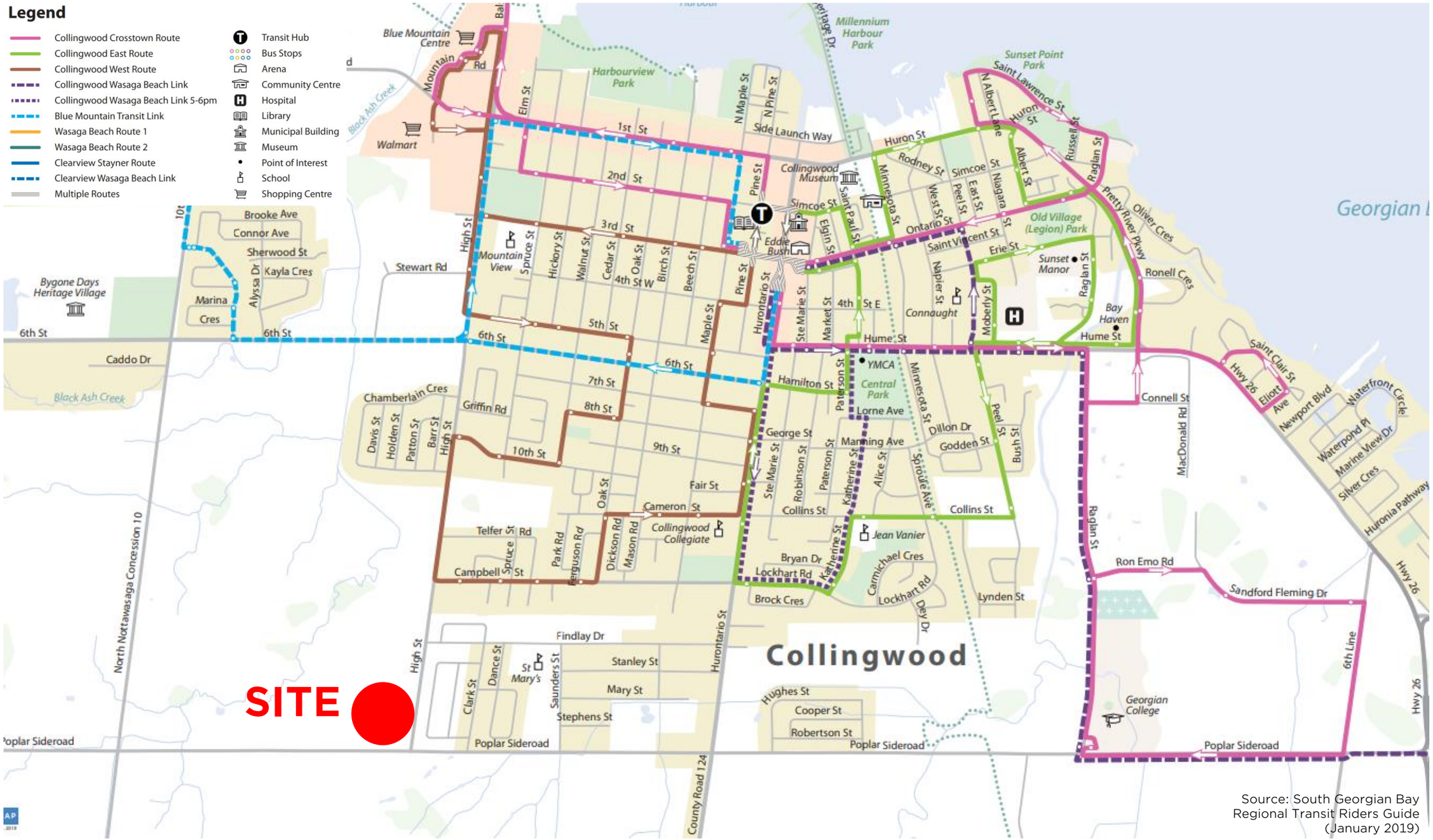
Rowland Street & Poplar Sideroad/County Road 32


Looking south along High Street from proposed access location

Looking north along High Street from proposed access location

SUMMIT VIEW – PHASE 3

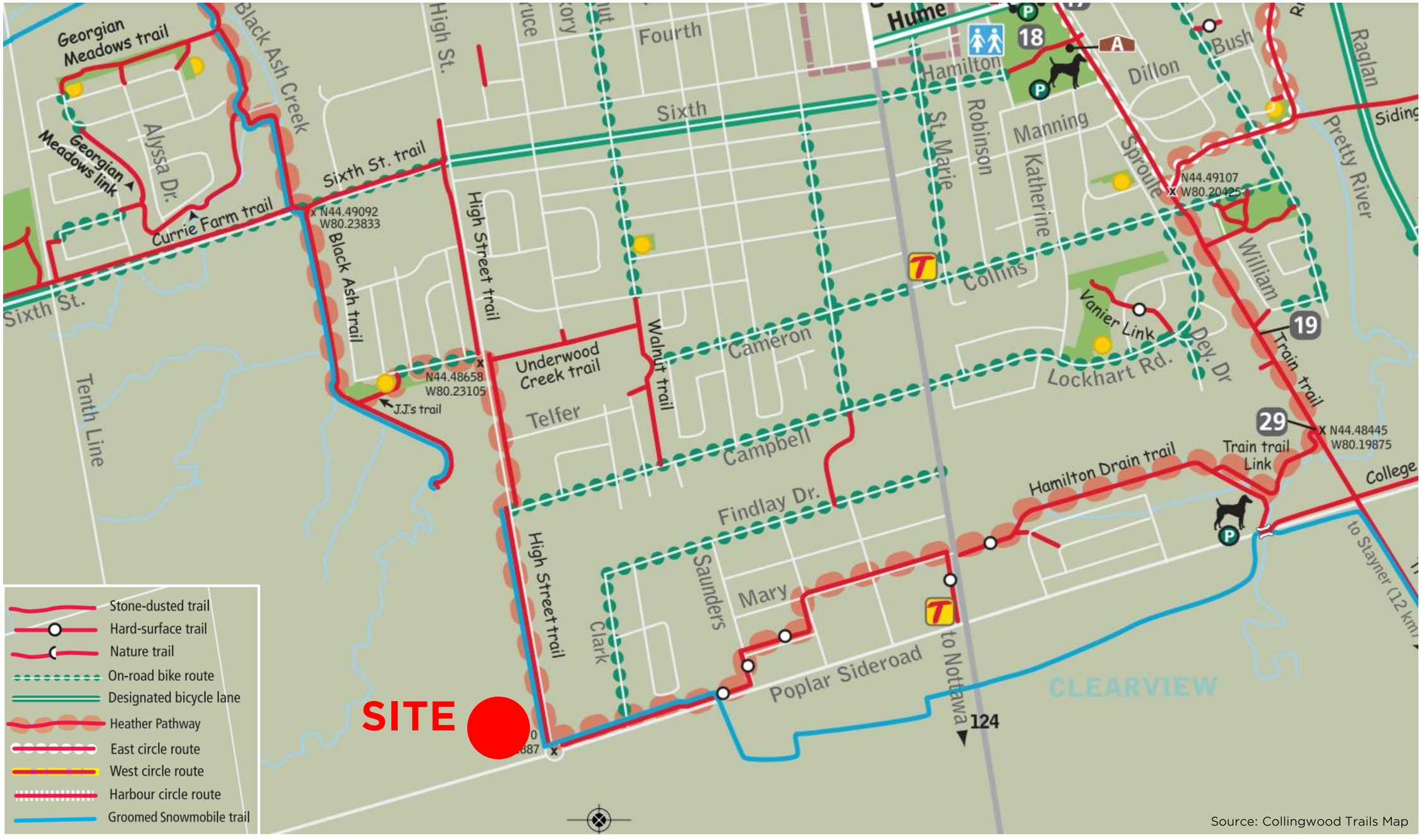
Figure 2C: Area Road Network



Source: South Georgian Bay Regional Transit Riders Guide (January 2019)

SUMMIT VIEW – PHASE 3

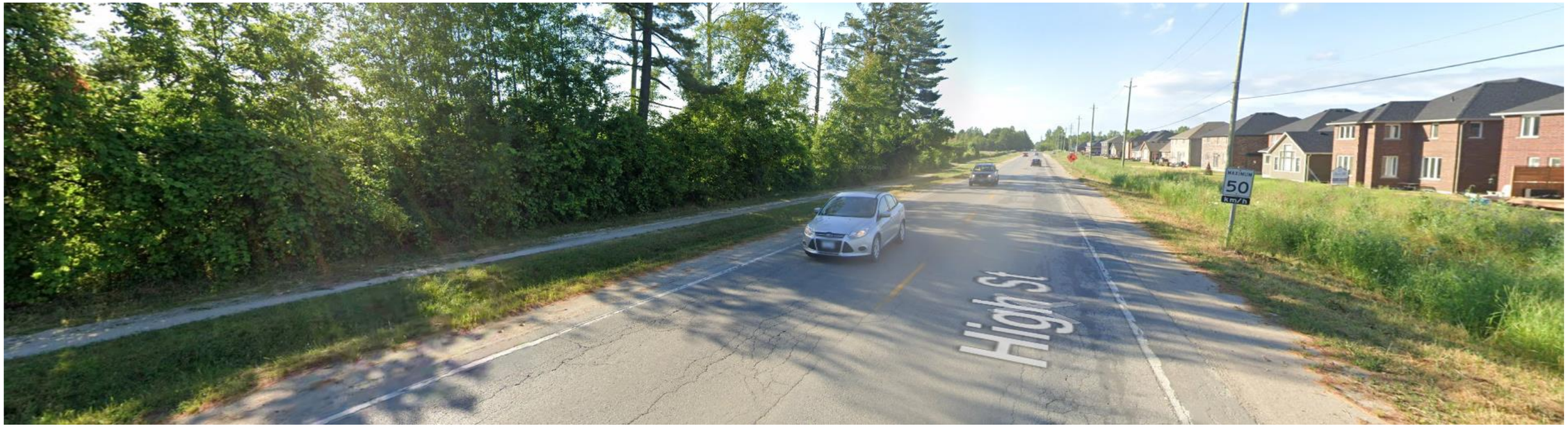
Figure 3: Area Transit Network



SUMMIT VIEW – PHASE 3

Figure 4: Area Trail Network

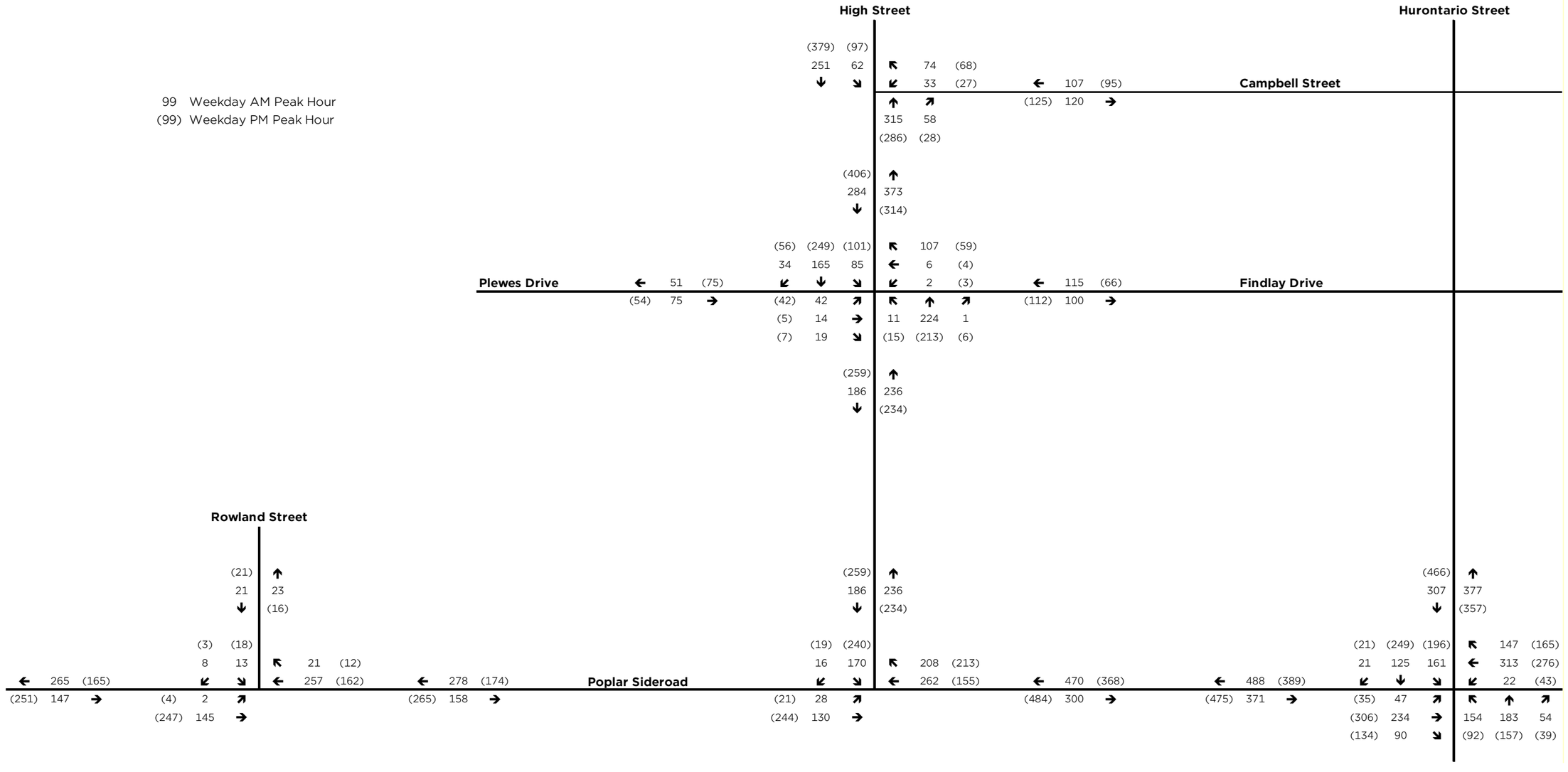
Looking west on Poplar Sideroad frontage



Looking north on Highway Street frontage

Figure 5: Active Trail Facilities along Site Frontages

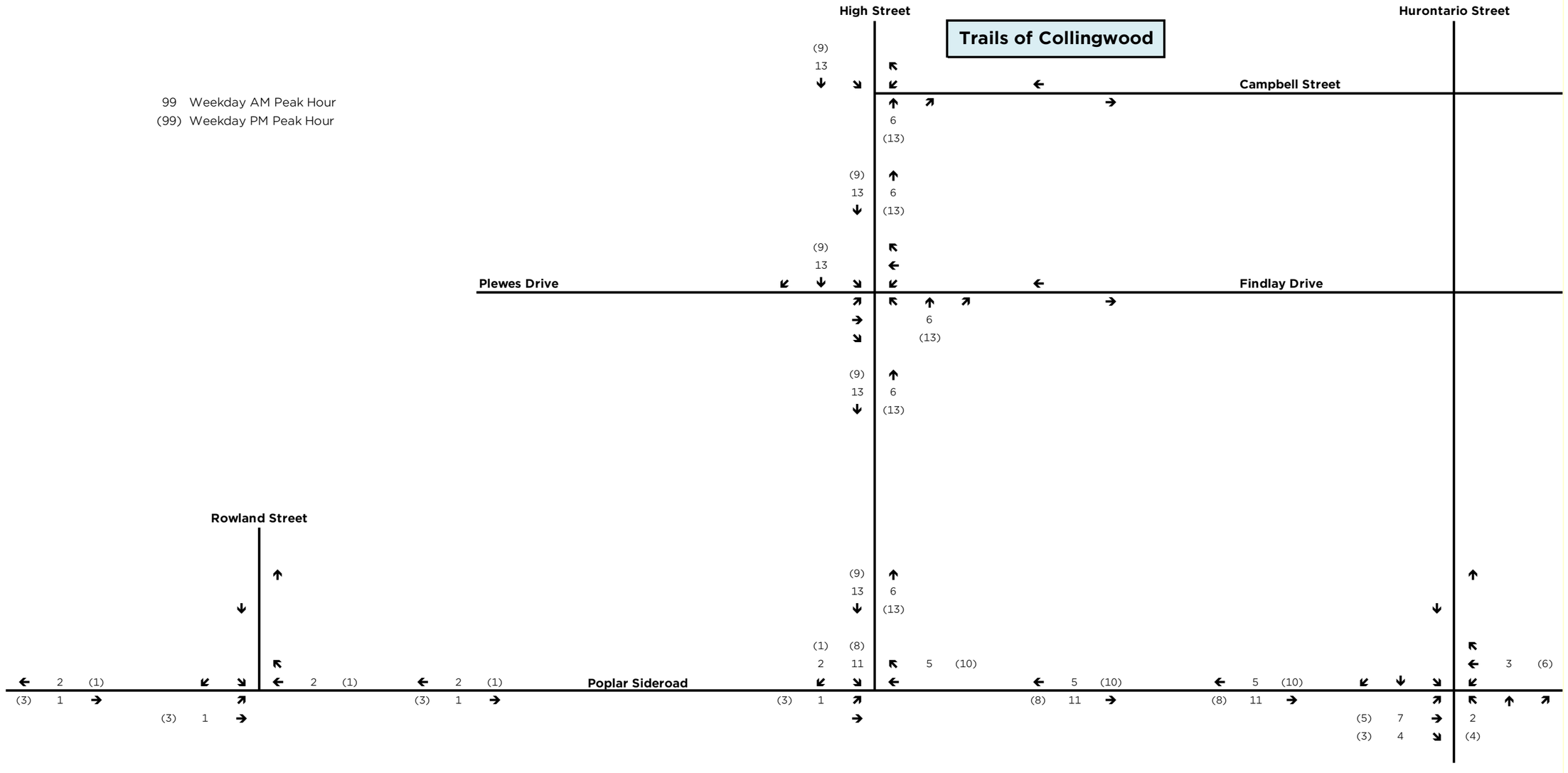
99 Weekday AM Peak Hour
(99) Weekday PM Peak Hour



SUMMIT VIEW – PHASE 3

Figure 6: Traffic Volumes - 2023

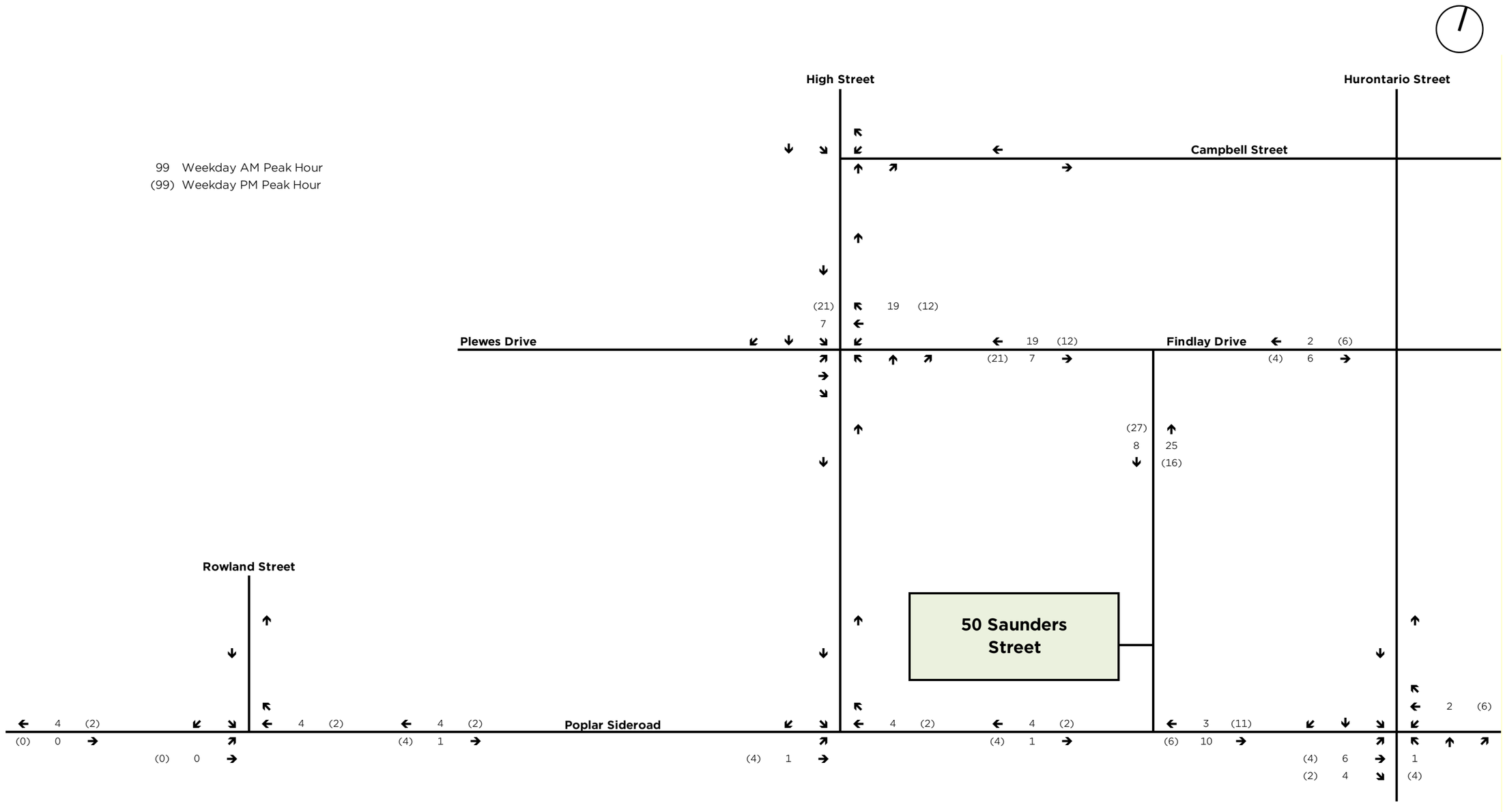
99 Weekday AM Peak Hour
(99) Weekday PM Peak Hour



SUMMIT VIEW – PHASE 3

Figure 7: Background Development – Trails of Collingwood

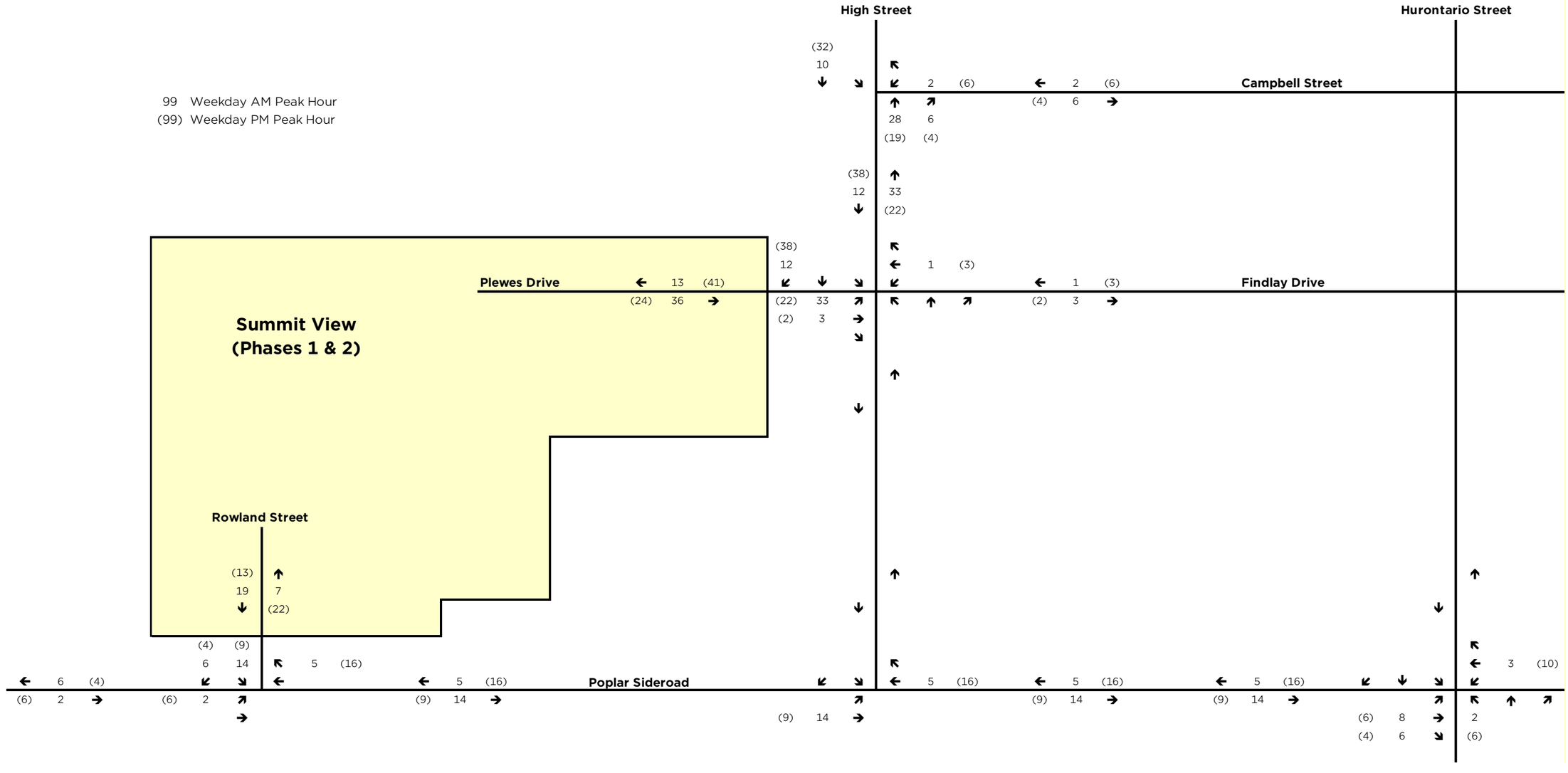
99 Weekday AM Peak Hour
(99) Weekday PM Peak Hour



SUMMIT VIEW – PHASE 3

Figure 8: Background Development – 50 Saunders Street

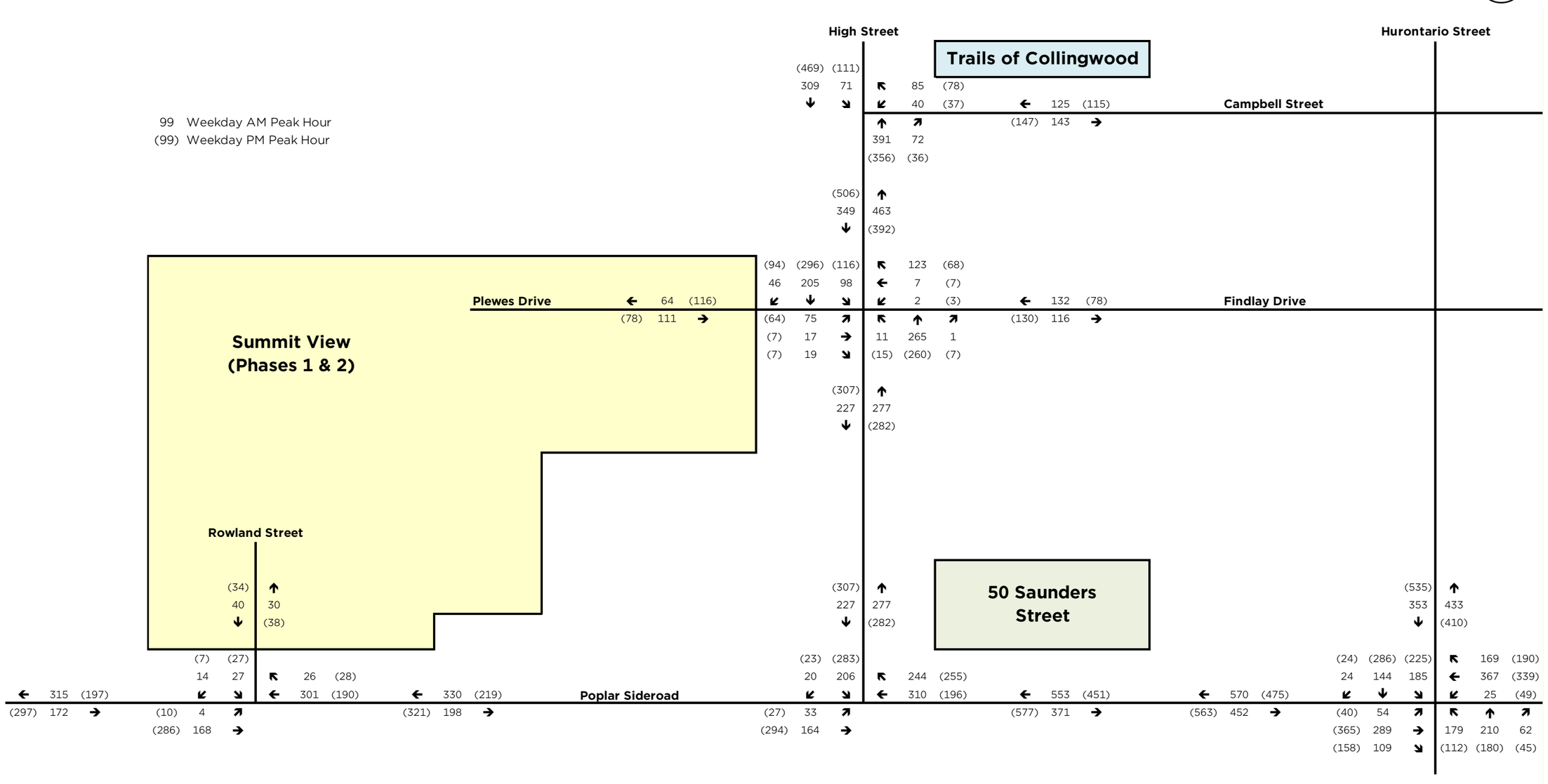
99 Weekday AM Peak Hour
(99) Weekday PM Peak Hour



SUMMIT VIEW – PHASE 3

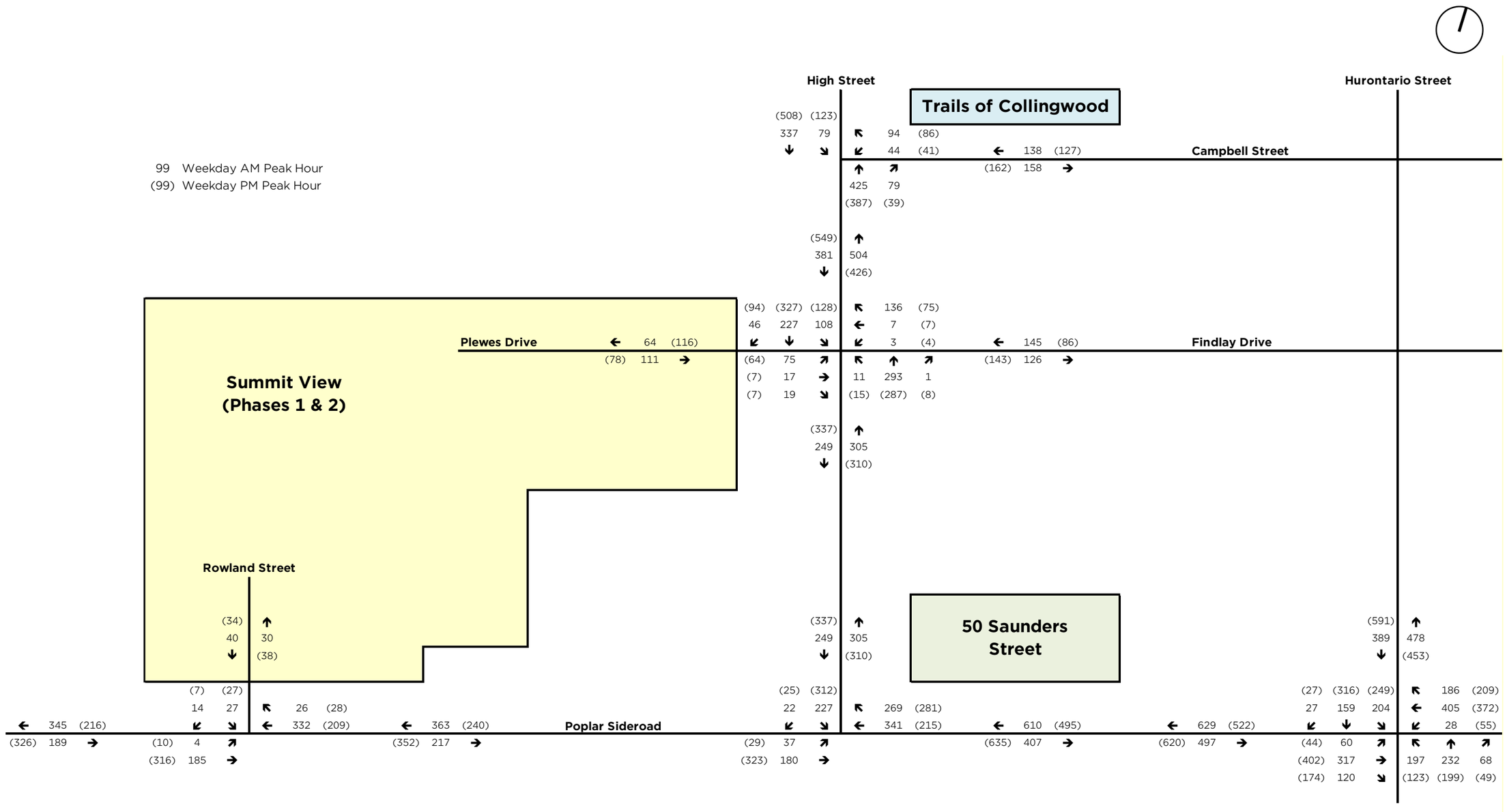
Figure 9: Background Development – Summit View, Phase 2 (107 remaining units)

99 Weekday AM Peak Hour
(99) Weekday PM Peak Hour



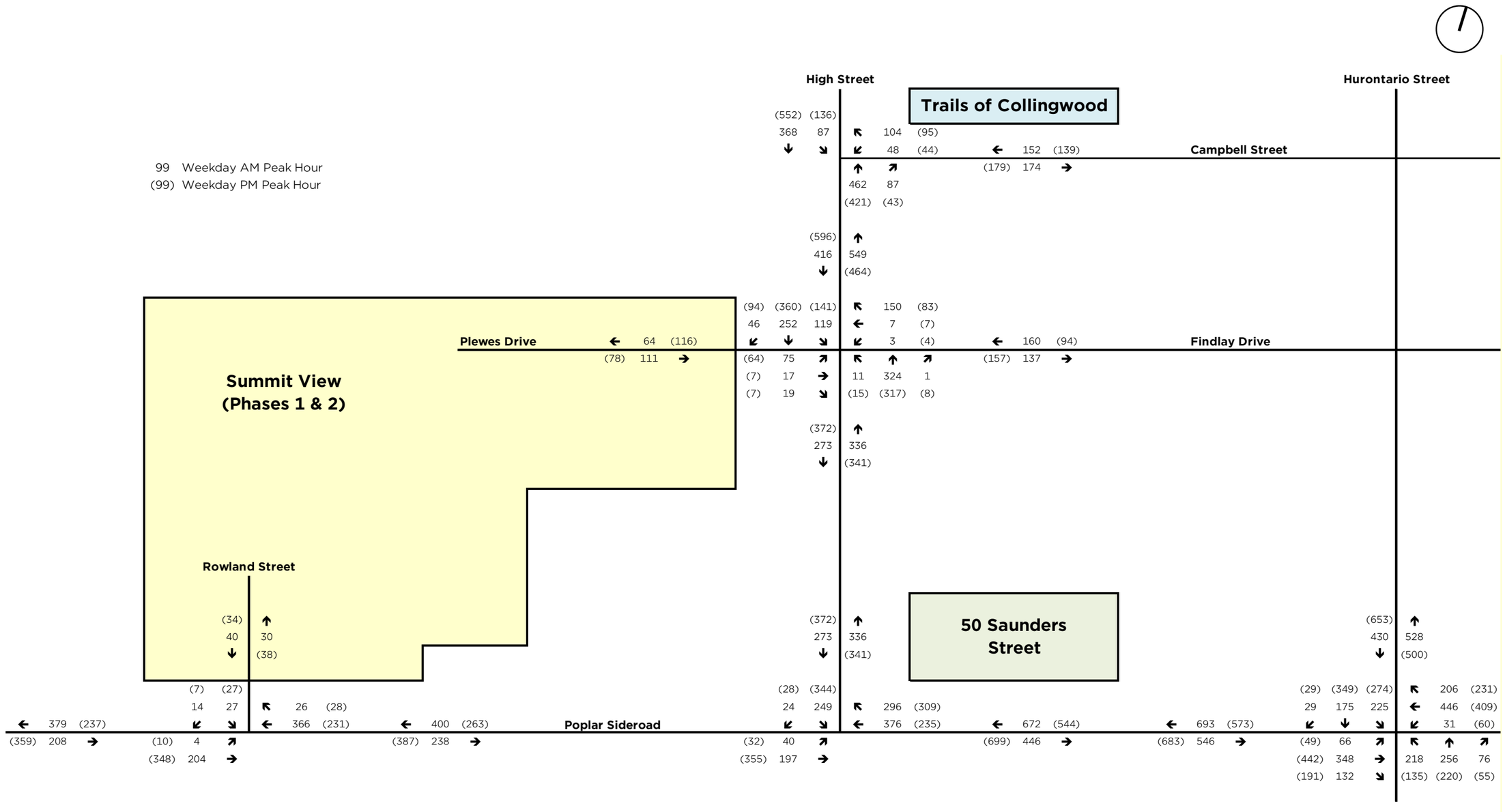
SUMMIT VIEW – PHASE 3

Figure 10: Background Traffic Volumes - 2030



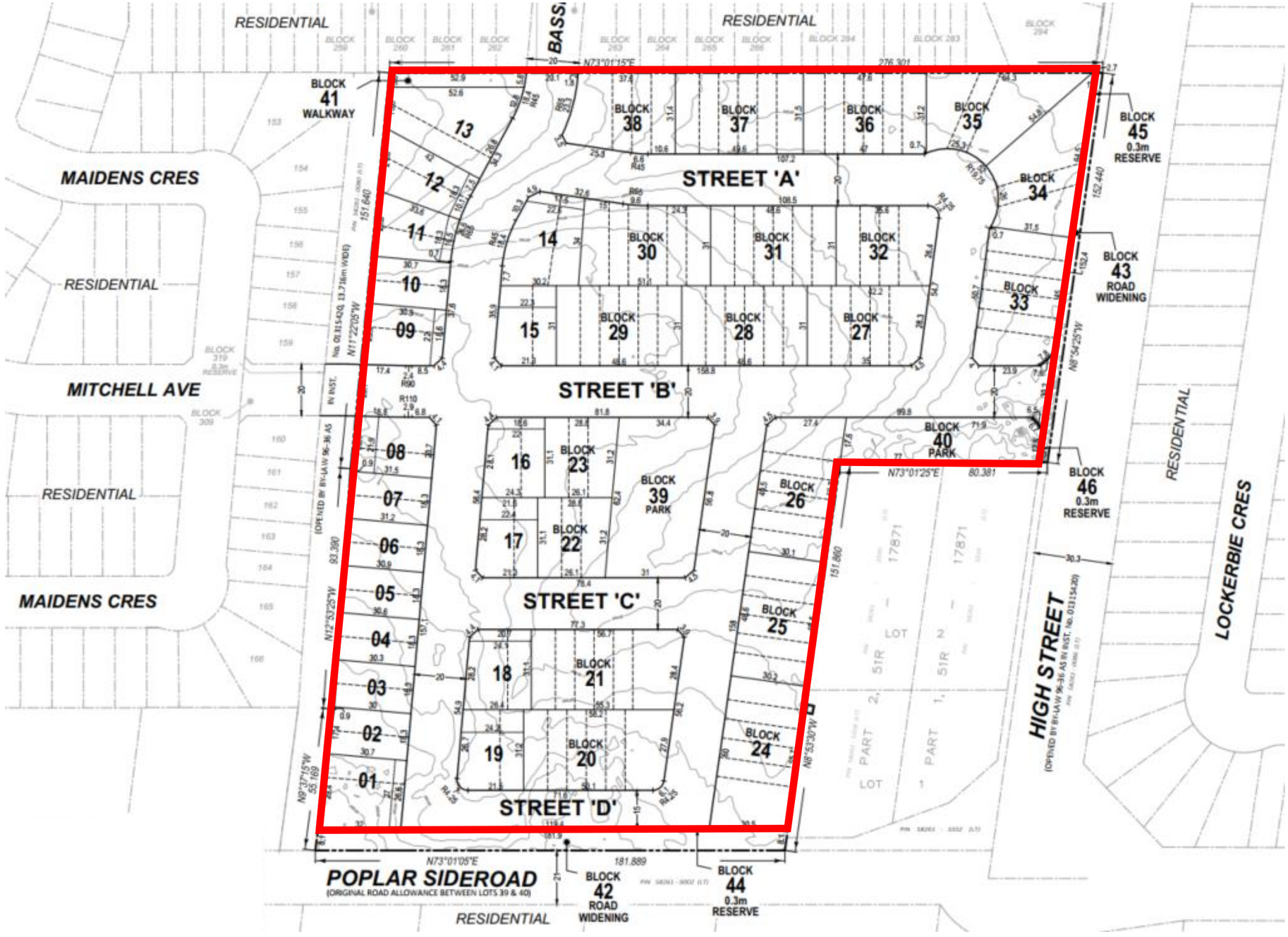
SUMMIT VIEW – PHASE 3

Figure 11: Background Traffic Volumes - 2035



SUMMIT VIEW – PHASE 3

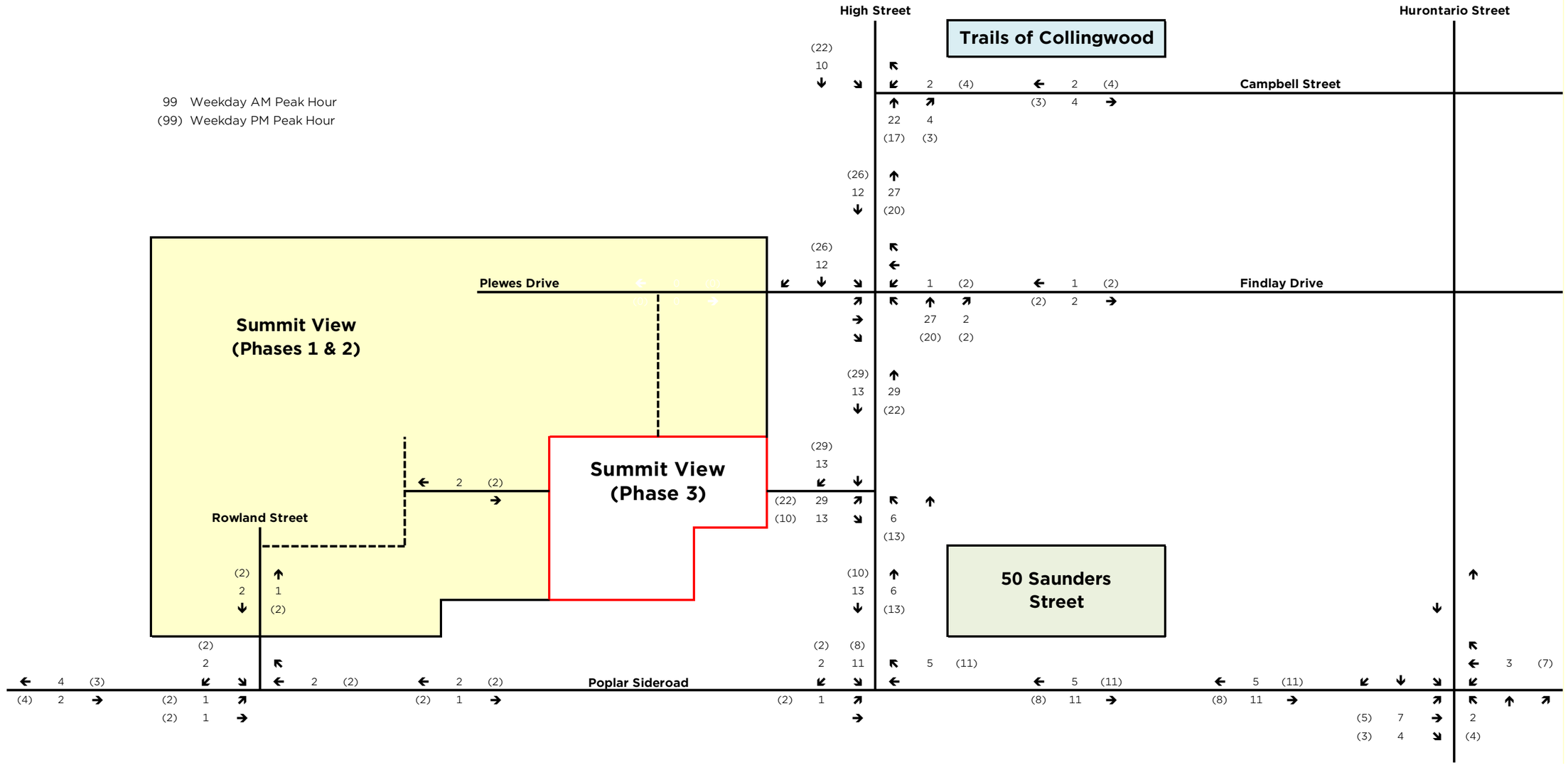
Figure 12: Background Traffic Volumes – 2040



SUMMIT VIEW – PHASE 3

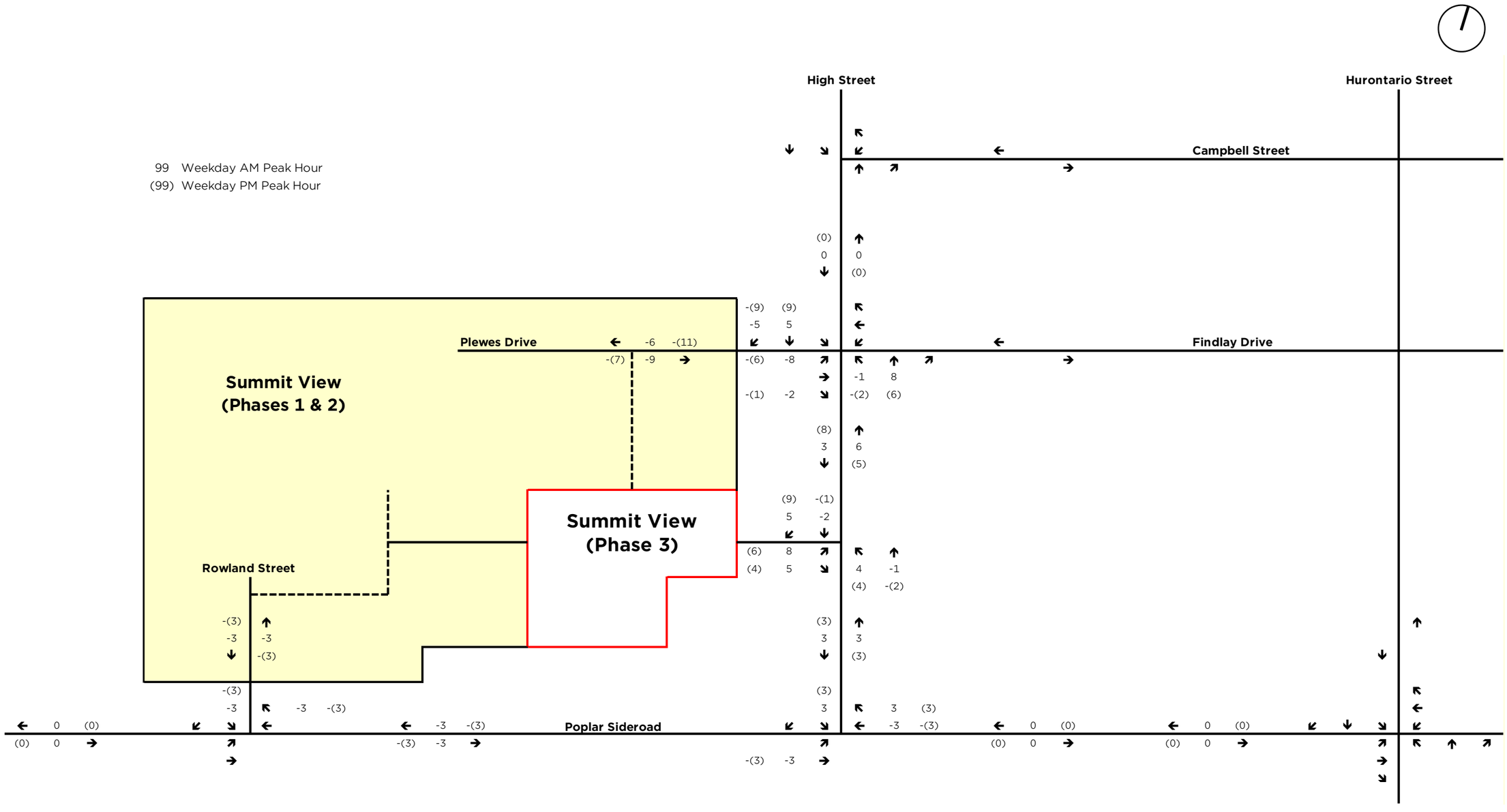
Figure 13: Site Plan

99 Weekday AM Peak Hour
(99) Weekday PM Peak Hour



SUMMIT VIEW – PHASE 3

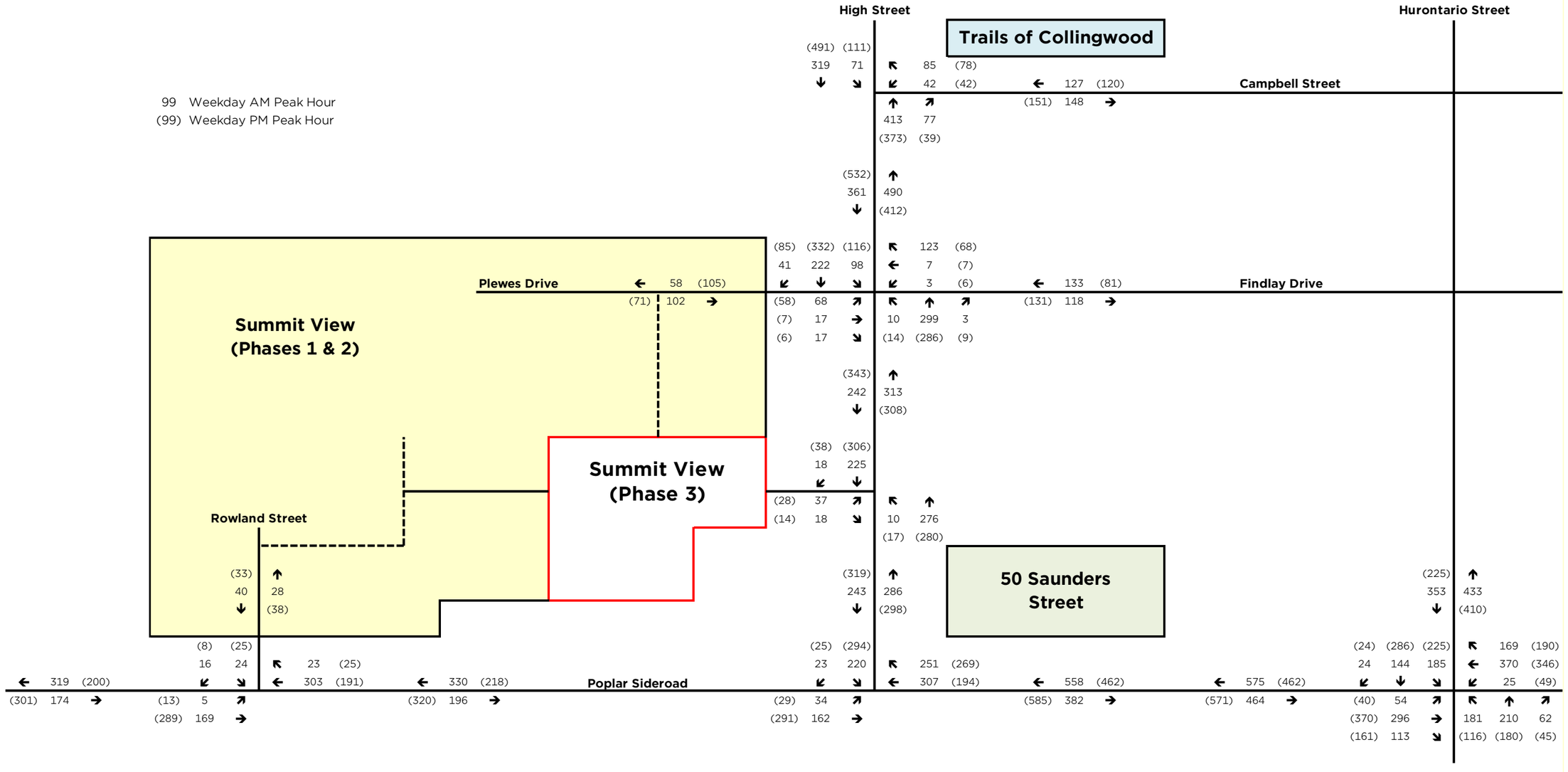
Figure 14: Summit View Phase 3 Volumes



SUMMIT VIEW – PHASE 3

Figure 15: Summit View Phases 1 & 2 – Trip Redistribution

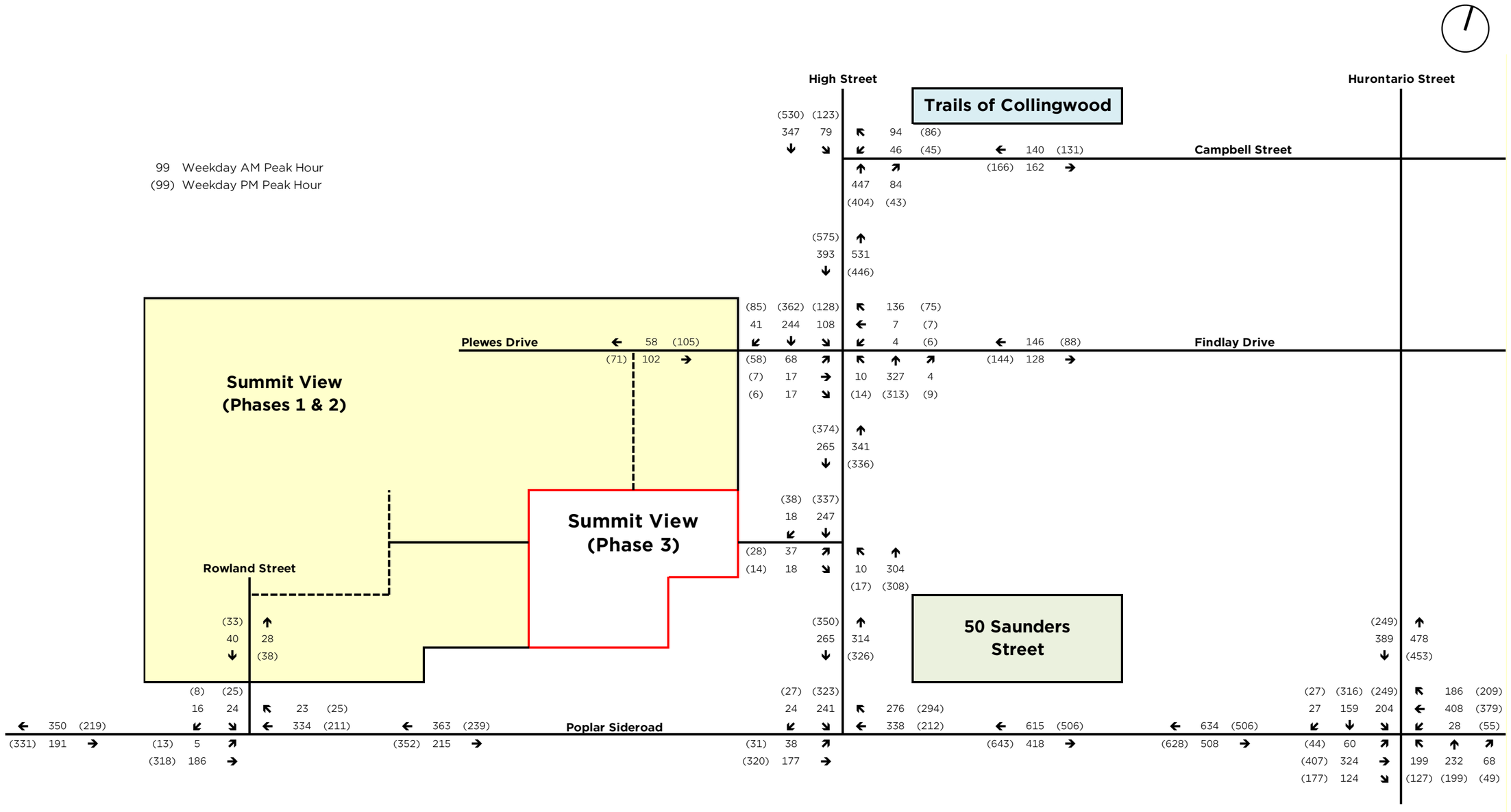
99 Weekday AM Peak Hour
(99) Weekday PM Peak Hour



SUMMIT VIEW – PHASE 3

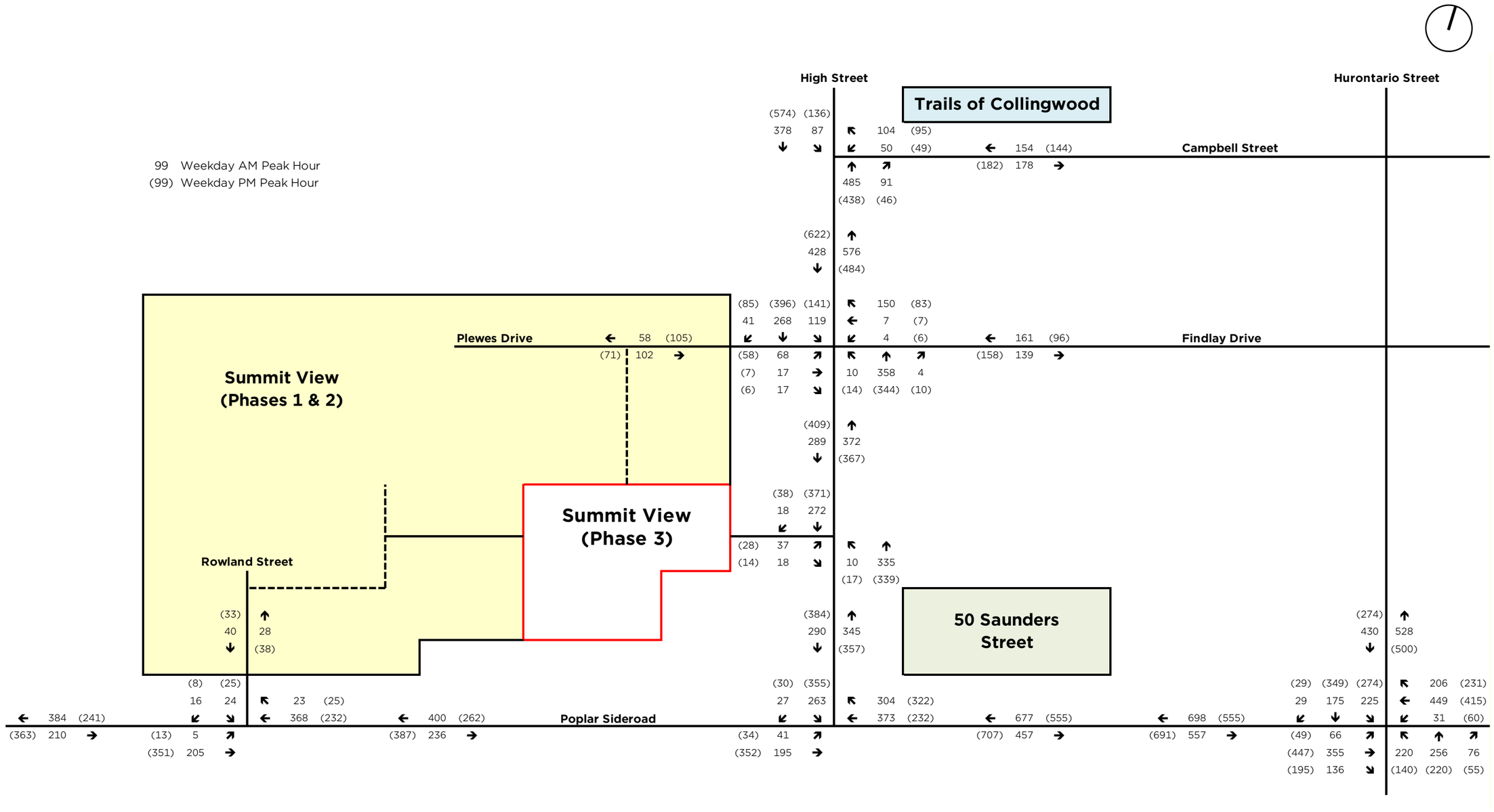
Figure 16: Total Traffic Volumes - 2030

99 Weekday AM Peak Hour
(99) Weekday PM Peak Hour



SUMMIT VIEW – PHASE 3

Figure 17: Total Traffic Volumes – 2035

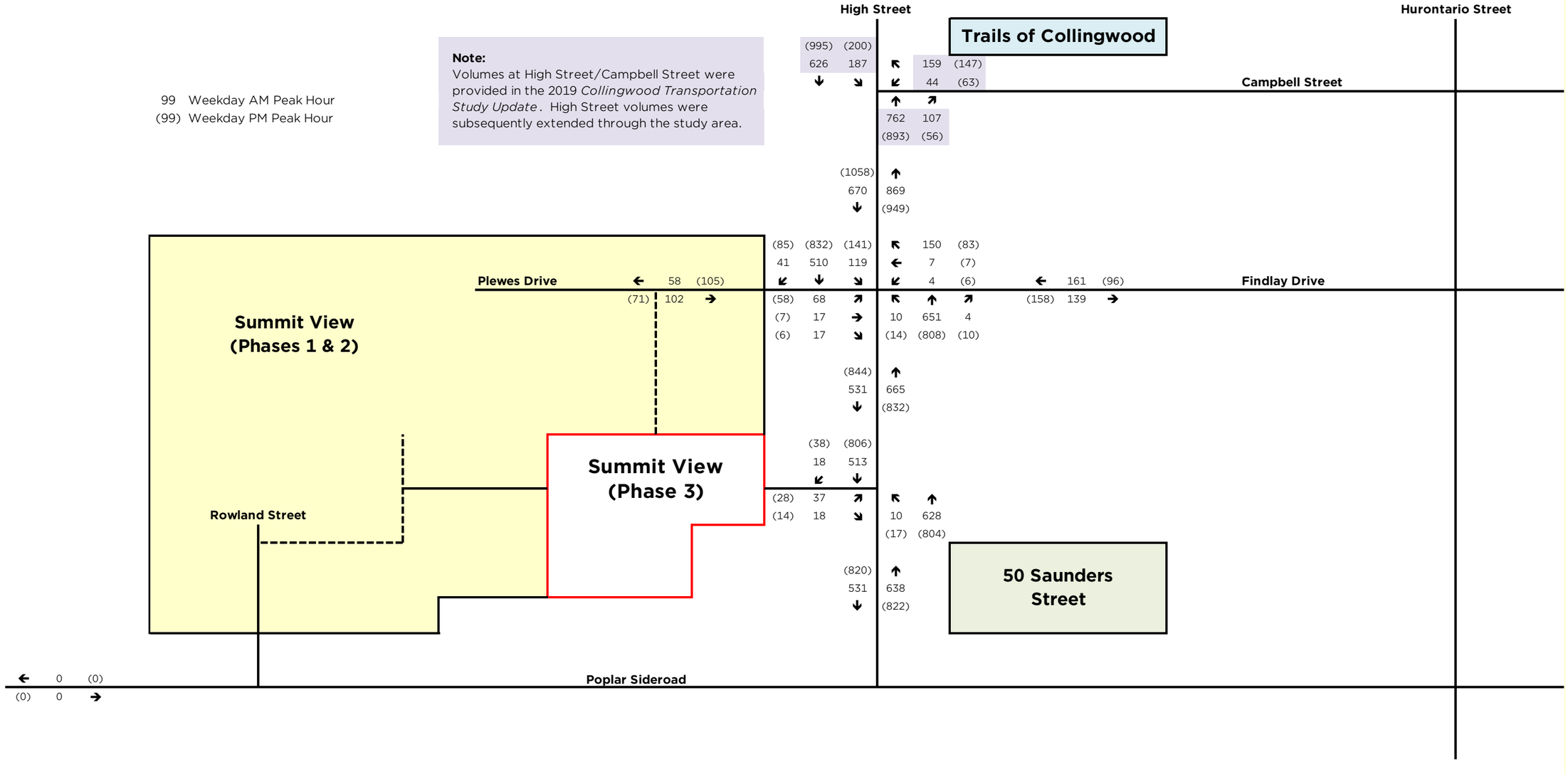


SUMMIT VIEW – PHASE 3

Figure 18: Total Traffic Volumes - 2040

99 Weekday AM Peak Hour
(99) Weekday PM Peak Hour

Note:
Volumes at High Street/Campbell Street were provided in the 2019 *Collingwood Transportation Study Update*. High Street volumes were subsequently extended through the study area.



SUMMIT VIEW – PHASE 3

Figure 19: Collingwood Transportation Study Update – 2041 Horizon

Appendix A:
Traffic Counts

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 8:30:00
To: 9:30:00

Municipality: Collingwood
Site #: 2300900001
Intersection: Poplar Sideroad & Hurontario St
TFR File #: 1
Count date: 18-Jan-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Poplar Sideroad runs W/E

North Leg Total:	684			
North Entering:	307			
North Peds:	5			
Peds Cross:	⋈			

Heavys	0	0	22	22
Trucks	2	4	1	7
Cars	19	121	138	278
Totals	21	125	161	

Heavys	12	
Trucks	4	
Cars	361	
Totals	377	

East Leg Total:	931	
East Entering:	482	
East Peds:	0	
Peds Cross:	⧖	

Hurontario St

Heavys	Trucks	Cars	Totals
8	22	458	488

Poplar Sideroad

Heavys	Trucks	Cars	Totals
1	1	45	47
4	9	221	234
1	10	79	90
6	20	345	

N
W E
S

Cars	Trucks	Heavys	Totals
138	0	9	147
303	6	4	313
16	6	0	22
457	12	13	

Poplar Sideroad

Cars	Trucks	Heavys	Totals
400	22	27	449

Country Rd 124

Peds Cross:	⧖			
West Peds:	1			
West Entering:	371			
West Leg Total:	859			

Cars	216			
Trucks	20			
Heavys	1			
Totals	237			

Cars	136	178	41	355
Trucks	14	3	12	29
Heavys	4	2	1	7
Totals	154	183	54	

Peds Cross:	⋈	
South Peds:	0	
South Entering:	391	
South Leg Total:	628	

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

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 #: 2300900001
Intersection: Poplar Sideroad & Hurontario St
TFR File #: 1
Count date: 18-Jan-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Poplar Sideroad runs W/E

North Leg Total: 823
North Entering: 466
North Peds: 4
Peds Cross: ⋈

Heavys	0	0	0	0
Trucks	0	0	3	3
Cars	21	249	193	463
Totals	21	249	196	

Heavys	1
Trucks	2
Cars	354
Totals	357

East Leg Total: 1025
East Entering: 484
East Peds: 0
Peds Cross: ⧗

Hurontario St

Heavys	Trucks	Cars	Totals
0	7	382	389

Poplar Sideroad

Heavys	Trucks	Cars	Totals
0	0	35	35
7	6	293	306
2	5	127	134
9	11	455	

Cars	Trucks	Heavys	Totals
164	1	0	165
271	5	0	276
40	3	0	43
475	9	0	

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S

Poplar Sideroad

Cars	Trucks	Heavys	Totals
519	10	12	541

Country Rd 124

Peds Cross: ⧗
West Peds: 1
West Entering: 475
West Leg Total: 864

Cars	416
Trucks	8
Heavys	2
Totals	426

Cars	90	155	33	278
Trucks	2	1	1	4
Heavys	0	1	5	6
Totals	92	157	39	

Peds Cross: ⋈
South Peds: 0
South Entering: 288
South Leg Total: 714

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Total Count Diagram

Municipality: Collingwood
Site #: 2300900001
Intersection: Poplar Sideroad & Hurontario St
TFR File #: 1
Count date: 18-Jan-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Poplar Sideroad runs W/E

North Leg Total:	3938
North Entering:	1981
North Peds:	12
Peds Cross:	⋈

Heavys	2	7	43	52
Trucks	3	14	9	26
Cars	123	935	845	1903
Totals	128	956	897	

Heavys	41
Trucks	18
Cars	1898
Totals	1957

East Leg Total:	5209
East Entering:	2594
East Peds:	0
Peds Cross:	⧖

Hurontario St

Heavys	Trucks	Cars	Totals
18	70	2257	2345

Cars	Trucks	Heavys	Totals
764	5	31	800
1543	31	12	1586
177	27	4	208
2484	63	47	

Poplar Sideroad

N
W E
S

Heavys	Trucks	Cars	Totals
1	2	219	222
14	37	1421	1472
6	32	556	594
21	71	2196	

Poplar Sideroad

Cars	Trucks	Heavys	Totals
2474	77	64	2615

Country Rd 124

Peds Cross:	⧖
West Peds:	2
West Entering:	2288
West Leg Total:	4633

Cars	1668
Trucks	73
Heavys	17
Totals	1758

Cars	591	915	208	1714
Trucks	36	11	31	78
Heavys	4	9	7	20
Totals	631	935	246	

Peds Cross:	⋈
South Peds:	0
South Entering:	1812
South Leg Total:	3570

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Traffic Count Summary

Intersection: Poplar Sideroad & Hurontario St | **Count Date:** 18-Jan-23 | **Municipality:** Collingwood

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	110	61	14	185	2
9:00:00	141	121	29	291	3
10:00:00	117	111	20	248	2
15:00:00	0	0	0	0	0
16:00:00	178	226	21	425	0
17:00:00	196	249	21	466	4
18:00:00	155	188	23	366	1
Totals:	897	956	128	1981	12

North/South Total Approaches: 3793

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	86	135	35	256	0
9:00:00	138	201	59	398	0
10:00:00	127	147	40	314	0
15:00:00	0	0	0	0	0
16:00:00	106	145	35	286	0
17:00:00	92	157	39	288	0
18:00:00	82	150	38	270	0
S Totals:	631	935	246	1812	0

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	31	254	161	446	0
9:00:00	24	314	130	468	0
10:00:00	27	251	88	366	0
15:00:00	0	0	0	0	0
16:00:00	39	251	133	423	0
17:00:00	43	276	165	484	0
18:00:00	44	240	123	407	0
Totals:	208	1586	800	2594	0

East/West Total Approaches: 4882

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	30	180	52	262	0
9:00:00	46	237	80	363	0
10:00:00	38	182	101	321	1
15:00:00	0	0	0	0	0
16:00:00	34	288	106	428	0
17:00:00	35	306	134	475	1
18:00:00	39	279	121	439	0
W Totals:	222	1472	594	2288	2

Calculated Values for Traffic Crossing Major Street

Hours Ending:	7:00	8:00	9:00	10:00	15:00	16:00	17:00	18:00
Crossing Values:	0	331	480	392	0	510	538	425

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 18-Jan-23 Site #: 2300900001

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	18	18	8	8	2	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1
7:30:00	37	19	18	10	4	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:45:00	64	27	42	24	10	6	0	0	0	0	0	0	0	0	1	1	0	0	1	0
8:00:00	102	38	57	15	12	2	0	0	0	0	1	1	8	8	4	3	1	1	2	1
8:15:00	141	39	87	30	26	14	0	0	0	0	1	0	8	0	4	0	1	0	2	0
8:30:00	163	22	112	25	31	5	1	1	2	2	1	0	8	0	4	0	1	0	2	0
8:45:00	197	34	132	20	33	2	1	0	2	0	1	0	11	3	4	0	1	0	3	1
9:00:00	225	28	174	42	40	7	1	0	4	2	2	1	25	14	4	0	1	0	5	2
9:15:00	266	41	213	39	42	2	2	1	4	0	2	0	29	4	4	0	1	0	6	1
9:30:00	301	35	233	20	50	8	2	0	6	2	3	1	30	1	4	0	1	0	7	1
9:45:00	319	18	254	21	55	5	2	0	7	1	3	0	30	0	4	0	1	0	7	0
10:00:00	334	15	281	27	59	4	4	2	8	1	3	0	30	0	4	0	1	0	7	0
10:15:00	334	0	281	0	59	0	4	0	8	0	3	0	30	0	4	0	1	0	7	0
15:00:00	334	0	281	0	59	0	4	0	8	0	3	0	30	0	4	0	1	0	7	0
15:15:00	366	32	334	53	62	3	4	0	9	1	3	0	30	0	5	1	1	0	7	0
15:30:00	417	51	388	54	65	3	5	1	9	0	3	0	34	4	6	1	2	1	7	0
15:45:00	464	47	449	61	69	4	5	0	10	1	3	0	41	7	7	1	2	0	7	0
16:00:00	499	35	502	53	79	10	5	0	10	0	3	0	42	1	7	0	2	0	7	0
16:15:00	548	49	563	61	86	7	6	1	10	0	3	0	42	0	7	0	2	0	9	2
16:30:00	604	56	629	66	94	8	6	0	10	0	3	0	42	0	7	0	2	0	9	0
16:45:00	658	54	696	67	97	3	6	0	10	0	3	0	42	0	7	0	2	0	11	2
17:00:00	692	34	751	55	100	3	8	2	10	0	3	0	42	0	7	0	2	0	11	0
17:15:00	733	41	806	55	107	7	8	0	10	0	3	0	42	0	7	0	2	0	11	0
17:30:00	774	41	857	51	114	7	9	1	12	2	3	0	42	0	7	0	2	0	12	1
17:45:00	816	42	900	43	123	9	9	0	14	2	3	0	42	0	7	0	2	0	12	0
18:00:00	845	29	935	35	123	0	9	0	14	0	3	0	43	1	7	0	2	0	12	0
18:15:00	845	0	935	0	123	0	9	0	14	0	3	0	43	0	7	0	2	0	12	0
18:15:15	845	0	935	0	123	0	9	0	14	0	3	0	43	0	7	0	2	0	12	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 18-Jan-23 Site #: 2300900001

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	2	2	44	44	11	11	0	0	1	1	0	0	1	1	1	1	0	0	0	0
7:30:00	9	7	98	54	33	22	3	3	4	3	0	0	2	1	1	0	1	1	0	0
7:45:00	14	5	169	71	72	39	5	2	7	3	0	0	3	1	1	0	7	6	0	0
8:00:00	22	8	242	73	149	77	6	1	10	3	0	0	3	0	2	1	12	5	0	0
8:15:00	29	7	311	69	167	18	8	2	12	2	0	0	3	0	5	3	12	0	0	0
8:30:00	33	4	369	58	189	22	9	1	12	0	0	0	3	0	6	1	12	0	0	0
8:45:00	36	3	448	79	225	36	12	3	14	2	0	0	3	0	8	2	17	5	0	0
9:00:00	38	2	544	96	270	45	14	2	15	1	0	0	3	0	9	1	21	4	0	0
9:15:00	43	5	611	67	299	29	14	0	16	1	0	0	3	0	9	0	21	0	0	0
9:30:00	49	6	672	61	327	28	15	1	18	2	0	0	3	0	10	1	21	0	0	0
9:45:00	55	6	742	70	345	18	17	2	19	1	0	0	3	0	10	0	21	0	0	0
10:00:00	60	5	790	48	358	13	19	2	19	0	0	0	3	0	10	0	21	0	0	0
10:15:00	60	0	790	0	358	0	19	0	19	0	0	0	3	0	10	0	21	0	0	0
15:00:00	60	0	790	0	358	0	19	0	19	0	0	0	3	0	10	0	21	0	0	0
15:15:00	71	11	852	62	396	38	19	0	20	1	2	2	3	0	10	0	24	3	0	0
15:30:00	77	6	904	52	421	25	20	1	22	2	2	0	3	0	10	0	29	5	0	0
15:45:00	86	9	969	65	457	36	21	1	24	2	3	1	3	0	10	0	30	1	0	0
16:00:00	96	10	1033	64	478	21	21	0	25	1	4	1	4	1	12	2	30	0	0	0
16:15:00	108	12	1097	64	520	42	21	0	28	3	4	0	4	0	12	0	30	0	0	0
16:30:00	113	5	1162	65	560	40	23	2	29	1	5	1	4	0	12	0	30	0	0	0
16:45:00	122	9	1231	69	600	40	23	0	29	0	5	0	4	0	12	0	30	0	0	0
17:00:00	136	14	1304	73	642	42	24	1	30	1	5	0	4	0	12	0	30	0	0	0
17:15:00	146	10	1372	68	673	31	25	1	31	1	5	0	4	0	12	0	30	0	0	0
17:30:00	155	9	1448	76	709	36	26	1	31	0	5	0	4	0	12	0	31	1	0	0
17:45:00	173	18	1505	57	736	27	26	0	31	0	5	0	4	0	12	0	31	0	0	0
18:00:00	177	4	1543	38	764	28	27	1	31	0	5	0	4	0	12	0	31	0	0	0
18:15:00	177	0	1543	0	764	0	27	0	31	0	5	0	4	0	12	0	31	0	0	0
18:15:15	177	0	1543	0	764	0	27	0	31	0	5	0	4	0	12	0	31	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 18-Jan-23 Site #: 2300900001

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	15	15	23	23	6	6	0	0	1	1	1	1	0	0	0	0	0	0	0	0
7:30:00	35	20	44	21	12	6	4	4	1	0	3	2	0	0	0	0	0	0	0	0
7:45:00	52	17	74	30	19	7	6	2	1	0	3	0	0	0	2	2	0	0	0	0
8:00:00	79	27	131	57	30	11	7	1	1	0	5	2	0	0	3	1	0	0	0	0
8:15:00	103	24	170	39	44	14	8	1	2	1	6	1	0	0	3	0	0	0	0	0
8:30:00	133	30	222	52	52	8	9	1	4	2	10	4	0	0	3	0	0	0	0	0
8:45:00	163	30	269	47	66	14	12	3	4	0	12	2	2	2	5	2	0	0	0	0
9:00:00	206	43	326	57	81	15	16	4	5	1	12	0	2	0	5	0	1	1	0	0
9:15:00	238	32	364	38	88	7	19	3	6	1	19	7	4	2	5	0	1	0	0	0
9:30:00	269	31	400	36	93	5	23	4	7	1	22	3	4	0	5	0	1	0	0	0
9:45:00	297	28	432	32	104	11	23	0	8	1	22	0	4	0	5	0	1	0	0	0
10:00:00	320	23	469	37	110	6	27	4	9	1	23	1	4	0	5	0	1	0	0	0
10:15:00	320	0	469	0	110	0	27	0	9	0	23	0	4	0	5	0	1	0	0	0
15:00:00	320	0	469	0	110	0	27	0	9	0	23	0	4	0	5	0	1	0	0	0
15:15:00	339	19	502	33	114	4	27	0	9	0	24	1	4	0	5	0	1	0	0	0
15:30:00	358	19	537	35	122	8	30	3	9	0	27	3	4	0	7	2	2	1	0	0
15:45:00	388	30	570	33	129	7	32	2	9	0	27	0	4	0	7	0	2	0	0	0
16:00:00	420	32	611	41	139	10	33	1	10	1	28	1	4	0	7	0	2	0	0	0
16:15:00	437	17	647	36	149	10	33	0	10	0	28	0	4	0	7	0	4	2	0	0
16:30:00	462	25	686	39	155	6	34	1	10	0	28	0	4	0	7	0	5	1	0	0
16:45:00	484	22	723	37	159	4	35	1	10	0	28	0	4	0	8	1	6	1	0	0
17:00:00	510	26	766	43	172	13	35	0	11	1	29	1	4	0	8	0	7	1	0	0
17:15:00	522	12	798	32	181	9	35	0	11	0	30	1	4	0	9	1	7	0	0	0
17:30:00	540	18	843	45	192	11	36	1	11	0	31	1	4	0	9	0	7	0	0	0
17:45:00	576	36	889	46	200	8	36	0	11	0	31	0	4	0	9	0	7	0	0	0
18:00:00	591	15	915	26	208	8	36	0	11	0	31	0	4	0	9	0	7	0	0	0
18:15:00	591	0	915	0	208	0	36	0	11	0	31	0	4	0	9	0	7	0	0	0
18:15:15	591	0	915	0	208	0	36	0	11	0	31	0	4	0	9	0	7	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 18-Jan-23 Site #: 2300900001

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	1	1	35	35	8	8	0	0	1	1	0	0	0	0	0	0	0	0	0	0
7:30:00	9	8	81	46	19	11	0	0	2	1	0	0	0	0	0	0	0	0	0	0
7:45:00	17	8	125	44	32	13	0	0	3	1	1	1	0	0	0	0	0	0	0	0
8:00:00	30	13	177	52	50	18	0	0	3	0	2	1	0	0	0	0	0	0	0	0
8:15:00	40	10	228	51	66	16	0	0	3	0	6	4	0	0	0	0	0	0	0	0
8:30:00	47	7	271	43	87	21	0	0	5	2	9	3	0	0	0	0	0	0	0	0
8:45:00	57	10	335	64	106	19	0	0	9	4	12	3	0	0	0	0	0	0	0	0
9:00:00	75	18	406	71	120	14	0	0	10	1	12	0	1	1	1	1	0	0	0	0
9:15:00	83	8	458	52	138	18	0	0	10	0	14	2	1	0	4	3	1	1	0	0
9:30:00	92	9	492	34	166	28	1	1	14	4	19	5	1	0	4	0	1	0	1	1
9:45:00	103	11	538	46	195	29	1	0	16	2	21	2	1	0	4	0	1	0	1	0
10:00:00	111	8	575	37	211	16	2	1	20	4	21	0	1	0	4	0	1	0	1	0
10:15:00	111	0	575	0	211	0	2	0	20	0	21	0	1	0	4	0	1	0	1	0
15:00:00	111	0	575	0	211	0	2	0	20	0	21	0	1	0	4	0	1	0	1	0
15:15:00	121	10	647	72	235	24	2	0	24	4	21	0	1	0	4	0	1	0	1	0
15:30:00	132	11	715	68	260	25	2	0	25	1	22	1	1	0	4	0	1	0	1	0
15:45:00	138	6	772	57	285	25	2	0	28	3	23	1	1	0	4	0	3	2	1	0
16:00:00	145	7	851	79	308	23	2	0	31	3	27	4	1	0	5	1	4	1	1	0
16:15:00	158	13	923	72	340	32	2	0	33	2	29	2	1	0	7	2	4	0	1	0
16:30:00	165	7	998	75	372	32	2	0	35	2	30	1	1	0	9	2	4	0	1	0
16:45:00	174	9	1068	70	412	40	2	0	36	1	31	1	1	0	11	2	4	0	2	1
17:00:00	180	6	1144	76	435	23	2	0	37	1	32	1	1	0	12	1	6	2	2	0
17:15:00	191	11	1224	80	464	29	2	0	37	0	32	0	1	0	13	1	6	0	2	0
17:30:00	199	8	1309	85	491	27	2	0	37	0	32	0	1	0	13	0	6	0	2	0
17:45:00	212	13	1367	58	529	38	2	0	37	0	32	0	1	0	14	1	6	0	2	0
18:00:00	219	7	1421	54	556	27	2	0	37	0	32	0	1	0	14	0	6	0	2	0
18:15:00	219	0	1421	0	556	0	2	0	37	0	32	0	1	0	14	0	6	0	2	0
18:15:15	219	0	1421	0	556	0	2	0	37	0	32	0	1	0	14	0	6	0	2	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 8:15:00
To: 9:15:00

Municipality: Collingwood
Site #: 2300900002
Intersection: Poplar Sideroad & High St
TFR File #: 1
Count date: 18-Jan-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: Poplar Sideroad runs W/E

North Leg Total: 422
North Entering: 186
North Peds: 0
Peds Cross: ⋈

Heavys	0	3	3
Trucks	0	11	11
Cars	16	156	172
Totals	16	170	

Heavys	2
Trucks	12
Cars	222
Totals	236

East Leg Total: 770
East Entering: 470
East Peds: 0
Peds Cross: ⧖

High St

Heavys	Trucks	Cars	Totals
2	11	265	278

Poplar Sideroad

Heavys	Trucks	Cars	Totals
0	3	25	28
5	7	118	130
5	10	143	

N
W E
S

Cars	Trucks	Heavys	Totals
197	9	2	208
249	11	2	262
446	20	4	

Poplar Sideroad

Cars	Trucks	Heavys	Totals
274	18	8	300

Peds Cross: ⧖
West Peds: 0
West Entering: 158
West Leg Total: 436

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 15:45:00
To: 16:45:00

Municipality: Collingwood
Site #: 2300900002
Intersection: Poplar Sideroad & High St
TFR File #: 1
Count date: 18-Jan-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: Poplar Sideroad runs W/E

North Leg Total: 493
North Entering: 259
North Peds: 0
Peds Cross: ⋈

Heavys	0	2	2
Trucks	0	14	14
Cars	19	224	243
Totals	19	240	

Heavys	0
Trucks	10
Cars	224
Totals	234

East Leg Total: 852
East Entering: 368
East Peds: 0
Peds Cross: ⧖

High St

Heavys	Trucks	Cars	Totals
1	4	169	174

Cars	Trucks	Heavys	Totals
203	10	0	213
150	4	1	155
353	14	1	

Poplar Sideroad

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	21	21
5	14	225	244
5	14	246	

Poplar Sideroad

Cars	Trucks	Heavys	Totals
449	28	7	484

Peds Cross: ⧖
West Peds: 0
West Entering: 265
West Leg Total: 439

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Total Count Diagram

Municipality: Collingwood
Site #: 2300900002
Intersection: Poplar Sideroad & High St
TFR File #: 1
Count date: 18-Jan-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: Poplar Sideroad runs W/E

North Leg Total: 2454
North Entering: 1233
North Peds: 5
Peds Cross: ⋈

Heavys	0	7	7
Trucks	3	52	55
Cars	104	1067	1171
Totals	107	1126	

Heavys	4
Trucks	58
Cars	1159
Totals	1221

East Leg Total: 4175
East Entering: 2188
East Peds: 1
Peds Cross: ⧖

High St

Heavys	Trucks	Cars	Totals
11	54	1116	1181

Poplar Sideroad

Heavys	Trucks	Cars	Totals
0	3	104	107
14	46	801	861
14	49	905	

N
W E
S

Cars	Trucks	Heavys	Totals
1055	55	4	1114
1012	51	11	1074
2067	106	15	

Poplar Sideroad

Cars	Trucks	Heavys	Totals
1868	98	21	1987

Peds Cross: ⧖
West Peds: 0
West Entering: 968
West Leg Total: 2149

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Traffic Count Summary

Intersection: Poplar Sideroad & High St | **Count Date:** 18-Jan-23 | **Municipality:** Collingwood

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds	North/South Total Approaches
	Left	Thru	Right	Grand Total		
7:00:00	*0*	*0*	*0*	*0*	*0*	*0*
8:00:00	*121*	*0*	*17*	*138*	*1*	*138*
9:00:00	*162*	*0*	*16*	*178*	*0*	*178*
10:00:00	*153*	*0*	*18*	*171*	*1*	*171*
15:00:00	*0*	*0*	*0*	*0*	*0*	*0*
16:00:00	*219*	*0*	*17*	*236*	*0*	*236*
17:00:00	*229*	*0*	*23*	*252*	*1*	*252*
18:00:00	*242*	*0*	*16*	*258*	*2*	*258*
Totals:	1126	0	107	1233	5	1233

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*0*	*0*	*0*	*0*
9:00:00	*0*	*0*	*0*	*0*	*0*
10:00:00	*0*	*0*	*0*	*0*	*0*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*0*	*0*	*0*	*0*	*0*
17:00:00	*0*	*0*	*0*	*0*	*0*
18:00:00	*0*	*0*	*0*	*0*	*0*
S Totals:	0	0	0	0	0

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds	East/West Total Approaches
	Left	Thru	Right	Grand Total		
7:00:00	*0*	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*175*	*140*	*315*	*0*	*401*
9:00:00	*0*	*270*	*203*	*473*	*0*	*625*
10:00:00	*0*	*219*	*170*	*389*	*1*	*503*
15:00:00	*0*	*0*	*0*	*0*	*0*	*0*
16:00:00	*0*	*162*	*218*	*380*	*0*	*568*
17:00:00	*0*	*139*	*228*	*367*	*0*	*629*
18:00:00	*0*	*109*	*155*	*264*	*0*	*430*
Totals:	0	1074	1114	2188	1	3156

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*11*	*75*	*0*	*86*	*0*
9:00:00	*27*	*125*	*0*	*152*	*0*
10:00:00	*17*	*97*	*0*	*114*	*0*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*17*	*171*	*0*	*188*	*0*
17:00:00	*23*	*239*	*0*	*262*	*0*
18:00:00	*12*	*154*	*0*	*166*	*0*
W Totals:	107	861	0	968	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*7:00*	*8:00*	*9:00*	*10:00*	*15:00*	*16:00*	*17:00*	*18:00*
Crossing Values:	*0*	*121*	*162*	*154*	*0*	*219*	*229*	*242*

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 18-Jan-23 Site #: 2300900002

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	25	25	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
7:30:00	49	24	0	0	8	7	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:45:00	85	36	0	0	10	2	3	3	0	0	0	0	0	0	0	0	0	0	1	0
8:00:00	117	32	0	0	17	7	4	1	0	0	0	0	0	0	0	0	0	0	1	0
8:15:00	143	26	0	0	21	4	8	4	0	0	0	0	0	0	0	0	0	0	1	0
8:30:00	177	34	0	0	25	4	12	4	0	0	0	0	0	0	0	0	0	0	1	0
8:45:00	227	50	0	0	30	5	15	3	0	0	0	0	0	0	0	0	0	0	1	0
9:00:00	266	39	0	0	33	3	15	0	0	0	0	0	2	2	0	0	0	0	1	0
9:15:00	299	33	0	0	37	4	19	4	0	0	0	0	3	1	0	0	0	0	1	0
9:30:00	328	29	0	0	40	3	23	4	0	0	0	0	3	0	0	0	0	0	2	1
9:45:00	371	43	0	0	42	2	26	3	0	0	2	2	3	0	0	0	0	0	2	0
10:00:00	403	32	0	0	49	7	30	4	0	0	2	0	3	0	0	0	0	0	2	0
10:15:00	403	0	0	0	49	0	30	0	0	0	2	0	3	0	0	0	0	0	2	0
15:00:00	403	0	0	0	49	0	30	0	0	0	2	0	3	0	0	0	0	0	2	0
15:15:00	456	53	0	0	53	4	31	1	0	0	2	0	3	0	0	0	0	0	2	0
15:30:00	503	47	0	0	59	6	32	1	0	0	2	0	3	0	0	0	0	0	2	0
15:45:00	558	55	0	0	65	6	34	2	0	0	2	0	5	2	0	0	0	0	2	0
16:00:00	612	54	0	0	66	1	38	4	0	0	2	0	5	0	0	0	0	0	2	0
16:15:00	677	65	0	0	72	6	41	3	0	0	2	0	7	2	0	0	0	0	2	0
16:30:00	732	55	0	0	79	7	44	3	0	0	2	0	7	0	0	0	0	0	2	0
16:45:00	782	50	0	0	84	5	48	4	0	0	2	0	7	0	0	0	0	0	2	0
17:00:00	828	46	0	0	88	4	49	1	0	0	3	1	7	0	0	0	0	0	3	1
17:15:00	897	69	0	0	91	3	51	2	0	0	3	0	7	0	0	0	0	0	3	0
17:30:00	957	60	0	0	95	4	51	0	0	0	3	0	7	0	0	0	0	0	3	0
17:45:00	1015	58	0	0	98	3	51	0	0	0	3	0	7	0	0	0	0	0	3	0
18:00:00	1067	52	0	0	104	6	52	1	0	0	3	0	7	0	0	0	0	0	5	2
18:15:00	1067	0	0	0	104	0	52	0	0	0	3	0	7	0	0	0	0	0	5	0
18:15:15	1067	0	0	0	104	0	52	0	0	0	3	0	7	0	0	0	0	0	5	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 18-Jan-23 Site #: 2300900002

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	32	32	21	21	0	0	2	2	1	1	0	0	0	0	0	0	0	0
7:30:00	0	0	65	33	55	34	0	0	6	4	3	2	0	0	1	1	0	0	0	0
7:45:00	0	0	105	40	96	41	0	0	11	5	5	2	0	0	1	0	0	0	0	0
8:00:00	0	0	157	52	131	35	0	0	16	5	8	3	0	0	2	1	1	1	0	0
8:15:00	0	0	227	70	172	41	0	0	20	4	11	3	0	0	4	2	2	1	0	0
8:30:00	0	0	277	50	212	40	0	0	23	3	12	1	0	0	5	1	2	0	0	0
8:45:00	0	0	336	59	259	47	0	0	27	4	14	2	0	0	5	0	2	0	0	0
9:00:00	0	0	412	76	324	65	0	0	28	1	17	3	0	0	5	0	2	0	0	0
9:15:00	0	0	476	64	369	45	0	0	31	3	20	3	0	0	6	1	4	2	0	0
9:30:00	0	0	532	56	404	35	0	0	34	3	25	5	0	0	7	1	4	0	0	0
9:45:00	0	0	582	50	448	44	0	0	35	1	30	5	0	0	7	0	4	0	0	0
10:00:00	0	0	618	36	477	29	0	0	39	4	32	2	0	0	7	0	4	0	1	1
10:15:00	0	0	618	0	477	0	0	0	39	0	32	0	0	0	7	0	4	0	1	0
15:00:00	0	0	618	0	477	0	0	0	39	0	32	0	0	0	7	0	4	0	1	0
15:15:00	0	0	663	45	523	46	0	0	43	4	33	1	0	0	7	0	4	0	1	0
15:30:00	0	0	695	32	568	45	0	0	46	3	35	2	0	0	9	2	4	0	1	0
15:45:00	0	0	726	31	634	66	0	0	47	1	38	3	0	0	10	1	4	0	1	0
16:00:00	0	0	764	38	688	54	0	0	51	4	39	1	0	0	11	1	4	0	1	0
16:15:00	0	0	799	35	739	51	0	0	51	0	42	3	0	0	11	0	4	0	1	0
16:30:00	0	0	831	32	786	47	0	0	51	0	47	5	0	0	11	0	4	0	1	0
16:45:00	0	0	876	45	837	51	0	0	51	0	48	1	0	0	11	0	4	0	1	0
17:00:00	0	0	903	27	904	67	0	0	51	0	51	3	0	0	11	0	4	0	1	0
17:15:00	0	0	940	37	950	46	0	0	51	0	51	0	0	0	11	0	4	0	1	0
17:30:00	0	0	965	25	991	41	0	0	51	0	53	2	0	0	11	0	4	0	1	0
17:45:00	0	0	992	27	1030	39	0	0	51	0	54	1	0	0	11	0	4	0	1	0
18:00:00	0	0	1012	20	1055	25	0	0	51	0	55	1	0	0	11	0	4	0	1	0
18:15:00	0	0	1012	0	1055	0	0	0	51	0	55	0	0	0	11	0	4	0	1	0
18:15:15	0	0	1012	0	1055	0	0	0	51	0	55	0	0	0	11	0	4	0	1	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 18-Jan-23 Site #: 2300900002

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 18-Jan-23 Site #: 2300900002

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	35	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	3	3	56	21	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
8:00:00	11	8	74	18	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
8:15:00	15	4	94	20	0	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0
8:30:00	23	8	120	26	0	0	3	3	5	2	0	0	0	0	0	0	0	0	0	0
8:45:00	27	4	158	38	0	0	3	0	8	3	0	0	0	0	1	1	0	0	0	0
9:00:00	35	8	187	29	0	0	3	0	10	2	0	0	0	0	3	2	0	0	0	0
9:15:00	40	5	212	25	0	0	3	0	10	0	0	0	0	0	5	2	0	0	0	0
9:30:00	44	4	237	25	0	0	3	0	17	7	0	0	0	0	5	0	0	0	0	0
9:45:00	49	5	254	17	0	0	3	0	17	0	0	0	0	0	5	0	0	0	0	0
10:00:00	52	3	273	19	0	0	3	0	19	2	0	0	0	0	5	0	0	0	0	0
10:15:00	52	0	273	0	0	0	3	0	19	0	0	0	0	0	5	0	0	0	0	0
15:00:00	52	0	273	0	0	0	3	0	19	0	0	0	0	0	5	0	0	0	0	0
15:15:00	60	8	302	29	0	0	3	0	21	2	0	0	0	0	5	0	0	0	0	0
15:30:00	61	1	340	38	0	0	3	0	23	2	0	0	0	0	5	0	0	0	0	0
15:45:00	67	6	386	46	0	0	3	0	25	2	0	0	0	0	6	1	0	0	0	0
16:00:00	69	2	432	46	0	0	3	0	30	5	0	0	0	0	6	0	0	0	0	0
16:15:00	75	6	500	68	0	0	3	0	35	5	0	0	0	0	7	1	0	0	0	0
16:30:00	80	5	552	52	0	0	3	0	36	1	0	0	0	0	8	1	0	0	0	0
16:45:00	88	8	611	59	0	0	3	0	39	3	0	0	0	0	11	3	0	0	0	0
17:00:00	92	4	652	41	0	0	3	0	42	3	0	0	0	0	13	2	0	0	0	0
17:15:00	98	6	713	61	0	0	3	0	44	2	0	0	0	0	14	1	0	0	0	0
17:30:00	102	4	758	45	0	0	3	0	44	0	0	0	0	0	14	0	0	0	0	0
17:45:00	102	0	784	26	0	0	3	0	46	2	0	0	0	0	14	0	0	0	0	0
18:00:00	104	2	801	17	0	0	3	0	46	0	0	0	0	0	14	0	0	0	0	0
18:15:00	104	0	801	0	0	0	3	0	46	0	0	0	0	0	14	0	0	0	0	0
18:15:15	104	0	801	0	0	0	3	0	46	0	0	0	0	0	14	0	0	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 8:15:00
To: 9:15:00

Municipality: Collingwood
Site #: 2300900003
Intersection: High St & Plewes Dr
TFR File #: 1
Count date: 18-Jan-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: High St runs N/S

North Leg Total: 651
North Entering: 285
North Peds: 7
Peds Cross: ⋈

Heavys	2	3	6	11
Trucks	1	10	0	11
Cars	31	153	79	263
Totals	34	166	85	

Heavys	4
Trucks	10
Cars	352
Totals	366

East Leg Total: 215
East Entering: 115
East Peds: 0
Peds Cross: ⧗

High St

Heavys	Trucks	Cars	Totals
2	2	47	51

Plewes Dr

Heavys	Trucks	Cars	Totals
1	0	41	42
1	0	13	14
0	1	18	19
2	1	72	

Cars	Trucks	Heavys	Totals
106	0	1	107
6	0	0	6
2	0	0	2
114	0	1	

N
W E
S

Findlay Dr

Cars	Trucks	Heavys	Totals
93	0	7	100

High St

Peds Cross: ⧗
West Peds: 2
West Entering: 75
West Leg Total: 126

Cars	173
Trucks	11
Heavys	3
Totals	187

Cars	10	205	1	216
Trucks	1	10	0	11
Heavys	0	2	0	2
Totals	11	217	1	

Peds Cross: ⋈
South Peds: 7
South Entering: 229
South Leg Total: 416

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

Municipality: Collingwood
Site #: 2300900003
Intersection: High St & Plewes Dr
TFR File #: 1
Count date: 18-Jan-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: High St runs N/S

North Leg Total: 722
North Entering: 398
North Peds: 0
Peds Cross: ⋈

Heavys	0	0	0	0
Trucks	0	6	0	6
Cars	56	235	101	392
Totals	56	241	101	

Heavys	0
Trucks	10
Cars	314
Totals	324

East Leg Total: 178
East Entering: 66
East Peds: 0
Peds Cross: ⧗

High St

Heavys	Trucks	Cars	Totals
0	0	75	75

Plewes Dr

Heavys	Trucks	Cars	Totals
0	0	42	42
0	0	5	5
0	0	7	7
0	0	54	

Cars	Trucks	Heavys	Totals
59	0	0	59
4	0	0	4
3	0	0	3
66	0	0	

N
W E
S

Findlay Dr

Cars	Trucks	Heavys	Totals
112	0	0	112

High St

Peds Cross: ⧗
West Peds: 2
West Entering: 54
West Leg Total: 129

Cars	245
Trucks	6
Heavys	0
Totals	251

Cars	15	213	6	234
Trucks	0	10	0	10
Heavys	0	0	0	0
Totals	15	223	6	

Peds Cross: ⋈
South Peds: 2
South Entering: 244
South Leg Total: 495

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Total Count Diagram

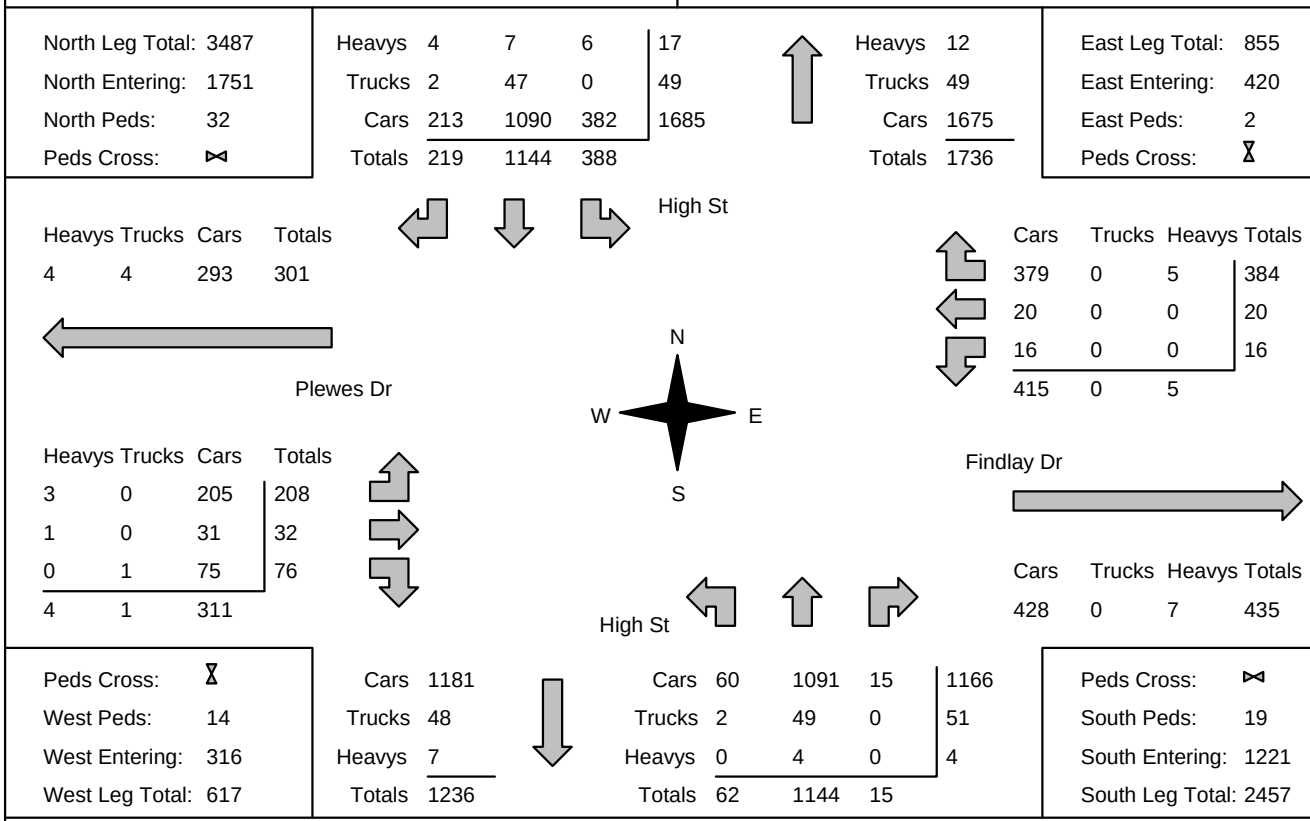
Municipality: Collingwood
Site #: 2300900003
Intersection: High St & Plewes Dr
TFR File #: 1
Count date: 18-Jan-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: High St runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Traffic Count Summary

Intersection: High St & Plewes Dr | **Count Date:** 18-Jan-23 | **Municipality:** Collingwood

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	13	124	16	153	3
9:00:00	87	161	26	274	6
10:00:00	38	159	28	225	8
15:00:00	0	0	0	0	0
16:00:00	78	219	44	341	8
17:00:00	85	240	50	375	3
18:00:00	87	241	55	383	4
Totals:	388	1144	219	1751	32

North/South Total Approaches: 2972

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	5	146	0	151	5
9:00:00	9	212	3	224	5
10:00:00	8	181	4	193	2
15:00:00	0	0	0	0	0
16:00:00	16	217	2	235	4
17:00:00	19	228	3	250	2
18:00:00	5	160	3	168	1
S Totals:	62	1144	15	1221	19

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	3	3	46	52	0
9:00:00	2	5	104	111	0
10:00:00	3	2	50	55	2
15:00:00	0	0	0	0	0
16:00:00	3	6	76	85	0
17:00:00	3	4	60	67	0
18:00:00	2	0	48	50	0
Totals:	16	20	384	420	2

East/West Total Approaches: 736

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	36	0	13	49	2
9:00:00	47	14	19	80	3
10:00:00	23	5	10	38	3
15:00:00	0	0	0	0	0
16:00:00	32	4	11	47	0
17:00:00	41	7	9	57	0
18:00:00	29	2	14	45	6
W Totals:	208	32	76	316	14

Calculated Values for Traffic Crossing Major Street

Hours Ending:	7:00	8:00	9:00	10:00	15:00	16:00	17:00	18:00
Crossing Values:	0	50	74	41	0	53	56	38

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 18-Jan-23 Site #: 2300900003

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	5	5	25	25	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	5	0	56	31	3	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1
7:45:00	7	2	87	31	8	5	0	0	3	3	0	0	0	0	0	0	0	0	1	0
8:00:00	13	6	120	33	15	7	0	0	4	1	1	1	0	0	0	0	0	0	3	2
8:15:00	26	13	147	27	18	3	0	0	7	3	1	0	0	0	0	0	0	0	3	0
8:30:00	39	13	183	36	26	8	0	0	11	4	1	0	0	0	0	0	1	1	3	0
8:45:00	70	31	230	47	35	9	0	0	13	2	1	0	4	4	0	0	2	1	5	2
9:00:00	94	24	270	40	39	4	0	0	13	0	1	0	6	2	2	2	2	0	9	4
9:15:00	105	11	300	30	49	10	0	0	17	4	2	1	6	0	3	1	2	0	10	1
9:30:00	118	13	333	33	59	10	0	0	20	3	2	0	6	0	3	0	2	0	12	2
9:45:00	123	5	378	45	62	3	0	0	25	5	2	0	6	0	3	0	2	0	13	1
10:00:00	132	9	412	34	66	4	0	0	29	4	2	0	6	0	3	0	2	0	17	4
10:15:00	132	0	412	0	66	0	0	0	29	0	2	0	6	0	3	0	2	0	17	0
15:00:00	132	0	412	0	66	0	0	0	29	0	2	0	6	0	3	0	2	0	17	0
15:15:00	156	24	465	53	72	6	0	0	30	1	2	0	6	0	3	0	2	0	19	2
15:30:00	174	18	511	46	80	8	0	0	31	1	2	0	6	0	3	0	4	2	21	2
15:45:00	195	21	569	58	99	19	0	0	33	2	2	0	6	0	5	2	4	0	25	4
16:00:00	210	15	621	52	108	9	0	0	37	4	2	0	6	0	5	0	4	0	25	0
16:15:00	229	19	688	67	118	10	0	0	39	2	2	0	6	0	7	2	4	0	28	3
16:30:00	252	23	749	61	138	20	0	0	41	2	2	0	6	0	7	0	4	0	28	0
16:45:00	277	25	804	55	148	10	0	0	44	3	2	0	6	0	7	0	4	0	28	0
17:00:00	295	18	852	48	158	10	0	0	44	0	2	0	6	0	7	0	4	0	28	0
17:15:00	330	35	923	71	174	16	0	0	45	1	2	0	6	0	7	0	4	0	28	0
17:30:00	354	24	982	59	190	16	0	0	46	1	2	0	6	0	7	0	4	0	31	3
17:45:00	370	16	1037	55	202	12	0	0	46	0	2	0	6	0	7	0	4	0	32	1
18:00:00	382	12	1090	53	213	11	0	0	47	1	2	0	6	0	7	0	4	0	32	0
18:15:00	382	0	1090	0	213	0	0	0	47	0	2	0	6	0	7	0	4	0	32	0
18:15:15	382	0	1090	0	213	0	0	0	47	0	2	0	6	0	7	0	4	0	32	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 18-Jan-23 Site #: 2300900003

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	1	1	1	1	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	1	0	1	0	15	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	3	2	3	2	25	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	3	0	3	0	46	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	4	1	3	0	65	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	5	1	4	1	80	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	5	0	7	3	110	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	5	0	8	1	149	39	0	0	0	0	0	0	0	0	0	0	1	1	0	0
9:15:00	6	1	9	1	171	22	0	0	0	0	0	0	0	0	0	0	1	0	0	0
9:30:00	6	0	10	1	183	12	0	0	0	0	0	0	0	0	0	0	1	0	0	0
9:45:00	7	1	10	0	188	5	0	0	0	0	0	0	0	0	0	0	1	0	0	0
10:00:00	8	1	10	0	199	11	0	0	0	0	0	0	0	0	0	0	1	0	2	2
10:15:00	8	0	10	0	199	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0
15:00:00	8	0	10	0	199	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0
15:15:00	9	1	12	2	216	17	0	0	0	0	0	0	0	0	0	0	1	0	2	0
15:30:00	10	1	15	3	237	21	0	0	0	0	0	0	0	0	0	0	3	2	2	0
15:45:00	10	0	15	0	255	18	0	0	0	0	0	0	0	0	0	0	5	2	2	0
16:00:00	11	1	16	1	271	16	0	0	0	0	0	0	0	0	0	0	5	0	2	0
16:15:00	12	1	16	0	286	15	0	0	0	0	0	0	0	0	0	0	5	0	2	0
16:30:00	12	0	18	2	301	15	0	0	0	0	0	0	0	0	0	0	5	0	2	0
16:45:00	13	1	19	1	311	10	0	0	0	0	0	0	0	0	0	0	5	0	2	0
17:00:00	14	1	20	1	331	20	0	0	0	0	0	0	0	0	0	0	5	0	2	0
17:15:00	15	1	20	0	345	14	0	0	0	0	0	0	0	0	0	0	5	0	2	0
17:30:00	15	0	20	0	362	17	0	0	0	0	0	0	0	0	0	0	5	0	2	0
17:45:00	16	1	20	0	370	8	0	0	0	0	0	0	0	0	0	0	5	0	2	0
18:00:00	16	0	20	0	379	9	0	0	0	0	0	0	0	0	0	0	5	0	2	0
18:15:00	16	0	20	0	379	0	0	0	0	0	0	0	0	0	0	0	5	0	2	0
18:15:15	16	0	20	0	379	0	0	0	0	0	0	0	0	0	0	0	5	0	2	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 18-Jan-23 Site #: 2300900003

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	22	22	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2	2
7:30:00	0	0	56	34	0	0	0	0	3	2	0	0	0	0	0	0	0	0	2	0
7:45:00	3	3	94	38	0	0	1	1	4	1	0	0	0	0	0	0	0	0	4	2
8:00:00	4	1	138	44	0	0	1	0	7	3	0	0	0	0	1	1	0	0	5	1
8:15:00	6	2	180	42	2	2	1	0	10	3	0	0	0	0	2	1	0	0	5	0
8:30:00	6	0	226	46	2	0	1	0	13	3	0	0	0	0	2	0	0	0	8	3
8:45:00	7	1	275	49	2	0	1	0	15	2	0	0	0	0	2	0	0	0	8	0
9:00:00	13	6	338	63	3	1	1	0	18	3	0	0	0	0	2	0	0	0	10	2
9:15:00	16	3	385	47	3	0	2	1	20	2	0	0	0	0	4	2	0	0	12	2
9:30:00	17	1	426	41	5	2	2	0	23	3	0	0	0	0	4	0	0	0	12	0
9:45:00	18	1	476	50	6	1	2	0	26	3	0	0	0	0	4	0	0	0	12	0
10:00:00	20	2	507	31	7	1	2	0	28	2	0	0	0	0	4	0	0	0	12	0
10:15:00	20	0	507	0	7	0	2	0	28	0	0	0	0	0	4	0	0	0	12	0
15:00:00	20	0	507	0	7	0	2	0	28	0	0	0	0	0	4	0	0	0	12	0
15:15:00	22	2	561	54	7	0	2	0	28	0	0	0	0	0	4	0	0	0	12	0
15:30:00	24	2	606	45	7	0	2	0	29	1	0	0	0	0	4	0	0	0	16	4
15:45:00	30	6	671	65	8	1	2	0	32	3	0	0	0	0	4	0	0	0	16	0
16:00:00	36	6	720	49	9	1	2	0	32	0	0	0	0	0	4	0	0	0	16	0
16:15:00	40	4	771	51	9	0	2	0	35	3	0	0	0	0	4	0	0	0	16	0
16:30:00	44	4	820	49	10	1	2	0	39	4	0	0	0	0	4	0	0	0	18	2
16:45:00	52	8	871	51	12	2	2	0	41	2	0	0	0	0	4	0	0	0	18	0
17:00:00	55	3	936	65	12	0	2	0	44	3	0	0	0	0	4	0	0	0	18	0
17:15:00	55	0	984	48	15	3	2	0	45	1	0	0	0	0	4	0	0	0	18	0
17:30:00	60	5	1025	41	15	0	2	0	47	2	0	0	0	0	4	0	0	0	18	0
17:45:00	60	0	1064	39	15	0	2	0	48	1	0	0	0	0	4	0	0	0	18	0
18:00:00	60	0	1091	27	15	0	2	0	49	1	0	0	0	0	4	0	0	0	19	1
18:15:00	60	0	1091	0	15	0	2	0	49	0	0	0	0	0	4	0	0	0	19	0
18:15:15	60	0	1091	0	15	0	2	0	49	0	0	0	0	0	4	0	0	0	19	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 18-Jan-23 Site #: 2300900003

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
7:30:00	10	6	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:45:00	17	7	0	0	8	5	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:00:00	36	19	0	0	13	5	0	0	0	0	0	0	0	0	0	0	0	0	2	1
8:15:00	43	7	0	0	17	4	0	0	0	0	0	0	0	0	0	0	0	0	3	1
8:30:00	56	13	4	4	20	3	0	0	0	0	0	0	0	0	0	0	0	0	5	2
8:45:00	69	13	10	6	28	8	0	0	0	0	1	1	0	0	1	1	0	0	5	0
9:00:00	82	13	13	3	31	3	0	0	0	0	1	0	1	1	1	0	0	0	5	0
9:15:00	84	2	13	0	35	4	0	0	0	0	1	0	1	0	1	0	0	0	5	0
9:30:00	93	9	14	1	35	0	0	0	0	0	1	0	1	0	1	0	0	0	6	1
9:45:00	101	8	14	0	36	1	0	0	0	0	1	0	1	0	1	0	0	0	6	0
10:00:00	105	4	18	4	41	5	0	0	0	0	1	0	1	0	1	0	0	0	8	2
10:15:00	105	0	18	0	41	0	0	0	0	0	1	0	1	0	1	0	0	0	8	0
15:00:00	105	0	18	0	41	0	0	0	0	0	1	0	1	0	1	0	0	0	8	0
15:15:00	111	6	19	1	44	3	0	0	0	0	1	0	1	0	1	0	0	0	8	0
15:30:00	117	6	19	0	48	4	0	0	0	0	1	0	2	1	1	0	0	0	8	0
15:45:00	126	9	22	3	50	2	0	0	0	0	1	0	3	1	1	0	0	0	8	0
16:00:00	135	9	22	0	52	2	0	0	0	0	1	0	3	0	1	0	0	0	8	0
16:15:00	139	4	24	2	55	3	0	0	0	0	1	0	3	0	1	0	0	0	8	0
16:30:00	150	11	27	3	57	2	0	0	0	0	1	0	3	0	1	0	0	0	8	0
16:45:00	162	12	29	2	59	2	0	0	0	0	1	0	3	0	1	0	0	0	8	0
17:00:00	176	14	29	0	61	2	0	0	0	0	1	0	3	0	1	0	0	0	8	0
17:15:00	181	5	29	0	62	1	0	0	0	0	1	0	3	0	1	0	0	0	10	2
17:30:00	187	6	30	1	67	5	0	0	0	0	1	0	3	0	1	0	0	0	10	0
17:45:00	192	5	30	0	73	6	0	0	0	0	1	0	3	0	1	0	0	0	11	1
18:00:00	205	13	31	1	75	2	0	0	0	0	1	0	3	0	1	0	0	0	14	3
18:15:00	205	0	31	0	75	0	0	0	0	0	1	0	3	0	1	0	0	0	14	0
18:15:15	205	0	31	0	75	0	0	0	0	0	1	0	3	0	1	0	0	0	14	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 8:30:00
To: 9:30:00

Municipality: Collingwood
Site #: 2300900004
Intersection: High St & Campbell St
TFR File #: 1
Count date: 18-Jan-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

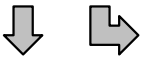
Major Road: High St runs N/S

North Leg Total: 681
North Entering: 311
North Peds: 2
Peds Cross: ⋈

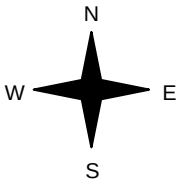
Heavys	9	1	10
Trucks	10	1	11
Cars	230	60	290
Totals	249	62	

Heavys	3
Trucks	11
Cars	356
Totals	370

East Leg Total: 227
East Entering: 107
East Peds: 0
Peds Cross: ⧖



Cars	Trucks	Heavys	Totals
73	1	0	74
32	0	1	33
105	1	1	



Campbell St

Cars	Trucks	Heavys	Totals
117	1	2	120

High St

Cars	262		
Trucks	10		
Heavys	10		
Totals	282		

Cars	283	57	340
Trucks	10	0	10
Heavys	3	1	4
Totals	296	58	

Peds Cross: ⋈
South Peds: 0
South Entering: 354
South Leg Total: 636

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

Municipality: Collingwood
Site #: 2300900004
Intersection: High St & Campbell St
TFR File #: 1
Count date: 18-Jan-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

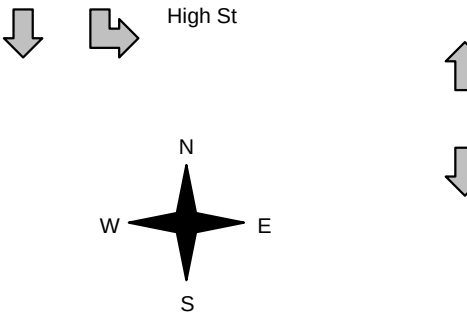
Major Road: High St runs N/S

North Leg Total: 834
North Entering: 470
North Peds: 4
Peds Cross: ⋈

Heavys	0	1	1
Trucks	6	0	6
Cars	367	96	463
Totals	373	97	

Heavys	0
Trucks	12
Cars	352
Totals	364

East Leg Total: 220
East Entering: 95
East Peds: 0
Peds Cross: ⋈



	Cars	Trucks	Heavys	Totals
	68	0	0	68
	27	0	0	27
	95	0	0	

	Cars	Trucks	Heavys	Totals
	124	0	1	125

High St

Cars	394		
Trucks	6		
Heavys	0		
Totals	400		

Cars	284	28	312
Trucks	12	0	12
Heavys	0	0	0
Totals	296	28	

Peds Cross: ⋈
South Peds: 0
South Entering: 324
South Leg Total: 724

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Total Count Diagram

Municipality: Collingwood
Site #: 2300900004
Intersection: High St & Campbell St
TFR File #: 1
Count date: 18-Jan-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: High St runs N/S

North Leg Total: 3917
North Entering: 2018
North Peds: 16
Peds Cross: ⋈

Heavys	15	6	21
Trucks	51	3	54
Cars	1524	419	1943
Totals	1590	428	

Heavys	15
Trucks	56
Cars	1828
Totals	1899

East Leg Total: 1198
East Entering: 551
East Peds: 6
Peds Cross: ⋈

High St

	Cars	Trucks	Heavys	Totals
	383	4	5	392
	157	0	2	159
	540	4	7	

N
W E
S

Campbell St

Cars	Trucks	Heavys	Totals
636	3	8	647

High St

Cars	1681		
Trucks	51		
Heavys	17		
Totals	1749		

Cars	1445	217	1662
Trucks	52	0	52
Heavys	10	2	12
Totals	1507	219	

Peds Cross: ⋈
South Peds: 4
South Entering: 1726
South Leg Total: 3475

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Traffic Count Summary

Intersection: High St & Campbell St | **Count Date:** 18-Jan-23 | **Municipality:** Collingwood

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	52	140	0	192	0
9:00:00	62	245	0	307	1
10:00:00	45	199	0	244	5
15:00:00	0	0	0	0	0
16:00:00	92	299	0	391	3
17:00:00	95	348	0	443	2
18:00:00	82	359	0	441	5
Totals:	428	1590	0	2018	16

North/South Total Approaches: 3744

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	0	178	51	229	1
9:00:00	0	303	55	358	2
10:00:00	0	228	23	251	0
15:00:00	0	0	0	0	0
16:00:00	0	284	39	323	0
17:00:00	0	297	31	328	0
18:00:00	0	217	20	237	1
S Totals:	0	1507	219	1726	4

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	15	0	43	58	0
9:00:00	27	0	65	92	1
10:00:00	22	0	66	88	2
15:00:00	0	0	0	0	0
16:00:00	42	0	91	133	2
17:00:00	30	0	62	92	0
18:00:00	23	0	65	88	1
Totals:	159	0	392	551	6

East/West Total Approaches: 551

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	0	0	0	0	0
9:00:00	0	0	0	0	0
10:00:00	0	0	0	0	0
15:00:00	0	0	0	0	0
16:00:00	0	0	0	0	0
17:00:00	0	0	0	0	0
18:00:00	0	0	0	0	0
W Totals:	0	0	0	0	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	7:00	8:00	9:00	10:00	15:00	16:00	17:00	18:00
Crossing Values:	0	16	30	27	0	45	32	29

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 18-Jan-23 Site #: 2300900004

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	8	8	32	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	14	6	62	30	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
7:45:00	21	7	96	34	0	0	0	0	3	3	0	0	1	0	0	0	0	0	0	0
8:00:00	51	30	133	37	0	0	0	0	7	4	0	0	1	0	0	0	0	0	0	0
8:15:00	65	14	171	38	0	0	0	0	9	2	0	0	1	0	0	0	0	0	0	0
8:30:00	77	12	221	50	0	0	0	0	13	4	0	0	2	1	1	1	0	0	1	1
8:45:00	87	10	300	79	0	0	0	0	15	2	0	0	2	0	5	4	0	0	1	0
9:00:00	112	25	361	61	0	0	0	0	15	0	0	0	2	0	9	4	0	0	1	0
9:15:00	129	17	400	39	0	0	0	0	20	5	0	0	2	0	10	1	0	0	2	1
9:30:00	137	8	451	51	0	0	1	1	23	3	0	0	3	1	10	0	0	0	3	1
9:45:00	145	8	500	49	0	0	2	1	28	5	0	0	3	0	10	0	0	0	3	0
10:00:00	154	9	542	42	0	0	2	0	32	4	0	0	3	0	10	0	0	0	6	3
10:15:00	154	0	542	0	0	0	2	0	32	0	0	0	3	0	10	0	0	0	6	0
15:00:00	154	0	542	0	0	0	2	0	32	0	0	0	3	0	10	0	0	0	6	0
15:15:00	174	20	617	75	0	0	2	0	33	1	0	0	3	0	10	0	0	0	7	1
15:30:00	196	22	682	65	0	0	2	0	34	1	0	0	4	1	11	1	0	0	9	2
15:45:00	219	23	759	77	0	0	2	0	37	3	0	0	4	0	13	2	0	0	9	0
16:00:00	244	25	829	70	0	0	3	1	41	4	0	0	4	0	13	0	0	0	9	0
16:15:00	268	24	920	91	0	0	3	0	43	2	0	0	4	0	15	2	0	0	9	0
16:30:00	290	22	1008	88	0	0	3	0	45	2	0	0	5	1	15	0	0	0	9	0
16:45:00	314	24	1098	90	0	0	3	0	48	3	0	0	5	0	15	0	0	0	9	0
17:00:00	338	24	1168	70	0	0	3	0	48	0	0	0	5	0	15	0	0	0	11	2
17:15:00	364	26	1287	119	0	0	3	0	49	1	0	0	5	0	15	0	0	0	13	2
17:30:00	387	23	1378	91	0	0	3	0	50	1	0	0	6	1	15	0	0	0	15	2
17:45:00	405	18	1451	73	0	0	3	0	50	0	0	0	6	0	15	0	0	0	15	0
18:00:00	419	14	1524	73	0	0	3	0	51	1	0	0	6	0	15	0	0	0	16	1
18:15:00	419	0	1524	0	0	0	3	0	51	0	0	0	6	0	15	0	0	0	16	0
18:15:15	419	0	1524	0	0	0	3	0	51	0	0	0	6	0	15	0	0	0	16	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 18-Jan-23 Site #: 2300900004

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	1	1	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	4	3	0	0	12	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	6	2	0	0	20	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	15	9	0	0	39	19	0	0	0	0	1	1	0	0	0	0	3	3	0	0
8:15:00	19	4	0	0	59	20	0	0	0	0	2	1	0	0	0	0	3	0	0	0
8:30:00	25	6	0	0	68	9	0	0	0	0	2	0	0	0	0	0	3	0	1	1
8:45:00	33	8	0	0	84	16	0	0	0	0	2	0	1	1	0	0	3	0	1	0
9:00:00	41	8	0	0	103	19	0	0	0	0	2	0	1	0	0	0	3	0	1	0
9:15:00	52	11	0	0	116	13	0	0	0	0	2	0	1	0	0	0	3	0	1	0
9:30:00	57	5	0	0	141	25	0	0	0	0	3	1	1	0	0	0	3	0	1	0
9:45:00	60	3	0	0	155	14	0	0	0	0	3	0	1	0	0	0	3	0	1	0
10:00:00	63	3	0	0	168	13	0	0	0	0	3	0	1	0	0	0	3	0	3	2
10:15:00	63	0	0	0	168	0	0	0	0	0	3	0	1	0	0	0	3	0	3	0
15:00:00	63	0	0	0	168	0	0	0	0	0	3	0	1	0	0	0	3	0	3	0
15:15:00	69	6	0	0	186	18	0	0	0	0	4	1	1	0	0	0	3	0	4	1
15:30:00	76	7	0	0	207	21	0	0	0	0	4	0	2	1	0	0	4	1	5	1
15:45:00	95	19	0	0	232	25	0	0	0	0	4	0	2	0	0	0	5	1	5	0
16:00:00	104	9	0	0	256	24	0	0	0	0	4	0	2	0	0	0	5	0	5	0
16:15:00	109	5	0	0	266	10	0	0	0	0	4	0	2	0	0	0	5	0	5	0
16:30:00	124	15	0	0	283	17	0	0	0	0	4	0	2	0	0	0	5	0	5	0
16:45:00	126	2	0	0	295	12	0	0	0	0	4	0	2	0	0	0	5	0	5	0
17:00:00	134	8	0	0	318	23	0	0	0	0	4	0	2	0	0	0	5	0	5	0
17:15:00	136	2	0	0	334	16	0	0	0	0	4	0	2	0	0	0	5	0	5	0
17:30:00	143	7	0	0	351	17	0	0	0	0	4	0	2	0	0	0	5	0	5	0
17:45:00	153	10	0	0	366	15	0	0	0	0	4	0	2	0	0	0	5	0	6	1
18:00:00	157	4	0	0	383	17	0	0	0	0	4	0	2	0	0	0	5	0	6	0
18:15:00	157	0	0	0	383	0	0	0	0	0	4	0	2	0	0	0	5	0	6	0
18:15:15	157	0	0	0	383	0	0	0	0	0	4	0	2	0	0	0	5	0	6	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 18-Jan-23 Site #: 2300900004

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	31	31	1	1	0	0	1	1	0	0	0	0	0	0	0	0	1	1
7:30:00	0	0	73	42	7	6	0	0	3	2	0	0	0	0	0	0	0	0	1	0
7:45:00	0	0	116	43	21	14	0	0	4	1	0	0	0	0	0	0	0	0	1	0
8:00:00	0	0	170	54	51	30	0	0	7	3	0	0	0	0	1	1	0	0	1	0
8:15:00	0	0	227	57	58	7	0	0	10	3	0	0	0	0	2	1	0	0	3	2
8:30:00	0	0	292	65	66	8	0	0	13	3	0	0	0	0	2	0	0	0	3	0
8:45:00	0	0	367	75	83	17	0	0	15	2	0	0	0	0	2	0	0	0	3	0
9:00:00	0	0	460	93	105	22	0	0	18	3	0	0	0	0	3	1	1	1	3	0
9:15:00	0	0	520	60	116	11	0	0	20	2	0	0	0	0	5	2	1	0	3	0
9:30:00	0	0	575	55	123	7	0	0	23	3	0	0	0	0	5	0	1	0	3	0
9:45:00	0	0	634	59	126	3	0	0	26	3	0	0	0	0	5	0	1	0	3	0
10:00:00	0	0	676	42	128	2	0	0	28	2	0	0	0	0	5	0	1	0	3	0
10:15:00	0	0	676	0	128	0	0	0	28	0	0	0	0	0	5	0	1	0	3	0
15:00:00	0	0	676	0	128	0	0	0	28	0	0	0	0	0	5	0	1	0	3	0
15:15:00	0	0	738	62	139	11	0	0	28	0	0	0	0	0	5	0	1	0	3	0
15:30:00	0	0	799	61	152	13	0	0	29	1	0	0	0	0	7	2	2	1	3	0
15:45:00	0	0	881	82	161	9	0	0	33	4	0	0	0	0	10	3	2	0	3	0
16:00:00	0	0	950	69	166	5	0	0	33	0	0	0	0	0	10	0	2	0	3	0
16:15:00	0	0	1013	63	173	7	0	0	36	3	0	0	0	0	10	0	2	0	3	0
16:30:00	0	0	1082	69	179	6	0	0	40	4	0	0	0	0	10	0	2	0	3	0
16:45:00	0	0	1145	63	191	12	0	0	42	2	0	0	0	0	10	0	2	0	3	0
17:00:00	0	0	1235	90	197	6	0	0	45	3	0	0	0	0	10	0	2	0	3	0
17:15:00	0	0	1297	62	201	4	0	0	48	3	0	0	0	0	10	0	2	0	3	0
17:30:00	0	0	1355	58	207	6	0	0	50	2	0	0	0	0	10	0	2	0	4	1
17:45:00	0	0	1401	46	212	5	0	0	51	1	0	0	0	0	10	0	2	0	4	0
18:00:00	0	0	1445	44	217	5	0	0	52	1	0	0	0	0	10	0	2	0	4	0
18:15:00	0	0	1445	0	217	0	0	0	52	0	0	0	0	0	10	0	2	0	4	0
18:15:15	0	0	1445	0	217	0	0	0	52	0	0	0	0	0	10	0	2	0	4	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 18-Jan-23 Site #: 2300900004

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

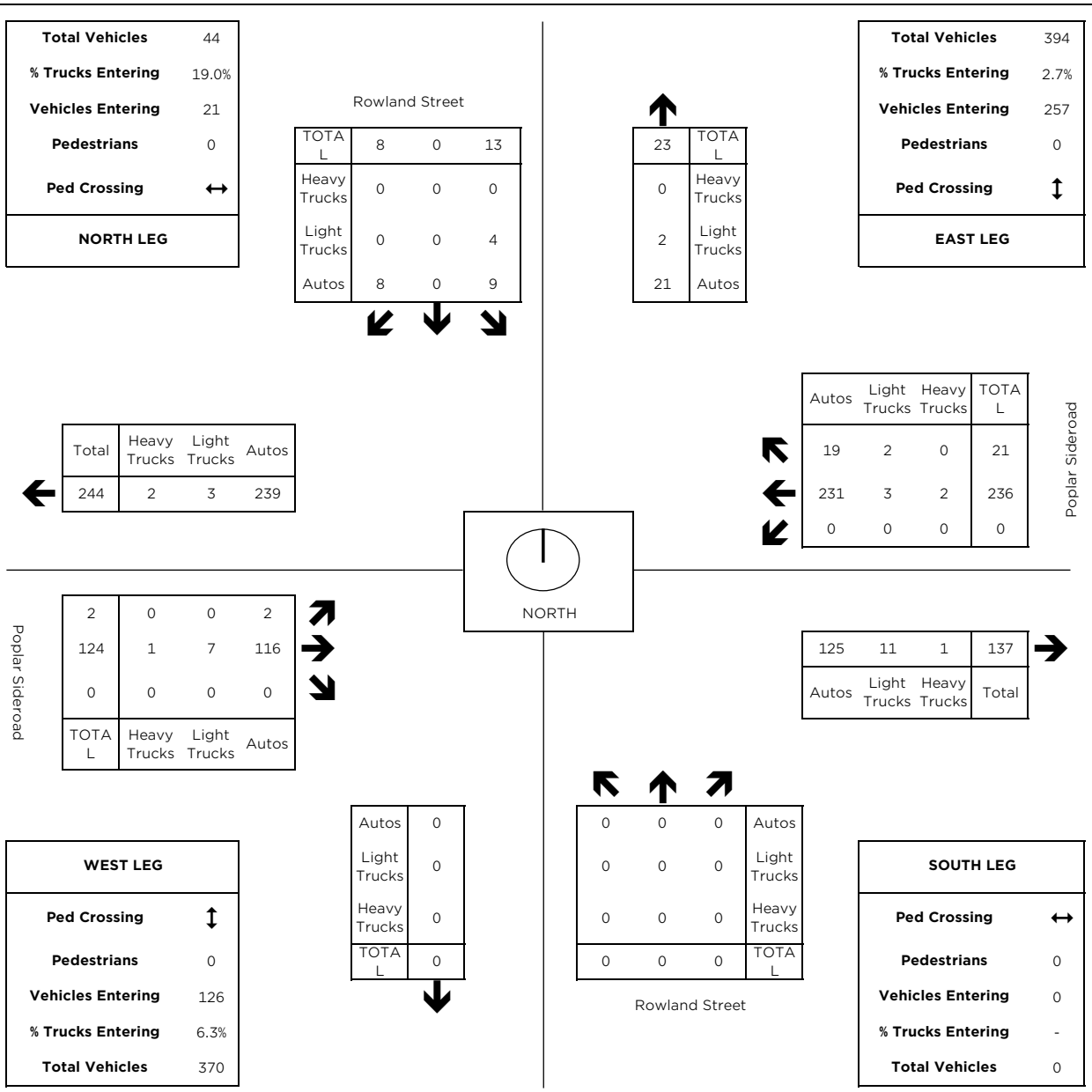
TATHAM ENGINEERING

INTERSECTION COUNT
AM PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Hunter Yovanovich	Jurisdiction/Date	Town of Collingwood	31 January 2023
Weather Conditions	Sunny, -9oc	Major Street	Poplar Sideroad	E-W
Project Name	Summit View Phase 3	Minor Street	Rowland Street	N-S
Project Number	118039	Intersection Control	stop control on minor street	

Additional Comments



8:15 to **9:15**

TATHAM ENGINEERING

INTERSECTION COUNT
MID-DAY PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Hunter Yovanovich	Jurisdiction/Date	Town of Collingwood	31 January 2023
Weather Conditions	Sunny, -9oc	Major Street	Poplar Sideroad	E-W
Project Name	Summit View Phase 3	Minor Street	Rowland Street	N-S
Project Number	118039	Intersection Control	stop control on minor street	

Additional Comments

Total Vehicles	31
% Trucks Entering	8.3%
Vehicles Entering	12
Pedestrians	0
Ped Crossing	↔
NORTH LEG	

Rowland Street

TOTAL	3	0	9
Heavy Trucks	0	0	0
Light Trucks	0	0	1
Autos	3	0	8

19	TOTAL
0	Heavy Trucks
3	Light Trucks
16	Autos

Total Vehicles	307
% Trucks Entering	4.5%
Vehicles Entering	157
Pedestrians	0
Ped Crossing	↕
EAST LEG	

Total	Heavy Trucks	Light Trucks	Autos
147	2	3	142

Autos	Light Trucks	Heavy Trucks	TOTAL
11	2	0	13
139	3	2	144
0	0	0	0

Poplar Sideroad

NORTH

Poplar Sideroad

6	0	1	5
141	2	7	132
0	0	0	0
TOTAL	Heavy Trucks	Light Trucks	Autos

140	8	2	150
Autos	Light Trucks	Heavy Trucks	Total

Autos	0
Light Trucks	0
Heavy Trucks	0
TOTAL	0

0	0	0	Autos
0	0	0	Light Trucks
0	0	0	Heavy Trucks
0	0	0	TOTAL

Rowland Street

WEST LEG	
Ped Crossing	↕
Pedestrians	0
Vehicles Entering	147
% Trucks Entering	6.8%
Total Vehicles	294

SOUTH LEG	
Ped Crossing	↔
Pedestrians	0
Vehicles Entering	0
% Trucks Entering	-
Total Vehicles	0

11:00 to **12:00**

TATHAM ENGINEERING

INTERSECTION COUNT
PM PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Hunter Yovanovich	Jurisdiction/Date	Town of Collingwood	31 January 2023
Weather Conditions	Sunny, -9oc	Major Street	Poplar Sideroad	E-W
Project Name	Summit View Phase 3	Minor Street	Rowland Street	N-S
Project Number	118039	Intersection Control	stop control on minor street	

Additional Comments

NORTH LEG	
Total Vehicles	37
% Trucks Entering	4.8%
Vehicles Entering	21
Pedestrians	0
Ped Crossing	↔

Rowland Street

TOTAL	3	0	18
Heavy Trucks	0	0	0
Light Trucks	0	0	1
Autos	3	0	17

16	TOTAL
0	Heavy Trucks
0	Light Trucks
16	Autos

EAST LEG	
Total Vehicles	416
% Trucks Entering	3.1%
Vehicles Entering	192
Pedestrians	0
Ped Crossing	↕

Total	Heavy Trucks	Light Trucks	Autos
183	3	3	177

Autos	Light Trucks	Heavy Trucks	TOTAL
12	0	0	12
174	3	3	180
0	0	0	0

Poplar Sideroad

NORTH

Poplar Sideroad

4	0	0	4
206	2	8	196
0	0	0	0
TOTAL	Heavy Trucks	Light Trucks	Autos

213	9	2	224
Autos	Light Trucks	Heavy Trucks	Total

Autos	0
Light Trucks	0
Heavy Trucks	0
TOTAL	0

0	0	0	Autos
0	0	0	Light Trucks
0	0	0	Heavy Trucks
0	0	0	TOTAL

Rowland Street

WEST LEG	
Ped Crossing	↕
Pedestrians	0
Vehicles Entering	210
% Trucks Entering	4.8%
Total Vehicles	393

SOUTH LEG	
Ped Crossing	↔
Pedestrians	0
Vehicles Entering	0
% Trucks Entering	-
Total Vehicles	0

15:45 to **16:45**

Appendix B:
LOS Definitions

TATHAM ENGINEERING

41 King Street, Unit 4
Barrie, Ontario L4N 6B5

T 705-733-9037
E info@tathameng.com
tathameng.com

CAPACITY ANALYSIS AT SIGNALIZED INTERSECTIONS

Highway Capacity Manual Methodology

The capacity of signalized intersections has been determined in terms of delay taken from Chapter 9 of the Highway Capacity Manual, Special Report 209, by the Transportation Research Board, 2000.

To assist in clarifying the arithmetic analysis associated with traffic engineering, it is often useful to refer to "Level of Service". 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:

Level of Service	Expected Delay to Minor Street Traffic	Average Control Delay 'd' (sec/veh)
A	Describes operations with very low control delay, up to 10 seconds/vehicle. This level of service occurs when progression is extremely favorable 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.	$10 \leq d \leq 20$
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 length, 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.	$20 \leq d \leq 35$
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.	$35 \leq d \leq 55$
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.	$55 \leq d \leq 80$
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.	$d > 80$

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CAPACITY ANALYSIS AT UNSIGNALIZED INTERSECTIONS

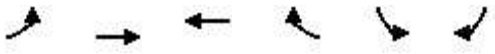
Highway Capacity Manual Methodology

The level of service at an unsignalized intersection is determined on the basis of control delay for each critical lane. This method of analysis is taken from the Highway Capacity Manual, Special Report 209, by the Transportation Research Board, 1997.

The average control delay for any particular critical movement (control delay includes initial deceleration, queue move-up time, stopped delay, and final acceleration delay) is a function of the service rate or capacity of the approach and degree of saturation. The level of service criteria for unsignalized intersections is outlined below and is related to ranges in vehicle delay.

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

Appendix C:
Existing Traffic Operations



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	145	257	21	13	8
Future Volume (Veh/h)	2	145	257	21	13	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	158	279	23	14	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	302				452	290
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	302				452	290
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				98	99
cM capacity (veh/h)	1259				564	749

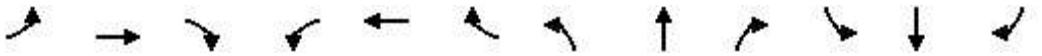
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	160	302	23
Volume Left	2	0	14
Volume Right	0	23	9
cSH	1259	1700	624
Volume to Capacity	0.00	0.18	0.04
Queue Length 95th (m)	0.0	0.0	0.9
Control Delay (s)	0.1	0.0	11.0
Lane LOS	A		B
Approach Delay (s)	0.1	0.0	11.0
Approach LOS			B

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	24.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	33	74	315	58	62	251
Future Volume (vph)	33	74	315	58	62	251
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	80	342	63	67	273

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	116	405	67	273
Volume Left (vph)	36	0	67	0
Volume Right (vph)	80	63	0	0
Hadj (s)	-0.32	-0.06	0.53	0.03
Departure Headway (s)	5.3	4.7	5.7	5.2
Degree Utilization, x	0.17	0.53	0.11	0.39
Capacity (veh/h)	608	752	609	671
Control Delay (s)	9.4	12.7	8.2	10.4
Approach Delay (s)	9.4	12.7	9.9	
Approach LOS	A	B	A	

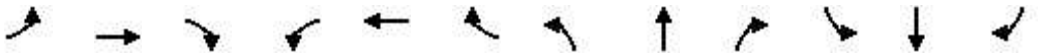
Intersection Summary			
Delay	11.2		
Level of Service	B		
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	14	19	2	6	107	11	224	1	85	165	34
Future Volume (Veh/h)	42	14	19	2	6	107	11	224	1	85	165	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	15	21	2	7	116	12	243	1	92	179	37
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	750	631	179	659	668	244	216			244		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	750	631	179	659	668	244	216			244		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	82	96	98	99	98	85	99			93		
cM capacity (veh/h)	259	367	864	335	350	795	1354			1322		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	82	125	12	244	92	179	37
Volume Left	46	2	12	0	92	0	0
Volume Right	21	116	0	1	0	0	37
cSH	338	727	1354	1700	1322	1700	1700
Volume to Capacity	0.24	0.17	0.01	0.14	0.07	0.11	0.02
Queue Length 95th (m)	7.1	4.7	0.2	0.0	1.7	0.0	0.0
Control Delay (s)	19.0	11.0	7.7	0.0	7.9	0.0	0.0
Lane LOS	C	B	A		A		
Approach Delay (s)	19.0	11.0	0.4		2.4		
Approach LOS	C	B					

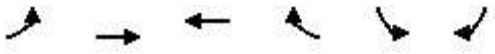
Intersection Summary				
Average Delay	4.9			
Intersection Capacity Utilization	37.4%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	234	90	22	313	147	154	183	54	161	125	21
Future Volume (vph)	47	234	90	22	313	147	154	183	54	161	125	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1805		1789	1883	1601	1789	1883	1601	1789	1843	
Flt Permitted	0.31	1.00		0.35	1.00	1.00	0.54	1.00	1.00	0.63	1.00	
Satd. Flow (perm)	592	1805		662	1883	1601	1024	1883	1601	1192	1843	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	254	98	24	340	160	167	199	59	175	136	23
RTOR Reduction (vph)	0	22	0	0	0	120	0	0	30	0	8	0
Lane Group Flow (vph)	51	330	0	24	340	40	167	199	29	175	151	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	19.2	16.5		17.4	15.6	15.6	30.1	30.1	30.1	21.7	21.7	
Effective Green, g (s)	19.2	16.5		17.4	15.6	15.6	30.1	30.1	30.1	21.7	21.7	
Actuated g/C Ratio	0.31	0.27		0.28	0.25	0.25	0.49	0.49	0.49	0.35	0.35	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	235	481		218	474	403	546	915	778	417	646	
v/s Ratio Prot	c0.01	c0.18		0.00	0.18		c0.02	0.11			0.08	
v/s Ratio Perm	0.06			0.03		0.03	0.13		0.02	c0.15		
v/c Ratio	0.22	0.69		0.11	0.72	0.10	0.31	0.22	0.04	0.42	0.23	
Uniform Delay, d1	15.6	20.4		16.5	21.1	17.8	9.2	9.1	8.3	15.3	14.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	4.0		0.2	5.1	0.1	0.3	0.5	0.1	3.1	0.8	
Delay (s)	16.1	24.4		16.7	26.3	17.9	9.5	9.7	8.4	18.4	15.1	
Level of Service	B	C		B	C	B	A	A	A	B	B	
Approach Delay (s)		23.4			23.3			9.4			16.8	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	61.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	247	162	12	18	3
Future Volume (Veh/h)	4	247	162	12	18	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	268	176	13	20	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	189				458	182
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	189				458	182
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				96	100
cM capacity (veh/h)	1385				559	860

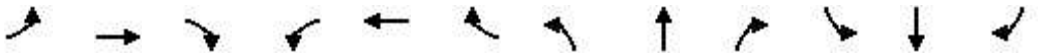
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	272	189	23
Volume Left	4	0	20
Volume Right	0	13	3
cSH	1385	1700	586
Volume to Capacity	0.00	0.11	0.04
Queue Length 95th (m)	0.1	0.0	0.9
Control Delay (s)	0.1	0.0	11.4
Lane LOS	A		B
Approach Delay (s)	0.1	0.0	11.4
Approach LOS			B

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		26.2%	ICU Level of Service
Analysis Period (min)		15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	27	68	286	28	97	379
Future Volume (vph)	27	68	286	28	97	379
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	74	311	30	105	412

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	103	341	105	412
Volume Left (vph)	29	0	105	0
Volume Right (vph)	74	30	0	0
Hadj (s)	-0.34	-0.02	0.53	0.03
Departure Headway (s)	5.5	4.9	5.6	5.1
Degree Utilization, x	0.16	0.46	0.16	0.59
Capacity (veh/h)	586	722	623	689
Control Delay (s)	9.5	11.9	8.5	14.0
Approach Delay (s)	9.5	11.9	12.9	
Approach LOS	A	B	B	

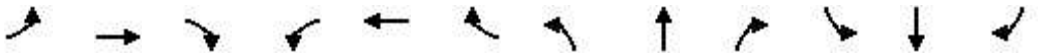
Intersection Summary			
Delay	12.2		
Level of Service	B		
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	5	7	3	4	59	15	213	6	101	249	56
Future Volume (Veh/h)	42	5	7	3	4	59	15	213	6	101	249	56
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	5	8	3	4	64	16	232	7	110	271	61
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	821	762	271	769	820	236	332			239		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	821	762	271	769	820	236	332			239		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	81	98	99	99	99	92	99			92		
cM capacity (veh/h)	248	303	768	288	281	804	1227			1328		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	59	71	16	239	110	271	61
Volume Left	46	3	16	0	110	0	0
Volume Right	8	64	0	7	0	0	61
cSH	278	681	1227	1700	1328	1700	1700
Volume to Capacity	0.21	0.10	0.01	0.14	0.08	0.16	0.04
Queue Length 95th (m)	6.0	2.6	0.3	0.0	2.1	0.0	0.0
Control Delay (s)	21.4	10.9	8.0	0.0	8.0	0.0	0.0
Lane LOS	C	B	A		A		
Approach Delay (s)	21.4	10.9	0.5		2.0		
Approach LOS	C	B					

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	36.9%	ICU Level of Service		A
Analysis Period (min)	15			

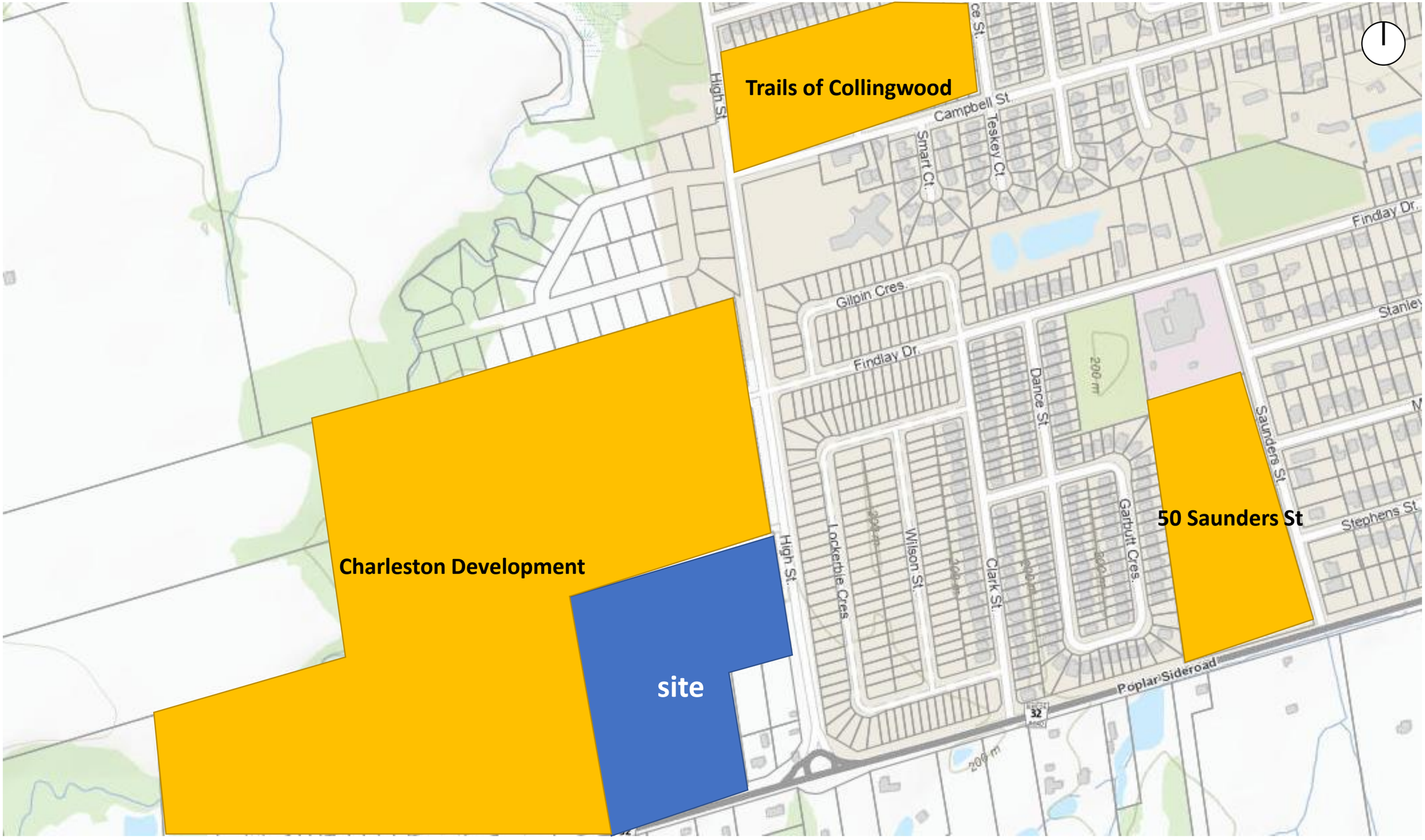


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	306	134	43	276	165	92	157	39	196	249	21
Future Volume (vph)	35	306	134	43	276	165	92	157	39	196	249	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1797		1789	1883	1601	1789	1883	1601	1789	1861	
Flt Permitted	0.47	1.00		0.21	1.00	1.00	0.39	1.00	1.00	0.65	1.00	
Satd. Flow (perm)	880	1797		386	1883	1601	727	1883	1601	1223	1861	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	333	146	47	300	179	100	171	42	213	271	23
RTOR Reduction (vph)	0	24	0	0	0	125	0	0	23	0	5	0
Lane Group Flow (vph)	38	455	0	47	300	54	100	171	19	213	289	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	20.5	18.6		22.3	19.5	19.5	29.3	29.3	29.3	20.8	20.8	
Effective Green, g (s)	20.5	18.6		22.3	19.5	19.5	29.3	29.3	29.3	20.8	20.8	
Actuated g/C Ratio	0.32	0.29		0.35	0.30	0.30	0.46	0.46	0.46	0.32	0.32	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	307	520		195	571	486	397	859	730	396	602	
v/s Ratio Prot	0.00	c0.25		c0.01	0.16		c0.02	0.09			0.16	
v/s Ratio Perm	0.04			0.07		0.03	0.10		0.01	c0.17		
v/c Ratio	0.12	0.87		0.24	0.53	0.11	0.25	0.20	0.03	0.54	0.48	
Uniform Delay, d1	15.3	21.7		15.4	18.5	16.1	10.7	10.4	9.6	17.8	17.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	15.1		0.6	0.9	0.1	0.3	0.5	0.1	5.2	2.7	
Delay (s)	15.5	36.8		16.0	19.4	16.2	11.0	11.0	9.7	22.9	20.1	
Level of Service	B	D		B	B	B	B	B	A	C	C	
Approach Delay (s)		35.2			18.0			10.8			21.3	
Approach LOS		D			B			B			C	

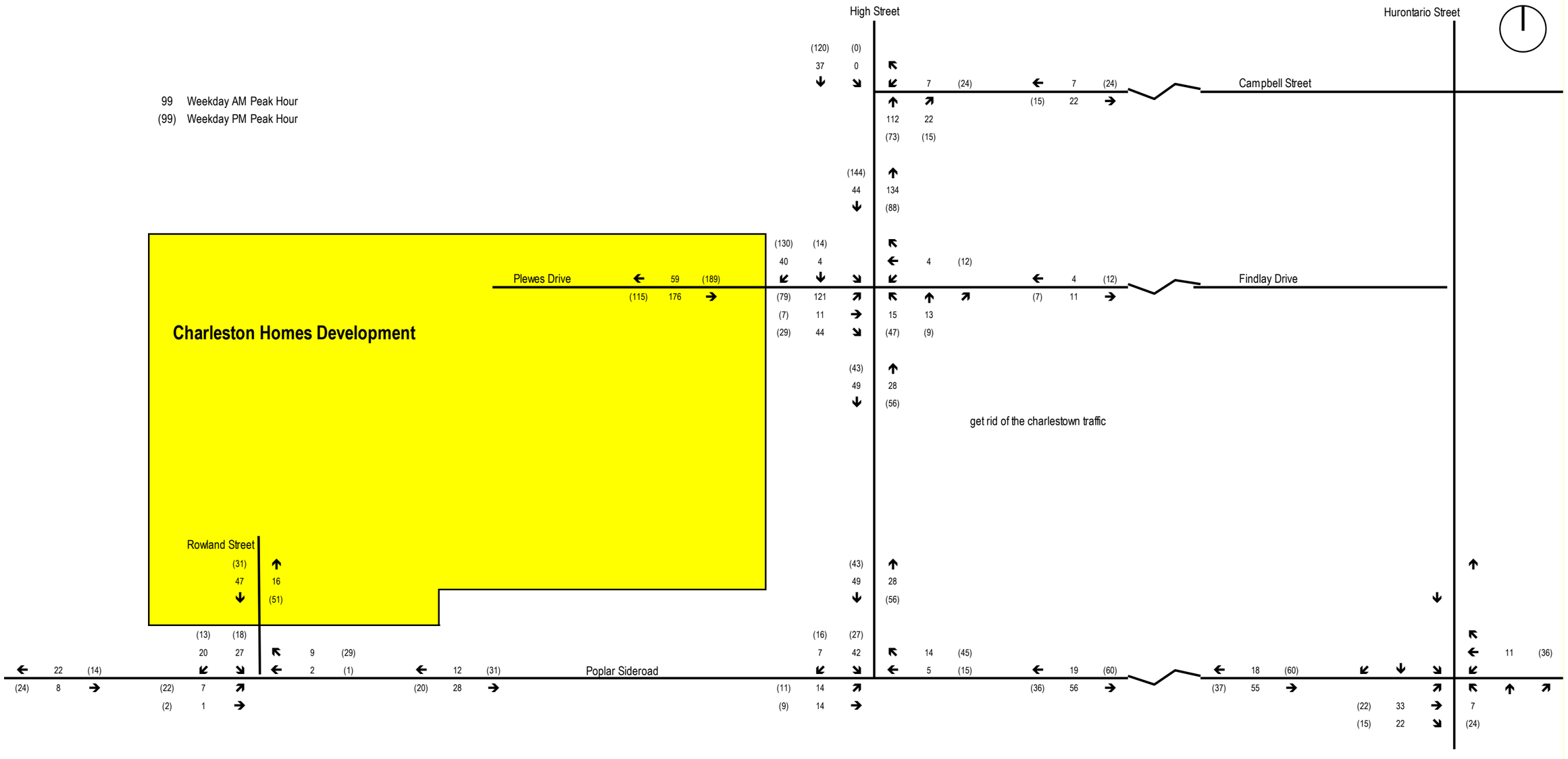
Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	64.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

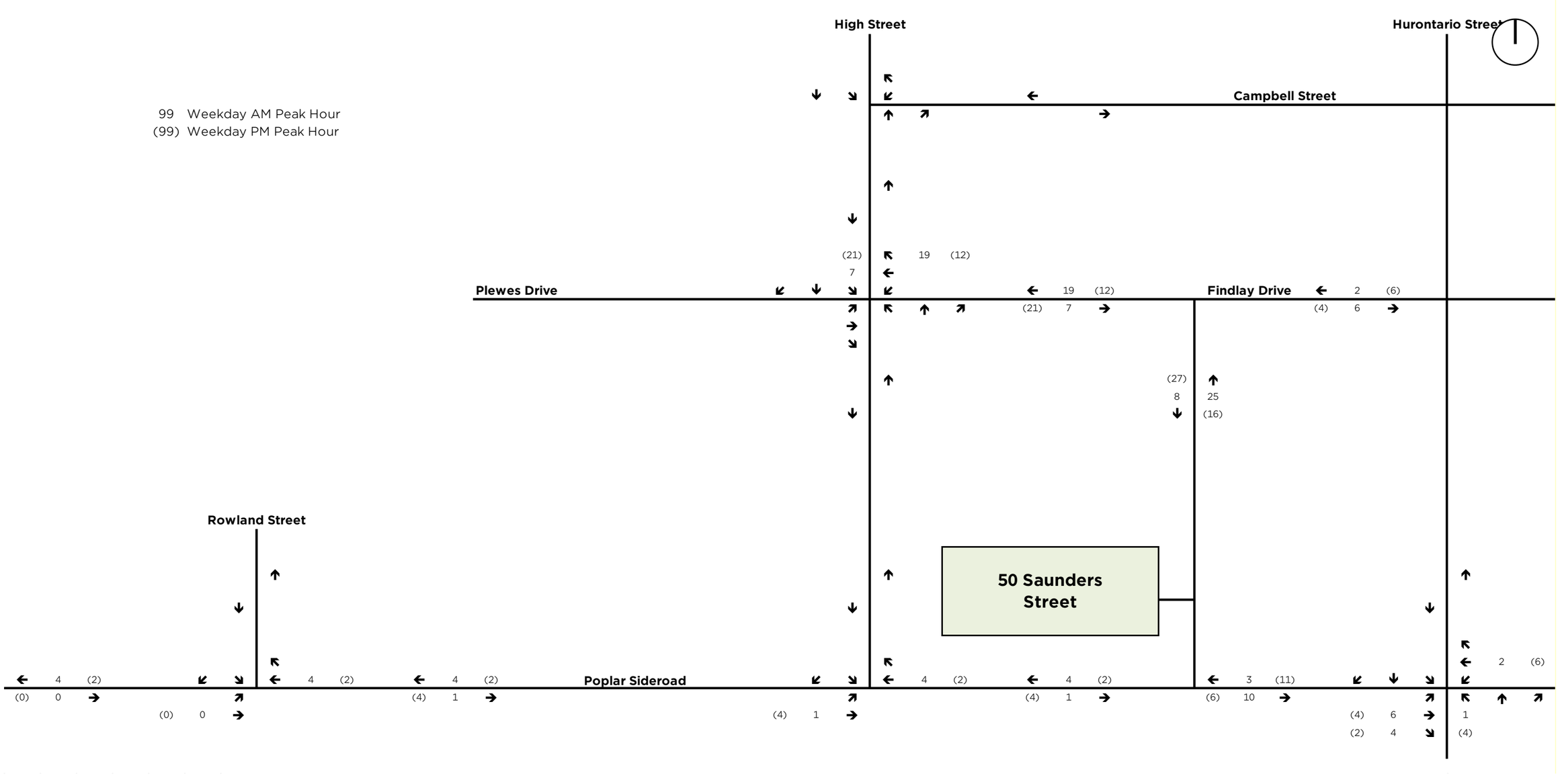
Appendix D:
Background Developments


Trails of Collingwood
Charleston Development
site
50 Saunders St
High St.
Campbell St.
Teskey Ct.
Smart Ct.
Findlay Dr.
Gilpin Cres.
Dance St.
200 m
Saunders St.
Stephens St.
Lockerbie Cres.
Wilson St.
Clark St.
Garbutt Cres.
Poplar Sideroad
32

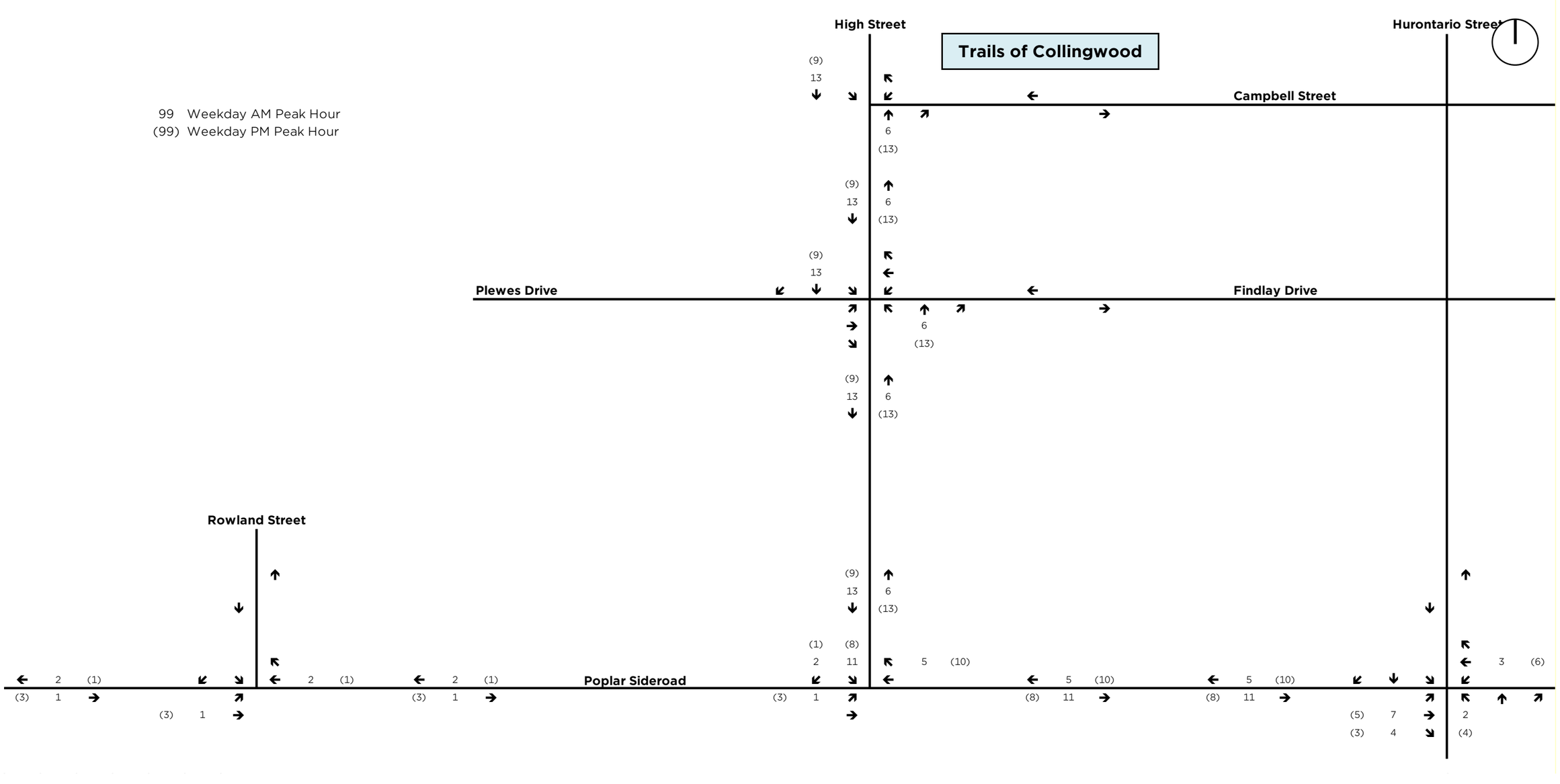
99 Weekday AM Peak Hour
(99) Weekday PM Peak Hour



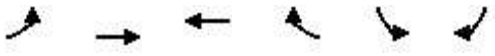
99 Weekday AM Peak Hour
(99) Weekday PM Peak Hour



99 Weekday AM Peak Hour
(99) Weekday PM Peak Hour



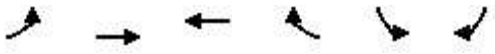
Appendix E: Future Background Traffic Operations



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	204	366	26	27	14
Future Volume (Veh/h)	4	204	366	26	27	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	222	398	28	29	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	426				642	412
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	426				642	412
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				93	98
cM capacity (veh/h)	1133				437	640

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	226	426	44
Volume Left	4	0	29
Volume Right	0	28	15
cSH	1133	1700	490
Volume to Capacity	0.00	0.25	0.09
Queue Length 95th (m)	0.1	0.0	2.2
Control Delay (s)	0.2	0.0	13.1
Lane LOS	A		B
Approach Delay (s)	0.2	0.0	13.1
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	30.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	168	301	26	27	14
Future Volume (Veh/h)	4	168	301	26	27	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	183	327	28	29	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	355				532	341
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	355				532	341
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				94	98
cM capacity (veh/h)	1204				506	701

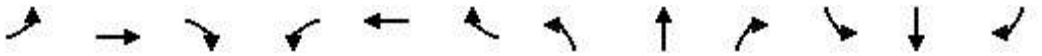
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	187	355	44
Volume Left	4	0	29
Volume Right	0	28	15
cSH	1204	1700	559
Volume to Capacity	0.00	0.21	0.08
Queue Length 95th (m)	0.1	0.0	1.9
Control Delay (s)	0.2	0.0	12.0
Lane LOS	A		B
Approach Delay (s)	0.2	0.0	12.0
Approach LOS			B

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	27.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	40	85	391	72	71	309
Future Volume (vph)	40	85	391	72	71	309
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	92	425	78	77	336

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	135	503	77	336
Volume Left (vph)	43	0	77	0
Volume Right (vph)	92	78	0	0
Hadj (s)	-0.31	-0.06	0.53	0.03
Departure Headway (s)	5.7	4.9	5.9	5.4
Degree Utilization, x	0.21	0.68	0.13	0.51
Capacity (veh/h)	561	718	588	647
Control Delay (s)	10.3	17.6	8.6	12.6
Approach Delay (s)	10.3	17.6	11.9	
Approach LOS	B	C	B	

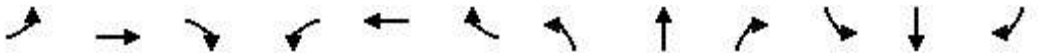
Intersection Summary			
Delay	14.4		
Level of Service	B		
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	17	19	2	7	123	11	265	1	98	205	46
Future Volume (Veh/h)	75	17	19	2	7	123	11	265	1	98	205	46
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	82	18	21	2	8	134	12	288	1	107	223	50
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	887	750	223	780	800	288	273			289		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	887	750	223	780	800	288	273			289		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	59	94	97	99	97	82	99			92		
cM capacity (veh/h)	198	309	817	271	289	751	1290			1273		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	121	144	12	289	107	223	50
Volume Left	82	2	12	0	107	0	0
Volume Right	21	134	0	1	0	0	50
cSH	243	674	1290	1700	1273	1700	1700
Volume to Capacity	0.50	0.21	0.01	0.17	0.08	0.13	0.03
Queue Length 95th (m)	19.4	6.1	0.2	0.0	2.1	0.0	0.0
Control Delay (s)	33.7	11.8	7.8	0.0	8.1	0.0	0.0
Lane LOS	D	B	A		A		
Approach Delay (s)	33.7	11.8	0.3		2.3		
Approach LOS	D	B					

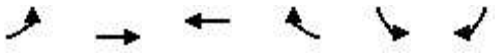
Intersection Summary				
Average Delay	7.1			
Intersection Capacity Utilization	47.1%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	289	109	25	367	169	179	210	62	185	144	24
Future Volume (vph)	54	289	109	25	367	169	179	210	62	185	144	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1806		1789	1883	1601	1789	1883	1601	1789	1843	
Flt Permitted	0.26	1.00		0.26	1.00	1.00	0.51	1.00	1.00	0.62	1.00	
Satd. Flow (perm)	492	1806		491	1883	1601	956	1883	1601	1161	1843	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	314	118	27	399	184	195	228	67	201	157	26
RTOR Reduction (vph)	0	21	0	0	0	133	0	0	36	0	9	0
Lane Group Flow (vph)	59	411	0	27	399	51	195	228	31	201	174	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	20.8	18.1		19.0	17.2	17.2	28.5	28.5	28.5	18.8	18.8	
Effective Green, g (s)	20.8	18.1		19.0	17.2	17.2	28.5	28.5	28.5	18.8	18.8	
Actuated g/C Ratio	0.34	0.29		0.31	0.28	0.28	0.46	0.46	0.46	0.30	0.30	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	221	528		188	523	444	510	866	737	352	559	
v/s Ratio Prot	c0.01	c0.23		0.00	0.21		c0.03	0.12			0.09	
v/s Ratio Perm	0.08			0.04		0.03	0.14		0.02	c0.17		
v/c Ratio	0.27	0.78		0.14	0.76	0.12	0.38	0.26	0.04	0.57	0.31	
Uniform Delay, d1	14.8	20.1		15.7	20.5	16.7	10.3	10.3	9.2	18.2	16.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	7.2		0.4	6.5	0.1	0.5	0.7	0.1	6.6	1.4	
Delay (s)	15.5	27.2		16.0	27.0	16.8	10.8	11.0	9.3	24.7	18.0	
Level of Service	B	C		B	C	B	B	B	A	C	B	
Approach Delay (s)		25.8			23.4			10.7			21.5	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	61.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	286	190	28	27	7
Future Volume (Veh/h)	10	286	190	28	27	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	311	207	30	29	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	237				555	222
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	237				555	222
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	99
cM capacity (veh/h)	1330				489	818

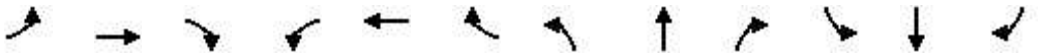
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	322	237	37
Volume Left	11	0	29
Volume Right	0	30	8
cSH	1330	1700	535
Volume to Capacity	0.01	0.14	0.07
Queue Length 95th (m)	0.2	0.0	1.7
Control Delay (s)	0.3	0.0	12.2
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	12.2
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	37	78	356	36	111	469
Future Volume (vph)	37	78	356	36	111	469
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	85	387	39	121	510

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	125	426	121	510
Volume Left (vph)	40	0	121	0
Volume Right (vph)	85	39	0	0
Hadj (s)	-0.31	-0.02	0.53	0.03
Departure Headway (s)	6.0	5.1	5.9	5.4
Degree Utilization, x	0.21	0.60	0.20	0.76
Capacity (veh/h)	550	681	603	659
Control Delay (s)	10.5	15.6	9.1	21.9
Approach Delay (s)	10.5	15.6	19.5	
Approach LOS	B	C	C	

Intersection Summary			
Delay	17.1		
Level of Service	C		
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	7	7	3	7	68	15	260	7	116	296	94
Future Volume (Veh/h)	64	7	7	3	7	68	15	260	7	116	296	94
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	70	8	8	3	8	74	16	283	8	126	322	102
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	967	897	322	905	995	287	424			291		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	967	897	322	905	995	287	424			291		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	63	97	99	99	96	90	99			90		
cM capacity (veh/h)	187	248	719	227	217	752	1135			1271		

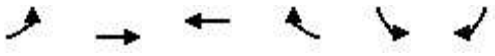
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	86	85	16	291	126	322	102
Volume Left	70	3	16	0	126	0	0
Volume Right	8	74	0	8	0	0	102
cSH	206	573	1135	1700	1271	1700	1700
Volume to Capacity	0.42	0.15	0.01	0.17	0.10	0.19	0.06
Queue Length 95th (m)	14.5	3.9	0.3	0.0	2.5	0.0	0.0
Control Delay (s)	34.4	12.4	8.2	0.0	8.1	0.0	0.0
Lane LOS	D	B	A		A		
Approach Delay (s)	34.4	12.4	0.4		1.9		
Approach LOS	D	B					

Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	41.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	365	159	49	339	190	112	180	45	225	286	24
Future Volume (vph)	40	365	159	49	339	190	112	180	45	225	286	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1798		1789	1883	1601	1789	1883	1601	1789	1862	
Flt Permitted	0.36	1.00		0.17	1.00	1.00	0.34	1.00	1.00	0.63	1.00	
Satd. Flow (perm)	677	1798		319	1883	1601	638	1883	1601	1195	1862	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	397	173	53	368	207	122	196	49	245	311	26
RTOR Reduction (vph)	0	22	0	0	0	139	0	0	27	0	4	0
Lane Group Flow (vph)	43	548	0	53	368	68	122	196	22	245	333	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	26.4	23.6		26.4	23.6	23.6	32.2	32.2	32.2	23.8	23.8	
Effective Green, g (s)	26.4	23.6		26.4	23.6	23.6	32.2	32.2	32.2	23.8	23.8	
Actuated g/C Ratio	0.37	0.33		0.37	0.33	0.33	0.45	0.45	0.45	0.33	0.33	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	291	588		173	616	524	347	840	715	394	614	
v/s Ratio Prot	0.01	c0.31		c0.01	0.20		c0.02	0.10			0.18	
v/s Ratio Perm	0.05			0.10		0.04	0.14		0.01	c0.21		
v/c Ratio	0.15	0.93		0.31	0.60	0.13	0.35	0.23	0.03	0.62	0.54	
Uniform Delay, d1	15.3	23.5		17.3	20.3	17.0	12.8	12.3	11.2	20.4	19.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	21.9		1.0	1.6	0.1	0.6	0.7	0.1	7.2	3.4	
Delay (s)	15.5	45.4		18.3	21.8	17.1	13.4	13.0	11.3	27.6	23.1	
Level of Service	B	D		B	C	B	B	B	B	C	C	
Approach Delay (s)		43.3			20.0			12.9			25.0	
Approach LOS		D			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	72.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	185	332	26	27	14
Future Volume (Veh/h)	4	185	332	26	27	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	201	361	28	29	15
Pedestrians			18			
Lane Width (m)			3.7			
Walking Speed (m/s)			1.1			
Percent Blockage			2			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	389				602	375
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	389				602	375
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				94	98
cM capacity (veh/h)	1170				453	671

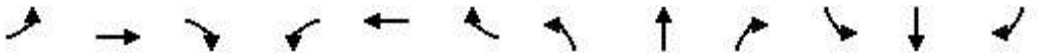
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	205	389	44
Volume Left	4	0	29
Volume Right	0	28	15
cSH	1170	1700	509
Volume to Capacity	0.00	0.23	0.09
Queue Length 95th (m)	0.1	0.0	2.1
Control Delay (s)	0.2	0.0	12.7
Lane LOS	A		B
Approach Delay (s)	0.2	0.0	12.7
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	44	94	425	79	79	337
Future Volume (vph)	44	94	425	79	79	337
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	102	462	86	86	366

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	150	548	86	366
Volume Left (vph)	48	0	86	0
Volume Right (vph)	102	86	0	0
Hadj (s)	-0.31	-0.06	0.53	0.03
Departure Headway (s)	5.9	5.0	6.1	5.6
Degree Utilization, x	0.25	0.76	0.14	0.57
Capacity (veh/h)	553	705	576	632
Control Delay (s)	10.8	22.1	8.9	14.3
Approach Delay (s)	10.8	22.1	13.3	
Approach LOS	B	C	B	

Intersection Summary			
Delay	17.2		
Level of Service	C		
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	17	19	3	7	136	11	293	1	108	227	46
Future Volume (Veh/h)	75	17	19	3	7	136	11	293	1	108	227	46
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	82	18	21	3	8	148	12	318	1	117	247	50
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	975	824	247	854	874	318	297			319		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	975	824	247	854	874	318	297			319		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	50	93	97	99	97	80	99			91		
cM capacity (veh/h)	165	276	792	238	259	722	1264			1241		

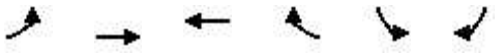
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	121	159	12	319	117	247	50
Volume Left	82	3	12	0	117	0	0
Volume Right	21	148	0	1	0	0	50
cSH	206	640	1264	1700	1241	1700	1700
Volume to Capacity	0.59	0.25	0.01	0.19	0.09	0.15	0.03
Queue Length 95th (m)	24.9	7.4	0.2	0.0	2.4	0.0	0.0
Control Delay (s)	44.8	12.5	7.9	0.0	8.2	0.0	0.0
Lane LOS	E	B	A		A		
Approach Delay (s)	44.8	12.5	0.3		2.3		
Approach LOS	E	B					

Intersection Summary				
Average Delay	8.3			
Intersection Capacity Utilization	49.9%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	317	120	28	405	186	197	232	68	204	159	27
Future Volume (vph)	60	317	120	28	405	186	197	232	68	204	159	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1806		1789	1883	1601	1789	1883	1601	1789	1843	
Flt Permitted	0.22	1.00		0.22	1.00	1.00	0.48	1.00	1.00	0.60	1.00	
Satd. Flow (perm)	419	1806		409	1883	1601	900	1883	1601	1136	1843	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	345	130	30	440	202	214	252	74	222	173	29
RTOR Reduction (vph)	0	20	0	0	0	143	0	0	41	0	9	0
Lane Group Flow (vph)	65	455	0	30	440	59	214	252	33	222	193	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	22.1	19.3		20.3	18.4	18.4	28.3	28.3	28.3	18.6	18.6	
Effective Green, g (s)	22.1	19.3		20.3	18.4	18.4	28.3	28.3	28.3	18.6	18.6	
Actuated g/C Ratio	0.35	0.31		0.32	0.29	0.29	0.45	0.45	0.45	0.30	0.30	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	207	553		173	549	467	477	845	719	335	544	
v/s Ratio Prot	c0.01	c0.25		0.01	0.23		c0.04	0.13			0.10	
v/s Ratio Perm	0.10			0.05		0.04	0.16		0.02	c0.20		
v/c Ratio	0.31	0.82		0.17	0.80	0.13	0.45	0.30	0.05	0.66	0.35	
Uniform Delay, d1	14.8	20.3		15.6	20.6	16.4	11.2	11.0	9.8	19.5	17.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	9.6		0.5	8.2	0.1	0.7	0.9	0.1	9.9	1.8	
Delay (s)	15.6	29.9		16.1	28.9	16.5	11.8	11.9	9.9	29.4	19.3	
Level of Service	B	C		B	C	B	B	B	A	C	B	
Approach Delay (s)		28.1			24.6			11.6			24.6	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	63.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	316	209	28	27	7
Future Volume (Veh/h)	10	316	209	28	27	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	343	227	30	29	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	257				607	242
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	257				607	242
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	99
cM capacity (veh/h)	1308				456	797

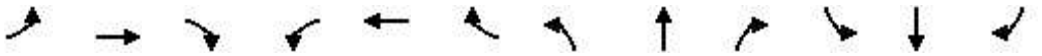
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	354	257	37
Volume Left	11	0	29
Volume Right	0	30	8
cSH	1308	1700	502
Volume to Capacity	0.01	0.15	0.07
Queue Length 95th (m)	0.2	0.0	1.8
Control Delay (s)	0.3	0.0	12.7
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	12.7
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	41	86	387	39	123	508
Future Volume (vph)	41	86	387	39	123	508
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	45	93	421	42	134	552

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	138	463	134	552
Volume Left (vph)	45	0	134	0
Volume Right (vph)	93	42	0	0
Hadj (s)	-0.31	-0.02	0.53	0.03
Departure Headway (s)	6.2	5.2	6.0	5.5
Degree Utilization, x	0.24	0.67	0.22	0.84
Capacity (veh/h)	544	667	591	648
Control Delay (s)	11.1	18.4	9.5	29.2
Approach Delay (s)	11.1	18.4	25.3	
Approach LOS	B	C	D	

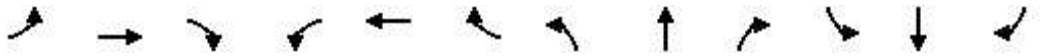
Intersection Summary			
Delay	21.3		
Level of Service	C		
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	7	7	4	7	75	15	287	8	128	327	94
Future Volume (Veh/h)	64	7	7	4	7	75	15	287	8	128	327	94
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	70	8	8	4	8	82	16	312	9	139	355	102
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1063	986	355	994	1084	316	457			321		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1063	986	355	994	1084	316	457			321		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	55	96	99	98	96	89	99			89		
cM capacity (veh/h)	156	217	689	195	190	724	1104			1239		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	86	94	16	321	139	355	102
Volume Left	70	4	16	0	139	0	0
Volume Right	8	82	0	9	0	0	102
cSH	173	534	1104	1700	1239	1700	1700
Volume to Capacity	0.50	0.18	0.01	0.19	0.11	0.21	0.06
Queue Length 95th (m)	18.4	4.8	0.3	0.0	2.9	0.0	0.0
Control Delay (s)	44.8	13.2	8.3	0.0	8.3	0.0	0.0
Lane LOS	E	B	A		A		
Approach Delay (s)	44.8	13.2	0.4		1.9		
Approach LOS	E	B					

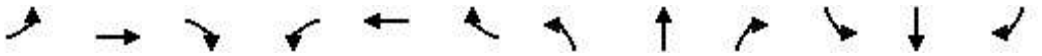
Intersection Summary				
Average Delay	5.7			
Intersection Capacity Utilization	43.7%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	402	174	55	372	209	123	199	49	249	316	27
Future Volume (vph)	44	402	174	55	372	209	123	199	49	249	316	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1798		1789	1883	1601	1789	1883	1601	1789	1861	
Flt Permitted	0.36	1.00		0.12	1.00	1.00	0.28	1.00	1.00	0.62	1.00	
Satd. Flow (perm)	684	1798		226	1883	1601	523	1883	1601	1173	1861	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	437	189	60	404	227	134	216	53	271	343	29
RTOR Reduction (vph)	0	18	0	0	0	140	0	0	30	0	3	0
Lane Group Flow (vph)	48	608	0	60	404	87	134	216	23	271	369	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	35.0	32.2		37.2	33.3	33.3	37.3	37.3	37.3	27.4	27.4	
Effective Green, g (s)	35.0	32.2		37.2	33.3	33.3	37.3	37.3	37.3	27.4	27.4	
Actuated g/C Ratio	0.40	0.37		0.43	0.38	0.38	0.43	0.43	0.43	0.32	0.32	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	311	666		166	721	613	303	808	687	369	586	
v/s Ratio Prot	0.00	c0.34		c0.02	0.21		c0.03	0.11			0.20	
v/s Ratio Perm	0.06			0.14		0.05	0.16		0.01	c0.23		
v/c Ratio	0.15	0.91		0.36	0.56	0.14	0.44	0.27	0.03	0.73	0.63	
Uniform Delay, d1	16.5	26.0		18.8	21.1	17.5	16.9	16.0	14.4	26.5	25.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	17.0		1.3	1.0	0.1	1.0	0.8	0.1	12.2	5.1	
Delay (s)	16.8	43.0		20.1	22.1	17.6	17.9	16.8	14.4	38.7	30.5	
Level of Service	B	D		C	C	B	B	B	B	D	C	
Approach Delay (s)		41.2			20.4			16.9			34.0	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	86.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	17	19	3	7	150	11	324	1	119	252	46
Future Volume (vph)	75	17	19	3	7	150	11	324	1	119	252	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.98			0.87		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.97			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1779			1644		1789	1883		1789	1883	1601
Flt Permitted		0.68			0.99		0.59	1.00		0.55	1.00	1.00
Satd. Flow (perm)		1256			1634		1113	1883		1035	1883	1601
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	82	18	21	3	8	163	12	352	1	129	274	50
RTOR Reduction (vph)	0	17	0	0	137	0	0	0	0	0	0	17
Lane Group Flow (vph)	0	104	0	0	37	0	12	353	0	129	274	33
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)		7.9			7.9		32.5	32.5		32.5	32.5	32.5
Effective Green, g (s)		7.9			7.9		32.5	32.5		32.5	32.5	32.5
Actuated g/C Ratio		0.16			0.16		0.66	0.66		0.66	0.66	0.66
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		200			261		732	1238		680	1238	1053
v/s Ratio Prot								c0.19			0.15	
v/s Ratio Perm		c0.08			0.02		0.01			0.12		0.02
v/c Ratio		0.52			0.14		0.02	0.29		0.19	0.22	0.03
Uniform Delay, d1		19.0			17.8		2.9	3.6		3.3	3.4	3.0
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		2.4			0.3		0.0	0.6		0.6	0.4	0.1
Delay (s)		21.5			18.1		3.0	4.1		3.9	3.8	3.0
Level of Service		C			B		A	A		A	A	A
Approach Delay (s)		21.5			18.1			4.1			3.7	
Approach LOS		C			B			A			A	

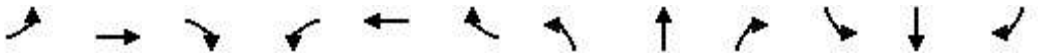
Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	49.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	48	104	462	87	87	368
Future Volume (vph)	48	104	462	87	87	368
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	113	502	95	95	400

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	165	597	95	400
Volume Left (vph)	52	0	95	0
Volume Right (vph)	113	95	0	0
Hadj (s)	-0.31	-0.06	0.53	0.03
Departure Headway (s)	6.1	5.1	6.2	5.7
Degree Utilization, x	0.28	0.85	0.16	0.63
Capacity (veh/h)	548	691	562	608
Control Delay (s)	11.5	30.3	9.2	16.9
Approach Delay (s)	11.5	30.3	15.4	
Approach LOS	B	D	C	

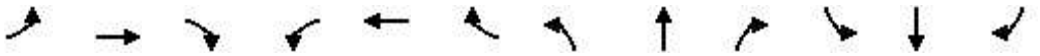
Intersection Summary			
Delay	22.0		
Level of Service	C		
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	17	19	3	7	150	11	324	1	119	252	46
Future Volume (Veh/h)	75	17	19	3	7	150	11	324	1	119	252	46
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	82	18	21	3	8	163	12	352	1	129	274	50
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1075	909	274	938	958	352	324			353		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1075	909	274	938	958	352	324			353		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	39	93	97	99	96	76	99			89		
cM capacity (veh/h)	134	243	765	205	227	691	1236			1206		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	121	174	12	353	129	274	50
Volume Left	82	3	12	0	129	0	0
Volume Right	21	163	0	1	0	0	50
cSH	169	609	1236	1700	1206	1700	1700
Volume to Capacity	0.71	0.29	0.01	0.21	0.11	0.16	0.03
Queue Length 95th (m)	33.2	8.9	0.2	0.0	2.7	0.0	0.0
Control Delay (s)	66.7	13.3	7.9	0.0	8.3	0.0	0.0
Lane LOS	F	B	A		A		
Approach Delay (s)	66.7	13.3	0.3		2.4		
Approach LOS	F	B					

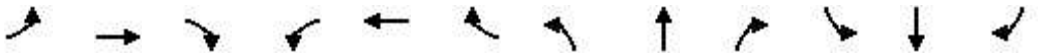
Intersection Summary				
Average Delay	10.4			
Intersection Capacity Utilization	53.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	348	132	31	446	206	218	256	76	225	175	29
Future Volume (vph)	66	348	132	31	446	206	218	256	76	225	175	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1806		1789	1883	1601	1789	1883	1601	1789	1843	
Flt Permitted	0.18	1.00		0.20	1.00	1.00	0.46	1.00	1.00	0.59	1.00	
Satd. Flow (perm)	337	1806		380	1883	1601	870	1883	1601	1109	1843	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	378	143	34	485	224	237	278	83	245	190	32
RTOR Reduction (vph)	0	17	0	0	0	153	0	0	46	0	8	0
Lane Group Flow (vph)	72	504	0	34	485	71	237	278	37	245	214	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	29.2	25.4		25.4	23.5	23.5	33.3	33.3	33.3	23.5	23.5	
Effective Green, g (s)	29.2	25.4		25.4	23.5	23.5	33.3	33.3	33.3	23.5	23.5	
Actuated g/C Ratio	0.39	0.34		0.34	0.32	0.32	0.45	0.45	0.45	0.32	0.32	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	207	619		166	597	507	456	846	719	351	584	
v/s Ratio Prot	c0.02	c0.28		0.01	0.26		c0.04	0.15			0.12	
v/s Ratio Perm	0.12			0.06		0.04	0.20		0.02	c0.22		
v/c Ratio	0.35	0.81		0.20	0.81	0.14	0.52	0.33	0.05	0.70	0.37	
Uniform Delay, d1	16.1	22.2		17.6	23.3	18.1	14.1	13.2	11.5	22.2	19.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.0	8.1		0.6	8.3	0.1	1.0	1.0	0.1	11.0	1.8	
Delay (s)	17.1	30.3		18.2	31.5	18.2	15.1	14.2	11.6	33.2	21.3	
Level of Service	B	C		B	C	B	B	B	B	C	C	
Approach Delay (s)		28.7			26.9			14.2			27.5	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	74.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		

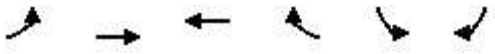
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	7	7	4	7	83	15	317	8	141	360	94
Future Volume (vph)	64	7	7	4	7	83	15	317	8	141	360	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.99			0.88		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.96			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1787			1656		1789	1876		1789	1883	1601
Flt Permitted		0.83			0.99		0.53	1.00		0.55	1.00	1.00
Satd. Flow (perm)		1545			1634		1000	1876		1034	1883	1601
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	70	8	8	4	8	90	16	345	9	153	391	102
RTOR Reduction (vph)	0	7	0	0	78	0	0	1	0	0	0	30
Lane Group Flow (vph)	0	79	0	0	24	0	16	353	0	153	391	72
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)		7.1			7.1		35.6	35.6		35.6	35.6	35.6
Effective Green, g (s)		7.1			7.1		35.6	35.6		35.6	35.6	35.6
Actuated g/C Ratio		0.14			0.14		0.69	0.69		0.69	0.69	0.69
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		212			224		688	1291		712	1296	1102
v/s Ratio Prot								0.19			c0.21	
v/s Ratio Perm		c0.05			0.01		0.02			0.15		0.05
v/c Ratio		0.37			0.11		0.02	0.27		0.21	0.30	0.07
Uniform Delay, d1		20.3			19.5		2.5	3.1		2.9	3.2	2.6
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		1.1			0.2		0.1	0.5		0.7	0.6	0.1
Delay (s)		21.4			19.7		2.6	3.6		3.6	3.8	2.7
Level of Service		C			B		A	A		A	A	A
Approach Delay (s)		21.4			19.7			3.6			3.6	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	51.7	Sum of lost time (s)	9.0
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	348	231	28	27	7
Future Volume (Veh/h)	10	348	231	28	27	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	378	251	30	29	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	281				666	266
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	281				666	266
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				93	99
cM capacity (veh/h)	1282				421	773

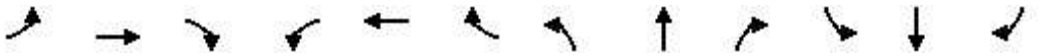
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	389	281	37
Volume Left	11	0	29
Volume Right	0	30	8
cSH	1282	1700	467
Volume to Capacity	0.01	0.17	0.08
Queue Length 95th (m)	0.2	0.0	2.0
Control Delay (s)	0.3	0.0	13.4
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	13.4
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	36.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	44	95	421	43	136	552
Future Volume (vph)	44	95	421	43	136	552
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	103	458	47	148	600

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	151	505	148	600
Volume Left (vph)	48	0	148	0
Volume Right (vph)	103	47	0	0
Hadj (s)	-0.31	-0.02	0.53	0.03
Departure Headway (s)	6.4	5.4	6.1	5.6
Degree Utilization, x	0.27	0.75	0.25	0.93
Capacity (veh/h)	536	654	579	630
Control Delay (s)	11.7	23.0	10.0	43.4
Approach Delay (s)	11.7	23.0	36.8	
Approach LOS	B	C	E	

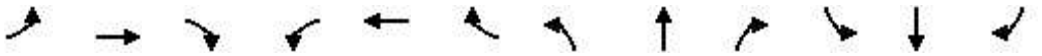
Intersection Summary			
Delay	29.1		
Level of Service	D		
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	7	7	4	7	83	15	317	8	141	360	94
Future Volume (Veh/h)	64	7	7	4	7	83	15	317	8	141	360	94
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	70	8	8	4	8	90	16	345	9	153	391	102
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1168	1083	391	1090	1180	350	493			354		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1168	1083	391	1090	1180	350	493			354		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	45	96	99	98	95	87	99			87		
cM capacity (veh/h)	127	187	658	164	163	694	1071			1205		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	86	102	16	354	153	391	102
Volume Left	70	4	16	0	153	0	0
Volume Right	8	90	0	9	0	0	102
cSH	142	502	1071	1700	1205	1700	1700
Volume to Capacity	0.60	0.20	0.01	0.21	0.13	0.23	0.06
Queue Length 95th (m)	24.0	5.7	0.3	0.0	3.3	0.0	0.0
Control Delay (s)	62.9	14.0	8.4	0.0	8.4	0.0	0.0
Lane LOS	F	B	A		A		
Approach Delay (s)	62.9	14.0	0.4		2.0		
Approach LOS	F	B					

Intersection Summary				
Average Delay	6.9			
Intersection Capacity Utilization	46.0%	ICU Level of Service	A	
Analysis Period (min)	15			



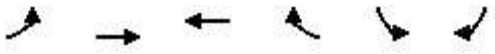
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	442	191	60	409	231	135	220	55	274	349	29
Future Volume (vph)	49	442	191	60	409	231	135	220	55	274	349	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1798		1789	1883	1601	1789	1883	1601	1789	1861	
Flt Permitted	0.30	1.00		0.12	1.00	1.00	0.23	1.00	1.00	0.61	1.00	
Satd. Flow (perm)	572	1798		223	1883	1601	429	1883	1601	1149	1861	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	53	480	208	65	445	251	147	239	60	298	379	32
RTOR Reduction (vph)	0	17	0	0	0	155	0	0	35	0	3	0
Lane Group Flow (vph)	53	671	0	65	445	96	147	239	25	298	408	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	37.9	33.9		37.7	33.8	33.8	37.1	37.1	37.1	27.5	27.5	
Effective Green, g (s)	37.9	33.9		37.7	33.8	33.8	37.1	37.1	37.1	27.5	27.5	
Actuated g/C Ratio	0.43	0.38		0.43	0.38	0.38	0.42	0.42	0.42	0.31	0.31	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	300	689		164	719	612	258	790	671	357	578	
v/s Ratio Prot	0.01	c0.37		c0.02	0.24		c0.03	0.13			0.22	
v/s Ratio Perm	0.07			0.15		0.06	0.21		0.02	c0.26		
v/c Ratio	0.18	0.97		0.40	0.62	0.16	0.57	0.30	0.04	0.83	0.71	
Uniform Delay, d1	16.0	26.8		20.1	22.1	17.9	18.4	17.0	15.1	28.3	26.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	27.6		1.6	1.6	0.1	2.9	1.0	0.1	20.1	7.1	
Delay (s)	16.2	54.4		21.7	23.7	18.1	21.3	18.0	15.2	48.4	33.9	
Level of Service	B	D		C	C	B	C	B	B	D	C	
Approach Delay (s)		51.7			21.7			18.7			40.0	
Approach LOS		D			C			B			D	

Intersection Summary			
HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	88.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Appendix F:
Signal Warrants

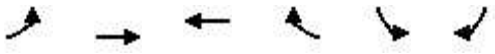
Appendix G:
Future Total Traffic Operations



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	186	334	23	24	16
Future Volume (Veh/h)	5	186	334	23	24	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	202	363	25	26	17
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	388				588	376
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	388				588	376
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				94	97
cM capacity (veh/h)	1170				470	671

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	207	388	43
Volume Left	5	0	26
Volume Right	0	25	17
cSH	1170	1700	533
Volume to Capacity	0.00	0.23	0.08
Queue Length 95th (m)	0.1	0.0	2.0
Control Delay (s)	0.2	0.0	12.3
Lane LOS	A		B
Approach Delay (s)	0.2	0.0	12.3
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	169	303	23	24	16
Future Volume (Veh/h)	5	169	303	23	24	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	184	329	25	26	17
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	354				536	342
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	354				536	342
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				95	98
cM capacity (veh/h)	1205				504	701

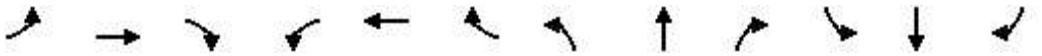
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	189	354	43
Volume Left	5	0	26
Volume Right	0	25	17
cSH	1205	1700	567
Volume to Capacity	0.00	0.21	0.08
Queue Length 95th (m)	0.1	0.0	1.9
Control Delay (s)	0.2	0.0	11.9
Lane LOS	A		B
Approach Delay (s)	0.2	0.0	11.9
Approach LOS			B

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	27.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	42	85	415	77	71	320
Future Volume (vph)	42	85	415	77	71	320
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	92	451	84	77	348

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	138	535	77	348
Volume Left (vph)	46	0	77	0
Volume Right (vph)	92	84	0	0
Hadj (s)	-0.30	-0.06	0.53	0.03
Departure Headway (s)	5.8	4.9	6.0	5.5
Degree Utilization, x	0.22	0.73	0.13	0.53
Capacity (veh/h)	556	716	583	641
Control Delay (s)	10.5	20.0	8.7	13.3
Approach Delay (s)	10.5	20.0	12.4	
Approach LOS	B	C	B	

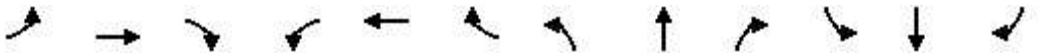
Intersection Summary			
Delay	15.9		
Level of Service	C		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	17	17	3	7	123	10	301	4	98	223	41
Future Volume (Veh/h)	68	17	17	3	7	123	10	301	4	98	223	41
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	74	18	18	3	8	134	11	327	4	107	242	45
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	943	809	242	834	852	329	287			331		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	943	809	242	834	852	329	287			331		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	59	94	98	99	97	81	99			91		
cM capacity (veh/h)	179	284	797	248	269	712	1275			1228		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	110	145	11	331	107	242	45
Volume Left	74	3	11	0	107	0	0
Volume Right	18	134	0	4	0	0	45
cSH	220	631	1275	1700	1228	1700	1700
Volume to Capacity	0.50	0.23	0.01	0.19	0.09	0.14	0.03
Queue Length 95th (m)	19.3	6.7	0.2	0.0	2.2	0.0	0.0
Control Delay (s)	36.7	12.4	7.8	0.0	8.2	0.0	0.0
Lane LOS	E	B	A		A		
Approach Delay (s)	36.7	12.4	0.3		2.2		
Approach LOS	E	B					

Intersection Summary				
Average Delay	6.9			
Intersection Capacity Utilization	48.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	297	114	25	371	169	181	210	62	185	144	24
Future Volume (vph)	54	297	114	25	371	169	181	210	62	185	144	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1805		1789	1883	1601	1789	1883	1601	1789	1843	
Flt Permitted	0.26	1.00		0.25	1.00	1.00	0.51	1.00	1.00	0.62	1.00	
Satd. Flow (perm)	494	1805		462	1883	1601	953	1883	1601	1161	1843	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	323	124	27	403	184	197	228	67	201	157	26
RTOR Reduction (vph)	0	21	0	0	0	132	0	0	36	0	9	0
Lane Group Flow (vph)	59	426	0	27	403	52	197	228	31	201	174	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	21.2	18.5		19.4	17.6	17.6	28.4	28.4	28.4	18.7	18.7	
Effective Green, g (s)	21.2	18.5		19.4	17.6	17.6	28.4	28.4	28.4	18.7	18.7	
Actuated g/C Ratio	0.34	0.30		0.31	0.28	0.28	0.46	0.46	0.46	0.30	0.30	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	224	536		182	532	453	505	859	731	349	554	
v/s Ratio Prot	c0.01	c0.24		0.00	0.21		c0.03	0.12			0.09	
v/s Ratio Perm	0.08			0.04		0.03	0.15		0.02	c0.17		
v/c Ratio	0.26	0.79		0.15	0.76	0.11	0.39	0.27	0.04	0.58	0.31	
Uniform Delay, d1	14.7	20.1		15.6	20.4	16.5	10.6	10.5	9.4	18.4	16.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	8.0		0.4	6.1	0.1	0.5	0.8	0.1	6.8	1.5	
Delay (s)	15.3	28.1		16.0	26.5	16.6	11.1	11.2	9.5	25.2	18.3	
Level of Service	B	C		B	C	B	B	B	A	C	B	
Approach Delay (s)		26.6			23.1			10.9			21.9	
Approach LOS		C			C			B			C	

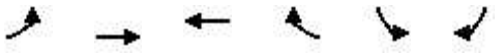
Intersection Summary			
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	62.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	19	10	276	225	18
Future Volume (Veh/h)	39	19	10	276	225	18
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	21	11	300	245	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	577	255	265			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	577	255	265			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	97	99			
cM capacity (veh/h)	474	784	1299			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	63	311	265
Volume Left	42	11	0
Volume Right	21	0	20
cSH	546	1299	1700
Volume to Capacity	0.12	0.01	0.16
Queue Length 95th (m)	3.0	0.2	0.0
Control Delay (s)	12.4	0.4	0.0
Lane LOS	B	A	
Approach Delay (s)	12.4	0.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	289	192	25	25	8
Future Volume (Veh/h)	13	289	192	25	25	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	314	209	27	27	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	236				564	222
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	236				564	222
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	99
cM capacity (veh/h)	1331				481	817

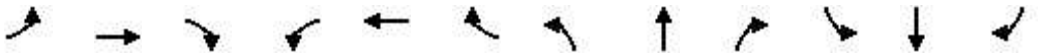
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	328	236	36
Volume Left	14	0	27
Volume Right	0	27	9
cSH	1331	1700	537
Volume to Capacity	0.01	0.14	0.07
Queue Length 95th (m)	0.2	0.0	1.6
Control Delay (s)	0.4	0.0	12.2
Lane LOS	A		B
Approach Delay (s)	0.4	0.0	12.2
Approach LOS			B

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	42	78	374	39	111	492
Future Volume (vph)	42	78	374	39	111	492
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	85	407	42	121	535

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	131	449	121	535
Volume Left (vph)	46	0	121	0
Volume Right (vph)	85	42	0	0
Hadj (s)	-0.29	-0.02	0.53	0.03
Departure Headway (s)	6.1	5.2	5.9	5.4
Degree Utilization, x	0.22	0.65	0.20	0.81
Capacity (veh/h)	545	674	597	653
Control Delay (s)	10.8	17.1	9.2	25.7
Approach Delay (s)	10.8	17.1	22.6	
Approach LOS	B	C	C	

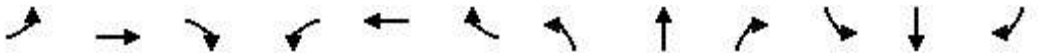
Intersection Summary			
Delay	19.4		
Level of Service	C		
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	7	6	3	7	68	14	288	9	116	334	85
Future Volume (Veh/h)	58	7	6	3	7	68	14	288	9	116	334	85
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	63	8	7	3	8	74	15	313	10	126	363	92
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1036	968	363	974	1055	318	455			323		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1036	968	363	974	1055	318	455			323		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	62	96	99	99	96	90	99			90		
cM capacity (veh/h)	167	225	682	203	200	723	1106			1237		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	78	85	15	323	126	363	92
Volume Left	63	3	15	0	126	0	0
Volume Right	7	74	0	10	0	0	92
cSH	184	541	1106	1700	1237	1700	1700
Volume to Capacity	0.42	0.16	0.01	0.19	0.10	0.21	0.05
Queue Length 95th (m)	14.6	4.2	0.3	0.0	2.6	0.0	0.0
Control Delay (s)	38.2	12.9	8.3	0.0	8.2	0.0	0.0
Lane LOS	E	B	A		A		
Approach Delay (s)	38.2	12.9	0.4		1.8		
Approach LOS	E	B					

Intersection Summary				
Average Delay	4.8			
Intersection Capacity Utilization	42.7%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	371	161	49	346	190	117	180	45	225	286	24
Future Volume (vph)	40	371	161	49	346	190	117	180	45	225	286	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1798		1789	1883	1601	1789	1883	1601	1789	1862	
Flt Permitted	0.35	1.00		0.17	1.00	1.00	0.34	1.00	1.00	0.63	1.00	
Satd. Flow (perm)	663	1798		314	1883	1601	634	1883	1601	1195	1862	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	403	175	53	376	207	127	196	49	245	311	26
RTOR Reduction (vph)	0	21	0	0	0	138	0	0	27	0	4	0
Lane Group Flow (vph)	43	557	0	53	376	69	127	196	22	245	333	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	26.8	24.0		26.8	24.0	24.0	32.2	32.2	32.2	23.8	23.8	
Effective Green, g (s)	26.8	24.0		26.8	24.0	24.0	32.2	32.2	32.2	23.8	23.8	
Actuated g/C Ratio	0.37	0.33		0.37	0.33	0.33	0.44	0.44	0.44	0.33	0.33	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	288	595		173	623	529	343	836	711	392	611	
v/s Ratio Prot	0.01	c0.31		c0.01	0.20		c0.02	0.10			0.18	
v/s Ratio Perm	0.05			0.10		0.04	0.14		0.01	c0.21		
v/c Ratio	0.15	0.94		0.31	0.60	0.13	0.37	0.23	0.03	0.62	0.54	
Uniform Delay, d1	15.3	23.5		17.3	20.3	16.9	13.0	12.5	11.4	20.6	19.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	22.1		1.0	1.7	0.1	0.7	0.7	0.1	7.3	3.5	
Delay (s)	15.5	45.6		18.3	21.9	17.1	13.7	13.2	11.4	27.9	23.4	
Level of Service	B	D		B	C	B	B	B	B	C	C	
Approach Delay (s)		43.5			20.0			13.1			25.3	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	72.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	29	14	18	280	306	40
Future Volume (Veh/h)	29	14	18	280	306	40
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	15	20	304	333	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	698	354	376			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	698	354	376			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	98	98			
cM capacity (veh/h)	399	689	1182			

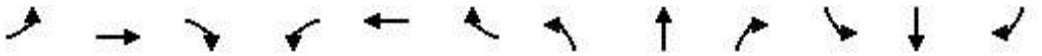
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	47	324	376
Volume Left	32	20	0
Volume Right	15	0	43
cSH	461	1182	1700
Volume to Capacity	0.10	0.02	0.22
Queue Length 95th (m)	2.6	0.4	0.0
Control Delay (s)	13.7	0.7	0.0
Lane LOS	B	A	
Approach Delay (s)	13.7	0.7	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	46	94	449	84	79	348
Future Volume (vph)	46	94	449	84	79	348
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	102	488	91	86	378

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	152	579	86	378
Volume Left (vph)	50	0	86	0
Volume Right (vph)	102	91	0	0
Hadj (s)	-0.30	-0.06	0.53	0.03
Departure Headway (s)	6.0	5.0	6.1	5.6
Degree Utilization, x	0.25	0.81	0.15	0.59
Capacity (veh/h)	551	703	571	627
Control Delay (s)	11.1	25.8	9.0	15.2
Approach Delay (s)	11.1	25.8	14.0	
Approach LOS	B	D	B	

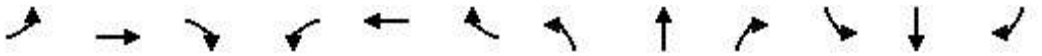
Intersection Summary			
Delay	19.4		
Level of Service	C		
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	17	17	4	7	136	10	329	4	108	245	41
Future Volume (Veh/h)	68	17	17	4	7	136	10	329	4	108	245	41
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	74	18	18	4	8	148	11	358	4	117	266	45
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1032	884	266	909	927	360	311			362		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1032	884	266	909	927	360	311			362		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	50	93	98	98	97	78	99			90		
cM capacity (veh/h)	148	254	773	217	240	684	1249			1197		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	110	160	11	362	117	266	45
Volume Left	74	4	11	0	117	0	0
Volume Right	18	148	0	4	0	0	45
cSH	185	597	1249	1700	1197	1700	1700
Volume to Capacity	0.59	0.27	0.01	0.21	0.10	0.16	0.03
Queue Length 95th (m)	24.7	8.2	0.2	0.0	2.5	0.0	0.0
Control Delay (s)	49.4	13.2	7.9	0.0	8.3	0.0	0.0
Lane LOS	E	B	A		A		
Approach Delay (s)	49.4	13.2	0.2		2.3		
Approach LOS	E	B					

Intersection Summary				
Average Delay	8.0			
Intersection Capacity Utilization	51.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	325	124	28	408	186	199	232	68	204	159	27
Future Volume (vph)	60	325	124	28	408	186	199	232	68	204	159	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1805		1789	1883	1601	1789	1883	1601	1789	1843	
Flt Permitted	0.24	1.00		0.22	1.00	1.00	0.48	1.00	1.00	0.60	1.00	
Satd. Flow (perm)	447	1805		410	1883	1601	901	1883	1601	1136	1843	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	353	135	30	443	202	216	252	74	222	173	29
RTOR Reduction (vph)	0	20	0	0	0	140	0	0	41	0	8	0
Lane Group Flow (vph)	65	468	0	30	443	62	216	252	33	222	194	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	23.9	21.2		22.1	20.3	20.3	29.3	29.3	29.3	19.6	19.6	
Effective Green, g (s)	23.9	21.2		22.1	20.3	20.3	29.3	29.3	29.3	19.6	19.6	
Actuated g/C Ratio	0.36	0.32		0.34	0.31	0.31	0.45	0.45	0.45	0.30	0.30	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	217	581		175	580	493	471	838	712	338	548	
v/s Ratio Prot	c0.01	c0.26		0.00	0.24		c0.04	0.13			0.11	
v/s Ratio Perm	0.10			0.05		0.04	0.17		0.02	c0.20		
v/c Ratio	0.30	0.81		0.17	0.76	0.13	0.46	0.30	0.05	0.66	0.35	
Uniform Delay, d1	14.9	20.4		15.7	20.6	16.4	11.8	11.7	10.3	20.2	18.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.8	8.0		0.5	5.9	0.1	0.7	0.9	0.1	9.6	1.8	
Delay (s)	15.7	28.4		16.2	26.5	16.5	12.5	12.6	10.5	29.8	19.9	
Level of Service	B	C		B	C	B	B	B	B	C	B	
Approach Delay (s)		26.9			23.1			12.3			25.1	
Approach LOS		C			C			B			C	

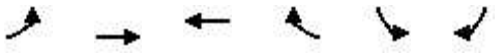
Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	65.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	19	10	304	247	18
Future Volume (Veh/h)	39	19	10	304	247	18
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	21	11	330	268	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	630	278	288			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	630	278	288			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	97	99			
cM capacity (veh/h)	442	761	1274			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	63	341	288
Volume Left	42	11	0
Volume Right	21	0	20
cSH	514	1274	1700
Volume to Capacity	0.12	0.01	0.17
Queue Length 95th (m)	3.2	0.2	0.0
Control Delay (s)	13.0	0.3	0.0
Lane LOS	B	A	
Approach Delay (s)	13.0	0.3	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	318	211	25	25	8
Future Volume (Veh/h)	13	318	211	25	25	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	346	229	27	27	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	256				616	242
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	256				616	242
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	99
cM capacity (veh/h)	1309				449	796

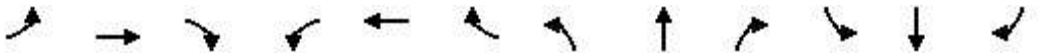
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	360	256	36
Volume Left	14	0	27
Volume Right	0	27	9
cSH	1309	1700	504
Volume to Capacity	0.01	0.15	0.07
Queue Length 95th (m)	0.2	0.0	1.7
Control Delay (s)	0.4	0.0	12.7
Lane LOS	A		B
Approach Delay (s)	0.4	0.0	12.7
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	45	86	405	43	123	532
Future Volume (vph)	45	86	405	43	123	532
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	93	440	47	134	578

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	142	487	134	578
Volume Left (vph)	49	0	134	0
Volume Right (vph)	93	47	0	0
Hadj (s)	-0.29	-0.02	0.53	0.03
Departure Headway (s)	6.3	5.3	6.0	5.5
Degree Utilization, x	0.25	0.72	0.22	0.89
Capacity (veh/h)	538	662	586	644
Control Delay (s)	11.4	20.5	9.6	35.5
Approach Delay (s)	11.4	20.5	30.6	
Approach LOS	B	C	D	

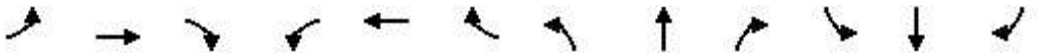
Intersection Summary			
Delay	24.9		
Level of Service	C		
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	7	6	6	7	75	14	315	9	128	364	85
Future Volume (Veh/h)	58	7	6	6	7	75	14	315	9	128	364	85
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	63	8	7	7	8	82	15	342	10	139	396	92
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1132	1056	396	1062	1143	347	488			352		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1132	1056	396	1062	1143	347	488			352		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	55	96	99	96	95	88	99			88		
cM capacity (veh/h)	139	197	653	174	175	696	1075			1207		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	78	97	15	352	139	396	92
Volume Left	63	7	15	0	139	0	0
Volume Right	7	82	0	10	0	0	92
cSH	154	476	1075	1700	1207	1700	1700
Volume to Capacity	0.51	0.20	0.01	0.21	0.12	0.23	0.05
Queue Length 95th (m)	18.6	5.7	0.3	0.0	3.0	0.0	0.0
Control Delay (s)	50.1	14.5	8.4	0.0	8.4	0.0	0.0
Lane LOS	F	B	A		A		
Approach Delay (s)	50.1	14.5	0.3		1.9		
Approach LOS	F	B					

Intersection Summary				
Average Delay	5.7			
Intersection Capacity Utilization	44.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	407	177	55	379	209	128	199	49	249	316	27
Future Volume (vph)	44	407	177	55	379	209	128	199	49	249	316	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1798		1789	1883	1601	1789	1883	1601	1789	1861	
Flt Permitted	0.36	1.00		0.12	1.00	1.00	0.28	1.00	1.00	0.62	1.00	
Satd. Flow (perm)	670	1798		224	1883	1601	521	1883	1601	1173	1861	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	442	192	60	412	227	139	216	53	271	343	29
RTOR Reduction (vph)	0	18	0	0	0	140	0	0	30	0	3	0
Lane Group Flow (vph)	48	616	0	60	412	87	139	216	23	271	369	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	35.3	32.5		37.5	33.6	33.6	37.3	37.3	37.3	27.4	27.4	
Effective Green, g (s)	35.3	32.5		37.5	33.6	33.6	37.3	37.3	37.3	27.4	27.4	
Actuated g/C Ratio	0.40	0.37		0.43	0.39	0.39	0.43	0.43	0.43	0.31	0.31	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	307	670		166	725	616	301	805	684	368	584	
v/s Ratio Prot	0.01	c0.34		c0.02	0.22		c0.03	0.11			0.20	
v/s Ratio Perm	0.06			0.14		0.05	0.17		0.01	c0.23		
v/c Ratio	0.16	0.92		0.36	0.57	0.14	0.46	0.27	0.03	0.74	0.63	
Uniform Delay, d1	16.5	26.1		18.9	21.1	17.4	17.1	16.1	14.5	26.7	25.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	18.0		1.3	1.0	0.1	1.1	0.8	0.1	12.4	5.1	
Delay (s)	16.8	44.1		20.2	22.1	17.5	18.2	16.9	14.6	39.1	30.7	
Level of Service	B	D		C	C	B	B	B	B	D	C	
Approach Delay (s)		42.2			20.5			17.1			34.2	
Approach LOS		D			C			B			C	

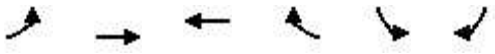
Intersection Summary			
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	87.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	29	14	18	308	337	40
Future Volume (Veh/h)	29	14	18	308	337	40
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	15	20	335	366	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	762	388	409			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	762	388	409			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	98	98			
cM capacity (veh/h)	366	661	1150			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	47	355	409
Volume Left	32	20	0
Volume Right	15	0	43
cSH	427	1150	1700
Volume to Capacity	0.11	0.02	0.24
Queue Length 95th (m)	2.8	0.4	0.0
Control Delay (s)	14.5	0.6	0.0
Lane LOS	B	A	
Approach Delay (s)	14.5	0.6	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	211	379	27	29	20
Future Volume (Veh/h)	6	211	379	27	29	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	229	412	29	32	22
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	441				670	426
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	441				670	426
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				92	96
cM capacity (veh/h)	1119				420	628

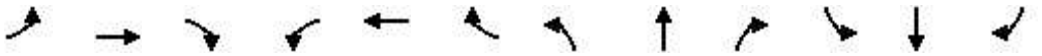
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	236	441	54
Volume Left	7	0	32
Volume Right	0	29	22
cSH	1119	1700	485
Volume to Capacity	0.01	0.26	0.11
Queue Length 95th (m)	0.1	0.0	2.8
Control Delay (s)	0.3	0.0	13.3
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	13.3
Approach LOS			B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	31.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	51	104	504	94	87	393
Future Volume (vph)	51	104	504	94	87	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5			4.5
Lane Util. Factor	1.00	1.00	0.95			0.95
Frt	1.00	0.85	0.98			1.00
Flt Protected	0.95	1.00	1.00			0.99
Satd. Flow (prot)	1789	1601	3494			3546
Flt Permitted	0.95	1.00	1.00			0.78
Satd. Flow (perm)	1789	1601	3494			2803
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	113	548	102	95	427
RTOR Reduction (vph)	0	97	21	0	0	0
Lane Group Flow (vph)	55	16	629	0	0	522
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Actuated Green, G (s)	5.6	5.6	24.3			24.3
Effective Green, g (s)	5.6	5.6	24.3			24.3
Actuated g/C Ratio	0.14	0.14	0.62			0.62
Clearance Time (s)	4.5	4.5	4.5			4.5
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	257	230	2182			1750
v/s Ratio Prot	c0.03		0.18			
v/s Ratio Perm		0.01				c0.19
v/c Ratio	0.21	0.07	0.29			0.30
Uniform Delay, d1	14.7	14.4	3.3			3.4
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.4	0.1	0.3			0.4
Delay (s)	15.1	14.5	3.7			3.8
Level of Service	B	B	A			A
Approach Delay (s)	14.7		3.7			3.8
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	5.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	38.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		

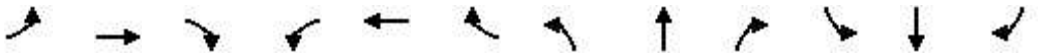
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	20	41	3	8	150	19	346	1	119	290	54
Future Volume (vph)	103	20	41	3	8	150	19	346	1	119	290	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.97			0.87			1.00			0.98	
Flt Protected		0.97			1.00			1.00			0.99	
Satd. Flow (prot)		1764			1645			3568			3471	
Flt Permitted		0.79			0.99			0.92			0.78	
Satd. Flow (perm)		1446			1634			3306			2731	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	112	22	45	3	9	163	21	376	1	129	315	59
RTOR Reduction (vph)	0	36	0	0	129	0	0	0	0	0	17	0
Lane Group Flow (vph)	0	143	0	0	46	0	0	398	0	0	486	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		8.0			8.0			21.0			21.0	
Effective Green, g (s)		8.0			8.0			21.0			21.0	
Actuated g/C Ratio		0.21			0.21			0.55			0.55	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		304			344			1827			1509	
v/s Ratio Prot												
v/s Ratio Perm		c0.10			0.03			0.12			c0.18	
v/c Ratio		0.47			0.13			0.22			0.32	
Uniform Delay, d1		13.1			12.2			4.3			4.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.2			0.2			0.3			0.6	
Delay (s)		14.3			12.4			4.6			5.2	
Level of Service		B			B			A			A	
Approach Delay (s)		14.3			12.4			4.6			5.2	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	38.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	382	141	31	463	206	221	256	76	225	175	29
Future Volume (vph)	66	382	141	31	463	206	221	256	76	225	175	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1807		1789	1883	1601	1789	1883	1601	1789	1843	
Flt Permitted	0.18	1.00		0.16	1.00	1.00	0.46	1.00	1.00	0.59	1.00	
Satd. Flow (perm)	344	1807		293	1883	1601	863	1883	1601	1109	1843	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	415	153	34	503	224	240	278	83	245	190	32
RTOR Reduction (vph)	0	16	0	0	0	150	0	0	46	0	8	0
Lane Group Flow (vph)	72	552	0	34	503	74	240	278	37	245	214	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	30.5	26.7		28.5	25.7	25.7	34.3	34.3	34.3	24.2	24.2	
Effective Green, g (s)	30.5	26.7		28.5	25.7	25.7	34.3	34.3	34.3	24.2	24.2	
Actuated g/C Ratio	0.39	0.35		0.37	0.33	0.33	0.44	0.44	0.44	0.31	0.31	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	206	624		162	626	532	450	835	710	347	576	
v/s Ratio Prot	c0.02	c0.31		0.01	0.27		c0.04	0.15			0.12	
v/s Ratio Perm	0.12			0.07		0.05	0.20		0.02	c0.22		
v/c Ratio	0.35	0.88		0.21	0.80	0.14	0.53	0.33	0.05	0.71	0.37	
Uniform Delay, d1	16.7	23.8		17.8	23.5	18.1	15.1	14.0	12.2	23.4	20.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.0	14.0		0.6	7.4	0.1	1.2	1.1	0.1	11.5	1.8	
Delay (s)	17.7	37.8		18.5	30.9	18.2	16.4	15.1	12.4	34.9	22.5	
Level of Service	B	D		B	C	B	B	B	B	C	C	
Approach Delay (s)		35.6			26.6			15.2			29.0	
Approach LOS		D			C			B			C	

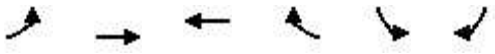
Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	77.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	30	13	6	350	298	13
Future Volume (Veh/h)	30	13	6	350	298	13
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	14	7	380	324	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					297	
pX, platoon unblocked						
vC, conflicting volume	535	169	338			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	535	169	338			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	98	99			
cM capacity (veh/h)	473	845	1218			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	47	134	253	216	122
Volume Left	33	7	0	0	0
Volume Right	14	0	0	0	14
cSH	544	1218	1700	1700	1700
Volume to Capacity	0.09	0.01	0.15	0.13	0.07
Queue Length 95th (m)	2.1	0.1	0.0	0.0	0.0
Control Delay (s)	12.2	0.5	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	12.2	0.2		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	23.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	205	369	23	24	16
Future Volume (Veh/h)	5	205	369	23	24	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	223	401	25	26	17
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	426				646	414
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	426				646	414
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				94	97
cM capacity (veh/h)	1133				434	639

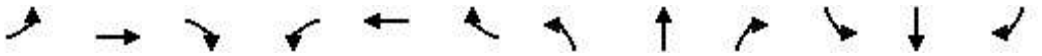
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	228	426	43
Volume Left	5	0	26
Volume Right	0	25	17
cSH	1133	1700	497
Volume to Capacity	0.00	0.25	0.09
Queue Length 95th (m)	0.1	0.0	2.1
Control Delay (s)	0.2	0.0	12.9
Lane LOS	A		B
Approach Delay (s)	0.2	0.0	12.9
Approach LOS			B

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		30.8%	ICU Level of Service
Analysis Period (min)		15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	50	104	486	92	87	379
Future Volume (vph)	50	104	486	92	87	379
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	113	528	100	95	412

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	167	628	95	412
Volume Left (vph)	54	0	95	0
Volume Right (vph)	113	100	0	0
Hadj (s)	-0.31	-0.06	0.53	0.03
Departure Headway (s)	6.3	5.2	6.3	5.8
Degree Utilization, x	0.29	0.90	0.17	0.66
Capacity (veh/h)	546	689	558	603
Control Delay (s)	11.8	37.2	9.3	18.1
Approach Delay (s)	11.8	37.2	16.4	
Approach LOS	B	E	C	

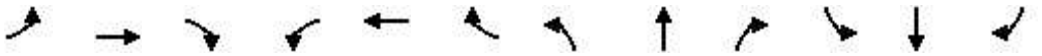
Intersection Summary			
Delay	25.9		
Level of Service	D		
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	17	17	4	7	150	10	360	4	119	269	41
Future Volume (vph)	68	17	17	4	7	150	10	360	4	119	269	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.98			0.87		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.97			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1782			1645		1789	1881		1789	1883	1601
Flt Permitted		0.68			0.99		0.58	1.00		0.53	1.00	1.00
Satd. Flow (perm)		1251			1632		1095	1881		992	1883	1601
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	74	18	18	4	8	163	11	391	4	129	292	45
RTOR Reduction (vph)	0	15	0	0	138	0	0	0	0	0	0	15
Lane Group Flow (vph)	0	95	0	0	37	0	11	395	0	129	292	30
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)		7.5			7.5		32.6	32.6		32.6	32.6	32.6
Effective Green, g (s)		7.5			7.5		32.6	32.6		32.6	32.6	32.6
Actuated g/C Ratio		0.15			0.15		0.66	0.66		0.66	0.66	0.66
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		191			249		727	1248		658	1250	1062
v/s Ratio Prot								c0.21			0.16	
v/s Ratio Perm		c0.08			0.02		0.01			0.13		0.02
v/c Ratio		0.50			0.15		0.02	0.32		0.20	0.23	0.03
Uniform Delay, d1		19.1			18.0		2.8	3.5		3.2	3.3	2.8
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		2.0			0.3		0.0	0.7		0.7	0.4	0.0
Delay (s)		21.1			18.3		2.8	4.2		3.9	3.7	2.9
Level of Service		C			B		A	A		A	A	A
Approach Delay (s)		21.1			18.3			4.1			3.7	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	49.1	Sum of lost time (s)	9.0
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	355	136	31	449	206	220	256	76	225	175	29
Future Volume (vph)	66	355	136	31	449	206	220	256	76	225	175	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1805		1789	1883	1601	1789	1883	1601	1789	1843	
Flt Permitted	0.19	1.00		0.20	1.00	1.00	0.45	1.00	1.00	0.59	1.00	
Satd. Flow (perm)	353	1805		373	1883	1601	852	1883	1601	1109	1843	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	386	148	34	488	224	239	278	83	245	190	32
RTOR Reduction (vph)	0	18	0	0	0	151	0	0	47	0	8	0
Lane Group Flow (vph)	72	516	0	34	488	73	239	278	36	245	214	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	29.6	25.8		25.8	23.9	23.9	32.3	32.3	32.3	22.2	22.2	
Effective Green, g (s)	29.6	25.8		25.8	23.9	23.9	32.3	32.3	32.3	22.2	22.2	
Actuated g/C Ratio	0.40	0.35		0.35	0.33	0.33	0.44	0.44	0.44	0.30	0.30	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	216	633		167	612	520	445	827	703	334	556	
v/s Ratio Prot	c0.02	c0.29		0.01	0.26		c0.04	0.15			0.12	
v/s Ratio Perm	0.12			0.07		0.05	0.19		0.02	c0.22		
v/c Ratio	0.33	0.82		0.20	0.80	0.14	0.54	0.34	0.05	0.73	0.39	
Uniform Delay, d1	15.5	21.7		17.1	22.6	17.5	14.4	13.5	11.8	23.0	20.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	8.0		0.6	7.1	0.1	1.3	1.1	0.1	13.3	2.0	
Delay (s)	16.4	29.7		17.7	29.7	17.7	15.6	14.6	12.0	36.3	22.3	
Level of Service	B	C		B	C	B	B	B	B	D	C	
Approach Delay (s)		28.1			25.6			14.7			29.7	
Approach LOS		C			C			B			C	

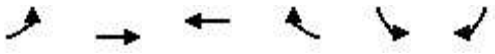
Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	73.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	19	10	335	272	18
Future Volume (Veh/h)	39	19	10	335	272	18
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	21	11	364	296	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					297	
pX, platoon unblocked						
vC, conflicting volume	692	306	316			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	692	306	316			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	97	99			
cM capacity (veh/h)	406	734	1244			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	63	375	316
Volume Left	42	11	0
Volume Right	21	0	20
cSH	477	1244	1700
Volume to Capacity	0.13	0.01	0.19
Queue Length 95th (m)	3.4	0.2	0.0
Control Delay (s)	13.7	0.3	0.0
Lane LOS	B	A	
Approach Delay (s)	13.7	0.3	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	367	239	29	29	11
Future Volume (Veh/h)	17	367	239	29	29	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	399	260	32	32	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	292				711	276
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	292				711	276
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				92	98
cM capacity (veh/h)	1270				394	763

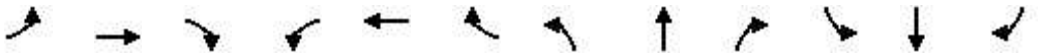
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	417	292	44
Volume Left	18	0	32
Volume Right	0	32	12
cSH	1270	1700	454
Volume to Capacity	0.01	0.17	0.10
Queue Length 95th (m)	0.3	0.0	2.4
Control Delay (s)	0.5	0.0	13.8
Lane LOS	A		B
Approach Delay (s)	0.5	0.0	13.8
Approach LOS			B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	52	95	484	48	136	619
Future Volume (vph)	52	95	484	48	136	619
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5			4.5
Lane Util. Factor	1.00	1.00	0.95			0.95
Frt	1.00	0.85	0.99			1.00
Flt Protected	0.95	1.00	1.00			0.99
Satd. Flow (prot)	1789	1601	3530			3547
Flt Permitted	0.95	1.00	1.00			0.76
Satd. Flow (perm)	1789	1601	3530			2731
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	57	103	526	52	148	673
RTOR Reduction (vph)	0	90	9	0	0	0
Lane Group Flow (vph)	57	13	569	0	0	821
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Actuated Green, G (s)	5.8	5.8	29.5			29.5
Effective Green, g (s)	5.8	5.8	29.5			29.5
Actuated g/C Ratio	0.13	0.13	0.67			0.67
Clearance Time (s)	4.5	4.5	4.5			4.5
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	234	209	2350			1818
v/s Ratio Prot	c0.03		0.16			
v/s Ratio Perm		0.01				c0.30
v/c Ratio	0.24	0.06	0.24			0.45
Uniform Delay, d1	17.3	16.9	2.9			3.5
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.5	0.1	0.2			0.8
Delay (s)	17.8	17.0	3.2			4.3
Level of Service	B	B	A			A
Approach Delay (s)	17.3		3.2			4.3
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	44.3	Sum of lost time (s)	9.0
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

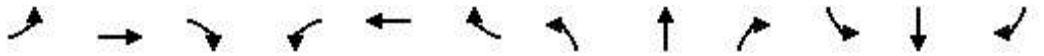
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	9	22	4	10	83	39	352	8	141	383	121
Future Volume (vph)	82	9	22	4	10	83	39	352	8	141	383	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.97			0.88			1.00			0.97	
Flt Protected		0.97			1.00			1.00			0.99	
Satd. Flow (prot)		1770			1662			3550			3440	
Flt Permitted		0.72			0.98			0.87			0.78	
Satd. Flow (perm)		1320			1636			3104			2706	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	89	10	24	4	11	90	42	383	9	153	416	132
RTOR Reduction (vph)	0	20	0	0	77	0	0	2	0	0	28	0
Lane Group Flow (vph)	0	103	0	0	28	0	0	432	0	0	673	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		5.5			5.5			23.2			23.2	
Effective Green, g (s)		5.5			5.5			23.2			23.2	
Actuated g/C Ratio		0.15			0.15			0.62			0.62	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		192			238			1910			1665	
v/s Ratio Prot												
v/s Ratio Perm		c0.08			0.02			0.14			c0.25	
v/c Ratio		0.53			0.12			0.23			0.40	
Uniform Delay, d1		14.9			14.0			3.2			3.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.8			0.2			0.3			0.7	
Delay (s)		17.8			14.2			3.5			4.4	
Level of Service		B			B			A			A	
Approach Delay (s)		17.8			14.2			3.5			4.4	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	37.7	Sum of lost time (s)	9.0
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	465	198	60	429	231	145	220	55	274	349	29
Future Volume (vph)	49	465	198	60	429	231	145	220	55	274	349	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1799		1789	1883	1601	1789	1883	1601	1789	1861	
Flt Permitted	0.32	1.00		0.11	1.00	1.00	0.20	1.00	1.00	0.61	1.00	
Satd. Flow (perm)	609	1799		200	1883	1601	375	1883	1601	1149	1861	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	53	505	215	65	466	251	158	239	60	298	379	32
RTOR Reduction (vph)	0	17	0	0	0	146	0	0	36	0	4	0
Lane Group Flow (vph)	53	703	0	65	466	105	158	239	24	298	407	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	39.6	36.6		41.6	37.6	37.6	35.6	35.6	35.6	26.0	26.0	
Effective Green, g (s)	39.6	36.6		41.6	37.6	37.6	35.6	35.6	35.6	26.0	26.0	
Actuated g/C Ratio	0.44	0.41		0.46	0.42	0.42	0.40	0.40	0.40	0.29	0.29	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	308	734		163	789	671	229	747	635	333	539	
v/s Ratio Prot	0.01	c0.39		c0.02	0.25		c0.04	0.13			0.22	
v/s Ratio Perm	0.07			0.17		0.07	0.23		0.01	c0.26		
v/c Ratio	0.17	0.96		0.40	0.59	0.16	0.69	0.32	0.04	0.89	0.76	
Uniform Delay, d1	15.4	25.8		19.3	20.1	16.2	20.6	18.7	16.6	30.5	29.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	23.2		1.6	1.2	0.1	8.4	1.1	0.1	28.7	9.5	
Delay (s)	15.6	49.0		21.0	21.3	16.3	29.0	19.8	16.7	59.2	38.5	
Level of Service	B	D		C	C	B	C	B	B	E	D	
Approach Delay (s)		46.7			19.7			22.6			47.2	
Approach LOS		D			B			C			D	

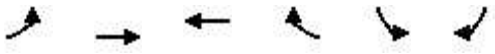
Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	89.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	10	13	369	393	29
Future Volume (Veh/h)	22	10	13	369	393	29
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	11	14	401	427	32
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					297	
pX, platoon unblocked						
vC, conflicting volume	672	230	459			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	672	230	459			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	99	99			
cM capacity (veh/h)	384	773	1098			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	35	148	267	285	174
Volume Left	24	14	0	0	0
Volume Right	11	0	0	0	32
cSH	457	1098	1700	1700	1700
Volume to Capacity	0.08	0.01	0.16	0.17	0.10
Queue Length 95th (m)	1.9	0.3	0.0	0.0	0.0
Control Delay (s)	13.5	0.9	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	13.5	0.3		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	29.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	351	232	25	25	8
Future Volume (Veh/h)	13	351	232	25	25	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	382	252	27	27	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	279				676	266
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	279				676	266
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				93	99
cM capacity (veh/h)	1284				415	773

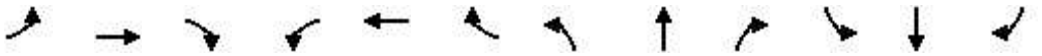
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	396	279	36
Volume Left	14	0	27
Volume Right	0	27	9
cSH	1284	1700	469
Volume to Capacity	0.01	0.16	0.08
Queue Length 95th (m)	0.3	0.0	1.9
Control Delay (s)	0.4	0.0	13.3
Lane LOS	A		B
Approach Delay (s)	0.4	0.0	13.3
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	39.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	49	95	439	46	136	575
Future Volume (vph)	49	95	439	46	136	575
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	103	477	50	148	625

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	156	527	148	625
Volume Left (vph)	53	0	148	0
Volume Right (vph)	103	50	0	0
Hadj (s)	-0.29	-0.02	0.53	0.03
Departure Headway (s)	6.5	5.4	6.2	5.7
Degree Utilization, x	0.28	0.80	0.25	0.98
Capacity (veh/h)	534	654	574	625
Control Delay (s)	12.0	26.4	10.1	54.3
Approach Delay (s)	12.0	26.4	45.9	
Approach LOS	B	D	E	

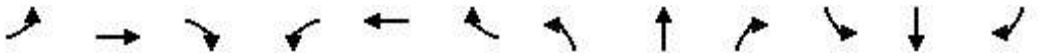
Intersection Summary			
Delay	35.2		
Level of Service	E		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	7	6	7	7	83	14	345	10	141	398	85
Future Volume (vph)	58	7	6	7	7	83	14	345	10	141	398	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.99			0.89		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.96			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1788			1661		1789	1875		1789	1883	1601
Flt Permitted		0.82			0.97		0.50	1.00		0.53	1.00	1.00
Satd. Flow (perm)		1519			1617		947	1875		1004	1883	1601
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	8	7	8	8	90	15	375	11	153	433	92
RTOR Reduction (vph)	0	6	0	0	78	0	0	1	0	0	0	24
Lane Group Flow (vph)	0	72	0	0	28	0	15	385	0	153	433	68
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)		7.0			7.0		36.8	36.8		36.8	36.8	36.8
Effective Green, g (s)		7.0			7.0		36.8	36.8		36.8	36.8	36.8
Actuated g/C Ratio		0.13			0.13		0.70	0.70		0.70	0.70	0.70
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		201			214		660	1306		699	1312	1115
v/s Ratio Prot								0.21			c0.23	
v/s Ratio Perm		c0.05			0.02		0.02			0.15		0.04
v/c Ratio		0.36			0.13		0.02	0.29		0.22	0.33	0.06
Uniform Delay, d1		20.9			20.2		2.5	3.1		2.9	3.1	2.5
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		1.1			0.3		0.1	0.6		0.7	0.7	0.1
Delay (s)		21.9			20.5		2.5	3.6		3.6	3.8	2.6
Level of Service		C			C		A	A		A	A	A
Approach Delay (s)		21.9			20.5			3.6			3.6	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	52.8	Sum of lost time (s)	9.0
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	448	195	60	416	231	140	220	55	274	349	29
Future Volume (vph)	49	448	195	60	416	231	140	220	55	274	349	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1798		1789	1883	1601	1789	1883	1601	1789	1861	
Flt Permitted	0.30	1.00		0.12	1.00	1.00	0.22	1.00	1.00	0.61	1.00	
Satd. Flow (perm)	572	1798		218	1883	1601	414	1883	1601	1149	1861	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	53	487	212	65	452	251	152	239	60	298	379	32
RTOR Reduction (vph)	0	17	0	0	0	153	0	0	35	0	3	0
Lane Group Flow (vph)	53	682	0	65	452	98	152	239	25	298	408	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	38.6	34.6		38.6	34.6	34.6	36.7	36.7	36.7	27.1	27.1	
Effective Green, g (s)	38.6	34.6		38.6	34.6	34.6	36.7	36.7	36.7	27.1	27.1	
Actuated g/C Ratio	0.43	0.39		0.43	0.39	0.39	0.41	0.41	0.41	0.31	0.31	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	303	700		165	733	623	250	778	661	350	567	
v/s Ratio Prot	0.01	c0.38		c0.02	0.24		c0.03	0.13			0.22	
v/s Ratio Perm	0.07			0.15		0.06	0.22		0.02	c0.26		
v/c Ratio	0.17	0.97		0.39	0.62	0.16	0.61	0.31	0.04	0.85	0.72	
Uniform Delay, d1	15.7	26.7		20.0	21.8	17.6	18.9	17.5	15.5	29.0	27.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	27.5		1.6	1.6	0.1	4.1	1.0	0.1	22.1	7.7	
Delay (s)	16.0	54.1		21.5	23.3	17.7	23.1	18.5	15.6	51.1	35.1	
Level of Service	B	D		C	C	B	C	B	B	D	D	
Approach Delay (s)		51.4			21.3			19.7			41.8	
Approach LOS		D			C			B			D	

Intersection Summary			
HCM 2000 Control Delay	34.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	88.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		

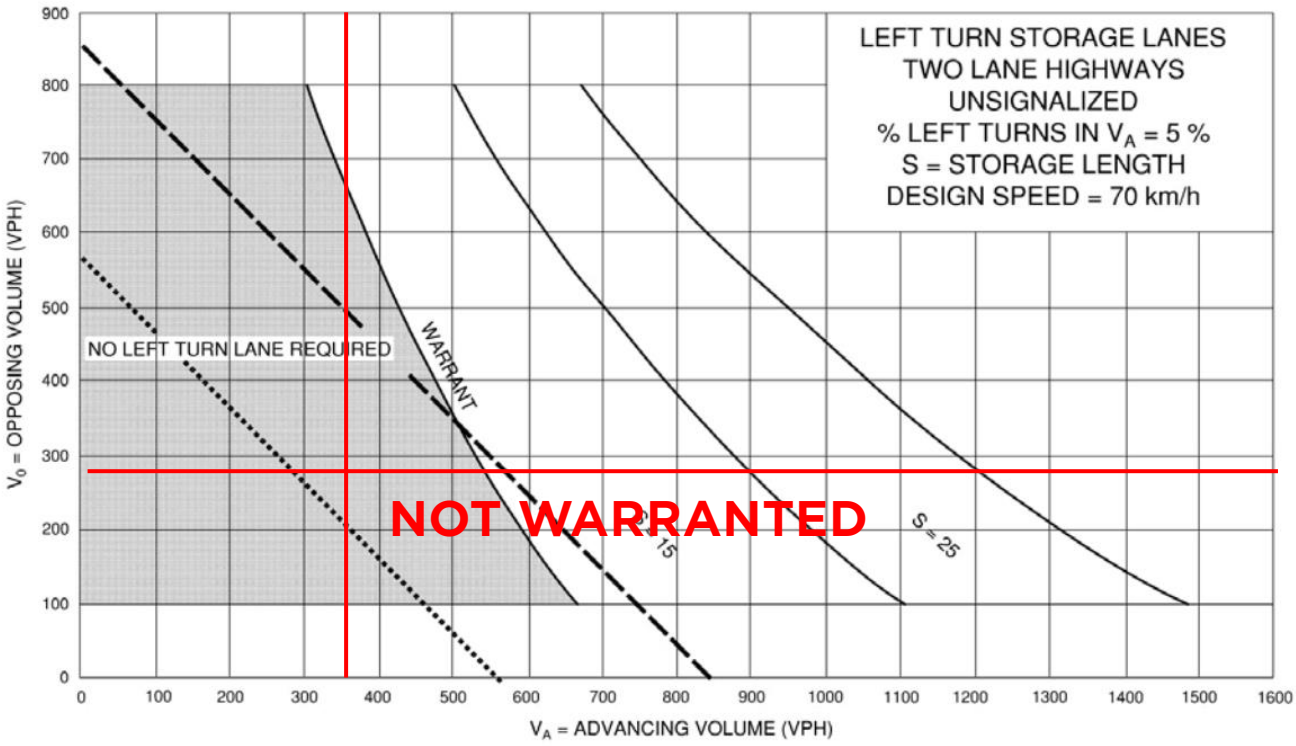
c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	29	14	18	339	371	40
Future Volume (Veh/h)	29	14	18	339	371	40
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	15	20	368	403	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					297	
pX, platoon unblocked						
vC, conflicting volume	832	424	446			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	832	424	446			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	98	98			
cM capacity (veh/h)	333	630	1114			

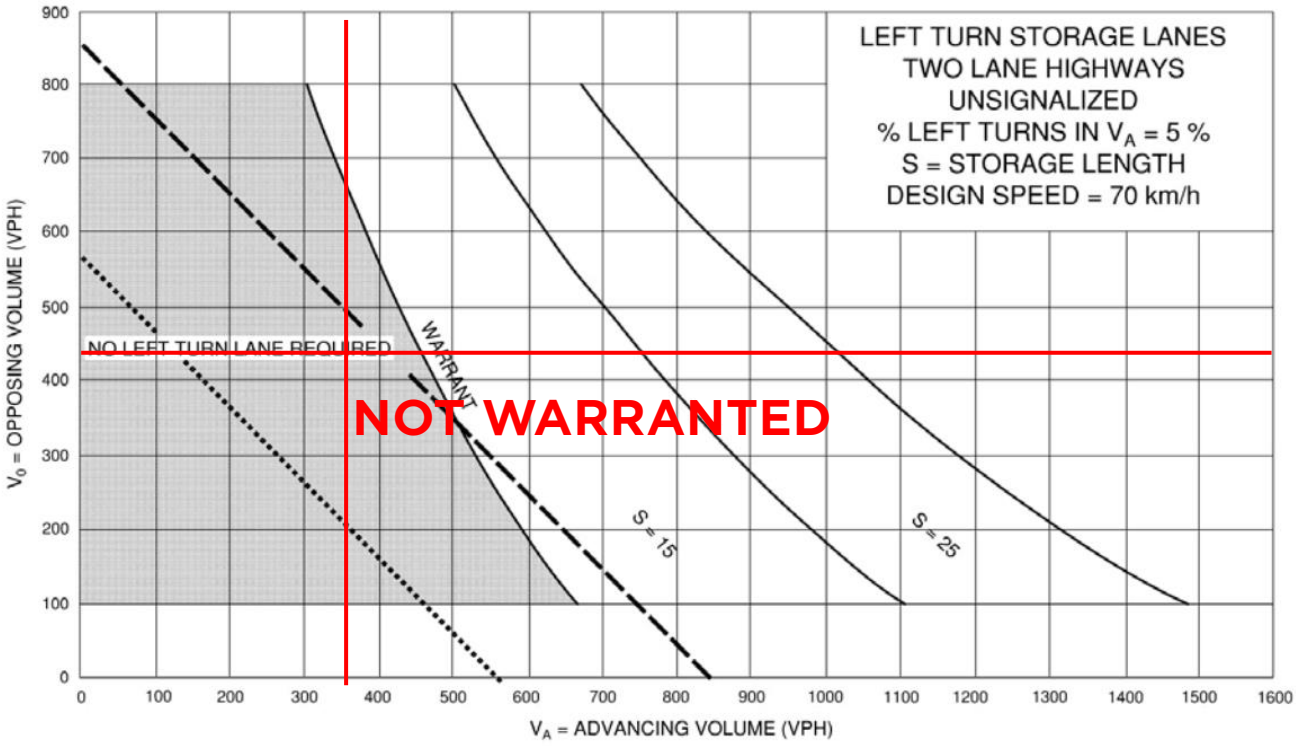
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	47	388	446
Volume Left	32	20	0
Volume Right	15	0	43
cSH	392	1114	1700
Volume to Capacity	0.12	0.02	0.26
Queue Length 95th (m)	3.1	0.4	0.0
Control Delay (s)	15.4	0.6	0.0
Lane LOS	C	A	
Approach Delay (s)	15.4	0.6	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix H:
Left Turn Warrants

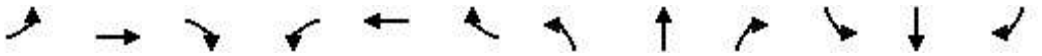


2040 Total Conditions – AM Peak Hour



2040 Total Conditions - PM

Appendix I:
Future Total Sensitivity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	17	17	4	7	150	10	651	4	119	510	41
Future Volume (vph)	68	17	17	4	7	150	10	651	4	119	510	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.98			0.87			1.00			0.99	
Flt Protected		0.97			1.00			1.00			0.99	
Satd. Flow (prot)		1782			1645			3573			3514	
Flt Permitted		0.65			0.99			0.94			0.74	
Satd. Flow (perm)		1192			1632			3378			2611	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	74	18	18	4	8	163	11	708	4	129	554	45
RTOR Reduction (vph)	0	14	0	0	139	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	96	0	0	36	0	0	723	0	0	723	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.7			7.7			35.6			35.6	
Effective Green, g (s)		7.7			7.7			35.6			35.6	
Actuated g/C Ratio		0.15			0.15			0.68			0.68	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		175			240			2299			1777	
v/s Ratio Prot												
v/s Ratio Perm		c0.08			0.02			0.21			c0.28	
v/c Ratio		0.55			0.15			0.31			0.41	
Uniform Delay, d1		20.7			19.4			3.4			3.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.5			0.3			0.4			0.7	
Delay (s)		24.1			19.7			3.8			4.4	
Level of Service		C			B			A			A	
Approach Delay (s)		24.1			19.7			3.8			4.4	
Approach LOS		C			B			A			A	

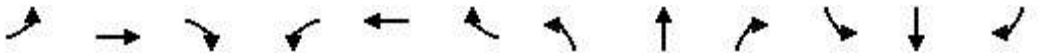
Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	52.3	Sum of lost time (s)	9.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	19	10	627	512	18
Future Volume (Veh/h)	39	19	10	627	512	18
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	21	11	682	557	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					297	
pX, platoon unblocked						
vC, conflicting volume	930	288	577			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	930	288	577			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	84	97	99			
cM capacity (veh/h)	263	708	993			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	63	238	455	371	206
Volume Left	42	11	0	0	0
Volume Right	21	0	0	0	20
cSH	333	993	1700	1700	1700
Volume to Capacity	0.19	0.01	0.27	0.22	0.12
Queue Length 95th (m)	5.2	0.3	0.0	0.0	0.0
Control Delay (s)	18.3	0.5	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	18.3	0.2		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	34.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	7	6	7	7	83	14	809	10	141	832	85
Future Volume (vph)	58	7	6	7	7	83	14	809	10	141	832	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.99			0.89			1.00			0.99	
Flt Protected		0.96			1.00			1.00			0.99	
Satd. Flow (prot)		1788			1661			3569			3512	
Flt Permitted		0.81			0.97			0.93			0.71	
Satd. Flow (perm)		1501			1617			3333			2527	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	8	7	8	8	90	15	879	11	153	904	92
RTOR Reduction (vph)	0	6	0	0	78	0	0	1	0	0	7	0
Lane Group Flow (vph)	0	72	0	0	28	0	0	904	0	0	1142	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.1			7.1			38.3			38.3	
Effective Green, g (s)		7.1			7.1			38.3			38.3	
Actuated g/C Ratio		0.13			0.13			0.70			0.70	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		195			211			2346			1779	
v/s Ratio Prot												
v/s Ratio Perm		c0.05			0.02			0.27			c0.45	
v/c Ratio		0.37			0.13			0.39			0.64	
Uniform Delay, d1		21.6			20.9			3.3			4.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.2			0.3			0.5			1.8	
Delay (s)		22.8			21.2			3.7			6.1	
Level of Service		C			C			A			A	
Approach Delay (s)		22.8			21.2			3.7			6.1	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	54.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	29	14	18	804	805	40
Future Volume (Veh/h)	29	14	18	804	805	40
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	15	20	874	875	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					297	
pX, platoon unblocked	1.00	1.00	1.00			
vC, conflicting volume	1374	459	918			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1371	455	915			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	76	97	97			
cM capacity (veh/h)	133	551	740			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	47	311	583	583	335
Volume Left	32	20	0	0	0
Volume Right	15	0	0	0	43
cSH	176	740	1700	1700	1700
Volume to Capacity	0.27	0.03	0.34	0.34	0.20
Queue Length 95th (m)	7.8	0.6	0.0	0.0	0.0
Control Delay (s)	32.8	0.9	0.0	0.0	0.0
Lane LOS	D	A			
Approach Delay (s)	32.8	0.3		0.0	
Approach LOS	D				

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		