TATHAM ENGINEERING

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140 Mountain Road

TRAFFIC IMPACT BRIEF

2596482 Ontario Ltd.

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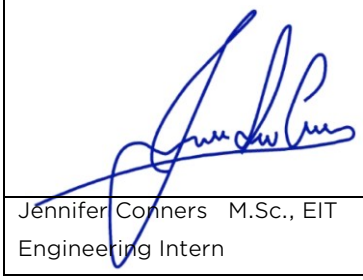	 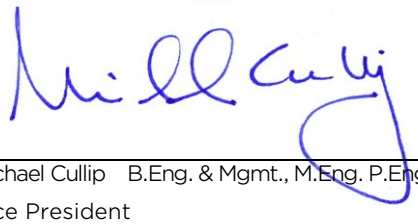
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Issue	Date	Description
1	December 23, 2022	Final Report

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1 Introduction

Tatham Engineering was retained by 2596482 Ontario Ltd. to prepare a Traffic Impact Brief in support of the proposed multi-unit industrial/commercial building development to be located at 140 Mountain Road in the Town of Collingwood. The location of the development site is illustrated in Figure 1.

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

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

2 Existing Conditions

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

2.1 ROAD NETWORK

The road network to be addressed by this study consists of Mountain Road in the vicinity of the proposed development. Photographs of the road system are provided in Figure 2.

Mountain Road

Mountain Road is an east-west arterial road under the jurisdiction of the Town of Collingwood. The road has a two-lane rural cross-section, providing one travel lane per direction with 1.0 metre gravel shoulders and open ditches. A multi-use trail is provided along the south side of the road. Mountain Road has a posted speed limit of 60 km/h and an assumed design speed of 70 km/h (posted + 10 km/h, typical for lower speed roads). As per the *Collingwood Transportation Study Update*[1], Mountain Road has a planning capacity of 900 vehicles per hour per lane (vphpl). Within the study area, Mountain Road is relatively straight and flat.

2.2 ACTIVE TRANSPORTATION NETWORK

As evident in the aerial photograph of Figure 2 and further illustrated in the Collingwood Trails map provided in Figure 3, there is a 3.0 metre wide multi-use path (Mountain Road Trail) along the south side of Mountain Road, extending from Black Ash Trail to Tenth Line Trail. The site also abuts the Taylor Creek Trail, which runs east-west to the south of the site.

2.3 TRAFFIC VOLUMES

To ensure consistency with the traffic projections in the *Collingwood Transportation Study Update,* the existing (2022) traffic volumes through the study area were established through interpolation of the 2019 and 2031 traffic projections provided therein. For the purpose of this study, the traffic volumes provided for the east leg of the intersection of Mountain Road at Tenth Line were used to establish the existing volumes across the frontage of the site.

The resulting 2022 traffic volumes are provided Figure 4. A review of the peak-period traffic counts at the adjacent intersection, indicate that the Mountain Road weekday morning peak hour

[1] *Collingwood Transportation Study Update.* RJ Burnside & Associates Limited, August 2019

generally occurs between 8:00 and 9:00 AM with the weekday evening peak hour generally occurring between 4:00 and 5:00 PM.

2.4 TRAFFIC OPERATIONS

2.4.1 Road Section Operations

The assessment of the Mountain Road operations considers the following:

- the 2022 peak hour peak directional volumes on Mountain Road across the frontage of the site (maximum of AM and PM volumes);
- an assumed lane capacity of 900 vehicles per hour (vphpl) as per the *Collingwood Transportation Study Update*; and
- the provision of one through lane per direction.

The resulting road operations are summarized in Table 1. The volume to capacity (v/c) ratio details the degree to which the road capacity is consumed (a v/c ratio of less than 1.0 indicates the road is operating at less than capacity while a v/c of 1.0 or greater indicates capacity has been reached or surpassed).

Table 1: Road Section Operations – 2022

ROAD SECTION & LANES PER DIRECTION		CAPACITY[1]		TRAFFIC VOLUMES		VOLUME TO CAPACITY	
		WB	EB	WB	EB	WB	EB
Mountain Road	1	900	900	584	632	0.65	0.70

[1] capacity is noted as vehicles per hour per direction

As indicated, Mountain Road is currently operating at 70% of its available capacity or less during the peak hour conditions. In context of this, no improvements are required to address capacity under existing conditions.

3 Proposed Development

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

3.1 SITE LOCATION

The proposed project site is located at 140 Mountain Road in the Town of Collingwood. The site encompasses approximately 2.0 hectares of land that is situated on the south side of Mountain Road approximately 1 kilometre west of the Balsam Street and First Street intersection, and 0.25 kilometres east of the Tenth Line and Mountain Road intersection. At present, the site consists of areas of open and wooded space.

3.2 LAND-USE

The proposed development will consist of a 6,821 m^2 (73,421 ft^2) multi-unit industrial building, a site plan for which is provided in Figure 5.

3.3 ACCESS

3.3.1 Access Location & Configuration

The proposed development will be served by two access points on Mountain Road, both of which will provide two-way operations with one travel lane per direction. As per the *Collingwood Zoning By-law No. 2010-040*, the entrance width for non-residential development shall be a minimum of 3.0 metres to a maximum of 7.5 metres. The site plan indicates an entrance width of 7.5 metres, thus satisfying the Town's requirements.

In addition, the by-law notes that for sites with lot frontage of more than 20 metres but less than 100 metres, a maximum of two entrances should be provided and the combined width of both entrances shall not be great than 30% of the lot frontage. The combined width of the proposed access points (15 metres) equates to approximately 21% of the lot frontage (70 metres), therefore, the proposed site access arrangement meets the town requirements both with respect to the number of access points and the extent of such.

3.3.2 Access Spacing

Along local and collector roads, the Transportation Association of Canada's (TAC) *Geometric Design Guide for Canadian Roads*[2] suggests a minimum tangent length of 5.0 metres between industrial driveways (measured from end of curb radius to end of curb radius of each driveway). As determined from the site plan, a tangent length of 20 metres is proposed, thus satisfying the TAC guidelines for driveway spacing.

3.3.3 Sight Line Assessment

The sight line assessment has considered both minimum stopping sight distance and intersection sight distance requirements as per the TAC *Geometric Design Guide for Canadian Roads*, and further detailed below.

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

The minimum stopping sight and intersection sight distance requirements, and the available sight lines along Mountain Road, are provided in Table 2.

Table 2: Sight Line Assessment

INTERSECTION	DESIGN SPEED	STOPPING SIGHT DISTANCE	INTERSECTION SIGHT DISTANCE		SIGHT DISTANCE TO/FROM	
			Left Turn	Right Turn	East	West
Site Access	70 km/h	105 m	150 m	130 m	>150 m	>150 m

The available sight lines are in excess of 150 metres in both directions, and thus satisfy the TAC requirements. This is not unexpected given that Mountain Road is relatively straight and flat through the study area.

[2] *Geometric Design Guide for Canadian Roads, Chapter 8.* Transportation Association of Canada. June 2017

3.4 CIRCULATION

3.4.1 Vehicle Circulation

Town requirements state that an aisle serving a parking area with parking stalls oriented in excess of 70° must have a minimum width of 6.0 metres. Furthermore, a fire access route must maintain a minimum clear width of 6.0 metres with a minimum centre turn radius of 12.0 metres (as per the *Ontario Building Code*). As per the site plan, the internal aisle serving the parking area will maintain a minimum clear width of 6.0 metres with a minimum centre turn radius of 14.0 metres. As such, the site layout satisfies Town and fire access route requirements with respect to the circulation of vehicles throughout the site.

3.4.2 Pedestrian & Bicycle Circulation

Pedestrian and bicycle access will be provided by the existing Town trail system along Mountain Road and to the rear of the property (a 1.8 metre pathway connection is proposed to the Taylor Creek Trail). Curbside concrete sidewalks will be provided along both sides of the internal circulatory road through the development to accommodate pedestrian and bicycle travel through and within the site.

3.5 PARKING

The proposed development will provide a total of 144 parking spaces including 4 accessible spaces. Pursuant to the Town's *Zoning By-law*, the following parking requirements apply:

- warehouse: 1 space per 100 m^2 gross floor area (GFA); and
- manufacturing, processing, assembly or fabrication plant: 1 space per 100 m^2 GFA.

In this respect, the development is required to provide a total of 69 parking spaces (6821 m^2 GFA ÷ 1 space/100m^2).

The zoning also outlines that where the total number of parking spaces required is between 51 to 100 parking spaces, a minimum of 3 accessible spaces must be provided; 4 such spaces are proposed.

In considering the proposed parking supply (144 spaces, including 4 accessible spaces), it satisfies the Town's minimum parking requirements.

3.6 TRAFFIC

3.6.1 Trip Generation

The number of vehicle trips to be generated by the proposed development has been determined based on type of use, developments size and trip generation rates published in the *ITE Trip*

Generation Manual, 11th Edition[3]. Based on the proposed development, trip rates for the *industrial park* (ITE code 130) land-use have been applied.

A summary of the expected vehicle-trip generation is summarized in Table 3. As indicated, the site is expected to generate 25 new trips during both the AM and PM peak hour.

Table 3: Trip Generation – 140 Mountain Road

LAND USE	VARIABLE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		In	Out	Total	In	Out	Total
Industrial Park (ITE 130)	trips per 1,000 ft² GFA	0.32	0.08	0.40	0.08	0.32	0.40
	73,421 ft² GFA	20	5	25	5	20	25

3.6.2 Trip Distribution & Assignment

The distribution of the site-generated trips was determined based on a review of existing travel patterns, the proximity of the site to the built-up area of the Town and previous traffic studies completed for developments in the area. In consideration of this, the following distribution was assumed:

- to/from the east on Mountain Road - 70%; and
- to/from the west on Mountain Road – 30%.

It is noted that trips travelling to/from the north and south will do so via travel routes beyond the immediate study area (i.e. Highway 26, Grey Road 21, County Road 124, etc.). The resulting site generated traffic assigned to the road network is illustrated in Figure 6.

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

4 Future Conditions

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

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

For the purpose of this study and given the limited volume of trips to be generated by the site, a 5 year horizon (2027) has been considered to assess the impact of the development on the road network.

4.1 ROAD NETWORK IMPROVEMENTS

As per the *Tenth Line and Mountain Road Improvements, Municipal Class EA*[4] and the *Town of Collingwood Transportation Study Update,* Mountain Road is to be widened to a 5-lane cross section (i.e. a centre two-way left-turn lane plus two travel lanes in each direction) from Tenth Line to Cambridge Street. At present, a replacement and widening of the existing Mountain Road bridge is scheduled to for completion in 2023. For purpose of this analysis, widening of the subject section of Mountain Road has been considered as complete by 2027.

4.2 TRAFFIC VOLUMES

Traffic volumes for the 2027 horizon year have been determined from volume projections provided in the *Collingwood Transportation Study Update*, which considered the following:

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

As the *Collingwood Transportation Study Update* did not provide traffic projections specifically for the 2027 horizon, such were interpolated from the 2019 and 2031 volumes, assuming a constant growth over the corresponding planning horizon (considering both background and development growth). The total traffic volumes for the 2027 horizon are provided in Figure 7.

[4] *Tenth Line and Mountain Road Improvements, Municipal Class EA.* Ainley Group. April 2019.

4.3 TRAFFIC OPERATIONS

4.3.1 Road Section Operations

The operations of the study area road network were again investigated to consider the 2027 traffic volumes, a summary of which is provided in Table 4 (reflective of volumes to the east of the proposed development site which will be greater than those to the west). As noted, the directional capacity of Mountain Road has increased to reflect the planned widening to 5 lanes (900 vphpl x 2 lanes per direction; no additional capacity has been attributed to the centre turn lane).

Table 4: Road Section Operations - 2027

ROAD SECTION & LANES PER DIRECTION		CAPACITY[1]		TRAFFIC VOLUMES		VOLUME TO CAPACITY	
		WB	EB	WB	EB	WB	EB
Mountain Road (east of the site)	2	1800	1800	852	819	0.47	0.46

[1] Capacity is denoted as vehicles per hour per direction

As indicated, Mountain Road is expected to operate at less than 50% of its available capacity in 2027 when considering the planned widening. No further improvements are required to accommodate the 2027 volumes. Should the widening be deferred beyond 2027, the road will continue to operate at less than its capacity (projected volumes < 900 vphpl).

4.3.2 Intersection Operations

The site access operations were reviewed based on the following:

- the 2027 traffic volumes;
- single lane approaches at each access operating under stop control; and
- procedures outlined in the *2000 Highway Capacity Manual*[5] (using Synchro v.11 software).

For unsignalized intersections, the analysis considers:

- average delay (measured in seconds);
- level of service (LOS); and
- volume to capacity (v/c) for the critical movements (i.e. those operating under stop control).

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

With respect to the noted metrics:

- a level of service 'A' corresponds to the best operating conditions with minimal delays, whereas level service 'F' corresponds to poor operations resulting from high intersection delays; and
- a v/c ratio of less than 1.0 indicates the intersection movement/ approach is operating at less than capacity while a v/c ratio of 1.0 indicates capacity has been reached.

A summary of the analysis is provided Table 5, whereas detailed operations worksheets are included in Appendix B.

Table 5: Intersection Operations - 2027

INTERSECTION, CONTROL & MOVEMENT			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Mountain Road at West Access	yield	WB L	10	A	0.01	10	B	0.00
	stop	NB LR	13	B	0.00	14	B	0.03
Mountain Road at East Access	yield	WB L	9	A	0.01	10	B	0.00
	stop	NB LR	12	B	0.01	14	B	0.03

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

As indicated, the proposed site access points on Mountain Road will provide excellent operations (LOS B or better) during both the AM and PM peak hours.

4.4 TURN LANE REQUIREMENTS

MTO guidelines suggest that an exclusive right turn lane be considered where right turn volumes exceed 60 vehicles per hour and impede the operations of through traffic. Given the limited volumes turning right at the site access points (less than 5 trips), a dedicated right turn lane is not required.

With respect to a left turn lane, the proposed widening of Mountain Road will provide a continuous centre turn lane to accommodate left turning traffic.

5 Summary

Proposed Development

The study has addressed the transportation impacts associated with the proposed industrial development to be located at 140 Mountain Road in the Town of Collingwood. Upon completion, the development is expected to generate an additional 25 trips during the AM peak hour and 25 trips during the PM peak hour.

Sight Line Assessment

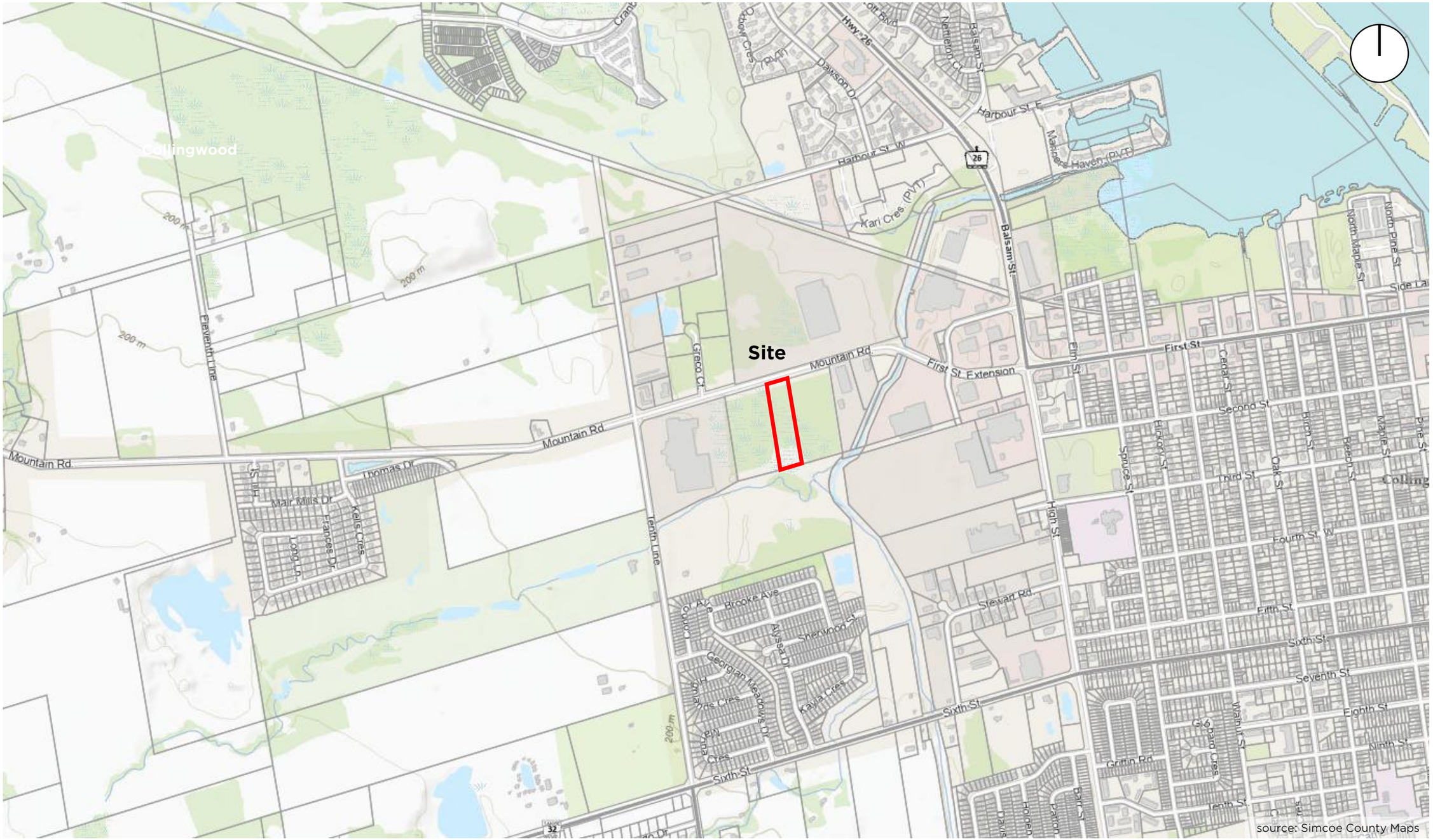
The available sight lines along Mountain Road at the proposed site access points were reviewed in context of TAC guidelines for minimum stopping sight and intersection sight distances. Given the relatively straight and flat alignment of Mountain Road, the available sight lines (>150 metres in both directions) satisfy the TAC minimum sight distance requirements for a design speed of 70 km/h (10 km/h over the posted speed limit).

Transportation Impacts

In addressing the study area traffic operations, the road section operations along Mountain Road were analysed under existing (2022) and future (2027) conditions. The review also included an assessment of the site access operations under future conditions. Based on the assessment of existing and future conditions, no improvements are required to support the proposed development.

Turn Lane Requirements

Given the limited volumes accessing the site, an exclusive right turn lane is not warranted on Mountain Road at either site access. Furthermore, the proposed widening of Mountain Road will provide a continuous centre turn lane to accommodate left turning traffic.



source: Simcoe County Maps

140 MOUNTAIN ROAD

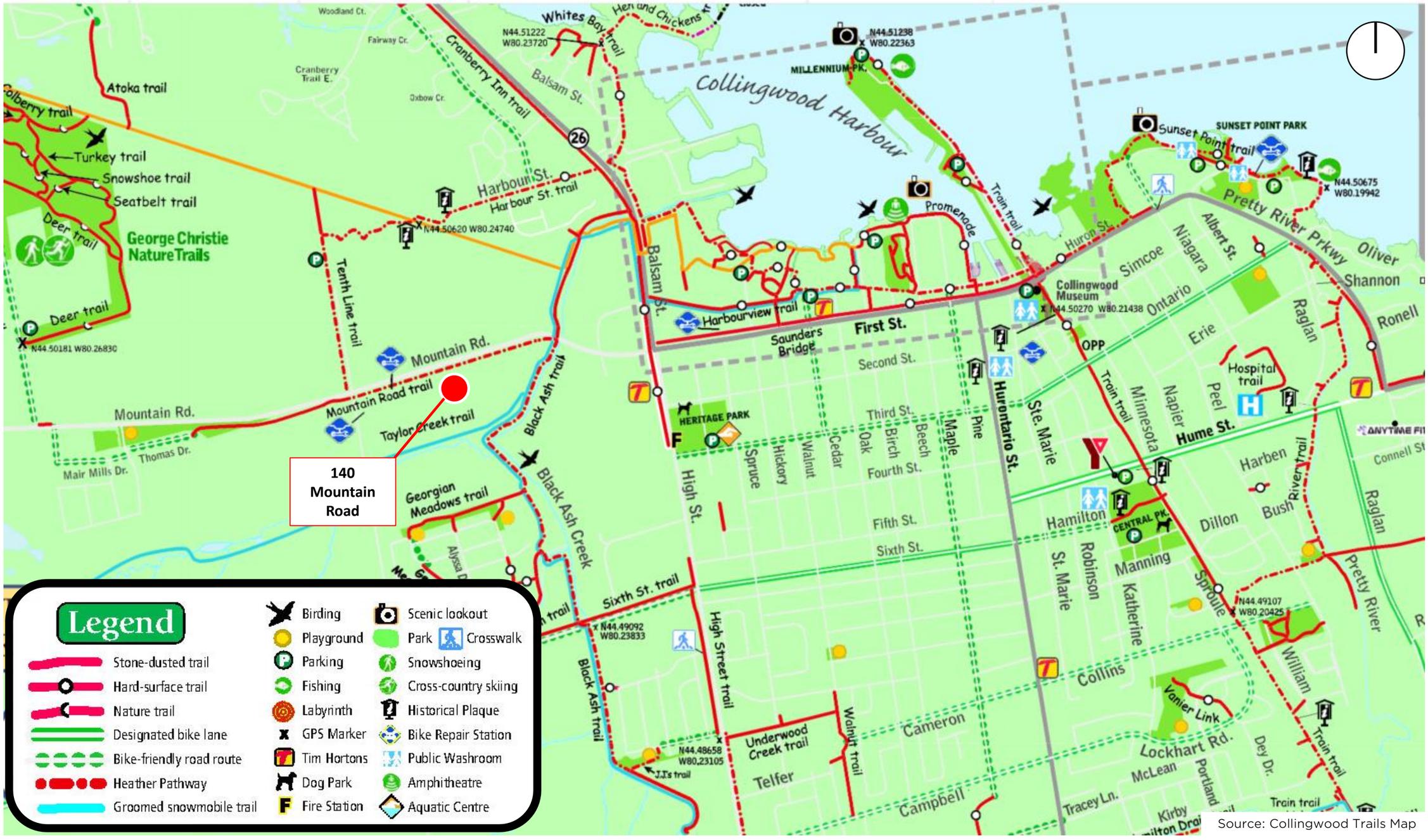
Figure 1: Site Location

140 MOUNTAIN ROAD

Figure 2: Area Road Network

Looking east along Mountain Road from the frontage of the site

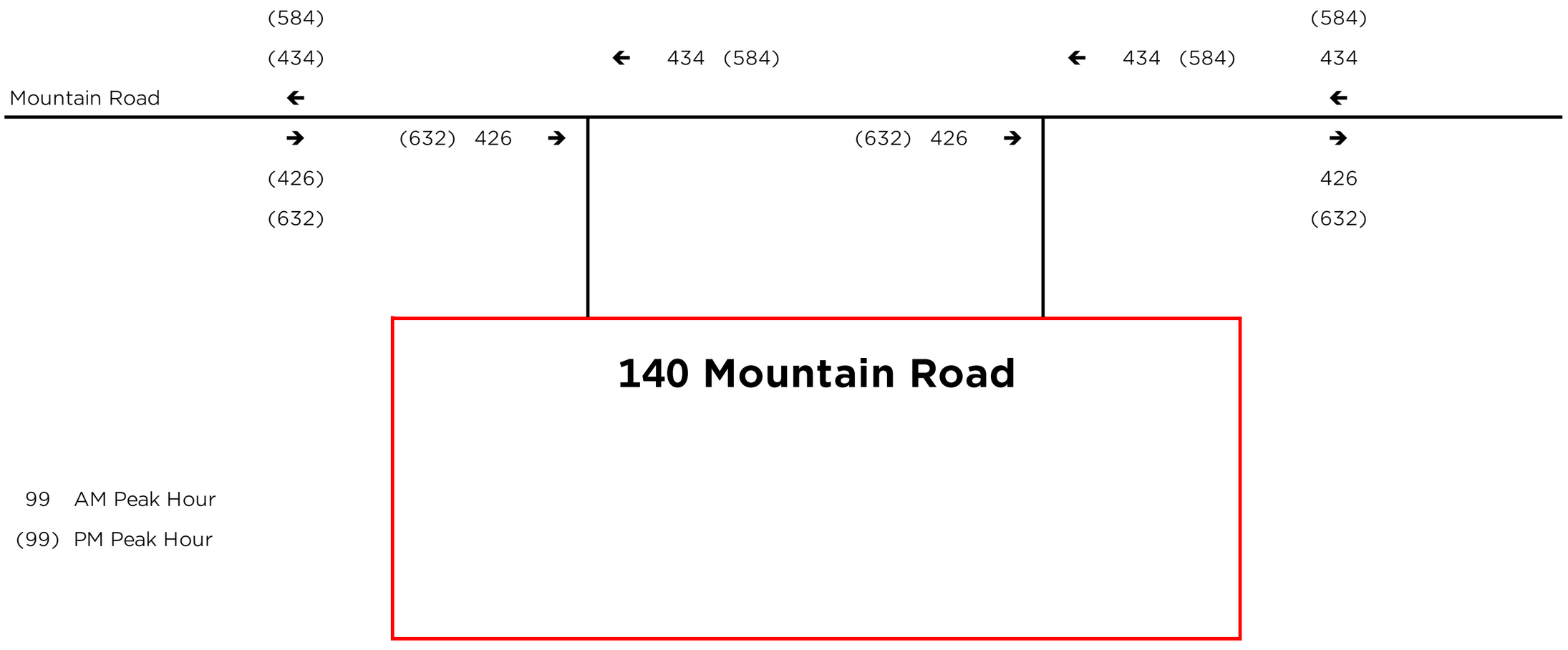
Looking west along Mountain Road from the frontage of the site



Source: Collingwood Trails Map

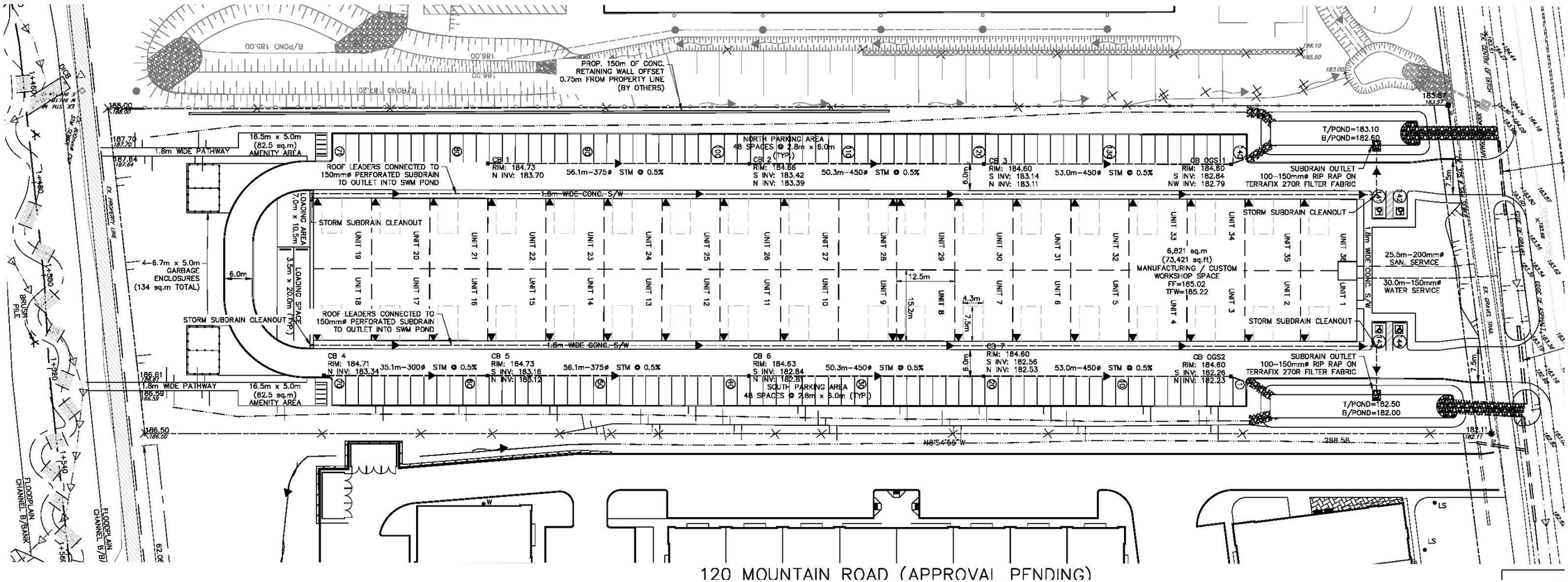
140 MOUNTAIN ROAD

Figure 3: Area Trails Network



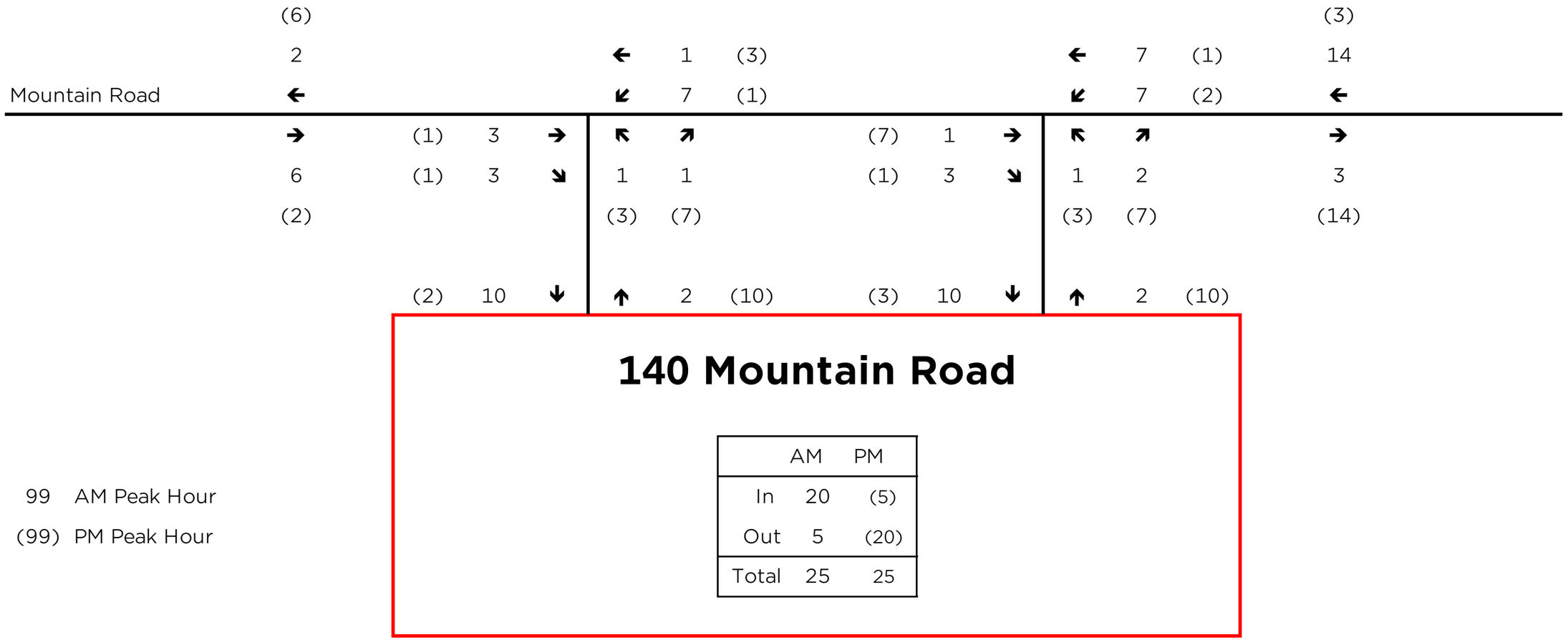
140 MOUNTAIN ROAD

Figure 4: Traffic Volumes - 2022



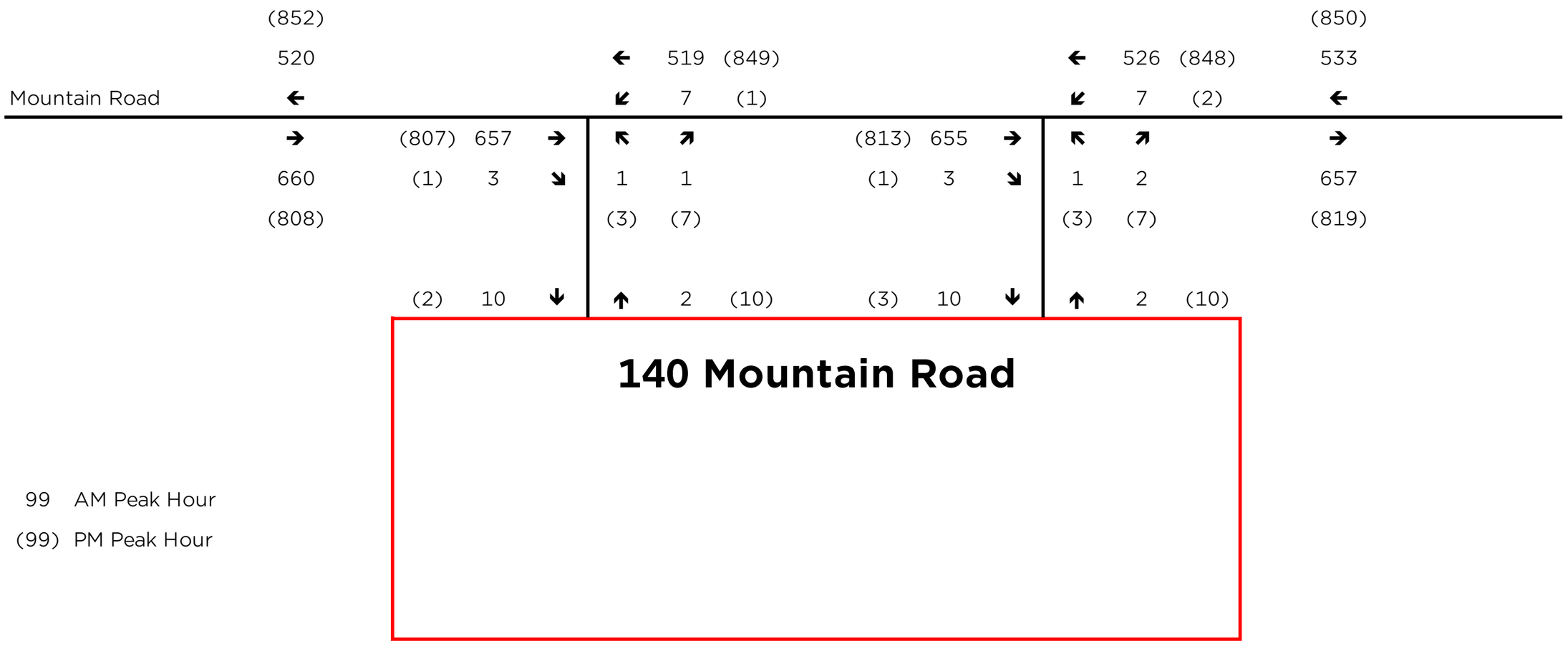
140 MOUNTAIN ROAD

Figure 5: Site Plan



140 MOUNTAIN ROAD

Figure 6: Traffic Volumes – 140 Mountain Road



99 AM Peak Hour

(99) PM Peak Hour

140 MOUNTAIN ROAD

Figure 7: Traffic Volumes - 2027

Appendix A: Collingwood Transportation Study Update Excerpts

Collingwood Transportation Study Update

Town of Collingwood
97 Hurontario Street
Collingwood, ON L9Y 3Z5

R.J. Burnside & Associates Limited
3 Ronell Crescent
Collingwood ON L9Y 4J6 CANADA

August 2019
300043606.0000

2.4 Existing Traffic Volumes

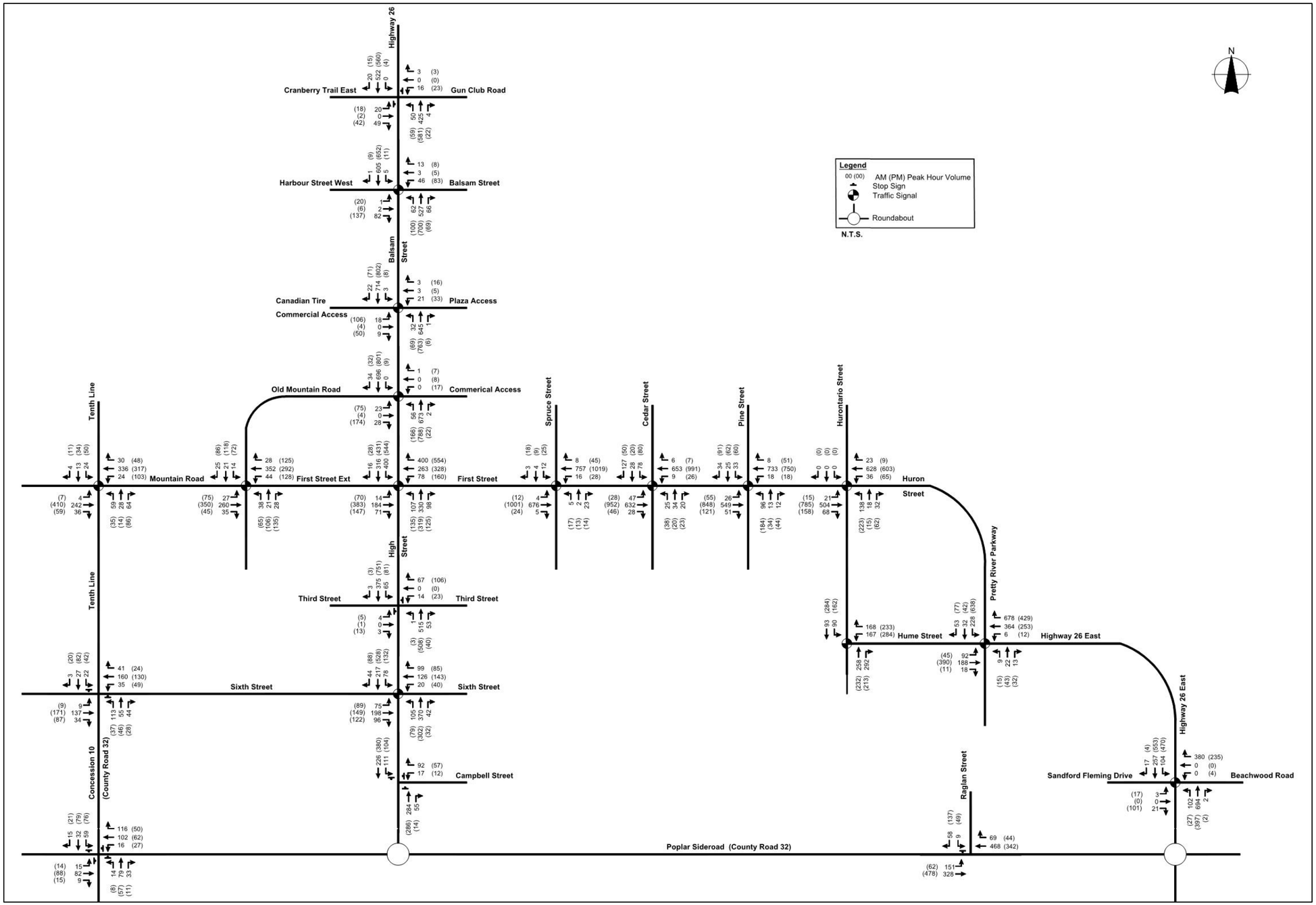
Turning Movement Counts (TMCs) were conducted on behalf of Burnside by Ontario Traffic Inc. (OTI) at the 20 key intersections in the Study Area on Wednesday, December 12, 2018. Data was collected at each intersection between 7:00 AM to 9:00 AM, 11:00 AM to 2:00 PM, and 3:00 PM to 6:00 PM. The TMC data for the AM and PM peak periods is provided in Appendix A (data for the 11:00 AM to 2:00 PM period will be provided to the Town digitally).

Since the proposed Sandford Fleming Drive connection to the Beachwood Road/Highway 26 intersection has been included as an existing condition, minor turning volumes were added to the Sandford Fleming Drive leg of the intersection based on assumed traffic generation and distribution for the surrounding land uses.

The weekday AM and PM peak periods were selected for analysis purposes as these time periods represent the typical peak periods throughout the Town's road network. Often, for tourist/recreational locations such as Collingwood, traffic volumes are highest in the summer months. Since the TMCs for this study were collected on December 12, the data was compared with historic summer and winter traffic counts from various sources (e.g. Town, County, traffic studies from other consultants) to determine what overall seasonal adjustment factor should be applied. The results of our comparisons indicated that the application of a 5.0% adjustment factor would be most reasonable, therefore the TMC volumes were increased by 5.0% to represent existing summer weekday conditions.

The existing traffic volumes, which include the application of the seasonal adjustment factor outlined above, are illustrated in Figure 4.

Figure 4: Existing Traffic Volumes



5.0 Town of Collingwood Future Developments

5.1 Proposed Development Details

To more precisely estimate traffic growth in specific locations in the Town, the type, size, location, status, and phasing of various developments have been considered. A map of the future development locations, prepared by Cole Engineering, is illustrated in Figure 10.

Developments anticipated to be completed and occupied by horizon years 2031 and 2041 were considered in this study. The assumed percentage occupancy of each development within the 2031 and 2041time periods was estimated by Burnside based on the most recent information available and confirmed by Town staff. Details on all developments considered in the traffic volume projections and analysis in this study, including the assumed percentage occupancy and corresponding numerical identifiers in relation to the map in Figure 10, have been summarized in Table 15 and Table 16 for horizon years 2031 and 2041, respectively.

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

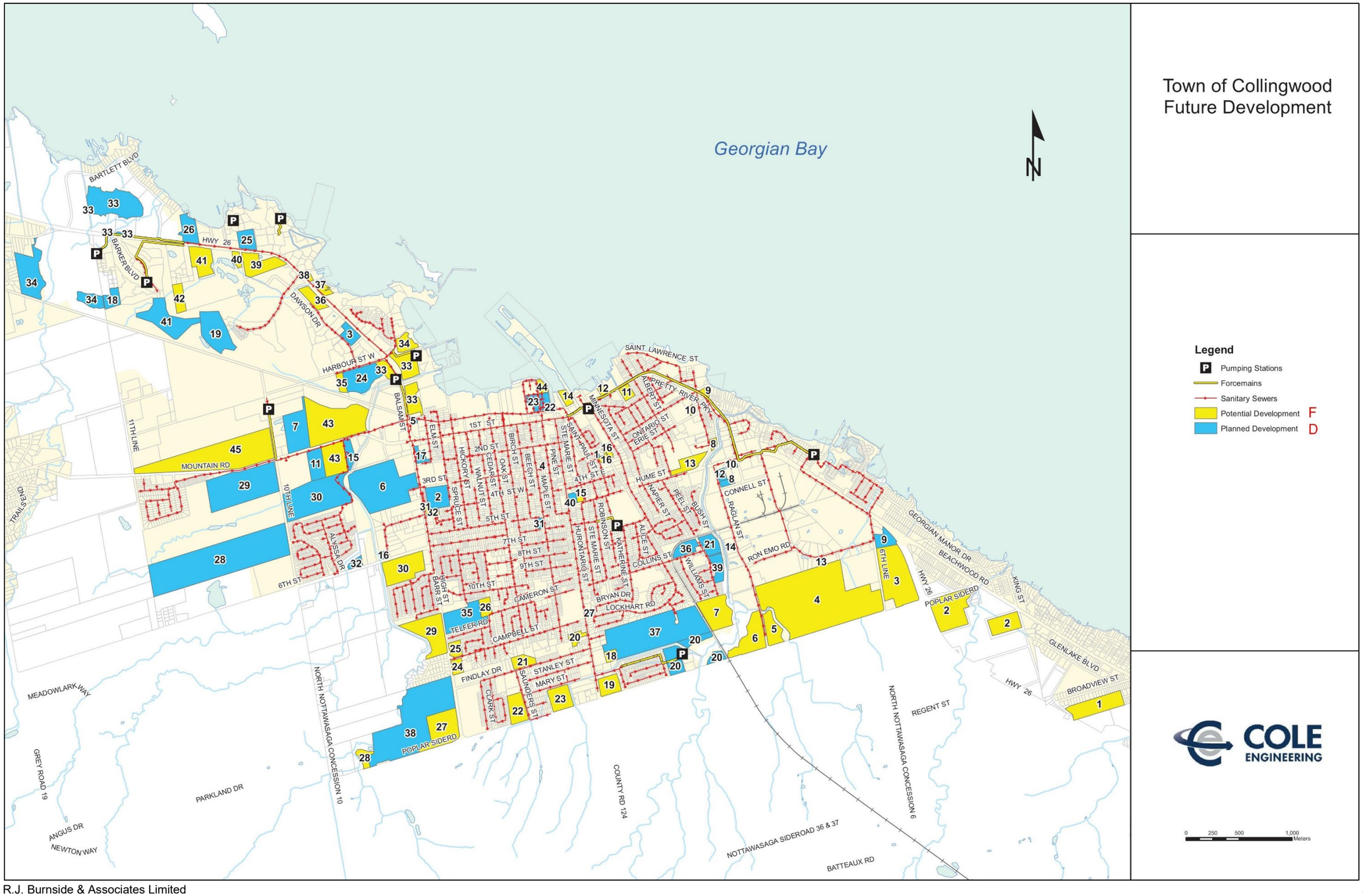


Table 15: Town of Collingwood Medium-Term Developments (Horizon Year 2031)

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

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

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

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

5.2 Development Traffic Generation

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

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

Table 17: Proposed Development Trip Generations Estimates

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

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

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

-	AM Peak Hour			PM Peak Hour		
	In	Out	Tot.	In	Out	Tot.
2031 Total Development Traffic**	1,800	2,861	4,661	3,658	3,167	6,825
2041 Total Development Traffic**	3,584	5,025	8,609	6,069	5,541	11,610

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

** Includes 2031 Total Development Traffic amounts.

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

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

Figure 13: 2031 Total Traffic Volumes

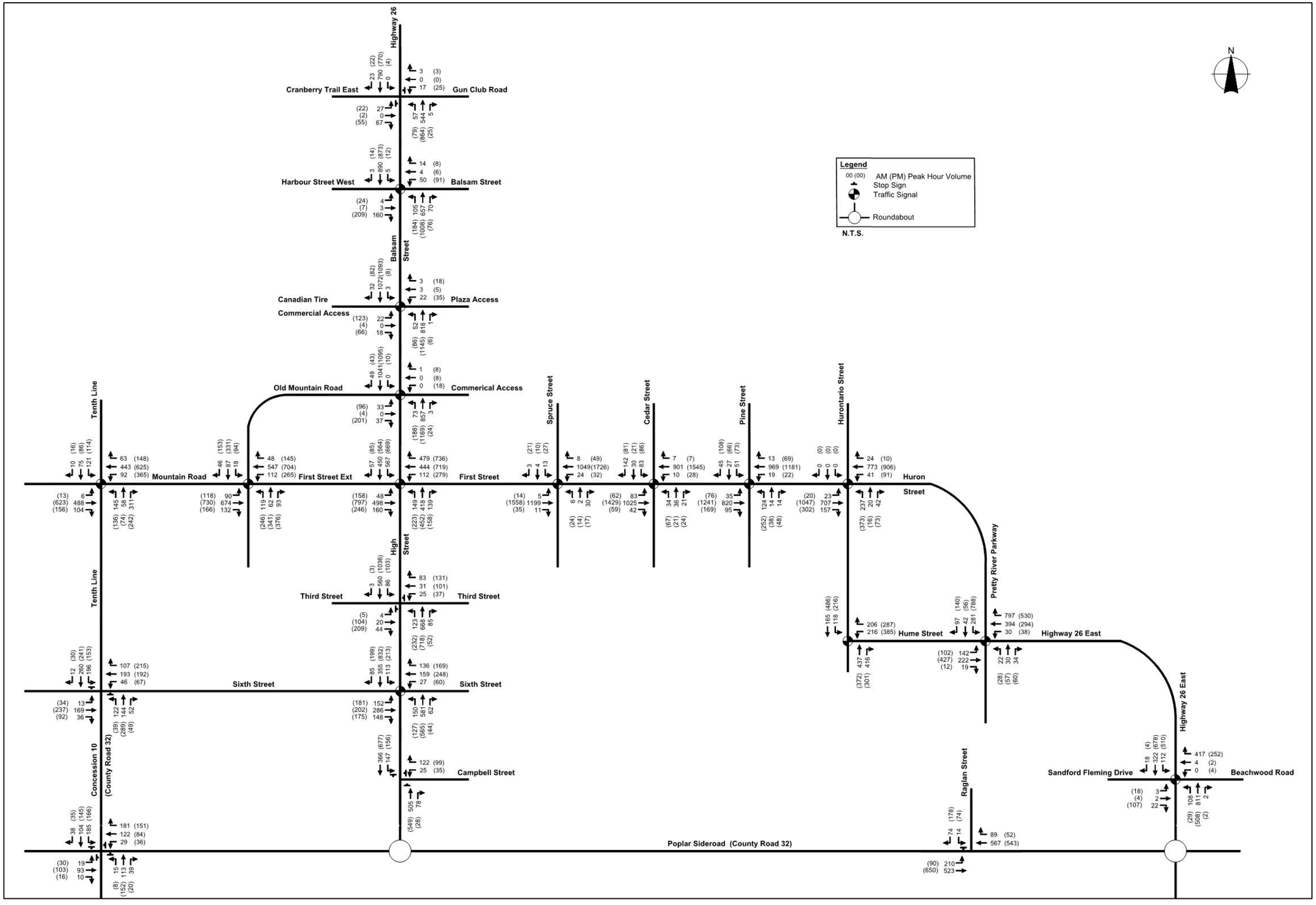
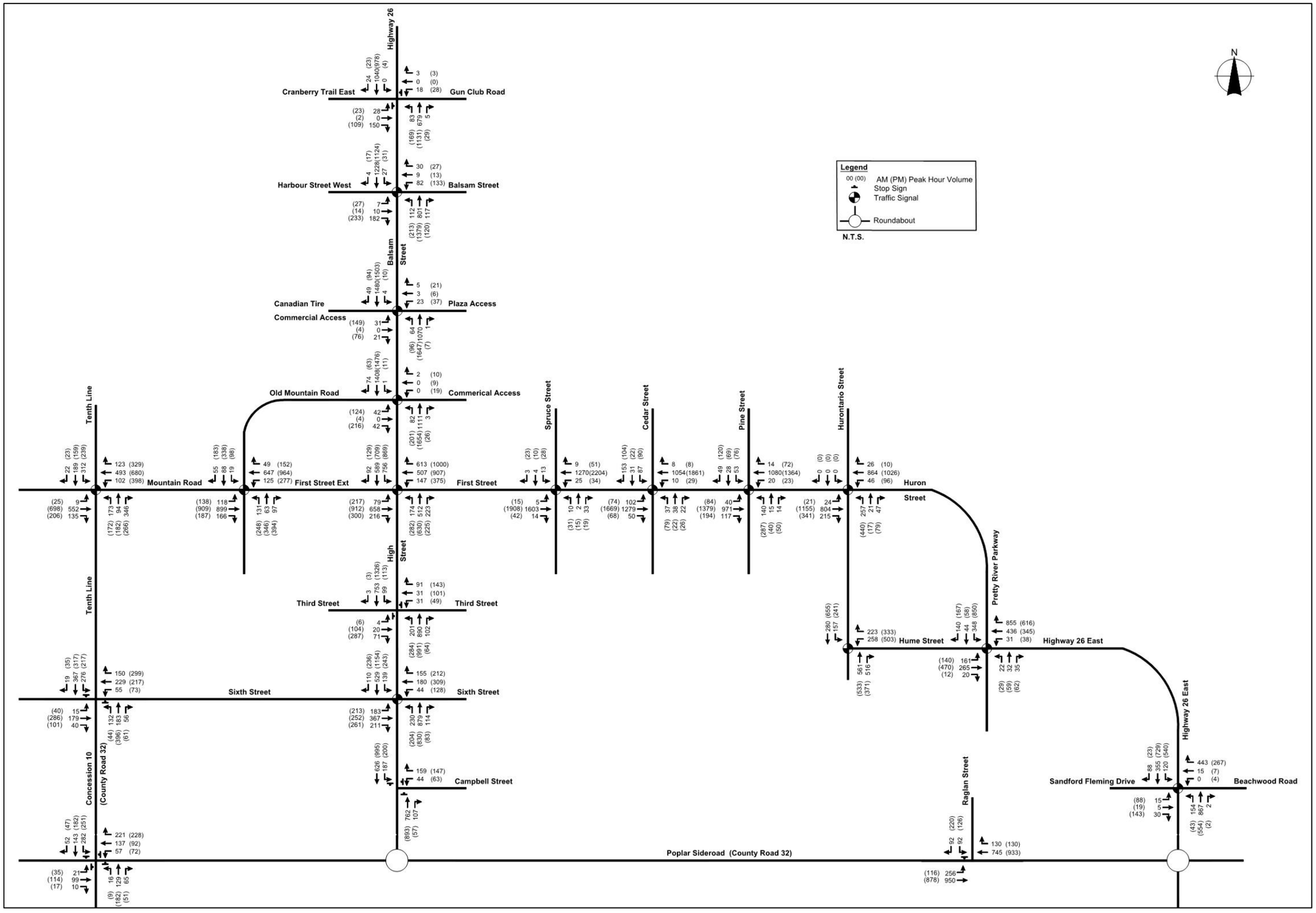


Figure 14: 2041 Total Traffic Volumes



Appendix B:
Traffic Operations

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	655	3	7	526	1	2
Future Volume (Veh/h)	655	3	7	526	1	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	809	4	9	649	1	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			813		1154	406
vC1, stage 1 conf vol					811	
vC2, stage 2 conf vol					342	
vCu, unblocked vol			813		1154	406
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			810		365	594

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	539	274	9	324	324	3
Volume Left	0	0	9	0	0	1
Volume Right	0	4	0	0	0	2
cSH	1700	1700	810	1700	1700	491
Volume to Capacity	0.32	0.16	0.01	0.19	0.19	0.01
Queue Length 95th (m)	0.0	0.0	0.3	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	9.5	0.0	0.0	12.4
Lane LOS			A			B
Approach Delay (s)	0.0		0.1			12.4
Approach LOS						B

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	28.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	657	3	7	519	1	1
Future Volume (Veh/h)	657	3	7	519	1	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	811	4	9	641	1	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			815		1152	408
vC1, stage 1 conf vol					813	
vC2, stage 2 conf vol					338	
vCu, unblocked vol			815		1152	408
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			808		365	593

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	541	274	9	320	320	2
Volume Left	0	0	9	0	0	1
Volume Right	0	4	0	0	0	1
cSH	1700	1700	808	1700	1700	452
Volume to Capacity	0.32	0.16	0.01	0.19	0.19	0.00
Queue Length 95th (m)	0.0	0.0	0.3	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	9.5	0.0	0.0	13.0
Lane LOS			A			B
Approach Delay (s)	0.0		0.1			13.0
Approach LOS						B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	28.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	813	1	2	848	3	7
Future Volume (Veh/h)	813	1	2	848	3	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	1004	1	2	1047	4	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			1005		1532	502
vC1, stage 1 conf vol					1004	
vC2, stage 2 conf vol					528	
vCu, unblocked vol			1005		1532	502
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	98
cM capacity (veh/h)			685		281	514

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	669	336	2	524	524	13
Volume Left	0	0	2	0	0	4
Volume Right	0	1	0	0	0	9
cSH	1700	1700	685	1700	1700	410
Volume to Capacity	0.39	0.20	0.00	0.31	0.31	0.03
Queue Length 95th (m)	0.0	0.0	0.1	0.0	0.0	0.7
Control Delay (s)	0.0	0.0	10.3	0.0	0.0	14.1
Lane LOS			B			B
Approach Delay (s)	0.0		0.0			14.1
Approach LOS						B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	33.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	807	1	1	849	3	7
Future Volume (Veh/h)	807	1	1	849	3	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	996	1	1	1048	4	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			997		1522	498
vC1, stage 1 conf vol					996	
vC2, stage 2 conf vol					526	
vCu, unblocked vol			997		1522	498
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	98
cM capacity (veh/h)			690		284	517

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	664	333	1	524	524	13
Volume Left	0	0	1	0	0	4
Volume Right	0	1	0	0	0	9
cSH	1700	1700	690	1700	1700	413
Volume to Capacity	0.39	0.20	0.00	0.31	0.31	0.03
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.7
Control Delay (s)	0.0	0.0	10.2	0.0	0.0	14.0
Lane LOS			B			B
Approach Delay (s)	0.0		0.0			14.0
Approach LOS						B

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	33.5%	ICU Level of Service		A
Analysis Period (min)	15			