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372 Grey Road 21

TRAFFIC IMPACT BRIEF

Rhemm Properties Ltd.

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Issue	Date	Description
1	January 17, 2024	Final Report
2	July 26, 2024	Revised Site Plan
3	April 11, 2025	Revised Site Plan
4	July 23, 2025	Revised Site Plan
5	April 9, 2026	Updated per review comments
6	June 30, 2026	Revised Site Plan

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1 Introduction

Tatham Engineering Limited has been retained by Rhemm Properties Ltd. to prepare a traffic impact brief to support a Draft Plan of Subdivision Application for a residential development at 372 Grey Road 21 in the Town of The Blue Mountains. The location of the development site is illustrated in Figure 1.

The purpose of this study is to review the proposed development from a transportation perspective, addressing site traffic volumes, on-site circulation, parking requirements and potential impacts to the adjacent road system. 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
- potential transportation impacts associated with the proposed development.

An initial traffic impact brief was issued on January 17, 2024, which addressed a previous development proposal consisting of 39 detached residential units and 28 semi-detached units. The development plan was subsequently revised on several occasions warranting several updates to the brief. The fourth version was submitted for MTO to review with the fifth version issued to address MTO comments.

2 Existing Conditions

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

2.1 ROAD NETWORK

The road network to be addressed by this study consists of Highway 26, Lakeshore Road East and their respective intersection. Mapping and photographs of the road network are provided in Figure 2 with further details provided below.

Highway 26

Key elements and characteristics of Highway 26 are as follows:

- under the jurisdiction of MTO and designated a Class 2B Arterial as per the MTO's *Highway Access Management Guideline*;
- oriented east-west through the study area;
- 1 travel lane per direction with a paved road surface, paved shoulders and a rural cross-section;
- posted speed limit of 70 km/h through the study area;
- wide curve (radius of approximately 600 metres) and flat alignment within the immediate study area; and
- assumed planning capacity of 900 vehicles per hour per lane (vphpl) reflective of its arterial road designation.

Lakeshore Road East

Lakeshore Road East has the following characteristics:

- under the jurisdiction of the Town of The Blue Mountains and designated a local road under the Town's *Official Plan*;
- generally oriented parallel to Highway 26 (i.e. east-west), reorients to a north-south alignment where it intersects with Highway 26;
- 1 travel lane per direction with a rural cross-section and a paved road surface;
- posted speed limit of 50 km/h; and
- assumed planning capacity of 400 vphpl reflective of its local road status.

Highway 26 & Lakeshore Road East/Fraser Crescent

The intersection of Highway 26 with Lakeshore Road East/Fraser Crescent is a 4-leg, unsignalized intersection, with stop control on Lakeshore Road East and Fraser Crescent (the south and north legs). As evident in Figure 2, the north, west and south approaches each consist of a single shared left-through-right lane. A westbound left turn lane was recently constructed on the east approach, consisting of a 30-metre storage lane, a 60-metre parallel lane and a 140-metre taper (as determined from field measures). Otherwise, the east approach has a shared through-right lane.

2.2 TRANSIT NETWORK

Blue Mountain Transit operates between the Blue Mountain Resort and Craigleith areas and the Town of Collingwood, including connections to the remaining transit routes within Collingwood and immediate areas (including Wasaga Beach) via the Collingwood Main Terminal. Through the study area, Blue Mountain Transit operates along Highway 26, Lakeshore Road East and Timmons Street, as illustrated in Figure 3. It is noted that service is provided in a loop within the Blue Mountain Resort and Craigleith area, operating in a clockwise fashion (and thus only eastbound service is provided in the area of the subject site). The closest bus stop is provided on Timmons Street, approximately 250 metres from the subject site (albeit such may not be directly accessible); another stop is provided on Lakeshore Road East, approximately 1,400 metres from the site (refer to Figure 3).

2.3 TRAFFIC VOLUMES

2.3.1 Traffic Counts

Previous versions of this study utilized older count data gathered in support of other development applications. At MTO's request, new counts were undertaken at the intersection of Highway 26 with Lakeshore Road East. The counts were conducted on Thursday, February 12, 2026, from 07:00 to 09:00, 11:00 to 14:00, and 15:00 to 18:00. The observed traffic volumes are illustrated in Figure 4, with detailed count sheets provided in Appendix A.

2.3.2 Adjustments

Traffic volumes on many roads are typically highest during the summer months owing to increased recreational/leisure travel. As the traffic counts noted above were completed in February (reflective of winter volumes), the need to apply a seasonal adjustment was reviewed.

MTO publishes Annual Average Daily Traffic (AADT), Summer Average Daily Traffic (SADT), and Winter Average Daily Traffic (WADT) volumes for all provincial highways[1]. The historical AADT, SADT, and WADT volumes on Highway 26 between Grey Road 19 and Grey Road 21 were reviewed for the period 2015 to 2021 (the most recent data available) to establish any seasonal variations that may exist. The corresponding volumes and their respective ratios are summarized in **Error! Reference source not found.**. Data is not available for the year 2020. As indicated, the a vailable data indicates that SADT volumes on this section of Highway 26 are in the order of 55% greater than WADT volumes.

Table 1: Highway 26 Traffic Volumes (Grey Road 19 to 21)

YEAR	AADT	SADT	WADT	SADT/AADT	SADT/WADT
2015	8,600	10,500	7,300	1.22	1.44
2016	8,700	10,600	7,400	1.22	1.43
2017	9,050	12,100	7,350	1.34	1.65
2018	9,150	12,200	7,450	1.33	1.64
2019	9,200	12,300	7,500	1.34	1.64
2021	9,350	12,200	7,650	1.30	1.59
Average				**1.29**	**1.56**

The observed mainline volumes on Highway 26, as per Figure 4, are in the order of 1,100 total vehicles during the weekday AM peak hour, and 1,300 total vehicles during the weekday PM peak hour. These volumes are comparable in magnitude to the 2025 baseline projections detailed in the previous version of this study (mainline volumes in the order of 1,000 and 1,300 AM and PM peak trips, respectively), which were developed from older traffic data collected in the summer. As such, the increase in average daily traffic during the summer season is likely indicative of increases in predominantly off-peak traffic volumes, rather than on-peak traffic volumes. Notwithstanding, the observed peak hour volumes were increased by a factor of 1.2 (i.e. 20%) to ensure a more conservative assessment.

The resulting 2026 traffic volumes are illustrated in Figure 5.

[1] *Provincial Highways Traffic Volumes 1988-2019*. Ministry of Transportation of Ontario.

2.4 TRAFFIC OPERATIONS

The assessment of existing conditions provides the baseline from which the future traffic volumes and operations can be assessed. Operations at the study area intersection and along the highway approaches have been considered as detailed in the following sections (as intersections are typically the bottleneck of the road system, their operations are more critical).

2.4.1 Intersection Operations

The intersection analyses were completed to investigate the operations of the Highway 26 intersection with Lakeshore Road East/Fraser Crescent based on:

- the 2026 traffic volumes (employing a minimum of 2 vehicles per turning movement);
- the existing intersection configurations and controls; and
- procedures outlined in the *2000 Highway Capacity Manual*[2] (using Synchro v.12 software).

For unsignalized intersections, the review considers the following metrics for the critical, stop controlled movements/approaches:

- average delay (measured in seconds);
- level of service (LOS) - level of service 'A' corresponds to the best operating condition with minimal delays whereas level of service 'F' corresponds to poor operations resulting from high intersection delays (level of service definitions are provided in Appendix B); and
- volume to capacity (v/c) ratios – a v/c ratio of less than 1.00 indicates the intersection movement/approach is operating at less than capacity while v/c of 1.00 indicates capacity has been reached.

A summary of the 2026 intersection analyses is provided in Table 2; corresponding detailed operational worksheets are included in Appendix C. Based on the existing volumes, intersection configurations and controls, the study area intersection provides acceptable levels of service (LOS E or better) during both peak hours. As such, no intersection improvements are required to support the existing conditions.

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

Table 2: Intersection Operations – 2026

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Highway 26 & Lakeshore Rd E/ Fraser Crescent	NB LTR	stop	17	C	0.04	26	D	0.05
	SB LTR	stop	27	D	0.02	37	E	0.03

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

2.4.2 Road Operations

Further to the intersection operations, consideration has also been given to the operations of Highway 26 considering the following:

- the peak hour peak directional traffic volumes;
- an assumed lane capacity of 900 vehicles per hour per lane (vphpl); and
- the provision of one through lane per direction.

The resulting road operations are summarized in Table 3. As noted, based on the existing volumes, Highway 26 is currently operating at or near its assumed planning capacity (85% to 99%) and thus there is limited reserve capacity to accommodate additional growth. As previously noted, however, the intersections will serve as the bottlenecks of the transportation system and provided they can operate acceptably, so too will the highway itself.

Table 3: Road Operations – 2026

ROAD SECTION & DIRECTIONAL CAPACITY		PEAK TRAFFIC VOLUMES		PEAK V/C RATIOS	
		EB	WB	EB	WB
Highway 26 East of Lakeshore Road E	900 vph	891	768	0.99	0.85
Highway 26 West of Lakeshore Road E	900 vph	885	767	0.98	0.85

3 Proposed Development

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

3.1 LOCATION & LAND-USE

The subject site is located at 372 Grey Road 21 in the Town of The Blue Mountains (Craigleith area) as per Figure 1. The property is bound by the Georgian Trail to the north and east, the Trailshead residential development to the northwest (additional details on this and other developments provided in Chapter 4), and vacant land to the south and southwest.

The proposed development will consist of 47 single detached units and 6 semi-detached units as detailed in the Concept Plan provided in Figure 6. In addition, the detached units on Lots 32 through 53 (22 in total) are proposed to be configured to allow for an accessory dwelling unit (i.e. basement apartment), which could result in an additional 22 potential dwelling units within the development. It is noted that the development of the accessory units is subject to the individual owners and thus may not be realized. For the purpose of this study, it is assumed that all 22 accessory units will be developed, which results in the most conservative estimate of the impact of the proposed development (53 detached units + 22 accessory units).

Full build-out is assumed by 2030 recognizing that it will be contingent on the completion of the Trailshead development (or a portion thereof).

3.2 SITE ACCESS

Access to the existing road network (i.e. Lakeshore Road East and Highway 26) will be provided by means of a connection near the northwest corner of the subject site to a future municipal road to be constructed as part of the Trailshead residential development, as illustrated Figure 7 and further detailed in Section 4.2.2.

3.3 SITE CIRCULATION

The site will be served by a network of new municipal roads with widths of 8.5 metres and minimum 12.0 metre centreline turn radii. This will readily accommodate the manoeuvring requirements of typical design vehicles, including passenger vehicles, waste collection trucks and emergency response vehicles (e.g. fire trucks). A temporary hammerhead turnaround is provided at the south limit of the site to facilitate turnaround of large vehicles (to be in place until the road is extended further south to service future development).

3.4 SITE PARKING

As per the Town of The Blue Mountains Zoning By-law 2018-65, a single detached or semi-detached residential development must provide 2 parking spaces per unit, whereas an accessory dwelling unit must provide 1 space per unit.

Each residential unit will be provided with a minimum of 2 parking spaces between the driveway and garage, thus satisfying the Town's requirement. For those units with provisions for accessory dwelling units, an additional parking space will be provided (minimum of 3 in total for the associated residential unit).

3.5 SITE TRAFFIC

3.5.1 Trip Generation

The number of vehicle trips to be generated by the proposed development for the weekday AM and PM peak hours has been determined based on type of use, development size, and trip generation rates as per the *ITE Trip Generation Manual, 12th Edition*[3]. Based on the proposed development, trip rates for the following ITE land use category have been employed:

- *single family detached* – ITE land-use code 210; and
- *single family attached* – ITE land-use code 215.

ITE trip rates are provided in Table 4 with the associated trip estimates provided in Table 5. For both LUC 210 and 215, ITE provides average trip generation rates as well as a fitted curve equation. For this development, use of the fitted curve equation for LUC 210 and average rates for LUC 215 results in the highest trip estimates for the proposed development.

As indicated, the proposed development is expected to generate 51 trips during the AM peak hour and 64 trips during the PM peak hour, assuming all of the potential accessory dwelling units are realized.

Table 4: Trip Rates – 372 Grey Road 21

LAND USE	VARIABLE	WEEKDAY AM PEAK HOUR	WEEKDAY PM PEAK HOUR
single family detached (LUC 210)	trips per unit (fitted curve)	T = 0.67(X) + 5.59 27% in; 73% out	ln(T) = 0.92ln(X) + 0.33 62% in; 38% out
single family attached (LUC 215)	trips per unit (average)	0.47 25% in; 75% out	0.51 57% in; 43% out

[3] *Trip Generation Manual, 12th Edition*. Institute of Transportation Engineers, August 2025.

Table 5: Trip Estimates – 372 Grey Road 21

LAND USE	SIZE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		In	Out	Total	In	Out	Total
single and semi-detached units (LUC 210)	53 units	11	30	41	33	20	53
accessory units (LUC 215)	22 units	2	8	10	6	5	11
Total	**75 units**	**13**	**38**	**51**	**39**	**25**	**64**

3.5.2 Trip Distribution & Assignment

The distribution of the site traffic volumes reflects the proximity of the development site to the Town of The Blue Mountains to the west and the Town of Collingwood to the east and considers the assumptions of the *Aquavil Traffic Impact Study*. For purposes of this assessment, the following distribution has been assumed:

- 45% to/from the west via Highway 26; and
- 55% to/from the east via Highway 26.

The resulting site generated traffic assigned to the road network is illustrated in Figure 8, assuming that all traffic will be oriented to/from Highway 12 via its intersection with Lakeshore Road East.

4 Future Conditions

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

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

For the purpose of this study, 2030 and 2035 horizons have been considered to assess the impact of the development on the road network – 2030 represents the assumed full build-out of the site (contingent on the completion of the Trailshead development), whereas 2035 reflects a further 5-year horizon.

4.1 ROAD NETWORK

A Municipal Class Environmental Assessment (Class EA) was initiated in 2015 by the Town of The Blue Mountains, the County of Grey and the MTO to investigate improvements to the Highway 26 corridor and surrounding road networks between Grey Road 19 and Grey Road 21. As per information presented at the 2018 Public Information Centre, the following road system improvements have been identified within the study area:

- realignment of the intersection of Lakeshore Road East with Highway 26 to a new alignment further west of the existing intersection;
- addition of a dedicated westbound left turn lane on Highway 26 at the new intersection; and
- closure of the west connection of Fraser Crescent to Highway 26 (located opposite Lakeshore Road East).

It is acknowledged that the improvements identified in the Class EA have yet to be implemented (albeit a westbound left turn lane has been constructed on Highway 26 at the existing Lakeshore Road East intersection) and as such, the existing road system remains in its current configuration for future horizons.

4.2 TRAFFIC VOLUMES

4.2.1 Background Growth

Based on the historical MTO traffic data presented in Table 1, the average annual daily traffic on Highway 26 has grown by approximately 1.4% per annum between 2015 and 2021. Notwithstanding, as requested by MTO, a background growth rate of 2.0% per annum has been applied to the through volumes on Highway 26 through the 2035 horizon.

No background growth has been applied to Lakeshore Road East. Given its function as a local road, any increases in traffic volumes on Lakeshore Road will be driven by new development along its length rather than other growth beyond the corridor. This local development growth has been addressed separately in the following section.

4.2.2 Background Developments

In addition to the noted background growth, several other developments were identified within the study area which will contribute additional traffic volumes to the study area network. The location of each development is illustrated in Figure 10. Details of each are summarized below; excerpts from their respective traffic studies and their individual distribution of trips through the study area network are provided in Appendix D. All noted developments are assumed to be fully built-out by the 2030 horizon.

Trailshead

The Trailshead development is a residential development consisting of a total of 202 single detached and townhouse units, located immediately west of the subject site and through which the subject site will have access to Lakeshore Road. Trip generation and distribution was obtained from the appendices of the *Aquavil Traffic Impact Study*[4]. Fully built out, the site is expected to generate a total of 91 trips during the weekday AM peak hour and 109 trips during the weekday PM peak hour.

Aquavil

The Aquavil development is a large, mixed-use development located north of Highway 26, centred around Brophy's Lane (approximately 1 km northeast of the subject site). Per the *Aquavil Traffic Impact Study*, the development proposed contains a total of approximately 480 residential units (a mix of apartments, detached, semi-detached/townhouses, and senior's residences) and 9,100 m^2 of commercial/retail space, to be constructed in two phases. Trip generation and distribution was obtained from the *Aquavil Traffic Impact Study*. Fully built out, the site is expected to generate 259 trips during the weekday AM peak hour and 589 trips during the weekday PM peak hour.

Parkbridge Craigleith

The Parkbridge Craigleith development is a residential development located along Lakeshore Road, approximately 1 km west of the subject site and adjacent to the *Blue Trails* development. The Parkbridge development consists of a total of 211 single detached and townhouse units. Trip

[4] *Aquavil Traffic Impact Study.* Crozier Consulting Engineers, September 2019.

generation and distribution was obtained from the appendices of the *Aquavil Traffic Impact Study*. Fully built out, the site is expected to generate 133 trips during the weekday AM peak hour and 175 trips during the weekday PM peak hour.

209806 Highway 26

209806 Highway 26 is a small residential development located on Highway 26 (opposite Blue Mountain Drive) consisting of 17 townhouse units on the site of a former motel. Trip generation details were obtained from the *209806 Highway 26 Traffic Impact Brief*[5]. Fully built out, the site is expected to generate 8 trips during the weekday AM peak hour and 10 trips during the weekday PM peak hour. Given the very low trip generation of this site, it is assumed that any traffic travelling through the subject study area is captured in the background growth applied to Highway 26.

Background Development Trips

A summary of the additional vehicle trips expected to be generated by each noted background development is provided in Table 6.

Table 6: Background Development Trips

DEVELOPMENT	SIZE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		In	Out	Total	In	Out	Total
Trailshead	225 units	16	75	91	73	36	109
Aquavil	480 units 9,100 m^2 commerical	100	159	259	310	279	589
Parkbridge Craigleith	211 units	32	101	133	111	64	175
Total		**148**	**335**	**483**	**494**	**379**	**873**

Based on the trip assignment presented in their respective studies, the trips from these developments were assigned through the study area road network. The combined traffic from all developments is illustrated in Figure 10 with individual assignment from each development presented in Appendix D.

[5] *209806 Highway 26 Traffic Impact Brief*. Tatham Engineering Ltd. July 4, 2022.

4.2.3 Traffic Volumes

Traffic projections for the 2030 and 2035 horizon years were developed both with and without the subject development.

Future Background

The future background traffic volumes (i.e. without the subject development) are illustrated in Figure 11 and Figure 12 and have been determined from the following:

- the 2026 volumes;
- the noted background growth rate on each road; and
- additional volumes contributed by the noted background developments.

It is noted that the effective growth rate on Highway 26 (considering both the 2.0% base growth and additional volumes added by background developments) is in the order of 2.7% to 2.9% per annum.

Future Total

The future total volumes (i.e. with the subject development) are illustrated in Figure 13 and Figure 14, and are reflective of the future background volumes plus the traffic generated by the proposed development.

4.3 TRAFFIC OPERATIONS

4.3.1 Intersection Operations

The intersection of Highway 26 with Lakeshore Road East/Fraser Crescent was reassessed under future conditions considering the following:

- the existing intersection location (i.e. no relocation of Lakeshore Road East) with Fraser Crescent on the north leg;
- the 2030 and 2035 traffic volumes (assuming minimum turning volumes of 2 vehicles per hour for all movements to/from Lakeshore Road East and Fraser Crescent).

Results of the operational analyses are summarized in Table 7 and Table 8, with detailed worksheets provided in Appendix E.

Table 7: Intersection Operations – 2030 & 2035 Background

INTERSECTION, MOVEMENT & CONTROL				WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
				Delay	LOS	V/C	Delay	LOS	V/C
2030	Highway 26 & Lakeshore Rd E/ Fraser Crescent	NB LTR	stop	36	E	0.39	**96**	**F**	0.54
		SB LTR	stop	46	E	0.04	**108**	**F**	0.10
2035	Highway 26 & Lakeshore Rd E/ Fraser Crescent	NB LTR	stop	48	E	0.48	**156**	**F**	0.71
		SB LTR	stop	**58**	**F**	0.05	**155**	**F**	0.14

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

Table 8: Intersection Operations – 2030 & 2035 Total

INTERSECTION, MOVEMENT & CONTROL				WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
				Delay	LOS	V/C	Delay	LOS	V/C
2030	Highway 26 & Lakeshore Rd E/ Fraser Crescent	NB LTR	stop	**72**	**F**	0.73	**322**	**F**	**1.25**
		SB LTR	stop	**51**	**F**	0.05	**138**	**F**	0.13
2035	Highway 26 & Lakeshore Rd E/ Fraser Crescent	NB LTR	stop	**120**	**F**	0.90	**546**	**F**	**1.69**
		SB LTR	stop	**65**	**F**	0.06	**208**	**F**	0.19

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

As indicated, the intersection of Highway 26 with Lakeshore Road East/Fraser Crescent provides acceptable operations (LOS E) during the weekday AM peak hour under 2030 background conditions. It provides poor operations (LOS F) with elevated delays during the weekday PM peak at this horizon, and poor operations during both peaks by the 2035 horizon under background conditions. Operations worsen under future total conditions, with the intersection providing poor operations (LOS F) during both peak periods at the 2030 horizon, with capacity constraints (i.e. v/c > 1.00) expected during the PM peak hour on Lakeshore Road. While the overall magnitude of traffic on Lakeshore Road East and Fraser Crescent is not significant (fewer than 75 vph under background conditions, and 110 vph under total conditions), the amount of cross-traffic forecast on Highway 26 is significant (over 1,500 vph in total). These increased volumes result in smaller and less frequent gaps in the through traffic stream to facilitate safe turning manoeuvres from the intersecting side streets. It is noted that this poor performance is

also observed at the intersections assessed in the Aquavil traffic study and is attributed to the increased through volumes on Highway 26, particularly during the summer months.

The high delays on Lakeshore Road are caused by the left-turning volumes, despite accounting for only 30% of the volume on that approach. It is expected that left-turning motorists experiencing excessive delays may divert westward on Lakeshore Road East to Grey Road 19, where they can complete a left turn at the signalized intersection of Grey Road 19 and Highway 26. Additionally, while the Lakeshore Road East approach has been assessed as a single shared left-through-right turn lane, sufficient space is likely available at Highway 26 (due to the large corner radius) to allow right-turning vehicles to bypass a queuing left-turning or through-moving vehicle. This would reduce delays and improve overall operations of that approach further.

The delays on Fraser Crescent are caused by the same reason noted above (left-turning volume), but are not of concern, recognizing that the assessed volumes (2 vehicles per turning movement) are minimal. Additionally, should the road works noted in Section 4.1 be completed by either future horizon, the north approach would be removed entirely. This would have the simultaneous effect of somewhat reduced delays on the south approach due to the removal of movement conflicts with the north approach.

4.3.2 Road Operations

The operations of Highway 26 across the study intersection were again assessed considering the 2030 and 2035 traffic volumes, a summary of which is provided in Table 9. As noted, by the 2030 horizon, Highway 26 will operate above its planning capacity (v/c ratios of 1.05 to 1.29). This is a reflection of the assumed continued growth in the highway volumes and the additional traffic to be generated by the background developments, and thus not precipitated by the subject site. A previously noted, the intersections will serve as the bottlenecks of the transportation system and provided they can operate acceptably, so too will the highway itself.

Table 9: Road Operations – 2030 & 2035

ROAD SECTION & DIRECTIONAL CAPACITY			PEAK TRAFFIC VOLUMES		PEAK V/C RATIOS	
			EB	WB	EB	WB
2030	Hwy 26 East of Lakeshore Road E	900 vph	1,165	947	**1.29**	**1.05**
	Hwy 26 West of Lakeshore Road E	900 vph	1,157	953	**1.29**	**1.06**
2035	Hwy 26 East of Lakeshore Road E	900 vph	1,265	1,024	**1.41**	**1.14**
	Hwy 26 West of Lakeshore Road E	900 vph	1,257	1,039	**1.40**	**1.15**

4.4 TURN LANE REQUIREMENTS

The need for exclusive turn lanes on Highway 26 to service the site have been considered (i.e. turn lanes on the highway at Lakeshore Road East).

4.4.1 Right Turn Lane

Right turn lanes are generally warranted where right turn volumes exceed 60 vehicles per hour and/or impede through traffic. In considering this threshold and the projected right turn volumes, an eastbound right turn lane on Highway 26 at Lakeshore Road East is not required.

4.4.2 Left Turn Lane

As per the *Eden Oaks – Blue Trails Residential Development Traffic Impact Study*, a westbound left turn lane with 30 metres of storage, a 60 metre parallel lane and a 145 metre taper was identified as required to accommodate the Trailshead development under the 2030 horizon. A previously noted, this turn lane has been constructed to consist of 30 metres of storage, a 60 metre parallel lane and a 140 metre taper (as evident in Figure 2, the length of the turn lane is restricted slightly by the proximity of Fraser Crescent to the east, in that the turn lane is not desired to extend through the Fraser Crescent intersection). Given the additional developments proposed within the area, including the subject site, and the increased traffic volumes on Highway 26 associated with the 2035 horizon considered for this study, the warrant analysis for the left turn lane was revisited.

Based on the requirements for 5% (AM peak) and 10% (PM peak) left turns in the advancing volumes at a design speed of 90 km/h (reflective of the 70 km/h posted speed limit), a westbound left turn with a storage length of 50 metres is warranted; corresponding MTO nomographs are provided in Appendix F. Notwithstanding these findings, it is not considered practical to extend the turn lane any further as such would result in the turn lane extending past the east intersection of Fraser Crescent. The existing turn lane is expected to serve the anticipated turning traffic appropriately without need for further modifications.

5 Summary

Proposed Development

This report has addressed the traffic impacts of the proposed residential development to be located at 372 Grey Road 21, which will consist of 47 single detached units, 6 semi-detached units and up to 22 accessory units, totalling a potential of 75 residential units. Fully built out, the development is expected to generate 51 trips during the weekday AM peak hour and 64 trips during the weekday PM peak hour (assuming all of the accessory dwelling units are realized).

Transportation Impacts

To assess the impact of the proposed development, the operations of the key intersection of Highway 26 with Lakeshore Road East/Fraser Crescent were assessed under existing (2026) and future (2030 and 2035) conditions. Based on the operational analyses, the noted intersection provides acceptable operations (LOS E or better) under existing conditions, and will provide poor operations (LOS F) under both the 2030 and 2035 horizons. The latter operating levels are due largely to the significant increase in through volumes along Highway 26 by the 2035 horizon resulting from background growth and new developments in the area. The poor intersection operations are not expected to be problematic, recognizing that drivers have alternative options available to avoid delays at the intersection (i.e. motorists, particularly those destined to/from the west, can access Highway 26 via its signalized intersection with Grey Road 19, which is accessible via Lakeshore Road East).

The available through capacity on Highway 26 was also assessed at each horizon. Under existing conditions, Highway 26 operates at or below 99% of its planning capacity. By 2035 the road is projected to operate at 114% capacity or greater. While this is not desirable, the intersection operations indicate that Highway 26 itself will continue to provide acceptable operations through the 2035 horizon, thus no action is required.

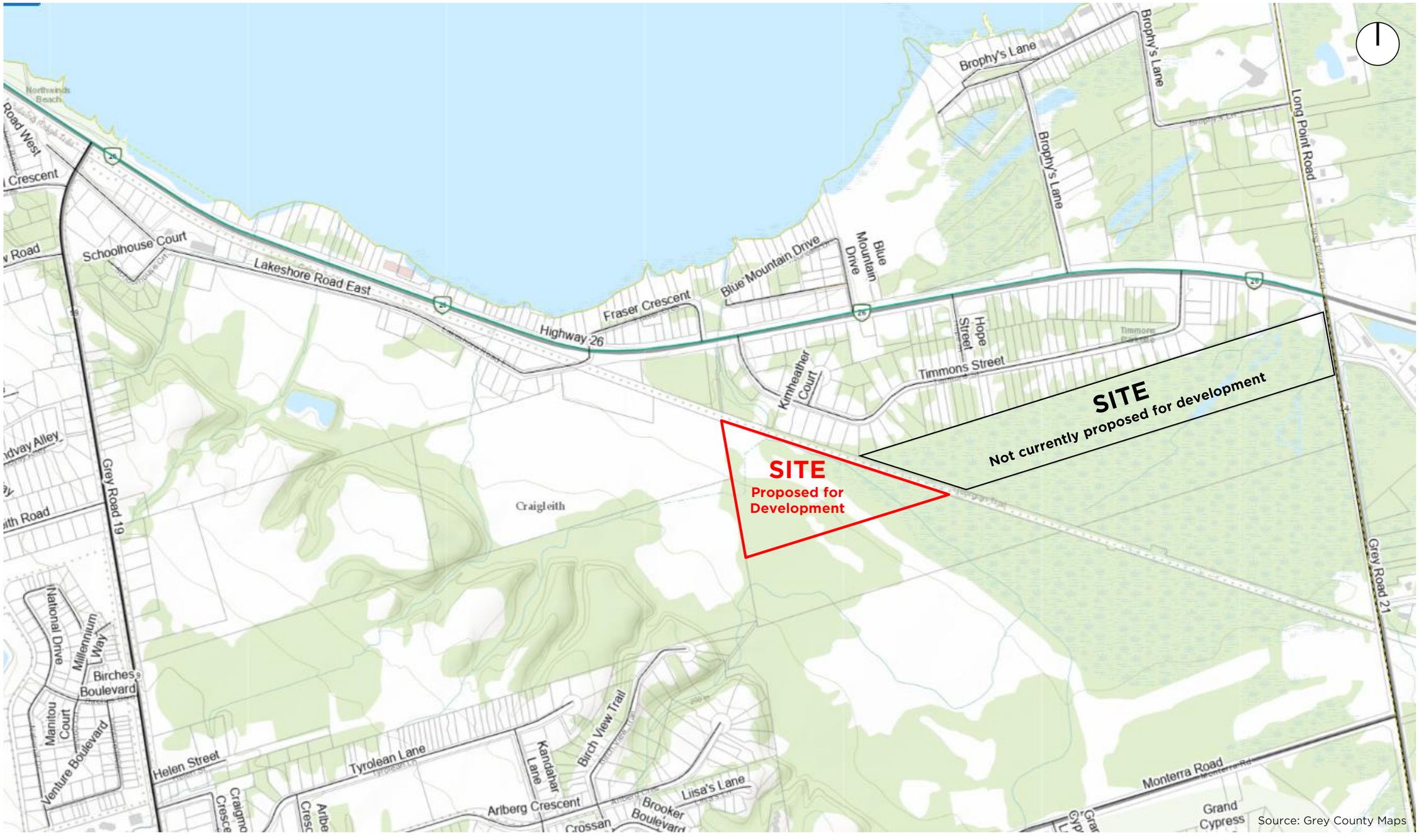
Overall, the development is not expected to have a significant impact on the area road network.

Turn Lane Requirements

A westbound left turn lane on Highway 26 at Lakeshore Road with 30 metres of storage was previously identified as necessary to serve the Trailshead development adjacent to the subject site and has been constructed. Upon review of the relevant MTO warrants with consideration for continued development and growth in the area, an increase in the storage length to 50 metres is warranted by the 2035 horizon. However, the ability to extend the turn lane is constrained given

the proximity of the east Fraser Crescent intersection. In this regard, the existing turn lane is considered appropriate.

With respect to the need for an eastbound right turn lane on Highway 26 at Lakeshore Road, such is not required given the reduced volume of right turns from the highway.



372 GREY ROAD 21 – TRAFFIC IMPACT BRIEF

Figure 1: Site Location



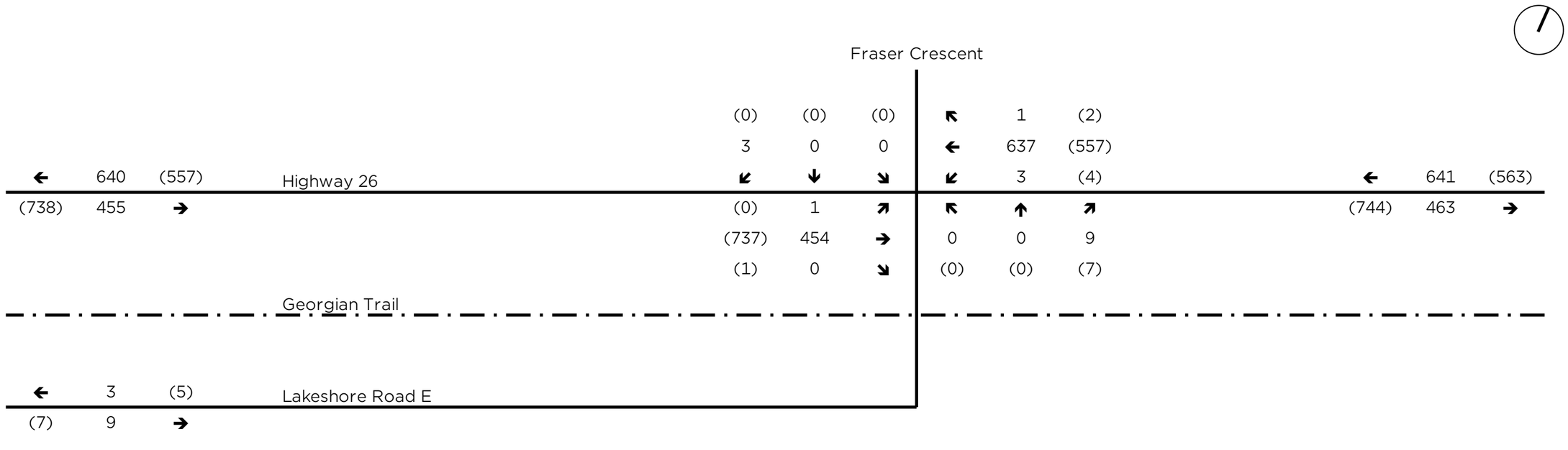
Figure 2A: Area Road Network



Figure 2B: Area Road Network - Westbound Left Turn Lane at Lakeshore Road East



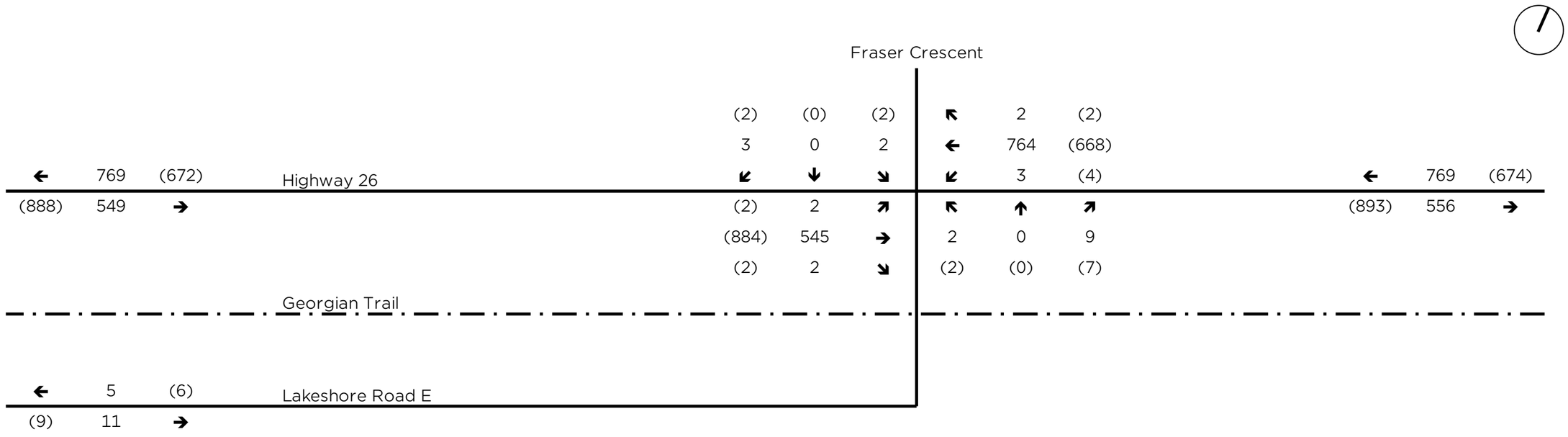
Figure 3: Area Transit Network



10 AM Peak Hour

(10) PM Peak Hour

Figure 4: Traffic Volumes – 2026 Counts



10 AM Peak Hour
(10) PM Peak Hour

2 minimum volume for turns to/from Lakeshore Road E & Fraser Crescent

Figure 5: Traffic Volumes – 2026

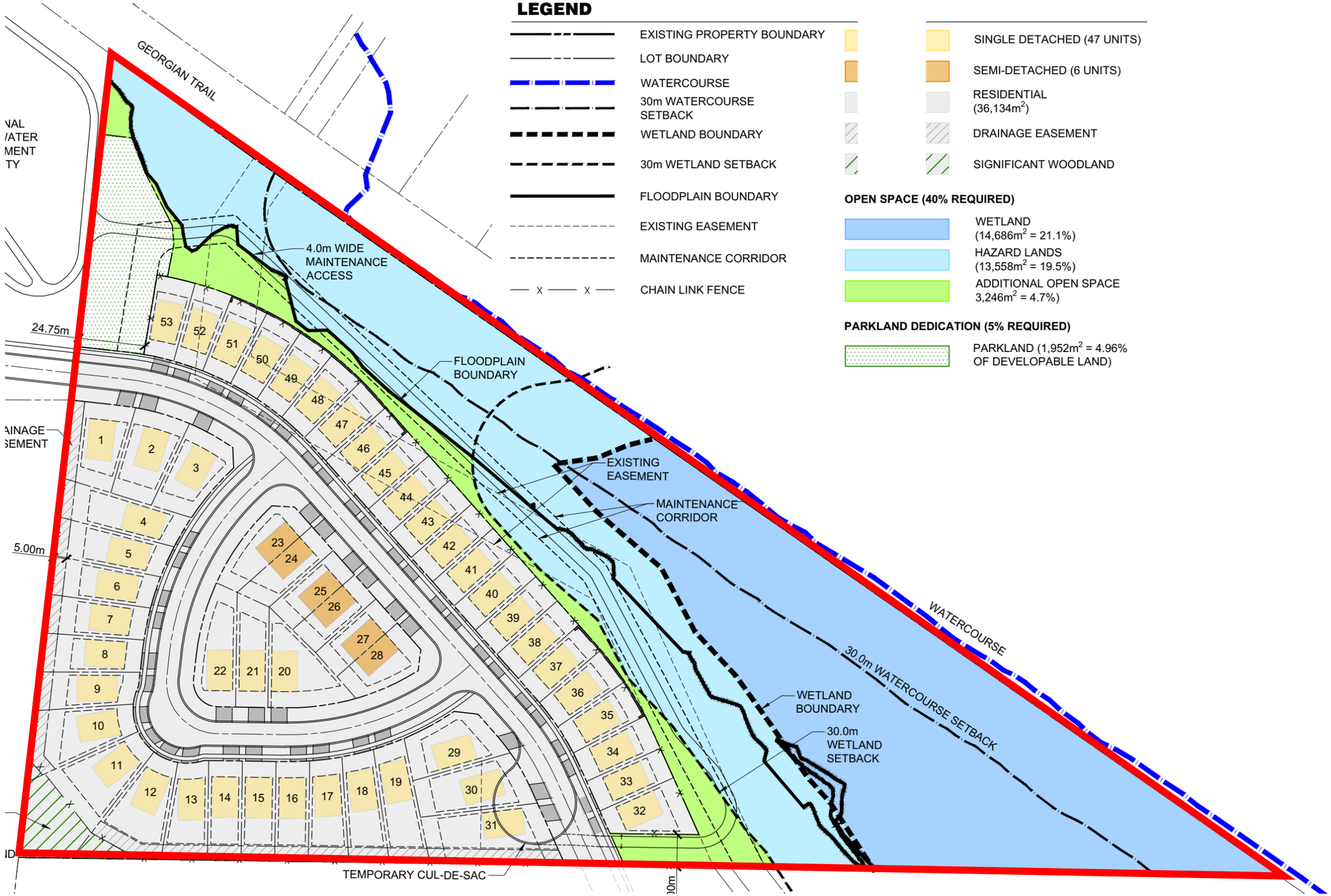
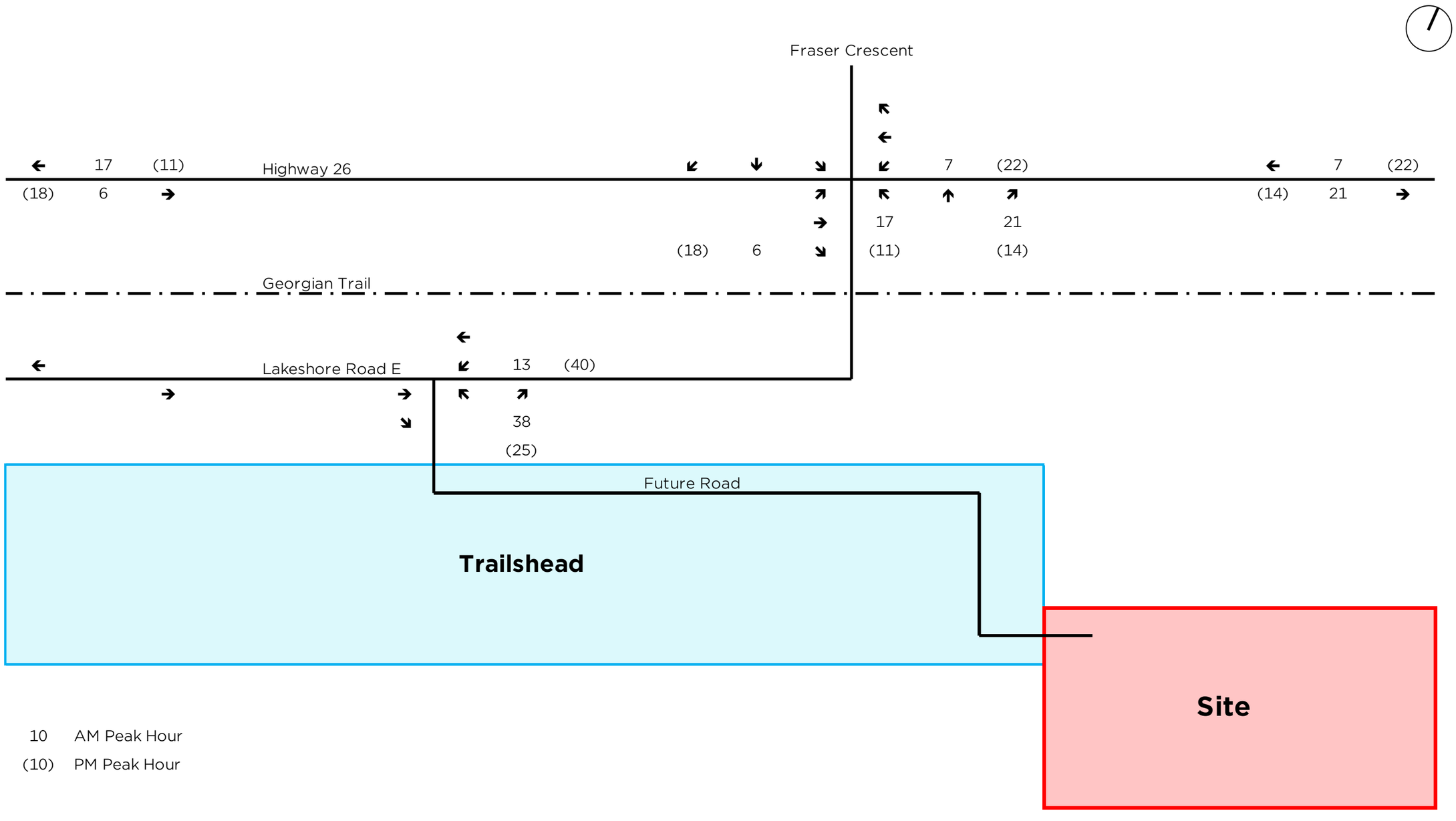


Figure 6: Concept Plan



Figure 7: Future Road Network



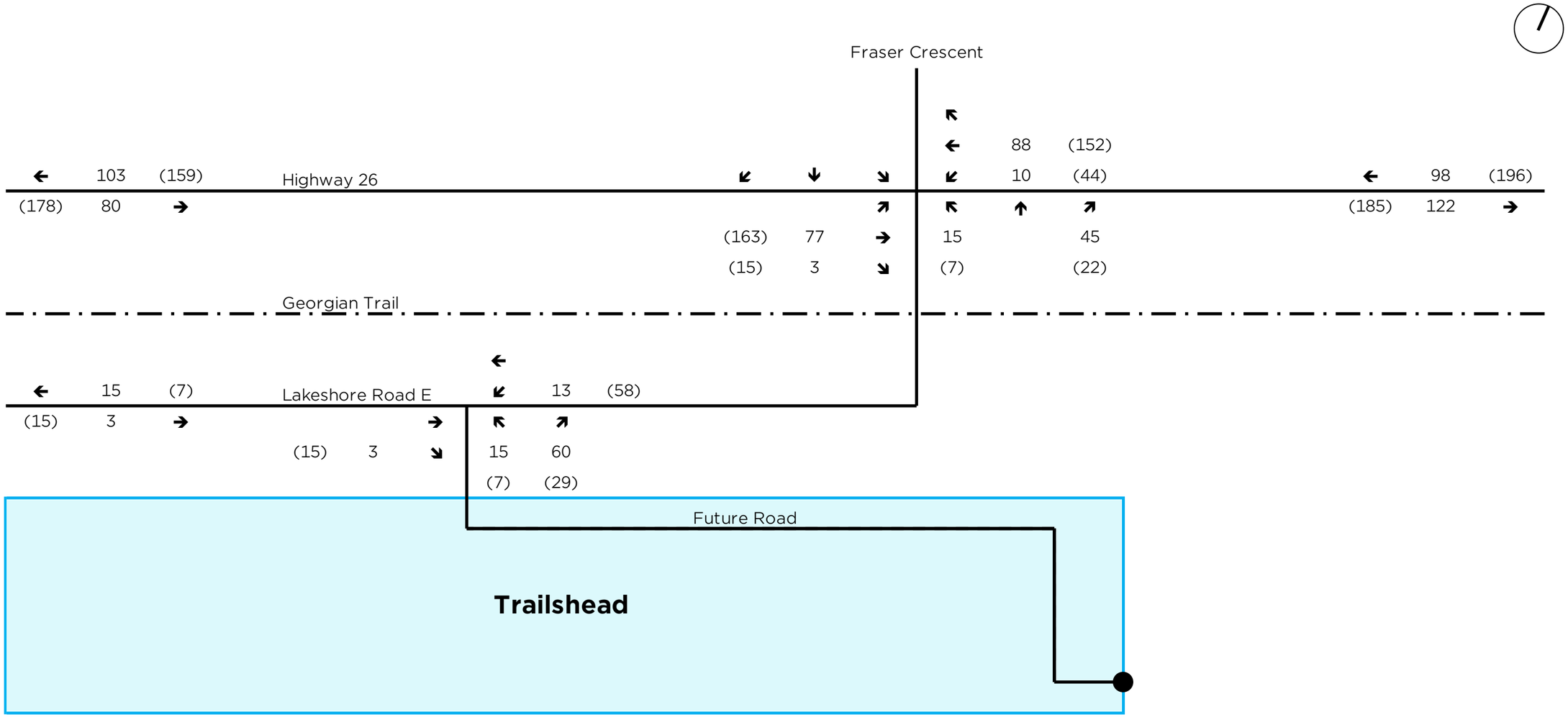
372 GREY ROAD 21 – TRAFFIC IMPACT BRIEF

Figure 8: Traffic Volumes – 372 Grey Road 21



372 GREY ROAD 21 – TRAFFIC IMPACT BRIEF

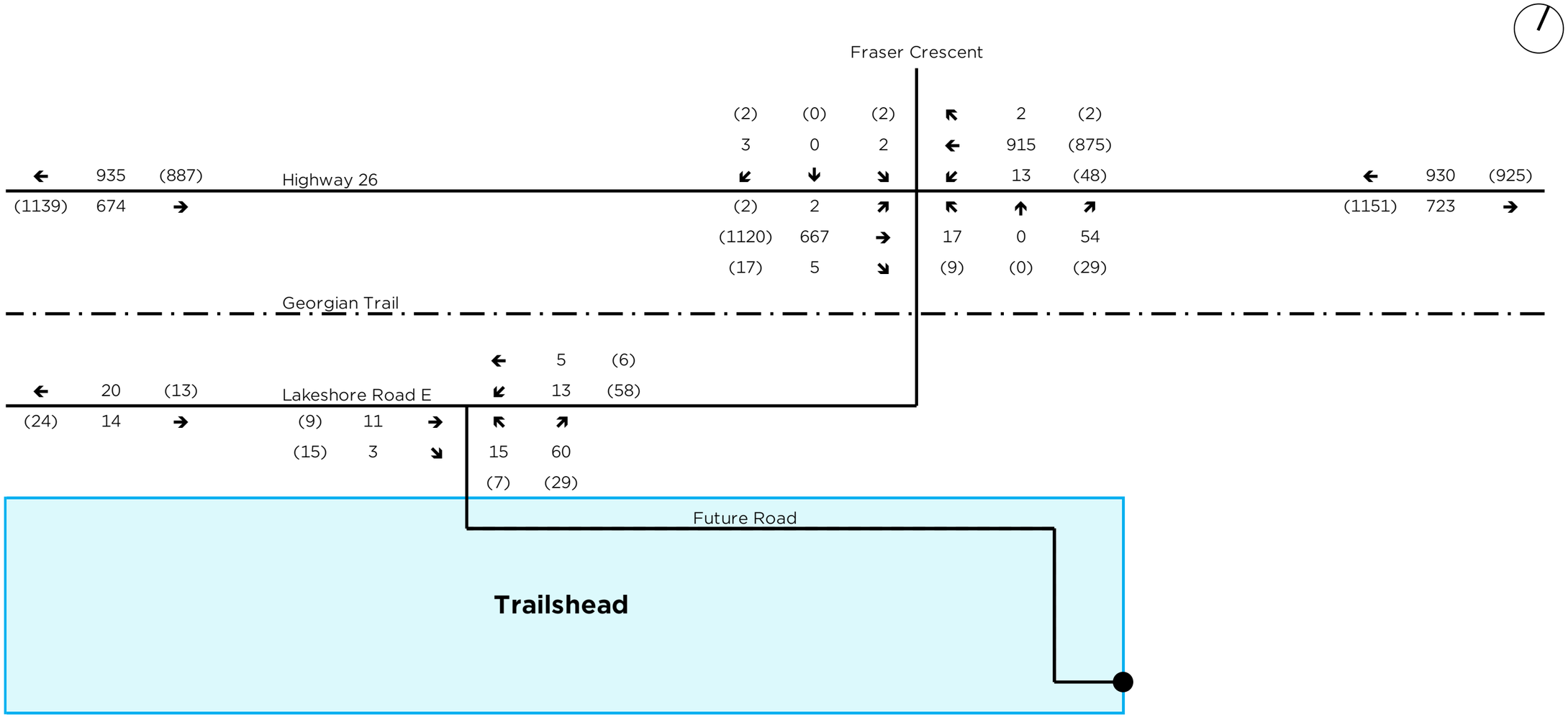
Figure 9: Background Developments



10 AM Peak Hour

(10) PM Peak Hour

Figure 10: Traffic Volumes – Background Developments

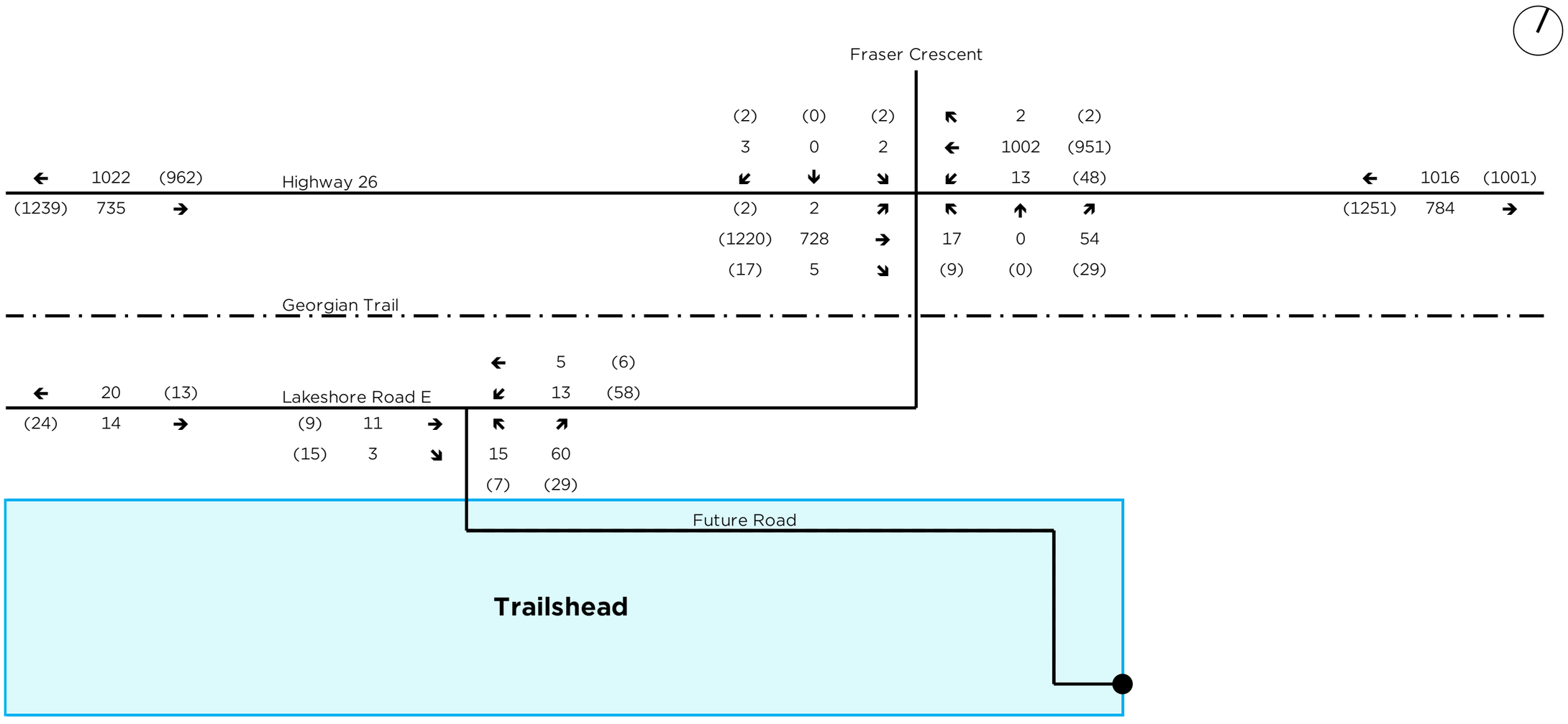


10 AM Peak Hour

(10) PM Peak Hour

2 minimum volume for turns to/from Lakeshore Road E & Fraser Crescent

Figure 11: Traffic Volumes – 2030 Background

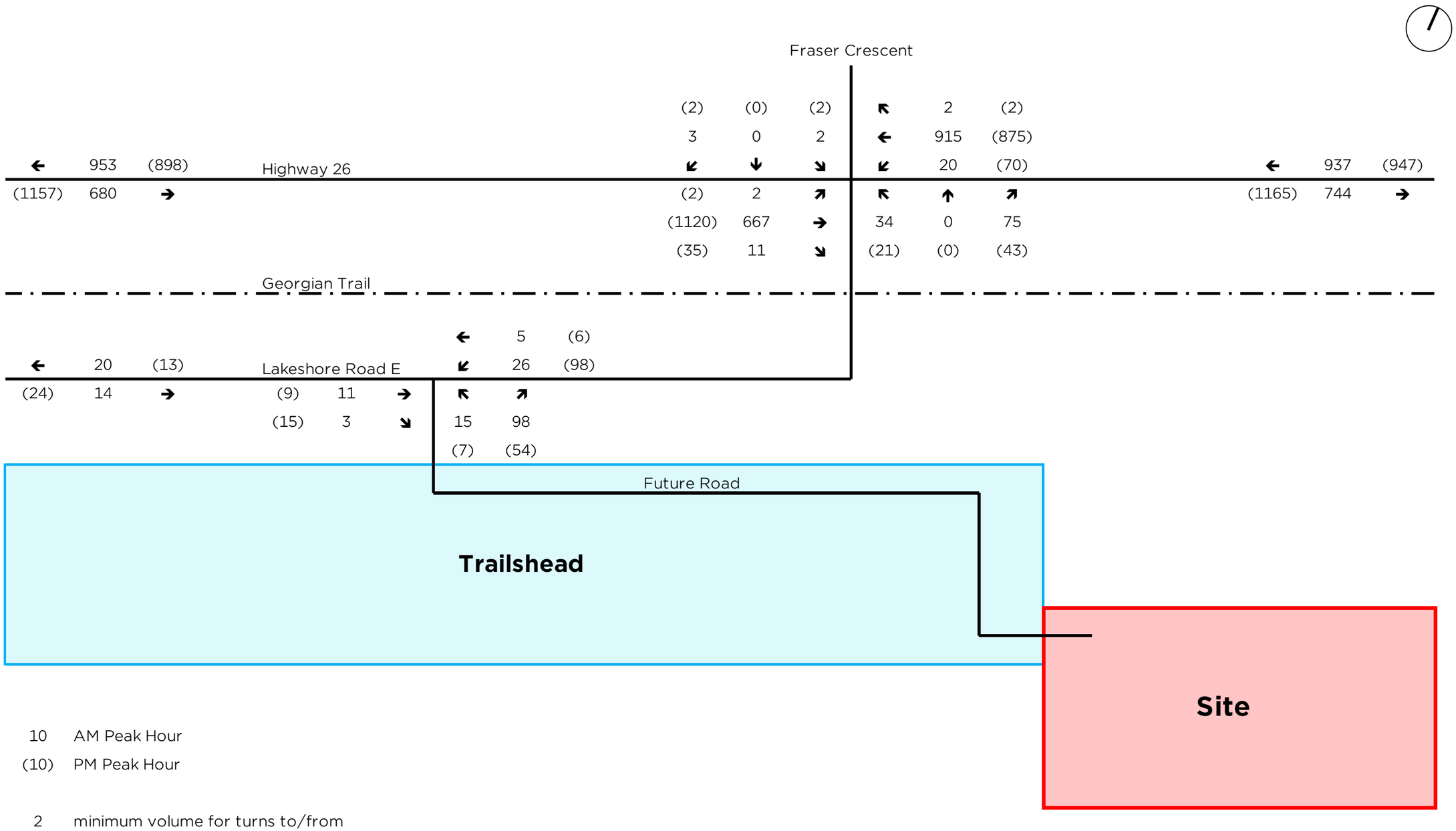


10 AM Peak Hour

(10) PM Peak Hour

2 minimum volume for turns to/from Lakeshore Road E & Fraser Crescent

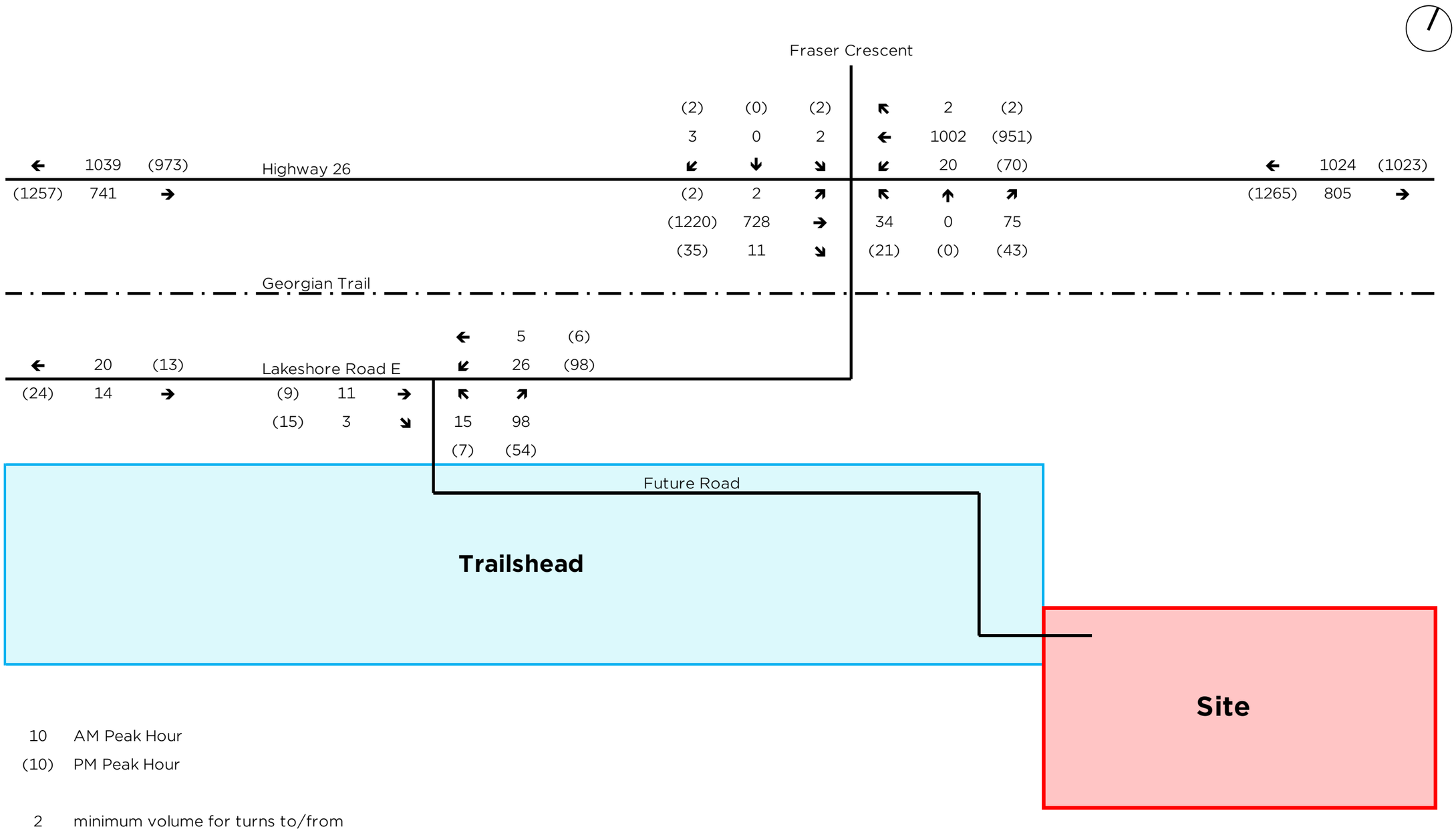
Figure 12: Traffic Volumes – 2035 Background



10 AM Peak Hour
(10) PM Peak Hour

2 minimum volume for turns to/from Lakeshore Road E & Fraser Crescent

Figure 13: Traffic Volumes – 2030 Total



10 AM Peak Hour
(10) PM Peak Hour

2 minimum volume for turns to/from Lakeshore Road E & Fraser Crescent

Figure 14: Traffic Volumes – 2035 Total

Appendix A:
Traffic Counts

Highway 26 & Lakeshore Road East/Fraser Crescent

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

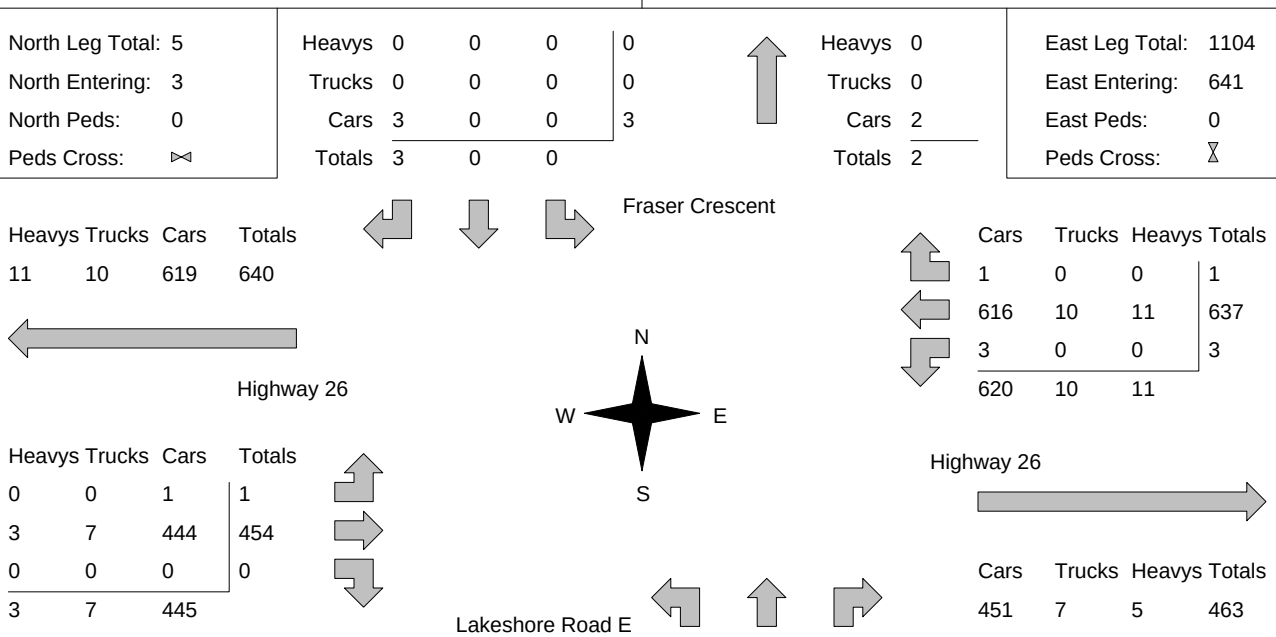
One Hour Peak
From: 8:00:00
To: 9:00:00

Municipality: Craigleith
Site #: 0000001200
Intersection: Highway 26 & Lakeshore Road Eas
TFR File #: 1
Count date: 12-Feb-2026

Weather conditions:
Light Snow
Person(s) who counted:

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

Major Road: Highway 26 runs W/E



Comments

Highway 26 & Lakeshore Road East/Fraser Crescent

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

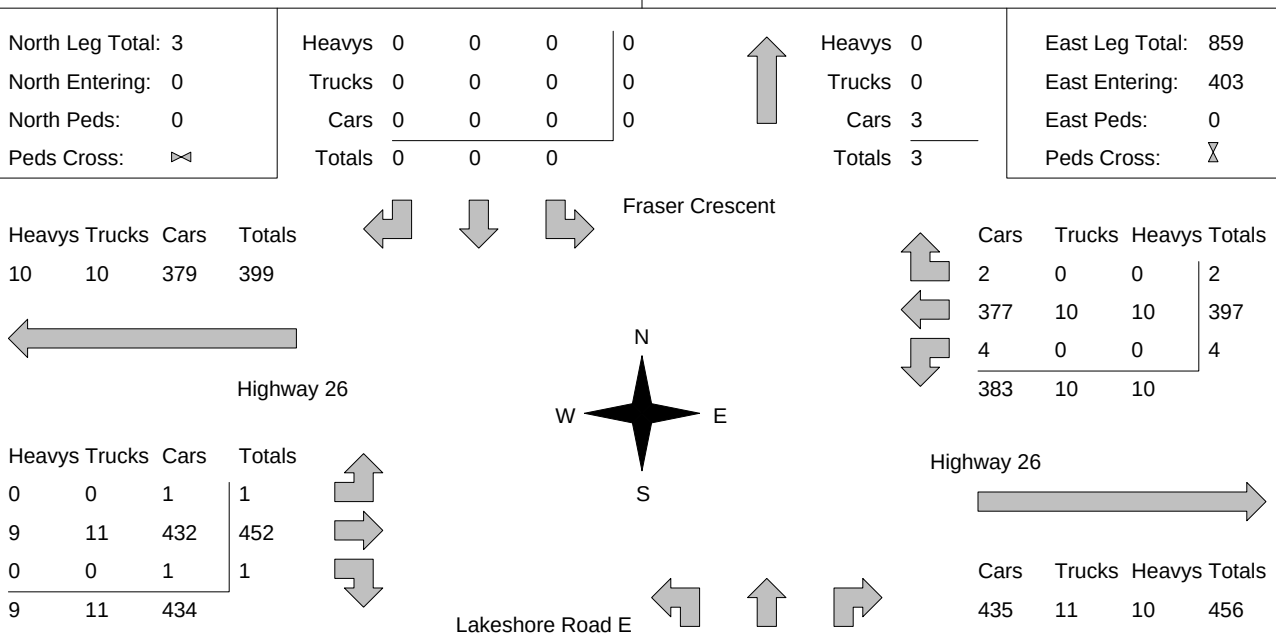
One Hour Peak
From: 12:00:00
To: 13:00:00

Municipality: Craigleith
Site #: 0000001200
Intersection: Highway 26 & Lakeshore Road Eas
TFR File #: 1
Count date: 12-Feb-2026

Weather conditions:
Light Snow
Person(s) who counted:

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

Major Road: Highway 26 runs W/E



Comments

Highway 26 & Lakeshore Road East/Fraser Crescent

Afternoon Peak Diagram

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

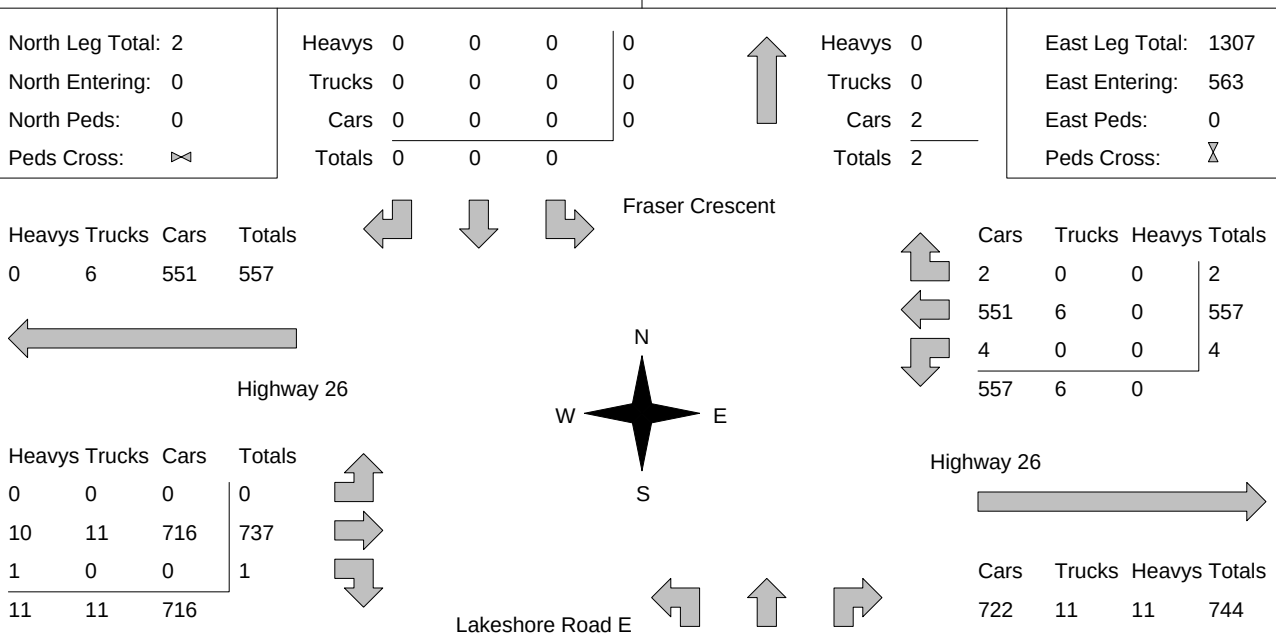
One Hour Peak
From: 16:00:00
To: 17:00:00

Municipality: Craigleith
Site #: 0000001200
Intersection: Highway 26 & Lakeshore Road Eas
TFR File #: 1
Count date: 12-Feb-2026

Weather conditions:
Light Snow
Person(s) who counted:

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

Major Road: Highway 26 runs W/E



Comments

Highway 26 & Lakeshore Road East/Fraser Crescent

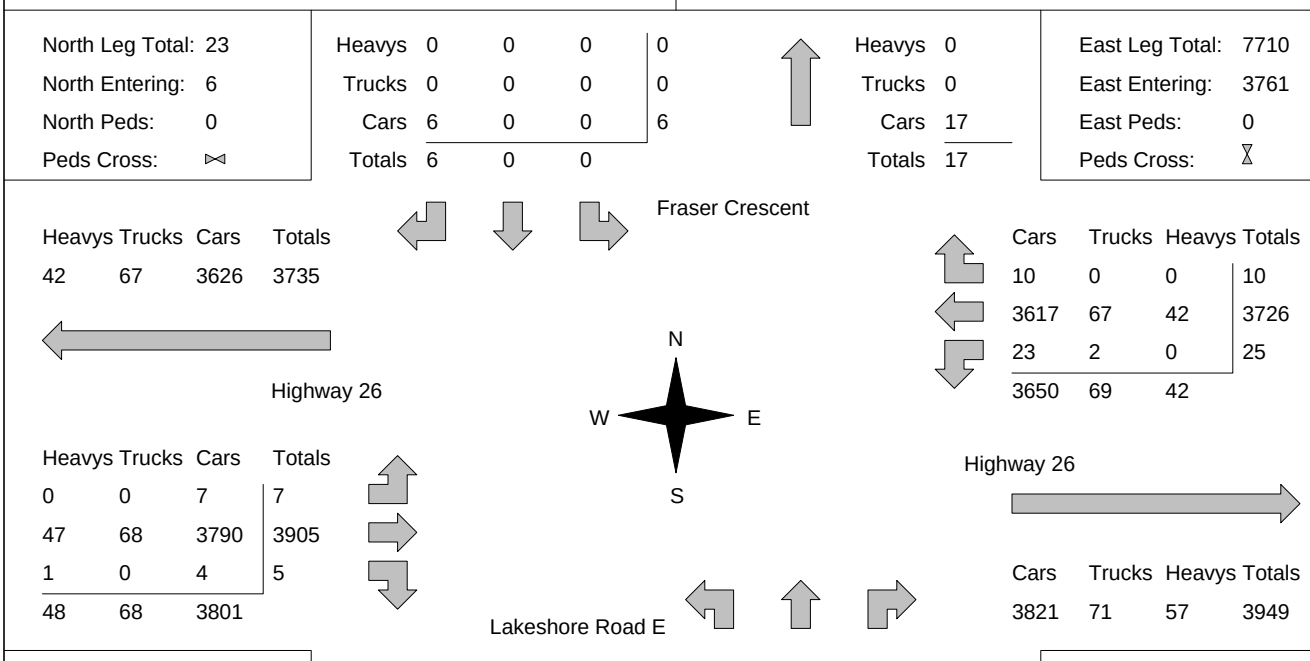
Total Count Diagram

Municipality: Craigleith
Site #: 0000001200
Intersection: Highway 26 & Lakeshore Road Eas
TFR File #: 1
Count date: 12-Feb-2026

Weather conditions:
Light Snow
Person(s) who counted:

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

Major Road: Highway 26 runs W/E



Comments

Highway 26 & Lakeshore Road East/Fraser Crescent
Traffic Count Summary

Intersection: Highway 26 & Lakeshore Road Ea | **Count Date:** 12-Feb-2026 | **Municipality:** Craigleith

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	0	0	0	0	0	4
9:00:00	0	0	3	3	0	12
11:00:00	0	0	0	0	0	0
12:00:00	0	0	0	0	0	6
13:00:00	0	0	0	0	0	6
14:00:00	0	0	1	1	0	7
15:00:00	0	0	0	0	0	0
16:00:00	0	0	2	2	0	6
17:00:00	0	0	0	0	0	7
18:00:00	0	0	0	0	0	5
Totals:	0	0	6	6	0	53

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	0	0	4	4	0
9:00:00	0	0	9	9	0
11:00:00	0	0	0	0	0
12:00:00	1	0	5	6	0
13:00:00	2	0	4	6	0
14:00:00	0	0	6	6	0
15:00:00	0	0	0	0	0
16:00:00	0	0	4	4	1
17:00:00	0	0	7	7	0
18:00:00	0	0	5	5	0
Totals:	3	0	44	47	1

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	1	339	0	340	0	630
9:00:00	3	637	1	641	0	1096
11:00:00	0	0	0	0	0	0
12:00:00	1	400	1	402	0	810
13:00:00	4	397	2	403	0	857
14:00:00	3	376	2	381	0	840
15:00:00	0	0	0	0	0	0
16:00:00	3	508	2	513	0	1086
17:00:00	4	557	2	563	0	1301
18:00:00	6	512	0	518	0	1058
Totals:	25	3726	10	3761	0	7678

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	0	290	0	290	0
9:00:00	1	454	0	455	1
11:00:00	0	0	0	0	0
12:00:00	2	406	0	408	1
13:00:00	1	452	1	454	0
14:00:00	1	456	2	459	0
15:00:00	0	0	0	0	0
16:00:00	2	571	0	573	1
17:00:00	0	737	1	738	0
18:00:00	0	539	1	540	0
Totals:	7	3905	5	3917	3

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	0	1	2	2	0	1	0	0

Appendix B:
Level of Service Definitions

TATHAM ENGINEERING

CAPACITY ANALYSIS AT SIGNALIZED INTERSECTIONS

Highway Capacity Manual Methodology

The capacity of signalized intersections has been determined on the basis of control delay for each signalized lane group. The method of analysis is taken from the Highway Capacity Manual, Special Report 209, by the Transportation Research Board.

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 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 volume to capacity 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.	$d > 80$

TATHAM ENGINEERING

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.

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 Street Traffic	Average Control Delay 'd' (sec/veh)
A	Little or no delays	$d \leq 10$
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	$d > 50$

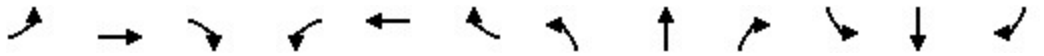
Appendix C:
Intersection Operations – Existing

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	545	2	3	764	2	2	0	9	2	0	2
Future Volume (Veh/h)	2	545	2	3	764	2	2	0	9	2	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	2	580	2	3	813	2	2	0	10	2	0	2
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	815			582			1406	1406	581	1415	1406	814
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	815			582			1406	1406	581	1415	1406	814
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	98	98	100	99
cM capacity (veh/h)	812			992			116	138	514	112	138	378

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	584	3	815	12	4
Volume Left	2	3	0	2	2
Volume Right	2	0	2	10	2
cSH	812	992	1700	326	173
Volume to Capacity	0.00*	0.00*	0.48	0.04	0.02
Queue Length 95th (m)	0.1	0.1	0.0	0.9	0.5
Control Delay (s/veh)	0.1	8.6	0.0	16.5	26.3
Lane LOS	A	A		C	D
Approach Delay (s/veh)	0.1	0.0		16.5	26.3
Approach LOS				C	D

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	50.3%	ICU Level of Service		A
Analysis Period (min)	15			

* Value less than 0.01.



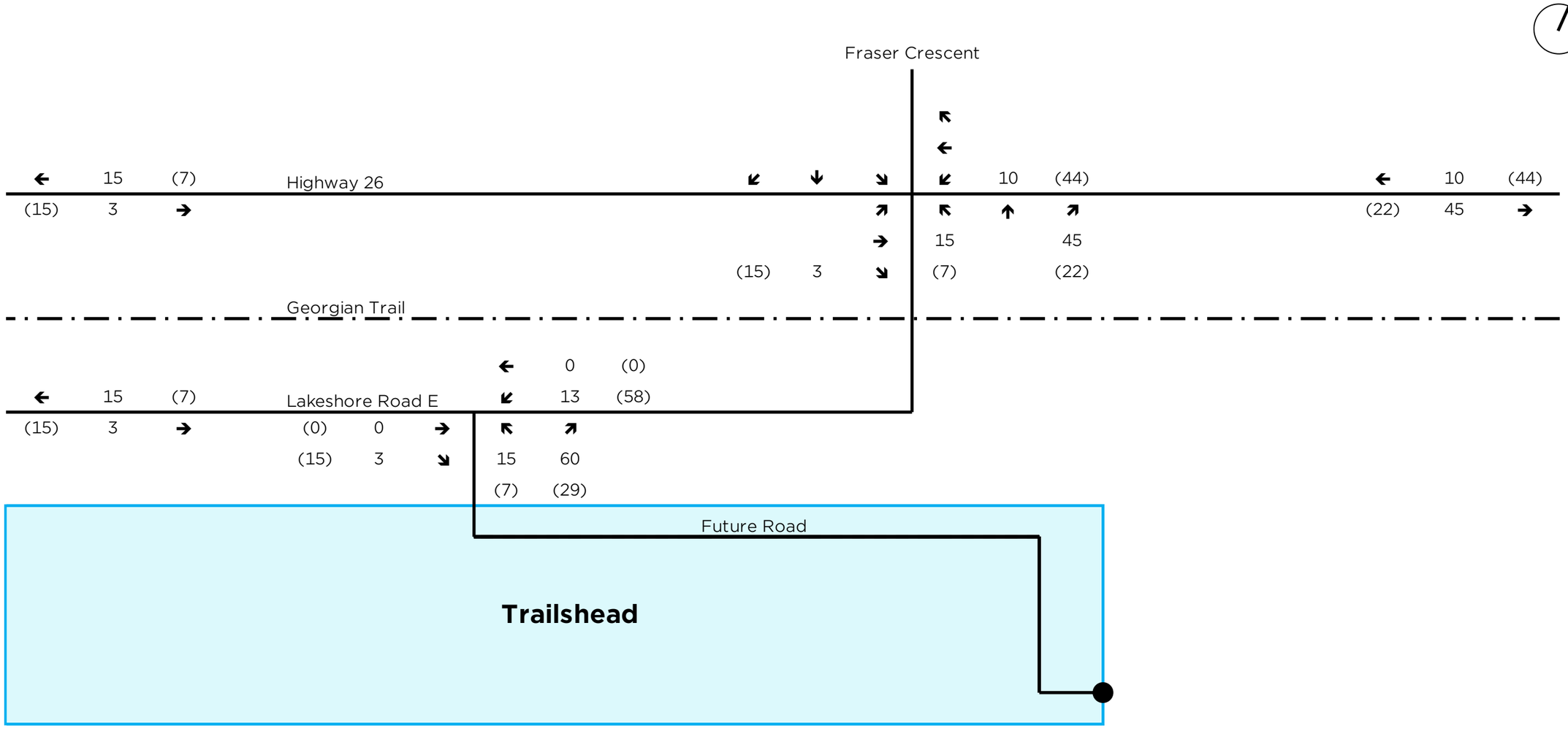
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	884	2	4	668	2	2	0	7	2	0	2
Future Volume (Veh/h)	2	884	2	4	668	2	2	0	7	2	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	961	2	4	726	2	2	0	8	2	0	2
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	728			963			1702	1702	962	1709	1702	727
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	728			963			1702	1702	962	1709	1702	727
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			97	100	97	97	100	100
cM capacity (veh/h)	876			715			72	91	310	69	91	424

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	965	4	728	10	4
Volume Left	2	4	0	2	2
Volume Right	2	0	2	8	2
cSH	876	715	1700	186	119
Volume to Capacity	0.00*	0.00*	0.43	0.05	0.03
Queue Length 95th (m)	0.1	0.1	0.0	1.3	0.8
Control Delay (s/veh)	0.1	10.1	0.0	25.4	36.2
Lane LOS	A	B		D	E
Approach Delay (s/veh)	0.1	0.1		25.4	36.2
Approach LOS				D	E

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	58.2%	ICU Level of Service		B
Analysis Period (min)	15			

* Value less than 0.01.

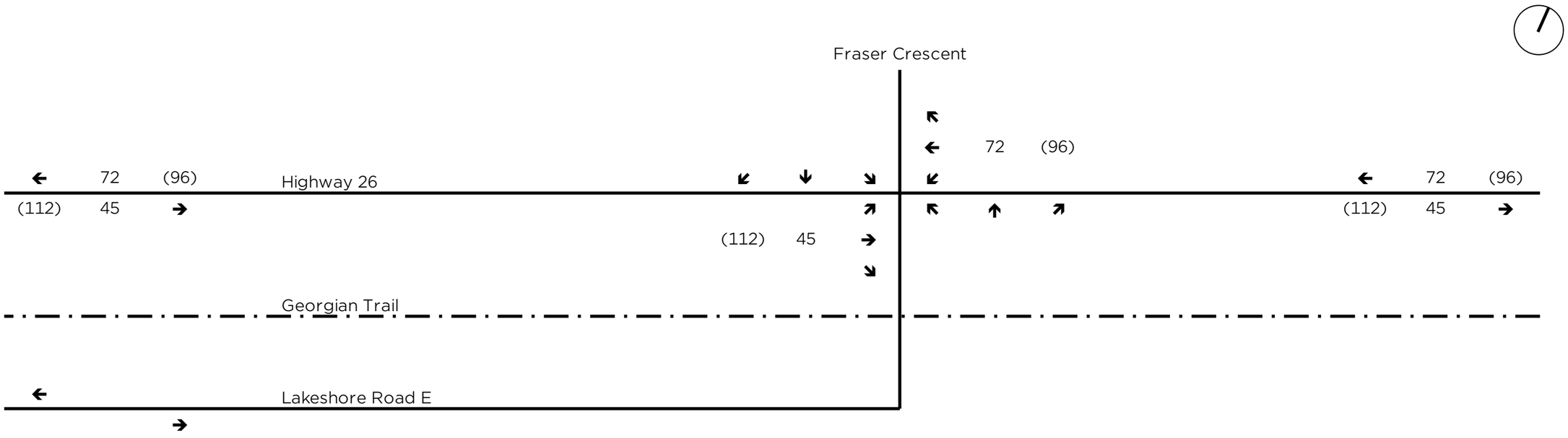
Appendix D:
Background Developments



10 AM Peak Hour

(10) PM Peak Hour

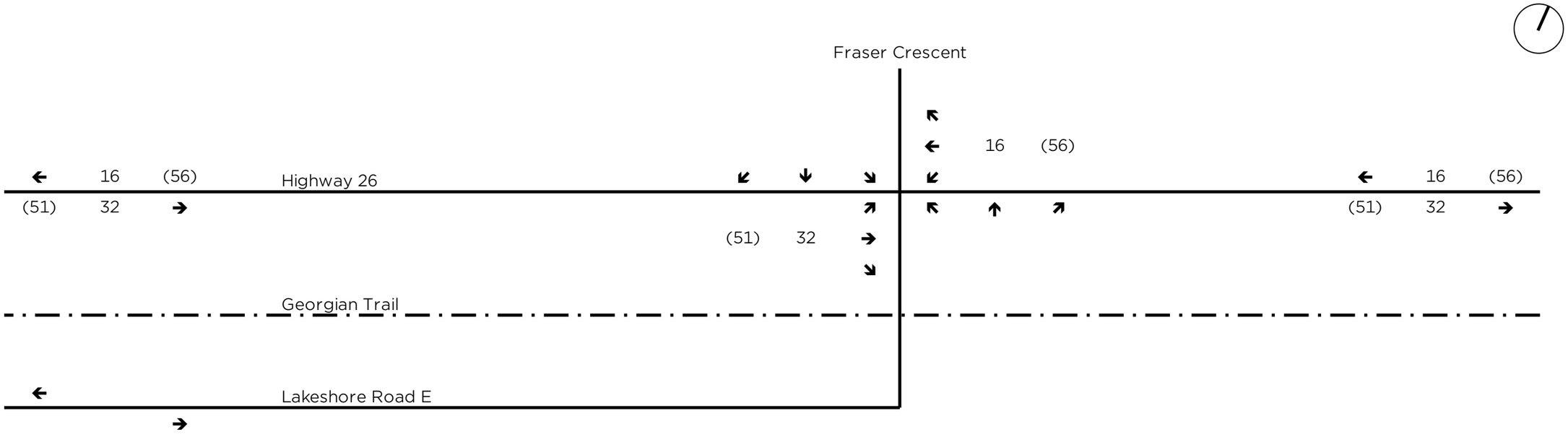
Figure D1: Trailshead



10 AM Peak Hour

(10) PM Peak Hour

Figure D2: Aquavil



10 AM Peak Hour

(10) PM Peak Hour

Figure D3: Parkbridge Craigleith

TRAFFIC IMPACT STUDY

AQUAVIL
TOWN OF THE BLUE MOUNTAINS
COUNTY OF GREY

PREPARED FOR:
ROYALTON HOMES INC.

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
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COLLINGWOOD, ONTARIO
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SEPTEMBER 2019

CFCA FILE NO. 876-4866

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CROZIER
CONSULTING ENGINEERS

- Closure of both Timmons Street accesses with traffic re-routed to Hope Street
- Traffic signals (including left-turn lanes and pedestrian cross-walks) recommended at Highway 26 and Grey Road 21/Long Point Road.

As noted in Section 3.6, signals are warranted under existing Saturday traffic volume conditions at the intersection of Highway 26 and Long Point Road/Grey Road 21. Accordingly, the intersection was analyzed under signalized conditions through all horizon years under future background and future total conditions.

The MTO will also continue to monitor speeds and collisions along the Highway 26 EA corridor to determine any required changes in posted speed limit.

The closures noted above were considered under future total traffic conditions. The development of Street "A" has been accounted for as part of Phase 1. Similarly, the development of "Street B" has been accounted for as part of Phase 2.

The timing of the closer of Timmons Street is unknown, accordingly the analysis contained within this report did not account for the Timmons Street intersections to be closed. Under existing conditions, Timmons Street (east intersection) had a maximum of 9 outbound vehicles and 13 inbound vehicles. The closure of Timmons Street and the redirection of traffic to Hope Street is expected to have a minimal impact on the Hope Street and Highway 26 intersection operations.

The Highway 26 EA PIC slides, as well as the "Highway 26 Widening" Committee of The Whole report have been included in Appendix I for reference.

4.4 Background Development Trip Generation

Grey County staff have identified several developments near the site, which may have forecasted trips travelling past the site on Highway 26. The development details and respective traffic volume forecasts are discussed in the subsequent sections, and the forecasted volumes have been incorporated into the future background volumes for all horizon years. The background developments requested by the County are as follows:

- Blue Vista*
- Eden Oak
- Long Point Road Subdivision
- Monterra Phase 2*
- Mountain House
- Parkbridge Craigleith
- Windfall (Phases 4 to 6)

It is noted that the Blue Vista and Monterra Phase 2 developments did not forecast trips to travel to and from the north on Grey Road 21, and therefore these developments were not accounted for in the background traffic forecasts at the study intersections.

4.4.1. Eden Oak

The Eden Oak development is located on the south side of Highway 26 at the eastern terminus of Lakeshore Road East. The development is proposed to consist of 194 semi-detached/townhouse dwelling units, and for the purpose of this assessment, it was assumed that the development would be fully built-out by the first horizon year (2022). The trip generation forecasts and distributions were obtained from the original Traffic Impact Study and subsequent Traffic Opinion Letter (TOL) completed

by Crozier in July 2012 and August 2014, respectively. The trip generation forecasts in the TIS and TOL accounted for trips generated by the future eight single-detached dwelling units known as the Chaisson Lands.

The trip generation for the weekday a.m. and p.m. peak hours was adopted from the TOL, which forecasted the trips using the average rates included in the ITE Trip Generation Manual, 8th Edition. For consistency, the Saturday trip generation was forecasted using the same methodology. The total trip generation of the Eden Oak and Chaisson Lands developments are summarized in Table 5.

Table 5: Eden Oak Trip Generation

Development	Unit Type	Number of Units	Roadway Peak Hour	Number of Trips		
				Inbound	Outbound	Total
Eden Oak	Single Family Detached and Semis/ Townhouses	202	Weekday A.M.	16	75	91
			Weekday P.M.	73	36	109
			Saturday	53	45	98

The trip distribution described in the original TIS assumed 60 percent of trips to arrive from and depart to the east on Highway 26. Accordingly, 60 percent of the inbound and outbound trips were added to the through movements on Highway 26 within the study area. This equates to 10, 44, and 32 inbound trips in the weekday a.m., p.m. and Saturday peak hours, respectively, and 45, 22, and 27 outbound trips in the weekday a.m., p.m., and Saturday peak hours, respectively. Relevant excerpts from the Eden Oak TIS and TOL, and the trip distribution and assignment have been included in Appendix J.

4.4.2. Long Point Road Subdivision

The Long Point Road Subdivision is located on the west side of Long Point Road between Brophy's Lane and Highway 26. The development is proposed to consist of 22 single family detached dwelling units, and for the purpose of this assessment, it was assumed that the units would be fully built-out and occupied by 2022. A traffic analysis was not completed for this development; accordingly, the trips were forecasted using the fitted curve equations summarized in the ITE Trip Generation Manual, 10th Edition for Land Use Category 210: "Single-Family Detached Housing". The Long Point Road Subdivision trip generation is summarized in Table 6.

Table 6: Long Point Road Subdivision Trip Generation

Development	Unit Type	Number of Units	Roadway Peak Hour	Number of Trips		
				Inbound	Outbound	Total
Long Point Road	Single Family Detached	22	Weekday A.M.	5	15	20
			Weekday P.M.	15	9	24
			Saturday	19	17	36

Trips were distributed to the boundary road network based on the observed travel patterns at Highway 26 and Long Point Road. The Draft Plan of Subdivision, trip distribution and trip assignment have been included in Appendix K for reference.

4.4.3. Mountain House

The Mountain House development is located in the northwest quadrant of the intersection of Grey Road 19 and Grey Road 21. Information relating to the development was obtained from the Blue Vista TIS completed by Tatham. Phase 1 of the development is currently under construction, with Phases 2 and 3 expected to be completed by 2022. Upon full build-out, the development will consist of 230 condominium units. The weekday p.m. and Saturday trip generation forecasts described below were obtained from the Blue Vista TIS, and the weekday a.m. trip generation was forecasted using the ITE Trip Generation Manual, 10th Edition. The trip generation of Mountain House is summarized in Table 7.

Table 7: Mountain House Trip Generation

Development	Unit Type	Number of Units	Roadway Peak Hour	Number of Trips		
				Inbound	Outbound	Total
Mountain House	Multifamily Housing (Low-Rise)	230	Weekday A.M.	24	82	106
			Weekday P.M.	80	39	119
			Saturday	58	50	108

The Blue Vista TIS accounted for ten percent of trips travelling to and from the north via Grey Road 21. For the purpose of this assessment, the trips were split equally to the east and west at Highway 26. Excerpts from the Blue Vista TIS relating to Mountain House, and the trip assignment at Highway 26 and Long Point Road/Grey Road 21 and Highway 26, have been included in Appendix L for reference.

4.4.4. Parkbridge Craigleith

The Parkbridge Craigleith development is located on the east side of Grey Road 19, and is bounded by Lakeshore Road to the north, the proposed Eden Oak development to the east, and the proposed Home Farm development to the south. The development is proposed to consist of 45 single family detached units and 166 townhouse units. For the purpose of this assessment, it has been assumed that the development will be completed by 2025. The original TIS was completed by Crozier in December 2016, and a subsequent Sensitivity Analysis and Transportation Assessment were completed in January and February 2019, respectively.

The original reports were completed based on an older version of the Site Plan which has since been updated to reflect the unit breakdown described above. The original assessment forecasted the trip generation using the Recreational Homes land use, however comments received in the peer review indicated that the trip generation forecasts should be based on permanent residential land uses. Accordingly, the trip generation of the development was forecasted using the fitted curve equations provided in the TIE Trip Generation Manual, 10th Edition for Land Use Categories 210 "Single-Family Detached Housing" and 220 "Multifamily Housing (Low-Rise)".

It is noted that land use 220 does not provide data for Saturday peak hour trip generation. Accordingly, the data provided for Land Use Category 221 "Multifamily Housing (Mid-Rise)" was used as a surrogate for the townhouse units. The Parkbridge Craigleith trip generation is summarized in Table 8.

Table 8: Parkbridge Craigleith Trip Generation

Development	Unit Type	Number of Units	Roadway Peak Hour	Number of Trips		
				Inbound	Outbound	Total
Parkbridge Craigleith	Single Family Detached	45	Weekday A.M.	8	25	33
			Weekday P.M.	30	17	47
			Saturday	30	26	56
	Townhouse	166	Weekday A.M.	18	59	77
			Weekday P.M.	58	35	93
			Saturday	37	39	76
Total		211	Weekday A.M.	26	84	110
			Weekday P.M.	88	52	140
			Saturday	67	65	132

The trips were distributed to the boundary road network based on the distributions illustrated in the 2018 Traffic Assessment for Option 3 (Figure 24). The distribution assumed 50 percent of trips would arrive from and depart to the east. Accordingly, 50 percent of the inbound and outbound trips were added to the through movements on Highway 26 within the study area. Relevant excerpts from the Parkbridge Traffic Assessment, the updated Site Plan, and the trip assignment have been included in Appendix M.

4.4.5. Windfall (Phases 4 to 6)

The Windfall development is located to the north and east of Grey Road 19, just west of Grey Road 21. Information relating to the development was obtained from the Windfall Traffic Impact Study completed by Tatham and updated in September 2018. Phases 4 to 6 are still outstanding, and Phase 4 is expected to be complete by the 2022 horizon date, and Phases 5 and 6 are expected to be complete by 2025.

The trip generation of the development was forecasted using the trip generation rate established through surveys of the existing Windfall development. The TIS did not forecast the weekday a.m. trip generation, as such the ITE Trip Generation Manual, 10th Edition was utilized. The generation is summarized in Table 9.

Table 9: Windfall (Phases 4-6) Trip Generation

Development/ Phase	Unit Type	Number of Units	Roadway Peak Hour	Number of Trips		
				Inbound	Outbound	Total
Windfall Phase 4	Single Family Detached and Semi-detached	164	Weekday A.M.	22	71	93
			Weekday P.M.	79	77	156
			Saturday	85	77	162
Windfall Phases 5/6	Single Family Detached and Semi-detached	244	Weekday A.M.	33	103	136
			Weekday P.M.	118	114	232
			Saturday	126	114	240

The trips were distributed to the boundary road network, per the distributions established through existing travel patterns. The Windfall TIS notes that only 2.5 percent of trips are expected to travel north on Grey Road 21 towards the site. For the purpose of this assessment, half the trips travelling north on Grey Road 21 were assumed to travel west on Highway 26, with the remaining 50 percent assumed to travel east. Relevant excerpts from the Windfall TIS and the trip assignment at Grey Road 21 and Highway 26 have been included in Appendix N for reference.

4.5 Intersection Operations

The 2022, 2025, 2030 and 2035 future background traffic volumes are illustrated in Figures 7, 8, 9 and 10, respectively. These volumes account for the background traffic volumes illustrated in Figures 5 and 6 and a growth rate of 1.5 percent. The 2022, 2025, 2030 and 2035 future background traffic levels of service are summarized in Table 10, Table 11, Table 12 and Table 13, respectively.

The future background operations at the study intersections were analyzed using the existing lane configuration, apart from Highway 26 and Long Point Road/Grey Road 21. It is acknowledged that signals are warranted at the intersection of Highway 26 and Long Point Road/Grey Road 21 under existing traffic volume conditions. However, the signalization would occur during Phase 2 when the east lands are developed. Accordingly, the 2022 horizon year was assessed under both unsignalized and signalized conditions, and the remaining horizon years only assessed the signalized operations.

The signal timings for the intersection of Highway 26 and Long Point Road/Grey Road 21 were based on the timings observed at Highway 26 and Waterfall Lane, with minor adjustments to the amber, walk and flashing don't walk phases. A protected phase was not provided for left-turns at the intersection under future background conditions as the volumes of left-turns on all approaches did not justify it. The intersection was modeled with eastbound, westbound, northbound and southbound left-turn lanes, and right-turn lanes in the east and westbound directions. The storage lengths used are as follows:

- Eastbound Left Turn Lane = 55 m
- Eastbound Right Turn Lane = 25 m
- Westbound Left Turn Lane = 50 m
- Westbound Right Turn Lane = 20 m
- Northbound Left Turn Lane = 50 m
- Southbound Left Turn Lane = 30 m

The turn-lane dimensions were selected to accommodate the forecasted 2035 future total 95th percentile queues. The specific dimensions of the storage, deceleration length and taper should be confirmed during detailed design. The dimensions and timing of implementation should also be coordinated with the ongoing Environmental Assessment on Highway 26.

LOS definitions are included in Appendix E and detailed capacity analysis worksheets are included in Appendix F.

5.0 Future Total Conditions

5.1 Future Road Network

As described in Section 4.3, the development of the site will result in the closure of Blue Mountain Drive and Brophy's Lane at Highway 26. A new internal road layout is proposed which would result in the development of Street "A", which would form the fourth leg of the intersection of Highway 26 and Hope Street, as well as the development of Street "B" which would intersect with Highway 26 opposite Grey Road 21. Long Point Road would form a T-intersection with Street "B".

Street "A" is part of Phase 1 and is therefore accounted for in all horizon years. Street "B" is part of Phase 2 and is therefore accounted for in the 2025, 2030 and 2035 horizon years.

The future traffic control and lane configurations at the study intersections are illustrated in Figure 11. The figure accounts for the auxiliary turn lanes identified in Section 5.4, as well as the proposed signalized intersection at Highway 26 and Long Point Road/Grey Road 21.

5.2 Site Generated Traffic

The proposed development will result in additional vehicles on the boundary road network that previously did not exist. The proposed development will also result in additional turning movements at the site entrances.

The trip generation of the proposed development was forecasted using the average rates and fitted curve equations, where appropriate, provided in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition for the following land uses:

- LUC 210: Single-Family Detached Housing
- LUC 220: Multifamily Housing (Low-Rise)
- LUC 221: Multifamily Housing (Mid-Rise)
- LUC 252: Senior Adult Housing – Attached
- LUC 820: Shopping Centre

Saturday data is not available for LUC 220, therefore the rates provided for LUC 221 have been used as a surrogate.

As defined by the ITE Trip Generation Handbook, 3rd Edition, primary trips are made for the specific purpose of visiting the generator. Pass-by trips are made as intermediate stops on the way from an origin to a primary destination without a route diversion. Accordingly, these vehicles do not increase the volume of vehicles on the roadway.

The pass-by trip percentage of the commercial retail pass-by trips was forecasted using the rates provided by the ITE Trip Generation Handbook. Land Use Category 820 "Shopping Centre" was used to forecast a pass-by trip percentage of 34 percent for the p.m. peak period and 26 percent for the Saturday peak period. A pass-by percentage was not applied to the a.m. peak periods as this trip generation generally captures employees of the commercial retail uses.

Relevant excerpts from the ITE Trip Generation Manual, 10th Edition and ITE Trip Generation Handbook, 3rd Edition have been included in Appendix O. The forecasted trip generation of Phase 1 (the western lands) is tabulated in Table 14, and the forecasted trip generation of Phase 2 (the eastern lands) is tabulated in Table 15.

Table 14: Trip Generation – Phase 1 (Western Lands)

Land Use	Peak Hour	Trip Type	Trips Generated		
			Inbound	Outbound	Total
LUC 210: Single-Family Detached Housing (2 Units)	Weekday A.M.	Primary	0	1	1
	Weekday P.M.		1	1	2
	Saturday		1	1	2
LUC 220: Multifamily Housing (Low-Rise) (56 Units)	Weekday A.M.	Primary	6	21	27
	Weekday P.M.		22	13	35
	Saturday		15	15	30
LUC 221: Multifamily Housing (Mid-Rise) (176 Units)	Weekday A.M.	Primary	15	45	60
	Weekday P.M.		47	30	77
	Saturday		40	41	81
Total	Weekday A.M.	Primary	21	67	88
	Weekday P.M.		70	44	114
	Saturday		56	57	113

Table 15: Trip Generation – Phase 2 (Eastern Lands)

Land Use	Peak Hour	Trip Type	Trips Generated		
			Inbound	Outbound	Total
LUC 220: Multifamily Housing (Low-Rise) (50 Units)	Weekday A.M.	Primary	6	19	25
	Weekday P.M.		20	12	32
	Saturday		14	14	28
LUC 221: Multifamily Housing (Mid-Rise) (100 Units)	Weekday A.M.	Primary	9	25	34
	Weekday P.M.		27	17	44
	Saturday		24	25	49
LUC 252: Senior Adult Housing – Attached (100 Units)	Weekday A.M.	Primary	7	13	20
	Weekday P.M.		14	12	26
	Saturday		20	13	33
LUC 820: Shopping Centre (98,000 ft^2)	Weekday A.M.	Primary	57	35	92
		Pass-by	0	0	0
	Weekday P.M.	Primary	118	128	246
		Pass-by	61	66	127
	Saturday	Primary	169	157	326
		Pass-by	60	55	115
Total	Weekday A.M.	Primary	79	92	171
	Weekday P.M.		179	169	348
	Saturday		227	209	436
	Weekday A.M.	Pass-by	0	0	0
	Weekday P.M.		61	66	127
	Saturday		60	55	115

5.3 Trip Distribution and Assignment

The trips generated by the proposed development were distributed to the boundary road network based on the travel patterns observed on the boundary road network. The existing travel patterns indicate that in the weekday a.m., p.m. and Saturday peak hours, 45 percent of trips arrive from and depart to the west on Highway 26, 20 percent of trips arrive from and depart to the south on Grey Road 21, and the remaining 35 percent of trips arrive from and depart to the east on Highway 26. The above trip distribution was applied to the Phase 1 residential trips as well as the Phase 2 residential, commercial primary and commercial pass-by trips.

The Phase 1 and Phase 2 residential trip distributions are illustrated in Figures 12 and 13 and the Phase 2 commercial primary and pass-by trip distributions are illustrated in Figures 14 and 15. The corresponding trip assignments are illustrated in Figures 16, 17, 18 and 19, respectively. The trips illustrated in Figures 16 through 19 were superimposed on the 2022, 2025, 2030 and 2035 future background volumes illustrated in Figures 7 through 10 to establish the future total traffic volumes. The 2022, 2025, 2030 and 2035 future total traffic volumes are illustrated in Figures 20, 21, 22 and 23, respectively.

5.4 Signalization of Highway 26 and **Street "A"/Hope Street**

A signal warrant analysis was undertaken to determine if signals are warranted under 2035 future total conditions at the intersection of Highway 26 and Street "A"/Hope Street. The analysis followed the procedures specified in Chapter 4 of the "Ontario Traffic Manual – Book 12", March 2012. Justifications 1 (Minimum Vehicular Volume), 2 (Delay to Cross Traffic), and 3 (Combination of Justifications 1 and 2) were selected.

The signal warrant utilized traffic volumes recorded on Friday, July 5, 2019: 6:00 a.m. to 10:00 am and 3:00 p.m. to 7:00 p.m. and on Saturday, July 6, 2019: 10:00 a.m. to 6:00 p.m. The trips generated by the site were applied to the boundary road network in the same proportion as the roadway volumes to the peak hour roadway volumes. For example, the 6:00 to 7:00 a.m. weekday roadway volumes were 36 percent of the a.m. peak hour volumes, so the a.m. site trips were factored by the same 36 percent.

This assessment determined that signals are not warranted under 2035 future total traffic volume conditions, the volumes are too low to meet the minimum thresholds. Accordingly, the intersection of Highway 26 and Street "A"/Hope Street was analyzed as stop-controlled in the northbound and southbound directions through all horizon years. The signal warrant sheets and traffic volumes have been included in Appendix P.

5.5 Auxiliary Turn-Lane Assessment

A left-turn lane warrant was undertaken for an eastbound left-turn lane on Highway 26 at Street "A"/Hope Street. The warrant was completed using the MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads. Highway 26 has a posted speed limit of 60 km/h adjacent to the site, thus an 80 km/h design speed was selected, reflecting a traffic engineering convention of a 20 km/h increase to the posted speed limit for higher speed roads.

The analysis was completed for the 2035 horizon year to determine the ultimate turn-lane requirements to support the development. Table 16 summarizes the results of the eastbound left-turn lane warrant assessment. Auxiliary left-turn lane warrant charts have been included in Appendix Q for reference.

APPENDIX C

Correspondence

Madeleine Ferguson

From: Katzirz, Zsolt (MTO) <Zsolt.Katzirz@ontario.ca>
Sent: Thursday, June 20, 2019 1:55 PM
To: Alex Fleming
Cc: Brian Worsley; Kevin Morris; Madeleine Ferguson
Subject: FW: Hwy 26 - Aquavil Craigleith Traffic Study Proposed Terms of Reference

Alex,

Please see our comments below in red……

We will need more details regrading the RIRO to properly assess and comment.

Ontario

Zsolt Katzirz | Corridor Management Planner
Highway Corridor Management Section | West Region | Ministry of Transportation
659 Exeter Road | London, Ontario | N6E 1L3
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From: Alex Fleming <afleming@cfcrozier.ca>
Sent: June-19-19 11:33 AM
To: Brian Worsley <bworsley@thebluemountains.ca>; Katzirz, Zsolt (MTO) <Zsolt.Katzirz@ontario.ca>
Cc: Kevin Morris <kmorris@cfcrozier.ca>; Madeleine Ferguson <mferguson@cfcrozier.ca>
Subject: Aquavil Craigleith Traffic Study Proposed Terms of Reference

Hi Zsolt/Brian,

As a follow up to the site visit earlier, we have prepared a terms of reference for the updated Traffic Study for the AquaVil (Craigleith Village) project.

The proposed changes to the boundary road network include the closure of Blue Mountain Drive and Brophys Lane at Highway 26 and the development of a fourth leg at the intersection of Highway 26 and Hope Street. The client is also seeking approvals for a new right-in/right-out access to the commercial lands from Highway 26, which would be located just west of Long Point Road/Grey Road 21.

We propose the following scope of work for the TIS:

1. The TIS will analyze the operations of the following intersections in the weekday a.m., p.m. and Saturday mid-day peak hours:
    a. Highway 26 and Blue Mountain Drive
    b. Highway 26 and Hope Street
    c. Highway 26 and Brophys Lane
    d. Highway 26 and Long Point Road/Grey Road 21
    e. Proposed site accesses
    f. Highway 26 and Timmons St
    g. Grey Road 21 and Silver Creek Drive

2. The development is proposed to be built in two phases. Phase 1 will consist of the residential dwellings contained in the western portion of the site, while Phase 2 will consist of the residential and commercial buildings in the eastern portion of the site. Phase 1 is assumed to be completed within three years, and Phase 2 is assumed to be completed three years following Phase 1. Accordingly the following horizon years will be analyzed: Phase 1 Completion (2022), Phase 2 Completion (2025), 5 years beyond full buildout (2030) and 10 years beyond full buildout (2035).

3. AADT and SADT provided by the MTO indicated that from 2012 to 2016 on Highway 26 at Long Point Road/Grey Road 21, the roadway experienced growth rates of 1.18% and 1.66%, respectively. Accordingly, a growth rate of 1.5% is proposed.

4. The TIS will account for the trips generated by background developments planned in close proximity to the site. We have identified the following developments: Eden Oak, Parkbridge Craigleith and Home Farm. Please advise of any other nearby planned developments.

5. The trip generation characteristics of the development will be forecasted using the data provided in the ITE Trip Generation Manual, 10th Edition. The pass-by percentages will be obtained from the ITE Trip Generation Handbook, 3rd Edition.

6. The proposed site accesses will be analyzed from a sight distance perspective, and an auxiliary turn-lane assessment will be completed at the accesses.

7. The TIS will include a signal warrant at the intersections of Highway 26 and Hope Street and Highway 26 and Long Point Road/Grey Road 21. Should signals be warranted under any of the horizon years, a roundabout feasibility assessment will be completed.

8. The analysis will complete a review of the feasibility of a right-in/right-out entrance to the commercial lands from an operations and safety perspective.

9. Please calculate queues/storage lengths at signalized intersections using the methodology outlined in the MTO Supplement for TAC.

10. For the Synchro files, please use a PHF of 0.88 and an ideal saturation flow rate of 1900.

Please let us know if you have any comments regarding the above scope of work and feel free to call if you wish to discuss further.

Thanks,
Alex

| **ALEXANDER FLEMING**, MBA, P.Eng. | ASSOCIATE | C.F. CROZIER & ASSOCIATES
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Madeleine Ferguson

From: Scherzer, Randy <Randy.Scherzer@grey.ca>
Sent: Thursday, July 18, 2019 5:35 PM
To: Madeleine Ferguson; Patrick Hoy
Cc: Alex Fleming
Subject: RE: AquaVil (Craigleith Village) - TIS Terms of Reference

Hi Madeleine,

Sorry for the delayed response. Pat and I were both on vacation earlier this month and we are still playing some catch up.

We generally have no concerns with the TIS Terms of Reference for AquaVil noted below. For the Hwy 26/Grey 21 intersection, I believe the preliminary EA results have indicated that signals are warranted/recommended for this intersection. You may want to confirm this with Reg at the Town who is heading up the EA. Based on this, our preference is that a roundabout feasibility assessment be completed.

With respect to other developments in the area, there is also the Long Point Subdivision (proposed to exit off of Long Point Road), the Windfall development, Monterra Phase 2, Windfall Mountain House, as well as proposed Blue Vista Subdivision on Grey Road 21 (also note the proposed Blue Vista would connect with the Second Nature development as well). Although the traffic impacts from these developments will likely be minimal for vehicles exiting these developments and heading to Hwy 26/Grey Road 21 intersection, we would like to see the numbers for these developments considered. Some of the information regarding these developments can be found on the County website at this location - https://www.grey.ca/planning-development/planning-applications There may also be other developments on the Collingwood side that we may not be aware of.

Thanks,
Randy

Randy Scherzer
Director of Planning
Phone: +1 519-372-0219 ext. 1237



From: Madeleine Ferguson <mferguson@cfcrozier.ca>
Sent: July 2, 2019 9:03 PM
To: Hoy, Pat <Pat.Hoy@grey.ca>; Scherzer, Randy <Randy.Scherzer@grey.ca>
Cc: Alex Fleming <afleming@cfcrozier.ca>
Subject: AquaVil (Craigleith Village) - TIS Terms of Reference

[EXTERNAL EMAIL]

Hi Pat and Randy,

We are currently preparing a revised Traffic Impact Study for the AquaVil (Craigleith Village) development. The

development consists of residential units in the western portion of the lands, and commercial buildings in the eastern portion of the lands. I have attached the most recent concept plan. Based on the current plan, the proposed changes to the boundary road network include the closure of Blue Mountain Drive and Brophys Lane at Highway 26 and the development of a fourth leg at the intersection of Highway 26 and Hope Street. The client is also seeking approvals for a new right-in/right-out access to the commercial lands from Highway 26. The attached concept plan does not show the RIRO entrance, but we will be investigating its feasibility along that segment.

We have circulated these TOR with the MTO and Town, and the workplan below encompasses the scope confirmed with the MTO.

We propose the following scope of work for the TIS:

1. The TIS will analyze the operations of the following intersections in the weekday a.m., p.m. and Saturday mid-day peak hours:
    a. Highway 26 and Blue Mountain Drive
    b. Highway 26 and Hope Street
    c. Highway 26 and Brophys Lane
    d. Highway 26 and Long Point Road/Grey Road 21
    e. Highway 26 and Timmons Street
    f. Grey Road 21 and Silver Creek Drive
    g. Proposed site accesses

2. The development is proposed to be built in two phases. Phase 1 will consist of the residential dwellings contained in the western portion of the site, while Phase 2 will consist of the residential and commercial buildings in the eastern portion of the site. Phase 1 is assumed to be completed within three years, and Phase 2 is assumed to be completed three years following Phase 1. Accordingly the following horizon years will be analyzed: Phase 1 Completion (2022), Phase 2 Completion (2025), 5 years beyond full buildout (2030) and 10 years beyond full buildout (2035).

3. AADT and SADT provided by the MTO indicated that from 2012 to 2016 on Highway 26 at Long Point Road/Grey Road 21, the roadway experienced growth rates of 1.18% and 1.66%, respectively. Accordingly, a growth rate of 1.5% is proposed for all movements.

4. The TIS will account for the trips generated by background developments planned in close proximity to the site. We have identified the following developments: Eden Oak, Parkbridge Craigleith and Home Farm. Please advise of any other nearby planned developments.

5. The trip generation characteristics of the development will be forecasted using the data provided in the ITE Trip Generation Manual, 10th Edition. The pass-by percentages will be obtained from the ITE Trip Generation Handbook, 3rd Edition.

6. The proposed site accesses will be analyzed from a sight distance perspective, and an auxiliary turn-lane assessment will be completed at the accesses.

7. The TIS will include a signal warrant at the intersections of Highway 26 and Hope Street and Highway 26 and Long Point Road/Grey Road 21. Should signals be warranted under any of the horizon years, a roundabout feasibility assessment will be completed.

8. The analysis will complete a review of the feasibility of a right-in/right-out entrance to the commercial lands from an operations and safety perspective.

9. The MTO Supplement for TAC will be referenced for calculating queues/storage lengths at signalized intersections.

10. Synchro analysis will be modeled using a PHF of 0.88 and ideal saturation flow rate of 1900, as requested by the MTO.

Please let us know if you have any comments regarding the above scope of work and feel free to call if you wish to discuss further.

Thanks,

Madeleine Ferguson EIT | Transportation
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APPENDIX J

Eden Oak Development

TRAFFIC IMPACT STUDY

EDEN OAK – BLUE TRAILS
RESIDENTIAL DEVLEOPMENT

EDEN OAK (TRAILSHEAD) INC.
TOWN OF THE BLUE MOUNTAINS

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
110 PINE STREET
COLLINGWOOD, ONTARIO
L9Y 2N9

JULY 2012

CFCA FILE NO. 218-2659

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Old Lakeshore Road is a two lane east-west rural local roadway under the jurisdiction of the Town of The Blue Mountains. The posted speed limit is 50 km/h. The roadway consists of two 3.0 metre paved travel lanes with 0.5 metre granular shoulders.

Fraser Crescent is a two-lane local rural roadway under the jurisdiction of the Town of The Blue Mountains. The speed limit is not posted and is therefore 50 km/h per municipal regulation. The roadway consists of a 50 metre unpaved platform with no shoulders.

The four-legged intersection of Highway 26 and Old Lakeshore Road/Fraser Crescent is unsignalized. The east and west approaches (Highway 26) have no restriction to free-flow and consist of a shared left-turn/through/right-turn lane. The north approach (Fraser Crescent) and south approach (Old Lakeshore Road) are stop-controlled and consist of a shared left-turn/through/right-turn lane.

3.3 Development Proposal

The proposed development is to consist of mixed residential unit types. 128 clustered or attached townhomes are proposed, along with 62 semi-detached units. Additionally, five attached units are proposed away from the main site on the north side of Lakeshore. These units will serve as model homes for sales purposes.

The tenure of the internal roadway system is to be publically owned and contained within a 20 metre road allowance. Private condominium elements will exist within the site to serve the clustered townhomes.

Access to the public roadway will be through a single access to Old Lakeshore Road, approximately 85 metres south of the Highway 26 and Old Lakeshore Road/Fraser Crescent intersection. An allowance for a public road connection to undeveloped lands to the east has been made to accommodate future development to the east.

Refer to Figure 2 for the draft plan prepared by D.C. Slade & Associates, June, 2012.

3.4 Traffic Data

Turning movement counts at the intersection of Highway 26 and Old Lakeshore Road/Fraser Crescent were undertaken by C. F. Crozier & Associates staff from 7:00 to 9:00 a.m. and from 4:00 to 6:00 p.m. on June 22, 2012.

The a.m. peak hour was found to be from 8:00 to 9:00 a.m., and the p.m. peak hour was found to be from 4:15 to 5:15 p.m. The traffic count data is summarized in Appendix B.

Figure 3 illustrates the 2012 existing traffic volumes.

3.5 Intersection Operations

The operations of intersection were analyzed on the basis of the traffic volumes illustrated in Figure 3. The assessment of unsignalized intersections is based on the method outlined in the "Highway Capacity Manual, 2000" and was modeled using Synchro 8 software. The definitions for unsignalized intersections are included in Appendix A and detailed capacity analyses are included in Appendix C.
Table 1 outlines the 2012 traffic levels of service.

Figures 4, 5 and 6 illustrate the future background traffic volumes for the 2020, 2025 and 2030 horizon years, respectively, and reflect the Highway 26 corridor growth and the development specific growth from the Craigleith Village mixed use development.

4.4 Intersection Operations

The operations of the critical intersections were analyzed on the basis of the traffic volumes illustrated in Figures 4, 5 and 6. Table 3 outlines the 2020, 2025 and 2030 future background traffic levels of service. Detailed capacity analyses are included in Appendix C.

Table 3
Future Background Traffic Levels of Service

Intersection	Horizon Year	Peak Hour	Level of Service	Control Delay	95%ile Queue Length	Volume-to-Capacity
Highway 26 and Old Lakeshore Road / Fraser Crescent	2020	A.M.	B	12.2 s	1 veh.	0.02
		P.M.	B	12.2 s	1 veh.	0.02
	2025	A.M.	B	12.5 s	1 veh.	0.02
		P.M.	B	12.5 s	1 veh.	0.02
	2030	A.M.	B	12.8 s	1 veh.	0.02
		P.M.	B	12.8 s	1 veh.	0.02

Note: The level of service of a stop-controlled intersection is based on the delay associated with the critical minor road movement.

As indicated in Table 3 the intersection of Highway 26 and Old Lakeshore Road/Fraser Crescent will experience minor increases in delays to a maximum of two seconds by the 2030 p.m. peak hour. This is a result of the low volume of vehicles entering Highway 26 from Old Lakeshore Road.

5.0 Site Generated Traffic

The proposed development will result in additional vehicles on the boundary road network, as well as additional turning movements at the boundary road intersections.

5.1 Trip Generation

The ITE Trip Generation Manual, 8th Edition was used to model the various residential unit types proposed for the subject lands. No category exists for semi-detached units; therefore the rates corresponding to townhouses were substituted as the most similar.

The five model home townhouses that are proposed on the north side of Old Lakeshore Road have been tabulated separately from the main site units.

Eight future units known as the Chaisson lands are not a part of the subject development proposal, but will access the boundary road system through the development access to Old Lakeshore Road. These units have been accounted for and are included in the site trip generation as single-family detached units.

The specific categories used are specified in Table 4, along with the corresponding trips.

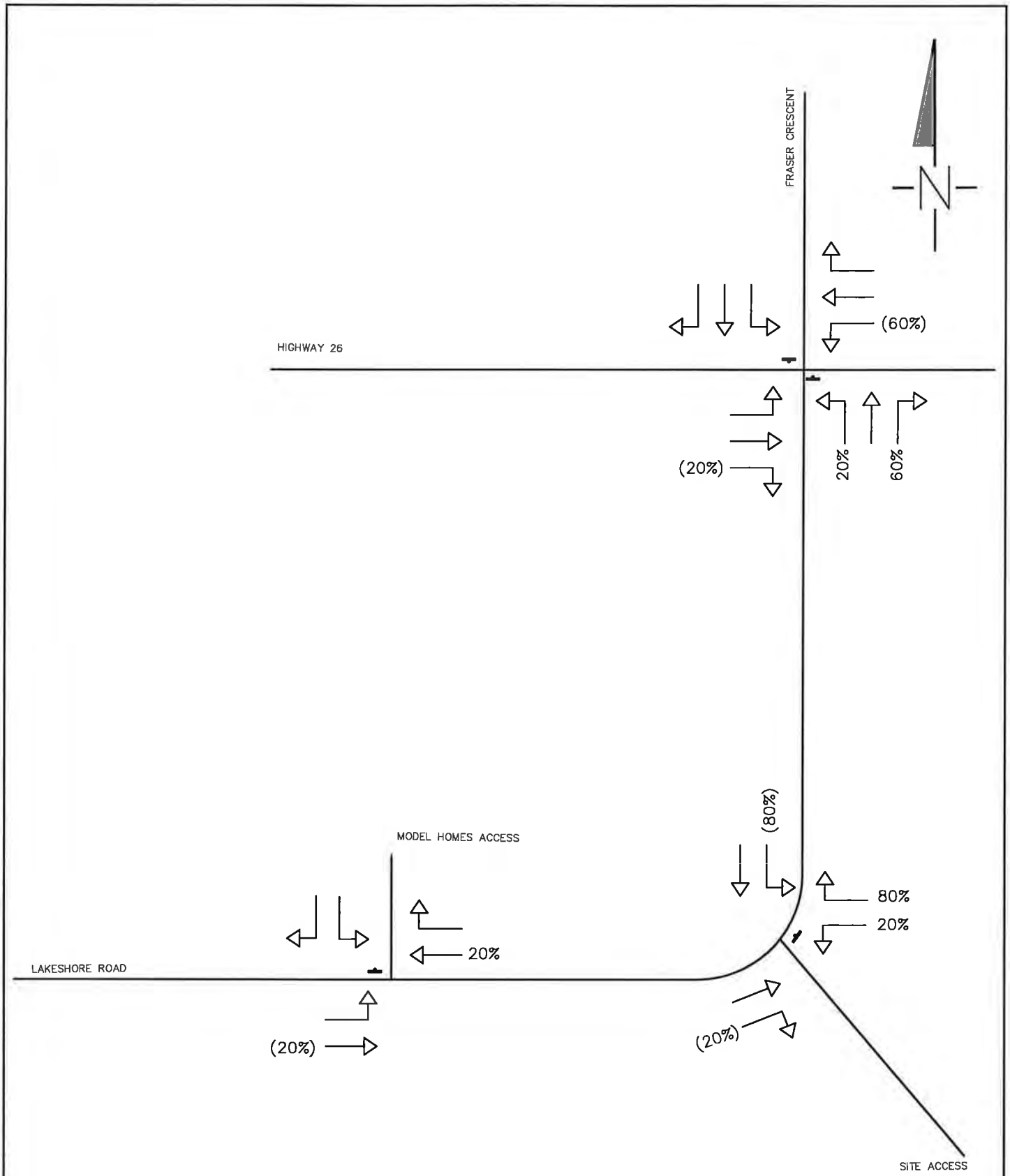
Table 4
Site Generated Residential Trips

Use	Units	Roadway Peak Hour	Number of Trips		
			Inbound	Outbound	Total
Single Family Lots Category 210 (Chaisson Lands)	8	Weekday A.M.	2	4	6
		Weekday P.M.	5	3	8
Semis/ Townhouses Category 230	212	Weekday A.M.	16	77	93
		Weekday P.M.	74	36	110
Model Home Townhouses Category 230	5	Weekday A.M.	0	2	2
		Weekday P.M.	2	1	3
Total Residential Trips	225	Weekday A.M.	18	83	101
		Weekday P.M.	81	40	121

5.2 Trip Distribution and Assignment

The trips generated by the development were distributed to the boundary roadways based on the location of retail, commercial and recreational destinations. With the Town of Collingwood located to the east of the subject lands, 60 percent of trips were assumed to arrive from/depart to the east along Highway 26. 20 percent of the trips were assumed to arrive from/depart to the west along Old Lakeshore Road for the recreational and leisure destinations associated with the Niagara Escarpment, primarily the Village at Blue. The remaining 20 percent of trips were assumed to arrive from/depart to Thornbury and areas west along Highway 26. Figure 7 illustrates the trip distribution.

The trips generated by the proposed development were assigned to the boundary road network as per the distribution illustrated in Figure 7. The trip assignment is illustrated in Figures 8.



Legend

STOP CONTROL

XX(YY) OUTBOUND (INBOUND) TRIP DISTRIBUTION

Project

EDEN OAK
CRAIGHLEITH

Drawing

TRIP DISTRIBUTION

CROZIER & ASSOCIATES
Consulting Engineers
THE HARBOUREDGE BUILDING,
40 HURON STREET, SUITE 301,
COLLINGWOOD, ON L9Y 4R3
705 446-3510 T
705 446-3520 F

Drawn By	Design By	Project
E.J.	C.C.C./D.D.D.	218-2659
Scale	Date	Check By	Drawing
N.T.S.	06/25/2012	E.E.E./F.F.F.	FIGURE 8

DATE: AUGUST 19, 2014

PROJECT NO: 218-2659

SENT VIA: EMAIL

County of Grey
595 9th Ave East
Owen Sound, ON N4K 3E3

Attention: Randy Scherzer, Director of Planning & Development

RE: CROZIER TRAFFIC IMPACT STUDY
SITE PLAN REVISION AND UNIT COUNT CHANGE
BLUE TRAILS RETIREMENT COMMUNITY, TOWN OF COLLINGWOOD

Dear Randy,

This letter is with regards to the updated site plan for the Blue Trails Subdivision in Collingwood, Ontario. The most updated site plan, dated February 21st, 2013 contains 23 units less than the site plan used to complete the Traffic Impact Study in support of the previous planning applications (Crozier, July 2012).

Trip generation calculations were undertaken for the new site plan to determine the traffic effects of the changes to the site plan. Table 1 and 2 display the trips generated from the previous site plan and the updated site plan, respectively.

Table 1- July 2012 Site Plan
Site Generated Residential Trips

Use	Units	Roadway Peak Hour	Number of Trips		
			Inbound	Outbound	Total
Single Family Lots Category 210 (Chaisson Lands)	8	Weekday A.M.	2	4	6
		Weekday P.M.	5	3	8
Semis/ Townhouses Category 230	212	Weekday A.M.	16	77	93
		Weekday P.M.	74	36	110
Model Home Townhouses Category 230	5	Weekday A.M.	0	2	2
		Weekday P.M.	2	1	3
Total Residential Trips	225	Weekday A.M.	18	83	101
		Weekday P.M.	81	40	121

Table 2- February 2013 Site Plan
Site Generated Residential Trips

Use	Units	Roadway Peak Hour	Number of Trips		
			Inbound	Outbound	Total
Single Family Lots Category 210 (Chaisson Lands)	8	Weekday A.M.	2	4	6
		Weekday P.M.	5	3	8
Semis/ Townhouses Category 230	194	Weekday A.M.	14	71	85
		Weekday P.M.	68	33	101
Total Residential Trips	202	Weekday A.M.	16	75	91
		Weekday P.M.	73	36	109

The net decrease in forcasted trips resulting from the change from 225 units (previous site plan) to 202 units (updated site plan) was 10 trips (2 entering and 8 exiting) in the a.m. peak period, and 12 trips (8 entering and 4 exiting) in the p.m. peak period. This change in trip generation will not materially alter the conclusions of the Traffic Impact Study submitted by Crozier & Associates dated July 2012. Thus, an update to the Traffic Impact study is not required as all conclusions in the previous study remain valid.

Should you have any questions or require any further information, please do not hesitate to contact the undersigned. Thank you.

Yours truly,

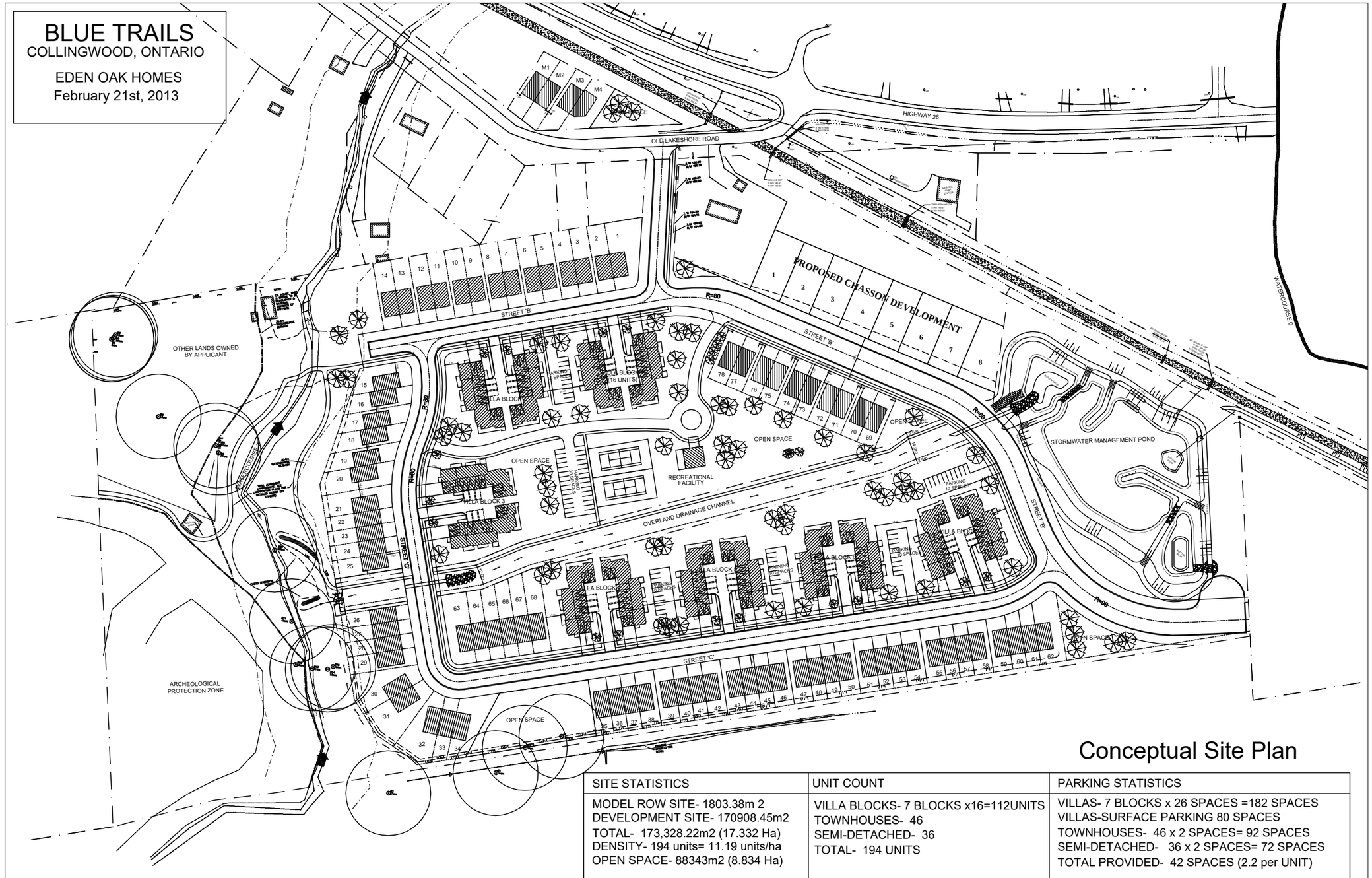
C.F. CROZIER & ASSOCIATES INC.

Alexander Fleming MBA, P.Eng
Transportation Manager

\\cfcsrv\projects\200\218 - Eden Oak\2659\Letters\20140815 Updated Site Plan Traffic Letter.docx

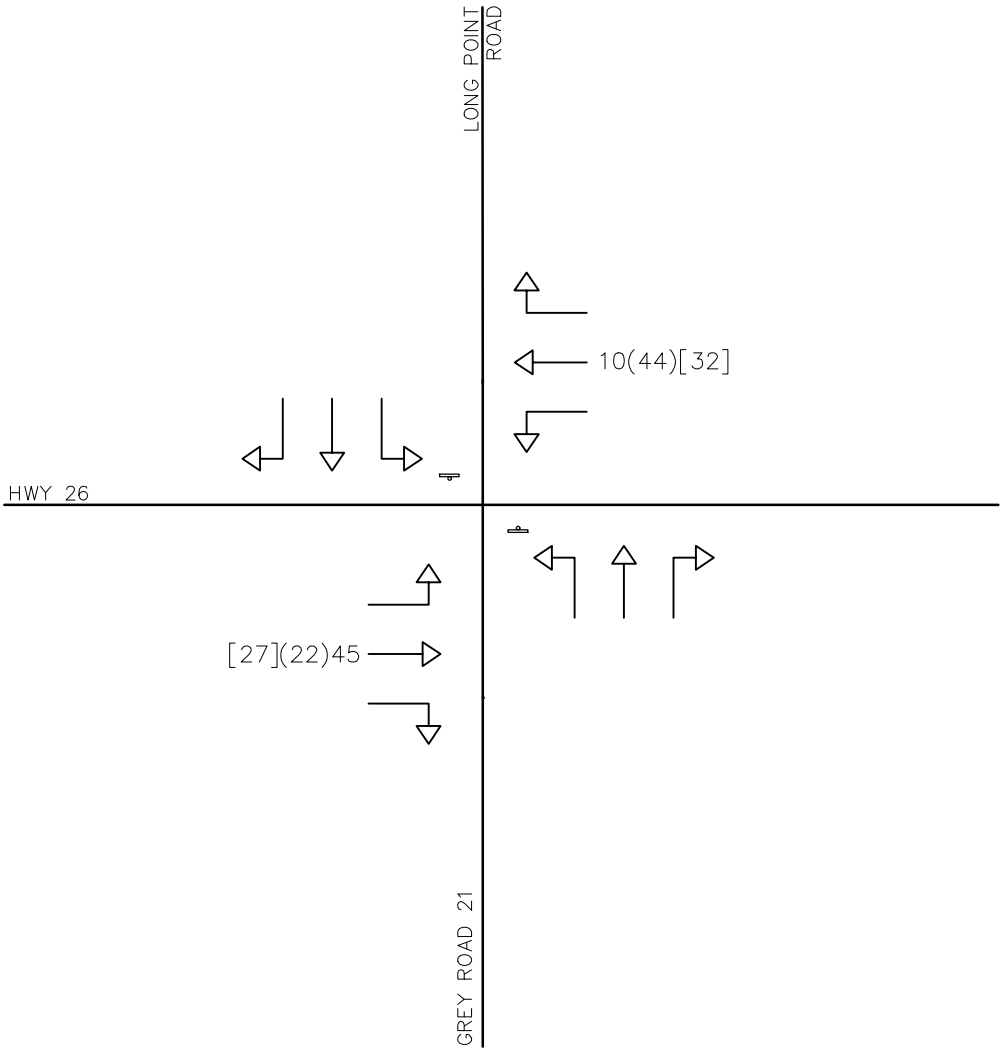
BLUE TRAILS
COLLINGWOOD, ONTARIO

EDEN OAK HOMES
February 21st, 2013



Conceptual Site Plan

SITE STATISTICS	UNIT COUNT	PARKING STATISTICS
MODEL ROW SITE- 1803.38m 2 DEVELOPMENT SITE- 170908.45m2 TOTAL- 173,328.22m2 (17.332 Ha) DENSITY- 194 units= 11.19 units/ha OPEN SPACE- 88343m2 (8.834 Ha)	VILLA BLOCKS- 7 BLOCKS x16=112UNITS TOWNHOUSES- 46 SEMI-DETACHED- 36 TOTAL- 194 UNITS	VILLAS- 7 BLOCKS x 26 SPACES =182 SPACES VILLAS-SURFACE PARKING 80 SPACES TOWNHOUSES- 46 x 2 SPACES= 92 SPACES SEMI-DETACHED- 36 x 2 SPACES= 72 SPACES TOTAL PROVIDED- 42 SPACES (2.2 per UNIT)



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

SIGNAL CONTROL

STOP CONTROL

XX(YY)[ZZ] WEEKDAY A.M. (WEEKDAY P.M.) [SATURDAY]

Project

AQUAVIL
TOWN OF THE BLUE MOUNTAINS

Drawing

EDEN OAK TRIP ASSIGNMENT

CROZIER & ASSOCIATES Consulting Engineers
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40 Huron Street, Suite 301,
Collingwood, ON L9Y 4R3
705 446-3510 T
705 446-3520 F
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Drawn By	Design By	Project	
M.J.	M.F.		876-4866
Scale	Date	Check By	Drawing
N.T.S.	SEPT. 26, 2019	M.F.	APP. J

APPENDIX M

Parkbridge Craigleith Development

TRAFFIC ASSESSMENT

PARKBRIDGE CRAIGLEITH RIDGE
TOWN OF THE BLUE MOUNTAINS

PREPARED FOR:
PARKBRIDGE LIFESTYLE COMMUNITIES INC.

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
40 HURON STREET, SUITE 301
COLLINGWOOD, ONTARIO
L9Y 4R3

FEBRUARY 2018

CFCA FILE NO. 1046-4031

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CROZIER
CONSULTING ENGINEERS

horizon years studied included 2018, 2023, and 2028, as required by the MTO TIS guidelines applicable at that time.

Intersection analysis of Grey Road 19 and Birches Boulevard and Grey Road 19 and Helen Street indicated that the intersections will experience minor delays and operate at a LOS "C" in the 2028 horizon year with the implementation of a southbound left-turn lane at the intersection of Grey Road 19 and Birches Boulevard.

Active transportation was not considered in this Traffic Impact Study.

5.3 Parkbridge Craigleith – December 2016

The Parkbridge residential development in Craigleith is approximately 27 hectares in size. The Concept Plan for the proposed development consists of 211 units comprising of 92 townhomes and 119 single-detached houses. The subject development is anticipated to be fully built out and occupied by 2021. Therefore, horizon years include 2021, 2026, and 2031, as required by the MTO TIS guidelines.

For the Traffic Impact Study, the following intersections were analyzed:

- Highway 26 and Grey Road 19
- Highway 26 and Lakeshore Road
- Grey Road 19 and Lakeshore Road
- Grey Road 19 and Craigleith Road

Intersection analysis of Highway 26 and Grey Road 19 is expected to continue operating at a LOS "B" in the 2031future total horizon year.

The intersection of Highway 26 and Lakeshore Road with and without the previously recommended westbound left-turn lane is expected to operate at a LOS "C" in the 2031 future total horizon year.

The intersection of Grey Road 19 and Craigleith Road is expected to operate at a LOS "B" in the 2031 future total horizon year.

All of the operations previously mentioned are expected to operate efficiently with minor increases to control delay given the addition of site generated traffic.

Active transportation was not analyzed within this study.

5.3.1 Parkbridge Trip Generation

The aforementioned operations were based on the following trip generation, as included in the December 2016 Traffic Impact Study.

Table 1 - Trip Generation

Subject Property Use	Roadway Peak Hour	Number of Trips		
		Inbound	Outbound	Total
Recreational Homes (Cat 260)	Weekday A.M.	23	11	34
	Weekday P.M.	23	33	56

In response to the MTO comments dated March 31st, 2017, a sensitivity analysis has been included in

Appendix I
Sensitivity Analysis

JANUARY 25, 2018

PROJECT NO: 1046-4031

SENT VIA: EMAIL
RWAGNER@PARKBRIDGE.COM

Parkbridge Lifestyle Communities Inc.
85 Theme Park Drive
Wasaga Beach, ON L9Z 1X7

Attention: Rob Wagner

RE: COMMENT RESPONSE LETTER
PARKBRIDGE CRAIGLEITH RIDGE RESIDENTIAL DEVELOPMENT
TOWN OF THE BLUE MOUNTAINS, COUNTY OF GREY

Dear Rob,

This letter has been prepared in response to the MTO's comments dated March 31, 2017 pertaining to the trip generation land use category utilized in the original Traffic Impact Study (TIS) (Crozier, December 2016) for the proposed Parkbridge Craigleith Ridge residential development.

In response to the MTO's comment, we have provided a sensitivity analysis illustrating the modified trip generation and corresponding operations for the preferred scenario, Option 3.

As described in the main body of the Traffic Assessment, the original TIS used Land Use Category 260: "Recreational Homes", which resulted in a total trip generation of 34 and 56 trips in the weekday a.m. and p.m. peak hours, respectively.

As requested by the MTO, the modified trip generation considered Land Use Category 210: "Single Family Detached Housing" and Land Use Category 220: "Multifamily Housing (Low-rise)". The trip generation was calculated using the fitted curve equations provided in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. The resulting trip generation is summarized in **Table 1** below.

Table 1 – Trip Generation

Subject Property Use	Roadway Peak Hour	Number of Trips		
		Inbound	Outbound	Total
L.U. 210: Single Family Detached Housing (119 Units)	Weekday A.M.	22	67	89
	Weekday P.M.	76	44	120
L.U. 220: Multifamily Housing (Low-Rise) (92 Units)	Weekday A.M.	10	34	44
	Weekday P.M.	35	20	55
Total	**Weekday A.M.**	**32**	**101**	**133**
	Weekday P.M.	**111**	**64**	**175**

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Collingwood, ON L9Y 4R3
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cfcrozier.ca

CROZIER CONSULTING ENGINEERS

The resulting trip generation represents an increase of 99 and 119 trips in the weekday a.m. and p.m. peak hours, respectively. This trip generation is considered an over-estimation, as the revised land use categories do not align with other typical Parkbridge developments.

Table 2 below outlines the traffic operations for both trip generation scenarios.

Table 2 - 2031 Future Total Level of Service (No connection to Lakeshore Drive)

Intersection	Control	Peak Hour	Level of Service	Control Delay	Control Delay (Original Trip Generation)	Max V/C Ratio	Max V/C Ratio (Original Trip Generation)
Highway 26 and Grey Road 19	Signal (Optimized)	A.M.	B	15.2 s	14.9 s	0.54 (EBT)	0.53 (EBT)
		P.M.	B	18.4 s	17.9 s	0.73 (EBT)	0.70 (EBT)
Highway 26 and Lakeshore Road	Stop	A.M.	C	16.8 s	15.8 s	0.27 (WBT)	0.27 (WBT)
		P.M.	D	30.1 s	27.7 s	0.50 (WBT)	0.47 (WBT)
Grey Road 19 and Lakeshore Road	Stop	A.M.	B	13.6 s	12.6 s	0.13 (NBT)	0.13 (NBT)
		P.M.	B	14.8 s	13.7 s	0.24 (NBT)	0.23 (NBT)
Grey Road 19 and Craigleith Road	Stop	A.M.	B	11.5 s	10.3 s	0.17 (WB)	0.05 (EB)
		P.M.	C	15.1 s	12.8 s	0.16 (WB)	0.07 (EB/WB)
Grey Road 19 and Birches Boulevard	Stop	A.M.	B	12.8 s	12.5 s	0.14 (WB/SB)	0.14 (WB)
		P.M.	C	17.3 s	16.5 s	0.27 (NBT)	0.25 (NBT)
Grey Road 19 and Helen Street	Stop	A.M.	B	12.9 s	12.6 s	0.15 (WB)	0.15 (WB)
		P.M.	C	17.0 s	16.4 s	0.33 (NB)	0.31 (NB)

Note: The Level of Service of a signalized intersection is based on the average control delay per vehicle. The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach; ie., Lakeshore Road and Craigleith Road

As illustrated in the above table, the additional traffic caused by modifying the trip generation assumptions has a marginal impact on the overall traffic operations of the boundary road network. For this reason, the revised trip generation is not expected to materially impact the recommendations and conclusions summarized in the original TIS or the Traffic Assessment (Crozier, January, 2018).

Auxiliary Lane Analysis

A left-turn lane warrant was undertaken in the original TIS for a southbound left-turn lane at the intersection of Grey Road 19 and Craigleith Road. The analysis indicated that a left-turn lane is not warranted. The results of this analysis are summarized in **Table 3** below. The analysis was revised to account for the change in trip generation, as requested by the MTO.

The analysis was completed using the Ontario Ministry of Transportation (MTO) Geometric Design Standards for Ontario Highways (GDSOH) during the weekday a.m. and p.m. periods under future total conditions. In keeping with the traffic engineering convention of design speeds 10 km/h in excess of the posted speed limit for typical roadways, a 60 km/h design speed at the subject site

was assumed. Thus, the warrants were governed by Figures EA-6 and EA-8 from the GDSOH, which cover unsignalized intersections with a design speed of 60 km/h. **Table 4** summarizes the left-turn lane warrant results. The MTO left-turn lane warrant charts have been attached for reference.

Table 3 – Original Trip Generation Left-Turn Lane Warrant

Intersection	Peak Hour	V_a	V_o	%LT in V_a	Warranted	Required Storage
Grey Road 19 and Craigleith Road	A.M.	186	203	9%	✗	N/A
	P.M	254	350	6%	✗	N/A

Table 4 – Sensitivity Left-Turn Lane Warrant

Intersection	Peak Hour	V_a	V_o	%LT in V_a	Warranted	Required Storage
Grey Road 19 and Craigleith Road	A.M.	192	206	11%	✗	N/A
	P.M	316	376	25%	✓	15 m

As summarized in **Table 3,** a left-turn lane is not warranted under the original trip generation land use assumption of recreational homes. Given the revised assumption of single family detached and multifamily low-rise, a left-turn lane would be warranted with a 15 metre storage length.

Although a left-turn lane is warranted at this location using the revised trip generation, the future total operations indicate that the southbound through and right-turn movements experience very minimal delays, and as such, the existing lane configuration is supportable from an operations perspective. The control delay for the southbound movement without the implementation of a left-turn lane is **2.6 seconds,** thereby supporting the original configuration without a left-turn lane.

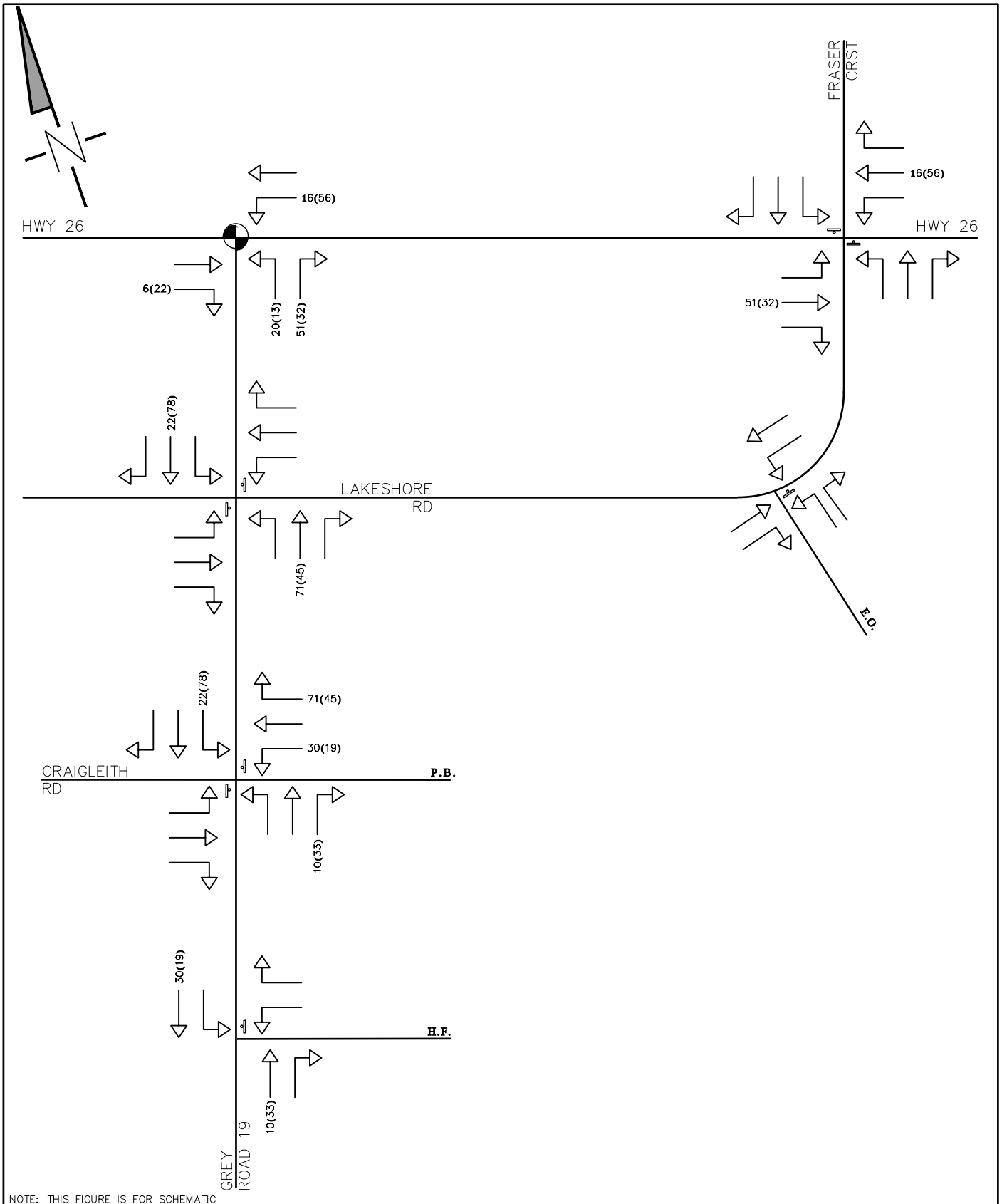
As noted previously, the revised trip generation represents a conservative analysis, as the modified land use categories do not align with the travel patterns and behaviors anticipated for this development. Accordingly, it is recommended that turning movement counts be re-taken after the development has occupancy, in order to establish peak hour traffic patterns, and determine if left-turn lanes are justified.

We trust this supplementary information is acceptable and addresses any outstanding concerns related to the trip generation. Should you have any questions or require any further information, please do not hesitate to contact the undersigned.

Sincerely,

C.F. CROZIER & ASSOCIATES INC.

Ryan MacLaughlan, P.Eng



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

SIGNAL CONTROL

STOP CONTROL

XX(YY) AM (PM)

Project

PARKBRIDGE CRAIGLEITH
TOWN OF THE BLUE MOUNTAINS

Drawing

OPTION 3 - PARKBRIDGE ASSIGNMENT: SENSITIVITY ANALYSIS

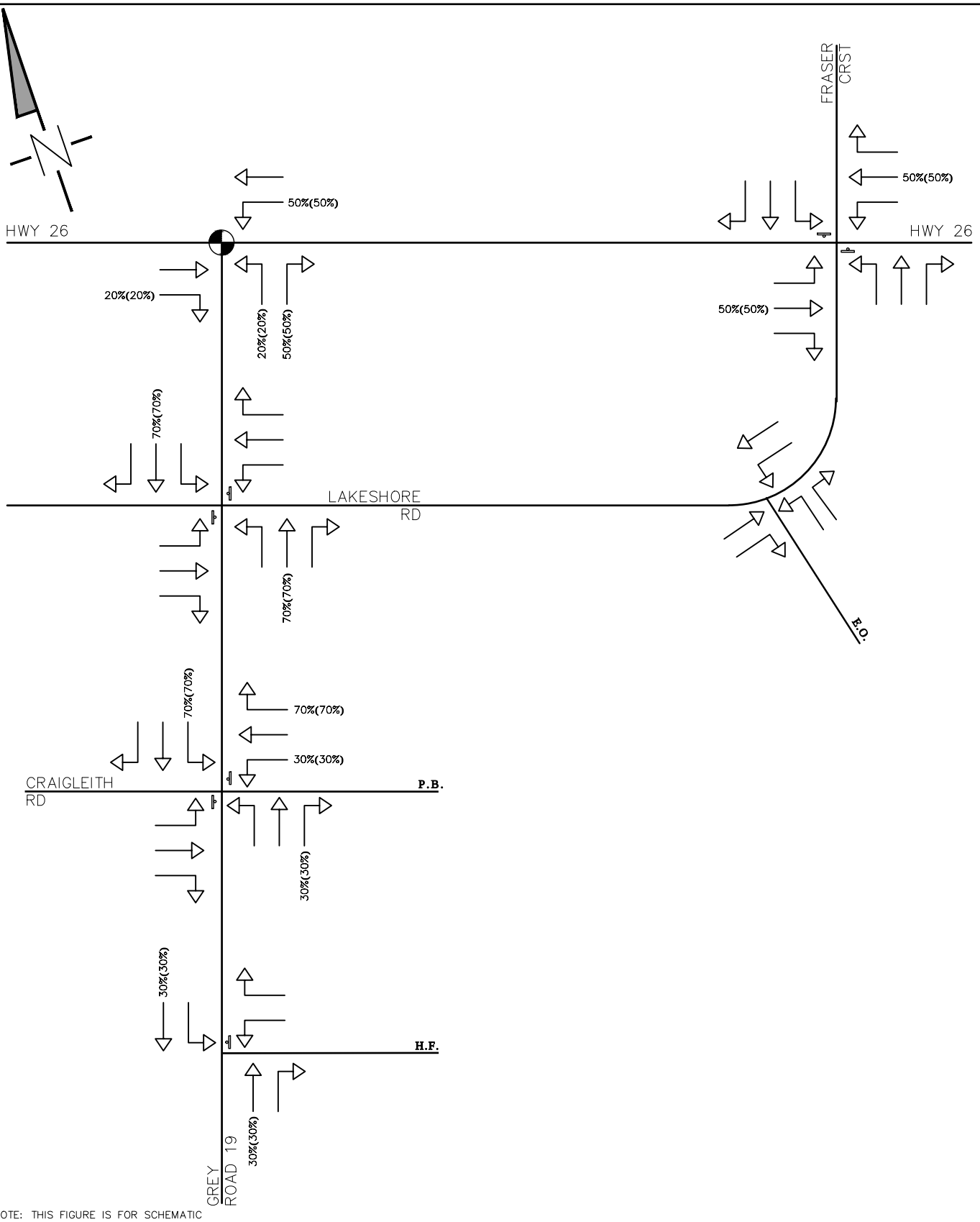
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Drawn By	Design By	Project
J.I.M.	M.N.F.	1046 - 4031

Scale	Date	Check By	Drawing
N.T.S.	JAN. 24, 2018	R.M.	FIG. i

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NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

SIGNAL CONTROL

STOP CONTROL

XX(YY) AM (PM)

Project

PARKBRIDGE CRAIGLEITH
TOWN OF THE BLUE MOUNTAINS

Drawing

OPTION 3 - PARKBRIDGE DISTRIBUTION

CROZIER & ASSOCIATES Consulting Engineers
The HarbourEdge Building, 40 Huron Street, Suite 301, Collingwood, ON L9Y 4R3
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Drawn By	Design By	Project
J.I.M.	M.N.F.	1046-4031

Scale	Date	Check By	Drawing
N.T.S.	JAN. 5, 2018	R.M.	FIG. 24

LEGEND

- CONSTRAINTS - HIGH
- CONSTRAINTS - MEDIUM
- TYPE A BACK-TO-BACK TOWNS
- TYPE B 1-STOREY TOWNS
- TYPE C LOFT TOWNS
- TYPE D 1-STOREY SINGLE
- TYPE E 2-STOREY SINGLE

NOTE: DETACHED LOTS CAN ACCOMMODATE BOTH SINGLE TYPE D OR E

LAKESIDE COURTS
Total 77 units

SINGLES
11u@15mx30m
LOFT TOWNS
40u@6.7mx30m
1-STOREY TOWNS
26u@9mx30m
VISITOR PARKING
22 spaces

CREEKSIDE COURTS
Total 65 units

SINGLES
34u@15mx30m
LOFT TOWNS
31u@6.7mx30m
VISITOR PARKING
90 spaces

HILLSIDE COURTS
Total 69 units

LOFT TOWNS
21u@6.7mx30m
BACK-TO-BACK TOWNS
48u@7.8mx15m
VISITOR PARKING
51 spaces

GEORGIAN BAY

HIGHWAY No. 26

LAKESHORE RD

GREY ROAD No. 19

CRAIGLEITH RD

STORAGE BUILDING AREA 5670 SQ.FT.

COMMUNITY CLUB HOUSE AREA 4730SQ.FT.

EMERGENCY ACCESS ROAD ONLY

BOLLARDS

TRAIL NETWORK CONNECTION complete w/ SIGNAGE AT CROSSING

GEORGIAN TRAIL

CANADIAN NATIONAL RAILWAY RIGHT OF WAY)

EPHEMERAL WATERCOURSE

PERMANENT WATERCOURSE

PEDESTRIAN TRAIL

ENVIRONMENTAL AREA

PLATER-FLEMING CONSERVATION AREA

NIPISSING RIDGE

15M MIN. BUFFER FROM CREEK (TYPICAL 30M PROVIDED)

STORMWATER POND

OPEN SPACE/ PRESERVED AREA

POTENTIAL PLAYGROUND

PEDESTRIAN PRIORITY ZONE

WETLAND PRESERVE

OPEN SPACE

UNPAVED EMERGENCY ACCESS LOOP

PEDESTRIAN TRAIL

PEDESTRIAN TRAIL

PERMANENT WATERCOURSE

SvN
110 Adelaide St. E.
Toronto, Canada
M5C 1K9
416.593.6499
www.svn-ap.com

41717 // Craigleith Ridge

Craigleith, Ontario

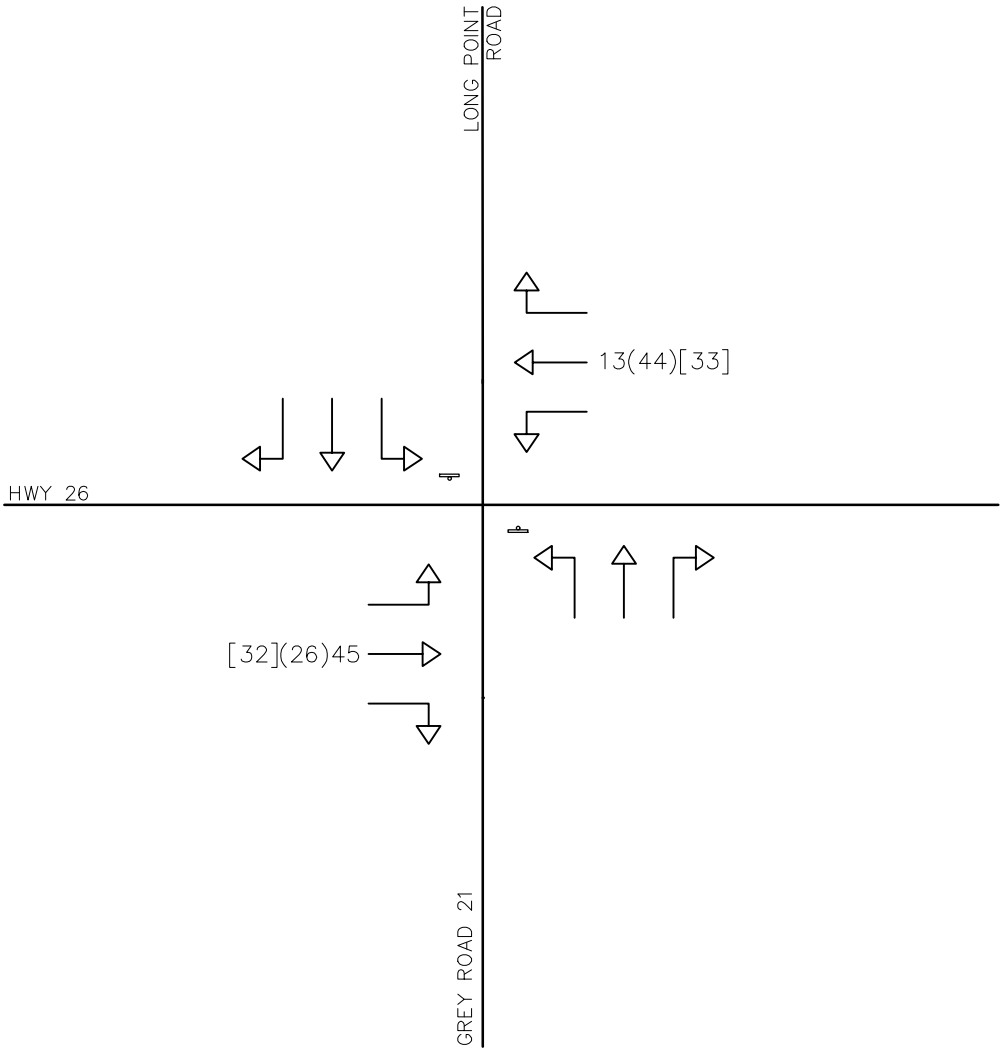
CRAIGLEITH RIDGE

TECHNICAL SITE PLAN

scale 1:2500

April 30, 2018

A0.1



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

SIGNAL CONTROL

STOP CONTROL

XX(YY)[ZZ] WEEKDAY A.M. (WEEKDAY P.M.) [SATURDAY]

Project

AQUAVIL
TOWN OF THE BLUE MOUNTAINS

Drawing

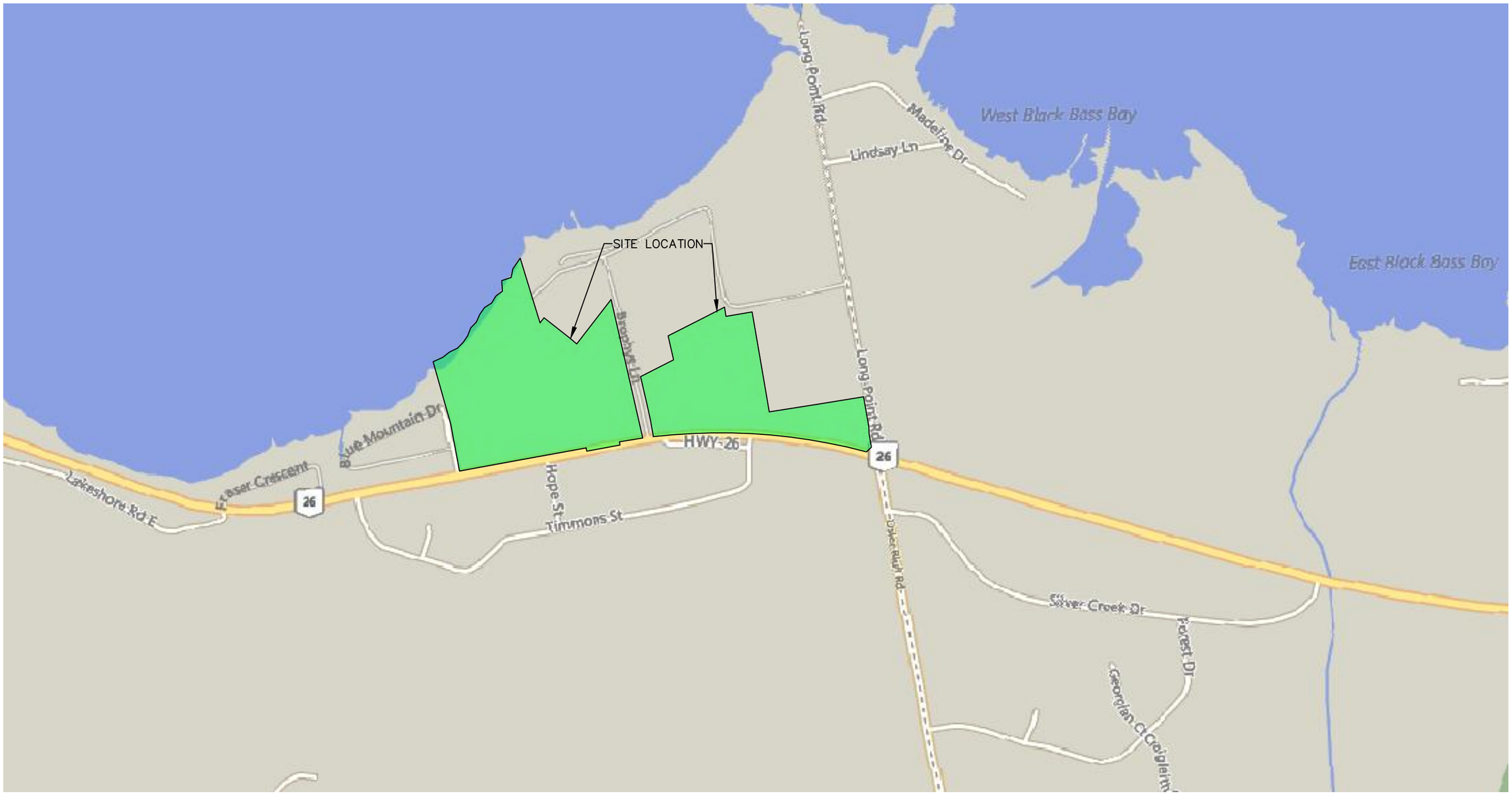
PARKBRIDGE TRIP ASSIGNMENT

CROZIER & ASSOCIATES Consulting Engineers
The HarbourEdge Building,
40 Huron Street, Suite 301,
Collingwood, ON L9Y 4R3
705 446-3510 T
705 446-3520 F
www.cfcrozier.ca
info@cfcrozier.ca

Drawn By	Design By	Project	Scale	Date	Check By	Drawing
M.J.	M.F.	876-4866	N.T.S.	SEPT. 26, 2019	M.F.	APP. M

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200 0m 200 400 600 800

SCALE: 1:10000

Project
AQUAVIL
TOWN OF THE BLUE MOUNTAINS

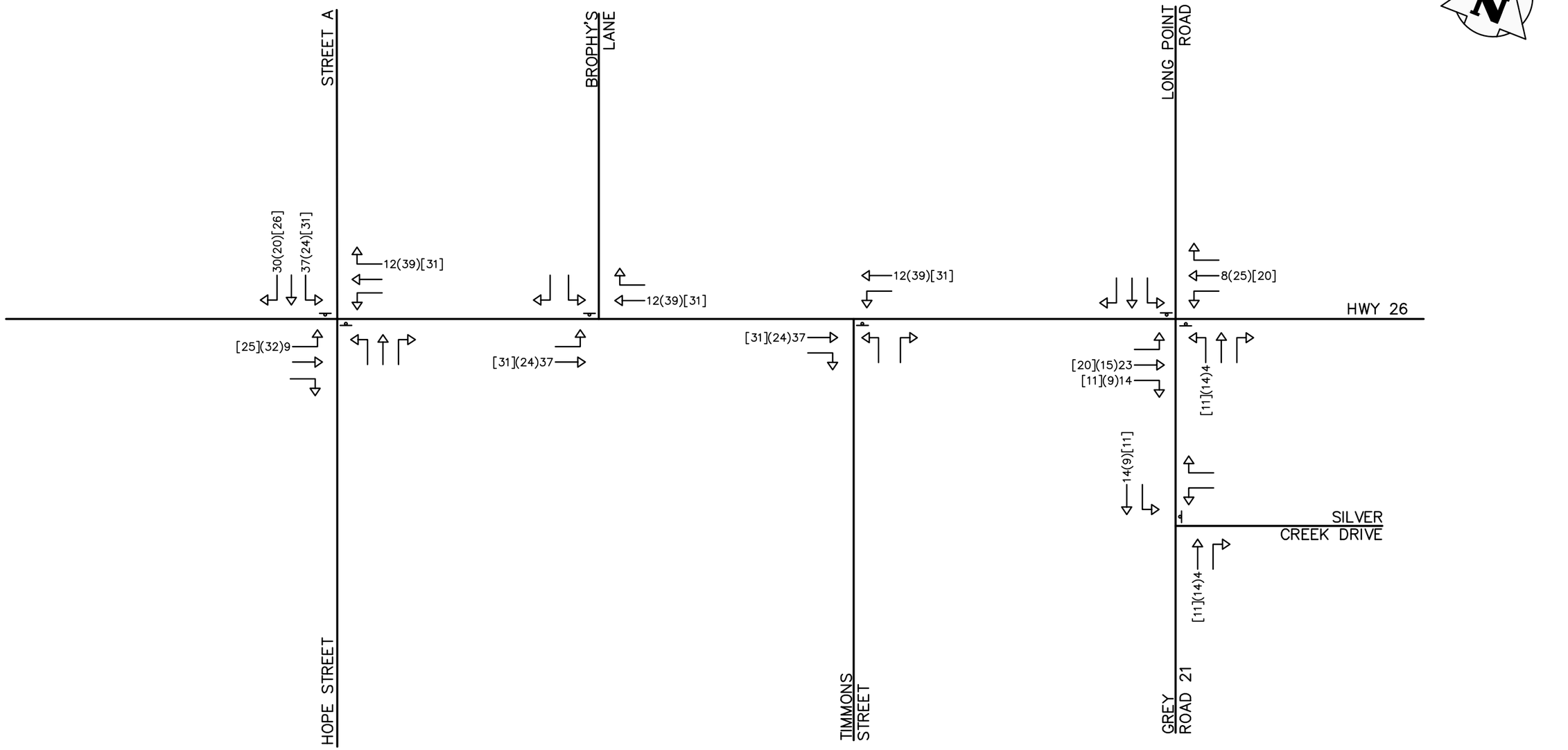
Drawing
SITE LOCATION

CROZIER CONSULTING ENGINEERS
8 MARKET STREET
SUITE 600
TORONTO, ON M5E 1M6
416-477-3392 T
WWW.CFCROZIER.CA

Drawn By	Design By	Project
M.V.R.	M.V.R.	876-4866
Scale	Date	Check By	Drawing
1:10000	SEP/27/2019	B.H.	FIG 2

J:\800\876 - Royalton\4866-Craigleith Village\CAD\Civil\Traffic\4866-302.dwg, Fig 2, 2019-09-25 3:18:42 PM, mrichardson

NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.



LEGEND:

⊕	SIGNAL CONTROL
⊣	STOP CONTROL
AM(PM)[SAT]	WEEKDAY AM(WEEKDAY PM)[SATURDAY]

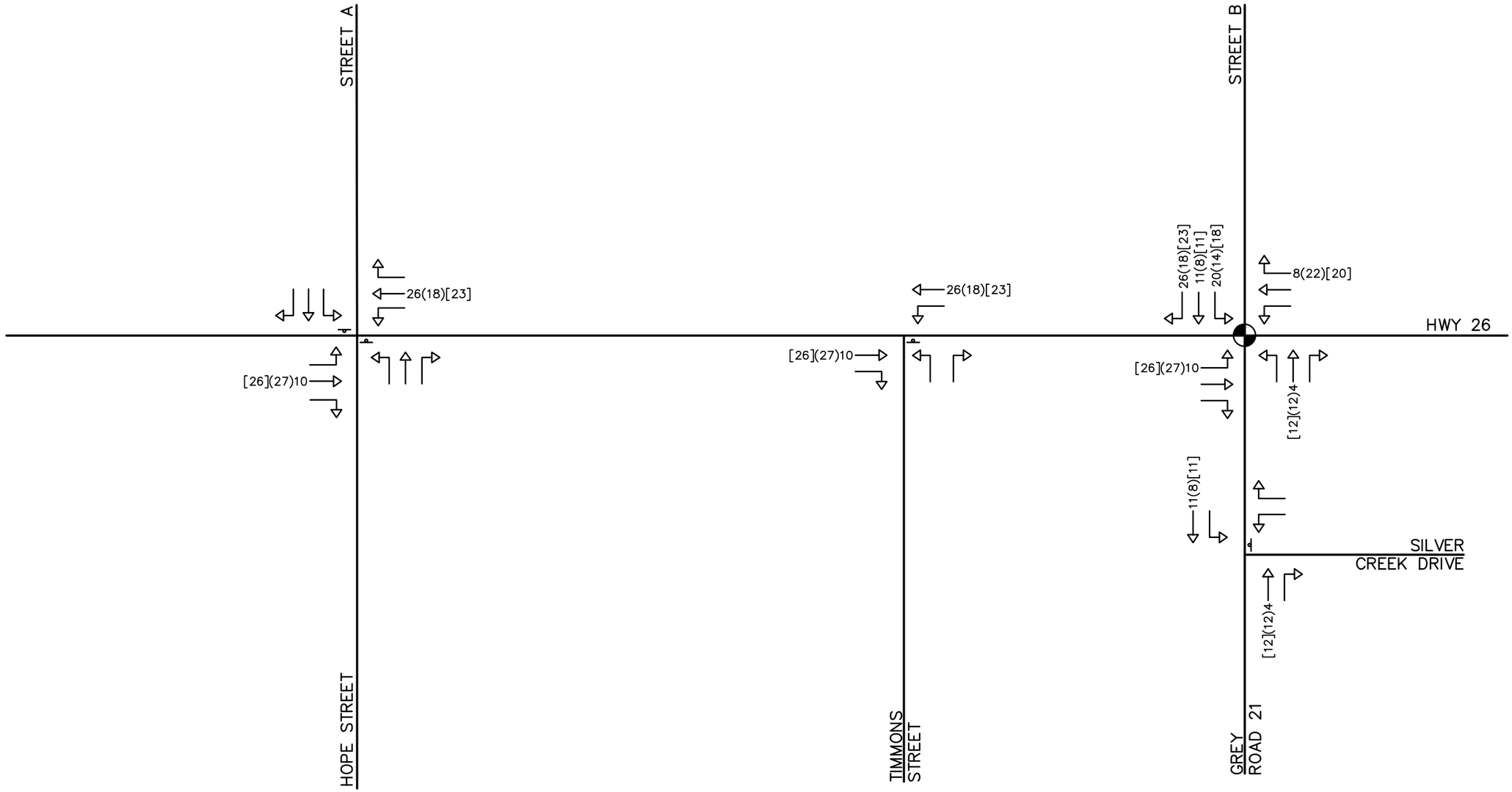
AQUAVIL
TOWN OF THE BLUE MOUNTAINS

PHASE 1 RESIDENTIAL TRIP ASSIGNMENT

CROZIER & ASSOCIATES Consulting Engineers
2800 High Point Drive
Suite 100
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905 875-4915 F
www.cfcrozier.ca

Drawn	Design	Project No.	
M.J.	M.F.		876-4866
Check	Check	Scale	Dwg.
M.F.	M.F.	N.T.S	FIG. 16

NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.



LEGEND:

	SIGNAL CONTROL
	STOP CONTROL
AM(PM)[SAT]	WEEKDAY AM(WEEKDAY PM)[SATURDAY]

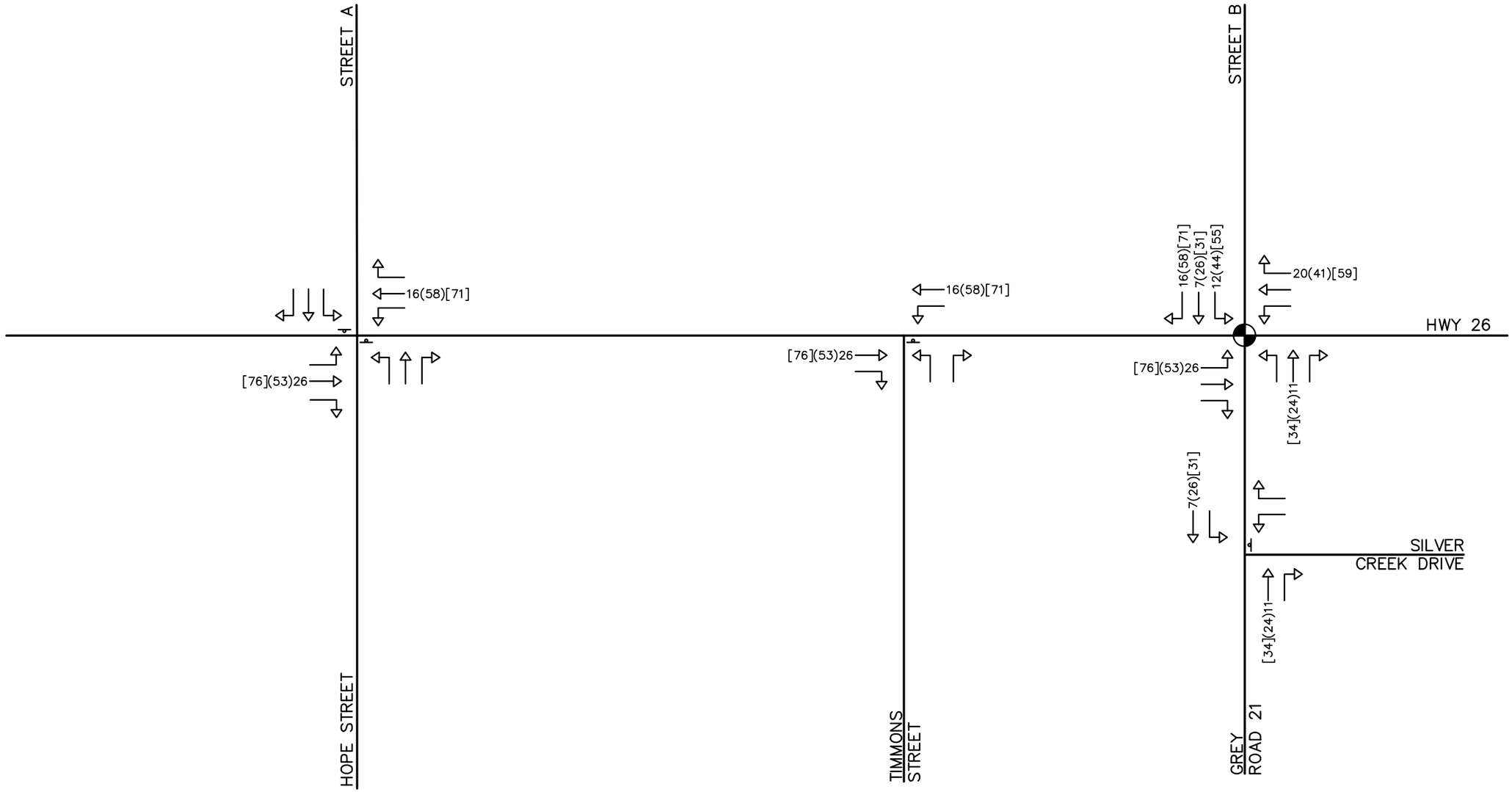
AQUAVIL
TOWN OF THE BLUE MOUNTAINS

PHASE 2 RESIDENTIAL TRIP ASSIGNMENT

CROZIER & ASSOCIATES Consulting Engineers
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Milton, ON L9T 6P4
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905 875-4915 F
www.cfcrozier.ca

Drawn	Design	Project No.	
M.J.	M.F.		876-4866
Check	Check	Scale	Dwg.
M.F.	M.F.	N.T.S	FIG. 17

NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.



LEGEND:

	SIGNAL CONTROL
	STOP CONTROL
AM(PM)[SAT]	WEEKDAY AM(WEEKDAY PM)[SATURDAY]

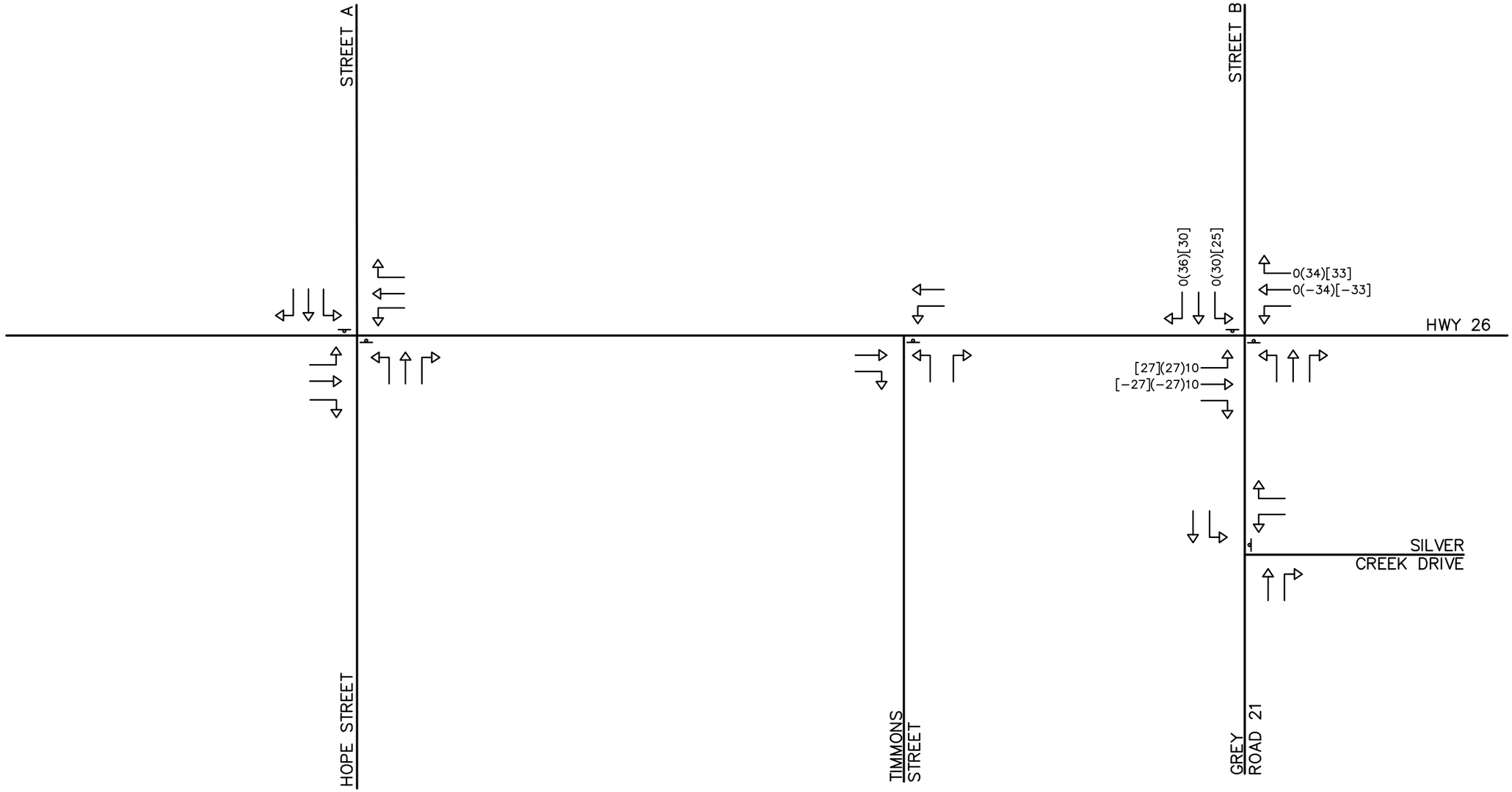
AQUAVIL
TOWN OF THE BLUE MOUNTAINS

PHASE 2 PRIMARY COMMERCIAL
TRIP ASSIGNMENT

CROZIER & ASSOCIATES Consulting Engineers
2800 High Point Drive
Suite 100
Milton, ON L9T 6P4
905 875-0026 T
905 875-4915 F
www.cfcrozier.ca

Drawn	Design	Project No.	
M.J.	M.F.		876-4866
Check	Check	Scale	Dwg.
M.F.	M.F.	N.T.S	FIG. 18

NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.



LEGEND:

- SIGNAL CONTROL
- STOP CONTROL
- AM(PM)[SAT] WEEKDAY AM(WEEKDAY PM)[SATURDAY]

AQUAVIL
TOWN OF THE BLUE MOUNTAINS

PHASE 2 PASS-BY COMMERCIAL TRIP ASSIGNMENT

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905 875-4915 F
www.cfcrozier.ca

Drawn	Design	Project No.	
M.J.	M.F.		876-4866
Check	Check	Scale	Dwg.
M.F.	M.F.	N.T.S	FIG. 19

TATHAM ENGINEERING

Enhancing our communities



209806 Highway 26, Craigleith

TRAFFIC IMPACT BRIEF

Pinnacle Building Group Corp.

File 121258 | September 8, 2022

Document Control

File:	Prepared by:	Prepared for:
121258	**Tatham Engineering Limited** 115 Sandford Fleming Drive, Suite 200 Collingwood, Ontario L9Y 5A6	**Pinnacle Building Group Corp.** 1001 Durst Road Waterloo, Ontario N2J 4G8
Date: **September 8, 2022**	**T** 705-444-2565 **tathameng.com**	

Authored by:	Reviewed by:
	
Michael Cullip B.Eng. & Mgmt., M.Eng., P.Eng. Vice President	Randy Simpson B.A.Sc., P.Eng. Director, Manager – Land Development

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Issue	Date	Description
1	September 8, 2022	Draft for client review

3.3.2 Pedestrian & Bicycle Circulation

Pedestrian and cyclist travel within the site will be accommodated via the internal condominium road given the limited volumes that will be served (ie. separate sidewalk and/or trail facilities will not be provided). The internal road provides direct access to Highway 26 to facilitate pedestrian and cyclist activity on the external road system.

3.4 SITE PARKING

As per the Town of the Blue Mountains Zoning By-law 2018-65, a residential townhouse must provide 2 parking spaces per unit.

Each residential unit will be provided with 2 parking spaces (1 on the driveway and 1 in the garage). In addition, 6 parking spaces will be provided in a dedicated visitor parking area at the end of the internal condominium road. In this regard, the proposed parking supply exceeds the overall Town requirements.

3.5 SITE TRAFFIC

3.5.1 Trip Generation

The number of vehicle trips to be generated by the proposed development for the weekday AM and PM peak hours has been determined based on type of use, development size, and trip generation rates as per the *ITE Trip Generation Manual, 11th Edition*. Based on the proposed development, trip rates for the following ITE land use category has been employed:

- *single family attached* - ITE code 215.

The associated trip rates and trip estimates are provided in Table 4. As indicated, the proposed development is expected to generate 8 trips during the AM peak hour and 10 trips during the PM peak hour, both of which are considered minor.

Table 4: Trip Generation – 209806 Highway 26 (proposed use)

LAND USE	VARIABLE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		In	Out	Total	In	Out	Total
multifamily housing - low-rise (ITE 220)	trips/unit	0.15	0.33	0.48	0.32	0.25	0.57
proposed townhouses	17 units	2	6	8	6	4	10

Under the previous motel use (assuming 6 units), the site was expected to have generated in the order of 2 to 3 peak hour trips, as detailed in Table 5. In this regard, the incremental increase

resulting from the proposed development of the site will be somewhat less (6 to 8 vehicles during the peak hours).

Table 5: Trip Generation – 209806 Highway 26 (previous use)

LAND USE	VARIABLE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		In	Out	Total	In	Out	Total
motel (ITE 220)	trips/unit	0.18	0.31	0.49	0.25	0.22	0.47
previous motel use	6 units	1	2	3	1	1	3

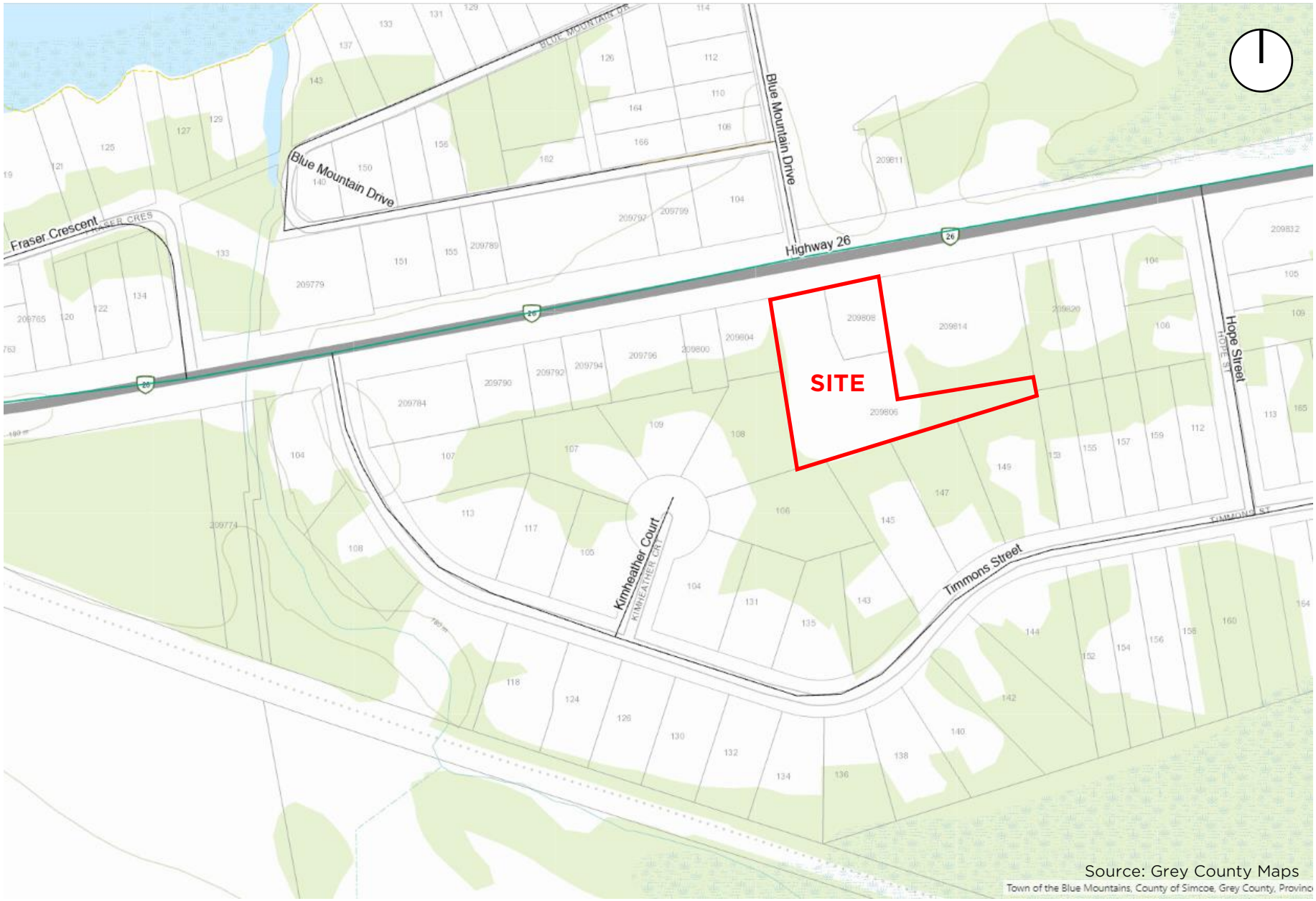
3.5.2 Trip Distribution & Assignment

The distribution of the site traffic volumes reflects the proximity of the development site to the Town of The Blue Mountains to the west and the Town of Collingwood to the east, and considers the assumptions of the *Aquavil Traffic Impact Study*. For purposes of this assessment, the following distribution has been assumed:

- 45% to/from the west via Highway 26; and
- 55% to/from the east via Highway 26.

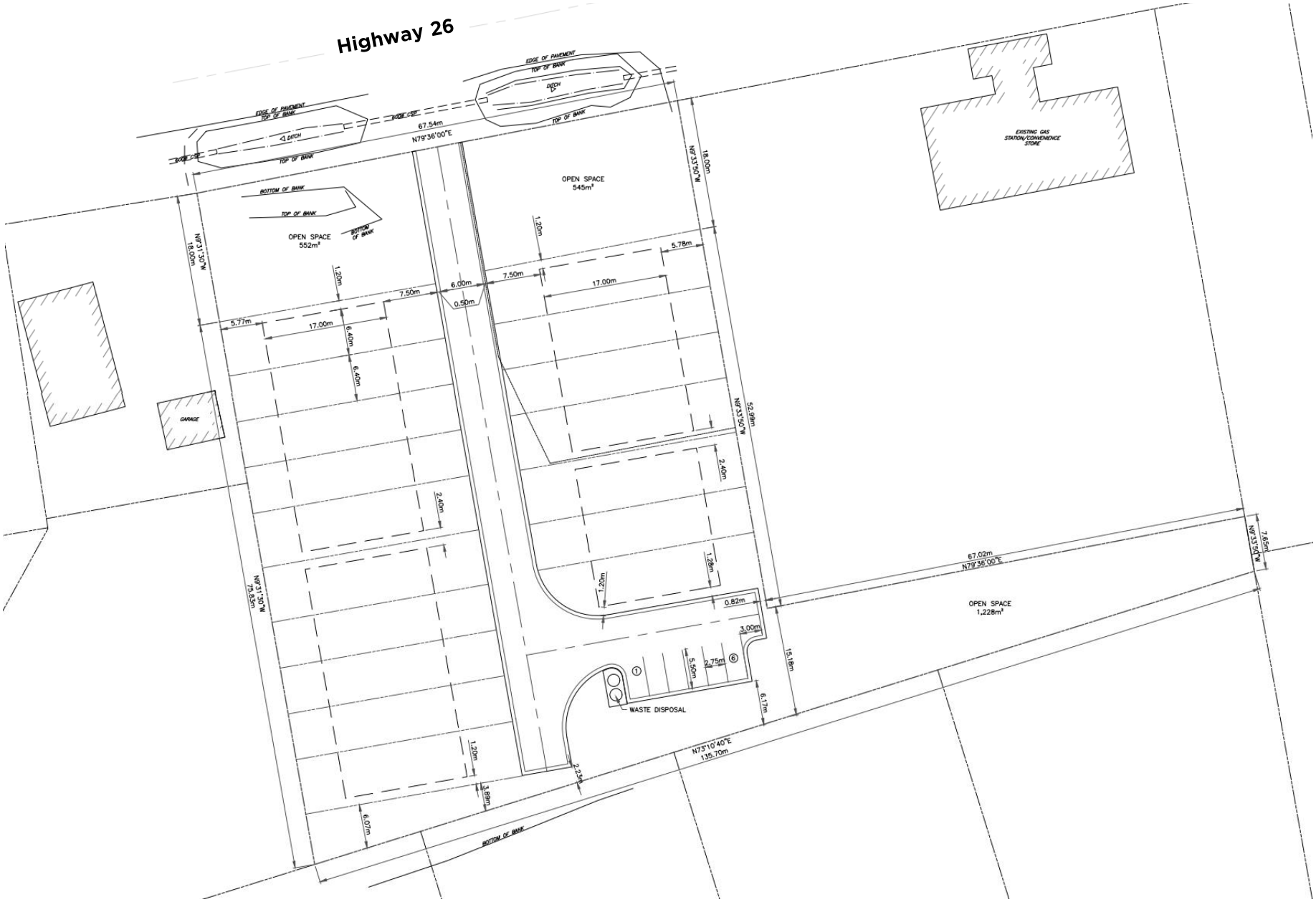
The resulting site generated traffic assigned to the road network is illustrated in Figure 7.

Given the reduced site traffic volumes, changes to the above noted distribution would not have significant bearing on the associated traffic volumes.



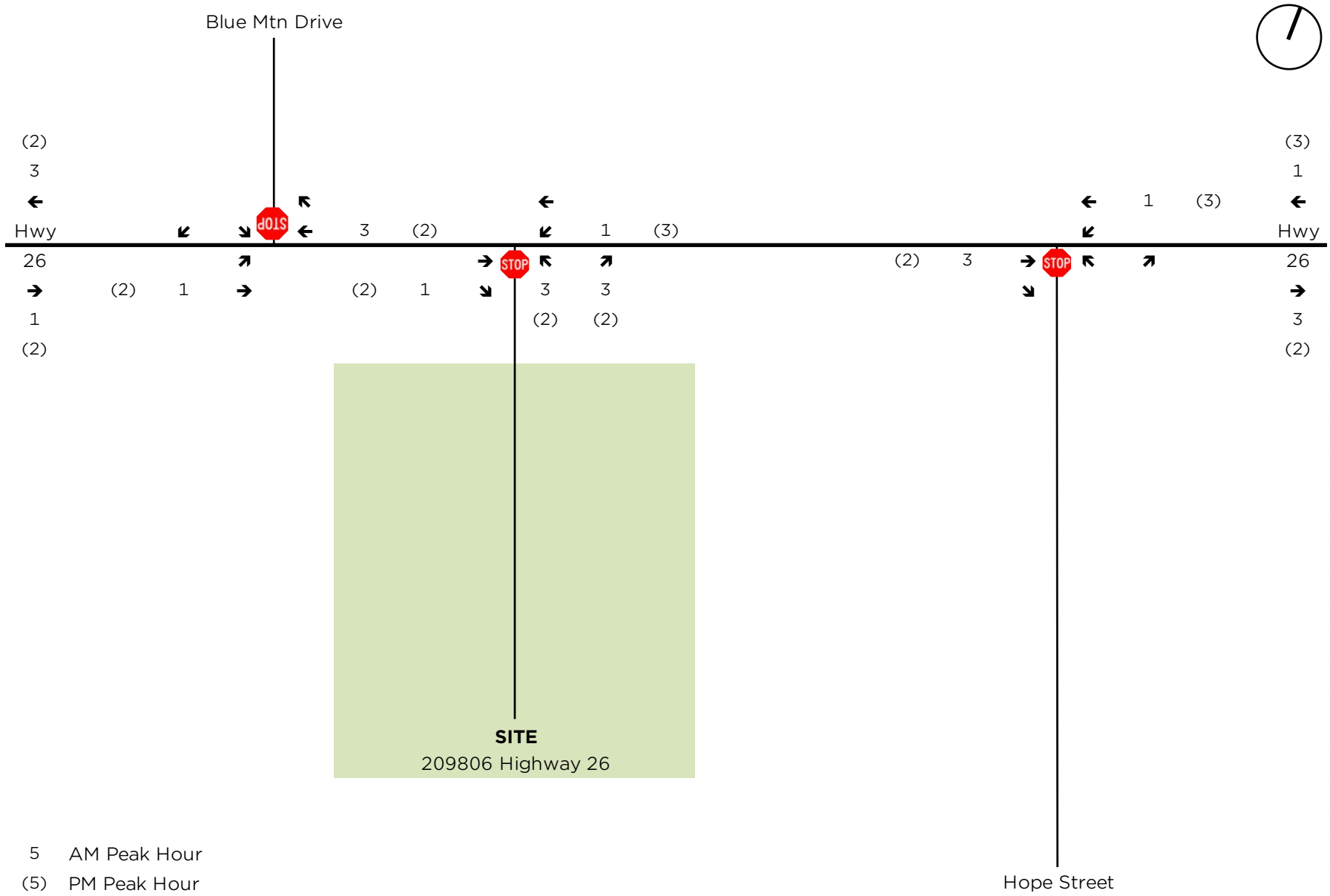
209806 HIGHWAY 26, CRAIGLEITH

Figure 1: Site Location



209806 HIGHWAY 26, CRAIGLEITH

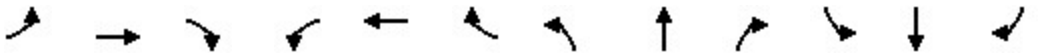
Figure 6: Site Plan



209806 HIGHWAY 26, CRAIGLEITH

Figure 7: Site Traffic Volumes

Appendix E:
Intersection Operations – Future

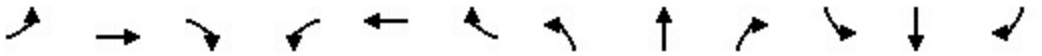


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	667	5	13	915	2	17	0	54	2	0	2
Future Volume (Veh/h)	2	667	5	13	915	2	17	0	54	2	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	2	710	5	14	973	2	18	0	57	2	0	2
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			715			1720	1720	713	1776	1721	974
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	975			715			1720	1720	713	1776	1721	974
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			74	100	87	96	100	99
cM capacity (veh/h)	707			885			69	88	432	55	88	306

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	717	14	975	75	4
Volume Left	2	14	0	18	2
Volume Right	5	0	2	57	2
cSH	707	885	1700	191	93
Volume to Capacity	0.00*	0.02	0.57	0.39	0.04
Queue Length 95th (m)	0.1	0.4	0.0	13.2	1.0
Control Delay (s/veh)	0.1	9.1	0.0	35.5	45.3
Lane LOS	A	A		E	E
Approach Delay (s/veh)	0.1	0.1		35.5	45.3
Approach LOS				E	E

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	59.5%	ICU Level of Service		B
Analysis Period (min)	15			

* Value less than 0.01.

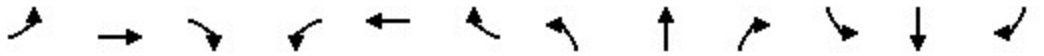


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1120	17	48	875	2	9	0	29	2	0	2
Future Volume (Veh/h)	2	1120	17	48	875	2	9	0	29	2	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	1217	18	52	951	2	10	0	32	2	0	2
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	953			1235			2287	2287	1226	2318	2295	952
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	953			1235			2287	2287	1226	2318	2295	952
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			61	100	85	90	100	99
cM capacity (veh/h)	721			564			26	36	218	21	35	315

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	1237	52	953	42	4
Volume Left	2	52	0	10	2
Volume Right	18	0	2	32	2
cSH	721	564	1700	78	39
Volume to Capacity	0.00*	0.09	0.56	0.54	0.10
Queue Length 95th (m)	0.1	2.3	0.0	17.5	2.4
Control Delay (s/veh)	0.1	12.0	0.0	95.2	107.1
Lane LOS	A	B		F	F
Approach Delay (s/veh)	0.1	0.6		95.2	107.1
Approach LOS				F	F

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

* Value less than 0.01.

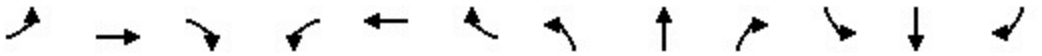


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	728	5	13	1002	2	17	0	54	2	0	2
Future Volume (Veh/h)	2	728	5	13	1002	2	17	0	54	2	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	2	774	5	14	1066	2	18	0	57	2	0	2
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	1068			779			1877	1877	777	1933	1878	1067
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1068			779			1877	1877	777	1933	1878	1067
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			66	100	86	95	100	99
cM capacity (veh/h)	653			838			53	70	397	42	70	270

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	781	14	1068	75	4
Volume Left	2	14	0	18	2
Volume Right	5	0	2	57	2
cSH	653	838	1700	156	73
Volume to Capacity	0.00*	0.02	0.63	0.48	0.05
Queue Length 95th (m)	0.1	0.4	0.0	17.2	1.3
Control Delay (s/veh)	0.1	9.4	0.0	47.8	57.4
Lane LOS	A	A		E	F
Approach Delay (s/veh)	0.1	0.1		47.8	57.4
Approach LOS				E	F

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	64.0%	ICU Level of Service	C	
Analysis Period (min)	15			

* Value less than 0.01.

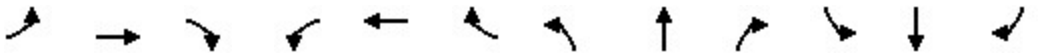


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1220	17	48	951	2	9	0	29	2	0	2
Future Volume (Veh/h)	2	1220	17	48	951	2	9	0	29	2	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	1326	18	52	1034	2	10	0	32	2	0	2
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			1344			2479	2479	1335	2510	2487	1035
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1036			1344			2479	2479	1335	2510	2487	1035
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			90			46	100	83	86	100	99
cM capacity (veh/h)	671			513			18	27	188	15	26	282

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	1346	52	1036	42	4
Volume Left	2	52	0	10	2
Volume Right	18	0	2	32	2
cSH	671	513	1700	59	28
Volume to Capacity	0.00*	0.10	0.61	0.71	0.14
Queue Length 95th (m)	0.1	2.6	0.0	23.2	3.3
Control Delay (s/veh)	0.2	12.8	0.0	155.4	154.9
Lane LOS	A	B		F	F
Approach Delay (s/veh)	0.2	0.6		155.4	154.9
Approach LOS				F	F

Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	76.8%	ICU Level of Service	D	
Analysis Period (min)	15			

* Value less than 0.01.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	667	11	20	915	2	34	0	75	2	0	2
Future Volume (Veh/h)	2	667	11	20	915	2	34	0	75	2	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	2	710	12	21	973	2	36	0	80	2	0	2
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			722			1737	1737	716	1816	1742	974
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	975			722			1737	1737	716	1816	1742	974
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			46	100	81	96	100	99
cM capacity (veh/h)	707			880			67	85	430	48	84	306

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	724	21	975	116	4
Volume Left	2	21	0	36	2
Volume Right	12	0	2	80	2
cSH	707	880	1700	160	83
Volume to Capacity	0.00*	0.02	0.57	0.73	0.05
Queue Length 95th (m)	0.1	0.6	0.0	33.5	1.1
Control Delay (s/veh)	0.1	9.2	0.0	71.5	50.5
Lane LOS	A	A		F	F
Approach Delay (s/veh)	0.1	0.2		71.5	50.5
Approach LOS				F	F

Intersection Summary				
Average Delay	4.8			
Intersection Capacity Utilization	62.1%	ICU Level of Service		B
Analysis Period (min)	15			

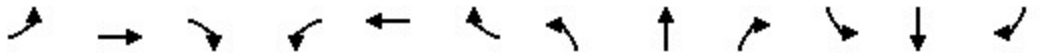
* Value less than 0.01.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1120	35	70	875	2	21	0	43	2	0	2
Future Volume (Veh/h)	2	1120	35	70	875	2	21	0	43	2	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	1217	38	76	951	2	23	0	47	2	0	2
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	953			1255			2345	2345	1236	2391	2363	952
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	953			1255			2345	2345	1236	2391	2363	952
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			86			0	100	78	88	100	99
cM capacity (veh/h)	721			554			22	31	215	16	30	315

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	1257	76	953	70	4
Volume Left	2	76	0	23	2
Volume Right	38	0	2	47	2
cSH	721	554	1700	56	31
Volume to Capacity	0.00*	0.14	0.56	1.25	0.13
Queue Length 95th (m)	0.1	3.6	0.0	46.0	3.0
Control Delay (s/veh)	0.1	12.5	0.0	321.6	137.5
Lane LOS	A	B		F	F
Approach Delay (s/veh)	0.1	0.9		321.6	137.5
Approach LOS				F	F

Intersection Summary				
Average Delay	10.2			
Intersection Capacity Utilization	73.6%	ICU Level of Service		D
Analysis Period (min)	15			

* Value less than 0.01.

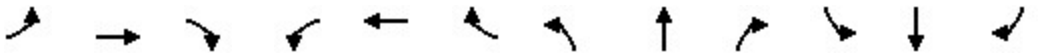


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	728	11	20	1002	2	34	0	75	2	0	2
Future Volume (Veh/h)	2	728	11	20	1002	2	34	0	75	2	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	2	774	12	21	1066	2	36	0	80	2	0	2
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	1068			786			1894	1894	780	1973	1899	1067
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1068			786			1894	1894	780	1973	1899	1067
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			30	100	80	95	100	99
cM capacity (veh/h)	653			833			52	68	395	36	67	270

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	788	21	1068	116	4
Volume Left	2	21	0	36	2
Volume Right	12	0	2	80	2
cSH	653	833	1700	129	64
Volume to Capacity	0.00*	0.03	0.63	0.90	0.06
Queue Length 95th (m)	0.1	0.6	0.0	44.4	1.5
Control Delay (s/veh)	0.1	9.4	0.0	119.4	64.8
Lane LOS	A	A		F	F
Approach Delay (s/veh)	0.1	0.2		119.4	64.8
Approach LOS				F	F

Intersection Summary				
Average Delay	7.2			
Intersection Capacity Utilization	66.7%	ICU Level of Service		C
Analysis Period (min)	15			

* Value less than 0.01.



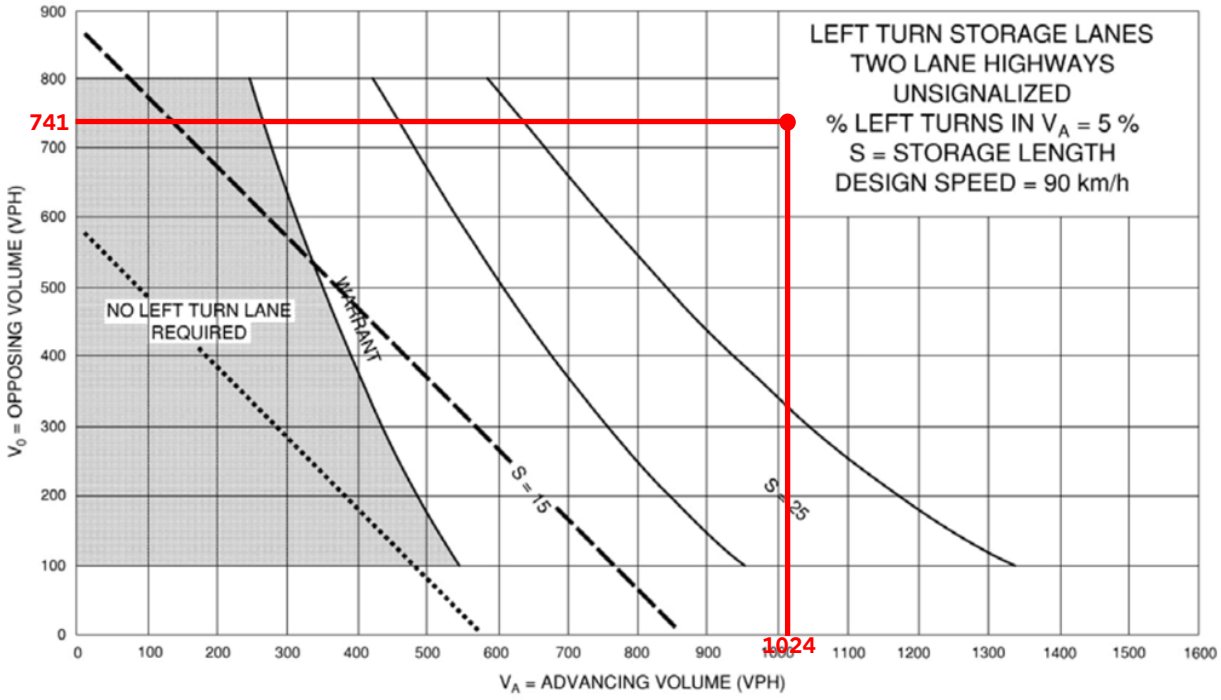
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1220	35	70	951	2	21	0	43	2	0	2
Future Volume (Veh/h)	2	1220	35	70	951	2	21	0	43	2	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	1326	38	76	1034	2	23	0	47	2	0	2
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			1364			2537	2537	1345	2583	2555	1035
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1036			1364			2537	2537	1345	2583	2555	1035
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			85			0	100	75	82	100	99
cM capacity (veh/h)	671			504			16	23	185	11	22	282

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	1366	76	1036	70	4
Volume Left	2	76	0	23	2
Volume Right	38	0	2	47	2
cSH	671	504	1700	42	21
Volume to Capacity	0.00*	0.15	0.61	1.69	0.19
Queue Length 95th (m)	0.1	4.0	0.0	54.7	4.2
Control Delay (s/veh)	0.2	13.4	0.0	545.3	207.4
Lane LOS	A	B		F	F
Approach Delay (s/veh)	0.2	0.9		545.3	207.4
Approach LOS				F	F

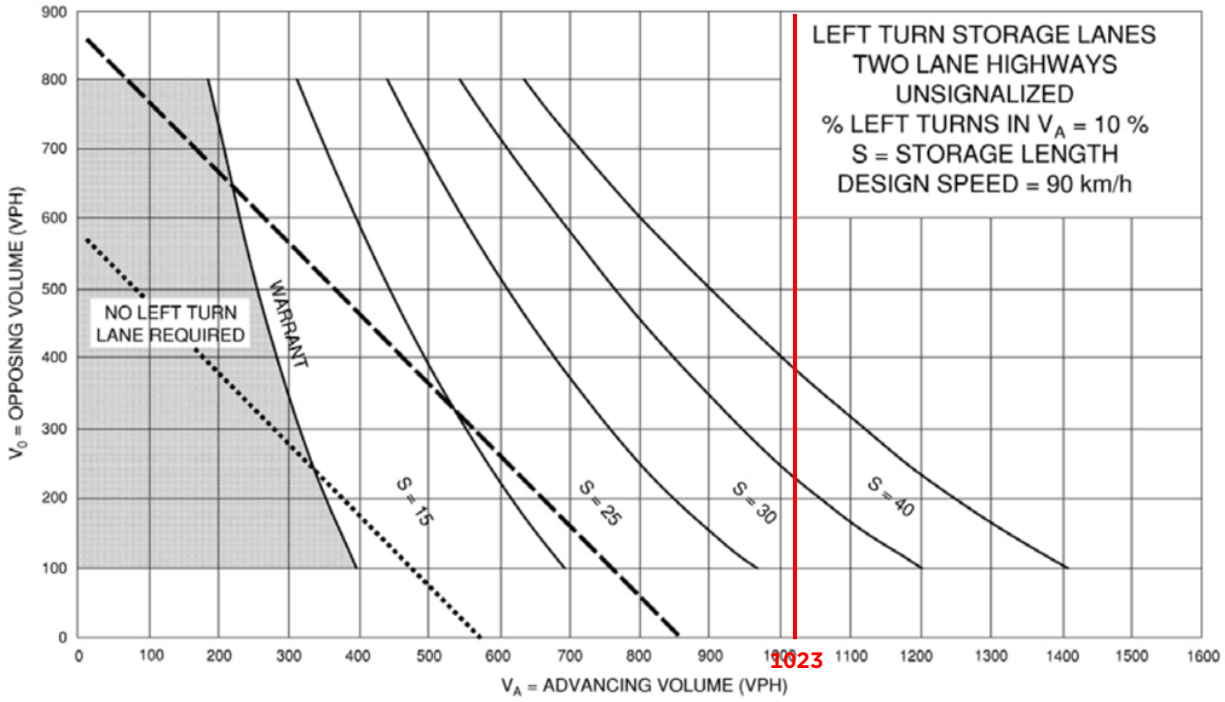
Intersection Summary			
Average Delay	15.8		
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

* Value less than 0.01.

Appendix F:
MTO Left Turn Warrants



2035 Total Traffic – Weekday AM Peak Hour



2035 Total Traffic – Weekday PM Peak Hour