TRAFFIC IMPACT STUDY UPDATE

ALTA RESIDENTIAL DEVELOPMENT – PHASE 2
THE TOWN OF THE BLUE MOUNTAINS
COUNTY OF GREY

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CROZIER
CONSULTING ENGINEERS

Revision Number	Date	Comments
0	July 2007	First Submission to Town
1	June 2021	TIS Update Submission to Town
2	February 2022	TIS Update Submission to Town

1.0 Executive Summary

C.F. Crozier & Associates Inc. (Crozier) was retained by Tabera Ltd. (Tabera) to undertake an update to the Traffic Impact Study (TIS) for Phase 2 of the proposed Alta residential development in the Town of the Blue Mountains, County of Grey. The original TIS was submitted in June 2007 and an update was prepared in June 2021. This February 2022 update has been prepared to address minor changes to the Draft Plan. This report among others has been produced in support of the Zoning By-law Amendment and Draft Plan of Subdivision Applications.

The subject lands are approximately 30 hectares and are bound by Hidden Lake Road to the north, Craigleith Provincial Park to the east, Alta Phase 1 lands to the south and privately owned lands to the west. The Draft Plan (dated February 11, 2022) proposes 60 detached (single-family) residential units. Access to the site is proposed by extending the existing Alta Road north to form a t-intersection with Hidden Lake Road. Within the development itself, two additional roadways (Street 'B' and Street 'C') will connect to Alta Road in crescents on both the east and west sides of Alta Road to provide access to the interior dwelling units.

The analysis contained within this report was completed based on a previous version of the Draft Plan which proposed 63 single detached (single-family) residential units. The trip generation described herein is overstated by 2 trips in the a.m. and p.m. peak hours. As such, the findings and conclusions contained within this report are conservative but remain valid based on the most recent Draft Plan.

Sidewalks are proposed on Alta Road and through the development to provide connectivity to the existing network on Alta Road and Arrowhead Road. There are also trail connections within the Alta Phase 1 lands to the Alpine Ski Club from Hemlock Court and Alta Road. Access to the Georgian Trail is located at Arrowhead Road and Hidden Lake Road, just south of Highway 26.

The study intersections are operating well under existing conditions. The intersection of Arrowhead Road and Alta Road operates at a Level of Service "A" during both peak hours. The intersection of Highway 26 and Arrowhead Road operates at a Level of Service "C" and "D" in the a.m. and p.m. peak hours, respectively. The intersection of Highway 26 and Hidden Lake Road operates at a Level of Service "B" and "C" in the a.m. and p.m. peak hours, respectively.

The following background developments were considered, and trips were applied as through volumes on Highway 26 as of the 2024 horizon year:

- Eden Oak
- Long Point Road Subdivision
- Aquavil
- Mountain House
- Parkbridge Craigleith
- Windfall Phases 4, 5 and 6

The intersection of Arrowhead Road and Alta Road is expected to continue operating at a Level of Service (LOS) "A" under future background traffic volume conditions. The intersection of Highway 26 and Arrowhead Road is forecasted to operate at a LOS "F" in the p.m. peak hour with a delay of 52.8 seconds and volume-to-capacity ratio of 0.424 (NB) under 2034 future background traffic volume conditions. This represents an increase in control delay of 27.0 seconds when compared to existing conditions. The intersection of Highway 26 and Hidden Lake Road is forecasted to operate

at a LOS "D" in the p.m. peak hour with a delay of 33.9 seconds and volume-to-capacity ratio of 0.155 (NB) under 2034 future background traffic volume conditions. This represents an increase in control delay of 13.4 seconds when compared to existing conditions.

The development is expected to generate 28 a.m. peak hour trips and 24 p.m. peak hour trips, based on the trip generation rate observed on Alta Road. An assessment of the existing units and corresponding trip generation was undertaken to establish the trip generation rate for the proposed development. The rate was established as the ITE Trip Generation Manual rate for recreational homes was lower and the rate for full-time single-family homes was higher when compared to the observed data. It is noted that this is considered a conservative assessment as the ongoing house construction is causing higher than expected a.m. inbound and p.m. outbound volumes.

The trips generated by the proposed residential development were distributed to the boundary road network based on the location of existing commercial, employment and recreational areas. 60 percent of trips were assumed to arrive and depart from the east while 40 percent would arrive and depart from the west.

Under 2034 future total conditions the intersection of Arrowhead Road and Alta Road is expected continue to operate at a LOS "A". The intersection of Highway 26 and Arrowhead Road is forecasted to continue to operate at a LOS "F" in the p.m. peak hour with a delay of 53.4 seconds and volume-to-capacity ratio of 0.443 (NB). This represents an increase in control delay of 0.6 seconds when compared to 2034 future background conditions. The intersection of Highway 26 and Hidden Lake Road is forecasted to operate at a LOS "E" in the p.m. peak hour with a delay of 36.6 seconds and volume-to-capacity ratio of 0.213 (NB). This represents an increase in control delay of 2.7 seconds when compared to 2034 future background conditions.

The above metrics indicate that the addition of the site generated traffic is expected to have a minimal impact on the operations of the boundary road network. The proposed development can be supported from a traffic operations perspective.

The available sight distance was assessed to the east and west of the future intersection of Alta Road and Hidden Lake Road. To the east, 75 metres of sight distance is available and to the west, clear sightlines are available to the terminus of Hidden Lake Road which is approximately 260 metres west of the future Alta Road connection. With vehicles anticipated to be primarily turning right onto Hidden Lake Road towards Highway 26, the available sight distance is sufficient to support the proposed intersection.

The analysis contained herein was prepared using a previous version of the Draft Plan. The findings and conclusions remain valid based on the most recent Draft Plan, dated February 11, 2022. Any minor revisions to the development concept are not expected to affect the conclusions contained within this report.

The development application can be supported from a transportation operations and safety perspective.

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2.1 Background

C.F. Crozier & Associates Inc. (Crozier) was retained by Tabera Ltd. (Tabera) to undertake an update to the Traffic Impact Study (TIS) for Phase 2 of the proposed Alta residential development in the Town of the Blue Mountains, County of Grey. The original TIS was submitted in June of 2007 and an update was prepared in June 2021. This February 2022 update has been prepared to address minor changes to the Draft Plan. This report among others has been produced in support of the Zoning By-law Amendment and Draft Plan of Subdivision Applications.

The subject lands are approximately 30 hectares and are bound by Hidden Lake Road to the north, Craigleith Provincial Park to the east, Alta Phase 1 lands to the south and privately owned lands to the west. The site location is illustrated in **Figure 1**.

2.2 Development Proposal

The Draft Plan (dated February 11, 2022) proposes 60 detached (single-family) residential units. Access to the site is proposed by extending the existing Alta Road north to form a t-intersection with Hidden Lake Road. Within the development itself, two additional roadways (Street 'B' and Street 'C') will connect to Alta Road in crescents on both the east and west sides of Alta Road to provide access to the interior dwelling units.

The analysis contained within this report was completed based on a previous version of the Draft Plan which proposed 63 single detached (single-family) residential units. The trip generation described herein is overstated by 2 trips in the a.m. and p.m. peak hours. As such, the findings and conclusions contained within this report remain valid based on the most recent Draft Plan.

As illustrated in the Draft Plan the roadways will have a right-of-way of 20 metres in accordance with the Town of Blue Mountains Engineering Standard (DWG. 16-STD-U1, 16-STD-R2). Further details regarding the roadway and cross-section elements shall be provided through detailed design. The proposed Draft Plan had been included as **Figure 2.**

2.3 Purpose and Scope

This TIS Update was prepared to support the Zoning By-law Amendment and Draft Plan of Subdivision Applications. The purpose of the study is to assess the impacts of the proposed development on the boundary road network and to recommend any required mitigation measures, if warranted.

The study reviews the following main aspects of the proposed development from a transportation engineering perspective:

- Existing, future background, and future total traffic operations at the study intersections;
- Forecasted trip generation of the proposed development;
- Sight distance at the proposed intersection of Alta Road and Hidden Lake Road.

Communications with the Town of the Blue Mountains staff has been included in **Appendix A**.

3.0 Existing Conditions

3.1 Study Intersections

The analysis contained herein includes the operations of the following intersections:

- Hidden Lake Road and Highway 26
- Arrowhead Road and Highway 26
- Alta Road and Arrowhead Road

3.2 Boundary Road Network

Details regarding the boundary road network have been summarized in **Table 1**.

Table 1: Boundary Road Network

Roadway	Highway 26	Hidden Lake Road	Arrowhead Road	Alta Road
Direction	East-West	North-South (at Highway 26) East-West (at site frontage)	North-South	East-West
Jurisdiction	Ministry of Transportation	The Town of The Blue Mountains	The Town of The Blue Mountains	The Town of The Blue Mountains
Street Classification[1]	Provincial Highway	Local	Minor-Collector	Local
Speed Limit	80 km/h	50 km/h	50 km/h	50 km/h (Assumed)
Number of Lanes	2	2	2	2
Pedestrian Facilities	None	None	Sidewalk with no boulevard from Margaret Dr. to Sleepy Hollow Rd.	Sidewalk with Boulevard on south side of roadway

Note [1]: The Town of The Blue Mountains Official Plan Schedule 'B-1' Transportation

Hidden Lake Road is an unpaved road which extends from Highway 26 at its north-eastern terminus and terminates to the west of the proposed development. Arrowhead Road extends from Highway 26 south to Sleepy Hollow Road. Alta Road extends from Arrowhead Road at its eastern limits and terminates at the edge of the proposed development lands.

3.3 Traffic Data

Turning movement counts were undertaken by Spectrum Traffic Data Inc. On Friday, April 30, 2021 from 6:00 a.m. to 10:00 a.m. and 3:00 p.m. to 7:00 p.m. Friday was selected for the assessment of peak hour conditions, as the area demographics include secondary recreational homes. Historical daily traffic volumes on Hidden Lake Road and Arrowhead Road were reviewed and found to be comparable, and generally higher on the Friday. Thus, in keeping with past analysis assumptions for this area, the Friday peak hours were assessed to capture both the commuter and recreational traffic volumes.

It is noted that the traffic volumes collected were seasonally adjusted to reflect peak summer volumes by applying a seasonal factor of 1.20 based on Ministry of Transportation Ontario (MTO) Annual Average Daily Traffic (AADT) and Summer Average Daily Traffic (SADT) data for the adjacent section of Highway 26.

Table 2 outlines the peak hours and peak hour factors for each of the study intersections. The traffic data has been provided in **Appendix B** and peak hour volumes are illustrated in **Figure 3.**

Table 2: Peak Hour Factors

Intersection	Peak Hour	Peak Hour Factor
Arrowhead Road & Alta Road	8 a.m. to 9 a.m.	0.83
	3 p.m. to 4 p.m.	0.71
Highway 26 & Arrowhead Road	7:45 a.m. to 8:45 a.m.	0.94
	3:15 p.m. to 4:15 p.m.	0.91
Highway 26 & Hidden Lake Road	7:45 a.m. to 8:45 a.m.	0.93
	3 p.m. to 4 p.m.	0.88

3.4 Intersection Operations

The operations of the study intersections were analyzed based on the traffic volumes illustrated in **Figure 3** and the peak hour factors listed in **Table 2**. **Table 3** summarizes the Levels of Service for the counts taken at the study intersection under seasonally adjusted existing traffic volume conditions. The Level of Service (LOS) definitions have been included in **Appendix C** and detailed capacity analysis worksheets are included in **Appendix D.**

Table 3: 2021 Seasonally Adjusted Existing Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum v/c ratio [2]	95th Percentile No. of Queueing Vehicles
Arrowhead Road and Alta Road	Stop (Alta - EB)	A.M.	A	8.6 s	0.008 (EB)	0 veh.
		P.M.	A	9.2 s	0.03 (EB)	0.1 veh.
Highway 26 and Arrowhead Road	Stop (Arrowhead - NB)	A.M.	C	15.9 s	0.083 (NB)	0.3 veh.
		P.M.	D	25.8 s	0.215 (NB)	0.8 veh.
Highway 26 and Hidden Lake Road	Stop (Hidden Lake - NB)	A.M.	B	13.6 s	0.018 (NB)	0.1 veh.
		P.M.	C	20.5 s	0.072 (NB)	0.2 veh.

Note[1]: The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM2010).
Note[2]: The maximum v/c ratio represents the maximum v/c ratio for the minor road approach movements at the intersection.

As noted in Table 3, the study intersections are currently operating with a LOS "D" or better in the Friday a.m. and p.m. peak hours. The existing volume-to-capacity ratios indicate that the boundary road network has excess capacity to accommodate increased traffic growth.

4.0 Future Background Conditions

4.1 Horizon Years and Growth Rate

The future operations were assessed for the year of full build-out, assumed 2024, as well as five (2029) and ten-years (2034) beyond full build-out.

A growth rate of one percent per year was utilized on all roadways. Growth rates of less than one percent were calculated for the segment of Highway 26 between Grey Road 19 and Thornbury based on AADT and SADT data from 2012 to 2016. This is the 2016 traffic volumes are the most recent

data available from MTO. In addition to the one percent growth rate, traffic generated by nearby developments were also accounted for.

4.2 Future Road Improvements

The Town of the Blue Mountains has initiated a Municipal Class Environmental Assessment (EA) for Hidden Lake Road. Project updates from 2018 are available on the Town's website. No Class EA has been published as of the creation of this TIS report. Therefore, Hidden Lake Road has been assessed based on its existing conditions.

4.3 Background Developments

The following developments are expected to generate background volumes along Highway 26 past the proposed development. The respective trip distributions and trip assignments described in their original studies were utilized for each background development. For the purpose of this assessment, it was assumed that all background developments would be fully built-out by the first (2024) horizon year. Relevant excepts from each of the studies conducted for the background developments can be referenced in **Appendix E.**

Eden Oak is a residential development located on the south side of Highway 26 at the eastern terminus of Lakeshore Road East. 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 **Long Point Road Subdivision** is located on the west side of Long Point Road between Brophy's Lane and Highway 26. 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".

Aquavil is a residential development located on the north side of Highway 26 between Blue Mountain Drive and Long Point Road. The development application process is still ongoing; however, the trip generation of the west lands was accounted for in this TIS. The trip generation was obtained from the TIS completed by Crozier in 2019. While the construction timeline is still uncertain, the western lands are assumed to be completed by the 2024 horizon year.

Mountain House is a residential development 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 the 2024 horizon year. The weekday p.m. 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.

Parkbridge Craigleith is a residential development 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. For the purpose of this assessment, it has been assumed that the development will be completed in advance of the 2024 horizon year. 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.

Windfall (Phases 4 to 6) is a residential development 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 2024 horizon year. To be conservative,

for the purpose of this assessment it has been assumed Phases 5 and 6 will also be complete by the 2024 horizon year.

The total trip generation for each of the developments mentioned is summarized in **Table 4**. The volume of trips passing the intersections of Highway 26 with Hidden Lake Road and Arrowhead Road will be less than shown in **Table 4**. Background development volumes for the 2024 horizon year are summarized in **Figure 4.**

Table 4: Background Developments

Development	Unit Type	Number of Units	Peak Hour	Number of Trips		
				Inbound	Outbound	Total
Eden Oak	Single Family Detached and Semis/Townhouses	202	Weekday A.M.	23	77	100
			Weekday P.M.	73	43	116
Long Point Road Subdivision	Single Family Detached	22	Weekday A.M.	5	15	20
			Weekday P.M.	15	9	24
Aquavil	Single Family Detached, Semis/Townhouses & Condo Units	234	Weekday A.M.	21	67	88
			Weekday P.M.	70	44	114
Mountain House	Multifamily Housing (Low-Rise)	230	Weekday A.M.	24	82	106
			Weekday P.M.	80	39	119
Windfall Phase 4	Single Family Detached and Semi-Detached	164	Weekday A.M.	22	71	93
			Weekday P.M.	79	77	156
Windfall Phases 5/6	Single Family Detached and Semi-Detached	244	Weekday A.M.	33	103	136
			Weekday P.M.	118	114	232
Parkbridge Craigleith	Single Family Detached	45	Weekday A.M.	8	25	33
			Weekday P.M.	30	17	47
	Townhouses	166	Weekday A.M.	18	59	77
			Weekday P.M.	58	35	93
Total			**Weekday A.M.**	**154**	**499**	**653**
			Weekday P.M.	**523**	**378**	**901**

4.4 Intersection Operations

The operations of the boundary road network were analyzed for the 2024, 2029 and 2034 horizon years based of the volumes illustrated in **Figure 5, Figure 6**, and **Figure 7** respectively. The anticipated intersection operations for the horizon years of 2024, 2029 and 2034 are summarized in Table 5, Table 6, Table 7, respectively. The LOS definitions are included in **Appendix C** and detailed capacity analysis worksheets are included in **Appendix D.**

Table 5: 2024 Future Background Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum v/c ratio [2]	95th Percentile No. of Queueing Vehicles
Arrowhead Road and Alta Road	Stop (Alta - EB)	A.M.	A	8.6 s	0.008 (EB)	0 veh.
		P.M.	A	9.3 s	0.032 (EB)	0.1 veh.
Highway 26 and Arrowhead Road	Stop (Arrowhead - NB)	A.M.	C	19.7 s	0.109 (NB)	0.4 veh.
		P.M.	E	39.1 s	0.321 (NB)	1.3 veh.
Highway 26 and Hidden Lake Road	Stop (Hidden Lake - NB)	A.M.	C	15.9 s	0.022 (NB)	0.1 veh.
		P.M.	D	27.8 s	0.115 (NB)	0.4 veh.

Note[1]: The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM2010).
Note[2]: The maximum v/c ratio represents the maximum v/c ratio for the minor road approach movements at the intersection.

Table 6: 2029 Future Background Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum v/c ratio [2]	95th Percentile No. of Queueing Vehicles
Arrowhead Road and Alta Road	Stop (Alta - EB)	A.M.	A	8.6 s	0.008 (EB)	0 veh.
		P.M.	A	9.3 s	0.033 (EB)	0.1 veh.
Highway 26 and Arrowhead Road	Stop (Arrowhead - NB)	A.M.	C	20.7 s	0.122 (NB)	0.4 veh.
		P.M.	E	45.0 s	0.364 (NB)	1.5 veh.
Highway 26 and Hidden Lake Road	Stop (Hidden Lake - NB)	A.M.	C	17.7 s	0.03 (NB)	0.1 veh.
		P.M.	D	30.1 s	0.125 (NB)	0.4 veh.

Note[1]: The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM2010).
Note[2]: The maximum v/c ratio represents the maximum v/c ratio for the minor road approach movements at the intersection.

Table 7: 2034 Future Background Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum v/c ratio [2]	95th Percentile No. of Queueing Vehicles
Arrowhead Road and Alta Road	Stop (Alta - EB)	A.M.	A	8.7 s	0.01 (EB)	0 veh.
		P.M.	A	9.3 s	0.036 (EB)	0.1 veh.
Highway 26 and Arrowhead Road	Stop (Arrowhead - NB)	A.M.	C	22.3 s	0.137 (NB)	0.5 veh.
		P.M.	F	52.8 s	0.424 (NB)	1.8 veh.
Highway 26 and Hidden Lake Road	Stop (Hidden Lake - NB)	A.M.	C	18.5 s	0.031 (NB)	0.1 veh.
		P.M.	D	33.9 s	0.155 (NB)	0.5 veh.

Note[1]: The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM2010).
Note[2]: The maximum v/c ratio represents the maximum v/c ratio for the minor road approach movements at the intersection.

The intersection of Arrowhead Road and Alta Road is expected to continue operating at a LOS "A" under future background traffic volume conditions. The intersection of Highway 26 and Arrowhead Road is forecasted to operate at a LOS "F" in the p.m. peak hour with a delay of 52.8 seconds and

volume-to-capacity ratio of 0.424 (NB) under 2034 future background traffic volume conditions. This represents an increase in control delay of 27.0 seconds when compared to existing conditions. The intersection of Highway 26 and Hidden Lake Road is forecasted to operate at a LOS "D" in the p.m. peak hour with a delay of 33.9 seconds and volume-to-capacity ratio of 0.155 (NB) under 2034 future background traffic volume conditions. This represents an increase in control delay of 13.4 seconds when compared to existing conditions.

The above metrics indicate that while the study intersections have excess capacity for additional traffic volumes, the increased east and westbound through movements on Highway 26 result in higher delays for the minor approaches.

5.0 Future Total Conditions

5.1 Site Generated Traffic

The proposed residential dwelling units are anticipated to be used as four-season recreational homes. Accordingly, the trip generation data contained within the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, was compared to the observed travel patterns on the roadway at Alta Road and Hidden Lake Road.

The trip generation data for ITE Land Use Category (LUC) 260 "Recreational Housing" was compared to the LUC 210 "Single-Family Detached Housing" which is representative of full-time occupancy, as shown in **Table 8**. It can be seen that LUC 210 results in a much higher trip generation than LUC 260.

Table 8: ITE Trip Generation Comparison

LUC	Peak Hours	Number of Trips		
		Inbound	Outbound	Total
210	A.M.	12	38	50
	P.M.	42	24	66
260	A.M.	9	5	14
	P.M.	7	11	18

As noted, the ITE Trip Generation rates were compared to the observed travel patterns on Alta Road and Hidden Lake Road. It should be noted that the a.m. inbound and p.m. outbound volumes to/from Alta Road are higher than residential developments typically operate. f. It is expected that this is a result of ongoing home construction on the second lot east of Arrowhead Road.

In order to establish trip generation rates from the existing volumes, the number of units on Hidden Lake Road and James Street was recorded and compared to the inbound and outbound volumes at the intersection of Highway 26 and Hidden Lake Road during the peak hour to establish a corresponding rate. The number of units (occupied, not under construction) on Alta Road and it's connecting Courts was also recorded and compared to the inbound and outbound volumes during the peak hour at the intersection of Alta Road and Arrowhead Road to establish a corresponding rate.

As noted previously, the following trip generation calculations were based on a previous version of the Draft Plan which proposed 63 single detached (single-family) residential units. The trip generation described herein is overstated by 2 trips in the a.m. and p.m. peak hours. As such, the findings and conclusions contained within this report remain valid based on the most recent Draft Plan.

As summarized in **Table 9**, Alta Road presented a higher rate of trip generation and was used to establish the trip generation for the proposed development.

Table 9: Recorded Trip Generation

Roadway	Number of Units	Peak Hour		Number of Trips		
				Inbound	Outbound	Total
Hidden Lake Road	65	A.M.	Volume	2	6	8
			Rate	0.03	0.09	0.12
		P.M.	Volume	14	11	25
			Rate	0.22	0.17	0.38
Alta Road	65 (+ 1 under construction)	A.M.	Volume	22	6	28
			Rate	0.34	0.09	0.43
		P.M.	Volume	8	16	24
			Rate	0.12	0.25	0.37

The forecasted trip generation for the proposed development is outlined in **Table 10**. It is noted that this is considered a conservative assessment as the ongoing house construction is causing higher than expected a.m. inbound and p.m. outbound volumes.

Table 10: Trip Generation

Number of Units	Peak Hour		Number of Trips		
			Inbound	Outbound	Total
63	A.M.	Rate	0.34	0.09	0.43
		Volume	22	6	28
	P.M.	Rate	0.12	0.25	0.37
		Volume	8	16	24

5.2 Trip Distribution and Assignment

The trips generated by the proposed residential development were distributed to the boundary road network based on observed travel patterns and the location of existing commercial and recreational areas. The Town of Collingwood and Blue Mountain Village are both located to the east of the proposed development, 60 percent of trips were assumed to arrive and depart from the east while 40 percent were assumed to arrive and depart from the west.

Of the 40 percent of trips travelling to and from the west on Highway 26, 30 percent were assumed to arrive and depart from Hidden Lake Road with the remaining 10 percent from Arrowhead Road. Of the 60 percent of trips travelling east, 30 percent were assumed to head south on Arrowhead Road from Alta Road, while the remaining 30 percent would travel on Highway 26 with 20 percent from Hidden Lake Road and the remaining 10 percent from Arrowhead Road.

The trip distribution and trip assignment are illustrated in **Figure 8** and **Figure 9,** respectively.

5.3 Intersection Operations

The future total traffic operations of the boundary road network were analyzed for the 2024, 2029 and 2034 horizon years based on the volumes illustrated in **Figure 9** being superimposed on the future background traffic volumes. The resulting future total traffic volumes for the 2024, 2029 and 2034 horizon years are illustrated in **Figure 10, Figure 11,** and **Figure 12,** respectively. The Levels of Service for the horizon years are summarized in **Table 11, Table 12** and **Table 13** respectively. The LOS definitions are included in **Appendix C** and detailed capacity analysis worksheets are included in **Appendix D.**

Table 11: 2024 Future Total Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum v/c ratio [2]	95th Percentile No. of Queueing Vehicles
Arrowhead Road and Alta Road	Stop (Alta - EB)	A.M.	A	8.7 s	0.012 (EB)	0 veh.
		P.M.	A	9.3 s	0.045 (EB)	0.1 veh.
Highway 26 and Arrowhead Road	Stop (Arrowhead - NB)	A.M.	C	19.7 s	0.112(NB)	0.4 veh.
		P.M.	E	40.4 s	0.34 (NB)	1.4 veh.
Highway 26 and Hidden Lake Road	Stop (Hidden Lake - NB)	A.M.	C	17.7 s	0.036 (NB)	0.1 veh.
		P.M.	D	29.9 s	0.164 (NB)	0.6 veh.

Note[1]: The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM2000).
Note[2]: The maximum v/c ratio represents the maximum v/c ratio for the minor road approach movements at the intersection.

Table 12: 2029 Future Total Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum v/c ratio [2]	95th Percentile No. of Queueing Vehicles
Arrowhead Road and Alta Road	Stop (Alta - EB)	A.M.	A	8.7 s	0.012(EB)	0 veh.
		P.M.	A	9.3 s	0.045 (EB)	0.1 veh.
Highway 26 and Arrowhead Road	Stop (Arrowhead - NB)	A.M.	C	21.0 s	0.124 (NB)	0.4 veh.
		P.M.	E	45.5 s	0.382 (NB)	1.6 veh.
Highway 26 and Hidden Lake Road	Stop (Hidden Lake - NB)	A.M.	C	18.4 s	0.039 (NB)	0.1 veh.
		P.M.	D	33.6 s	0.191 (NB)	0.7 veh.

Note[1]: The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM2000).
Note[2]: The maximum v/c ratio represents the maximum v/c ratio for the minor road approach movements at the intersection.

Table 13: 2034 Future Total Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum v/c ratio [2]	95th Percentile No. of Queueing Vehicles
Arrowhead Road and Alta Road	Stop (Alta - EB)	A.M.	A	8.8 s	0.015 (EB)	0 veh.
		P.M.	A	9.4 s	0.049 (EB)	0.2 veh.
Highway 26 and Arrowhead Road	Stop (Arrowhead - NB)	A.M.	C	22.2 s	0.14 (NB)	0.5 veh.
		P.M.	F	53.4 s	0.443 (NB)	2 veh.
Highway 26 and Hidden Lake Road	Stop (Hidden Lake - NB)	A.M.	C	18.8 s	0.043 (NB)	0.1 veh.
		P.M.	E	36.6 s	0.213 (NB)	0.8 veh.

Note[1]: The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM2000).

Note[2]: The maximum v/c ratio represents the maximum v/c ratio for the minor road approach movements at the intersection.

The intersection of Arrowhead Road and Alta Road is expected to continue operating at a LOS "A" under future total traffic volume conditions. The intersection of Highway 26 and Arrowhead Road is forecasted to continue to operate at a LOS "F" in the p.m. peak hour with a delay of 53.4 seconds and volume-to-capacity ratio of 0.443 (NB). This represents an increase in control delay of 0.6 seconds when compared to 2034 future background conditions. The intersection of Highway 26 and Hidden Lake Road is forecasted to operate at a LOS "E" in the p.m. peak hour with a delay of 36.6 seconds and volume-to-capacity ratio of 0.213 (NB). This represents an increase in control delay of 2.7 seconds when compared to 2034 future background conditions.

The above metrics indicate that the addition of the site generated traffic is expected to have a minimal impact on the operations of the boundary road network. The proposed development can be supported from a traffic operations perspective.

6.0 Active Transportation

Pedestrian sidewalks within the development will connect to existing sidewalk facilities along Alta Road. Approximately 320 metres west of Arrowhead Road a partially paved, unmarked trail crosses Alta Road leading to the Alpine Ski Club. This trail is illustrated on the Town of the Blue Mountains Trail Network map included in **Appendix F.**

The future entrance to the proposed development is approximately 800 metres (9-minute walking distance) south-west on Hidden Lake Road from the Georgian Trail. The Georgian Trail is a multi-use path and provides pedestrian and cyclist connections from the Municipality of Meaford, through the Town of the Blue Mountains to the Town of Collingwood. A trail map has been included in **Appendix G.**

7.0 Sight Distance Review

A sight distance analysis was conducted to assess the available sight distance to the east and west of the future intersection of Alta Road and Hidden Lake Road. To the east, 75 metres of sight distance is available and to the west, clear sightlines are available to the terminus of Hidden Lake Road which is approximately 260 metres west of the future Alta Road connection.

With vehicles anticipated to be primarily turning right onto Hidden Lake Road towards Highway 26, the available sight distance is sufficient to support the proposed intersection. Additionally, the upward slope of Hidden Lake Road approach the proposed Alta Road intersection from the east

has the positive impact of reducing driver speeds, thereby reducing sight distance requirements.

8.0 Conclusions

The analysis contained within this report resulted in the following findings:

- The study intersections are operating well under existing conditions.
    - The intersection of Arrowhead Road and Alta Road operates at a LOS "A" during both peak hours.
    - The intersection of Highway 26 and Arrowhead Road operates at a LOS "C" and "D" in the a.m. and p.m. peak hours, respectively.
    - The intersection of Highway 26 and Hidden Lake Road operates at a LOS "B" and "C" in the a.m. and p.m. peak hours, respectively.
        - The northbound 95th percentile queue length is expected be approximately one car in length during the p.m. peak hour.

- The following background developments were considered, and trips were applied as through volumes on Highway 26 as of the 2024 horizon year.
    - Eden Oak Development, Long Point Subdivision, Aquavil, Mountain House Development, Windfall Phase 4/5/6, and Parkbridge Craigleith Development

- Under 2034 future background conditions:
    - The intersection of Arrowhead Road and Alta Road continue to operate with a LOS "A".
    - The intersection of Highway 26 and Arrowhead Road is forecasted to operate at a LOS "F" in the p.m. peak hour with a delay of 52.8 seconds and volume-to-capacity ratio of 0.424 (NB) under 2034 future background traffic volume conditions.
        - This represents an increase in control delay of 27.0 seconds when compared to existing conditions.
    - The intersection of Highway 26 and Hidden Lake Road is forecasted to operate at a LOS "D" in the p.m. peak hour with a delay of 33.9 seconds and volume-to-capacity ratio of 0.155 (NB) under 2034 future background traffic volume conditions.
        - This represents an increase in control delay of 13.4 seconds when compared to existing conditions.

- The development is expected to generate 28 a.m. peak hour trips and 24 p.m. peak hour trips, based on the trip generation rate observed on Alta Road.
    - The rate was established using the observed data as the ITE Trip Generation Manual rate for recreational homes was lower and the rate for full-time single-family homes higher than the observed travel patterns.
    - It is noted that this trip generation estimate is considered conservative as ongoing house construction on Alta Road is causing higher than expected a.m. inbound and p.m. outbound volumes.
    - As noted, this trip generation was based on a previous version of the Draft Plan and is overstated by 2 trips in the a.m. and p.m. peak hours. As such, the findings and conclusions contained within this report remain valid based on the most recent Draft Plan.

- The trips generated by the proposed residential development were distributed to the boundary road network based on the location of existing commercial and recreational areas.

- Under 2034 future total conditions
    - The intersection of Arrowhead Road and Alta Road is expected to continue operating at a LOS "A".
    - The intersection of Highway 26 and Arrowhead Road is forecasted to continue to operate at a LOS "F" in the p.m. peak hour with a delay of 53.4 seconds and volume-to-capacity ratio of 0.443 (NB).
        - This represents an increase in control delay of 0.6 seconds when compared to 2034 future background conditions.
    - The intersection of Highway 26 and Hidden Lake Road is forecasted to operate at a LOS "E" in the p.m. peak hour with a delay of 36.6 seconds and volume-to-capacity ratio of 0.213 (NB).
        - This represents an increase in control delay of 2.7 seconds when compared to 2034 future background conditions.

- The available sight distance was assessed to the east and west of the future intersection of Alta Road and Hidden Lake Road. To the east, 75 metres of sight distance is available and to the west, clear sightlines are available to the terminus of Hidden Lake Road which is approximately 260 metres west of the future Alta Road connection. With vehicles anticipated to be primarily turning right onto Hidden Lake Road towards Highway 26, the available sight distance is sufficient to support the proposed intersection.

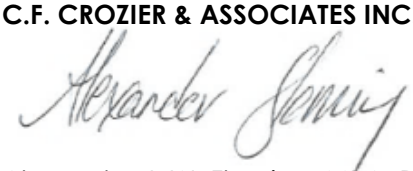
The above metrics indicate that the addition of the site generated traffic is expected to have a minimal impact on the operations of the boundary road network. The proposed development can be supported from a traffic operations perspective.

The analysis described herein was prepared using a previous version of the Draft Plan. The findings and conclusions contained within this report remain valid based on the recent Draft Plan, dated February 11, 2022. Any minor revisions to the development concept are not expected to affect the conclusions contained within this report.

The development application can be supported from a transportation operations and safety perspective.

Respectfully submitted by,

C.F. CROZIER & ASSOCIATES INC.



Alexander J. W. Fleming, MBA, P.Eng.
Associate, Manager of Transportation

C.F. CROZIER & ASSOCIATES INC.

Madeleine Ferguson, P.Eng.
Manager of Transportation

AF/kh/la

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APPENDIX A

Town Communications

	Term of Reference	Town Comment	Response
1.	Assess the following intersections: a. Highway 26 & Arrowhead Road b. Highway 26 & Hidden Lake Road c. Arrowhead Road & Alta Road	Yes that covers it.	Acknowledged.
2.	Assess the Friday a.m. and p.m. peak hours of the development.	Are these typically the worst case? Sunday evening?	We reviewed historical daily traffic volumes on Hidden Lake Road and Arrowhead Road and found them to be comparable, and generally higher on the Friday. Thus, in keeping with our typical analysis assumptions for this area, we have assessed the Friday peak hours to capture both the commuter and recreational traffic volumes. It is noted that the volumes collected were seasonally adjusted to reflect peak summer volumes by applying a seasonal factor of 1.20 based on a comparison between MTO AADT and SADT data.
	a. We are working to obtain historical traffic data from the MTO for the Highway 26 intersections.		
	b. We will also commission TMCs from a specialty traffic counting firm and utilize the historical data to derive the expected 2021 traffic volumes without the impacts of COVID-19.	Yes. Possible to utilize/purchase any traffic data from nearby Georgian Woodlands? TIS? Too old?	The Georgian Woodlands data was about 10 years old so too old for the purpose of this assessment.
3.	Forecast the trip generation characteristics of the development using the ITE Trip Generation Manual, 10th Edition.	OK.	Acknowledged.
4.	Assess the horizon years of full build-out (assumed 2024) as well as 5 and 10 years beyond (2029 and 2034).	Yes, and verify with Operation department for any nearby Traffic studies/upgrades and/or check DC bkgd study. Adam Fraser, Transportation Master Plan Coordinator.	Capacity improvements have not been identified for the study area.
5.	Utilize growth rates of 1% on all roadways. Growth rates of less than 1% were calculated on Highway 26 at Grey Road 19 using MTO AADT and SADT data from 2012 to 2016.	Can this growth rate be cross checked with planning documents to support assumption?	The Blue Mountain website community profile states "Overall, the population of The Blue Mountain, ON is growing at a rate of 0.99% per year over the past 15 years…it's population grew…an average growth of 1.77% per year from 2011 to 2016." The Official Plan predicts 2.4% growth from 2011 to 2026 per year, however the above note does not reflect this prediction. The proposed 1% growth rate is in keeping with the observed historical growth on Highway 26, and the incorporation of nearby background developments accounts for any additional growth attributed to new development.

	a. We will also account for trips generated by background developments in close proximity to the site.	Background? Future?	The TIS accounts for trips generated by a number of planned developments in the area including Long Point, Mountain House, Parkbridge Craigleith, Eden Oak, Windfall and Aquavil West.
6.	Review the proposed connection to Hidden Lake Road.	Yes. If with Alta 2 there will be over 100 lots utilizing Alta Road for access, a secondary means of access, such as Hidden Lake Rd, will be required.	Acknowledged, secondary access to Hidden Lake Road is proposed.
7.	Provide commentary on the internal road layout and intersection geometry, as well as the existing and future active transportation network.	Yes including commentary on internal road design speed and signage.	Acknowledged.

APPENDIX B

Traffic Data

Crozier & Associates
SUITE 301 40 HURON STREET
COLLINGWOOD ONTARIO, L9Y 4R3
CANADA

Turning Movement Count (3 . ARROWHEAD RD & ALTA RD)

Start Time	N Approach ARROWHEAD RD					S Approach ARROWHEAD RD					W Approach ALTA RD					Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	UTurn N:N	Peds N:	Approach Total	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Left W:N	UTurn W:W	Peds W:	Approach Total		
06:00:00	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	
06:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
06:30:00	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2	
06:45:00	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3	6
07:00:00	0	2	0	0	2	3	1	0	0	4	0	0	0	0	0	6	11
07:15:00	0	5	0	0	5	3	1	0	0	4	0	1	0	1	1	10	21
07:30:00	1	3	0	0	4	3	0	0	0	3	0	0	0	1	0	7	26
07:45:00	0	7	0	0	7	6	1	0	0	7	3	1	0	3	4	18	41
08:00:00	6	11	0	0	17	3	1	0	0	4	0	0	0	0	0	21	56
08:15:00	6	5	0	0	11	5	1	0	0	6	2	1	0	0	3	20	66
08:30:00	1	3	0	0	4	5	1	0	0	6	1	0	0	1	1	11	70
08:45:00	5	7	0	0	12	3	1	0	0	4	2	0	0	0	2	18	70
09:00:00	0	5	0	0	5	4	0	0	0	4	0	0	0	0	0	9	58
09:15:00	4	5	0	0	9	2	1	0	0	3	2	1	0	1	3	15	53
09:30:00	2	3	0	0	5	3	0	0	0	3	2	2	0	1	4	12	54
09:45:00	5	5	0	0	10	5	1	0	0	6	2	2	0	2	4	20	56
BREAK																	
15:00:00	1	8	0	0	9	12	1	0	0	13	1	6	0	0	7	29	
15:15:00	1	5	0	0	6	9	0	0	0	9	1	0	0	0	1	16	
15:30:00	3	5	0	0	8	6	1	0	0	7	1	2	0	2	3	18	
15:45:00	1	5	0	0	6	8	0	0	0	8	2	3	0	2	5	19	82
16:00:00	2	4	0	1	6	6	1	0	0	7	1	4	0	1	5	18	71
16:15:00	0	4	0	0	4	4	1	0	0	5	0	3	0	0	3	12	67
16:30:00	2	10	0	0	12	5	1	0	0	6	0	6	0	1	6	24	73
16:45:00	3	4	0	0	7	7	1	0	0	8	3	2	0	0	5	20	74
17:00:00	1	2	0	0	3	5	1	0	0	6	2	1	0	2	3	12	68
17:15:00	0	1	0	0	1	5	1	0	0	6	0	0	0	0	0	7	63
17:30:00	2	5	0	0	7	2	1	0	0	3	1	3	0	1	4	14	53
17:45:00	0	7	0	0	7	5	2	0	0	7	1	4	0	0	5	19	52
18:00:00	2	3	0	0	5	1	0	0	0	1	0	0	0	1	0	6	46
18:15:00	1	0	0	0	1	1	1	0	0	2	0	0	0	1	0	3	42
18:30:00	4	2	0	0	6	4	0	0	0	4	0	1	0	0	1	11	39
18:45:00	1	3	1	0	5	1	0	0	0	1	0	0	0	0	0	6	26

Crozier & Associates
SUITE 301 40 HURON STREET
COLLINGWOOD ONTARIO, L9Y 4R3
CANADA

Grand Total	54	134	1	1	189	127	21	0	0	148	27	43	0	21	70	**407**	-
Approach%	28.6%	70.9%	0.5%		-	85.8%	14.2%	0%		-	38.6%	61.4%	0%		-	**-**	-
Totals %	13.3%	32.9%	0.2%		46.4%	31.2%	5.2%	0%		36.4%	6.6%	10.6%	0%		17.2%	**-**	-
Heavy	2	19	0		-	21	1	0		-	2	3	0		-	**-**	-
Heavy %	3.7%	14.2%	0%		-	16.5%	4.8%	0%		-	7.4%	7%	0%		-	**-**	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-

Crozier & Associates
SUITE 301 40 HURON STREET
COLLINGWOOD ONTARIO, L9Y 4R3
CANADA

Peak Hour: 08:00 AM - 09:00 AM Weather: Broken Clouds (4.94 °C)

Start Time	N Approach ARROWHEAD RD					S Approach ARROWHEAD RD					W Approach ALTA RD					Int. Total (15 min)
	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	
08:00:00	6	11	0	0	17	3	1	0	0	4	0	0	0	0	0	21
08:15:00	6	5	0	0	11	5	1	0	0	6	2	1	0	0	3	20
08:30:00	1	3	0	0	4	5	1	0	0	6	1	0	0	1	1	11
08:45:00	5	7	0	0	12	3	1	0	0	4	2	0	0	0	2	18
Grand Total	18	26	0	0	44	16	4	0	0	20	5	1	0	1	6	**70**
Approach%	40.9%	59.1%	0%		-	80%	20%	0%		-	83.3%	16.7%	0%		-	**-**
Totals %	25.7%	37.1%	0%		62.9%	22.9%	5.7%	0%		28.6%	7.1%	1.4%	0%		8.6%	**-**
PHF	0.75	0.59	0		0.65	0.8	1	0		0.83	0.63	0.25	0		0.5	**-**
Heavy	0	5	0		5	4	0	0		4	0	0	0		0	**-**
Heavy %	0%	19.2%	0%		11.4%	25%	0%	0%		20%	0%	0%	0%		0%	**-**
Lights	18	21	0		39	12	4	0		16	5	1	0		6	**-**
Lights %	100%	80.8%	0%		88.6%	75%	100%	0%		80%	100%	100%	0%		100%	**-**
Single-Unit Trucks	0	5	0		5	4	0	0		4	0	0	0		0	**-**
Single-Unit Trucks %	0%	19.2%	0%		11.4%	25%	0%	0%		20%	0%	0%	0%		0%	**-**
Articulated Trucks	0	0	0		0	0	0	0		0	0	0	0		0	**-**
Articulated Trucks %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Bicycles on Road	0	0	0		0	0	0	0		0	0	0	0		0	**-**
Bicycles on Road %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	0%		-	-	-	100%		**-**
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**

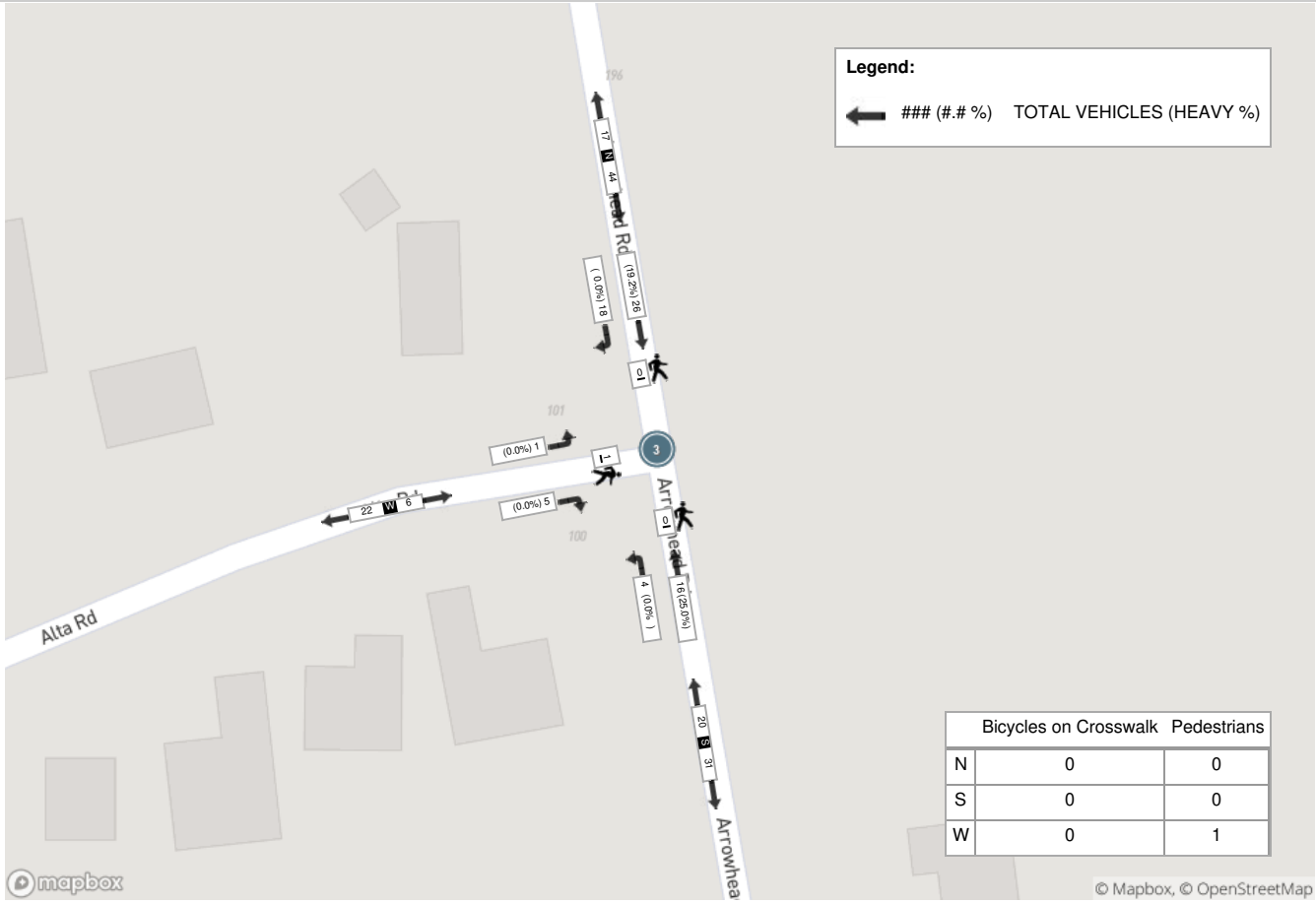
Crozier & Associates
SUITE 301 40 HURON STREET
COLLINGWOOD ONTARIO, L9Y 4R3
CANADA

Peak Hour: 03:00 PM - 04:00 PM Weather: Overcast Clouds (3.9 °C)

Start Time	N Approach ARROWHEAD RD					S Approach ARROWHEAD RD					W Approach ALTA RD					Int. Total (15 min)
	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	
15:00:00	1	8	0	0	9	12	1	0	0	13	1	6	0	0	7	29
15:15:00	1	5	0	0	6	9	0	0	0	9	1	0	0	0	1	16
15:30:00	3	5	0	0	8	6	1	0	0	7	1	2	0	2	3	18
15:45:00	1	5	0	0	6	8	0	0	0	8	2	3	0	2	5	19
Grand Total	6	23	0	0	29	35	2	0	0	37	5	11	0	4	16	**82**
Approach%	20.7%	79.3%	0%		-	94.6%	5.4%	0%		-	31.3%	68.8%	0%		-	**-**
Totals %	7.3%	28%	0%		35.4%	42.7%	2.4%	0%		45.1%	6.1%	13.4%	0%		19.5%	**-**
PHF	0.5	0.72	0		0.81	0.73	0.5	0		0.71	0.63	0.46	0		0.57	**-**
Heavy	1	4	0		5	5	1	0		6	0	3	0		3	**-**
Heavy %	16.7%	17.4%	0%		17.2%	14.3%	50%	0%		16.2%	0%	27.3%	0%		18.8%	**-**
Lights	5	19	0		24	30	1	0		31	5	8	0		13	**-**
Lights %	83.3%	82.6%	0%		82.8%	85.7%	50%	0%		83.8%	100%	72.7%	0%		81.3%	**-**
Single-Unit Trucks	0	4	0		4	5	1	0		6	0	2	0		2	**-**
Single-Unit Trucks %	0%	17.4%	0%		13.8%	14.3%	50%	0%		16.2%	0%	18.2%	0%		12.5%	**-**
Articulated Trucks	1	0	0		1	0	0	0		0	0	1	0		1	**-**
Articulated Trucks %	16.7%	0%	0%		3.4%	0%	0%	0%		0%	0%	9.1%	0%		6.3%	**-**
Bicycles on Road	0	0	0		0	0	0	0		0	0	0	0		0	**-**
Bicycles on Road %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	0%		-	-	-	50%		**-**
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	**-**
Bicycles on Crosswalk%	-	-	-	0%		-	-	-	0%		-	-	-	50%		**-**

Crozier & Associates
SUITE 301 40 HURON STREET
COLLINGWOOD ONTARIO, L9Y 4R3
CANADA

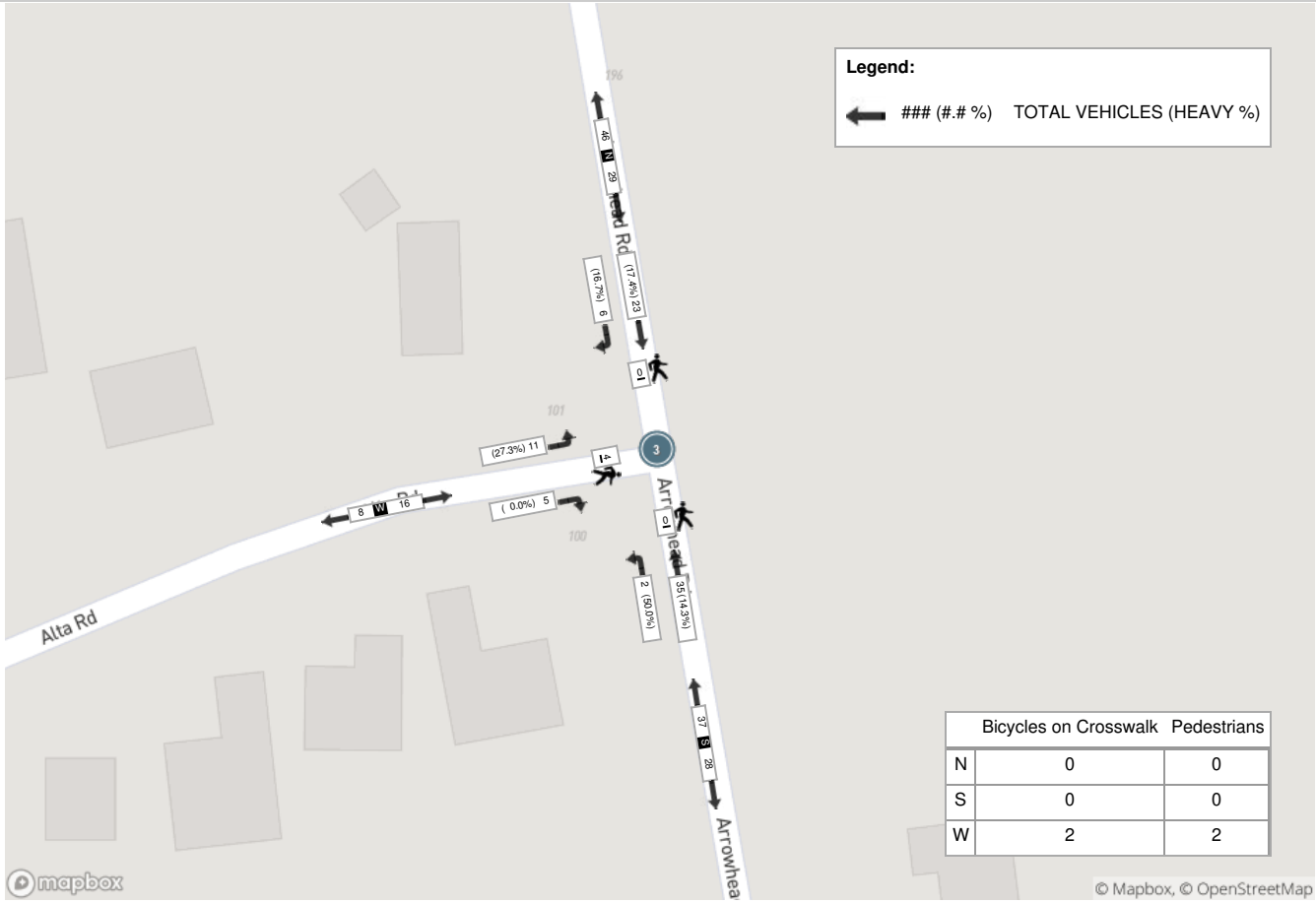
Peak Hour: 08:00 AM - 09:00 AM Weather: Broken Clouds (4.94 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	0
S	0	0
W	0	1

Crozier & Associates
SUITE 301 40 HURON STREET
COLLINGWOOD ONTARIO, L9Y 4R3
CANADA

Peak Hour: 03:00 PM - 04:00 PM Weather: Overcast Clouds (3.9 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	0
S	0	0
W	2	2

Crozier & Associates
SUITE 301 40 HURON STREET
COLLINGWOOD ONTARIO, L9Y 4R3
CANADA

Turning Movement Count (2 . HWY 26 & ARROWHEAD RD)

Start Time	E Approach HWY 26					S Approach ARROWHEAD RD					W Approach HWY 26					Int. Total (15 min)	Int. Total (1 hr)
	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	UTurn W:W	Peds W:	Approach Total		
06:00:00	19	0	0	0	19	0	1	0	0	1	0	19	0	0	19	39	
06:15:00	24	0	0	0	24	0	0	0	0	0	0	27	0	0	27	51	
06:30:00	24	0	0	0	24	0	0	0	0	0	2	39	0	0	41	65	
06:45:00	53	3	0	0	56	0	0	0	0	0	0	43	0	0	43	99	254
07:00:00	50	0	0	0	50	2	3	0	0	5	4	54	0	0	58	113	328
07:15:00	69	2	0	0	71	2	1	0	0	3	1	59	0	0	60	134	411
07:30:00	73	0	0	0	73	0	2	0	0	2	7	65	0	0	72	147	493
07:45:00	84	1	0	0	85	4	4	0	0	8	4	63	0	0	67	160	554
08:00:00	82	5	0	0	87	2	2	0	0	4	12	85	0	0	97	188	629
08:15:00	100	4	0	0	104	2	3	0	0	5	8	75	0	0	83	192	687
08:30:00	78	1	0	0	79	1	5	0	0	6	4	90	0	0	94	179	719
08:45:00	62	5	0	0	67	0	1	0	0	1	8	59	0	0	67	135	694
09:00:00	77	1	0	0	78	0	4	0	0	4	3	67	0	0	70	152	658
09:15:00	77	2	0	0	79	1	3	0	0	4	4	92	0	0	96	179	645
09:30:00	83	0	0	1	83	1	2	0	0	3	6	79	0	0	85	171	637
09:45:00	62	5	0	0	67	3	5	0	0	8	4	74	0	0	78	153	655
BREAK																	
15:00:00	104	5	0	0	109	5	13	0	0	18	3	80	0	0	83	210	
15:15:00	116	3	0	0	119	1	6	0	0	7	4	140	0	0	144	270	
15:30:00	103	3	0	0	106	3	4	0	0	7	5	116	0	0	121	234	
15:45:00	112	4	0	0	116	4	8	0	0	12	4	116	0	0	120	248	962
16:00:00	102	2	0	0	104	3	7	0	0	10	4	108	0	0	112	226	978
16:15:00	93	0	0	0	93	3	4	0	0	7	4	106	0	0	110	210	918
16:30:00	97	1	0	0	98	5	5	0	0	10	13	122	0	0	135	243	927
16:45:00	108	5	0	0	113	4	8	0	0	12	3	100	0	0	103	228	907
17:00:00	83	1	0	0	84	2	3	0	0	5	3	91	0	0	94	183	864
17:15:00	97	0	0	0	97	1	5	0	0	6	1	87	0	0	88	191	845
17:30:00	96	3	0	0	99	2	2	0	0	4	5	73	0	0	78	181	783
17:45:00	81	4	0	0	85	2	6	0	0	8	4	56	0	0	60	153	708
18:00:00	63	3	0	0	66	0	2	0	0	2	1	65	0	0	66	134	659
18:15:00	71	1	0	0	72	1	0	0	0	1	1	51	0	0	52	125	593
18:30:00	47	3	0	0	50	3	3	0	0	6	2	41	0	0	43	99	511
18:45:00	46	2	0	0	48	0	1	0	0	1	4	39	0	0	43	92	450

Crozier & Associates
SUITE 301 40 HURON STREET
COLLINGWOOD ONTARIO, L9Y 4R3
CANADA

Grand Total	2436	69	0	1	2505	57	113	0	0	170	128	2381	0	0	2509	**5184**	-
Approach%	97.2%	2.8%	0%		-	33.5%	66.5%	0%		-	5.1%	94.9%	0%		-	**-**	-
Totals %	47%	1.3%	0%		48.3%	1.1%	2.2%	0%		3.3%	2.5%	45.9%	0%		48.4%	**-**	-
Heavy	116	5	0		-	2	20	0		-	16	83	0		-	**-**	-
Heavy %	4.8%	7.2%	0%		-	3.5%	17.7%	0%		-	12.5%	3.5%	0%		-	**-**	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-

Crozier & Associates
SUITE 301 40 HURON STREET
COLLINGWOOD ONTARIO, L9Y 4R3
CANADA

Peak Hour: 07:45 AM - 08:45 AM Weather: Broken Clouds (4.94 °C)

Start Time	E Approach HWY 26					S Approach ARROWHEAD RD					W Approach HWY 26					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
07:45:00	84	1	0	0	85	4	4	0	0	8	4	63	0	0	67	160
08:00:00	82	5	0	0	87	2	2	0	0	4	12	85	0	0	97	188
08:15:00	100	4	0	0	104	2	3	0	0	5	8	75	0	0	83	192
08:30:00	78	1	0	0	79	1	5	0	0	6	4	90	0	0	94	179
Grand Total	344	11	0	0	355	9	14	0	0	23	28	313	0	0	341	**719**
Approach%	96.9%	3.1%	0%		-	39.1%	60.9%	0%		-	8.2%	91.8%	0%		-	**-**
Totals %	47.8%	1.5%	0%		49.4%	1.3%	1.9%	0%		3.2%	3.9%	43.5%	0%		47.4%	**-**
PHF	0.86	0.55	0		0.85	0.56	0.7	0		0.72	0.58	0.87	0		0.88	**-**
Heavy	26	1	0		27	0	5	0		5	4	18	0		22	**-**
Heavy %	7.6%	9.1%	0%		7.6%	0%	35.7%	0%		21.7%	14.3%	5.8%	0%		6.5%	**-**
Lights	318	10	0		328	9	9	0		18	24	295	0		319	**-**
Lights %	92.4%	90.9%	0%		92.4%	100%	64.3%	0%		78.3%	85.7%	94.2%	0%		93.5%	**-**
Single-Unit Trucks	19	1	0		20	0	5	0		5	4	13	0		17	**-**
Single-Unit Trucks %	5.5%	9.1%	0%		5.6%	0%	35.7%	0%		21.7%	14.3%	4.2%	0%		5%	**-**
Articulated Trucks	7	0	0		7	0	0	0		0	0	5	0		5	**-**
Articulated Trucks %	2%	0%	0%		2%	0%	0%	0%		0%	0%	1.6%	0%		1.5%	**-**
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**

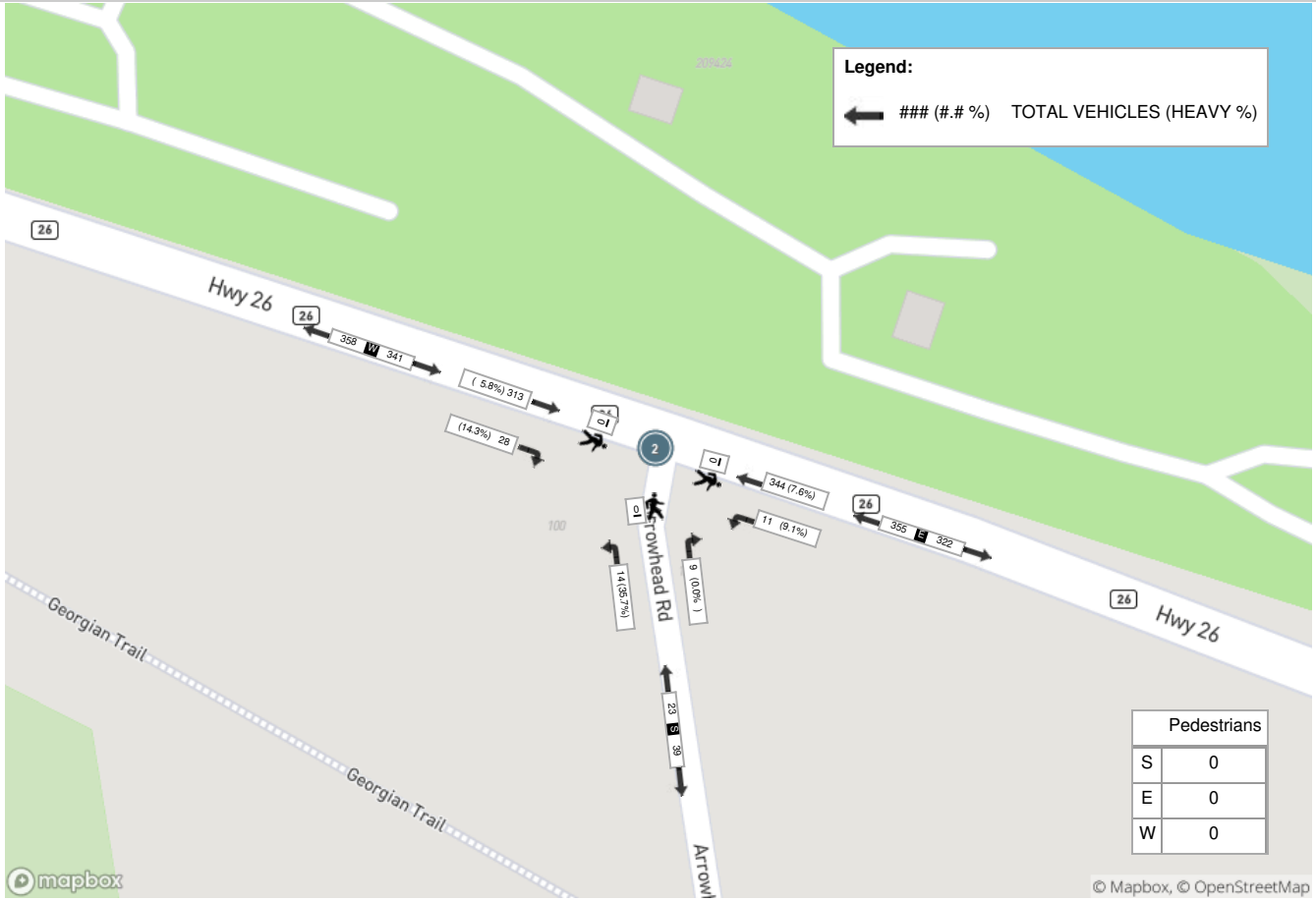
Crozier & Associates
SUITE 301 40 HURON STREET
COLLINGWOOD ONTARIO, L9Y 4R3
CANADA

Peak Hour: 03:15 PM - 04:15 PM Weather: Overcast Clouds (3.9 °C)

Start Time	E Approach HWY 26					S Approach ARROWHEAD RD					W Approach HWY 26					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
15:15:00	116	3	0	0	119	1	6	0	0	7	4	140	0	0	144	270
15:30:00	103	3	0	0	106	3	4	0	0	7	5	116	0	0	121	234
15:45:00	112	4	0	0	116	4	8	0	0	12	4	116	0	0	120	248
16:00:00	102	2	0	0	104	3	7	0	0	10	4	108	0	0	112	226
Grand Total	433	12	0	0	445	11	25	0	0	36	17	480	0	0	497	**978**
Approach%	97.3%	2.7%	0%		-	30.6%	69.4%	0%		-	3.4%	96.6%	0%		-	**-**
Totals %	44.3%	1.2%	0%		45.5%	1.1%	2.6%	0%		3.7%	1.7%	49.1%	0%		50.8%	**-**
PHF	0.93	0.75	0		0.93	0.69	0.78	0		0.75	0.85	0.86	0		0.86	**-**
Heavy	15	1	0		16	1	4	0		5	3	15	0		18	**-**
Heavy %	3.5%	8.3%	0%		3.6%	9.1%	16%	0%		13.9%	17.6%	3.1%	0%		3.6%	**-**
Lights	418	11	0		429	10	21	0		31	14	465	0		479	**-**
Lights %	96.5%	91.7%	0%		96.4%	90.9%	84%	0%		86.1%	82.4%	96.9%	0%		96.4%	**-**
Single-Unit Trucks	11	0	0		11	0	4	0		4	3	13	0		16	**-**
Single-Unit Trucks %	2.5%	0%	0%		2.5%	0%	16%	0%		11.1%	17.6%	2.7%	0%		3.2%	**-**
Articulated Trucks	4	1	0		5	1	0	0		1	0	2	0		2	**-**
Articulated Trucks %	0.9%	8.3%	0%		1.1%	9.1%	0%	0%		2.8%	0%	0.4%	0%		0.4%	**-**
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**

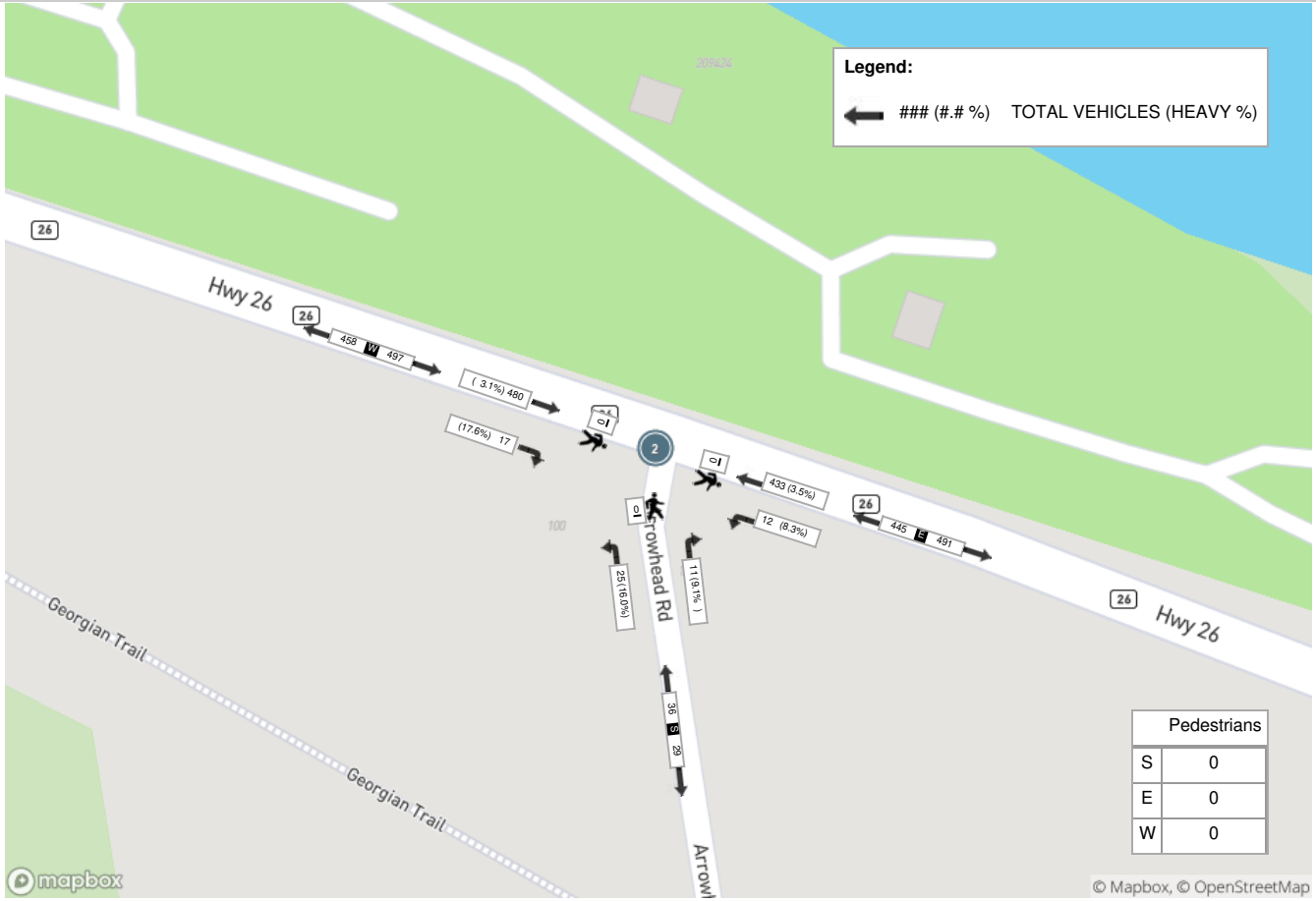
Crozier & Associates
SUITE 301 40 HURON STREET
COLLINGWOOD ONTARIO, L9Y 4R3
CANADA

Peak Hour: 07:45 AM - 08:45 AM Weather: Broken Clouds (4.94 °C)



Crozier & Associates
SUITE 301 40 HURON STREET
COLLINGWOOD ONTARIO, L9Y 4R3
CANADA

Peak Hour: 03:15 PM - 04:15 PM Weather: Overcast Clouds (3.9 °C)



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SUITE 301 40 HURON STREET
COLLINGWOOD ONTARIO, L9Y 4R3
CANADA

Turning Movement Count (1 . HWY 26 & HIDDEN LAKE RD)

Start Time	E Approach HWY 26					S Approach HIDDEN LAKE RD					W Approach HWY 26					Int. Total (15 min)	Int. Total (1 hr)
	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	UTurn W:W	Peds W:	Approach Total		
06:00:00	20	0	0	0	20	0	1	0	0	1	0	19	0	0	19	40	
06:15:00	24	0	0	0	24	0	0	0	0	0	0	28	0	0	28	52	
06:30:00	23	0	0	0	23	1	0	0	0	1	0	41	0	0	41	65	
06:45:00	48	0	0	0	48	1	0	0	0	1	2	43	0	0	45	94	251
07:00:00	52	2	0	0	54	0	0	0	0	0	0	60	0	0	60	114	325
07:15:00	74	0	0	0	74	1	0	0	0	1	0	58	0	0	58	133	406
07:30:00	73	1	0	0	74	1	1	0	0	2	1	68	0	0	69	145	486
07:45:00	85	0	0	0	85	1	1	0	0	2	0	74	0	0	74	161	553
08:00:00	78	0	0	0	78	0	0	0	0	0	0	90	0	0	90	168	607
08:15:00	104	0	0	0	104	2	1	0	0	3	0	80	0	0	80	187	661
08:30:00	83	1	0	0	84	1	0	0	0	1	1	95	0	0	96	181	697
08:45:00	64	1	0	0	65	0	0	0	0	0	0	67	0	0	67	132	668
09:00:00	79	1	0	0	80	0	2	0	0	2	1	73	0	0	74	156	656
09:15:00	77	3	0	0	80	1	0	0	0	1	0	88	0	0	88	169	638
09:30:00	81	0	0	0	81	0	0	0	0	0	0	85	0	0	85	166	623
09:45:00	71	1	0	0	72	1	2	0	0	3	1	78	0	0	79	154	645
BREAK																	
15:00:00	116	1	0	0	117	0	0	0	0	0	1	92	0	0	93	210	
15:15:00	120	4	0	0	124	4	0	0	0	4	1	138	0	0	139	267	
15:30:00	100	2	0	0	102	1	3	0	0	4	1	114	0	0	115	221	
15:45:00	119	1	0	0	120	2	4	0	0	6	0	118	0	0	118	244	942
16:00:00	99	3	0	0	102	1	0	0	0	1	0	106	0	0	106	209	941
16:15:00	106	1	0	0	107	1	1	0	0	2	3	109	0	0	112	221	895
16:30:00	100	0	0	0	100	1	1	0	0	2	2	128	0	0	130	232	906
16:45:00	115	0	0	0	115	5	1	0	0	6	1	96	0	0	97	218	880
17:00:00	86	2	0	0	88	6	0	0	0	6	1	92	0	0	93	187	858
17:15:00	96	2	0	0	98	1	0	0	0	1	0	83	0	0	83	182	819
17:30:00	99	1	0	0	100	0	3	0	0	3	0	79	0	0	79	182	769
17:45:00	86	2	0	0	88	3	0	0	0	3	2	56	0	0	58	149	700
18:00:00	67	0	0	0	67	2	0	0	0	2	3	65	0	0	68	137	650
18:15:00	66	2	0	0	68	2	0	0	0	2	3	49	0	0	52	122	590
18:30:00	49	2	0	0	51	1	1	0	0	2	1	42	0	0	43	96	504
18:45:00	47	2	0	0	49	0	0	0	0	0	1	41	0	0	42	91	446

Crozier & Associates
SUITE 301 40 HURON STREET
COLLINGWOOD ONTARIO, L9Y 4R3
CANADA

Grand Total	2507	35	0	0	2542	40	22	0	0	62	26	2455	0	0	2481	**5085**	-
Approach%	98.6%	1.4%	0%		-	64.5%	35.5%	0%		-	1%	99%	0%		-	**-**	-
Totals %	49.3%	0.7%	0%		50%	0.8%	0.4%	0%		1.2%	0.5%	48.3%	0%		48.8%	**-**	-
Heavy	137	1	0		-	3	3	0		-	2	98	0		-	**-**	-
Heavy %	5.5%	2.9%	0%		-	7.5%	13.6%	0%		-	7.7%	4%	0%		-	**-**	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-

Crozier & Associates
SUITE 301 40 HURON STREET
COLLINGWOOD ONTARIO, L9Y 4R3
CANADA

Peak Hour: 07:45 AM - 08:45 AM Weather: Broken Clouds (4.94 °C)

Start Time	E Approach HWY 26					S Approach HIDDEN LAKE RD					W Approach HWY 26					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
07:45:00	85	0	0	0	85	1	1	0	0	2	0	74	0	0	74	161
08:00:00	78	0	0	0	78	0	0	0	0	0	0	90	0	0	90	168
08:15:00	104	0	0	0	104	2	1	0	0	3	0	80	0	0	80	187
08:30:00	83	1	0	0	84	1	0	0	0	1	1	95	0	0	96	181
Grand Total	350	1	0	0	351	4	2	0	0	6	1	339	0	0	340	**697**
Approach%	99.7%	0.3%	0%		-	66.7%	33.3%	0%		-	0.3%	99.7%	0%		-	**-**
Totals %	50.2%	0.1%	0%		50.4%	0.6%	0.3%	0%		0.9%	0.1%	48.6%	0%		48.8%	**-**
PHF	0.84	0.25	0		0.84	0.5	0.5	0		0.5	0.25	0.89	0		0.89	**-**
Heavy	30	0	0		30	1	1	0		2	0	21	0		21	**-**
Heavy %	8.6%	0%	0%		8.5%	25%	50%	0%		33.3%	0%	6.2%	0%		6.2%	**-**
Lights	320	1	0		321	3	1	0		4	1	318	0		319	**-**
Lights %	91.4%	100%	0%		91.5%	75%	50%	0%		66.7%	100%	93.8%	0%		93.8%	**-**
Single-Unit Trucks	22	0	0		22	1	1	0		2	0	16	0		16	**-**
Single-Unit Trucks %	6.3%	0%	0%		6.3%	25%	50%	0%		33.3%	0%	4.7%	0%		4.7%	**-**
Articulated Trucks	8	0	0		8	0	0	0		0	0	5	0		5	**-**
Articulated Trucks %	2.3%	0%	0%		2.3%	0%	0%	0%		0%	0%	1.5%	0%		1.5%	**-**

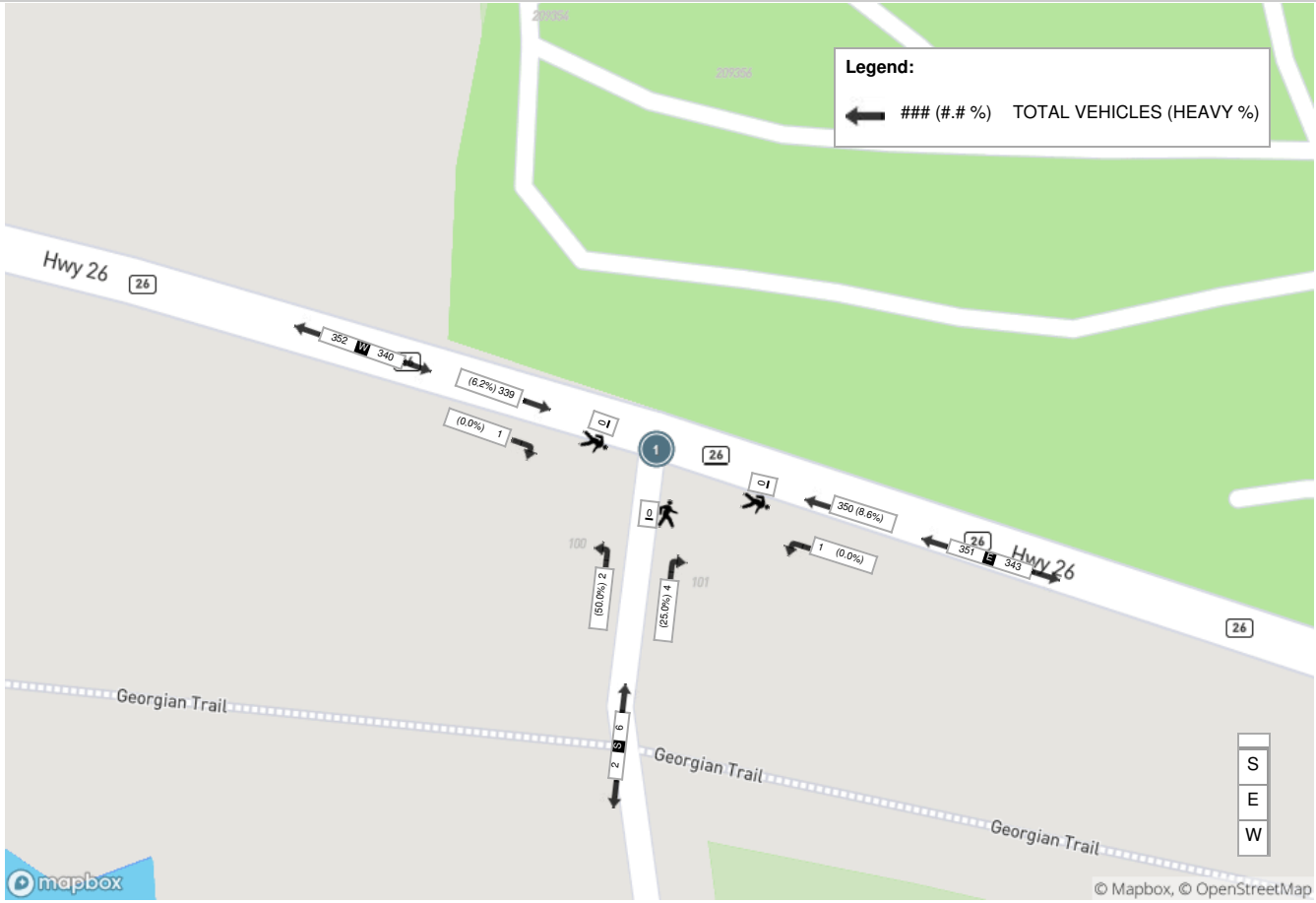
Crozier & Associates
SUITE 301 40 HURON STREET
COLLINGWOOD ONTARIO, L9Y 4R3
CANADA

Peak Hour: 03:00 PM - 04:00 PM Weather: Overcast Clouds (3.9 °C)

Start Time	E Approach HWY 26					S Approach HIDDEN LAKE RD					W Approach HWY 26					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
15:00:00	116	1	0	0	117	0	0	0	0	0	1	92	0	0	93	210
15:15:00	120	4	0	0	124	4	0	0	0	4	1	138	0	0	139	267
15:30:00	100	2	0	0	102	1	3	0	0	4	1	114	0	0	115	221
15:45:00	119	1	0	0	120	2	4	0	0	6	0	118	0	0	118	244
Grand Total	455	8	0	0	463	7	7	0	0	14	3	462	0	0	465	**942**
Approach%	98.3%	1.7%	0%		-	50%	50%	0%		-	0.6%	99.4%	0%		-	**-**
Totals %	48.3%	0.8%	0%		49.2%	0.7%	0.7%	0%		1.5%	0.3%	49%	0%		49.4%	**-**
PHF	0.95	0.5	0		0.93	0.44	0.44	0		0.58	0.75	0.84	0		0.84	**-**
Heavy	20	0	0		20	1	1	0		2	0	14	0		14	**-**
Heavy %	4.4%	0%	0%		4.3%	14.3%	14.3%	0%		14.3%	0%	3%	0%		3%	**-**
Lights	435	8	0		443	6	6	0		12	3	448	0		451	**-**
Lights %	95.6%	100%	0%		95.7%	85.7%	85.7%	0%		85.7%	100%	97%	0%		97%	**-**
Single-Unit Trucks	17	0	0		17	1	1	0		2	0	13	0		13	**-**
Single-Unit Trucks %	3.7%	0%	0%		3.7%	14.3%	14.3%	0%		14.3%	0%	2.8%	0%		2.8%	**-**
Articulated Trucks	3	0	0		3	0	0	0		0	0	1	0		1	**-**
Articulated Trucks %	0.7%	0%	0%		0.6%	0%	0%	0%		0%	0%	0.2%	0%		0.2%	**-**

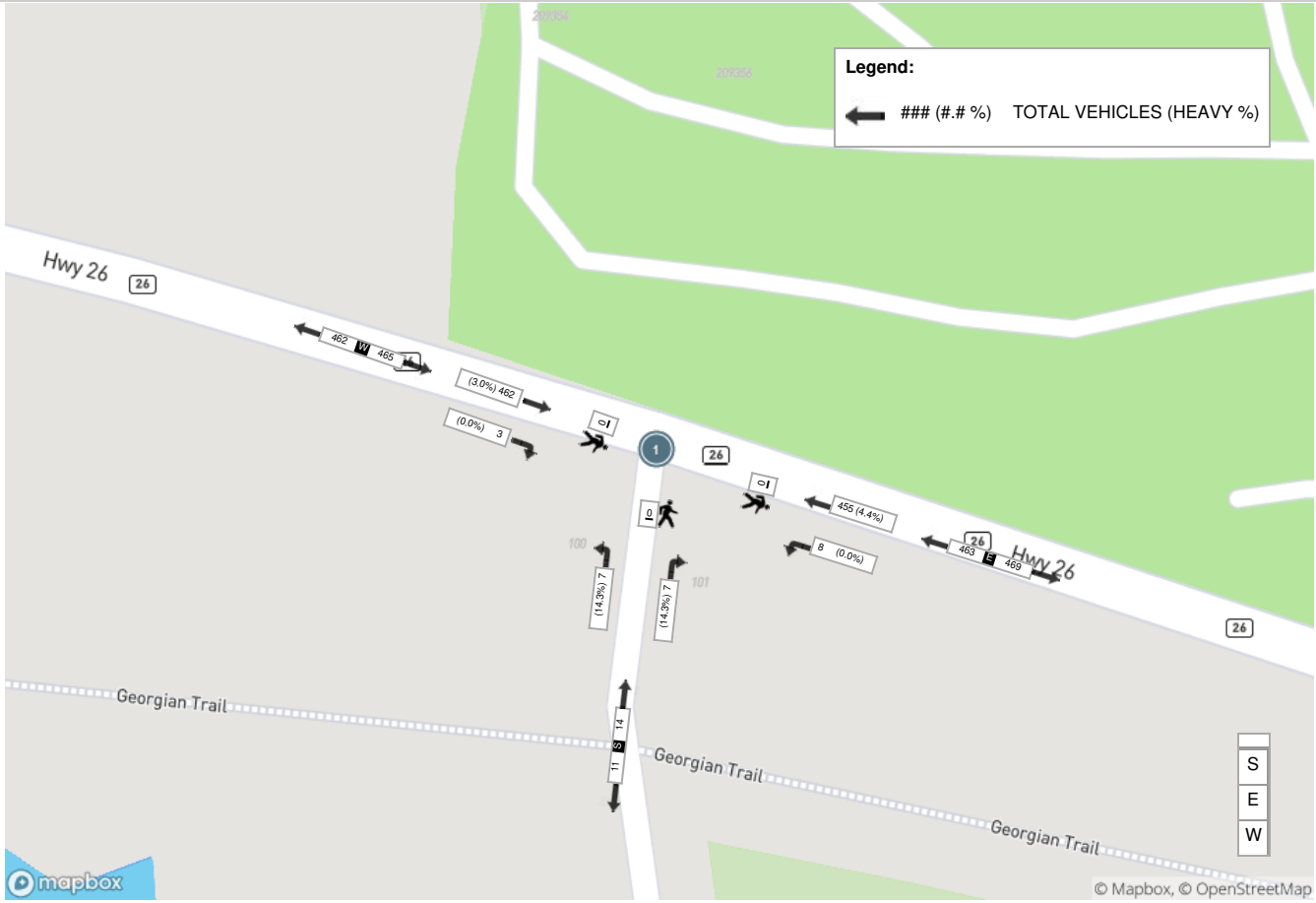
Crozier & Associates
SUITE 301 40 HURON STREET
COLLINGWOOD ONTARIO, L9Y 4R3
CANADA

Peak Hour: 07:45 AM - 08:45 AM Weather: Broken Clouds (4.94 °C)



Crozier & Associates
SUITE 301 40 HURON STREET
COLLINGWOOD ONTARIO, L9Y 4R3
CANADA

Peak Hour: 03:00 PM - 04:00 PM Weather: Overcast Clouds (3.9 °C)



APPENDIX C

Level of Service Definitions

Level of Service Definitions

Two-Way Stop Controlled Intersections

Level of Service	Control Delay per Vehicle (seconds)	Interpretation
A	≤ 10	EXCELLENT. Large and frequent gaps in traffic on the main roadway. Queuing on the minor street is rare.
B	> 10 and ≤ 15	VERY GOOD. Many gaps exist in traffic on the main roadway. Queuing on the minor street is minimal.
C	> 15 and ≤ 25	GOOD. Fewer gaps exist in traffic on the main roadway. Delay on minor approach becomes more noticeable.
D	> 25 and ≤ 35	FAIR. Infrequent and shorter gaps in traffic on the main roadway. Queue lengths develop on the minor street.
E	> 35 and ≤ 50	POOR. Very infrequent gaps in traffic on the main roadway. Queue lengths become noticeable.
F	> 50	UNSATISFACTORY. Very few gaps in traffic on the main roadway. Excessive delay with significant queue lengths on the minor street.

Adapted from Highway Capacity Manual 2000, Transportation Research Board

APPENDIX D

Capacity Analysis Worksheets

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	6	5	19	31	22
Future Vol, veh/h	1	6	5	19	31	22
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	25	19	0
Mvmt Flow	1	7	6	23	37	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	87	52	65	0	-	0
Stage 1	52	-	-	-	-	-
Stage 2	35	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	919	1021	1550	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	993	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	913	1020	1549	-	-	-
Mov Cap-2 Maneuver	913	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	992	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	1.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1549	-	1003	-	-
HCM Lane V/C Ratio	0.004	-	0.008	-	-
HCM Control Delay (s)	7.3	0	8.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	376	34	13	413	17	11
Future Vol, veh/h	376	34	13	413	17	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	120	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	6	14	9	8	36	0
Mvmt Flow	400	36	14	439	18	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	436	0	867	400
Stage 1	-	-	-	-	400	-
Stage 2	-	-	-	-	467	-
Critical Hdwy	-	-	4.19	-	6.76	6.2
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	-	-	2.281	-	3.824	3.3
Pot Cap-1 Maneuver	-	-	1087	-	283	654
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	566	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1087	-	278	654
Mov Cap-2 Maneuver	-	-	-	-	278	-
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	556	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	15.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	359	-	-	1087	-
HCM Lane V/C Ratio	0.083	-	-	0.013	-
HCM Control Delay (s)	15.9	-	-	8.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	407	1	1	420	2	5
Future Vol, veh/h	407	1	1	420	2	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	140	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	6	0	0	9	50	25
Mvmt Flow	438	1	1	452	2	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	439	0	892	438
Stage 1	-	-	-	-	438	-
Stage 2	-	-	-	-	454	-
Critical Hdwy	-	-	4.1	-	6.9	6.45
Critical Hdwy Stg 1	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	5.9	-
Follow-up Hdwy	-	-	2.2	-	3.95	3.525
Pot Cap-1 Maneuver	-	-	1132	-	259	573
Stage 1	-	-	-	-	560	-
Stage 2	-	-	-	-	550	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1132	-	259	573
Mov Cap-2 Maneuver	-	-	-	-	259	-
Stage 1	-	-	-	-	560	-
Stage 2	-	-	-	-	549	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	426	-	-	1132	-
HCM Lane V/C Ratio	0.018	-	-	0.001	-
HCM Control Delay (s)	13.6	-	-	8.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	13	6	2	42	28	7
Future Vol, veh/h	13	6	2	42	28	7
Conflicting Peds, #/hr	0	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	27	0	50	14	17	17
Mvmt Flow	18	8	3	59	39	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	113	48	53	0	-	0
Stage 1	48	-	-	-	-	-
Stage 2	65	-	-	-	-	-
Critical Hdwy	6.67	6.2	4.6	-	-	-
Critical Hdwy Stg 1	5.67	-	-	-	-	-
Critical Hdwy Stg 2	5.67	-	-	-	-	-
Follow-up Hdwy	3.743	3.3	2.65	-	-	-
Pot Cap-1 Maneuver	827	1027	1294	-	-	-
Stage 1	914	-	-	-	-	-
Stage 2	898	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	820	1024	1290	-	-	-
Mov Cap-2 Maneuver	820	-	-	-	-	-
Stage 1	909	-	-	-	-	-
Stage 2	895	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1290	-	875	-	-
HCM Lane V/C Ratio	0.002	-	0.031	-	-
HCM Control Delay (s)	7.8	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	576	20	14	520	30	13
Future Vol, veh/h	576	20	14	520	30	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	120	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	18	8	4	16	9
Mvmt Flow	633	22	15	571	33	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	655	0	1234	633
Stage 1	-	-	-	-	633	-
Stage 2	-	-	-	-	601	-
Critical Hdwy	-	-	4.18	-	6.56	6.29
Critical Hdwy Stg 1	-	-	-	-	5.56	-
Critical Hdwy Stg 2	-	-	-	-	5.56	-
Follow-up Hdwy	-	-	2.272	-	3.644	3.381
Pot Cap-1 Maneuver	-	-	904	-	183	467
Stage 1	-	-	-	-	503	-
Stage 2	-	-	-	-	521	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	904	-	179	467
Mov Cap-2 Maneuver	-	-	-	-	179	-
Stage 1	-	-	-	-	503	-
Stage 2	-	-	-	-	508	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	25.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	220	-	-	904	-
HCM Lane V/C Ratio	0.215	-	-	0.017	-
HCM Control Delay (s)	25.8	-	-	9.1	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	554	4	10	546	8	8
Future Vol, veh/h	554	4	10	546	8	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	140	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	0	0	4	14	14
Mvmt Flow	630	5	11	620	9	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	635	0	1272	630
Stage 1	-	-	-	-	630	-
Stage 2	-	-	-	-	642	-
Critical Hdwy	-	-	4.1	-	6.54	6.34
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	2.2	-	3.626	3.426
Pot Cap-1 Maneuver	-	-	958	-	175	461
Stage 1	-	-	-	-	509	-
Stage 2	-	-	-	-	502	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	958	-	172	461
Mov Cap-2 Maneuver	-	-	-	-	172	-
Stage 1	-	-	-	-	509	-
Stage 2	-	-	-	-	493	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	20.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	251	-	-	958	-
HCM Lane V/C Ratio	0.072	-	-	0.012	-
HCM Control Delay (s)	20.5	-	-	8.8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	6	5	20	32	22
Future Vol, veh/h	1	6	5	20	32	22
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	25	19	0
Mvmt Flow	1	7	6	24	39	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	90	54	67	0	-	0
Stage 1	54	-	-	-	-	-
Stage 2	36	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	915	1019	1547	-	-	-
Stage 1	974	-	-	-	-	-
Stage 2	992	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	910	1018	1546	-	-	-
Mov Cap-2 Maneuver	910	-	-	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	991	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	1.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1546	-	1001	-	-
HCM Lane V/C Ratio	0.004	-	0.008	-	-
HCM Control Delay (s)	7.3	0	8.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	488	35	14	491	17	11
Future Vol, veh/h	488	35	14	491	17	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	120	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	6	14	9	8	36	0
Mvmt Flow	519	37	15	522	18	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	556	0	1071	519
Stage 1	-	-	-	-	519	-
Stage 2	-	-	-	-	552	-
Critical Hdwy	-	-	4.19	-	6.76	6.2
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	-	-	2.281	-	3.824	3.3
Pot Cap-1 Maneuver	-	-	980	-	211	561
Stage 1	-	-	-	-	534	-
Stage 2	-	-	-	-	514	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	980	-	206	561
Mov Cap-2 Maneuver	-	-	-	-	206	-
Stage 1	-	-	-	-	534	-
Stage 2	-	-	-	-	503	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	19.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	274	-	-	980	-
HCM Lane V/C Ratio	0.109	-	-	0.015	-
HCM Control Delay (s)	19.7	-	-	8.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	520	1	1	499	2	5
Future Vol, veh/h	520	1	1	499	2	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	140	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	6	0	0	9	50	25
Mvmt Flow	559	1	1	537	2	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	560	0	1098	559
Stage 1	-	-	-	-	559	-
Stage 2	-	-	-	-	539	-
Critical Hdwy	-	-	4.1	-	6.9	6.45
Critical Hdwy Stg 1	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	5.9	-
Follow-up Hdwy	-	-	2.2	-	3.95	3.525
Pot Cap-1 Maneuver	-	-	1021	-	191	487
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	499	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1021	-	191	487
Mov Cap-2 Maneuver	-	-	-	-	191	-
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	499	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	338	-	-	1021	-
HCM Lane V/C Ratio	0.022	-	-	0.001	-
HCM Control Delay (s)	15.9	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	6	2	43	28	7
Future Vol, veh/h	14	6	2	43	28	7
Conflicting Peds, #/hr	0	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	27	0	50	14	17	17
Mvmt Flow	20	8	3	61	39	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	115	48	53	0	-	0
Stage 1	48	-	-	-	-	-
Stage 2	67	-	-	-	-	-
Critical Hdwy	6.67	6.2	4.6	-	-	-
Critical Hdwy Stg 1	5.67	-	-	-	-	-
Critical Hdwy Stg 2	5.67	-	-	-	-	-
Follow-up Hdwy	3.743	3.3	2.65	-	-	-
Pot Cap-1 Maneuver	825	1027	1294	-	-	-
Stage 1	914	-	-	-	-	-
Stage 2	896	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	818	1024	1290	-	-	-
Mov Cap-2 Maneuver	818	-	-	-	-	-
Stage 1	909	-	-	-	-	-
Stage 2	893	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1290	-	871	-	-
HCM Lane V/C Ratio	0.002	-	0.032	-	-
HCM Control Delay (s)	7.8	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	685	21	15	651	31	14
Future Vol, veh/h	685	21	15	651	31	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	120	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	18	8	4	16	9
Mvmt Flow	753	23	16	715	34	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	776	0	1500	753
Stage 1	-	-	-	-	753	-
Stage 2	-	-	-	-	747	-
Critical Hdwy	-	-	4.18	-	6.56	6.29
Critical Hdwy Stg 1	-	-	-	-	5.56	-
Critical Hdwy Stg 2	-	-	-	-	5.56	-
Follow-up Hdwy	-	-	2.272	-	3.644	3.381
Pot Cap-1 Maneuver	-	-	814	-	125	398
Stage 1	-	-	-	-	441	-
Stage 2	-	-	-	-	444	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	814	-	121	398
Mov Cap-2 Maneuver	-	-	-	-	121	-
Stage 1	-	-	-	-	441	-
Stage 2	-	-	-	-	429	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	39.1
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	154	-	-	814	-
HCM Lane V/C Ratio	0.321	-	-	0.02	-
HCM Control Delay (s)	39.1	-	-	9.5	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	1.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	663	4	10	679	9	9
Future Vol, veh/h	663	4	10	679	9	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	140	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	0	0	4	14	14
Mvmt Flow	753	5	11	772	10	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	758	0	1547	753
Stage 1	-	-	-	-	753	-
Stage 2	-	-	-	-	794	-
Critical Hdwy	-	-	4.1	-	6.54	6.34
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	2.2	-	3.626	3.426
Pot Cap-1 Maneuver	-	-	862	-	118	391
Stage 1	-	-	-	-	445	-
Stage 2	-	-	-	-	425	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	862	-	115	391
Mov Cap-2 Maneuver	-	-	-	-	115	-
Stage 1	-	-	-	-	445	-
Stage 2	-	-	-	-	416	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	27.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	178	-	-	862	-
HCM Lane V/C Ratio	0.115	-	-	0.013	-
HCM Control Delay (s)	27.8	-	-	9.2	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	6	5	21	34	23
Future Vol, veh/h	1	6	5	21	34	23
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	25	19	0
Mvmt Flow	1	7	6	25	41	28

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	93	56	70	0	-	0
Stage 1	56	-	-	-	-	-
Stage 2	37	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	912	1016	1544	-	-	-
Stage 1	972	-	-	-	-	-
Stage 2	991	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	907	1015	1543	-	-	-
Mov Cap-2 Maneuver	907	-	-	-	-	-
Stage 1	967	-	-	-	-	-
Stage 2	990	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	1.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1543	-	998	-	-
HCM Lane V/C Ratio	0.004	-	0.008	-	-
HCM Control Delay (s)	7.3	0	8.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	508	36	14	513	18	12
Future Vol, veh/h	508	36	14	513	18	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	120	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	6	14	9	8	36	0
Mvmt Flow	540	38	15	546	19	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	578	0	1116	540
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	576	-
Critical Hdwy	-	-	4.19	-	6.76	6.2
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	-	-	2.281	-	3.824	3.3
Pot Cap-1 Maneuver	-	-	962	-	198	546
Stage 1	-	-	-	-	521	-
Stage 2	-	-	-	-	501	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	962	-	194	546
Mov Cap-2 Maneuver	-	-	-	-	194	-
Stage 1	-	-	-	-	521	-
Stage 2	-	-	-	-	490	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	20.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	261	-	-	962	-
HCM Lane V/C Ratio	0.122	-	-	0.015	-
HCM Control Delay (s)	20.7	-	-	8.8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	542	1	1	521	3	5
Future Vol, veh/h	542	1	1	521	3	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	140	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	6	0	0	9	50	25
Mvmt Flow	583	1	1	560	3	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	584	0	1145	583
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	562	-
Critical Hdwy	-	-	4.1	-	6.9	6.45
Critical Hdwy Stg 1	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	5.9	-
Follow-up Hdwy	-	-	2.2	-	3.95	3.525
Pot Cap-1 Maneuver	-	-	1001	-	178	472
Stage 1	-	-	-	-	475	-
Stage 2	-	-	-	-	486	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1001	-	178	472
Mov Cap-2 Maneuver	-	-	-	-	178	-
Stage 1	-	-	-	-	475	-
Stage 2	-	-	-	-	486	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	17.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	291	-	-	1001	-
HCM Lane V/C Ratio	0.03	-	-	0.001	-
HCM Control Delay (s)	17.7	-	-	8.6	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	6	3	45	30	8
Future Vol, veh/h	14	6	3	45	30	8
Conflicting Peds, #/hr	0	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	27	0	50	14	17	17
Mvmt Flow	20	8	4	63	42	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	123	52	57	0	-	0
Stage 1	52	-	-	-	-	-
Stage 2	71	-	-	-	-	-
Critical Hdwy	6.67	6.2	4.6	-	-	-
Critical Hdwy Stg 1	5.67	-	-	-	-	-
Critical Hdwy Stg 2	5.67	-	-	-	-	-
Follow-up Hdwy	3.743	3.3	2.65	-	-	-
Pot Cap-1 Maneuver	816	1021	1290	-	-	-
Stage 1	910	-	-	-	-	-
Stage 2	892	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	809	1018	1286	-	-	-
Mov Cap-2 Maneuver	809	-	-	-	-	-
Stage 1	905	-	-	-	-	-
Stage 2	889	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1286	-	862	-	-
HCM Lane V/C Ratio	0.003	-	0.033	-	-
HCM Control Delay (s)	7.8	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	716	22	16	679	32	14
Future Vol, veh/h	716	22	16	679	32	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	120	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	18	8	4	16	9
Mvmt Flow	787	24	18	746	35	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	811	0	1569	787
Stage 1	-	-	-	-	787	-
Stage 2	-	-	-	-	782	-
Critical Hdwy	-	-	4.18	-	6.56	6.29
Critical Hdwy Stg 1	-	-	-	-	5.56	-
Critical Hdwy Stg 2	-	-	-	-	5.56	-
Follow-up Hdwy	-	-	2.272	-	3.644	3.381
Pot Cap-1 Maneuver	-	-	789	-	113	381
Stage 1	-	-	-	-	425	-
Stage 2	-	-	-	-	427	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	789	-	109	381
Mov Cap-2 Maneuver	-	-	-	-	109	-
Stage 1	-	-	-	-	425	-
Stage 2	-	-	-	-	410	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	45
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	139	-	-	789	-
HCM Lane V/C Ratio	0.364	-	-	0.022	-
HCM Control Delay (s)	45	-	-	9.7	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	1.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	692	4	10	707	9	9
Future Vol, veh/h	692	4	10	707	9	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	140	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	0	0	4	14	14
Mvmt Flow	786	5	11	803	10	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	791	0	1611	786
Stage 1	-	-	-	-	786	-
Stage 2	-	-	-	-	825	-
Critical Hdwy	-	-	4.1	-	6.54	6.34
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	2.2	-	3.626	3.426
Pot Cap-1 Maneuver	-	-	838	-	108	374
Stage 1	-	-	-	-	429	-
Stage 2	-	-	-	-	411	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	838	-	105	374
Mov Cap-2 Maneuver	-	-	-	-	105	-
Stage 1	-	-	-	-	429	-
Stage 2	-	-	-	-	401	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	30.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	164	-	-	838	-
HCM Lane V/C Ratio	0.125	-	-	0.014	-
HCM Control Delay (s)	30.1	-	-	9.4	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	7	5	22	36	25
Future Vol, veh/h	1	7	5	22	36	25
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	25	19	0
Mvmt Flow	1	8	6	27	43	30

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	98	59	74	0	-	0
Stage 1	59	-	-	-	-	-
Stage 2	39	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	906	1012	1538	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	989	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	901	1011	1537	-	-	-
Mov Cap-2 Maneuver	901	-	-	-	-	-
Stage 1	964	-	-	-	-	-
Stage 2	988	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	1.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1537	-	996	-	-
HCM Lane V/C Ratio	0.004	-	0.01	-	-
HCM Control Delay (s)	7.4	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	528	38	15	536	19	12
Future Vol, veh/h	528	38	15	536	19	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	120	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	6	14	9	8	36	0
Mvmt Flow	562	40	16	570	20	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	602	0	1164	562
Stage 1	-	-	-	-	562	-
Stage 2	-	-	-	-	602	-
Critical Hdwy	-	-	4.19	-	6.76	6.2
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	-	-	2.281	-	3.824	3.3
Pot Cap-1 Maneuver	-	-	942	-	184	530
Stage 1	-	-	-	-	509	-
Stage 2	-	-	-	-	486	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	942	-	179	530
Mov Cap-2 Maneuver	-	-	-	-	179	-
Stage 1	-	-	-	-	509	-
Stage 2	-	-	-	-	474	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	22.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	241	-	-	942	-
HCM Lane V/C Ratio	0.137	-	-	0.017	-
HCM Control Delay (s)	22.3	-	-	8.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	564	1	1	544	3	5
Future Vol, veh/h	564	1	1	544	3	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	140	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	6	0	0	9	50	25
Mvmt Flow	606	1	1	585	3	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	607	0	1193	606
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	587	-
Critical Hdwy	-	-	4.1	-	6.9	6.45
Critical Hdwy Stg 1	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	5.9	-
Follow-up Hdwy	-	-	2.2	-	3.95	3.525
Pot Cap-1 Maneuver	-	-	981	-	166	457
Stage 1	-	-	-	-	462	-
Stage 2	-	-	-	-	472	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	981	-	166	457
Mov Cap-2 Maneuver	-	-	-	-	166	-
Stage 1	-	-	-	-	462	-
Stage 2	-	-	-	-	471	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	18.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	276	-	-	981	-
HCM Lane V/C Ratio	0.031	-	-	0.001	-
HCM Control Delay (s)	18.5	-	-	8.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	7	3	48	31	8
Future Vol, veh/h	15	7	3	48	31	8
Conflicting Peds, #/hr	0	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	27	0	50	14	17	17
Mvmt Flow	21	10	4	68	44	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	130	54	59	0	-	0
Stage 1	54	-	-	-	-	-
Stage 2	76	-	-	-	-	-
Critical Hdwy	6.67	6.2	4.6	-	-	-
Critical Hdwy Stg 1	5.67	-	-	-	-	-
Critical Hdwy Stg 2	5.67	-	-	-	-	-
Follow-up Hdwy	3.743	3.3	2.65	-	-	-
Pot Cap-1 Maneuver	808	1019	1287	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	887	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	801	1016	1283	-	-	-
Mov Cap-2 Maneuver	801	-	-	-	-	-
Stage 1	903	-	-	-	-	-
Stage 2	884	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1283	-	859	-	-
HCM Lane V/C Ratio	0.003	-	0.036	-	-
HCM Control Delay (s)	7.8	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	748	23	16	707	34	15
Future Vol, veh/h	748	23	16	707	34	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	120	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	18	8	4	16	9
Mvmt Flow	822	25	18	777	37	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	847	0	1635	822
Stage 1	-	-	-	-	822	-
Stage 2	-	-	-	-	813	-
Critical Hdwy	-	-	4.18	-	6.56	6.29
Critical Hdwy Stg 1	-	-	-	-	5.56	-
Critical Hdwy Stg 2	-	-	-	-	5.56	-
Follow-up Hdwy	-	-	2.272	-	3.644	3.381
Pot Cap-1 Maneuver	-	-	765	-	103	363
Stage 1	-	-	-	-	409	-
Stage 2	-	-	-	-	413	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	765	-	99	363
Mov Cap-2 Maneuver	-	-	-	-	99	-
Stage 1	-	-	-	-	409	-
Stage 2	-	-	-	-	396	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	52.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	127	-	-	765	-
HCM Lane V/C Ratio	0.424	-	-	0.023	-
HCM Control Delay (s)	52.8	-	-	9.8	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	1.8	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	723	4	11	737	10	10
Future Vol, veh/h	723	4	11	737	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	140	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	0	0	4	14	14
Mvmt Flow	822	5	13	838	11	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	827	0	1686	822
Stage 1	-	-	-	-	822	-
Stage 2	-	-	-	-	864	-
Critical Hdwy	-	-	4.1	-	6.54	6.34
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	2.2	-	3.626	3.426
Pot Cap-1 Maneuver	-	-	813	-	96	356
Stage 1	-	-	-	-	412	-
Stage 2	-	-	-	-	393	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	813	-	93	356
Mov Cap-2 Maneuver	-	-	-	-	93	-
Stage 1	-	-	-	-	412	-
Stage 2	-	-	-	-	381	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	33.9
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	147	-	-	813	-
HCM Lane V/C Ratio	0.155	-	-	0.015	-
HCM Control Delay (s)	33.9	-	-	9.5	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	8	11	20	32	27
Future Vol, veh/h	2	8	11	20	32	27
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	25	19	0
Mvmt Flow	2	10	13	24	39	33

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	107	57	73	0	-	0
Stage 1	57	-	-	-	-	-
Stage 2	50	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	895	1015	1540	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	978	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	885	1014	1539	-	-	-
Mov Cap-2 Maneuver	885	-	-	-	-	-
Stage 1	961	-	-	-	-	-
Stage 2	977	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	2.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1539	-	985	-	-
HCM Lane V/C Ratio	0.009	-	0.012	-	-
HCM Control Delay (s)	7.4	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	489	37	16	496	17	12
Future Vol, veh/h	489	37	16	496	17	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	120	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	6	14	9	8	36	0
Mvmt Flow	520	39	17	528	18	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	559	0	1082	520
Stage 1	-	-	-	-	520	-
Stage 2	-	-	-	-	562	-
Critical Hdwy	-	-	4.19	-	6.76	6.2
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	-	-	2.281	-	3.824	3.3
Pot Cap-1 Maneuver	-	-	978	-	208	560
Stage 1	-	-	-	-	533	-
Stage 2	-	-	-	-	509	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	978	-	203	560
Mov Cap-2 Maneuver	-	-	-	-	203	-
Stage 1	-	-	-	-	533	-
Stage 2	-	-	-	-	496	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	19.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	276	-	-	978	-
HCM Lane V/C Ratio	0.112	-	-	0.017	-
HCM Control Delay (s)	19.7	-	-	8.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	522	8	6	501	4	6
Future Vol, veh/h	522	8	6	501	4	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	140	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	6	0	0	9	50	25
Mvmt Flow	561	9	6	539	4	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	570	0	1112	561
Stage 1	-	-	-	-	561	-
Stage 2	-	-	-	-	551	-
Critical Hdwy	-	-	4.1	-	6.9	6.45
Critical Hdwy Stg 1	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	5.9	-
Follow-up Hdwy	-	-	2.2	-	3.95	3.525
Pot Cap-1 Maneuver	-	-	1013	-	187	486
Stage 1	-	-	-	-	487	-
Stage 2	-	-	-	-	492	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1013	-	186	486
Mov Cap-2 Maneuver	-	-	-	-	186	-
Stage 1	-	-	-	-	487	-
Stage 2	-	-	-	-	488	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	17.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	295	-	-	1013	-
HCM Lane V/C Ratio	0.036	-	-	0.006	-
HCM Control Delay (s)	17.7	-	-	8.6	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	11	5	43	28	9
Future Vol, veh/h	17	11	5	43	28	9
Conflicting Peds, #/hr	0	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	27	0	50	14	17	17
Mvmt Flow	24	15	7	61	39	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	125	50	56	0	-	0
Stage 1	50	-	-	-	-	-
Stage 2	75	-	-	-	-	-
Critical Hdwy	6.67	6.2	4.6	-	-	-
Critical Hdwy Stg 1	5.67	-	-	-	-	-
Critical Hdwy Stg 2	5.67	-	-	-	-	-
Follow-up Hdwy	3.743	3.3	2.65	-	-	-
Pot Cap-1 Maneuver	814	1024	1291	-	-	-
Stage 1	912	-	-	-	-	-
Stage 2	888	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	804	1021	1287	-	-	-
Mov Cap-2 Maneuver	804	-	-	-	-	-
Stage 1	904	-	-	-	-	-
Stage 2	885	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1287	-	877	-	-
HCM Lane V/C Ratio	0.005	-	0.045	-	-
HCM Control Delay (s)	7.8	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	689	22	16	653	32	15
Future Vol, veh/h	689	22	16	653	32	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	120	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	18	8	4	16	9
Mvmt Flow	757	24	18	718	35	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	781	0	1511	757
Stage 1	-	-	-	-	757	-
Stage 2	-	-	-	-	754	-
Critical Hdwy	-	-	4.18	-	6.56	6.29
Critical Hdwy Stg 1	-	-	-	-	5.56	-
Critical Hdwy Stg 2	-	-	-	-	5.56	-
Follow-up Hdwy	-	-	2.272	-	3.644	3.381
Pot Cap-1 Maneuver	-	-	810	-	123	396
Stage 1	-	-	-	-	439	-
Stage 2	-	-	-	-	441	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	810	-	118	396
Mov Cap-2 Maneuver	-	-	-	-	118	-
Stage 1	-	-	-	-	439	-
Stage 2	-	-	-	-	425	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	40.4
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	152	-	-	810	-
HCM Lane V/C Ratio	0.34	-	-	0.022	-
HCM Control Delay (s)	40.4	-	-	9.5	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	1.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	664	6	11	679	13	12
Future Vol, veh/h	664	6	11	679	13	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	140	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	0	0	4	14	14
Mvmt Flow	755	7	13	772	15	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	762	0	1553	755
Stage 1	-	-	-	-	755	-
Stage 2	-	-	-	-	798	-
Critical Hdwy	-	-	4.1	-	6.54	6.34
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	2.2	-	3.626	3.426
Pot Cap-1 Maneuver	-	-	859	-	117	390
Stage 1	-	-	-	-	444	-
Stage 2	-	-	-	-	423	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	859	-	114	390
Mov Cap-2 Maneuver	-	-	-	-	114	-
Stage 1	-	-	-	-	444	-
Stage 2	-	-	-	-	412	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	29.9
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	173	-	-	859	-
HCM Lane V/C Ratio	0.164	-	-	0.015	-
HCM Control Delay (s)	29.9	-	-	9.3	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	8	12	21	34	28
Future Vol, veh/h	2	8	12	21	34	28
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	25	19	0
Mvmt Flow	2	10	14	25	41	34

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	112	59	76	0	-	0
Stage 1	59	-	-	-	-	-
Stage 2	53	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	890	1012	1536	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	975	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	880	1011	1535	-	-	-
Mov Cap-2 Maneuver	880	-	-	-	-	-
Stage 1	959	-	-	-	-	-
Stage 2	974	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	2.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1535	-	982	-	-
HCM Lane V/C Ratio	0.009	-	0.012	-	-
HCM Control Delay (s)	7.4	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	509	39	16	517	18	12
Future Vol, veh/h	509	39	16	517	18	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	120	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	6	14	9	8	36	0
Mvmt Flow	541	41	17	550	19	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	582	0	1125	541
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	584	-
Critical Hdwy	-	-	4.19	-	6.76	6.2
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	-	-	2.281	-	3.824	3.3
Pot Cap-1 Maneuver	-	-	959	-	195	545
Stage 1	-	-	-	-	521	-
Stage 2	-	-	-	-	496	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	959	-	190	545
Mov Cap-2 Maneuver	-	-	-	-	190	-
Stage 1	-	-	-	-	521	-
Stage 2	-	-	-	-	483	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	21
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	257	-	-	959	-
HCM Lane V/C Ratio	0.124	-	-	0.018	-
HCM Control Delay (s)	21	-	-	8.8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	544	8	6	523	4	6
Future Vol, veh/h	544	8	6	523	4	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	140	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	6	0	0	9	50	25
Mvmt Flow	585	9	6	562	4	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	594	0	1159	585
Stage 1	-	-	-	-	585	-
Stage 2	-	-	-	-	574	-
Critical Hdwy	-	-	4.1	-	6.9	6.45
Critical Hdwy Stg 1	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	5.9	-
Follow-up Hdwy	-	-	2.2	-	3.95	3.525
Pot Cap-1 Maneuver	-	-	992	-	175	470
Stage 1	-	-	-	-	473	-
Stage 2	-	-	-	-	479	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	992	-	173	470
Mov Cap-2 Maneuver	-	-	-	-	173	-
Stage 1	-	-	-	-	473	-
Stage 2	-	-	-	-	475	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	18.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	279	-	-	992	-
HCM Lane V/C Ratio	0.039	-	-	0.007	-
HCM Control Delay (s)	18.4	-	-	8.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	11	5	45	30	9
Future Vol, veh/h	17	11	5	45	30	9
Conflicting Peds, #/hr	0	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	27	0	50	14	17	17
Mvmt Flow	24	15	7	63	42	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	130	53	59	0	-	0
Stage 1	53	-	-	-	-	-
Stage 2	77	-	-	-	-	-
Critical Hdwy	6.67	6.2	4.6	-	-	-
Critical Hdwy Stg 1	5.67	-	-	-	-	-
Critical Hdwy Stg 2	5.67	-	-	-	-	-
Follow-up Hdwy	3.743	3.3	2.65	-	-	-
Pot Cap-1 Maneuver	808	1020	1287	-	-	-
Stage 1	909	-	-	-	-	-
Stage 2	887	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	798	1017	1283	-	-	-
Mov Cap-2 Maneuver	798	-	-	-	-	-
Stage 1	901	-	-	-	-	-
Stage 2	884	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1283	-	872	-	-
HCM Lane V/C Ratio	0.005	-	0.045	-	-
HCM Control Delay (s)	7.8	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	719	23	16	680	33	16
Future Vol, veh/h	719	23	16	680	33	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	120	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	18	8	4	16	9
Mvmt Flow	790	25	18	747	36	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	815	0	1573	790
Stage 1	-	-	-	-	790	-
Stage 2	-	-	-	-	783	-
Critical Hdwy	-	-	4.18	-	6.56	6.29
Critical Hdwy Stg 1	-	-	-	-	5.56	-
Critical Hdwy Stg 2	-	-	-	-	5.56	-
Follow-up Hdwy	-	-	2.272	-	3.644	3.381
Pot Cap-1 Maneuver	-	-	787	-	112	379
Stage 1	-	-	-	-	424	-
Stage 2	-	-	-	-	427	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	787	-	108	379
Mov Cap-2 Maneuver	-	-	-	-	108	-
Stage 1	-	-	-	-	424	-
Stage 2	-	-	-	-	410	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	45.5
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	141	-	-	787	-
HCM Lane V/C Ratio	0.382	-	-	0.022	-
HCM Control Delay (s)	45.5	-	-	9.7	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	1.6	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	693	6	12	708	14	12
Future Vol, veh/h	693	6	12	708	14	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	140	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	0	0	4	14	14
Mvmt Flow	788	7	14	805	16	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	795	0	1621	788
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	833	-
Critical Hdwy	-	-	4.1	-	6.54	6.34
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	2.2	-	3.626	3.426
Pot Cap-1 Maneuver	-	-	835	-	106	373
Stage 1	-	-	-	-	428	-
Stage 2	-	-	-	-	407	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	835	-	103	373
Mov Cap-2 Maneuver	-	-	-	-	103	-
Stage 1	-	-	-	-	428	-
Stage 2	-	-	-	-	395	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	33.6
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	155	-	-	835	-
HCM Lane V/C Ratio	0.191	-	-	0.016	-
HCM Control Delay (s)	33.6	-	-	9.4	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	9	12	22	36	29
Future Vol, veh/h	3	9	12	22	36	29
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	25	19	0
Mvmt Flow	4	11	14	27	43	35

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	117	62	79	0	-	0
Stage 1	62	-	-	-	-	-
Stage 2	55	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	884	1009	1532	-	-	-
Stage 1	966	-	-	-	-	-
Stage 2	973	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	874	1008	1531	-	-	-
Mov Cap-2 Maneuver	874	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	972	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	2.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1531	-	971	-	-
HCM Lane V/C Ratio	0.009	-	0.015	-	-
HCM Control Delay (s)	7.4	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	530	40	17	540	19	13
Future Vol, veh/h	530	40	17	540	19	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	120	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	6	14	9	8	36	0
Mvmt Flow	564	43	18	574	20	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	607	0	1174	564
Stage 1	-	-	-	-	564	-
Stage 2	-	-	-	-	610	-
Critical Hdwy	-	-	4.19	-	6.76	6.2
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	-	-	2.281	-	3.824	3.3
Pot Cap-1 Maneuver	-	-	938	-	182	529
Stage 1	-	-	-	-	508	-
Stage 2	-	-	-	-	482	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	938	-	177	529
Mov Cap-2 Maneuver	-	-	-	-	177	-
Stage 1	-	-	-	-	508	-
Stage 2	-	-	-	-	469	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	22.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	243	-	-	938	-
HCM Lane V/C Ratio	0.14	-	-	0.019	-
HCM Control Delay (s)	22.2	-	-	8.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	566	8	6	546	4	7
Future Vol, veh/h	566	8	6	546	4	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	140	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	6	0	0	9	50	25
Mvmt Flow	609	9	6	587	4	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	618	0	1208	609
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	599	-
Critical Hdwy	-	-	4.1	-	6.9	6.45
Critical Hdwy Stg 1	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	5.9	-
Follow-up Hdwy	-	-	2.2	-	3.95	3.525
Pot Cap-1 Maneuver	-	-	972	-	162	455
Stage 1	-	-	-	-	461	-
Stage 2	-	-	-	-	466	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	972	-	161	455
Mov Cap-2 Maneuver	-	-	-	-	161	-
Stage 1	-	-	-	-	461	-
Stage 2	-	-	-	-	462	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	18.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	273	-	-	972	-
HCM Lane V/C Ratio	0.043	-	-	0.007	-
HCM Control Delay (s)	18.8	-	-	8.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	18	12	5	48	31	10
Future Vol, veh/h	18	12	5	48	31	10
Conflicting Peds, #/hr	0	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	27	0	50	14	17	17
Mvmt Flow	25	17	7	68	44	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	137	55	62	0	-	0
Stage 1	55	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.67	6.2	4.6	-	-	-
Critical Hdwy Stg 1	5.67	-	-	-	-	-
Critical Hdwy Stg 2	5.67	-	-	-	-	-
Follow-up Hdwy	3.743	3.3	2.65	-	-	-
Pot Cap-1 Maneuver	801	1018	1284	-	-	-
Stage 1	907	-	-	-	-	-
Stage 2	882	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	791	1015	1280	-	-	-
Mov Cap-2 Maneuver	791	-	-	-	-	-
Stage 1	899	-	-	-	-	-
Stage 2	879	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1280	-	868	-	-
HCM Lane V/C Ratio	0.006	-	0.049	-	-
HCM Control Delay (s)	7.8	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	751	24	17	709	35	17
Future Vol, veh/h	751	24	17	709	35	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	120	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	18	8	4	16	9
Mvmt Flow	825	26	19	779	38	19

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	851	0	1642	825
Stage 1	-	-	-	-	825	-
Stage 2	-	-	-	-	817	-
Critical Hdwy	-	-	4.18	-	6.56	6.29
Critical Hdwy Stg 1	-	-	-	-	5.56	-
Critical Hdwy Stg 2	-	-	-	-	5.56	-
Follow-up Hdwy	-	-	2.272	-	3.644	3.381
Pot Cap-1 Maneuver	-	-	762	-	102	362
Stage 1	-	-	-	-	408	-
Stage 2	-	-	-	-	411	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	762	-	98	362
Mov Cap-2 Maneuver	-	-	-	-	98	-
Stage 1	-	-	-	-	408	-
Stage 2	-	-	-	-	393	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	53.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	129	-	-	762	-
HCM Lane V/C Ratio	0.443	-	-	0.025	-
HCM Control Delay (s)	53.4	-	-	9.8	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	2	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	724	6	12	738	14	13
Future Vol, veh/h	724	6	12	738	14	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	140	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	0	0	4	14	14
Mvmt Flow	823	7	14	839	16	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	830	0	1690	823
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	867	-
Critical Hdwy	-	-	4.1	-	6.54	6.34
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	2.2	-	3.626	3.426
Pot Cap-1 Maneuver	-	-	811	-	96	356
Stage 1	-	-	-	-	412	-
Stage 2	-	-	-	-	392	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	811	-	93	356
Mov Cap-2 Maneuver	-	-	-	-	93	-
Stage 1	-	-	-	-	412	-
Stage 2	-	-	-	-	379	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	36.6
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	144	-	-	811	-
HCM Lane V/C Ratio	0.213	-	-	0.017	-
HCM Control Delay (s)	36.6	-	-	9.5	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

APPENDIX E

Background Development Excerpts

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
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JULY 2012

CFCA FILE NO. 218-2659

The material in this report reflects best judgment in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. C.F. Crozier & Associates Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

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.

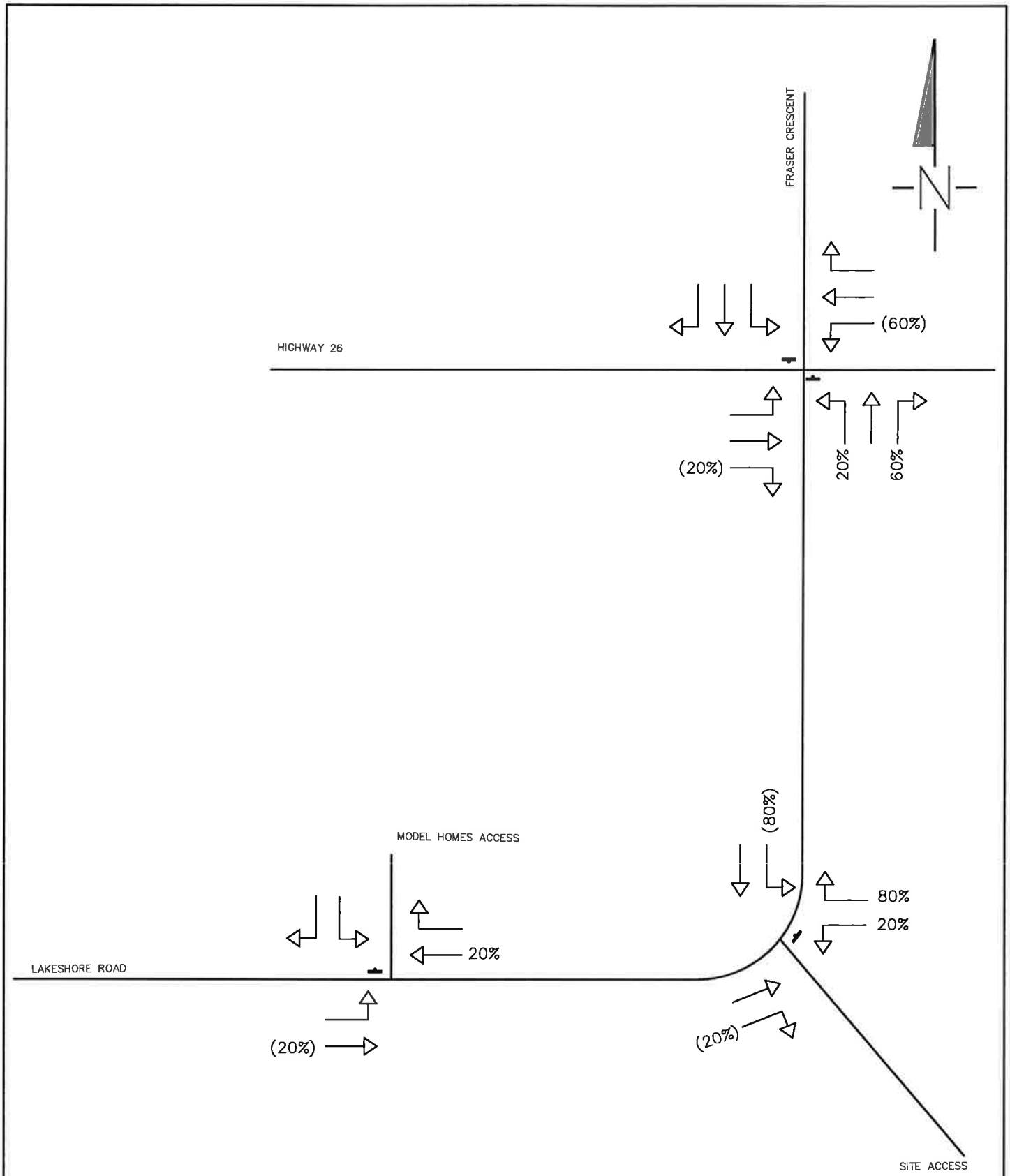
Table 4
Site Generated Residential Trips

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
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

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

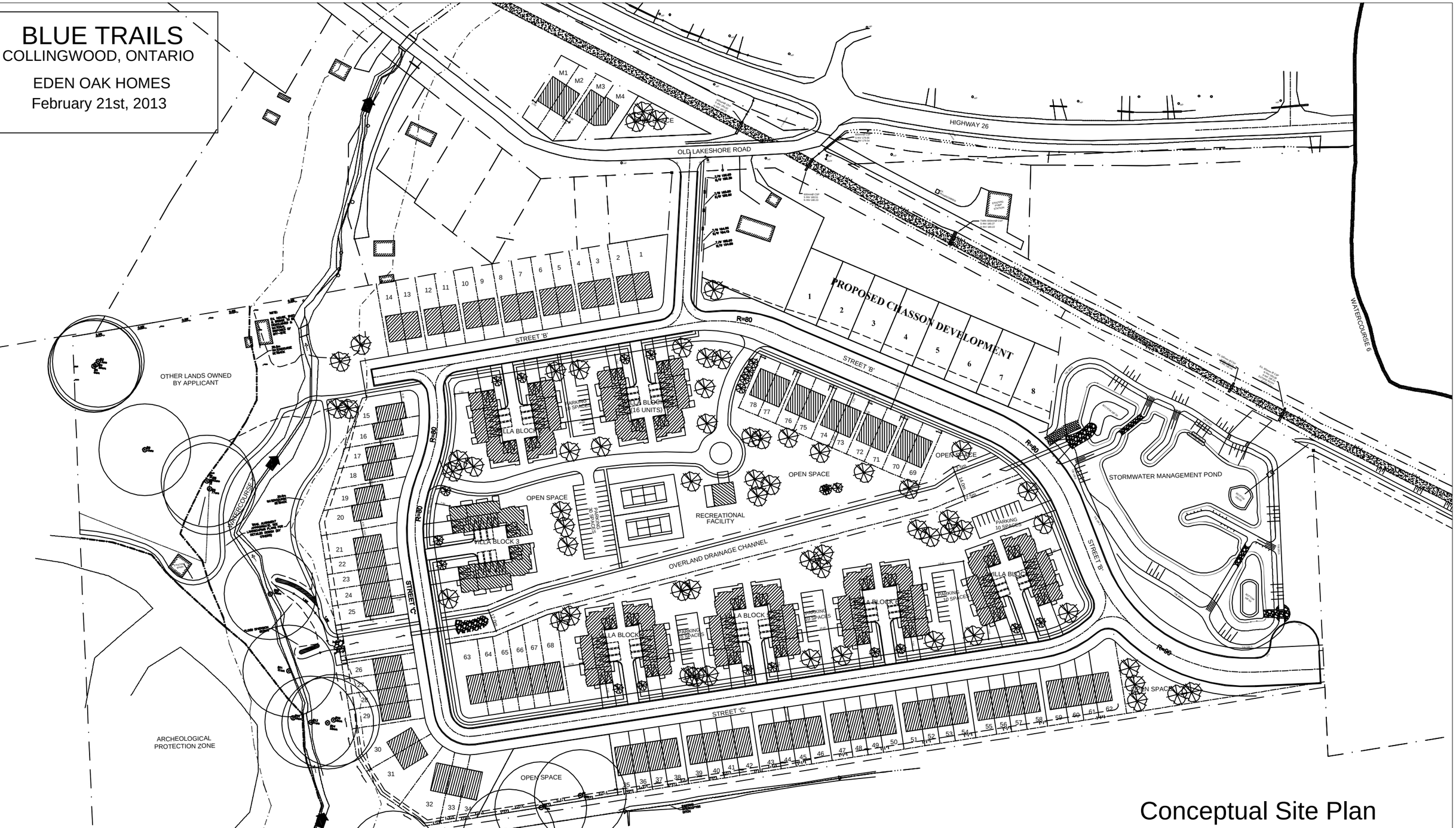
\\cfcsrv\projects\200\218 - Eden Oak\2659\Letters\20140815 Updated Site Plan Traffic Letter.docx

BLUE TRAILS

COLLINGWOOD, ONTARIO

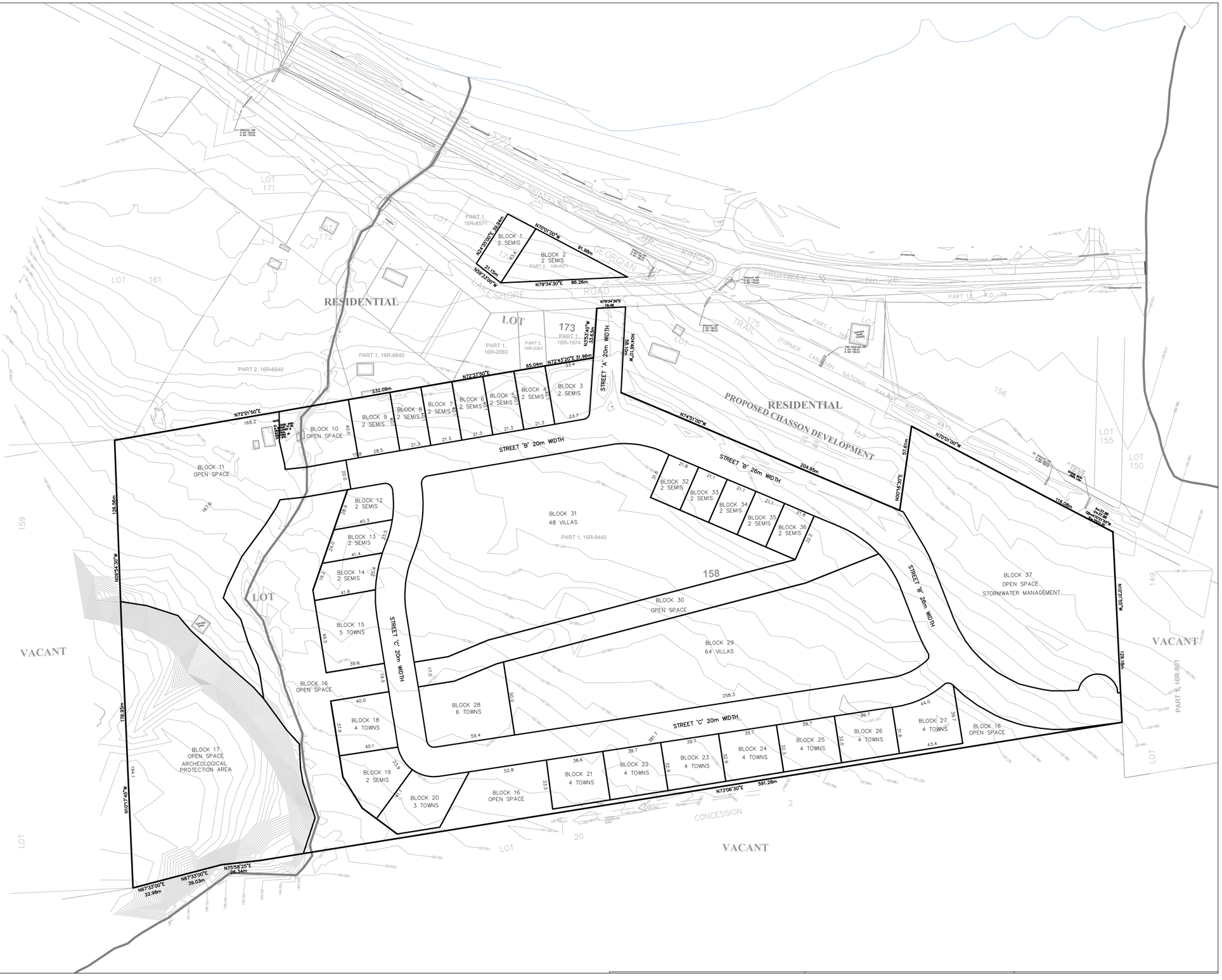
EDEN OAK HOMES

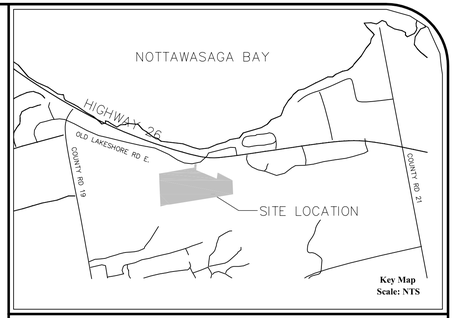
February 21st, 2013



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)





Key Map
Scale: NTS

DRAFT PLAN OF SUBDIVISION
Part of Lots 158, 173 and 174
Registered Plan 529
TOWN OF THE BLUE MOUNTAINS
(Geographic Township of Collingwood)
COUNTY OF GREY

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

SEPT, 2014 _____ O.L.S.

PAUL THOMSEN, OLS
ZUBEK, EMO, PATTEN & THOMSEN LTD.
ONTARIO LAND SURVEYOR
TOWN OF COLLINGWOOD

OWNER'S CERTIFICATE

EDEN OAK (TRAILSHEAD) INC. HAS AUTHORIZED D.C. SLADE CONSULTANTS INC. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE COUNTY OF GREY FOR APPROVAL.

SEPT, 2014 _____.

ANDREW PASCUZZO MCIP, RPP
D.C. SLADE CONSULTANTS INC.

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51 (17) OF THE PLANNING ACT

(a) AS SHOWN ON DRAFT PLAN,
(b) AS SHOWN ON DRAFT PLAN,
(c) AS SHOWN ON DRAFT AND KEY PLAN,
(d) THE LAND IS TO BE USED ACCORDING TO THE SCHEDULE OF LAND USE,
(e) AS SHOWN ON DRAFT PLAN,
(f) AS SHOWN ON DRAFT PLAN,
(g) AS SHOWN ON DRAFT PLAN,
(h) MUNICIPAL WATER SUPPLY,
(i) CLAY,
(j) AS SHOWN ON DRAFT PLAN,
(k) MUNICIPAL SANITARY SEWER,
(l) AS SHOWN ON DRAFT PLAN.

SCHEDULE OF LAND USE	UNITS	AREA
BLOCK 1 - SEMI DETACHED	2	0.0884 ha.
BLOCK 2 - SEMI DETACHED	2	0.1526 ha.
BLOCK 3 - SEMI DETACHED	2	0.1138 ha.
BLOCK 4 - SEMI DETACHED	2	0.0854 ha.
BLOCK 5 - SEMI DETACHED	2	0.0854 ha.
BLOCK 6 - SEMI DETACHED	2	0.0854 ha.
BLOCK 7 - SEMI DETACHED	2	0.0854 ha.
BLOCK 8 - SEMI DETACHED	2	0.0854 ha.
BLOCK 9 - SEMI DETACHED	2	0.0854 ha.
BLOCK 10 - OPEN SPACE (TO BE DEDICATED TO TOWN)		0.1992 ha.
BLOCK 11 - PRIVATE OPEN SPACE		1.4375 ha.
BLOCK 12 - SEMI DETACHED	2	0.0900 ha.
BLOCK 13 - SEMI DETACHED	2	0.0869 ha.
BLOCK 14 - SEMI DETACHED	2	0.1010 ha.
BLOCK 15 - TOWNHOUSES	5	0.2002 ha.
BLOCK 16 - OPEN SPACE (TO BE DEDICATED TO TOWN)		1.5907 ha.
BLOCK 17 - OPEN SPACE (ARCHAEOLOGICAL AREA)		1.7187 ha.
BLOCK 18 - TOWNHOUSES	4	0.1514 ha.
BLOCK 19 - SEMI DETACHED	2	0.1429 ha.
BLOCK 20 - TOWNHOUSES	3	0.1607 ha.
BLOCK 21 - TOWNHOUSES	4	0.1301 ha.
BLOCK 22 - TOWNHOUSES	4	0.1310 ha.
BLOCK 23 - TOWNHOUSES	4	0.1299 ha.
BLOCK 24 - TOWNHOUSES	4	0.1287 ha.
BLOCK 25 - TOWNHOUSES	4	0.1274 ha.
BLOCK 26 - TOWNHOUSES	4	0.1264 ha.
BLOCK 27 - TOWNHOUSES	4	0.1539 ha.
BLOCK 28 - TOWNHOUSES	6	0.2649 ha.
BLOCK 29 - VILLAS	64	1.8072 ha.
BLOCK 30 - OPEN SPACE (TO BE DEDICATED TO TOWN)		0.5964 ha.
BLOCK 31 - VILLAS, COMMUNITY REC AREA	48	2.2140 ha.
BLOCK 32 - SEMI DETACHED	2	0.0689 ha.
BLOCK 33 - SEMI DETACHED	2	0.0669 ha.
BLOCK 34 - SEMI DETACHED	2	0.0672 ha.
BLOCK 35 - SEMI DETACHED	2	0.0675 ha.
BLOCK 36 - SEMI DETACHED	2	0.0700 ha.
BLOCK 37 - OPEN SPACE (STORMWATER MANAGEMENT)		1.6522 ha.
ROADS		2.7566 ha.
TOTAL	194	17.3328 ha.

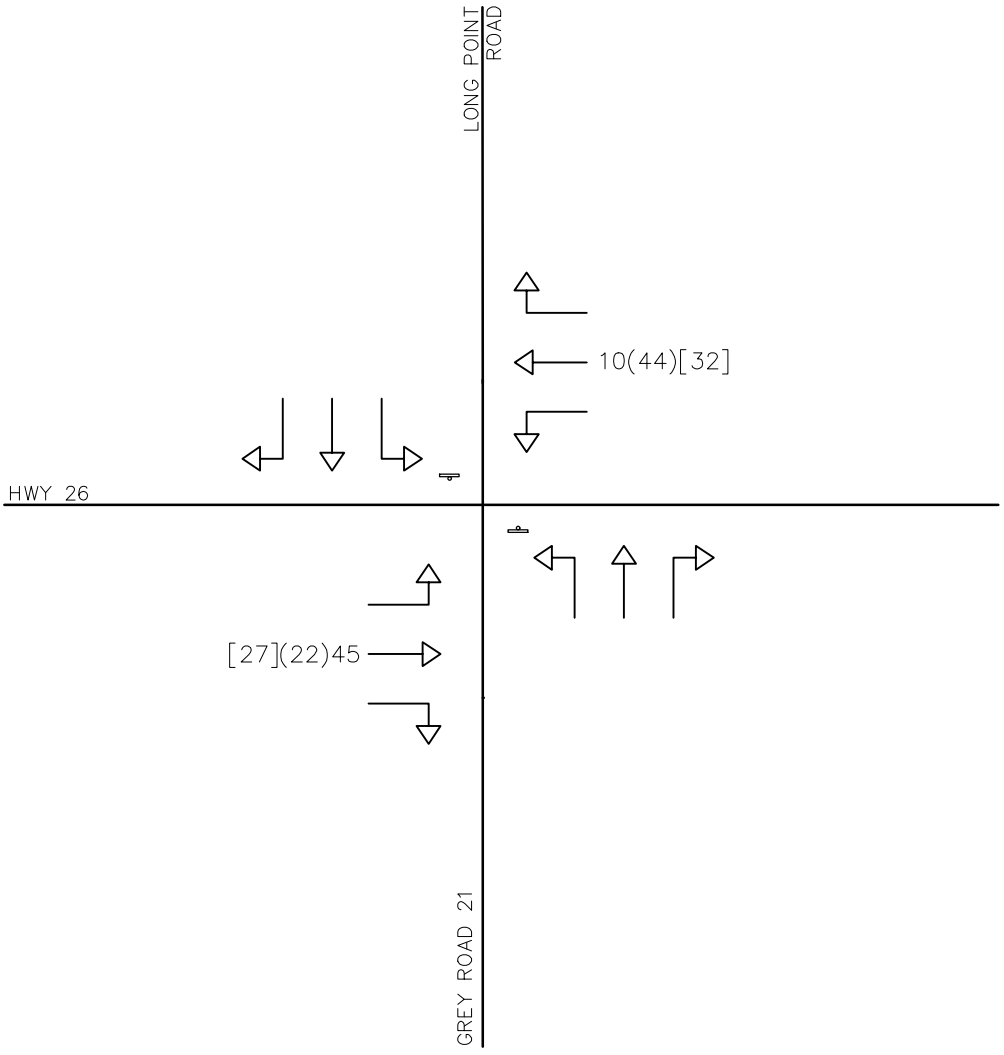
25 0 25 50 75 100 125m
SCALE = 1:1250

METRIC
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

PROJECT: 573-06	DRAWN: AP	DATE: AUGUST/2014

DWG: 573-06-DP18

D.C. Slade Consultants INC.
Planning & Development
243 Hurontario Street, Collingwood, ON Phone: 705.4441830



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

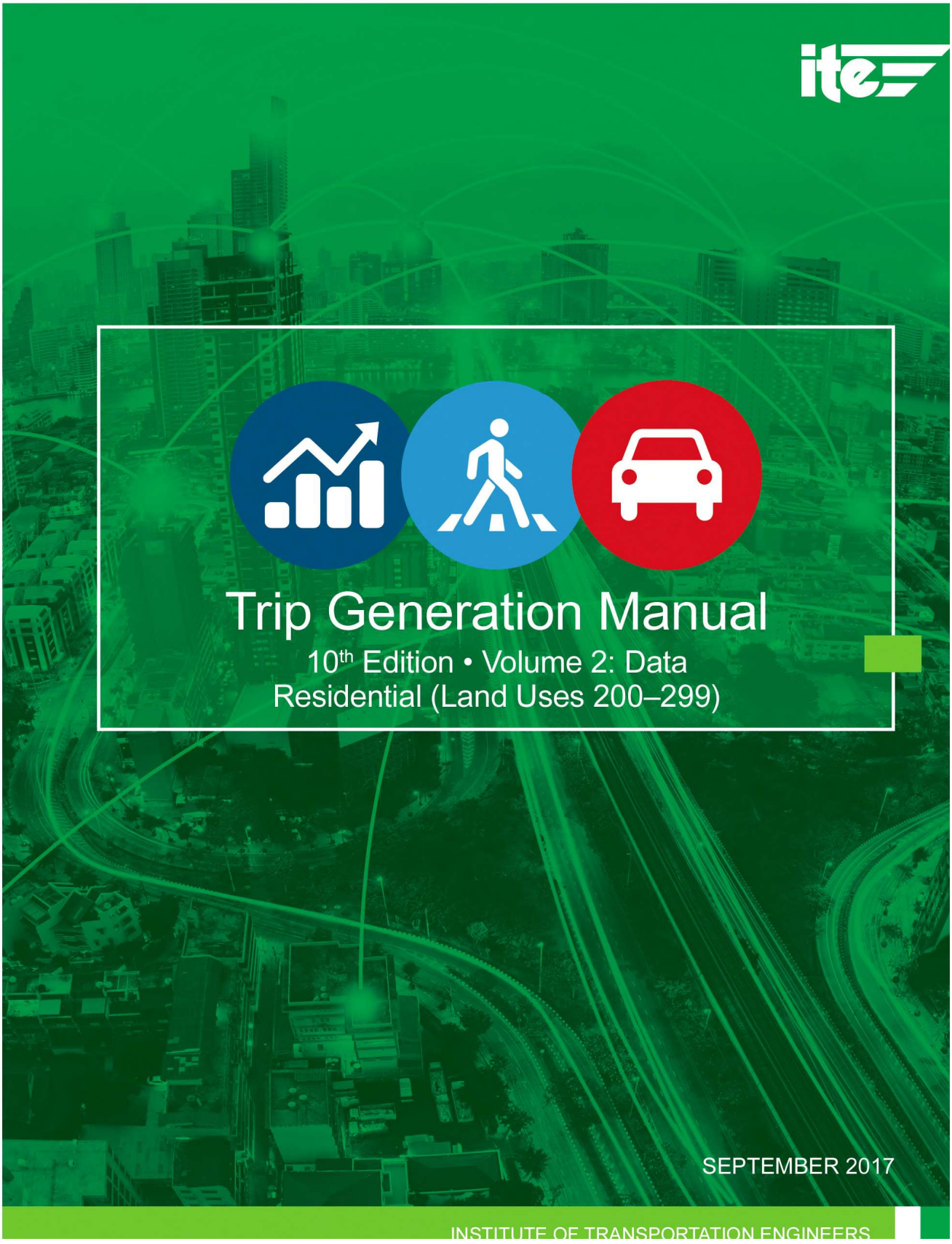
AQUAVIL
TOWN OF THE BLUE MOUNTAINS

Drawing

EDEN OAK TRIP ASSIGNMENT

CROZIER & ASSOCIATES Consulting Engineers
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	
M.J.	M.F.		876-4866
Scale	Date	Check By	Drawing
N.T.S.	SEPT. 26, 2019	M.F.	APP. J



Trip Generation Manual

10th Edition • Volume 2: Data
Residential (Land Uses 200–299)

SEPTEMBER 2017

INSTITUTE OF TRANSPORTATION ENGINEERS

Land Use: 210
Single-Family Detached Housing

Description

Single-family detached housing includes all single-family detached homes on individual lots. A typical site surveyed is a suburban subdivision.

Additional Data

The number of vehicles and residents had a high correlation with average weekday vehicle trip ends. The use of these variables was limited, however, because the number of vehicles and residents was often difficult to obtain or predict. The number of dwelling units was generally used as the independent variable of choice because it was usually readily available, easy to project, and had a high correlation with average weekday vehicle trip ends.

This land use included data from a wide variety of units with different sizes, price ranges, locations, and ages. Consequently, there was a wide variation in trips generated within this category. Other factors, such as geographic location and type of adjacent and nearby development, may also have had an effect on the site trip generation.

Single-family detached units had the highest trip generation rate per dwelling unit of all residential uses because they were the largest units in size and had more residents and more vehicles per unit than other residential land uses; they were generally located farther away from shopping centers, employment areas, and other trip attractors than other residential land uses; and they generally had fewer alternative modes of transportation available because they were typically not as concentrated as other residential land uses.

Time-of-day distribution data for this land use are presented in Appendix A. For the six general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:15 and 8:15 a.m. and 4:00 and 5:00 p.m., respectively. For the two sites with Saturday data, the overall highest vehicle volume was counted between 3:00 and 4:00 p.m. For the one site with Sunday data, the overall highest vehicle volume was counted between 10:15 and 11:15 a.m.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in California, Connecticut, Delaware, Illinois, Indiana, Maryland, Minnesota, Montana, New Jersey, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, and Virginia.

Source Numbers

100, 105, 114, 126, 157, 167, 177, 197, 207, 211, 217, 267, 275, 293, 300, 319, 320, 356, 357, 367, 384, 387, 407, 435, 522, 550, 552, 579, 598, 601, 603, 614, 637, 711, 716, 720, 728, 735, 868, 903, 925, 936

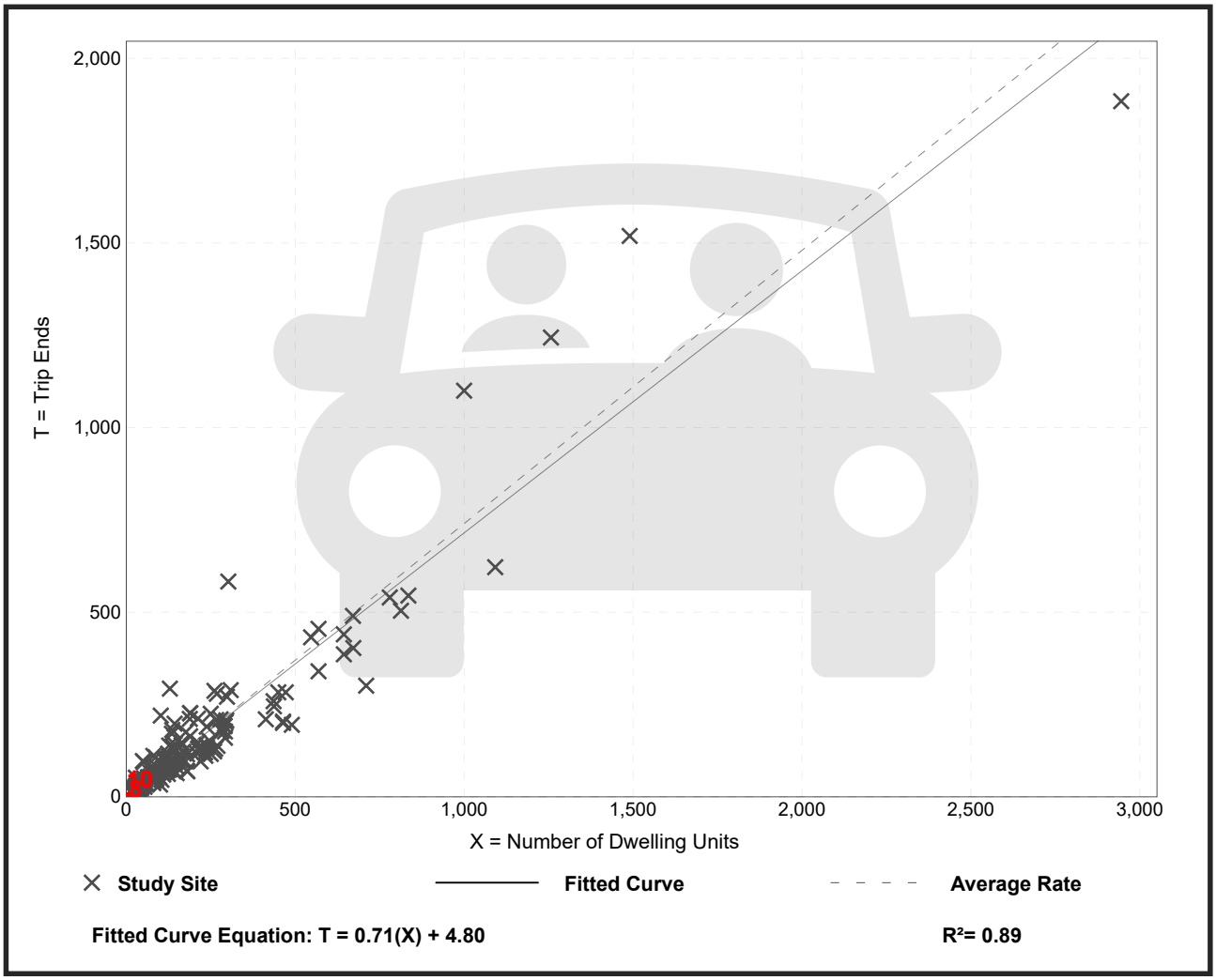
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 173
Avg. Num. of Dwelling Units: 219
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.74	0.33 - 2.27	0.27

Data Plot and Equation



Trip Gen Manual, 10th Ed + Supplement ● Institute of Transportation Engineers

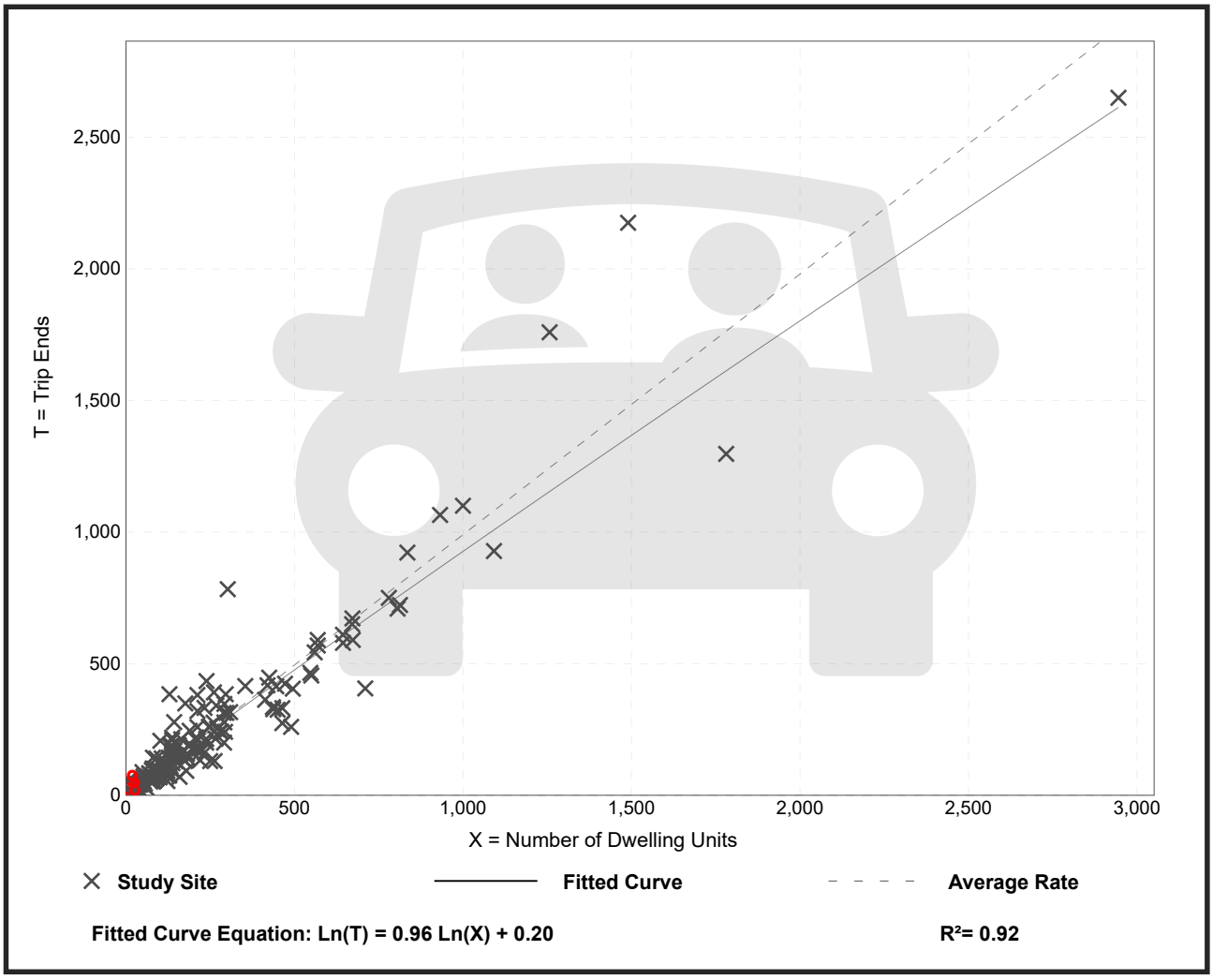
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 190
Avg. Num. of Dwelling Units: 242
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.44 - 2.98	0.31

Data Plot and Equation



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Single-Family Detached Housing
(210)

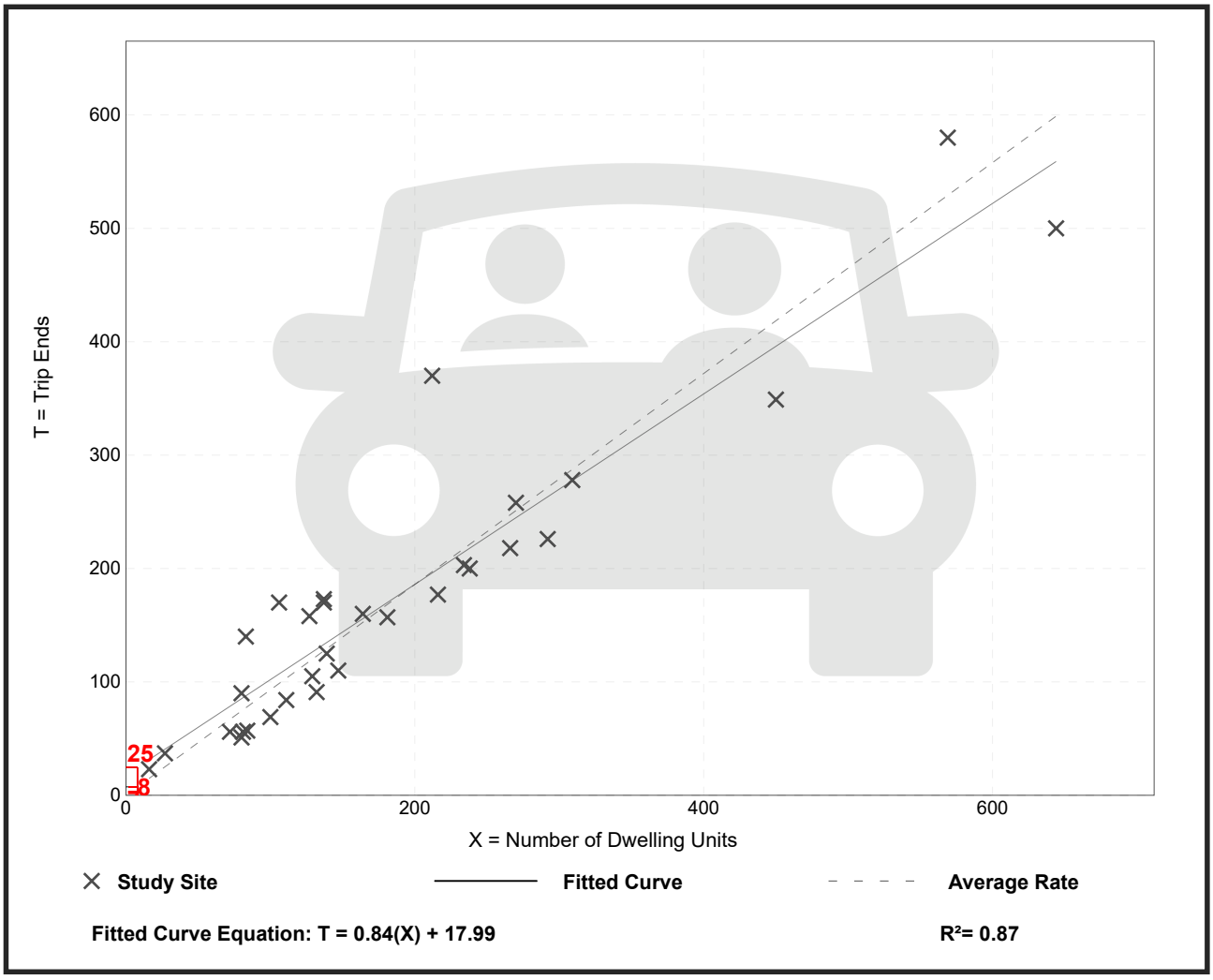
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Saturday, Peak Hour of Generator**

Setting/Location: **General Urban/Suburban**
Number of Studies: 31
Avg. Num. of Dwelling Units: 188
Directional Distribution: 54% entering, 46% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.93	0.64 - 1.75	0.26

Data Plot and Equation



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Land Use: 220
Multifamily Housing (Low-Rise)

Description

Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have one or two levels (floors). Multifamily housing (mid-rise) (Land Use 221), multifamily housing (high-rise) (Land Use 222), and off-campus student apartment (Land Use 225) are related land uses.

Additional Data

In prior editions of *Trip Generation Manual*, the low-rise multifamily housing sites were further divided into rental and condominium categories. An investigation of vehicle trip data found no clear differences in trip making patterns between the rental and condominium sites within the ITE database. As more data are compiled for future editions, this land use classification can be reinvestigated.

For the three sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.72 residents per occupied dwelling unit.

For the two sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 96.2 percent of the total dwelling units were occupied.

This land use included data from a wide variety of units with different sizes, price ranges, locations, and ages. Consequently, there was a wide variation in trips generated within this category. Other factors, such as geographic location and type of adjacent and nearby development, may also have had an effect on the site trip generation.

Time-of-day distribution data for this land use are presented in Appendix A. For the 10 general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:15 and 8:15 a.m. and 4:45 and 5:45 p.m., respectively. For the one site with Saturday data, the overall highest vehicle volume was counted between 9:45 and 10:45 a.m. For the one site with Sunday data, the overall highest vehicle volume was counted between 11:45 a.m. and 12:45 p.m.

For the one dense multi-use urban site with 24-hour count data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:00 and 8:00 a.m. and 6:15 and 7:15 p.m., respectively.

For the three sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.72 residents per occupied dwelling unit.

The average numbers of person trips per vehicle trip at the five general urban/suburban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.13 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.21 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in British Columbia (CAN), California, District of Columbia, Florida, Georgia, Illinois, Indiana, Maine, Maryland, Minnesota, New Jersey, New York, Ontario, Oregon, Pennsylvania, South Dakota, Tennessee, Texas, Utah, Virginia, and Washington.

It is expected that the number of bedrooms and number of residents are likely correlated to the number of trips generated by a residential site. Many of the studies included in this land use did not indicate the total number of bedrooms. To assist in the future analysis of this land use, it is important that this information be collected and included in trip generation data submissions.

Source Numbers

168, 187, 188, 204, 211, 300, 305, 306, 319, 320, 321, 357, 390, 412, 418, 525, 530, 571, 579, 583, 864, 868, 869, 870, 896, 903, 918, 946, 947, 948, 951

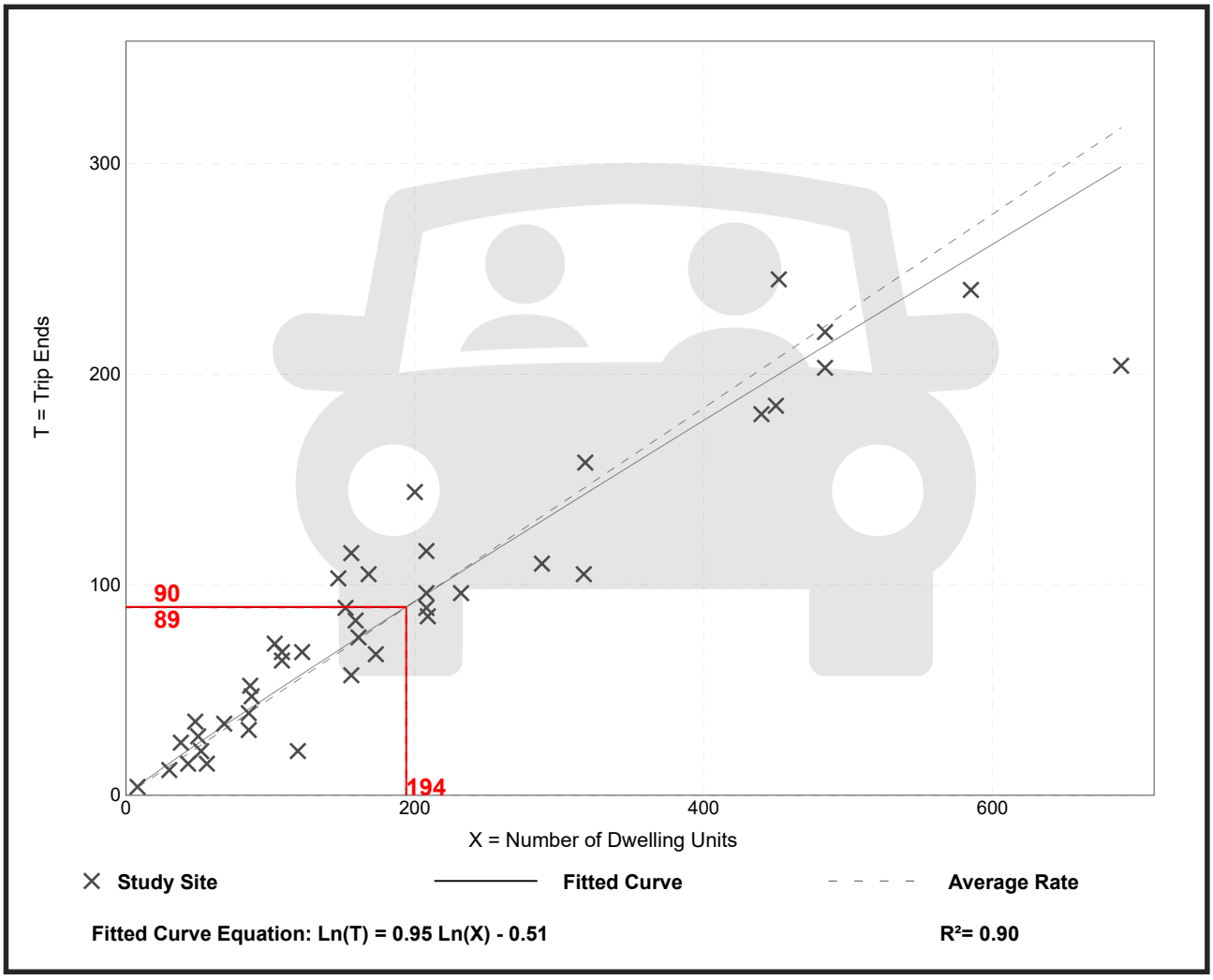
Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 42
Avg. Num. of Dwelling Units: 199
Directional Distribution: 23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.46	0.18 - 0.74	0.12

Data Plot and Equation



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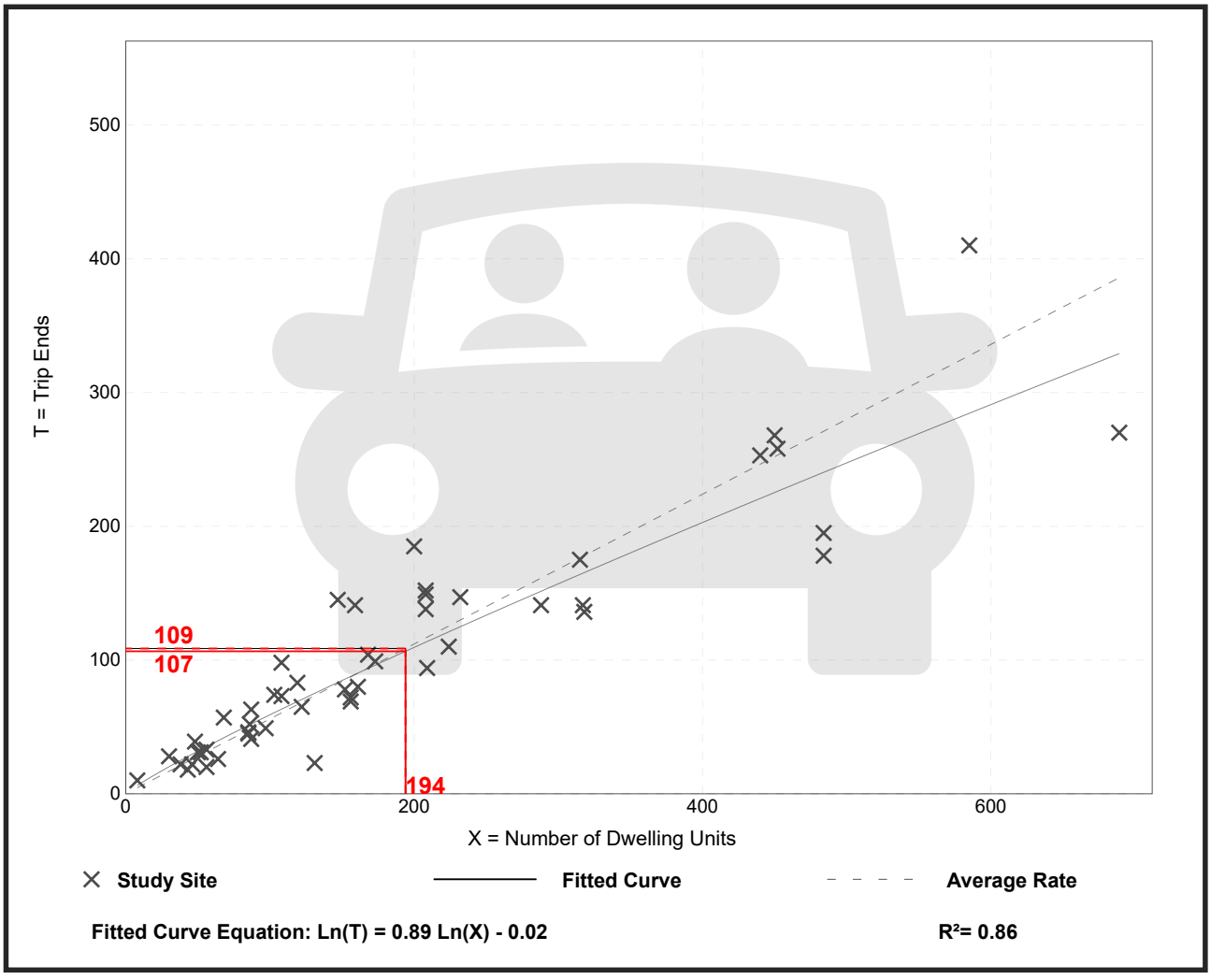
Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 50
Avg. Num. of Dwelling Units: 187
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.56	0.18 - 1.25	0.16

Data Plot and Equation



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Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Saturday, Peak Hour of Generator**

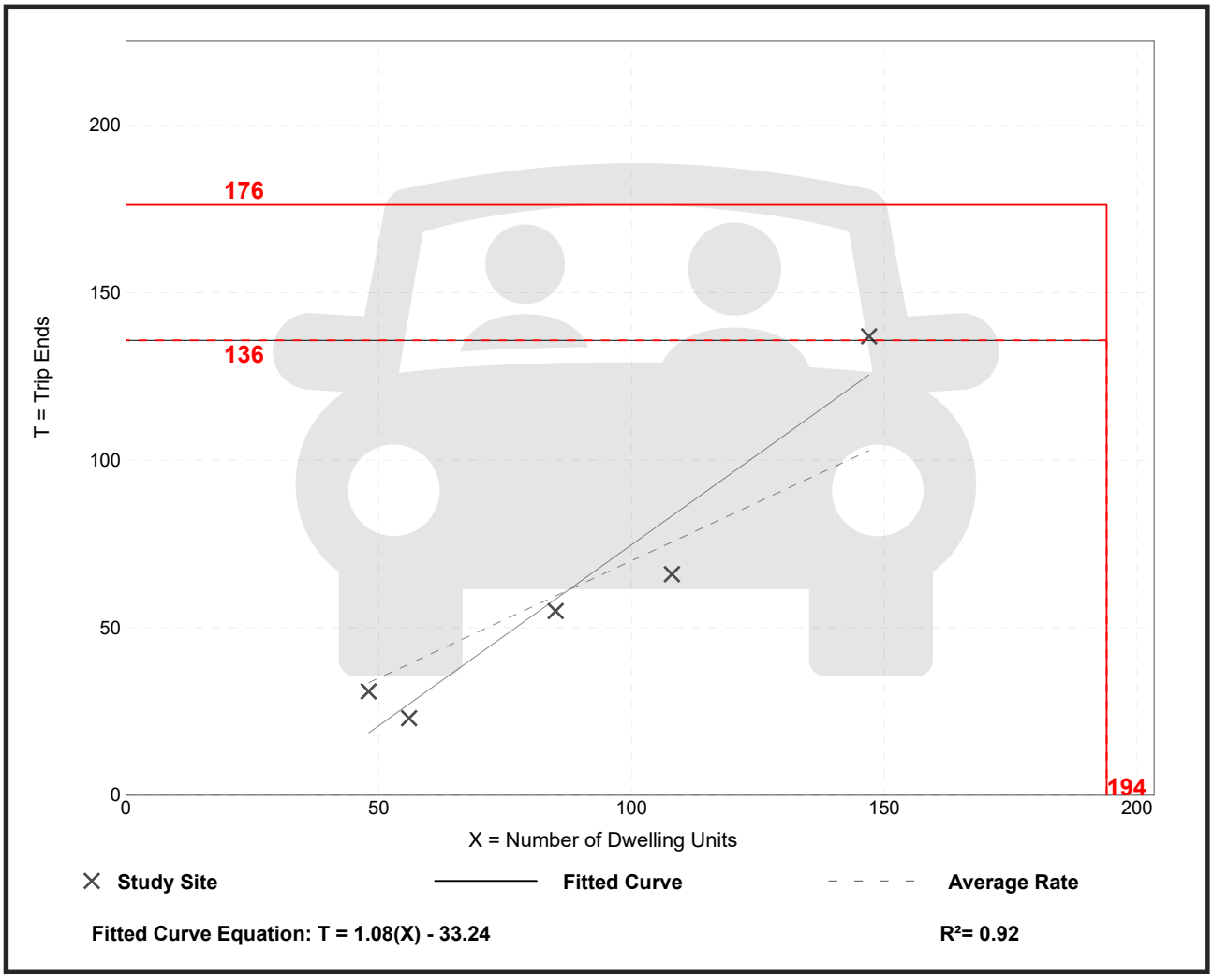
Setting/Location: **General Urban/Suburban**
Number of Studies: 5
Avg. Num. of Dwelling Units: 89
Directional Distribution: 54% entering, 46% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.41 - 0.93	0.20

Data Plot and Equation

Caution – Small Sample Size



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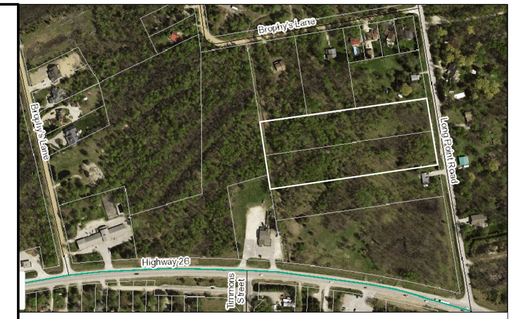
Long Point Road Subdivision



Draft Plan of Subdivision
Long Point Road

PART OF LOT 85
REGISTERED PLAN 529

TOWN OF THE BLUE MOUNTAINS
(Formerly Township of Collingwood)
COUNTY OF GREY

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

OCTOBER 29, 2018 _____
PAUL R. THOMSEN O.L.S.
ZUBEK, EMO, PATTEN & THOMSEN LTD

OWNER'S CERTIFICATE

PASCUZZO PLANNING INC. WAS AUTHORIZED BY TONY LESIAK AND ISABELA LEHMANN TO SUBMIT THE PROPOSED PLAN OF SUBDIVISION TO THE COUNTY OF GREY FOR APPROVAL.

OCTOBER 29, 2018 _____
ANDREW PASCUZZO MCIP RPP
PASCUZZO PLANNING INC.

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51 (17) OF THE PLANNING ACT

(a) AS SHOWN ON DRAFT PLAN,
(b) AS SHOWN ON DRAFT PLAN,
(c) AS SHOWN ON DRAFT AND KEY PLAN,
(d) THE LAND IS TO BE USED ACCORDING TO THE SCHEDULE OF LAND USE,
(e) AS SHOWN ON DRAFT PLAN,
(f) AS SHOWN ON DRAFT PLAN,
(g) AS SHOWN ON DRAFT PLAN,
(h) MUNICIPAL WATER SUPPLY,
(i) SAND,
(j) AS SHOWN ON DRAFT PLAN,
(k) MUNICIPAL SANITARY SEWER,
(l) EASEMENT -MUNICIPAL DRAIN

SCHEDULE OF LAND USE

	UNITS	AREA
SINGLE-FAMILY RESIDENTIAL (LOTS 1-22)	22	1.23 ha.
1 FOOT RESERVES (BLOCK 23 and 24)		0.002 ha.
OPEN SPACE (BLOCK 25)		0.45 ha.
ROAD (STREET A)		0.48 ha.
TOTAL	22	2.16 ha.

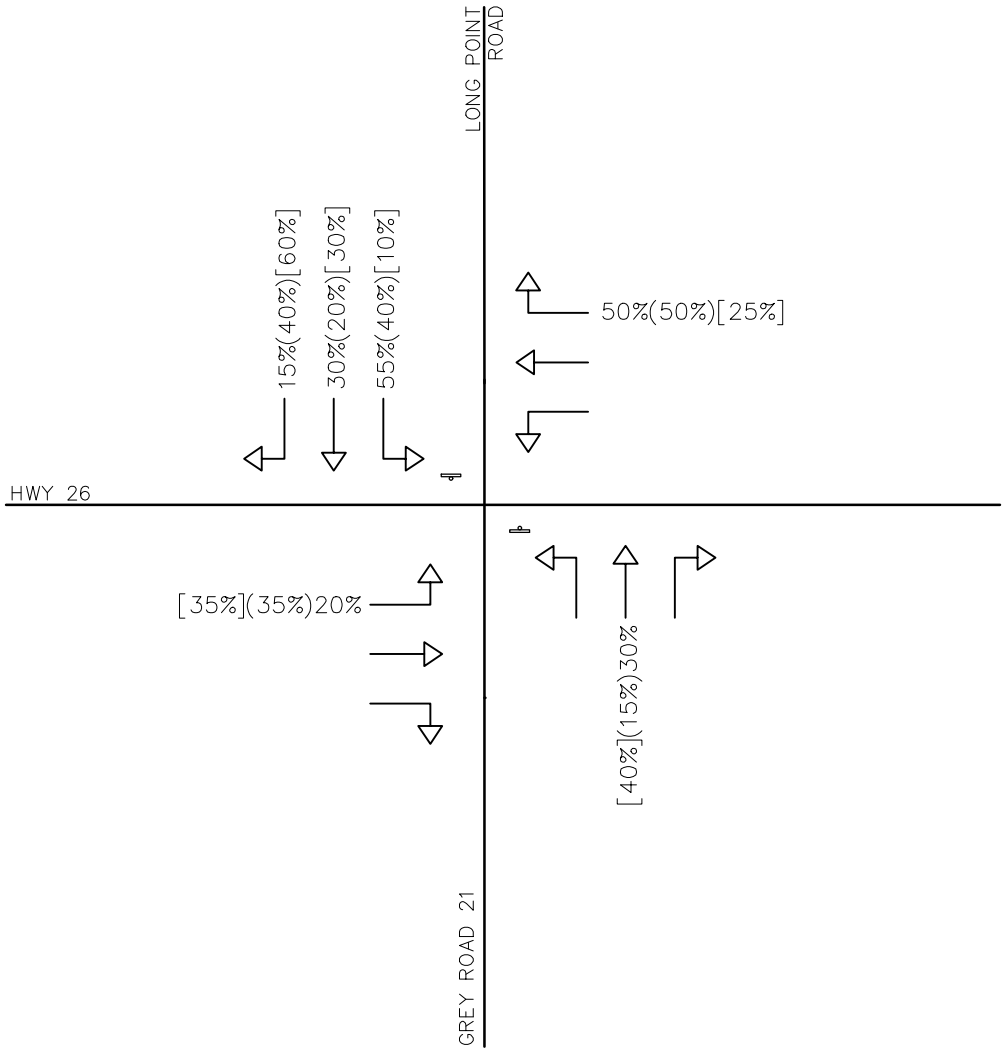
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

PROJECT: 892-17	DRAWN: AP	DATE: APRIL 2019

DWG: 892-17-DP5

PASCUZZO PLANNING INC.

BROPHY'S LANE
LONG POINT ROAD
STREET A (20 m)
RESIDENTIAL
VACANT
RESIDENTIAL
Block 24
0.3 m reserve
Block 25 (4466 m²)
Block 23
0.3 m reserve
PART 1, 16R-2186
PART 2, 16R-2186
PART 3, 16R-2186
PART 4, 16R-2186
PART 5, 16R-2186
PART 6, 16R-2186
PART 7, 16R-2186
PART 8, 16R-2186
PART 9, 16R-2186
PART 10, 16R-2186
PART 1, 16R-2607
R216292
INST. IN EASEMENT TO SUBJECT
AS LOT
REGISTERED PLAN
LOT 85
LOT 86
LOT 89
529
N80°52'15"E 236.20
N80°52'15"E 236.16
N9°47'35"W
N9°39'35"W
N9°43'35"W
63.7 m
91.44
35.7 m
20 m
15.25 m
20.12
71.32
179.0
179.5
180.0
181.0
181.5
Edge of Asphalt
Concrete Pad (Mail Box)
Frame Shed
Row of Cedars
0 10 50 100 m



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

LONG POINT TRIP DISTRIBUTION

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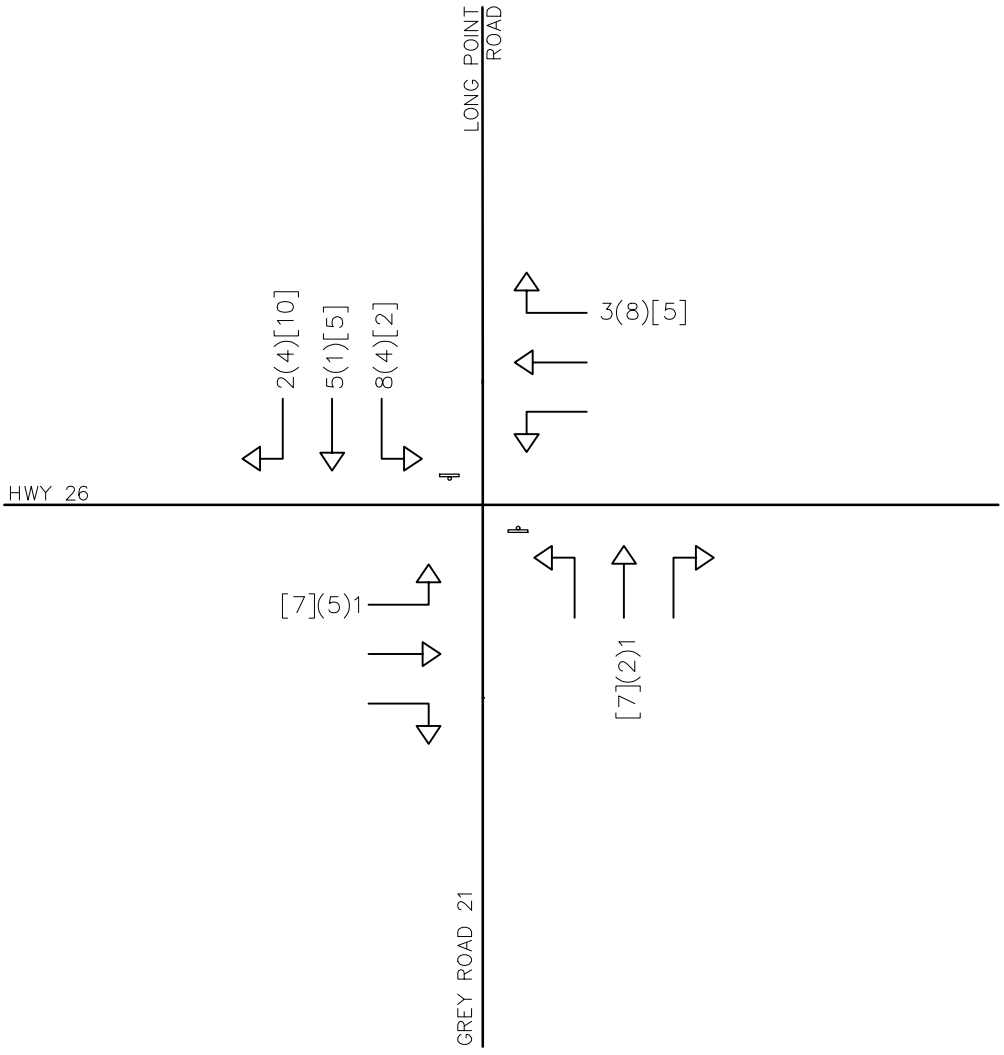
40 Huron Street, Suite 301,
Collingwood, ON L9Y 4R3
705 446-3510 T
705 446-3520 F
www.cfcrozier.ca
info@cfcrozier.ca

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. K.1



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Legend

SIGNAL CONTROL

STOP CONTROL

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

Project

AQUAVIL
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Drawing

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M.J.	M.F.	876-4866	N.T.S.	SEPT. 26, 2019	M.F.	APP. K.2

Aquavil Development

TRAFFIC IMPACT STUDY

AQUAVIL
TOWN OF THE BLUE MOUNTAINS
COUNTY OF GREY

PREPARED FOR:
ROYALTON HOMES INC.

PREPARED BY:

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

SEPTEMBER 2019

CFCA FILE NO. 876-4866

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CROZIER
CONSULTING ENGINEERS

1.0 Executive Summary

CF Crozier & Associates Inc. (Crozier) was retained by Royalton Homes Inc. to complete a Traffic Impact Study (TIS) to support a Redline Draft Plan Application and the associated Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA) Applications for the AquaVil development (the site). The purpose of the study is to assess the impacts of the proposed development on the boundary road network and to recommend any required mitigation measures, if warranted.

The site was Draft Plan approved in May 2014 under separate ownership. In support of the previous Draft Plan Application a Traffic Impact Study was prepared by Crozier ("Traffic Impact Study Update" – May 2009). The regulatory agencies (Town of The Blue Mountains, County of Grey and the Ontario Ministry of Transportation) requested an updated Traffic Impact Study be completed to assess the current operations and assess the potential for signals or a roundabout at the intersection of Highway 26 and Long Point Road/Grey Road 19.

The site is divided by Brophy's Lane, with 15.0 hectares of land to the west, and 10.8 hectares of land to the east. The site is bounded by Blue Mountain Drive to the west, Long Point Road to the east, existing residential dwellings and Georgian Bay to the north and Highway 26 to the south. The Redline Draft Plan Application and associated Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA) applications propose the following:

Phase 1 – West Lands (2022 Build-out)

- 176 Condo Units
- 36 Townhouse Units
- 20 Semi-Detached Units
- 2 Single-Detached Units
- Closure of Blue Mountain Drive
- New public road (Street "A") to connect to Highway 26 opposite Hope Street

Phase 2 – East Lands (2025 Build-out)

- 100 Apartment Units
- 100 Retirement/Seniors Units
- 9,100 Square Metres Commercial GFA
- 50 Residential Units Mixed with Commercial
- Closure of Brophy's Lane
- Brophy's Lane will be realigned (Street "B") and will connect with Highway 26 where Long Point Road was previously connected. Long Point Road will form a new T-intersection with Street "B"

It is noted that the site statistics for the east lands have not been definitively established at this time. The 9,100 square metre commercial GFA represents a maximum allowable area for the use. Accordingly, the assessment described within this report represents a conservative approach to forecasting the trip generation of the eastern lands.

In addition to the internal road network, pedestrian facilities are proposed throughout the development, including a pedestrian connection between the east and west lands. The connection will allow for access between the existing and proposed residential dwellings in the west and the commercial uses in the east.

The pedestrian facilities will tie into the proposed signalized intersection of Highway 26 and Street "B"/Grey Road 21, which will include pedestrian crosswalks. Access to the Georgian Trail is located approximately 700 metres south of Highway 26 on Grey Road 21.

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 ft²)	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.

NOTE:
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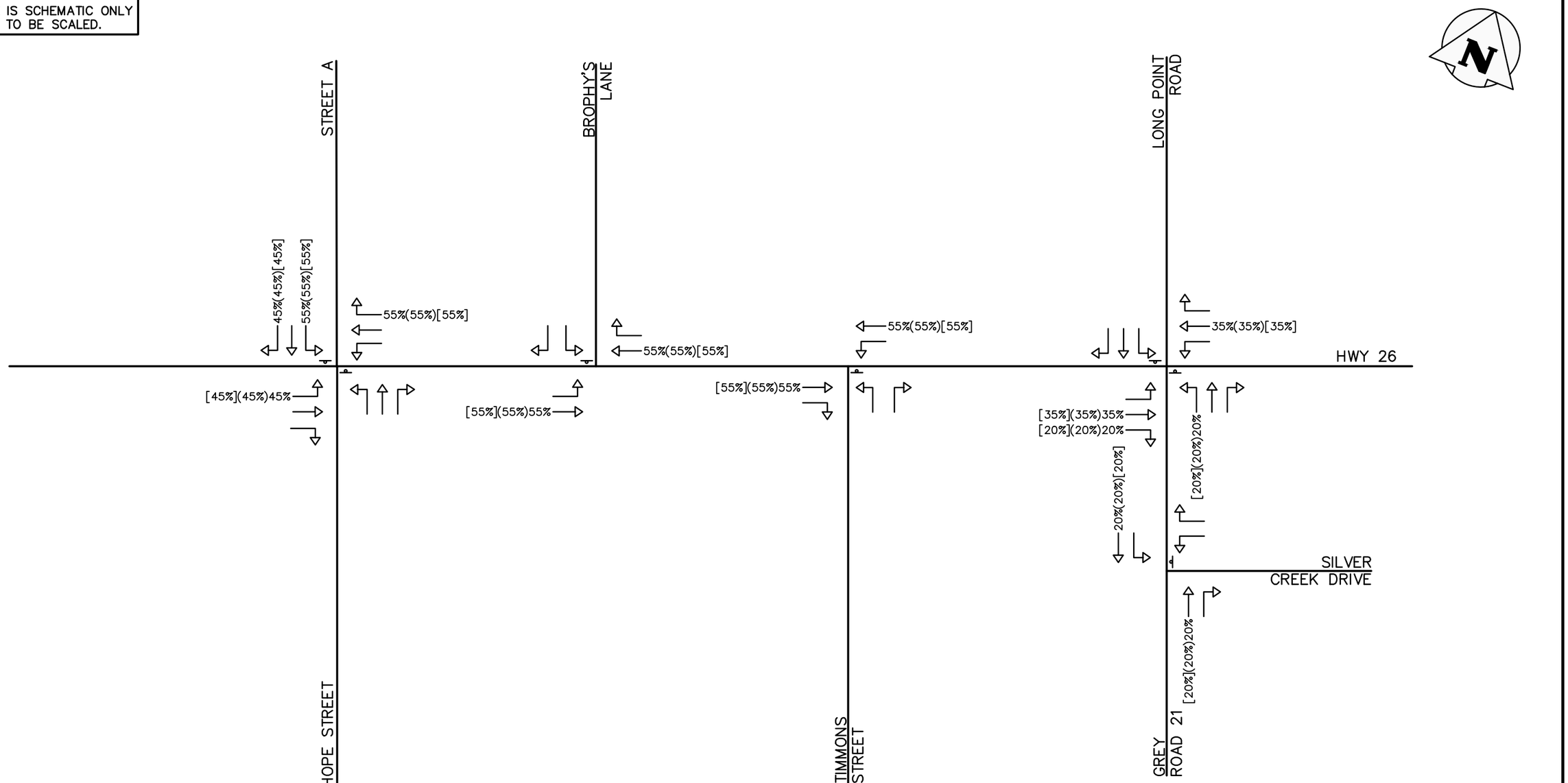

LEGEND:

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

AQUAVIL
TOWN OF THE BLUE MOUNTAINS

PHASE 1 RESIDENTIAL TRIP DISTRIBUTION

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. 12

NOTE:
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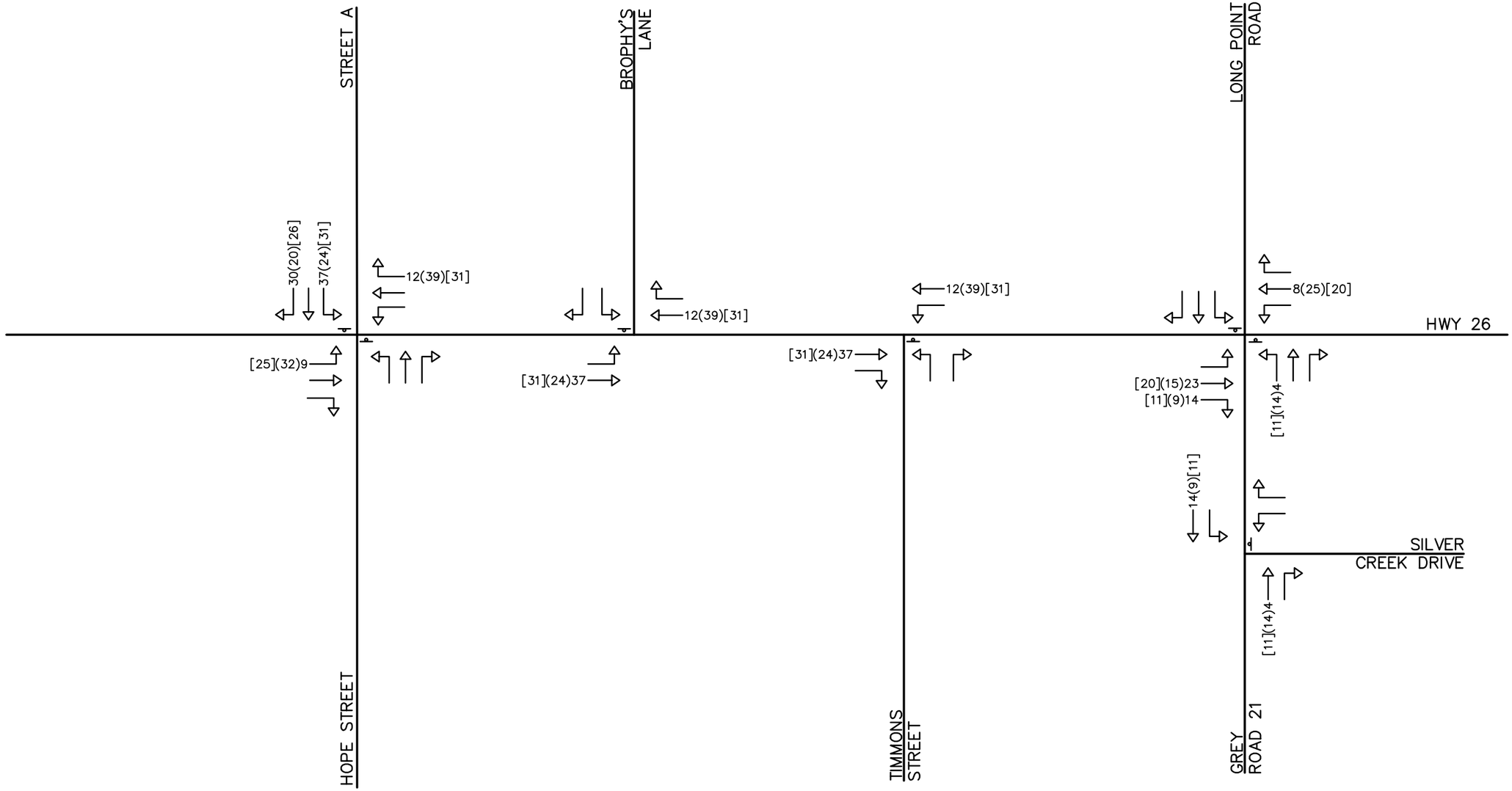

LEGEND:

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

AQUAVIL
TOWN OF THE BLUE MOUNTAINS

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

Mountain House Development

C.C. Tatham & Associates Ltd.
Consulting Engineers

BLUE VISTA

Town of The Blue Mountains

Traffic Impact Study

prepared by:

C.C. Tatham & Associates Ltd.
115 Sandford Fleming Drive, Suite 200
Collingwood, ON L9Y 5A6
Tel: (705) 444-2565 Fax: (705) 444-2327
info@cctatham.com

prepared for

Royalton Homes Inc.

February 27, 2019

CCTA File 117159

which was not otherwise considered in the noted report, has been developed based on the existing traffic patterns at the intersection.

Manorwood Blocks 152 & 153

Manorwood, formerly a part of the Second Nature Development, is located on the south-east corner of Grey Road 19 with Jozo Weider Boulevard. Whilst still under planning, the development is expected to consist of 74 townhouses across the 2 blocks.

Monterra Phase 2

Monterra Phase 2 is a 37 unit, single family home development located at the south-west corner of Grey Road 21 with Monterra Road.

Mountain House

Mountain House is a medium density development located on the northwest corner of Grey Road 19 and Grey Road 21. Upon full build-out, it will consist of 230 condominium units constructed over 12 buildings, varying in height from 2 to 4 stories. Phase 1 is currently under construction, with Phases 2 and 3 anticipated over the next several years.

Plateau East

Plateau East is located north of the Blue Vista site, and consists of 39 single detached lots. At the time of the March 2017 traffic counts, 13 of the 39 lots were assumed developed and occupied.

Second Nature

The Second Nature development is to consist of 178 single family detached units. Phase 1 is currently under construction as is Phase 2 (which is solely the construction of Crosswinds Boulevard within the Second Nature development limits). Phase 3 is in the approval process.

Windfall

The Windfall development is to consist of 279 single family detached units and 402 semi-detached units for a total of 681 residential units. At the time of the March 2017 traffic counts, Phase 1 was fully built-out and occupied (37 single family units), whereas Phase 2 was partially constructed with 13 of the 67 single family units and 10 of the 100 semi-detached units constructed and occupied. Thus 621 units remain to be constructed. For the purpose of this report, full build out of Phase 2 has been considered under existing conditions (2019). Phase 3 is currently under construction with build-out anticipated by 2019, whereas completion of Phases 4 through 6 is expected between 2021 and 2025.

3.2.3 Other Development Traffic Volumes

Trip Generation

Trip generation estimates for the continued development at the Blue Mountain Village were obtained from the report *Blue Mountain Resort Village Transportation Considerations.* For the remaining residential developments (with the exception of the Windfall development, as detailed below), trip estimates were prepared in consideration of the number and type of units anticipated (eg. single family, townhouses, semi-detached or condo units) and corresponding trip rates as per the ITE *Trip Generation Manual* 9th *Edition.*

For the Windfall development, trip estimates have been based on trip data specific to the Windfall site, as noted in the *Windfall Traffic Impact Study*[7]. Site specific trip rates were established from the 2017 traffic counts at Crosswinds Boulevard and Grey Road 19, recognizing that Crosswinds Boulevard only served Windfall development at the time of the count (at which time there were 50 singles and 10 semi-detached units occupied). Upon comparison, it was found that the site specific trip rates were relatively similar to the ITE rates; however, to reflect the unique product of Windfall, the "existing Windfall" trip rates were employed (which are considered conservative in that a greater proportion of the remaining Windfall units will be semi-detached units as opposed to singles, which are likely to generate fewer trips).

A summary of the corresponding trips for the various background developments considered is provided in Table 2, whereas additional details are provided in Appendix C.

Table 2: Background Development Trip Generation Estimates

Development	Size		Fri PM Peak Hour			Sat Peak Hour		
			in	out	total	in	out	total
Manorwood	74	units	26	13	39	19	16	35
Monterra Phase 2	32	units	20	12	32	16	14	30
Mountain House	230	units	80	39	119	58	50	108
Plateau East	26	units	17	10	27	13	11	24
Second Nature	178	units	113	67	180	88	78	166
Windfall	621	units	300	290	590	321	290	611
Total	1,161	units	556	431	987	515	459	974

[7] *Windfall Traffic Impact Study.* C.C. Tatham & Associates Ltd., Revised September, 2018.

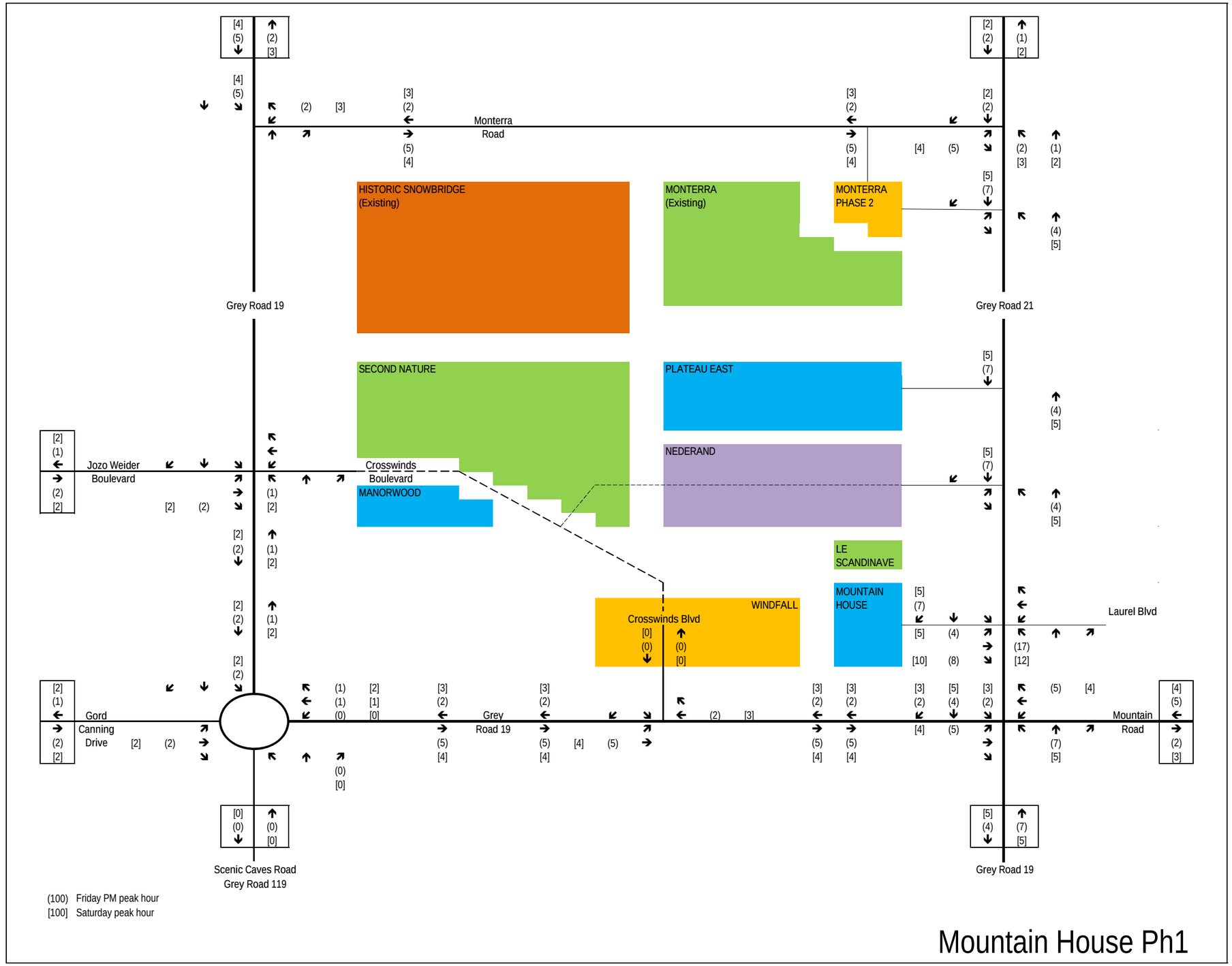
Table 3: Background Development Phasing

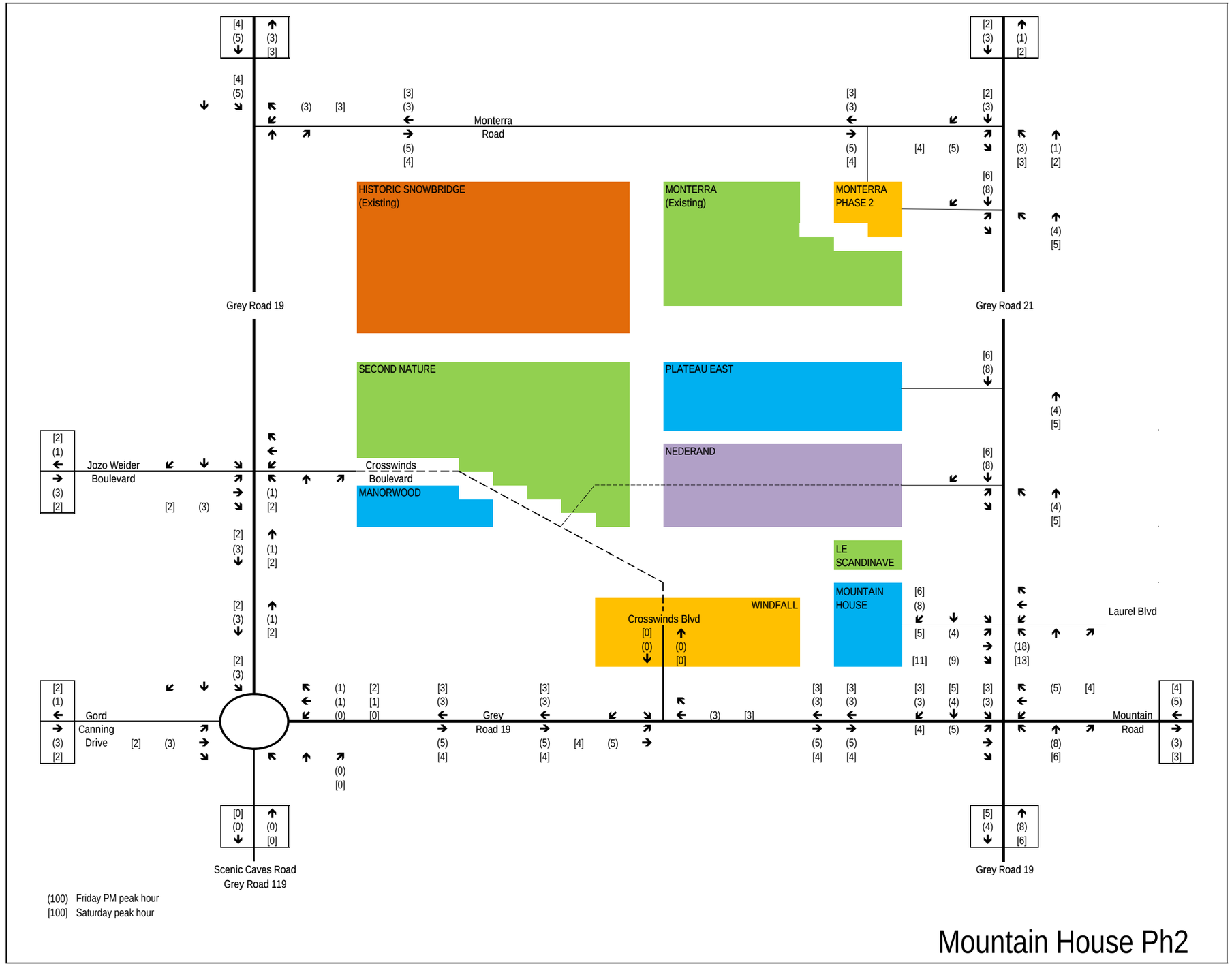
Development	Build-Out	Percent Complete by Year								
		2019	2020	2021	2022	2023	2024	2025	2030	2035
Blue Mountain Commercial	2021		66	100	100	100	100	100	100	100
Blue Mountain Residential	2021		66	100	100	100	100	100	100	100
Manorwood Block 152	2019		100	100	100	100	100	100	100	100
Manorwood Block 153	2021			100	100	100	100	100	100	100
Monterra Phase 2	2022		50	75	100	100	100	100	100	100
Mountain House Phase 1	2019		100	100	100	100	100	100	100	100
Mountain House Phase 2	2020		100	100	100	100	100	100	100	100
Mountain House Phase 3	2022				100	100	100	100	100	100
Plateau East	2018	100	100	100	100	100	100	100	100	100
Second Nature Phase 1	2019		100	100	100	100	100	100	100	100
Second Nature Phase 3	2024			25	50	75	100	100	100	100
Windfall Phase 2	2018	100	100	100	100	100	100	100	100	100
Windfall Phase 3	2019		100	100	100	100	100	100	100	100
Windfall Phase 4	2021		50	100	100	100	100	100	100	100
Windfall Phase 5	2023				50	100	100	100	100	100
Windfall Phase 6	2025						50	100	100	100

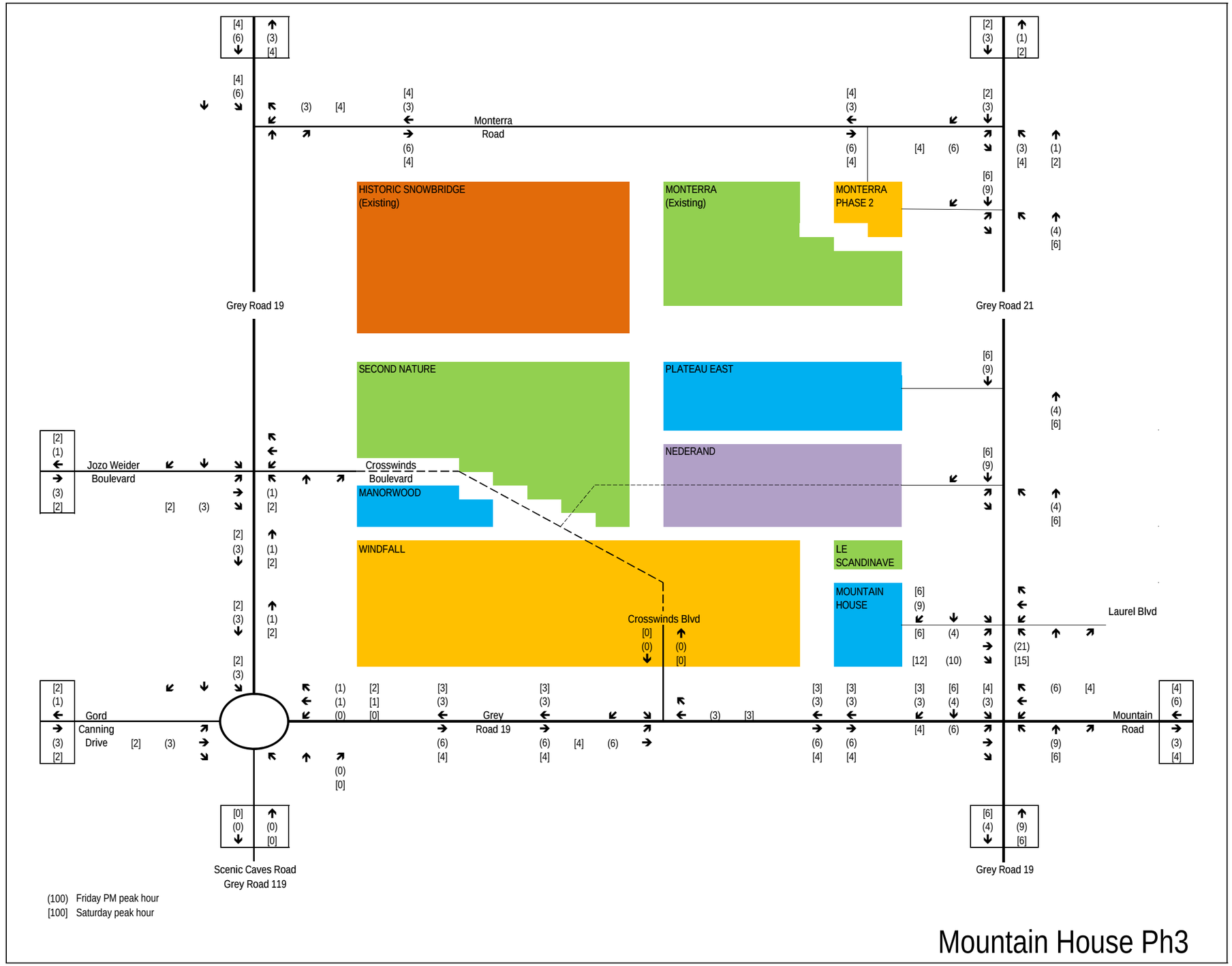
Recognizing that Second Nature Phase 2 consists solely of the construction of Crosswinds Boulevard within the Second Nature development, it has not been included in the table above (i.e. there are no dwelling units associated with Phase 2).

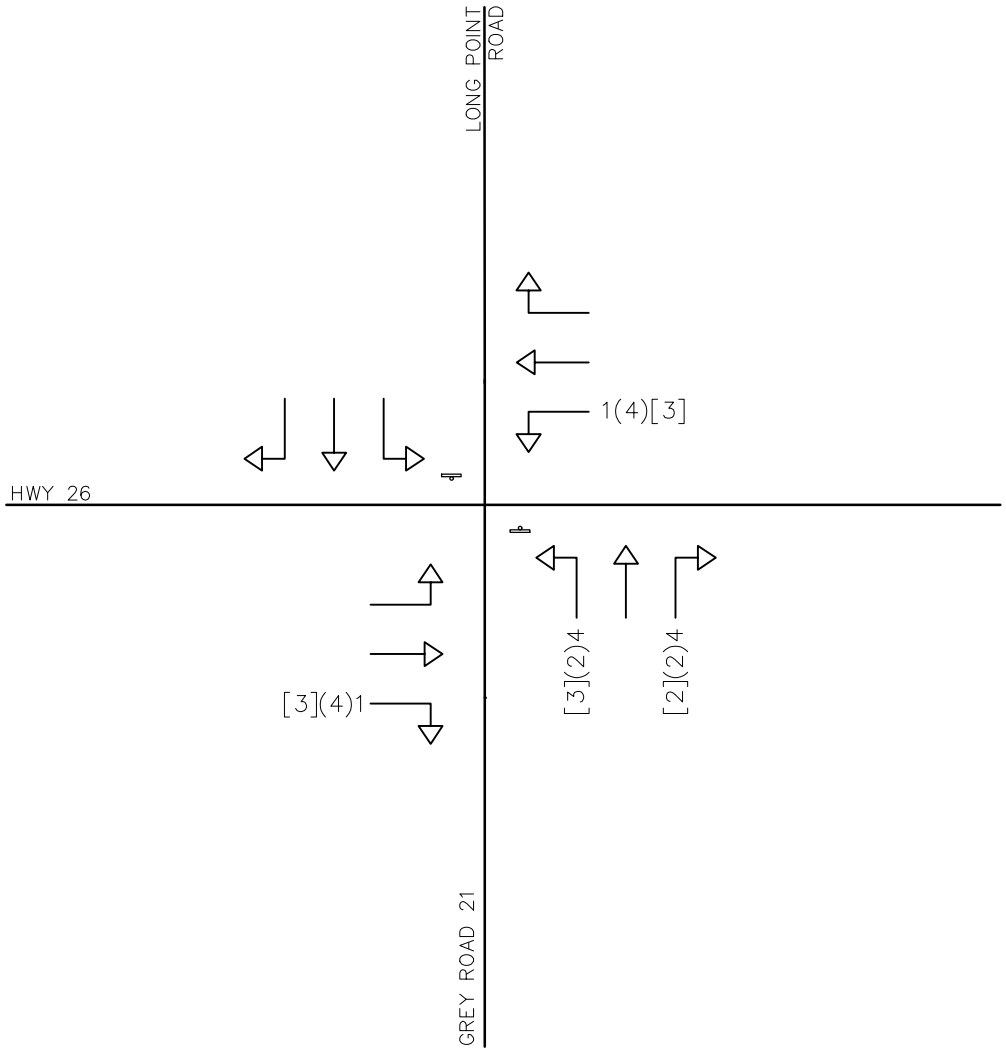
3.2.4 Background Traffic Volumes

The resulting future background traffic volumes (existing volume + general growth + other development traffic) are illustrated in Figure 6, Figure 7 and Figure 8 for the years 2025, 2030 and 2035.


Monterra
Road
HISTORIC SNOWBRIDGE
(Existing)
MONTERRA
(Existing)
MONTERRA
PHASE 2
Grey Road 19
Grey Road 21
SECOND NATURE
PLATEAU EAST
NEDERAND
Jozo Weider
Boulevard
Crosswinds
Boulevard
MANORWOOD
LE
SCANDINAVE
WINDFALL
Crosswinds Blvd
MOUNTAIN
HOUSE
Laurel Blvd
Gord
Canning
Drive
Grey
Road 19
Mountain
Road
Scenic Caves Road
Grey Road 119
Grey Road 19
(100) Friday PM peak hour
[100] Saturday peak hour
Mountain House Ph1


Monterra Road
Grey Road 19
Grey Road 21
Jozo Weider Boulevard
Crosswinds Boulevard
Crosswinds Blvd
Gord Canning Drive
Grey Road 19
Laurel Blvd
Mountain Road
Scenic Caves Road
Grey Road 119
Grey Road 19
HISTORIC SNOWBRIDGE (Existing)
MONTERRA (Existing)
MONTERRA PHASE 2
SECOND NATURE
PLATEAU EAST
NEDERAND
MANORWOOD
LE SCANDINAVE
WINDFALL
MOUNTAIN HOUSE
(100) Friday PM peak hour
[100] Saturday peak hour
Mountain House Ph2


Monterra Road
Grey Road 19
Grey Road 21
HISTORIC SNOWBRIDGE (Existing)
MONTERRA (Existing)
MONTERRA PHASE 2
SECOND NATURE
PLATEAU EAST
NEDERAND
MANORWOOD
WINDFALL
LE SCANDINAVE
MOUNTAIN HOUSE
Jozo Weider Boulevard
Crosswinds Boulevard
Crosswinds Blvd
Laurel Blvd
Gord Canning Drive
Grey Road 19
Mountain Road
Scenic Caves Road
Grey Road 119
Grey Road 19
(100) Friday PM peak hour
[100] Saturday peak hour
Mountain House Ph3



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Legend

SIGNAL CONTROL

STOP CONTROL

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

Project

AQUAVIL
TOWN OF THE BLUE MOUNTAINS

Drawing

MOUNTAIN HOUSE TRIP ASSIGNMENT

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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. L

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

Table 5 - 2031 Future Total Level of Service (with Public Roadway)

Intersection	Control	Peak Hour	Level of Service	Control Delay	Max V/C Ratio
Highway 26 and Grey Road 19	Signal	A.M.	B	14.3 s	0.58 (NBL)
		P.M.	B	18.6 s	0.87 (NBL)
Highway 26 and Grey Road 19	Signal (Optimized)	A.M.	B	16.3 s	0.57 (EBT)
		P.M.	B	18.5 s	0.71 (EBT)
Highway 26 and Lakeshore Road	Stop	A.M.	C	15.8 s	0.26 (WBT)
		P.M.	C	24.2 s	0.46 (WBT)
Grey Road 19 and Lakeshore Road	Stop	A.M.	B	10.6 s	0.12 (NBT)
		P.M.	B	10.5 s	0.20 (NBT)
Grey Road 19 and Craigleith Road	Stop	A.M.	B	12.9 s	0.06 (WB)
		P.M.	C	16.2 s	0.08 (WB)
Grey Road 19 and Birches Boulevard	Stop	A.M.	B	12.5 s	0.14 (WB)
		P.M.	C	16.5 s	0.25 (NBT)
Grey Road 19 and Helen Street	Stop	A.M.	B	12.6 s	0.15 (WB)
		P.M.	C	16.4 s	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

Although the level of service and control delay results are acceptable under existing signal timings for the intersection of Highway 26 and Grey Road 19, optimized timing results are included to illustrate that the volume-to-capacity ratio can be less than 0.85 without capital improvements.

The corresponding traffic volumes are illustrated in **Figure 18**.

As described in **Table 5**, no operational issues for any of the three developments are expected as a result of this internal road configuration.

6.4 Option 3 – Private Roadway Serving Parkbridge (No Connection to Lakeshore Road)

This option includes a private roadway serving only the Parkbridge residential development. For this option, the only connection to the boundary road network will occur along Grey Road 19. The proponent has confirmed that this connection would occur opposite of Craigleith road, in order to create a 4-legged intersection. This connection will ensure that further intensification of the intersection of Lakeshore Road and Highway 26 is avoided, as requested by the MTO.

Due to the single access point of this option, 80% of site generated traffic will be utilizing the intersection of Highway 26 and Grey Road 19. As indicated in in the travel survey included in **Appendix E,** trips originating from Grey Road 19 and Craigleith Road travelling to Collingwood are assumed to utilize Highway 26, as this route was determined to be quicker than travelling to Collingwood via Grey Road 19 and Mountain Road. This assumption also applies for the return trips from Collingwood to Craigleith Road.

Trip assignment and distribution information for this option is included in **Figures 19 to 25**. These operations are based on the future total volumes illustrated in **Figure 26.**

Traffic operations for this internal roadway configuration are illustrated below in **Table 6.**

Table 6 - 2031 Future Total Level of Service (No connection to Lakeshore Road)

Intersection	Control	Peak Hour	Level of Service	Control Delay	Max V/C Ratio
Highway 26 and Grey Road 19	Signal	A.M.	B	14.2 s	0.58 (NBL)
		P.M.	B	18.6 s	0.88 (NBL)
Highway 26 and Grey Road 19	Signal (Optimized)	A.M.	B	14.9 s	0.53 (EBT)
		P.M.	B	17.9 s	0.70 (EBT)
Highway 26 and Lakeshore Road	Stop	A.M.	C	15.8 s	0.27 (WBT)
		P.M.	D	27.7 s	0.47 (WBT)
Grey Road 19 and Lakeshore Road	Stop	A.M.	B	12.6 s	0.13 (NBT)
		P.M.	B	13.7 s	0.23 (NBT)
Grey Road 19 and Craigleith Road	Stop	A.M.	B	10.3 s	0.05 (EB)
		P.M.	B	12.8 s	0.07 (EB/WB)
Grey Road 19 and Birches Boulevard	Stop	A.M.	B	12.5 s	0.14 (WB)
		P.M.	C	16.5 s	0.25 (NBT)
Grey Road 19 and Helen Street	Stop	A.M.	B	12.6 s	0.15 (WB)
		P.M.	C	16.4 s	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

Although the level of service and control delay results are acceptable under existing signal timings for the intersection of Highway 26 and Grey Road 19, optimized timing results are included to illustrate that the volume-to-capacity ratio can be less than 0.85 without capital improvements.

It should be noted that although the intersection of Highway 26 and Lakeshore Road operates at a reduced level of service when compared to **Option 1 and 2**, the calculated control delays for each option are minimally different suggesting similar operations of the intersection, regardless of the pursued option. This increased control delay is a result of the reduced volume of the low-delay northbound right-turn movements, thereby increasing the overall average delay of the intersection. The change to a level of service "D" is a result of the 25 second delay threshold.

The corresponding traffic volumes are illustrated in **Figure 26**. Overall volumes on Highway 26 are not anticipated to change, as both the Parkbridge and Eden Oak developments travel to Collingwood via Highway 26 for all three configuration options. The difference between the configurations is whether the vehicles travelling to Collingwood enter Highway 26 at Grey Road 19 or Lakeshore Road.

As described in **Table 6** above, no operational issues for any of the three developments are expected as a result of this internal road configuration.

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**

40 Huron Street, Suite 301
Collingwood, ON L9Y 4R3
T. 705.446.3510
F. 705.446.3520
cfcrozier.ca

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,

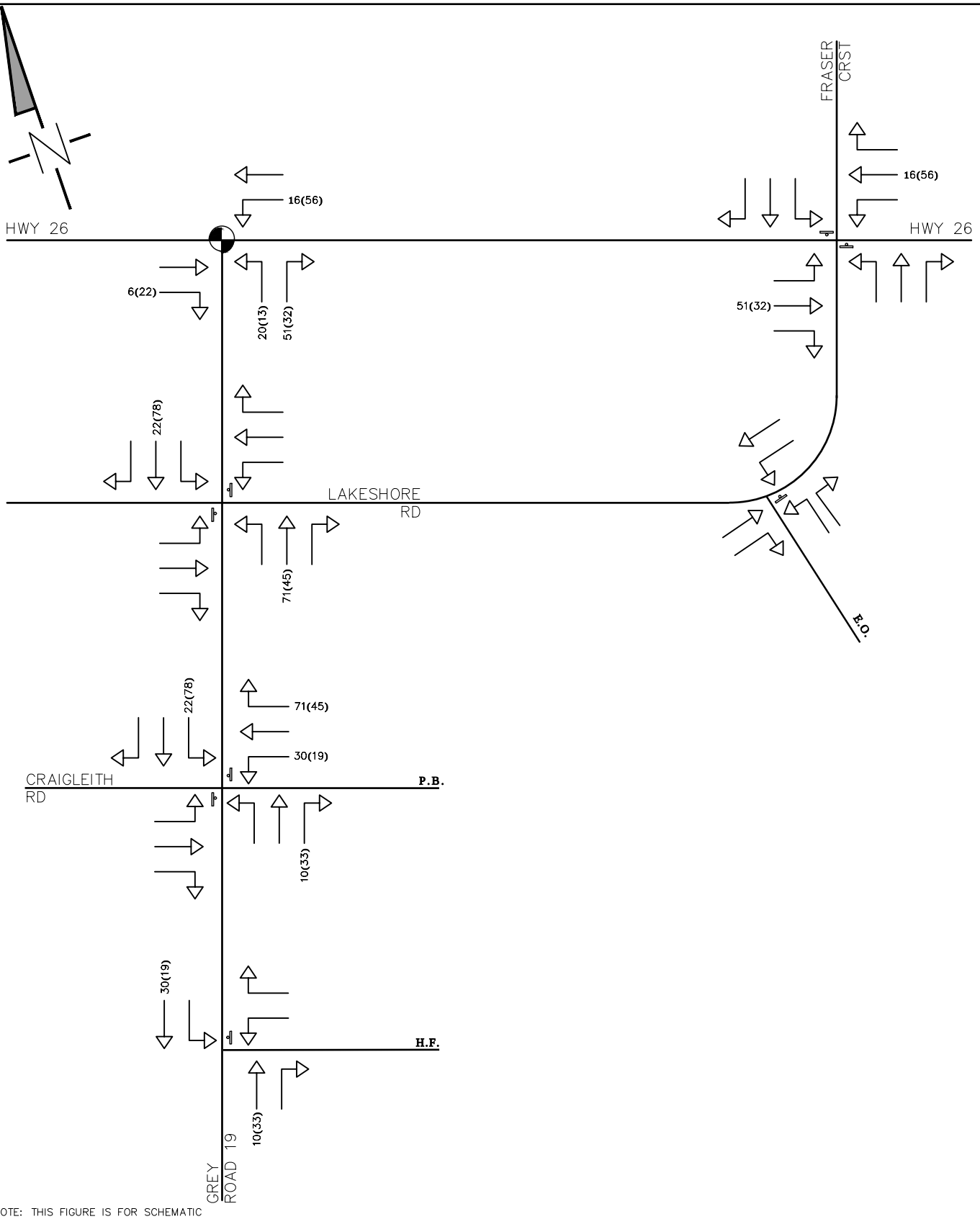
C.F. CROZIER & ASSOCIATES INC.

Ryan MacLaughlan, P.Eng

Project Engineer
/rm

c.c. Enclosure

J:\1000\1046-Parkbridge Lifestyle\4031-Craigleith Fogal Land Acq\Traffic\Sens Analysis With Modified Trip Gen.docx



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

CROZIER & ASSOCIATES Consulting Engineers
The HarbourEdge Building, 40 Huron Street, Suite 301, Collingwood, ON L9Y 4R3
705-446-3510 T
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www.cfcrozier.ca
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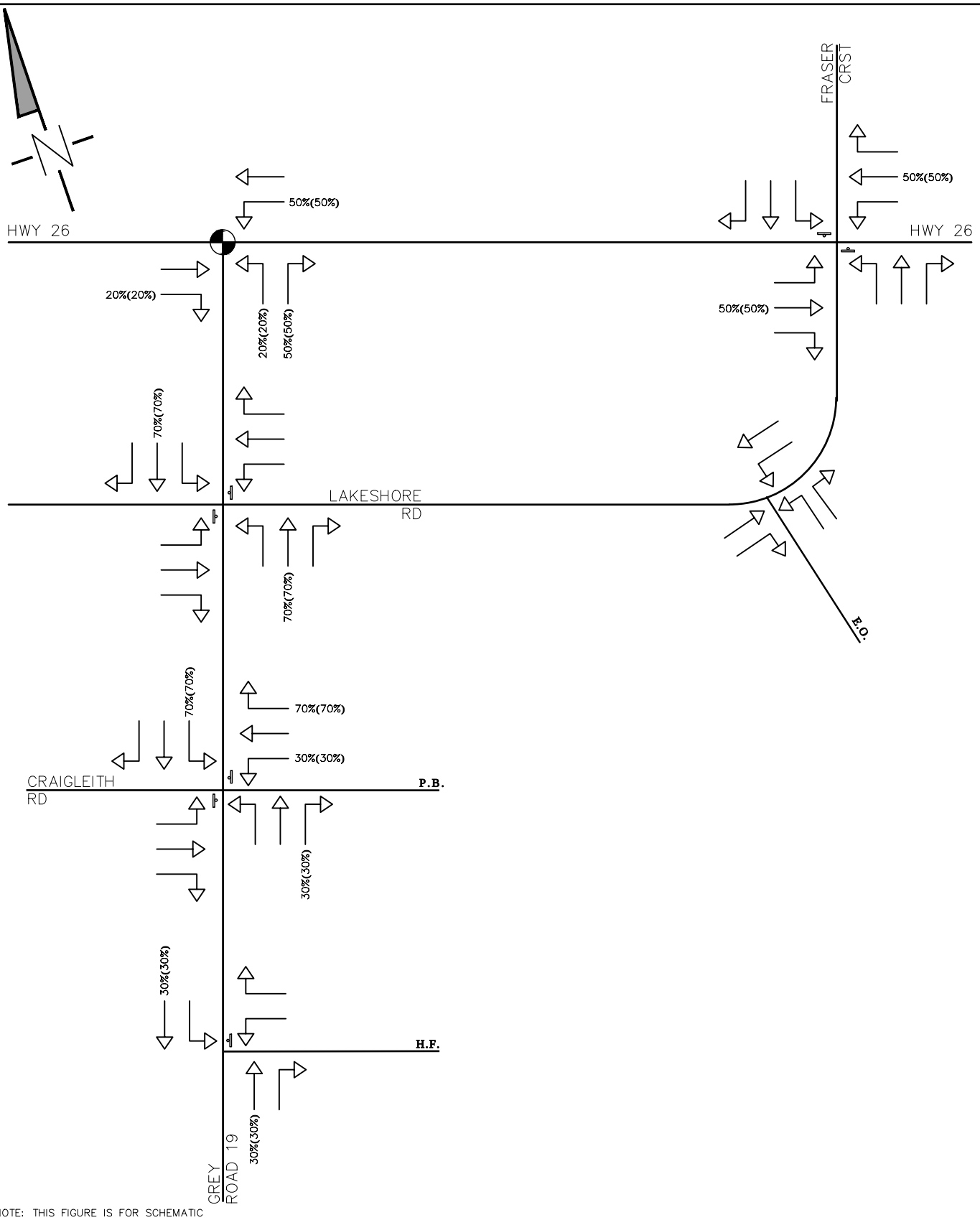
Drawn By	Design By	Project
J.I.M.	M.N.F.	1046 - 4031

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

List of Figures



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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705-446-3520 F
www.cfcrozier.ca
info@cfcrozier.ca

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

EMERGENCY ACCESS ROAD ONLY

BOLLARDS

TRAIL NETWORK CONNECTION complete w/ SIGNAGE AT CROSSING

GEORGIAN TRAIL

CANADIAN NATIONAL RAILWAY RIGHT OF WAY)

STORAGE BUILDING AREA 5670 SQ.FT.

EPHEMERAL WATERCOURSE

PEDESTRIAN TRAIL

ENVIRONMENTAL AREA

NIPISSING RIDGE

PLATER-FLEMING CONSERVATION AREA

COMMUNITY CLUB HOUSE AREA 4730SQ.FT.

PERMANENT WATERCOURSE

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

STORMWATER POND

OPEN SPACE/ PRESERVED AREA

POTENTIAL PLAYGROUND

STORMWATER POND

PEDESTRIAN PRIORITY ZONE

WETLAND PRESERVE

OPEN SPACE/ PRESERVED AREA

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

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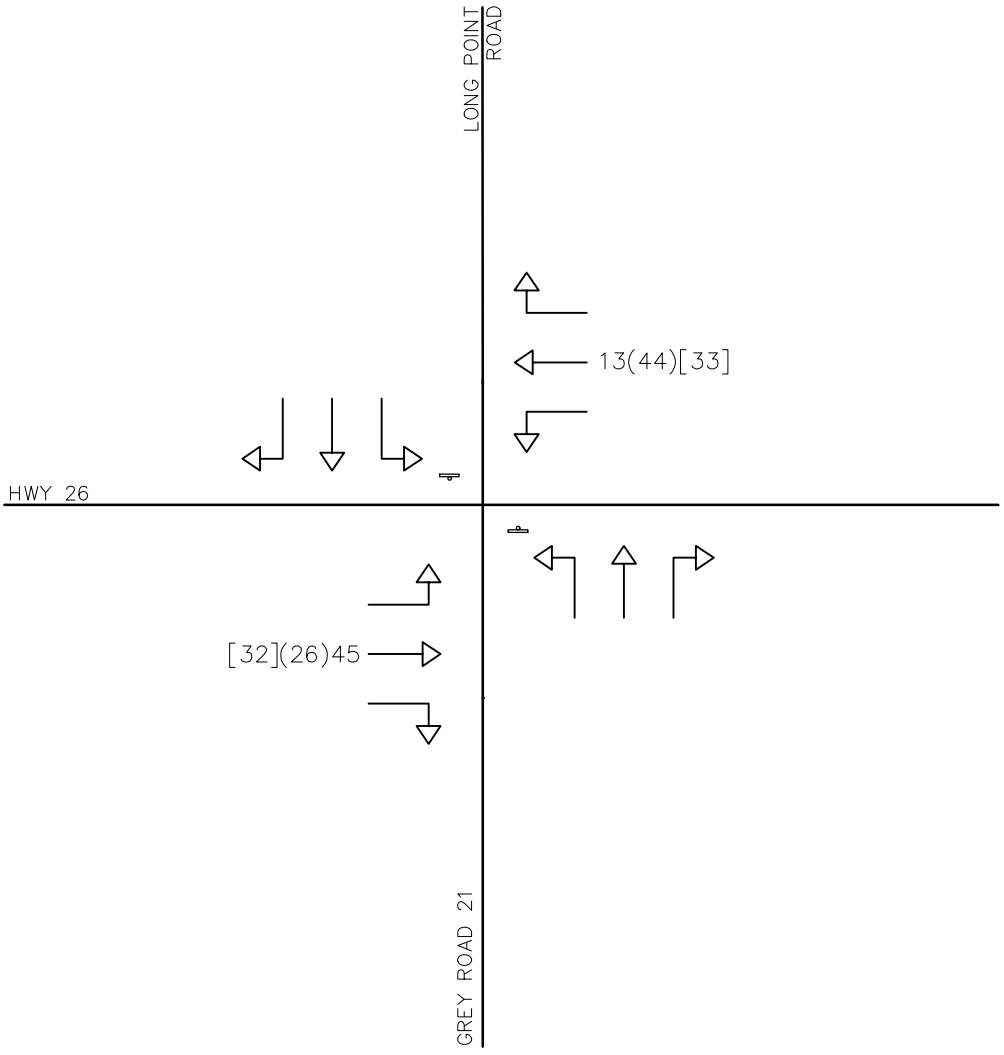

NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

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
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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

Windfall Development
Phases 4 to 6

C.C. Tatham & Associates Ltd.
Consulting Engineers

WINDFALL

Town of The Blue Mountains

Traffic Impact Study

prepared by:

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115 Sandford Fleming Drive, Suite 200
Collingwood, ON L9Y 5A6
Tel: (705) 444-2565 Fax: (705) 444-2327
info@cctatham.com

prepared for

Windfall GP Inc.

Revised September 2018

CCTA File 107067/111179

4 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 to the road network.

4.1 Site Location

As previously illustrated in Figure 1, the proposed development is located on the north and east side of Grey Road 19, west of Grey Road 21 in the Town of The Blue Mountains.

4.2 Proposed Land Use & Phasing

A breakdown of the proposed unit count by type and phase is provided in Table 8 and illustrated in Figure 9. Initially, the Windfall development was approved for 609 units; an increase in density in Phases 4 and 6 is proposed which will yield an additional 72 units (the increase in density is achieved through conversion of single units to semi-detached units. It is also noted that the phasing strategy has been revised as noted in Table 8.

Table 8: Proposed Land Use & Phase

Phase	Year Complete	Previous Plan			Current Plan		
		Single	Semi	Total	Single	Semi	Total
1	2016	37	0	37	37	0	37
2	2018	67	100	167	67	100	167
3	2019	29	40	69	29	40	69
4 (old Ph 6)	2021	103	20	123	62	102	164
5 (old Ph 4)	2023	42	82	124	42	82	124
6 (old Ph 5)	2025	73	16	89	42	78	120
Total		351	258	609	279	402	681
Change					-72	+144	+72

4.3 Site Access

As shown in Figure 9, 2 access points will be provided as follows:

- Crosswinds Boulevard through the Second Nature development, connecting to Grey Road 19 at its signalized intersection with Jozo Weider Boulevard; and
- Crosswinds Boulevard connecting to Grey Road 19 approximately 610 metres west of Grey Road 21 (measured from centreline to centreline) and 770 metres east of the roundabout.

The extension of Crosswinds Boulevard to provide a continuous linkage between Windfall and Second Nature, with connections to Grey Road 19 at both ends, is anticipated in 2020 in conjunction with the construction of Phase 4 of Windfall.

4.4 Site Generated Trips

4.4.1 Trip Generation

Trip generation rates for the proposed Windfall development were determined from the *ITE Trip Generation Manual 9th Edition* reflective of a "single family detached" land use (code 210). In addition, site specific trip rates were established from the 2017 traffic counts at Crosswinds Boulevard and Grey Road 19 given that Crosswinds Boulevard only served Windfall development at the time of the count (at which time there were 50 singles and 10 semi-detached units occupied). Both trip rates are noted in Table 9. As noted, the trip rates are relatively similar; to reflect the unique product of Windfall, the "existing Windfall" trip rates have been employed (which are considered conservative in that a greater proportion of the remaining Windfall units will be semi-detached units as opposed to singles, which are likely to generate fewer trips).

Table 9: Windfall Trip Generation Rates

Land Use	Variable	PM Peak Hour			Sat Peak Hour		
		in	out	total	in	out	total
ITE single family detached	units	0.64	0.37	1.01	0.49	0.44	0.93
existing Windfall	units	0.48	0.47	0.95	0.52	0.46	0.98

The resulting trip estimates for each phase of the Windfall development are summarized in Table 10. It is noted that at the time of the March 2017 traffic counts, the following units were complete and occupied:

- Phase 1: 37 single units; and
- Phase 2: 13 singles and 10 semi-detached units.

The traffic volumes associated with the above occupied units are captured in the traffic counts and thus these units were not considered in deriving the remaining Windfall trip estimates.

As noted, the remaining 621 units are expected to generate 590 new trips during the Friday PM peak hour and 611 trips during the Saturday peak hour (total of inbound and outbound trips). The additional

72 units, as proposed under the current development plan, will generate 68 additional trips during the Friday peak hour and 71 during the Saturday peak hour (which translates to slightly more than 1 additional trip every minute).

Table 10: Windfall Trip Generation Estimates

Development		Units		Fri PM Peak Hour			Sat Peak Hour		
		Total	Remain	in	out	total	in	out	total
Phase 1	singles	37	0	-	-	-	-	-	-
	semis	0	0	-	-	-	-	-	-
Phase 2	singles	67	54	26	25	51	28	25	53
	semis	100	90	44	42	86	47	42	89
Phase 3	singles	29	29	14	14	28	15	14	29
	semis	40	40	19	19	38	21	19	39
Phase 4	singles	62	62	30	29	59	32	29	61
	semis	102	102	49	48	97	53	48	100
Phase 5	singles	42	42	20	20	40	22	20	41
	semis	82	82	40	38	78	42	38	81
Phase 6	singles	42	42	20	20	40	22	20	41
	semis	78	78	38	36	74	40	36	77
Total		681	621	300	290	590	321	290	611
Additional Units		-	72	35	34	68	37	34	71

4.4.2 Trip Distribution & Assignment

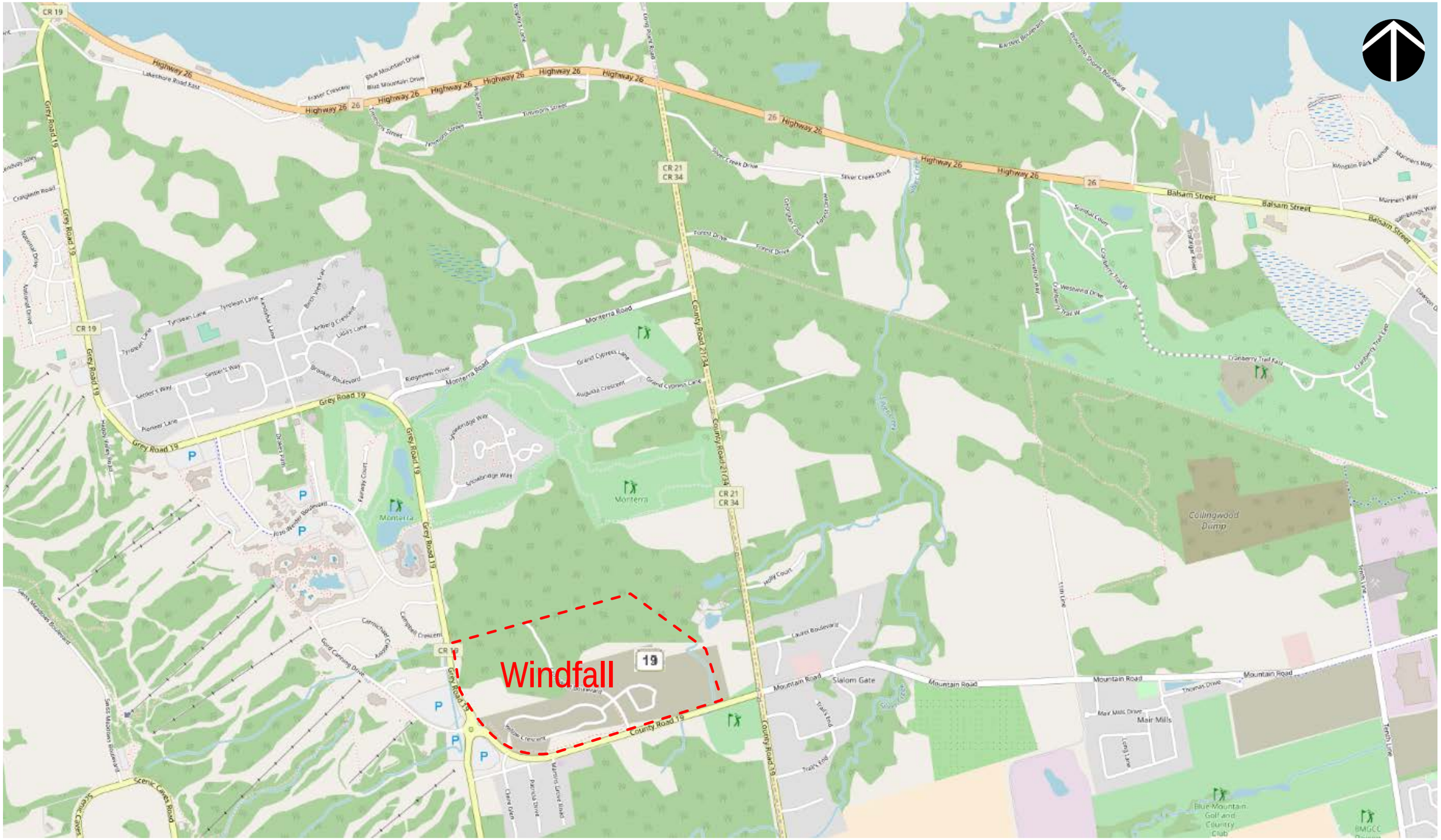
The distribution of the trips to be generated by the site to the area road system was based on the existing traffic patterns through the study area as realized through the March 2017 traffic counts (assuming that the future residents will exhibit similar travel patterns as the existing residents). The resulting distributions are summarized in Table 11. It is noted that there is a greater emphasis for travel to/from areas to the west of Windfall (ie. to the mountain) during the Saturday peak hour, which is likely attributed to winter ski activities in the immediate area.

Vehicles were assigned to the site access points based on the location of the residential units with respect to the access points and the directness of travel routes. The resulting site generated traffic volumes are illustrated in Figure 10 through Figure 14 for Phases 2 through 6 respectively, with the total

additional Windfall traffic illustrated in Figure 15. As previously noted, Crosswinds Boulevard is expected to be extended and completed through to the intersection of Grey Road 19/Jozo Weider Boulevard in the year 2020 in conjunction with construction of Phase 4, which is reflected in the Phase 4, 5 and 6 site volumes and the total Windfall site volumes (ie. traffic volumes to/from the west are expected to utilize Crosswinds Boulevard and travel through Windfall and Second Nature to access Grey Road 19).

Table 11: Windfall Trip Distribution

Direction		Friday PM Peak Hour	Saturday Peak Hour
to/from Grey Road 19	north	15%	25%
to/from Jozo Weider Boulevard	west	10%	12.5%
to/from Gord Canning Drive	west	10%	12.5%
to/from Grey Road 119 (Scenic Caves Road)	south	2.5%	2.5%
to/from Grey Road 21	north	2.5%	2.5%
to/from Mountain Road	east	40%	30%
to/from Grey Road 19	south	20%	15%
Total		100%	100%



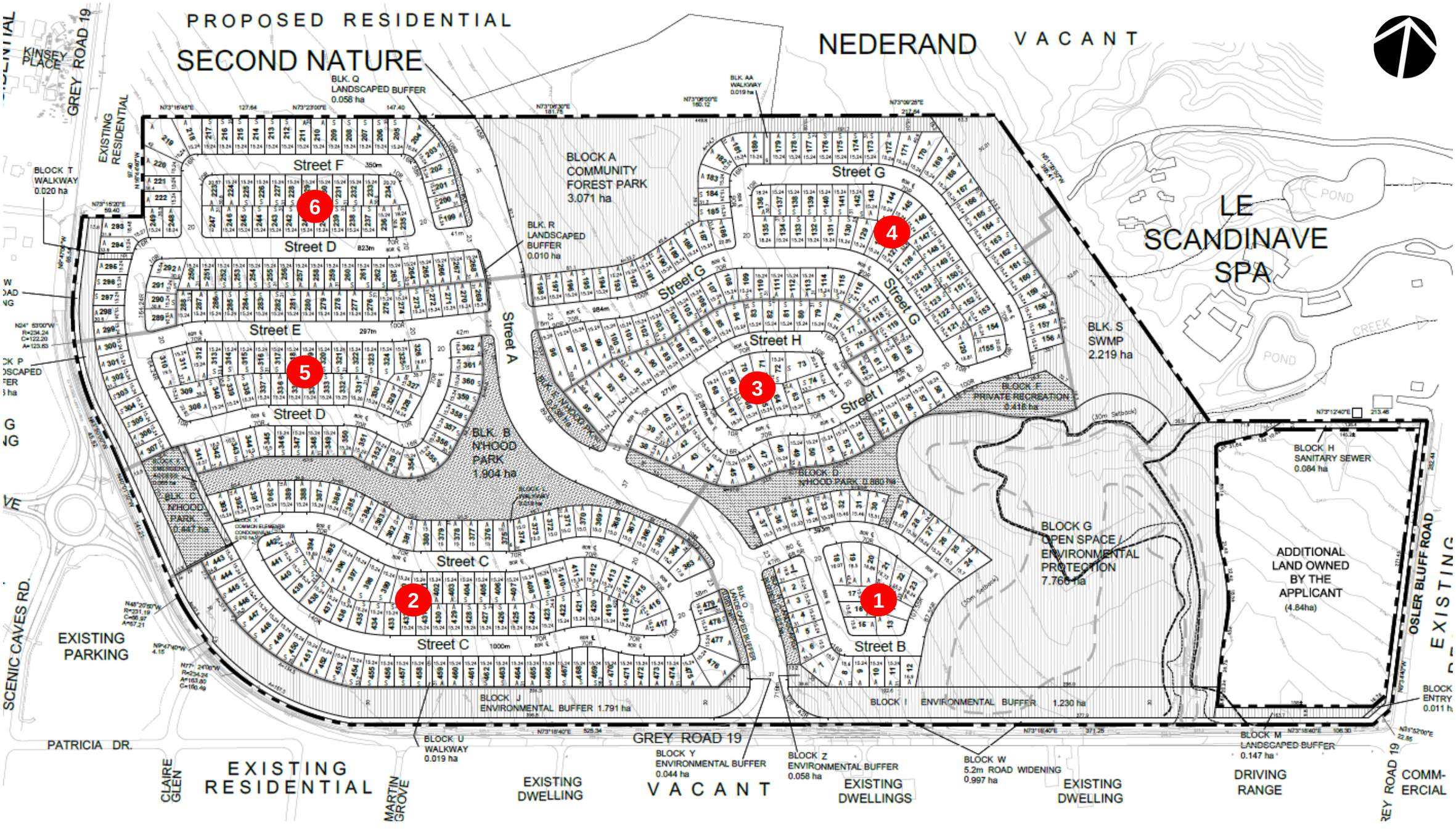
C.C.Tatham & Associates Ltd.
Consulting Engineers

Windfall Residential Development

Site Location

Figure

1



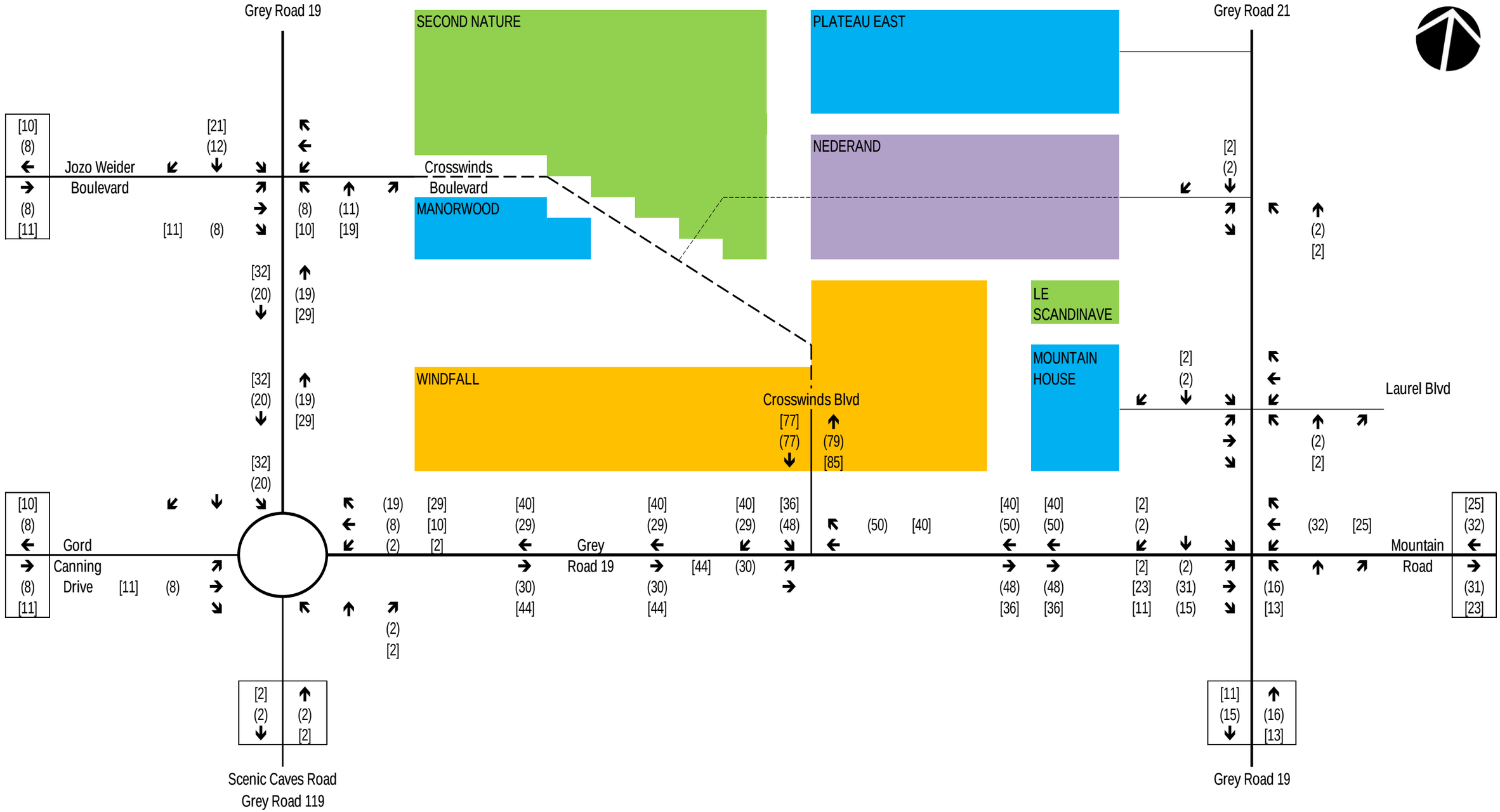
C.C.Tatham & Associates Ltd.
Consulting Engineers

Windfall Residential Development

Development Site Plan

Figure

9



(100) Friday PM peak hour
[100] Saturday peak hour

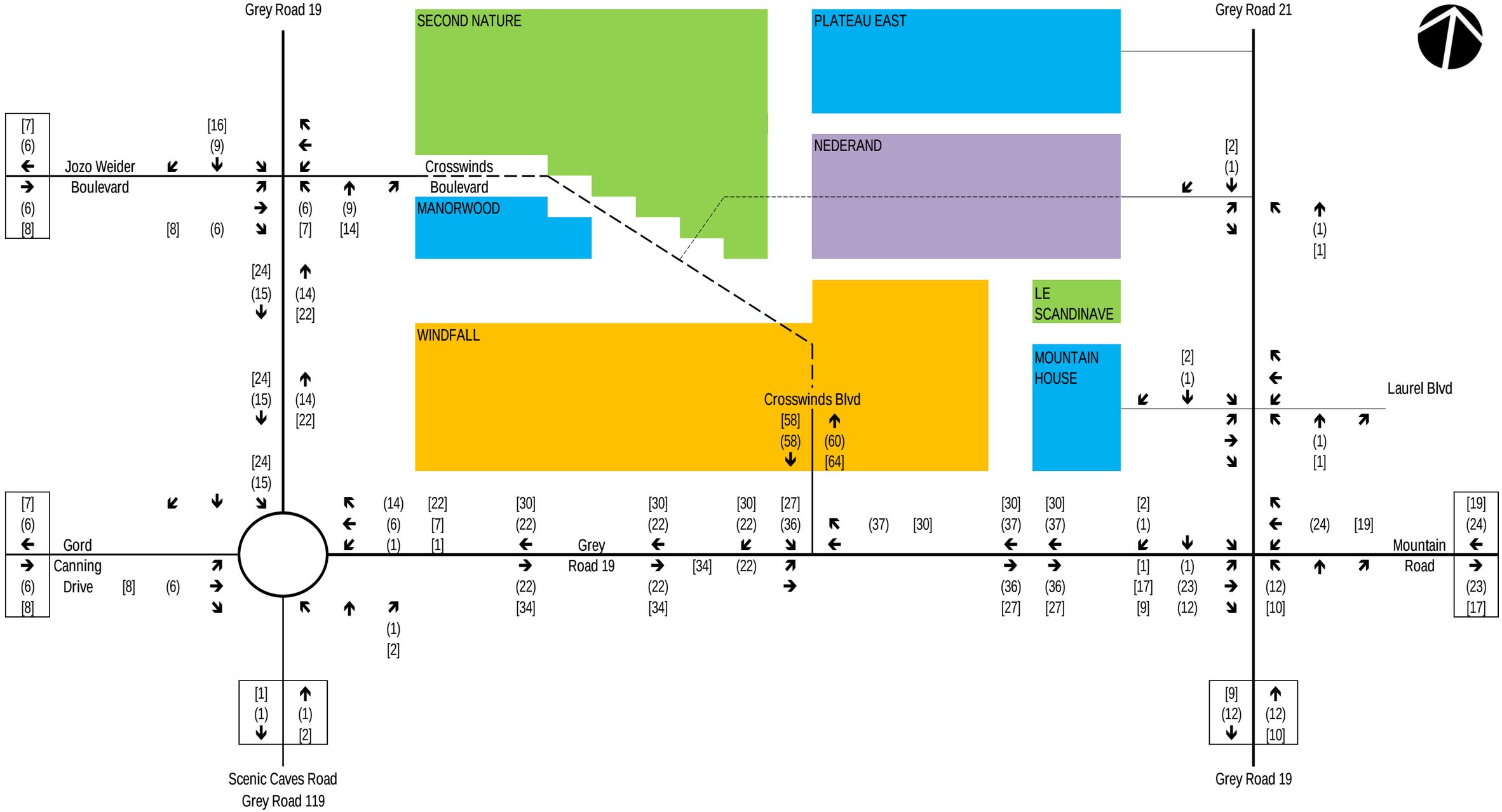
C.C.Tatham & Associates Ltd.
Consulting Engineers

Windfall Residential Development

Windfall Phase 4 Traffic Volumes

Figure

12



(100) Friday PM peak hour
[100] Saturday peak hour

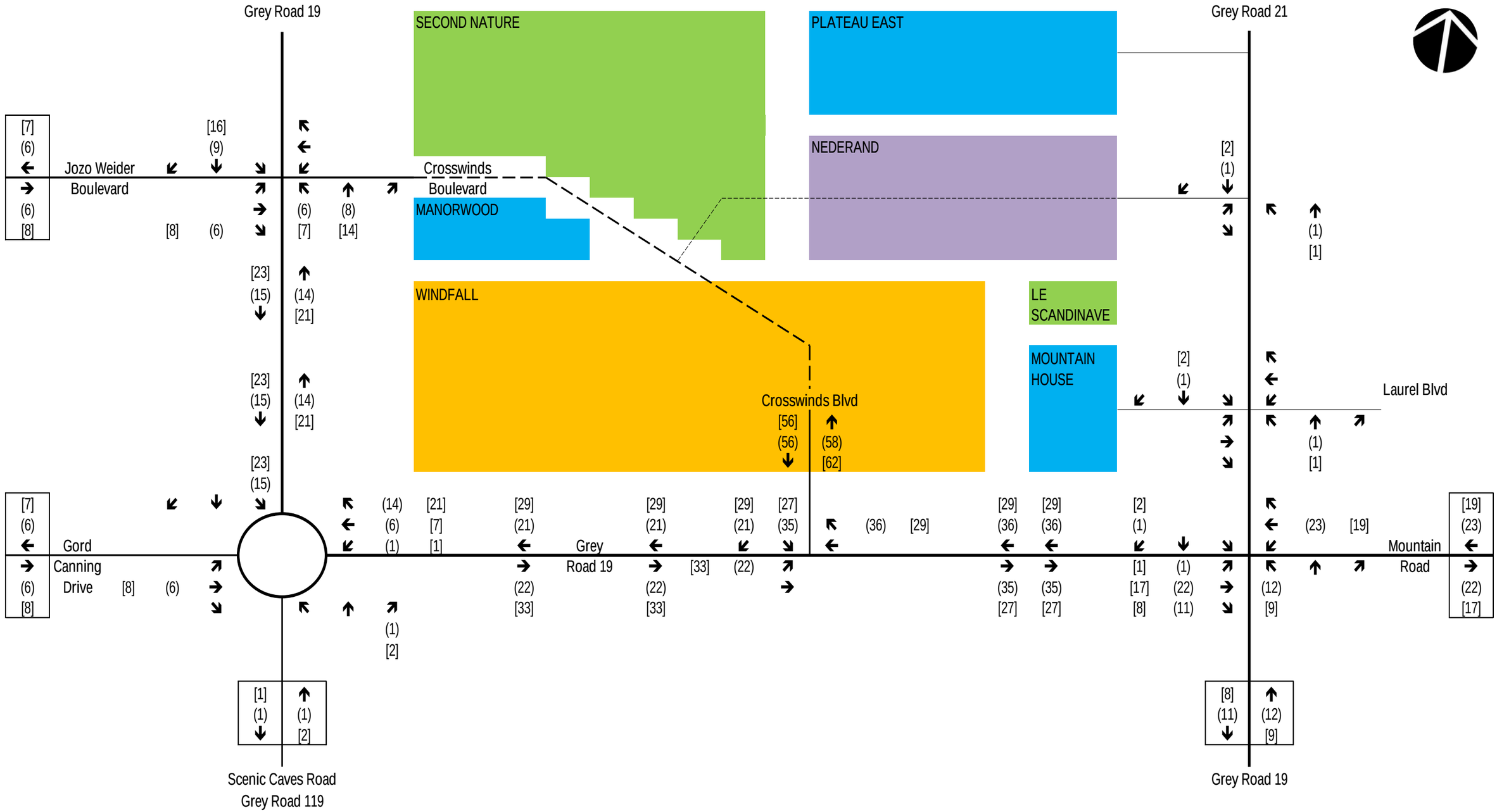
C.C.Tatham & Associates Ltd.
Consulting Engineers

Windfall Residential Development

Windfall Phase 5 Traffic Volumes

Figure

13



(100) Friday PM peak hour
[100] Saturday peak hour

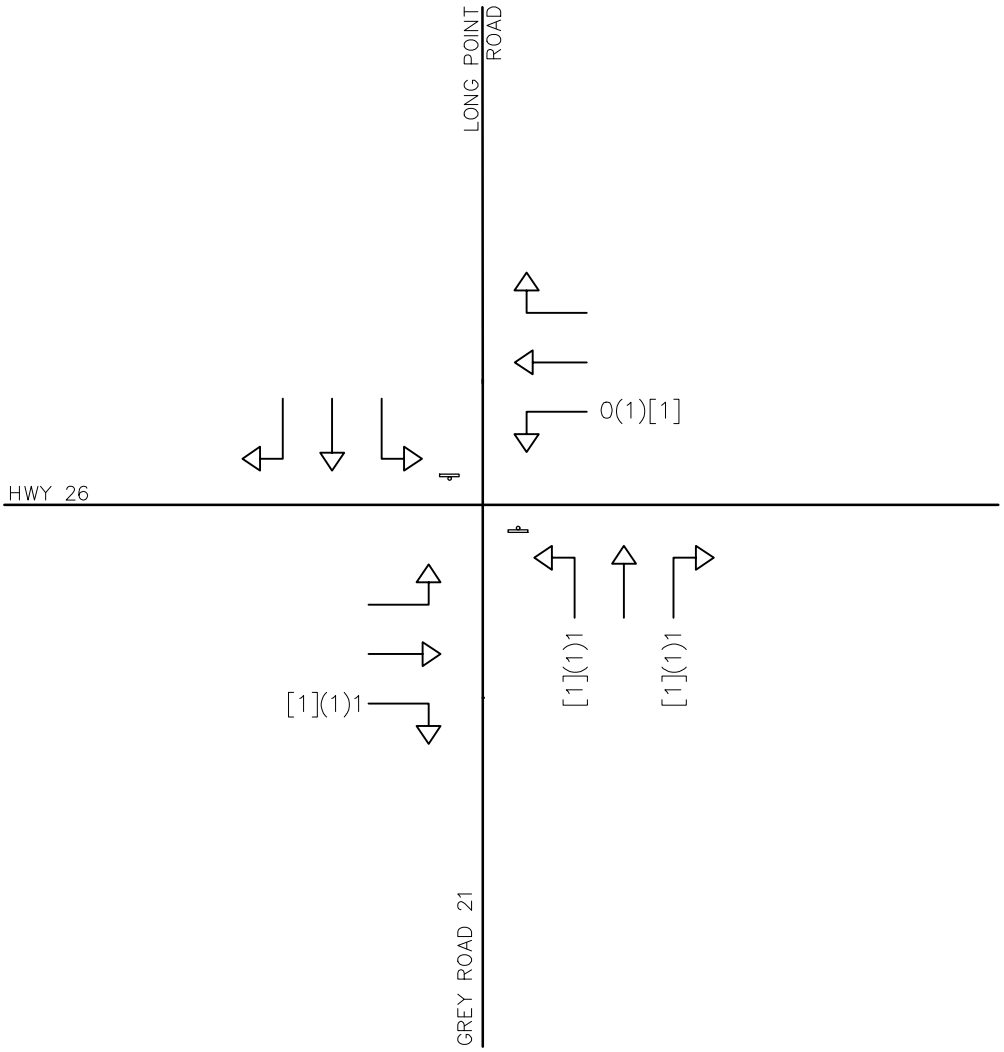
C.C.Tatham & Associates Ltd.
Consulting Engineers

Windfall Residential Development

Windfall Phase 6 Traffic Volumes

Figure

14



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

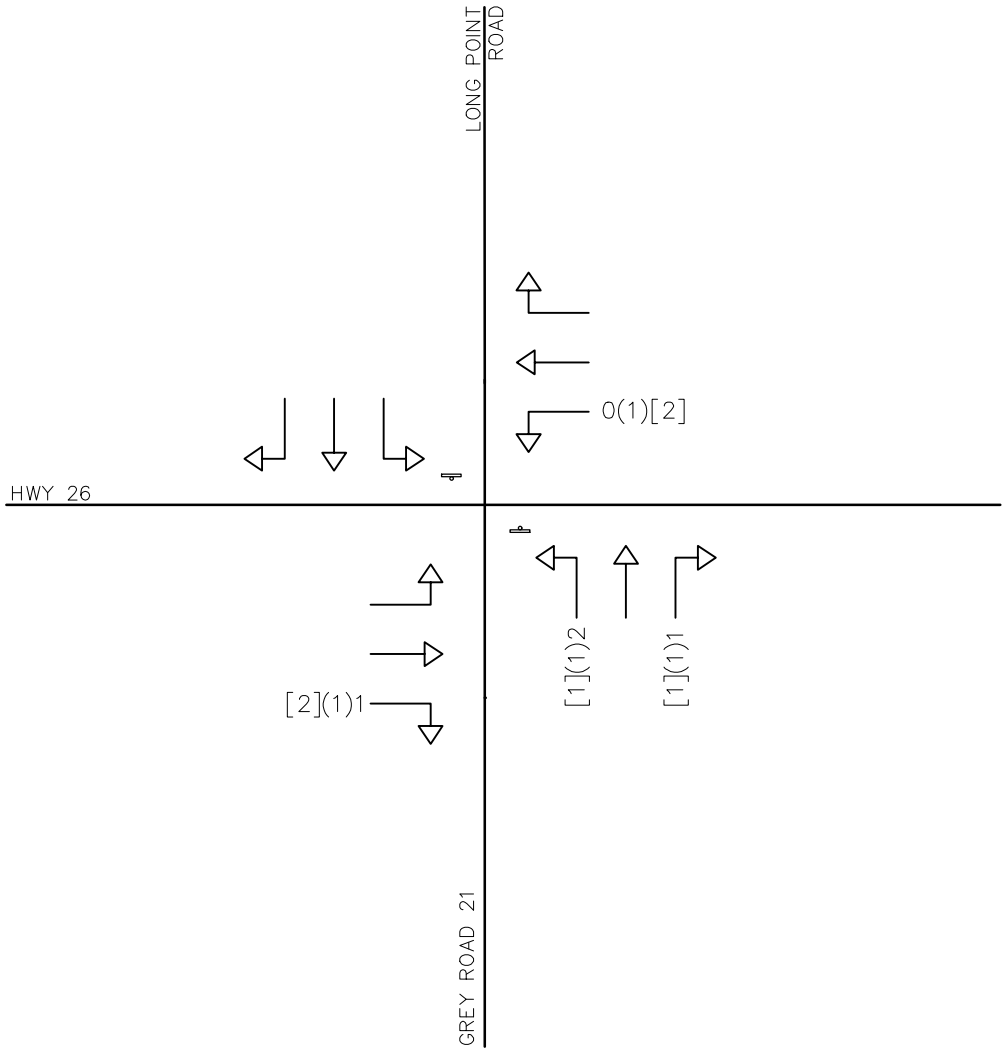
AQUAVIL
TOWN OF THE BLUE MOUNTAINS

Drawing

WINDFALL 4 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. N.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

WINDFALL 5 & 6 TRIP ASSIGNMENT

CROZIER & ASSOCIATES Consulting Engineers
The HarbourEdge Building,
40 Huron Street, Suite 301,
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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. N.2

APPENDIX F

The Town of the Blue Mountain Trail Network Map

Trails Network

The Blue Mountains

TOWN OF THE BLUE MOUNTAINS

LORA BAY
THORNBURY
CLARKSBURG
CAMPERDOWN
CRAIGLEITH
SLABTOWN
LOREE
HEATHCOTE
VICTORIA CORNERS
SWISS MEADOWS
BLUE MOUNTAIN VILLAGE
BANKS
RAVENNA
CASTLE GLEN
OSLER
REDWING
GIBRALTAR
KOLAPORE
DUNCAN
LITTLE GERMANY
PRETTY RIVER VALLEY

Meaford
Grey
Collingwood
Clearview
Highlands

39th Sideroad
Highway 26
Grey Road 113
11th Line
10th Line
33rd Sideroad
The Blue Mountains - Meaford Townline
Bruce St S
Clark St
Marsh St
30th Sideroad
Grey Road 40
River
Grey Road 2
7th Line
Grey Road 13
The Blue Mountains - Euphrasia Townline
24th Sideroad
Beaver
Sideroad 25
Old Mail Road
10th Line
21st Sideroad
6th Line
18th Sideroad
4th Line
5th Line
Grey Road 119
Swiss Meadows Blvd
Scenic Caves Road
Grey Road 19
Sideroad 22C
Fox Ridge Rd
3rd Line
12th Sideroad
11th Line
9th Sideroad
6th Sideroad
Sideroad 10D
Sideroad 7C
Long Point Rd
Timmons Parkette
Monterra Rd
Mountain Rd
6th Sireet
Poplar Sideroad
The Blue Mountains - Clearview Townline
2nd Line
36/37 Nottawasaga SDRD
Osprey - The Blue Mountains Townline
Osprey Heights
Eagle Cres
Reid's Hill
Road 55
Road 57D
Grey Road 31
Road 63
12th Concession B
10th Concession
Road 45

Peasemarsh Conservation Area
Council Beach
Delphi Point Park
Craigleith Provincial Park
Northwinds Beach
Clendenan Dam Conservation Area
Tomahawk Recreation Complex
Thornbury-Clarksburg Union Cemetery
Heathcote Park
Heathcote Presbyterian Church Cemetery
Victoria Holy Trinity Anglican Church Cemetery
Primitive Methodist Church Cemetery
White's Methodist Church Cemetery
Banks United Church Cemetery
Ravenna Hall
Loree Forest
Grey County Forest
Kolapore Uplands
Metcalfe Rock
Duncan Crevice Caves Provincial Lands
Crown Lands
3 Stage Provincial Lands
Crown Lands
Pretty River Valley Provincial Lands
Gibraltar Carmen Methodist Cemetery
Gibraltar Presbyterian Church Cemetery


Snowshoeing secret spots!
Photo Credit: Nancy Wentzell


Lilacs for everyone to enjoy!
Photo Credit: Nancy Wentzell


The Trestle Bridge - Thornbury!
Photo Credit: Nancy Wentzell


Paddling the Beaver River!
Photo Credit: Nancy Wentzell


Scaling the rock face!
Photo Credit: Nancy Wentzell


Cycling the Beaver River Trail!
Photo Credit: Shawn Ewart

Municipality of Grey Highlands

The Municipality of Grey Highlands plays host to a section of the awe-inspiring Bruce Trail and the expansive and meandering Beaver River.

The area is naturally rich with an abundance of green space and recreational opportunities.

For further recreation and trails information, please refer to their website at *www.greyhighlands.ca*

Meaford
the other big apple

The Municipality of Meaford is home to over 180km of trails! The trails network crosses a variety of lands including Municipal, County, Provincial, privately owned, and Conservation Authority lands. For further information, please refer to their website at *www.meaford.ca*

The Town of Collingwood Trails Network boasts over 60km of beautiful trails spread throughout Collingwood.

The Collingwood Trails map is available at a variety of local establishments and community locations. For more information, please refer to the Collingwood Trails website at *www.collingwoodtrails.ca*

CLEARVIEW TOWNSHIP
Established 1994

In support of an active and healthy community, the Township of Clearview has numerous trail linkages.

For maps and information please refer to the Township of Clearview's website at *www.clearview.ca*

Kolapore Uplands are known for the countless trails that intersect throughout the spectacular forest. It is highly recommended that one purchase a detailed Kolapore Uplands trails map, which are available at various local establishments. For more information, please refer to the Kolapore Uplands Wilderness Trails website at *www.kolaporeuplands.org*

TOWN OF THE BLUE MOUNTAINS

1-888-258-6867
www.thebluemountains.ca

Information shown on these drawings is compiled from numerous sources and may not be complete or accurate. The Blue Mountains is not responsible for any errors, omissions or deficiencies in this drawing. This document is for reference purposes only. No part of this supplied data may be reproduced or transmitted to others in any way without the written permission of The Corporation of the Town of The Blue Mountains. (LG 2011)

.5 0 1km

- Baseball Diamond
- Bike Lanes
- Campground
- Cemetery
- Community Centre
- Conservation Area
- Fishing
- Golf Course
- Great View
- Harbour
- Heritage Depot
- Information
- Parking
- Pioneer Cemetery
- Police
- Soccer Pitch
- Swimming Area
- Tennis Court
- Washrooms
- Wind Surfing
- Bruce Trail
- Georgian Trail
- Soft Surface Trail
- Hard Surface Trail
- Designated Bike Lanes
- Parks
- Grey County Forest
- Provincial Lands
- Crown Lands

Trails Network

TOWN OF THE BLUE MOUNTAINS

Welcome!

The Blue Mountains is pleased to provide the first edition of our Town's Trails Brochure.

This brochure provides trail users with maps that identify all formal Town owned and managed trails. It also identifies trails managed by others; such as the Bruce Trail.

The Blue Mountains offers a total of 260 kilometres of trails ranging from sidewalks to limestone and natural based trails. The trails offer scenic adventures along the Georgian Bay Shoreline and the Niagara Escarpment. They also link through a variety of towns and villages in The Blue Mountains.

The seamless connectivity of trails with our neighbouring communities offers an extended adventure and allows for active transportation opportunities.

Please enjoy your trail experience, and take the opportunity to *explore!*

Georgian Trail

The Georgian Trail!

Constructed on an old railway line, The Georgian Trail stretches from the Municipality of Meaford through The Blue Mountains to the Town of Collingwood. The Trail is quite flat with a base of limestone screening, making the experience for strollers, wheelchairs, and the like quite pleasant.

The Trail provides an up close and personal experience with some of the region's most beautiful and natural amenities. Rich agricultural lands, stunning views of the Niagara Escarpment and the spectacular shores of Georgian Bay just to name a few!

In Thornbury, the Trail crosses the Beaver River via an old trestle bridge, located just north of the Thornbury Fish Ladder.

Take a break and enjoy the *scenery!*

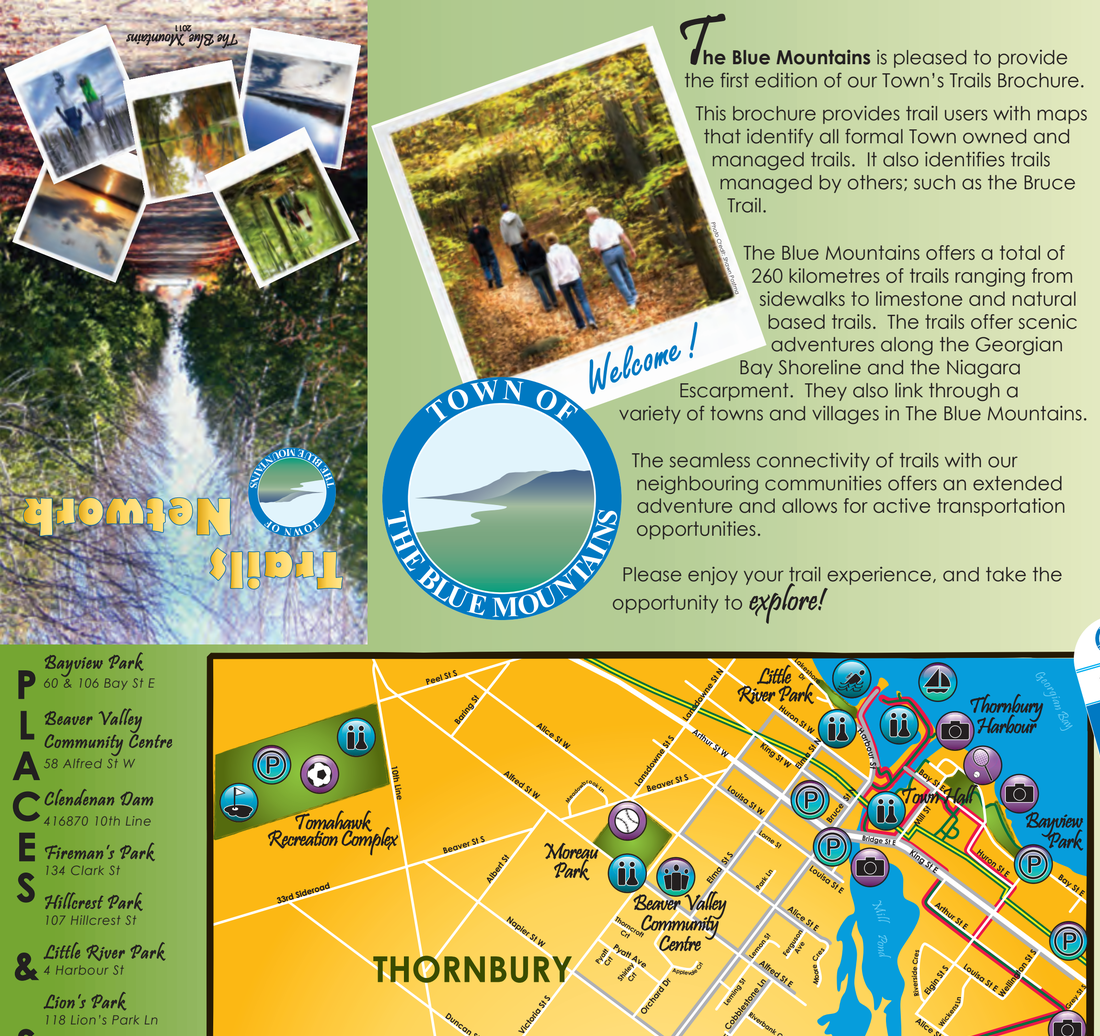
Places & Spaces

Places

- **Bayview Park** — 60 & 106 Bay St E
- **Beaver Valley Community Centre** — 58 Alfred St W
- **Clendenan Dam** — 416870 10th Line
- **Fireman's Park** — 134 Clark St
- **Hillcrest Park** — 107 Hillcrest St
- **Little River Park** — 4 Harbour St
- **Lion's Park** — 118 Lion's Park Ln
- **Marsh St Centre** — 187 Marsh St
- **Moreau Park** — 128 Alfred St W
- **Thornbury-Clarksburg Union Cemetery** — 44 Russell St W
- **Thornbury Harbour** — 41 Bruce St N
- **Tomahawk Recreation Complex** — 417230 10th Line

Spaces

- **Boyer Park** — 101 Crossan Crt
- **Craigleith Community Centre** — 132 Lakeshore Rd E
- **Craigleith Heritage Depot** — 113 Lakeshore Rd E
- **Craigleith Meadows Park** — 157 Alexandra Way
- **Craigleith Provincial Park** — 209403 Highway 26
- **Heritage Park** — 118 Kandahar Ln
- **Nipissing Ridge Park** — 205 Blueski George Cres
- **Northwinds Beach** — 209605 Highway 26



Paddling the Beaver River!

The Beaver River Trail

Completed in 2011, the Trail was constructed using Federal, Provincial and Municipal funds. The Trail in its entirety is 10.7 kilometres and connects the Thornbury Harbour to Clendenan Dam, by way of sidewalks and limestone based trails. A few looping sections of the Trail are natural based which provide a closer look at the Beaver River in an area that has not been reached in many years.

The Beaver River Trail has a number of scenic rest areas and vistas with benches. As well, the Trail meanders through Town parks such as Thornbury Riverwalk area located at The Blue Mountains Municipal Office, Lion's Park and Fireman's Park both in Clarksburg. Many interpretive signs provide historical and environmental education opportunities along the way making this trail both

enjoyable and educational!

(b)

Animal Track Identification

(a) White Tailed Deer
(b) Beaver
(c) Red Fox
(d) Raccoon

(c)

Trails Etiquette

Expect and respect other trail users.

Stay to the right - Pass on the left.

Please stay on the trail...
Do not make new trails or use unmarked trails.

Respect neighbouring landowners by staying off private property and avoiding excess noise.

Leave the trail as you found it; whatever you pack in, pack out!

Please leave the various wildflowers and wildlife for others to enjoy.

Maintain control of your pets and "Stoop and Scoop".

Some trails are user specific. Use trails only according to the permitted uses indicated on the trail signage.

Some trails may close seasonally. Obey any trail closure signs please!

If the weather has been inclement, wet trails may be susceptible to damage. If you are leaving tracks over ½" deep, avoid using the trail regardless of signage.

Cycling the countryside!

SHARE THE ROAD

Being a rural area, almost all of our roads are only two-lane, which means bicyclists, motorists, agricultural equipment operators, horses and riders and pedestrians will often be sharing the road. We want everyone to have a safe and enjoyable experience on our roads.

Ways Bicyclists Can Improve Safety
Follow Rules of the Road!
Be Predictable-Visible-Courteous!
Take Care of Your Gear and Yourself!

Ways Motorists Can Improve Bicyclist Safety
Watch for Bicyclists!
Pass with Care!
Yield to Bicyclists!

Sharing the Road in our Rural Area
Be Aware of Our Migrant Workers!
Watch for Slow Moving Farm Equipment!
Use Caution When Approaching Horses and Riders!

When everyone is careful and courteous, it's easy to share the *road!*

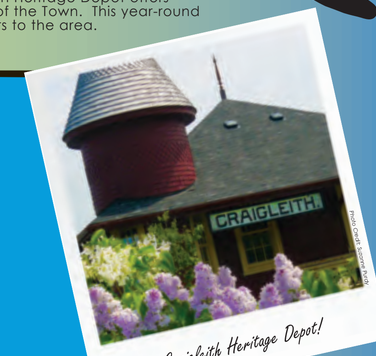
The Nipissing Ridge Trail

Nipissing Ridge Trail network is located just off the Georgian Trail along Lakeshore Road West in the Craigleith area. This limestone based trail meanders along the Niagara Escarpment's Nipissing Ridge, which is an ice-age glacial shoreline for the former Lake Algonquin, dating back approximately 4,000 - 5,500 years. Rich in cultural and historical significance, this trail network is a showcase for the Town.
The Nipissing Ridge Trail also runs along and through a local subdivision connecting the natural beauty of the area to the more developed areas, including the Nipissing Ridge Park and various alpine ski areas.

For a full experience of the area's rich significant history, the historical Craigleith Heritage Depot offers in-depth information. It highlights the unique cultural, natural and industrial history of the Town. This year-round facility has a multi-generational appeal, serving both locals and visitors to the area.

Stop in and take a step back in *history!*

(d)



Craigleith Heritage Depot!

Poisonous Plants

While exploring, please be aware that some of nature's less friendly plants call The Blue Mountains home. Poison ivy and Giant hogweed are two plant species that may cause a reaction if their sap touches your skin.

The best way to avoid coming in contact is to learn how to identify them.
For more facts on weeds in Ontario, refer to the Ministry of Agriculture Food & Rural Affairs website at *http://www.omafra.gov.on.ca/*

Poison ivy

Poison ivy leaves consist of three pointed (smooth or toothed) leaflets roughly 3-12cm long. The middle leaflet has the longest stalk. It is reddish in spring, green in the summer, and various shades of red, orange, and yellow in the Fall. Cream coloured berries may also be present. It can be a single plant, a shrub, or a vine! As the saying goes,
"Leaves of three... let them be!"

Giant hogweed

Giant hogweed is an invasive species that can cause severe burns. The leaves are quite large and very jagged. The stalk (stem) is coarsely hairy with purple blotches. This plant can grow to a height of 5 metres by late summer! It only flowers once during the last year of it's life and the flower alone can be upwards of 1 metre wide!

Sometimes it's confused with the common plant Queen Anne's Lace. But don't be mistaken... Giant hogweed can cause serious irritation!
Contact the Town should you suspect Giant hogweed on our trails!

(a)

Hunting Season

A variety of activities occur on public lands in The Blue Mountains, including traditional hunting seasons. Hunting is allowed on most Crown lands, County lands and some private lands, with the permission of land owners.

People planning to use the trails that are in or near the forested hunting areas should take some precautions;

Be Aware - Know the hunting season dates as they vary year to year.

Be Bright - It is safest to wear a bright blaze orange vest or jacket and hat.

Be Responsible - Dogs and other pets should wear brightly coloured markers to easily identify them as your pet - not wildlife!

The Ministry of Natural Resources website provides an abundance of information regarding hunting seasons in Ontario. *http://www.mnr.gov.on.ca/*

Special Thanks

to the shutterbugs that explored The Blue Mountains and shared their trails photos!

Nancy Newman, Rob Potter, Shawn Postma, Suzanne Purdy, Shawn Everitt & Lindsay Gosnell

Bruce Trail - Kolapore!

The Blue Mountains is home to a gorgeous section of the Bruce Trail. The Bruce Trail is a public footpath running from Niagara to Tobermory. It is entirely built and maintained by volunteers for the purpose of raising awareness for the protection of the Niagara Escarpment, the most significant landform in southern Ontario.

Bicycles, motorized vehicles, and horses are not allowed except along road sections of the Trail and in those few areas where explicit permission is posted.

The Blue Mountains section of the Main Trail is illustrated on the opposite page. Detailed mapping (including Side Trails) and further information is available at The Bruce Trail Conservancy. *http://brucetrail.org*

Leave only your thanks...
Take nothing but *photographs!*

APPENDIX G

Georgian Trail Network Map

Tom Thomson Trail to Owen Sound begins at Raper Park

Meaford

Meaford Harbour terminus (Bridge St.)

Memorial Park

Ride on Bikes 4

Nelson St.

Sykes St.

Grey Rd. 7

Christie Beach

Lora Bay
GOLF CLUB AT LORA BAY

S.R. 7

S.R. 4

S.R. 30

Peel St.

Arthur St. W.

Bruce St.

King St.

Bay St.

Thornbury

Fish ladder

Bayview Park

Peasemarsh
Nature Preserve

Marsh St.

Clarksburg

Council Beach

Grey Rd. 40

GEORGIAN BAY CLUB

Camperdown Rd.

GEORGIAN PEAKS
SKI CLUB

Wards Rd.

Craigleith
Prov. Park

Shale Rock Coffee House 5

Northwinds Beach

Arrowhead Rd.

Long Pt. Rd.

ALPINE
SKI CLUB

CRAIGLEITH
SKI CLUB

CRAIGLEITH
HERITAGE DEPOT

Blue Mt. Rd.

Craigleith Manor B&B 2

CRANBERRY
GOLF RESORT

MONTERRA
GOLF COURSE

BLUE
MOUNTAIN
VILLAGE

Mountain Rd.

Little Ed's Bikes & Skis 3

BLUE MOUNTAIN
GOLF CLUB

Osler Bluff Rd.

Scenic Caves
Nature Adventures

Tenth Line

Poplar Side Rd.

OSLER BLUFF
SKI CLUB

Collingwood

Harbourview Park terminus
(foot of Birch St.)

First St.

Second St.

Third St.

Fourth St.

Fifth St.

Sixth St.

High St.

St. Paul

Ste. Marie

Hurontario St.

Ontario St.

Hume St.

Burnside Consulting Engineers 1

Collingwood Trails

124

Loree Forest

BLUE MOUNTAIN

BEAVER VALLEY

Nottawasaga Bay

N

Georgian Trail
since 1989
GeorgianTrail.ca

Original Northern Railway Line

The Northern Railway line originally connected Collingwood and Meaford. It was completed in 1872 and used for rail transportation until its formal abandonment by the Canadian National Railways in 1984.

A 1988 feasibility study recommended that the property be kept in the public domain and developed as a recreational trail.

On October 31,1989 the Georgian Trail officially opened as a wonderful asset for both residents and visitors to the South Georgian Bay area.

Craigleith Depot, circa 1950

TRAIL LENGTH: 34 km

The Georgian Trail begins / ends in the east at Collingwood's Harbourview Park and near Meaford Harbour in the west. There are many access points along the way.

Public washrooms are seasonal

RATING: Easy / Accessible

USES: Hiking, cycling, jogging, cross-country skiing, snowshoeing

DISTANCES:

Meaford to Thornbury: **13 km**
Thornbury to Collingwood: **21 km**

MAP SCALE: 1 cm = 1 km

O.P.P. 883-310-1122
Emergencies call 911

SPONSORS

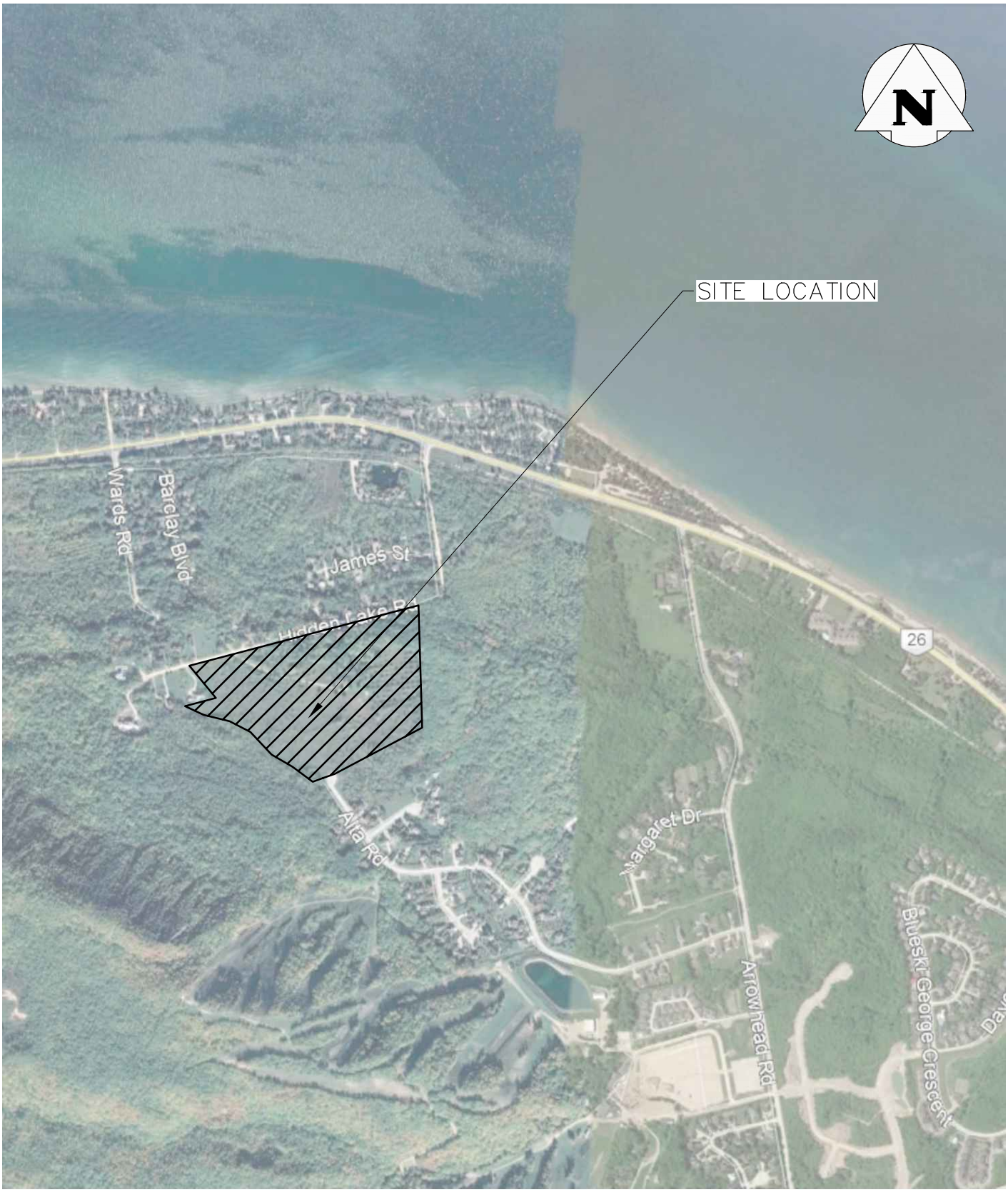
1. RJ Burnside Engineering
2. Craigleith Manor B&B
3. Little Ed's Bikes and Skis
4. Ride on Bikes–Rentals
5. Shale Rock Coffee House

Heathcote

WEBSITES

collingwood.ca/trails
collingwood.ca
meaford.ca
thebluemountains.ca
tomthomsontrail.com
visitsouthgeorgianbay.ca
natureleague.ca
watershedtrust.ca

FIGURES



ALTA RESIDENTIAL DEVELOPMENT – PHASE 2
THE TOWN OF THE BLUE MOUNTAINS

SITE LOCATION

CROZIER
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	Design	Project No.	
T.D.S.	K.H.		0119–2528
Date	Check	Scale	Dwg.
2021/11/25	K.H.	N.T.S	FIG. 01

DRAFT PLAN OF SUBDIVISION

OF PART OF LOTS 23 & 24
CONCESSION 4
BLOCKS 67, 72, 73 and PART of
BLOCKS 75 & 76 and PART of
ALTA ROAD
REGISTERED PLAN 1127
TOWN OF THE BLUE MOUNTAINS
(FORMER TOWNSHIP OF COLLINGWOOD)
COUNTY OF GREY

REVISED FEBRUARY 11, 2022

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51 (17) OF THE PLANNING ACT

(a) AS SHOWN ON DRAFT PLAN,
(b) AS SHOWN ON KEY PLAN,
(c) AS SHOWN ON DRAFT AND KEY PLANS,
(d) THE LAND IS TO BE USED ACCORDING TO THE SCHEDULE OF LAND USE,
(e) AS SHOWN ON DRAFT PLAN,
(f) AS SHOWN ON DRAFT PLAN,
(g) AS SHOWN ON DRAFT AND KEY PLANS,
(h) PIPED WATER TO BE MADE AVAILABLE
(i) SOIL IS SILTY CLAY,
(j) AS SHOWN ON DRAFT PLAN,
(k) PIPED WATER AND SANITARY SEWERS TO BE MADE AVAILABLE
(l) NONE

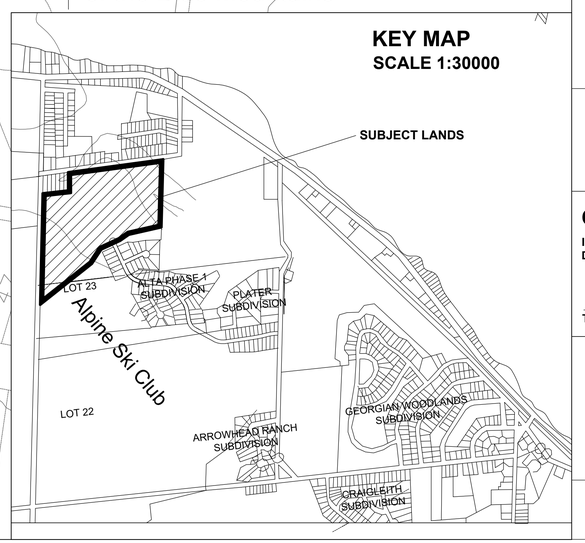
SCHEDULE OF LAND USE

	LOTS/BLOCKS	AREA (ha.)
LOW DENSTY RECREATIONAL RESIDENTIAL	LOTS 1-60	10.99
OPEN SPACE, WALKWAYS, STORMWATER MANAGEMENT	BLOCKS 61-65	15.87
ROADWAYS (Alta Road, Street B, Street C)		3.11
TOTAL AREA		29.97

	AREA (ha.)	PERCENT
ROADS AND RESIDENTIAL	14.10	47%
OPEN SPACE TOTAL	15.87	53%

NOTE:
Municipal road allowance shown (darker) is to be deeded to applicant by the Town of the Blue Mountains.

KEY MAP
SCALE 1:30000



SCALE 1:3000

METRIC

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

OWNER'S AUTHORIZATION

I AUTHORIZE PASCUZZO PLANNING INC. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE COUNTY OF GREY FOR APPROVAL

TABERA LTD. DATE

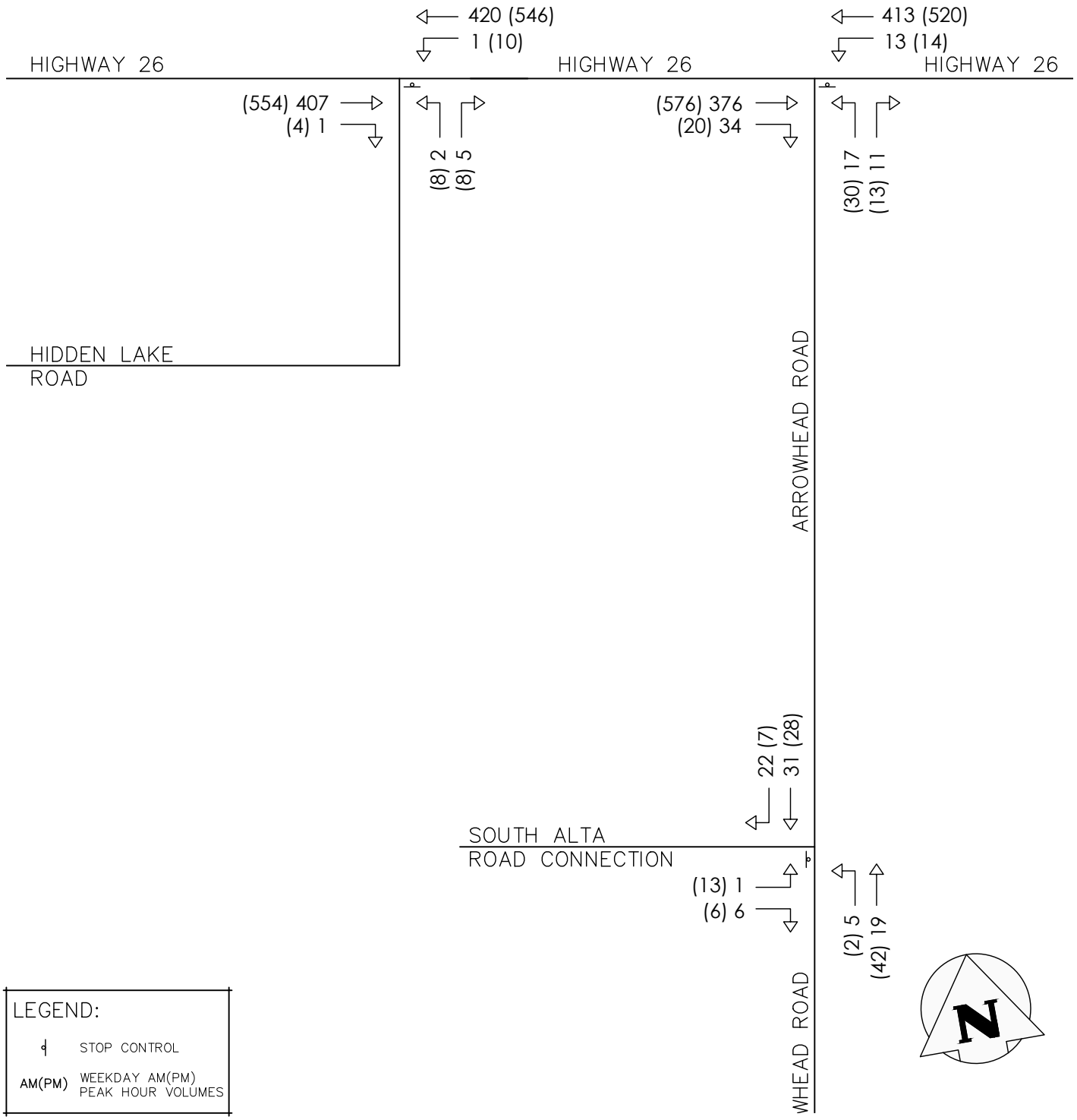
SURVEYOR'S CERTIFICATE

I CERTIFY THAT: THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY SHOWN ON THIS PLAN.

PAUL R. THOMSEN O.L.S. DATE

PASCUZZO PLANNING INC.

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



LEGEND:

ϕ	STOP CONTROL
AM(PM)	WEEKDAY AM(PM) PEAK HOUR VOLUMES

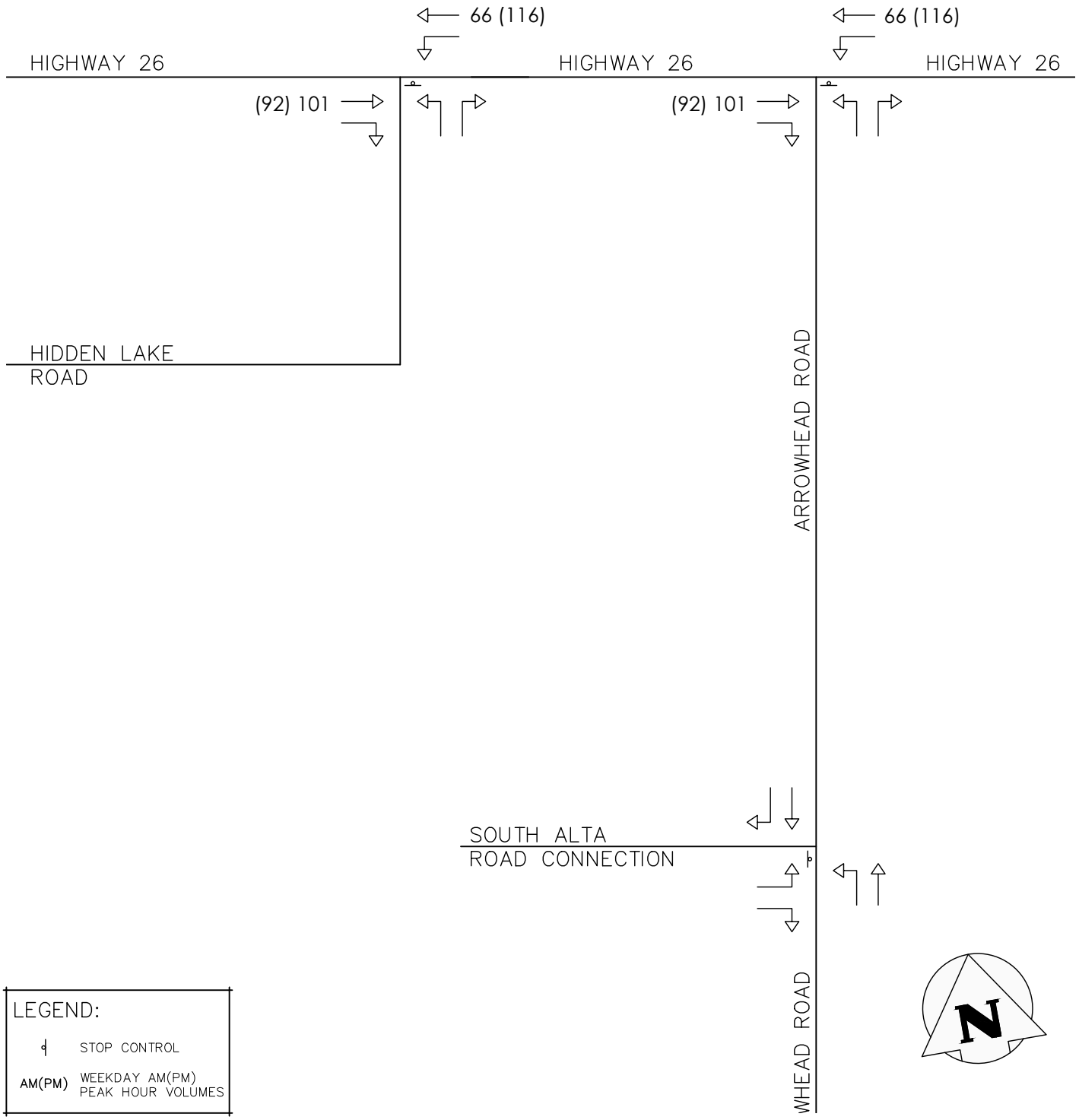
ALTA RESIDENTIAL DEVELOPMENT – PHASE 2
THE TOWN OF THE BLUE MOUNTAINS

Existing Peak Hour Volumes

CROZIER 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	Design	Project No.	
T.D.S.	K.H.		0119–2528
Date	Check	Scale	Dwg.
2021/11/25	K.H.	N.T.S	FIG.3

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



LEGEND:

ϕ	STOP CONTROL
AM(PM)	WEEKDAY AM(PM) PEAK HOUR VOLUMES

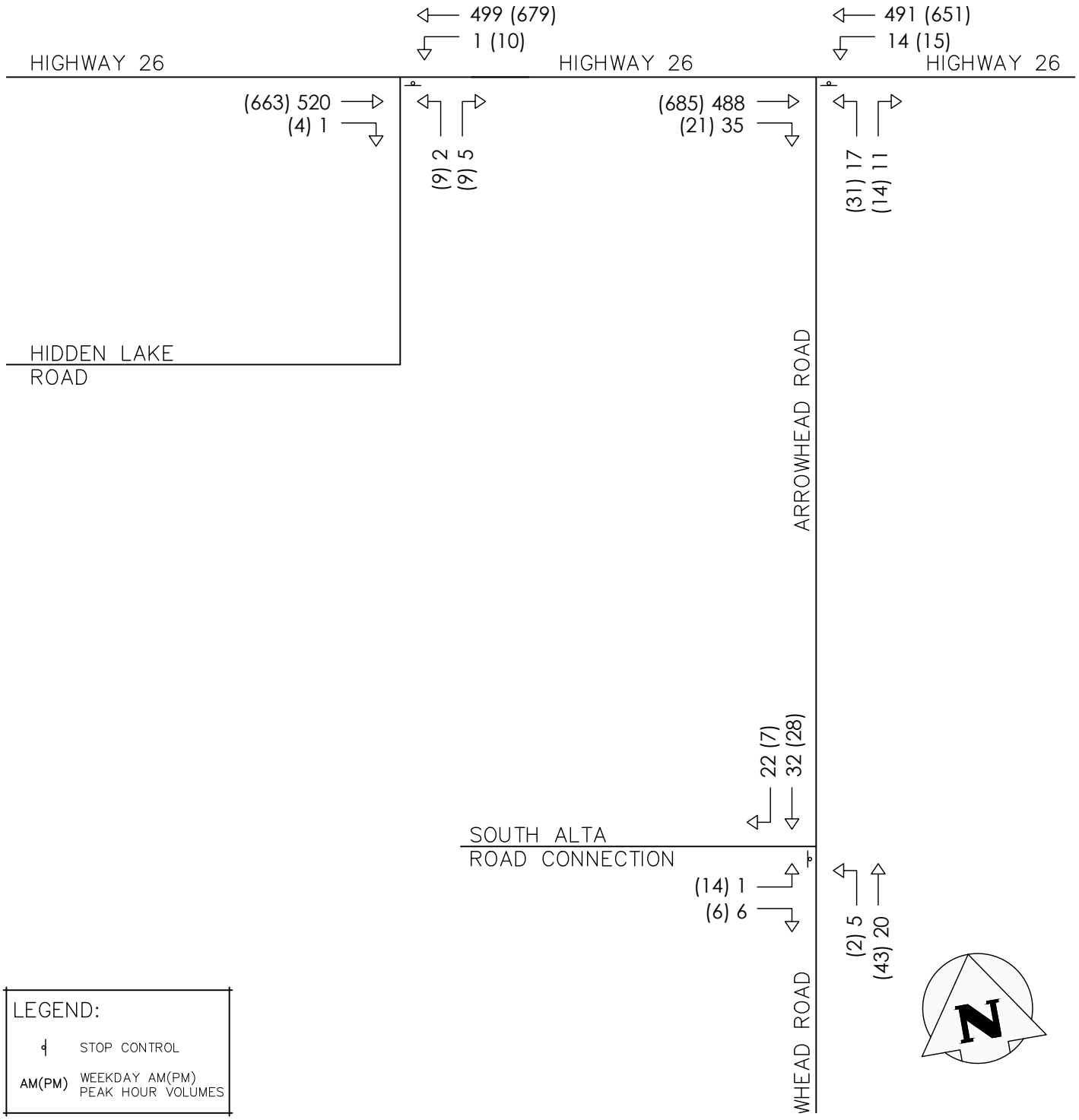
ALTA RESIDENTIAL DEVELOPMENT – PHASE 2
THE TOWN OF THE BLUE MOUNTAINS

2024 Background Development Volumes

CROZIER 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	Design	Project No.	
T.D.S.	K.H.		0119–2528
Date	Check	Scale	Dwg.
2021/11/25	K.H.	N.T.S	FIG. 4

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



LEGEND:

ϕ	STOP CONTROL
AM(PM)	WEEKDAY AM(PM) PEAK HOUR VOLUMES

ALTA RESIDENTIAL DEVELOPMENT – PHASE 2
THE TOWN OF THE BLUE MOUNTAINS

2024 Future Background Volumes

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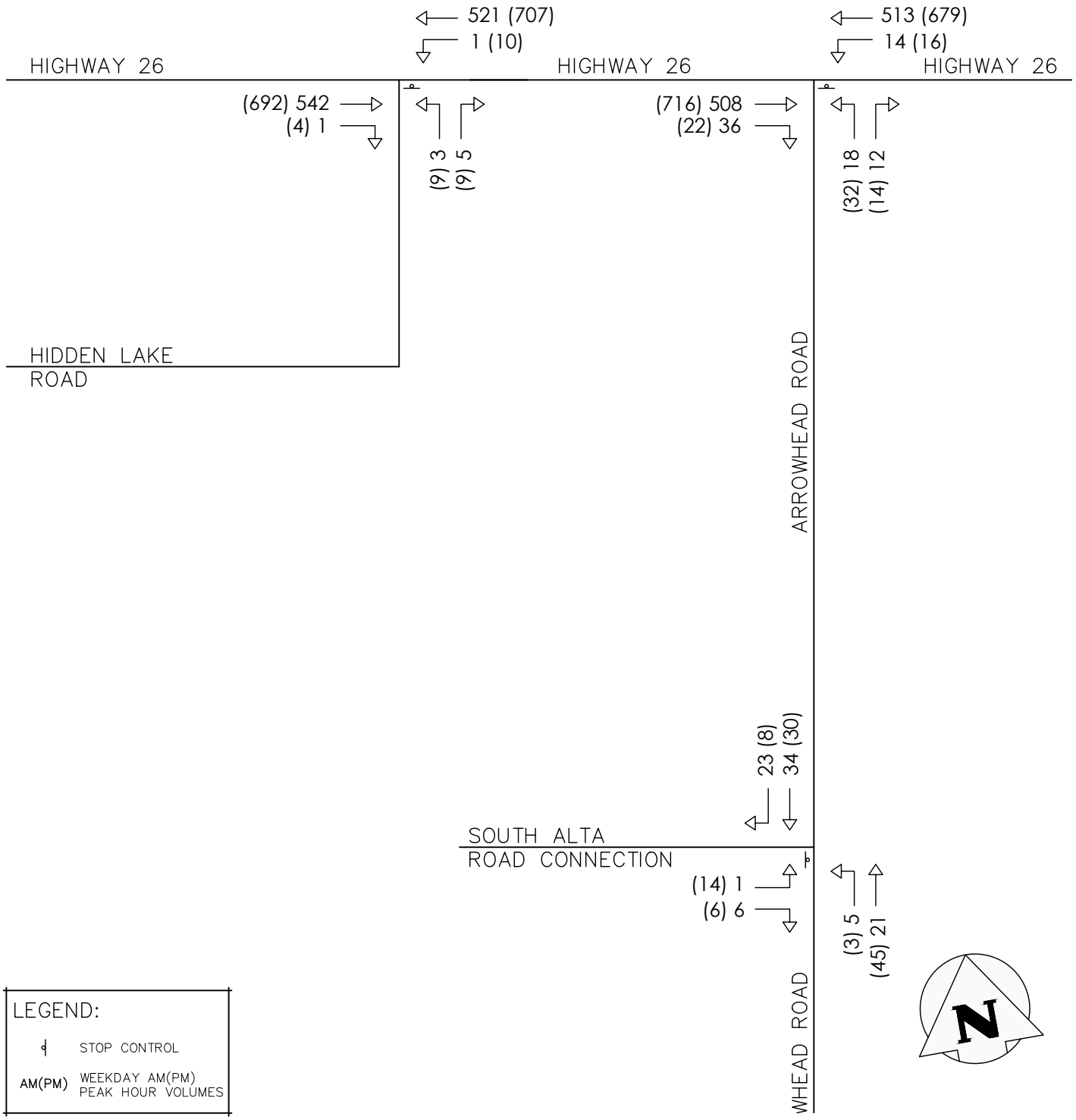
Drawn	Design	Project No.	
T.D.S.	K.H.		0119–2528
Date	Check	Scale	Dwg.
2021/11/25	K.H.	N.T.S	FIG.5

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



LEGEND:

ϕ	STOP CONTROL
AM(PM)	WEEKDAY AM(PM) PEAK HOUR VOLUMES

ALTA RESIDENTIAL DEVELOPMENT – PHASE 2
THE TOWN OF THE BLUE MOUNTAINS

2029 Future Background Volumes

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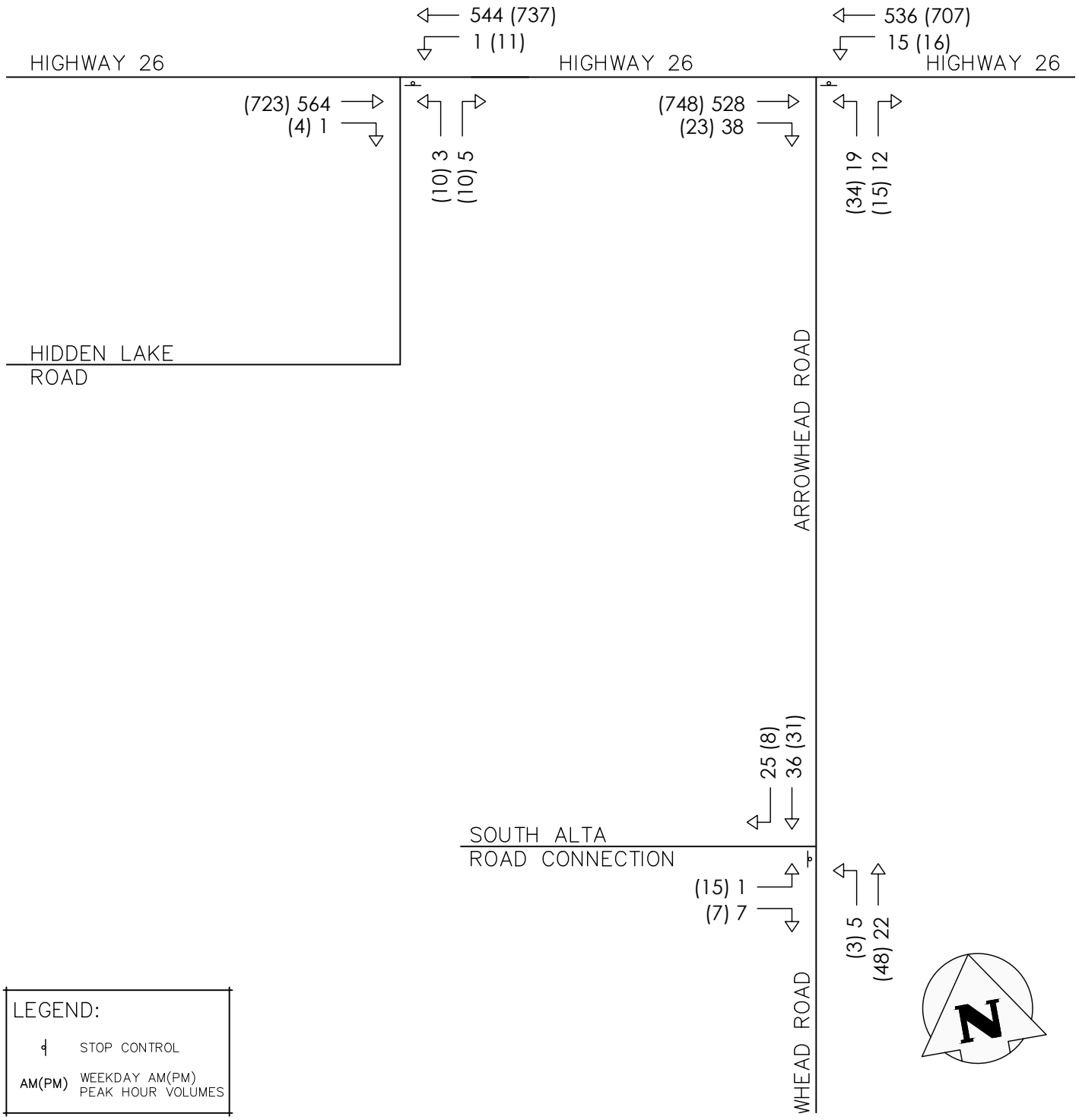
Drawn	Design	Project No.	
T.D.S.	K.H.		0119–2528
Date	Check	Scale	Dwg.
2021/11/25	K.H.	N.T.S	FIG. 6

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



LEGEND:

ϕ	STOP CONTROL
AM(PM)	WEEKDAY AM(PM) PEAK HOUR VOLUMES

ALTA RESIDENTIAL DEVELOPMENT – PHASE 2
THE TOWN OF THE BLUE MOUNTAINS

2034 Future Background Volumes

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Drawn	Design	Project No.	
T.D.S.	K.H.		0119–2528
Date	Check	Scale	Dwg.
2021/11/25	K.H.	N.T.S	FIG. 7

NOTE:
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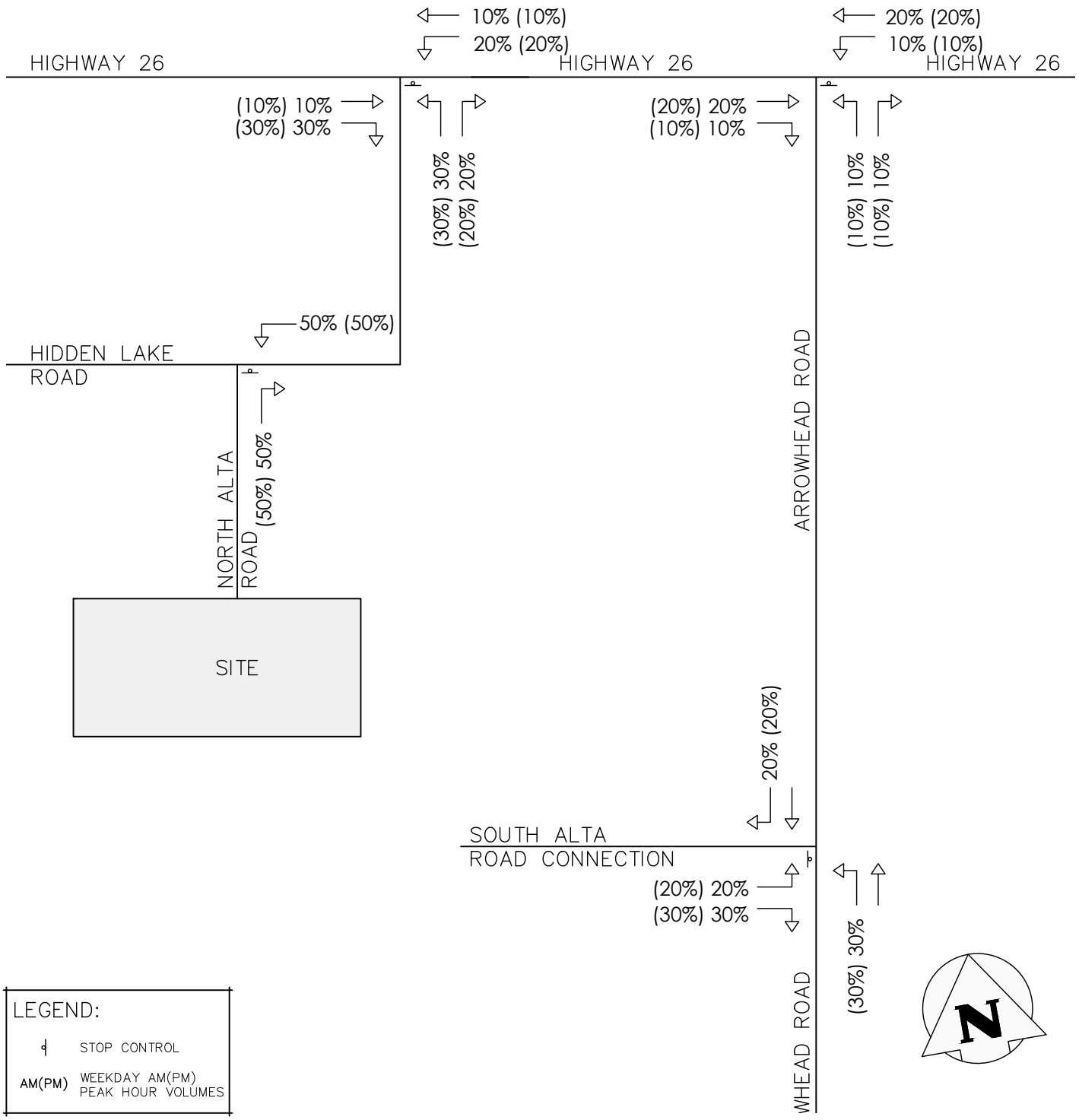

LEGEND:

ϕ	STOP CONTROL
AM(PM)	WEEKDAY AM(PM) PEAK HOUR VOLUMES

ALTA RESIDENTIAL DEVELOPMENT – PHASE 2
THE TOWN OF THE BLUE MOUNTAINS

Trip Distribution

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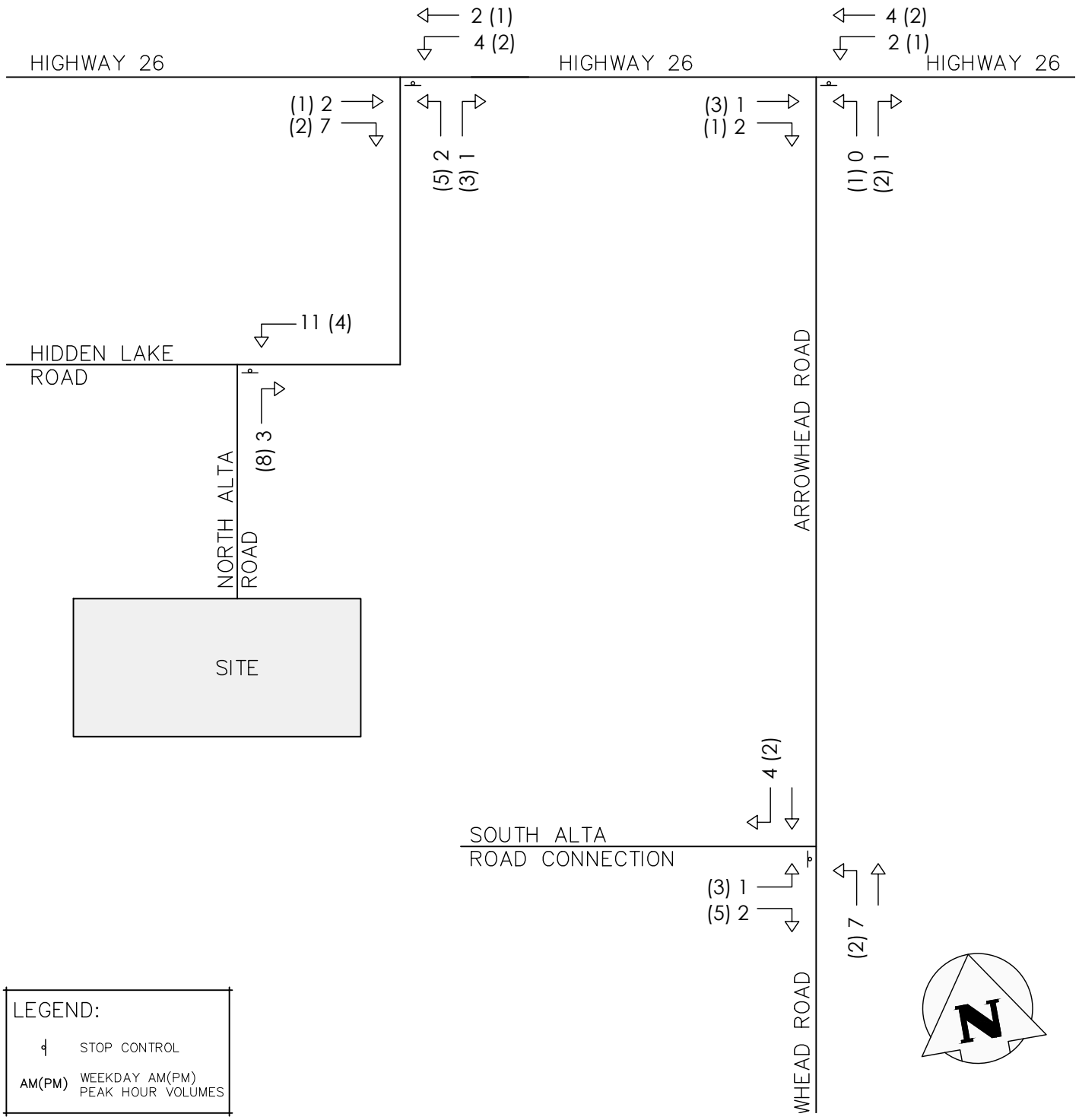
Drawn	Design	Project No.	
T.D.S.	K.H.		0119–2528
Date	Check	Scale	Dwg.
2021/11/25	K.H.	N.T.S	FIG. 8

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



LEGEND:

ϕ	STOP CONTROL
AM(PM)	WEEKDAY AM(PM) PEAK HOUR VOLUMES

ALTA RESIDENTIAL DEVELOPMENT – PHASE 2
THE TOWN OF THE BLUE MOUNTAINS

Trip Assignment

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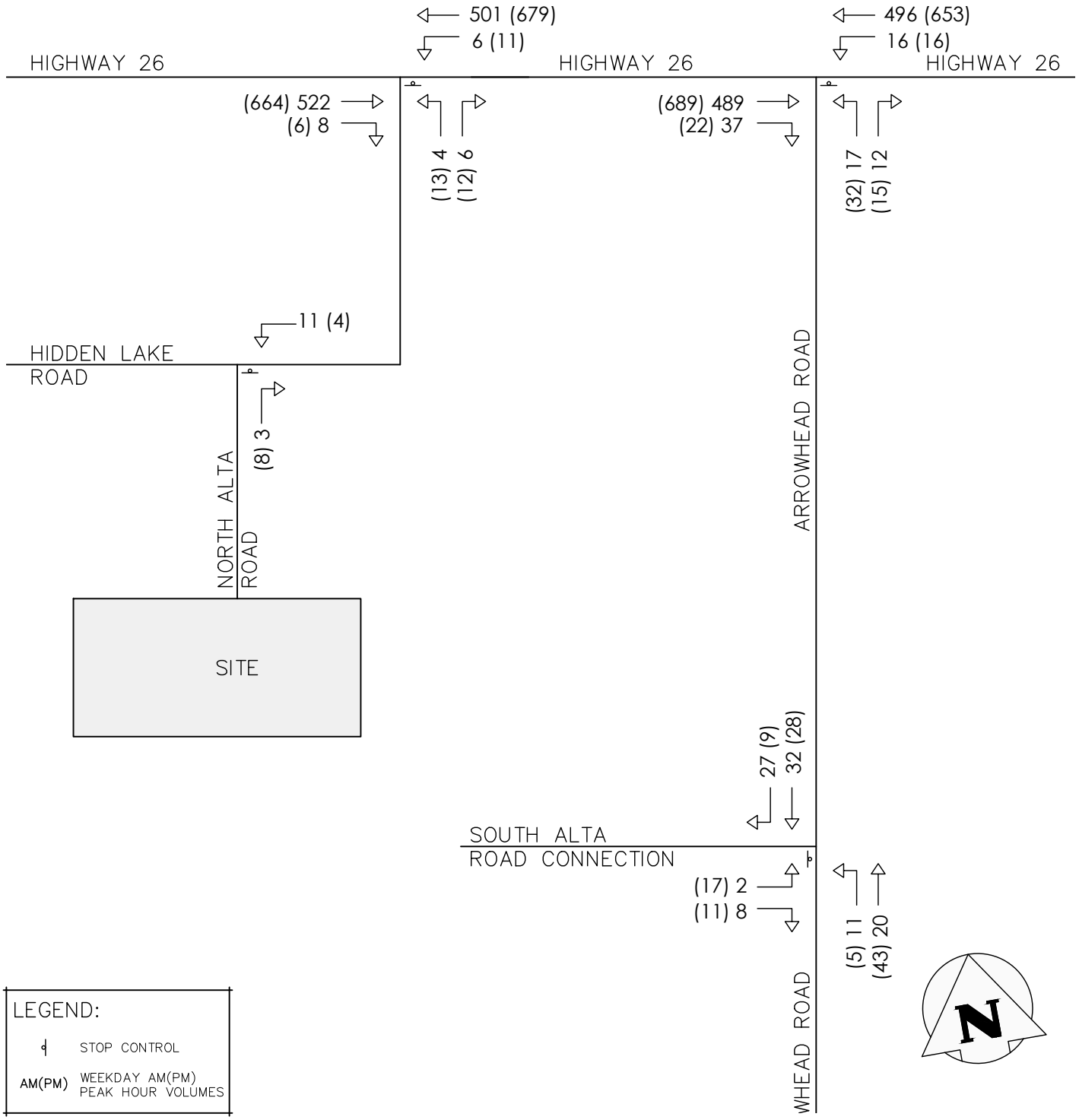
Drawn	Design	Project No.	
T.D.S.	K.H.		0119–2528
Date	Check	Scale	Dwg.
2021/11/25	K.H.	N.T.S	FIG. 9

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



LEGEND:

ϕ	STOP CONTROL
AM(PM)	WEEKDAY AM(PM) PEAK HOUR VOLUMES

ALTA RESIDENTIAL DEVELOPMENT – PHASE 2
THE TOWN OF THE BLUE MOUNTAINS

2024 Future Total Volumes

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Drawn	Design	Project No.	
T.D.S.	K.H.		0119–2528
Date	Check	Scale	Dwg.
2021/11/25	K.H.	N.T.S	FIG. 10

NOTE:
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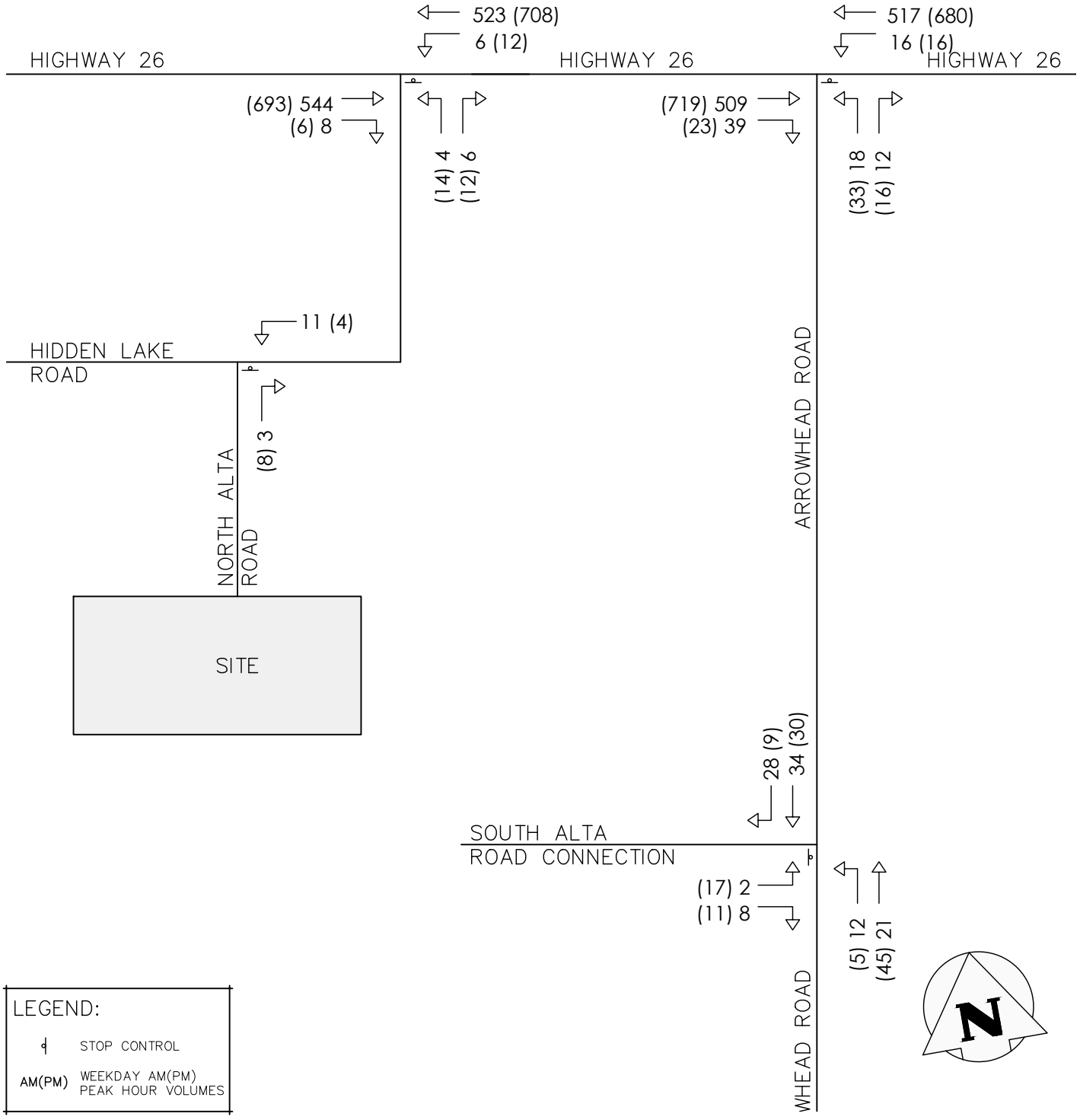

LEGEND:

ϕ	STOP CONTROL
AM(PM)	WEEKDAY AM(PM) PEAK HOUR VOLUMES

ALTA RESIDENTIAL DEVELOPMENT – PHASE 2
THE TOWN OF THE BLUE MOUNTAINS

2029 Future Total Volumes

CROZIER CONSULTING ENGINEERS
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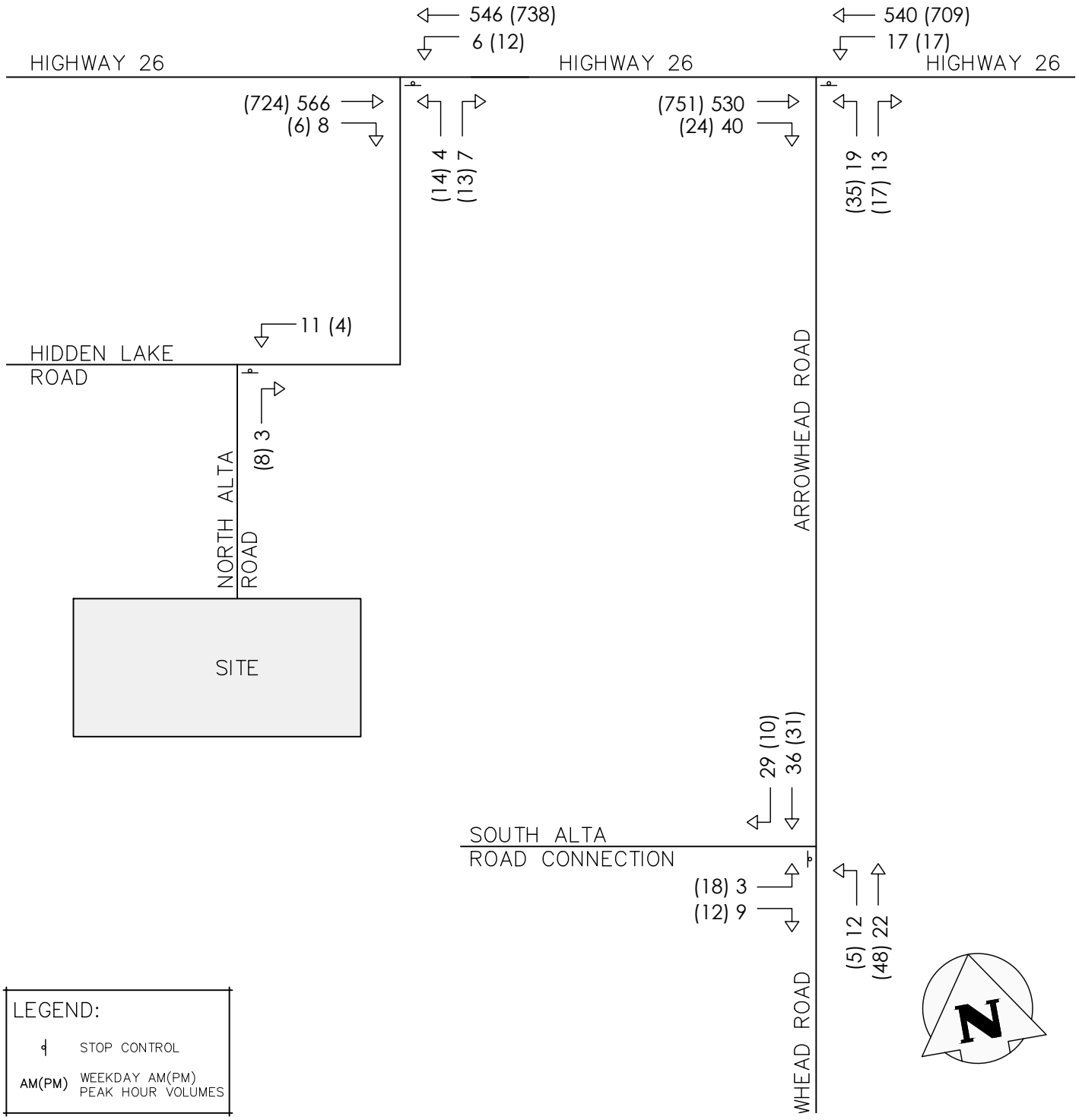
Drawn	Design	Project No.	
T.D.S.	K.H.		0119–2528
Date	Check	Scale	Dwg.
2021/11/25	K.H.	N.T.S	FIG. 11

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



LEGEND:

ϕ	STOP CONTROL
AM(PM)	WEEKDAY AM(PM) PEAK HOUR VOLUMES

ALTA RESIDENTIAL DEVELOPMENT – PHASE 2
THE TOWN OF THE BLUE MOUNTAINS

2034 Future Total Volumes

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Drawn	Design	Project No.	
T.D.S.	K.H.		0119–2528
Date	Check	Scale	Dwg.
2021/11/25	K.H.	N.T.S	FIG. 12