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7582 County Road 9

TRANSPORTATION IMPACT STUDY

2826878 Ontario Inc.

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	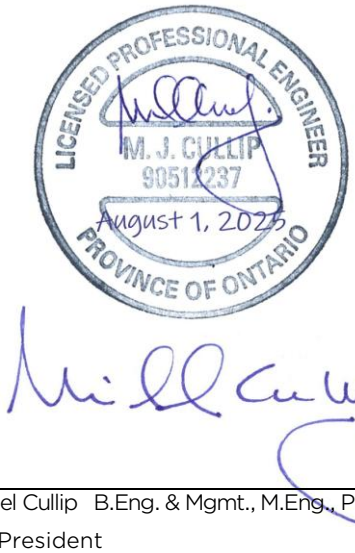
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Issue	Date	Description
1	August 1, 2025	Final Report

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1 Introduction

Tatham Engineering Limited was retained by 2826878 Ontario Inc. to prepare a transportation impact study in support of the proposed residential development to be located at 7582 County Road 9 in the Township of Clearview. The location of the site is illustrated in Figure 1.

1.1 REPORT OBJECTIVE

The objective of this report is to present the findings of the transportation impact study and to address the requirements of the Township of Clearview with respect to the potential transportation impacts of the proposed development on the area road network. In particular, the following will be discussed:

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

The study has been completed in accordance with the agreed upon Terms of Reference provided in Appendix A.

1.2 REPORT STRUCTURE

The report is structured as follows:

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

2 Existing Conditions

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

2.1 ROAD NETWORK

The road network to be addressed in this study consists of County Road 9, Fairgrounds Road South/Mill Street, Collingwood Street and the following intersections:

- County Road 9 with Collingwood Street; and
- County Road 9 with Fairgrounds Road South/Mill Street.

Aerial imagery of the road system is provided in Figure 2; whereas additional details are provided below. The functional classifications for the study area roads are per *Schedule G1* of the *Official Plan of the Township of Clearview*[1].

2.1.1 Roads

County Road 9

County Road 9 (known locally as Lousia Street but referenced as County Road 9 for the purpose of this study) is an east-west arterial road. While under the jurisdiction of the County of Simcoe to the west and east of the study area, the road is under the jurisdiction of the Township between Collingwood Street and Mary Street, which encompasses the study area. County Road 9 has a two-lane, semi-urban cross-section with gravel shoulders and a sidewalk on the south side of the road. The road has a posted speed limit of 50 km/h through the area.

Fairgrounds Road South/Mill Street

Fairgrounds Road South (north of County Road 9) and Mill Street (south of County Road 9) are both under the jurisdiction of the Township and together form a north-south corridor through the area.

Fairgrounds Road South is a collector road with a two-lane rural cross-section, providing one lane of travel per direction with gravel/grass shoulders and open ditches, and a posted speed limit of 50 km/h.

[1] *Official Plan of the Township of Clearview - Schedule G-1 Transportation System Creemore*. Township of Clearview. October 28, 2024.

Mill Street is an arterial road with a two-lane urban cross-section (i.e. curb and gutter), providing one lane of travel per direction with sidewalks provided on both sides of the road. The speed limit on Mill Street is unposted; thus, a speed limit of 50 km/h is assumed.

Collingwood Street

Collingwood Street is a north-south road under the jurisdiction of the Township, classified as a collector road to the south of County Road 9 and as a local road to the north of County Road 9. To the south of County Road 9, Collingwood Street provides a two-lane, semi-urban cross-section with gravel shoulders and a sidewalk on the east side of the road. There is barrier curb across the frontage of the Nottawasaga and Creemore Public School along with an on-street parking area. To the north of County Road 9, Collingwood Street consists of a two-lane rural cross-section with grass shoulders and open ditches. The road terminates as a dead end approximately 390 metres north of County Road 9. The speed limit is unposted; thus, a speed limit of 50 km/h is assumed.

2.1.2 Intersections

Fairgrounds Road South/Mill Street & County Road 9

The intersection of Fairgrounds Road South/Mill Street with County Road 9 is a 4-leg intersection operating with stop control on Fairgrounds Road South and Mill Street. All approaches are single lane (i.e. no exclusive turn lanes are provided).

Collingwood Street & County Road 9

The intersection of Collingwood Street with County Road 9 is a 4-leg intersection operating with stop control on Collingwood Street. All approaches are single lane (i.e. no exclusive turn lanes are provided).

2.2 ACTIVE TRANSPORTATION NETWORK

2.2.1 Pedestrian Network

As noted above, there are sidewalks provided on most of the study area roads. The existing sidewalk network is illustrated in Figure 3.

2.2.2 Cycling Network

There are no designated cycling facilities within the study area (cyclists either travel on the road or on the sidewalks).

2.3 TRAFFIC VOLUMES

2.3.1 Traffic Counts

To determine existing traffic volumes on the study area road network, a traffic count was conducted at the study area intersections on Wednesday, October 30, 2024, from 7:00 to 9:00, 11:00 to 14:00 and 15:00 to 18:00. The observed peak hour volumes (reflective of fall conditions) are illustrated in Figure 4, whereas count details are provided in Appendix B.

2.3.2 Seasonal Adjustment

To consider the need for seasonal adjustments to the traffic volumes, average daily traffic volumes for the spring, summer and fall periods were obtained from the County of Simcoe for County Road 9, both west and east of the study area. The seasonal volumes are provided in Table 1.

Table 1: County Road 9 Seasonal Traffic Volumes – 2024

ROAD SECTION	SPRING	SUMMER	FALL
County Road 9 Concession 8 to Mill Street	1,128	1,295	1,165
County Road 9 Mill Street to County Road 42	3,932	3,770	3,937

As indicated, the daily volumes on County Road 9 are relatively consistent across each season, with the summer volumes marginally greater than the spring and fall volumes to the west of Creemore, and marginally lower to the east of Creemore.

Given that there is no clear seasonal variation, and further recognizing that the observed traffic counts were conducted during the school year and thus capture the trip generation associated with the Nottawasaga and Creemore Public School (located on Collingwood Street, immediately south of County Road 9) that would not otherwise be on the network during the summer months, no seasonal variation was considered.

2.3.3 2025 Volumes

To reflect 2025 conditions, the 2024 volumes were adjusted by a background growth rate of 2.0% (additional discussion on background growth is provided in Section 3.2.1).

The resulting 2025 peak hour traffic volumes are illustrated in Figure 5. It is noted that small volume adjustments have been made to balance the volumes on County Road 9 between

Collingwood Street and Fairgrounds Road South/Mill Street. Furthermore, for movements where no volumes were observed, a minimum volume of 1 vehicle has been assumed.

2.4 TRAFFIC OPERATIONS

The capacity, and hence operations, of a road system is effectively dictated by its intersections. As such, the traffic assessment has focused on the operations of the study area intersections, based on the following:

- the 2025 peak hour traffic volumes;
- the existing intersection configurations and control; and
- procedures outlined in the *Highway Capacity Manual 6th Edition*[2] (using Synchro v.11 software).

For unsignalized intersections, the analysis considers the following for the critical movements (namely the stop-controlled movements of left turn movements):

- the average delay (measured in seconds);
- level of service (LOS); and
- volume to capacity (v/c) ratio.

Level of service A corresponds to the best operating condition with minimal delays whereas level of service F corresponds to poor operations resulting from high intersection delays (level of service definitions are provided in Appendix C). A v/c ratio of less than 1.0 indicates the intersection movement/approach is operating at less than capacity while v/c of 1.0 indicates capacity has been reached.

A summary of the operational assessment is provided in Table 2 with detailed operations worksheets included in Appendix D.

As indicated, the study area intersections provide excellent operations (LOS B or better) with minor delays and reserve capacity.

2.5 NEED FOR IMPROVEMENTS

Based on the existing volumes, intersection configurations and controls, and resulting operations, no intersection improvements are required to support the existing conditions.

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[2] *Highway Capacity Manual, 6th Edition*. Transportation Research Board, October 2016.

Table 2: Intersection Operations – 2025

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
County Road 9 & Collingwood Street	EB L	free	7	A	0.00	8	A	0.00
	WB L	free	8	A	0.06	8	A	0.05
	NB LTR	stop	10	B	0.12	10	B	0.08
	SB LTR	stop	12	B	0.01	11	B	0.01
County Road 9 & Fairgrounds Road South/ Mill St	EB L	free	8	A	0.02	8	A	0.01
	WB L	free	8	A	0.03	8	A	0.04
	NB LTR	stop	12	B	0.14	12	B	0.15
	SB LTR	stop	12	B	0.11	13	B	0.12

L – left T – thru R – right LTR – left-thru-right LT – left-thru TR – thru-right LR – left-right

3 Future Background Conditions

This chapter will describe the road network and background traffic volumes expected for the years 2030, 2035 and 2040. The 2030 horizon year has been adopted to reflect full build-out of the proposed development, whereas the 2035 and 2040 horizons have been adopted to address the longer-term impacts of the proposed development (5 and 10 years beyond full buildout).

3.1 ROAD NETWORK

There are no planned improvements to the study area road network within the study horizon considered herein. As such, the road network as described in Section 2.1 has been maintained in the assessment of future conditions.

3.2 TRAFFIC VOLUMES

Future background traffic volumes for the 2030, 2035 and 2040 horizon years have been estimated based on existing traffic volumes, background growth projections, and development specific volumes from planned developments in the area (excluding the subject development).

3.2.1 Background Growth

As resolved with the Town through the Terms of Reference, a background growth rate of 2% per annum has been applied to the volumes on the road network.

3.2.2 Development Growth

In addition to the background growth rate, additional traffic volumes generated by other planned developments in the area have also been considered. As resolved with the Township, the following developments have been identified for inclusion in establishing the future background volumes:

- Tribute Residential Development; and
- Zeng Residential Development.

The locations of the above-noted developments in relation to the subject site are provided in Figure 6 whereas additional details are provided below, with relevant excerpts from the corresponding traffic studies provided in Appendix E. For the purpose of this study, full build-out of the background developments has been assumed by the 2030 horizon.

Tribute Development

As per the *Creemore Commons Residential Development Traffic Impact Study*[3], the Tribute Development will consist of 365 single-family residential units and 171 townhouse units. Upon full buildout, it is projected to generate an additional 319 trips during the AM peak hour and 425 trips during the PM peak hour. The assignment of the development traffic through the study area is illustrated in Figure 7 and assumes all traffic distributed to/from the west along County Road 9 as per the respective TIS will continue through the study area intersections, dispersing to/from the north along Fairgrounds Road or continuing to/from the west on County Road 9. For the purposes of this report, it has been assumed that 75% of the traffic distributed through the study area will travel to/from the north along Fairgrounds Road North (i.e. to/from Collingwood, Blue Mountains, etc.); whereas the remaining 25% will travel to/from the west along County Road 9.

Zeng Development

As per the *Edward/George Residential Development Traffic Impact Brief*[4], the Zeng Development will consist of 32 single-family residential units and 30 townhouses. Upon full buildout, the development is projected to generate 44 new trips during the AM peak hour and 56 new trips during the PM peak hour. It has been assumed that 75% of the traffic distributed through the study area will travel to/from the north along Fairgrounds Road North (i.e. to/from Collingwood, Blue Mountains, etc.); whereas the remaining 25% will travel to/from the west along County Road 9. The distribution and assignment of the development trips to the study area is illustrated in Figure 8.

3.2.3 Background Traffic Volumes

The resulting background traffic volumes for the 2030, 2035 and 2040 horizon years are illustrated in Figure 9 through Figure 11, reflective of the 2025 volumes adjusted to consider a 2% background growth rate and the volumes associated with the background developments.

3.3 TRAFFIC OPERATIONS

The study area intersections were again analyzed for each horizon year given the projected background volumes. The results of the operational analyses are summarized in Table 3 through Table 5, with detailed worksheets provided in Appendix F.

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[3] *Creemore Commons Residential Development Traffic Impact Study.* Crozier Consulting Engineers, April 2023.

[4] *Edward/George Street Residential Development Traffic Impact Brief.* Tatham Engineering Limited, May 17, 2019.

As indicated, the study area intersections are expected to provide good operations (LOS C or better) with average to minor delays and reserve capacity through the 2040 horizon.

Table 3: Intersection Operations – 2030 Background

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
County Road 9 & Collingwood Street	EB L	free	8	A	0.00	8	A	0.00
	WB L	free	8	A	0.07	8	A	0.06
	NB LTR	stop	11	B	0.14	11	B	0.09
	SB LTR	stop	12	B	0.01	12	B	0.01
County Road 9 & Fairgrounds Road South/ Mill St	EB L	free	8	A	0.02	8	A	0.01
	WB L	free	8	A	0.04	8	A	0.04
	NB LTR	stop	13	B	0.21	13	B	0.20
	SB LTR	stop	14	B	0.19	16	C	0.26

L – left T – thru R – right LTR – left-thru-right LT – left-thru TR – thru-right LR – left-right

Table 4: Intersection Operations – 2035 Background

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
County Road 9 & Collingwood Street	EB L	free	8	A	0.00	8	A	0.00
	WB L	free	8	A	0.07	8	A	0.06
	NB LTR	stop	11	B	0.16	11	B	0.11
	SB LTR	stop	13	B	0.02	12	B	0.01
County Road 9 & Fairgrounds Road South/ Mill St	EB L	free	8	A	0.02	8	A	0.01
	WB L	free	8	A	0.04	8	A	0.04
	NB LTR	stop	14	B	0.24	14	B	0.24
	SB LTR	stop	15	B	0.22	18	C	0.30

L – left T – thru R – right LTR – left-thru-right LT – left-thru TR – thru-right LR – left-right

Table 5: Intersection Operations – 2040 Background

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
County Road 9 & Collingwood Street	EB L	free	8	A	0.00	8	A	0.00
	WB L	free	8	A	0.08	8	A	0.07
	NB LTR	stop	12	B	0.19	12	B	0.12
	SB LTR	stop	14	B	0.02	12	B	0.01
County Road 9 & Fairgrounds Road South/ Mill St	EB L	free	8	A	0.02	8	A	0.01
	WB L	free	8	A	0.04	8	A	0.05
	NB LTR	stop	15	C	0.28	15	C	0.28
	SB LTR	stop	17	C	0.26	20	C	0.35

L – left T – thru R – right LTR – left-thru-right LT – left-thru TR – thru-right LR – left-right

3.4 NEED FOR IMPROVEMENTS

Given that the study area intersections will continue to provide good operations based on the existing configurations and control, no improvements are required to accommodate the future background conditions from a traffic operations perspective.

4 Proposed Development

This section provides additional details about the proposed development, including its location, land use, projected site-generated traffic volumes, and the assignment of these volumes to the adjacent road network.

4.1 LOCATION

The subject site is located at 7582 County Road 9 in the community of Creemore, Township of Clearview, as illustrated in Figure 1.

4.2 LAND USE

As per the site plan provided in Figure 12, the proposed development will consist of the following:

- 8 freehold detached units; and
- 116 condominium townhouse units (standard and back-to-back townhouses).

Full build-out has been assumed by 2030.

4.3 ACCESS

The proposed single detached units will be provided with direct driveway access to the adjacent road network. As per the site plan, 2 units will have driveway access to Collingwood Street whereas the remaining 6 units will have driveway access to County Road 9. The exact driveway location for each lot will be resolved at detailed design.

Access to the townhouse units will be provided via a private condominium road network with connections to County Road 9 and Fairgrounds Road South as follows:

- the access to County Road 9 will be located approximately 120 metres west of Fairgrounds Road South (measured centre of intersection to centre of access); and
- the access to Fairgrounds Road South will be located approximately 75 metres north of County Road 9.

Corner clearance is the distance from an intersection to the nearest upstream or downstream access. Transportation of Canada's (TAC) *Geometric Design Guide for Canadian Roads*[5] recommends a minimum corner clearance of 35 metres (measured from edge of intersection to edge of access) for a downstream access on an arterial road and 25 metres for an upstream

[5] *Geometric Design Guide for Canadian Roads.* Transportation Association of Canada. June 2017.

access on a collector road. The site access on Fairgrounds Road South (i.e. upstream access on a collector road) provides a corner clearance of approximately 65 metres from the intersection with County Road 9 and thus satisfies the TAC recommended minimum corner clearance. It is noted that the site access on County Road 9 provides a corner clearance of approximately 108 metres from the intersection with Fairgrounds Road and 138 metres from the intersection with Collingwood Street; however, as County Road 9 is the major road and operates freely in the east-west direction at both intersections (i.e. stop control is on the minor approaches), the TAC minimum corner clearance distances are not applicable in this instance (in fact, a shorter corner clearance than the TAC minimums identified above would be acceptable). Regardless, the corner clearance provided in both directions at the County Road 9 access are significant and acceptable.

4.3.1 Sight Line Assessment

A sight line assessment was conducted to establish the available sight lines along County Road 9 and Fairgrounds Road South at the proposed site access locations.

TAC Standards

The assessment has considered both minimum stopping sight distance and intersection sight distance, as defined below and dictated per the standards published in the Transportation Association of Canada's (TAC) *Geometric Design Guide for Canadian Roads:*

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

The minimum stopping sight and intersection sight distance requirements are provided in Table 6. The available sight distances as determined through field measures are also summarized in Table 6.

Table 6: Site Access Sight Line Assessment

LOCATION	DESIGN SPEED	STOPPING SIGHT DISTANCE	INTERSECTION SIGHT DISTANCE		AVAILABLE SIGHTLINES TO/FROM	
			Left Turn	Right Turn	West/South	East/North
Street D (Fairgrounds Rd. S.)	60 km/h	85 m	130 m	110 m	60 m	150 m
Street D (County Road 9)	60 km/h	85 m	130 m	110 m	>200 m	>200 m

As indicated, the available sightlines to/from the east and west along County Road 9 and to/from the north along Fairgrounds Road South from the proposed access locations exceed the TAC guidelines and hence are deemed acceptable. The sight lines to/from the south along Fairgrounds Road South are not limited by the alignment of the road, but rather reflect the location of the intersection with County Road 9 (in fact, the actual sight lines extend well beyond County Road 9). For motorists approaching the site access from the south having completed a turning manoeuvre from County Road 9, the sight lines are limited by the proximity of the intersection to the site access. While not satisfying a design speed of 60 km/h, the available sight lines are nonetheless considered acceptable recognizing that vehicles approaching the site will have just completed a turning movement from County Road 9 and thus will be travelling at a reduced operating speed. With the access point readily visible, motorists will have sufficient time to complete the turning movement and observe any potential hazards at the site access points before accelerating to the speed limit.

Based on the above, the available sight distances are considered acceptable.

4.4 ACTIVE TRANSPORTATION

The site will include an internal sidewalk network throughout. The sidewalks will extend to both Fairgrounds Road South and County Road 9 at the respective access points and will be readily connected to any future sidewalk or active transportation facilities implemented on said roads (although none are currently planned).

4.5 PARKING

4.5.1 Standard Parking

According to the Township's *Zoning By-law*, a residential use must provide two parking spaces per dwelling unit, resulting in a requirement of 248 parking spaces. It is assumed that both the single-detached units and townhomes will meet this requirement by providing at least two parking spaces each (one garage space and one driveway space). Although the *Zoning By-law*

does not specify a requirement for visitor parking, the site includes an additional 17 parking spaces (or 0.14 spaces per unit) for visitors.

4.5.2 Barrier Free Parking

The Township's *Zoning By-law* requires developments with a parking requirement of 201 to 300 spaces to provide seven barrier-free spaces. As indicated on the site plan, the development will include seven barrier-free spaces, meeting the Township's requirements based on the 248-space parking requirement.

4.6 SITE TRAFFIC

4.6.1 Trip Generation

The number of vehicle trips to be generated by the proposed development has been determined based on the type of use, development size, and trip generation rates published in the *ITE Trip Generation Manual, 11th Edition*[6]. Based on the proposed development, the trip rates for *single family detached* (ITE code 210) and *single family attached* (ITE code 215) have been applied.

The ITE trip rates and resulting trip estimates are provided in Table 7 and Table 8, respectively. As indicated, the proposed development is expected to generate 62 trips during the AM peak hour and 74 trips during the PM peak hour (a total of inbound and outbound trips).

Table 7: Trip Generation Rates

LAND-USE	VARIABLE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		In	Out	Total	In	Out	Total
single family detached (ITE 210)	units	0.18	0.53	0.71	0.59	0.35	0.94
single family attached (ITE 215)	units	0.12	0.36	0.48	0.34	0.23	0.57

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

Table 8: Trip Estimates

LAND-USE	VARIABLE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		In	Out	Total	In	Out	Total
single family detached (ITE 210)	8 units	1	5	6	5	3	8
single family attached (ITE 215)	116 units	14	42	56	39	27	66
Total		**15**	**47**	**62**	**44**	**30**	**74**

As indicated, the proposed development is expected to generate 62 trips during AM peak hour and 74 trips during PM peak hour.

4.6.2 Trip Distribution

The distribution of site-generated trips was developed based on the results of the *2022 Transportation Tomorrow Survey* (TTS), a comprehensive travel survey conducted in the Greater Golden Horseshoe area every five years. Based on the trip distribution data available, the following trip distribution was established:

- to/from north - 40%;
- to/from south - 45%;
- to/from east - 10%; and
- to/from west - 5%.

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

- to/from the north
  - via Fairgrounds Road South - 15%;
  - via County Road 42 – 25%
- to/from the south
  - via Mill Street - 35%;
  - via County Road 42 – 10%.
- to/from the east
  - via County Road 9 – 10%

- to/from the west
    - via County Road - 5%.

The resulting assignment of site traffic to the road network is illustrated in Figure 14, while the TTS data for the area is provided in Appendix G. It is noted that the trips associated with the single detached units have been assigned to the site access points on County Road 9 and Fairgrounds Road South to ensure a conservative approach (i.e. assumes all site traffic will contribute to turning movements at the site access points).

5 Future Total Conditions

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

- total traffic volumes (background volumes + site volumes);
- operations at the study area intersections including the site access points; and
- potential improvements to the study area road network, if necessary.

5.1 TRAFFIC VOLUMES

To assess the impacts of the increased traffic volumes resulting from the proposed development, the site generated traffic was combined with the 2030, 2035 and 2040 background traffic volumes. The resulting total traffic volumes are presented in Figure 15 to Figure 17.

5.2 TRAFFIC OPERATIONS

The study area intersections were reanalyzed under the future total traffic horizons. Additionally, the operations of both site accesses were reviewed, assuming a single shared left-right outbound lane operating under stop control and a single inbound lane. The results of the operational review are presented in Table 9 through Table 11, while detailed worksheets are provided in Appendix H.

Table 9: Intersection Operations – 2030 Total

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
County Road 9 & Collingwood Street	EB L	free	8	A	0.00	8	A	0.00
	WB L	free	8	A	0.06	8	A	0.06
	NB LTR	stop	11	B	0.14	11	B	0.10
	SB LTR	stop	12	B	0.01	12	B	0.01
County Road 9 & Fairgrounds Road South/ Mill St	EB L	free	8	A	0.02	8	A	0.01
	WB L	free	8	A	0.04	8	A	0.04
	NB LTR	stop	14	B	0.23	14	B	0.24
	SB LTR	stop	16	C	0.26	17	C	0.31

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
County Road 9 & Site Access	EB L	free	8	A	0.00	8	A	0.00
	SB LR	stop	11	B	0.03	11	B	0.02
Fairgrounds Road South & Site Access	EB LR	stop	9	A	0.03	9	A	0.02
	NB L	free	7	A	0.00	8	A	0.01

L – left T – thru R – right LTR – left-thru-right LT – left-thru TR – thru-right LR – left-right

Table 10: Intersection Operations – 2035 Total

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
County Road 9 & Collingwood Street	EB L	free	8	A	0.00	8	A	0.00
	WB L	free	8	A	0.07	8	A	0.06
	NB LTR	stop	11	B	0.16	11	B	0.11
	SB LTR	stop	13	B	0.02	12	B	0.01
County Road 9 & Fairgrounds Road South/ Mill St	EB L	free	8	A	0.02	8	A	0.01
	WB L	free	8	A	0.04	8	A	0.04
	NB LTR	stop	15	C	0.27	15	C	0.28
	SB LTR	stop	17	C	0.29	19	C	0.35
County Road 9 & Site Access	EB L	free	8	A	0.00	8	A	0.00
	SB LR	stop	11	B	0.03	11	B	0.02
Fairgrounds Road South & Site Access	EB LR	stop	9	A	0.03	9	A	0.02
	NB L	free	7	A	0.00	8	A	0.01

L – left T – thru R – right LTR – left-thru-right LT – left-thru TR – thru-right LR – left-right

Table 11: Intersection Operations – 2040 Total

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
County Road 9 & Collingwood Street	EB L	free	8	A	0.00	8	A	0.00
	WB L	free	8	A	0.08	8	A	0.07
	NB LTR	stop	12	B	0.19	12	B	0.12
	SB LTR	stop	14	B	0.02	12	B	0.01
County Road 9 & Fairgrounds Road South/ Mill St	EB L	free	8	A	0.02	8	A	0.01
	WB L	free	8	A	0.05	8	A	0.05
	NB LTR	stop	16	C	0.31	17	C	0.33
	SB LTR	stop	19	C	0.34	22	C	0.41
County Road 9 & Site Access	EB L	free	8	A	0.00	8	A	0.00
	SB LR	stop	11	B	0.04	12	B	0.03
Fairgrounds Road South & Site Access	EB LR	stop	9	A	0.03	10	A	0.02
	NB L	free	8	A	0.00	8	A	0.01

L – left T – thru R – right LTR – left-thru-right LT – left-thru TR – thru-right LR – left-right

5.3 NEED FOR IMPROVEMENTS

5.3.1 Traffic Operations

As indicated, the study area intersections will continue to provide good operations (LOS C or better) through the 2040 horizon. As such, no additional improvements are required to accommodate the future total conditions from a traffic operations perspective.

5.3.2 Turn Lane Requirements

Despite the otherwise acceptable operations provided at all study area intersections including the site access points, the need for exclusive left and right turn lanes on County Road 9 and Fairgrounds Road South, to serve traffic entering the site, has been reviewed. The review reflects MTO warrants for exclusive left and right turn lanes at unsignalized intersections on a two-lane road with design speeds of 60 km/h.

Right Turn Lane

MTO guidelines suggest that exclusive right turn lanes be considered where right turn volumes exceed 60 vehicles per hour and impede the operations of through traffic. Based on the projected right turn volumes for both intersections (17 vehicles per hour or less), an exclusive right turn lane is not warranted at either intersection.

Left Turn Lane

With respect to left turn lanes, the need for such is based on the volume of left turning traffic, the volume of advancing and opposing traffic, and the design speed. Based on the MTO warrant criteria, no left turn lanes are warranted under the future total conditions. The completed warrants are provided in Appendix I.

6 Summary

Proposed Development

This study has addressed the transportation impacts associated with the proposed residential development located at 7582 County Road 9 in the Township of Clearview. Upon completion, the development is expected to generate 62 trips during the AM peak hour and 74 trips during the PM peak hour.

Transportation Impacts

In addressing the study area traffic operations, the intersections of County Road 9 with Collingwood Street and Fairgrounds Road South/Mill Street were analyzed under existing (2025) and future (2030, 2035 and 2040) horizon periods, whereas the site accesses were assessed under future (2030, 2035 and 2040) horizon periods.

The results of the operational analyses indicate that area road intersections will provide good operations through the 2040 horizon under the background and total conditions. Likewise, site access points will provide excellent operations through the 2040 horizon.

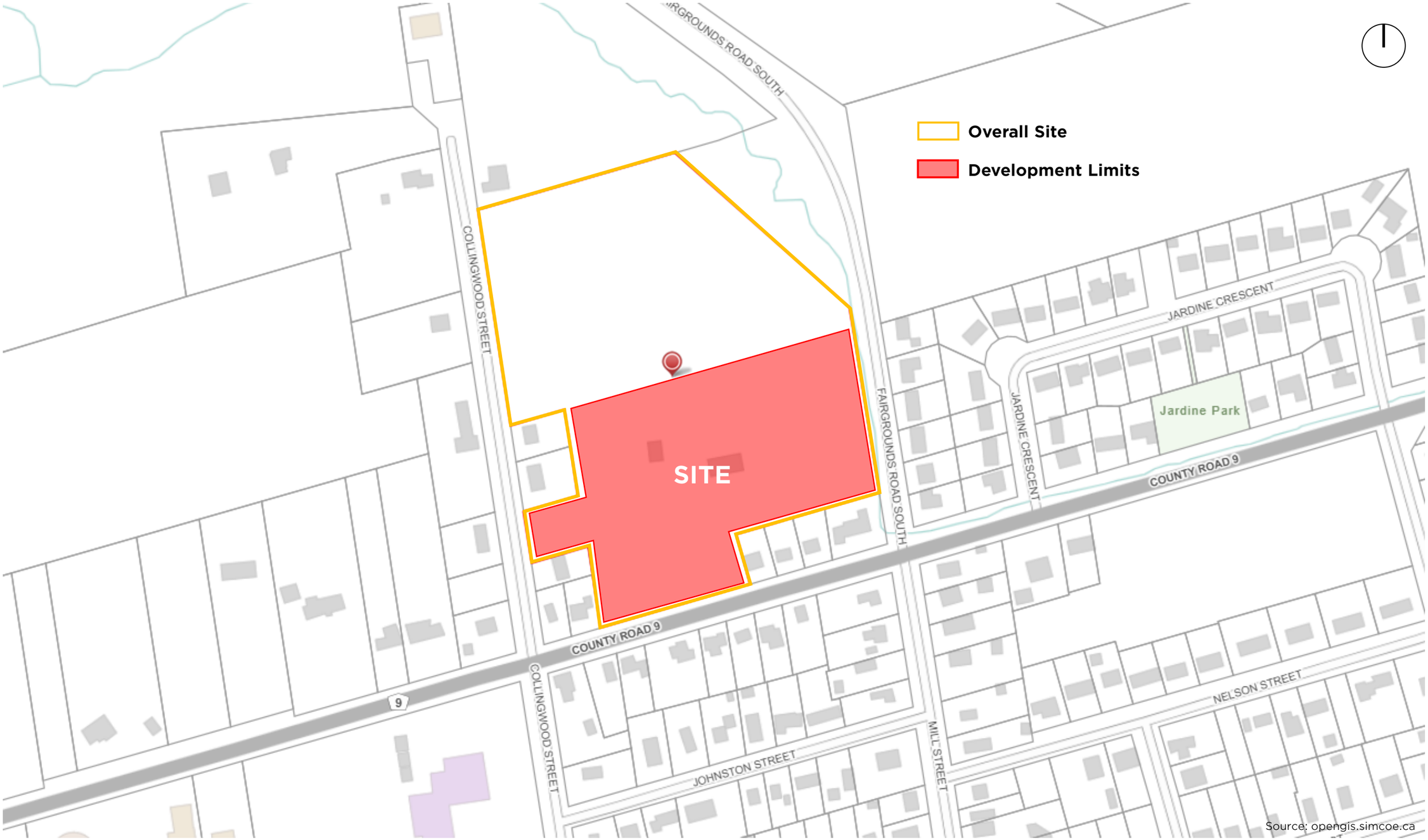
As such, no improvements are required to support the proposed development from a traffic operations perspective.

Sight Line Assessment

The available sight lines along County Road 9 and Fairgrounds Road South at site access points were reviewed in consideration of TAC sight distance requirements. Based on the assessment, the available sightlines are considered adequate.

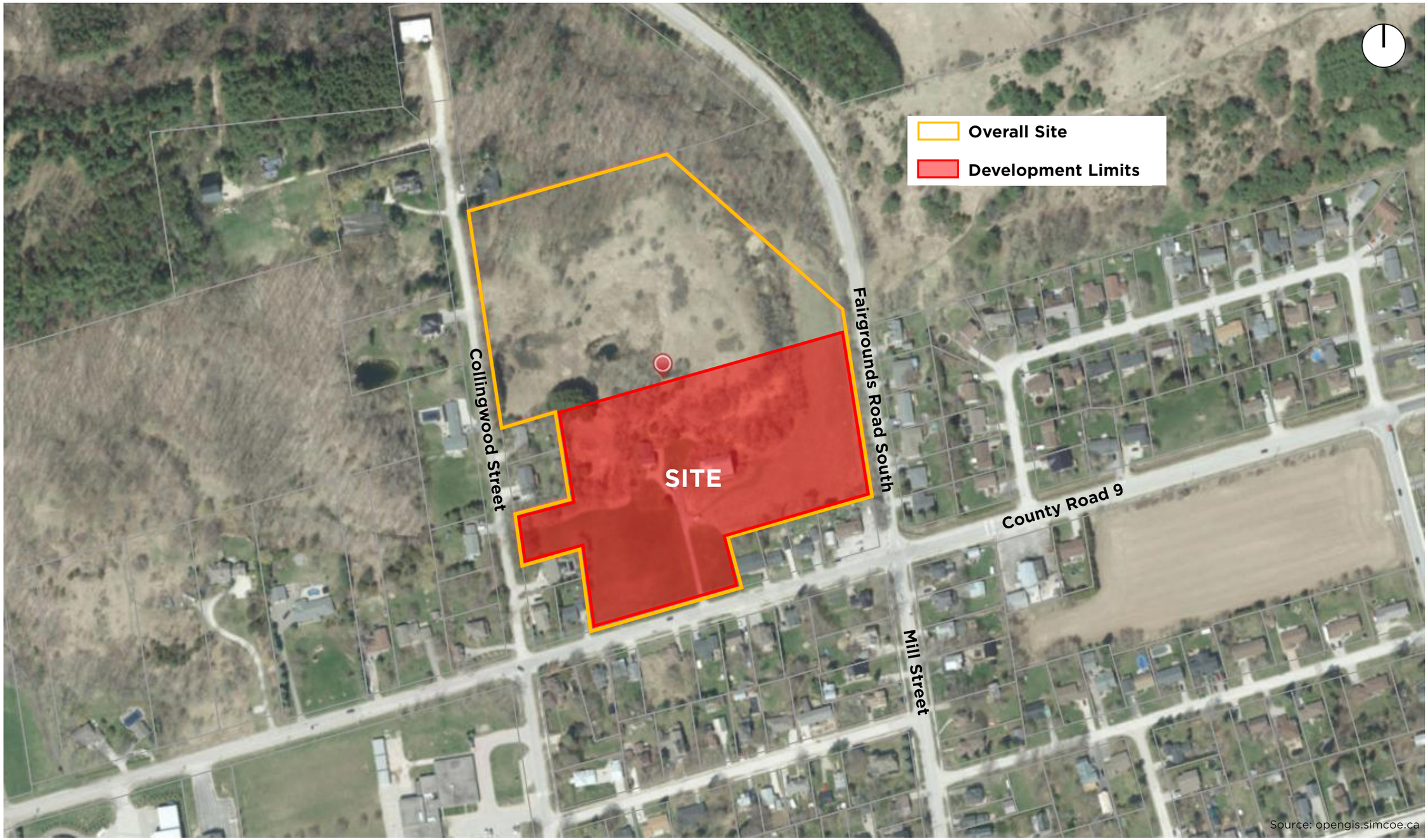
Turn Lane Requirements

The need for exclusive turn lanes was reviewed at the intersections of County Road 9 and Fairgrounds Road South with site access points. Through a review of the warrants, it was concluded that the projected volumes do not warrant exclusive turn lanes at either intersection.



7582 COUNTY ROAD 9 – TRANSPORTATION IMPACT STUDY

Figure 1: Site Location

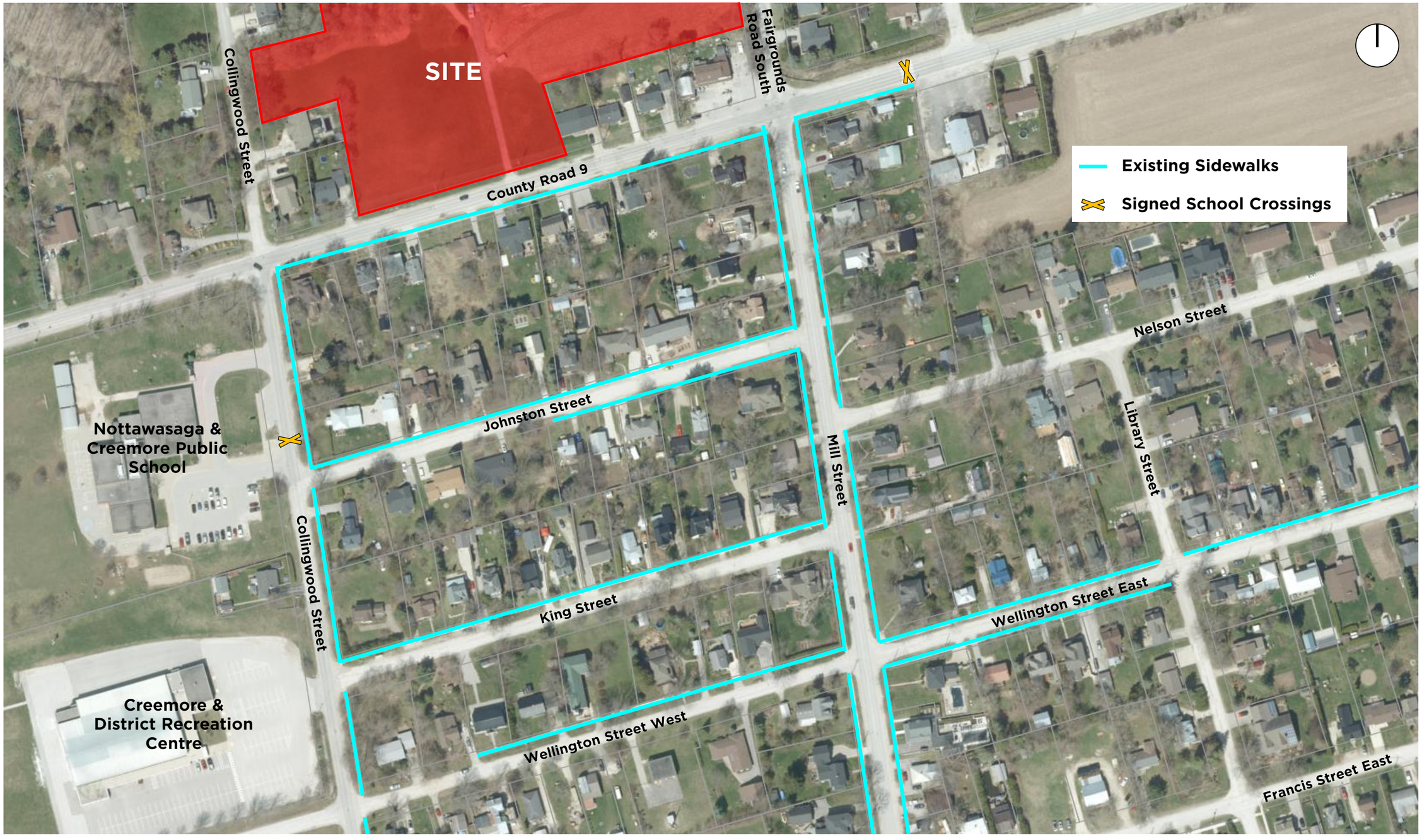


7582 COUNTY ROAD 9 – TRANSPORTATION IMPACT STUDY

Figure 2A: Area Road Network

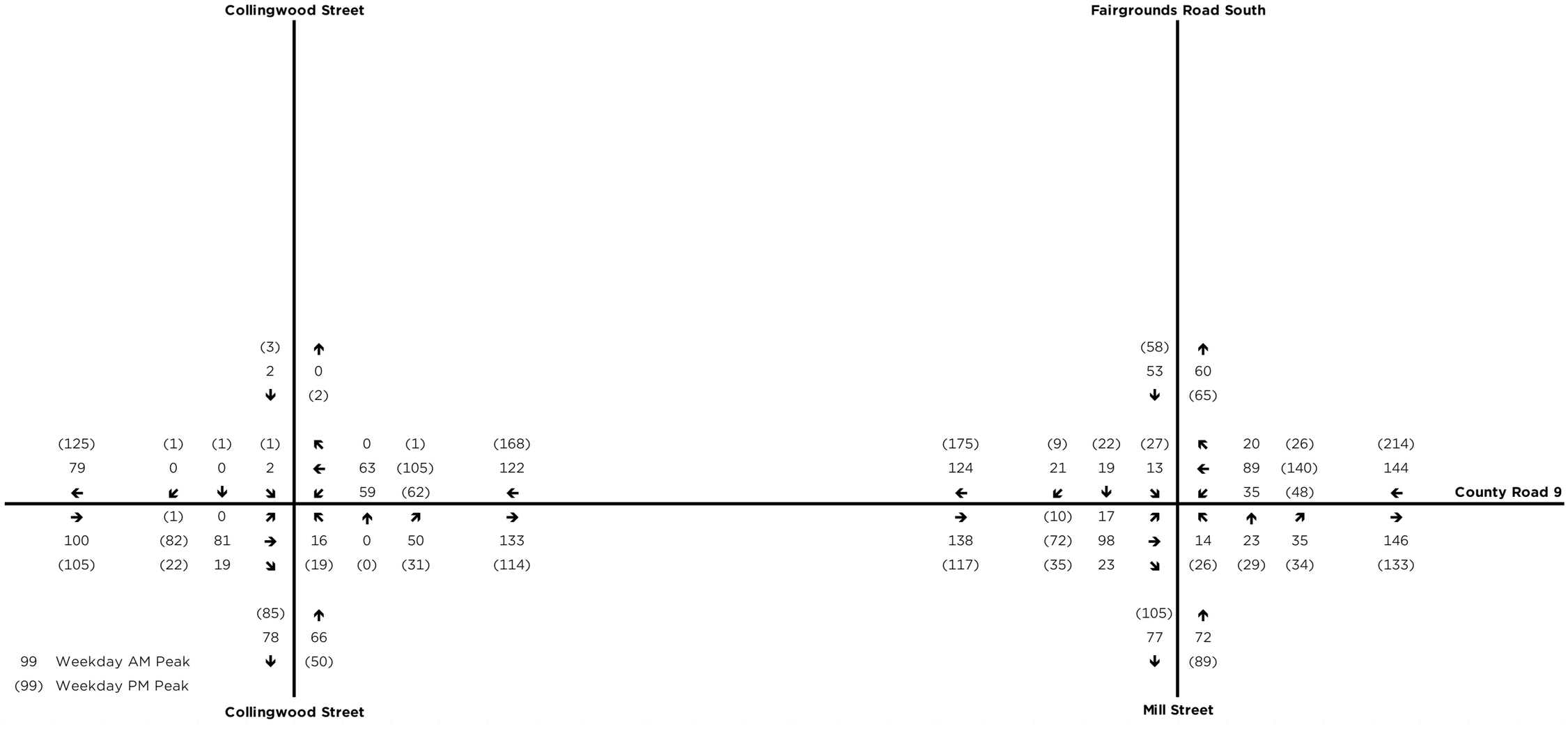
Intersection of Collingwood Street with County Road 9

Intersection of Fairground Road South/Mill Street with County Road 9



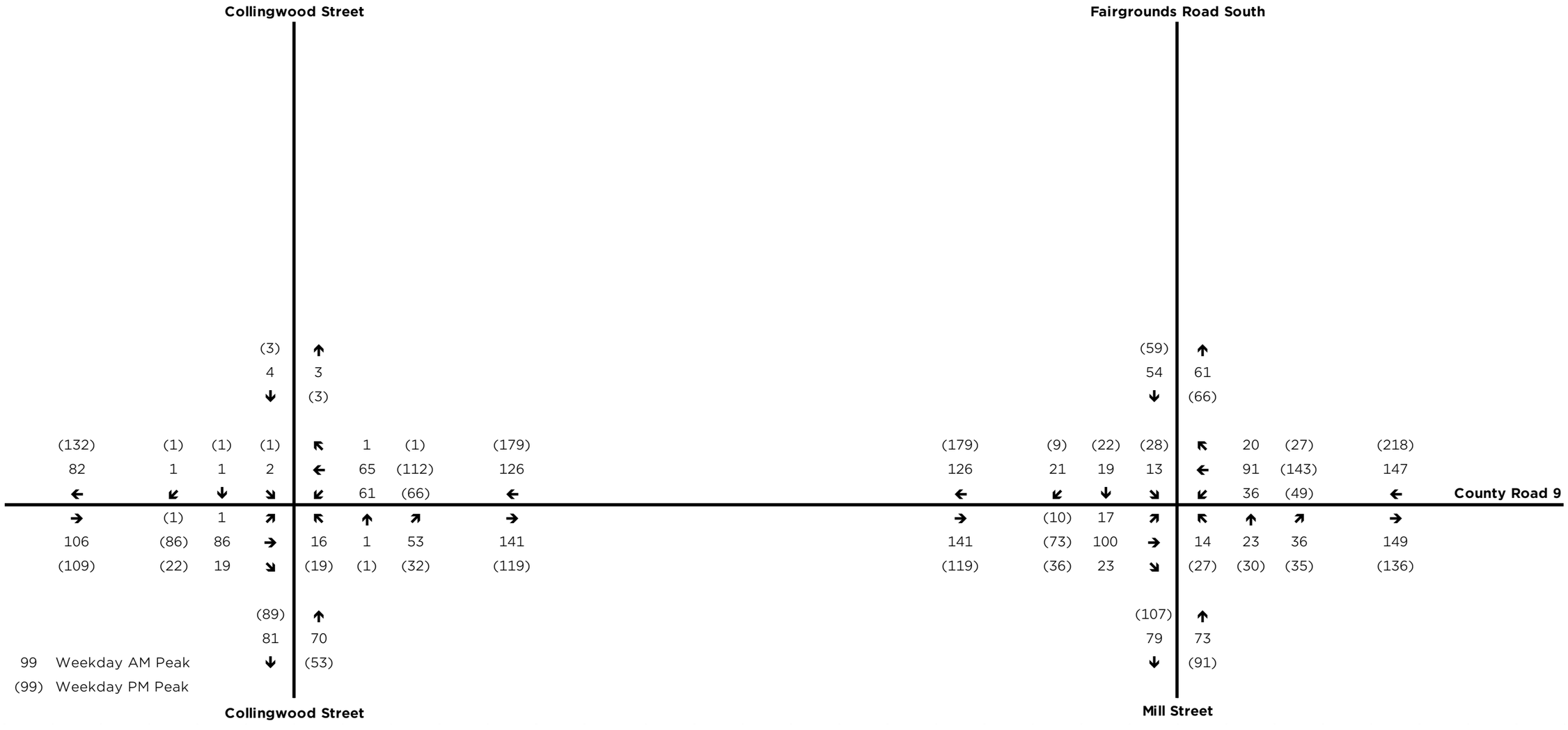
7582 COUNTY ROAD 9 – TRANSPORTATION IMPACT STUDY

Figure 3: Active Transportation Network - Sidewalks



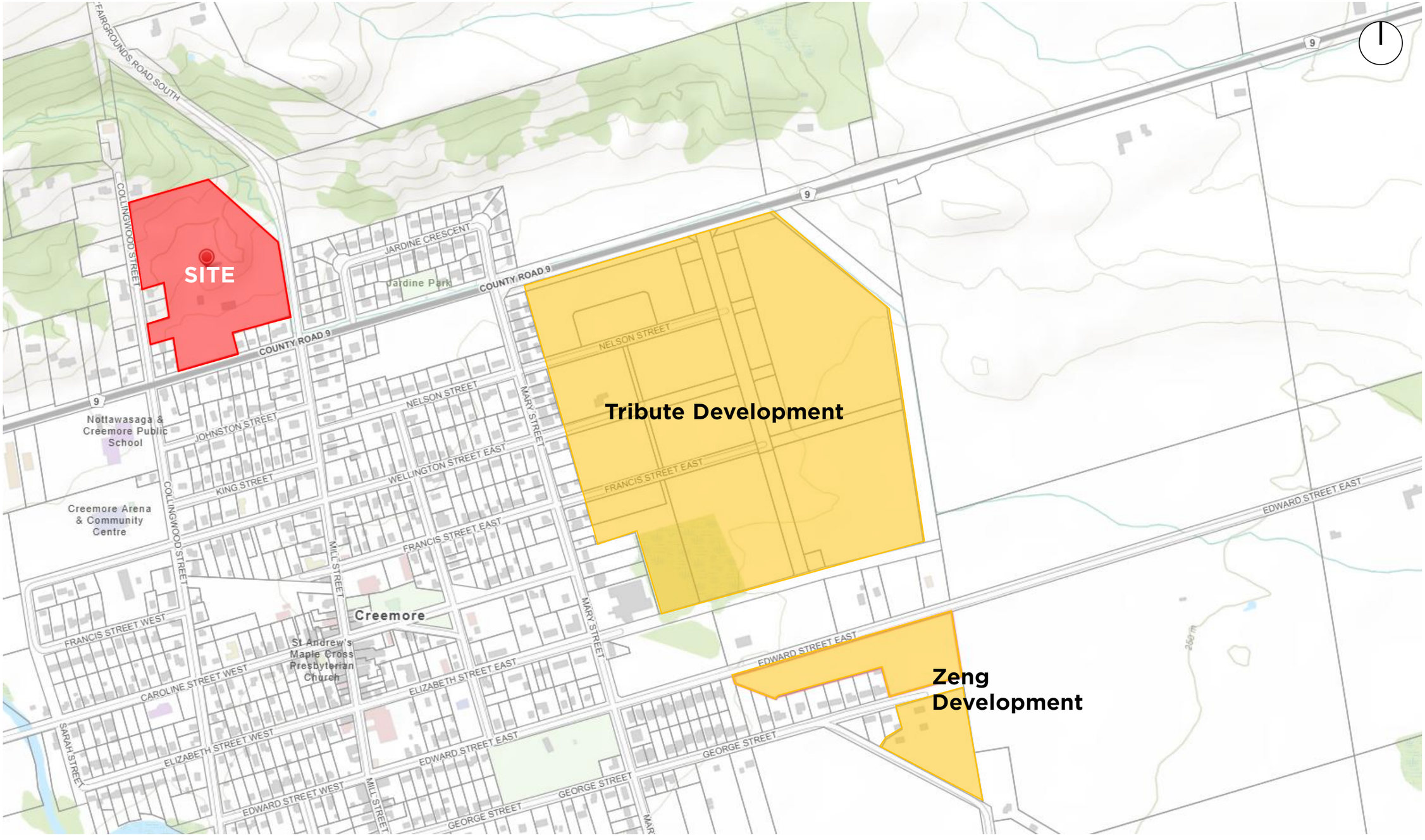
7582 COUNTY ROAD 9 – TRANSPORTATION IMPACT STUDY

Figure 4: Traffic Volumes – 2024 Counts



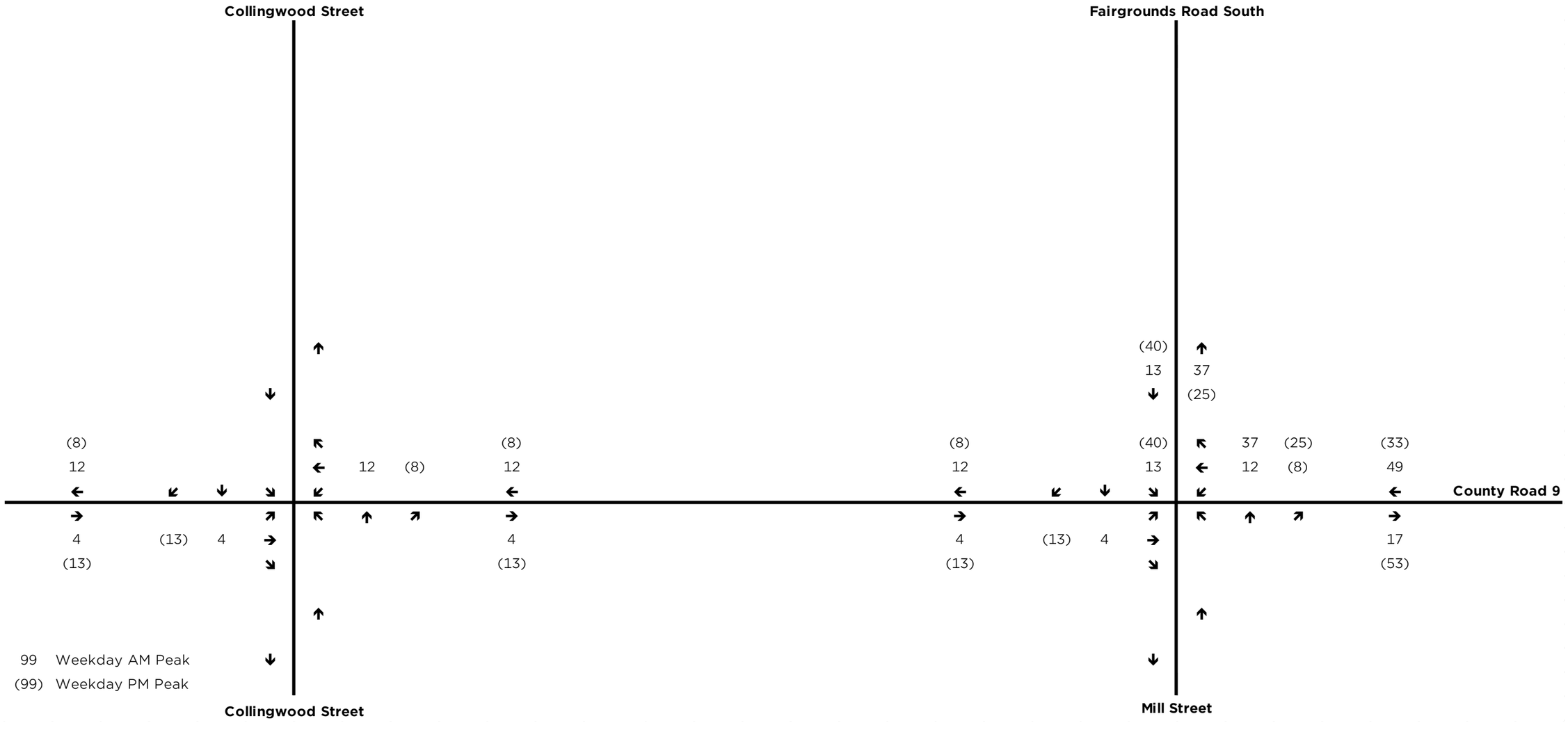
7582 COUNTY ROAD 9 – TRANSPORTATION IMPACT STUDY

Figure 5: Traffic Volumes – 2025



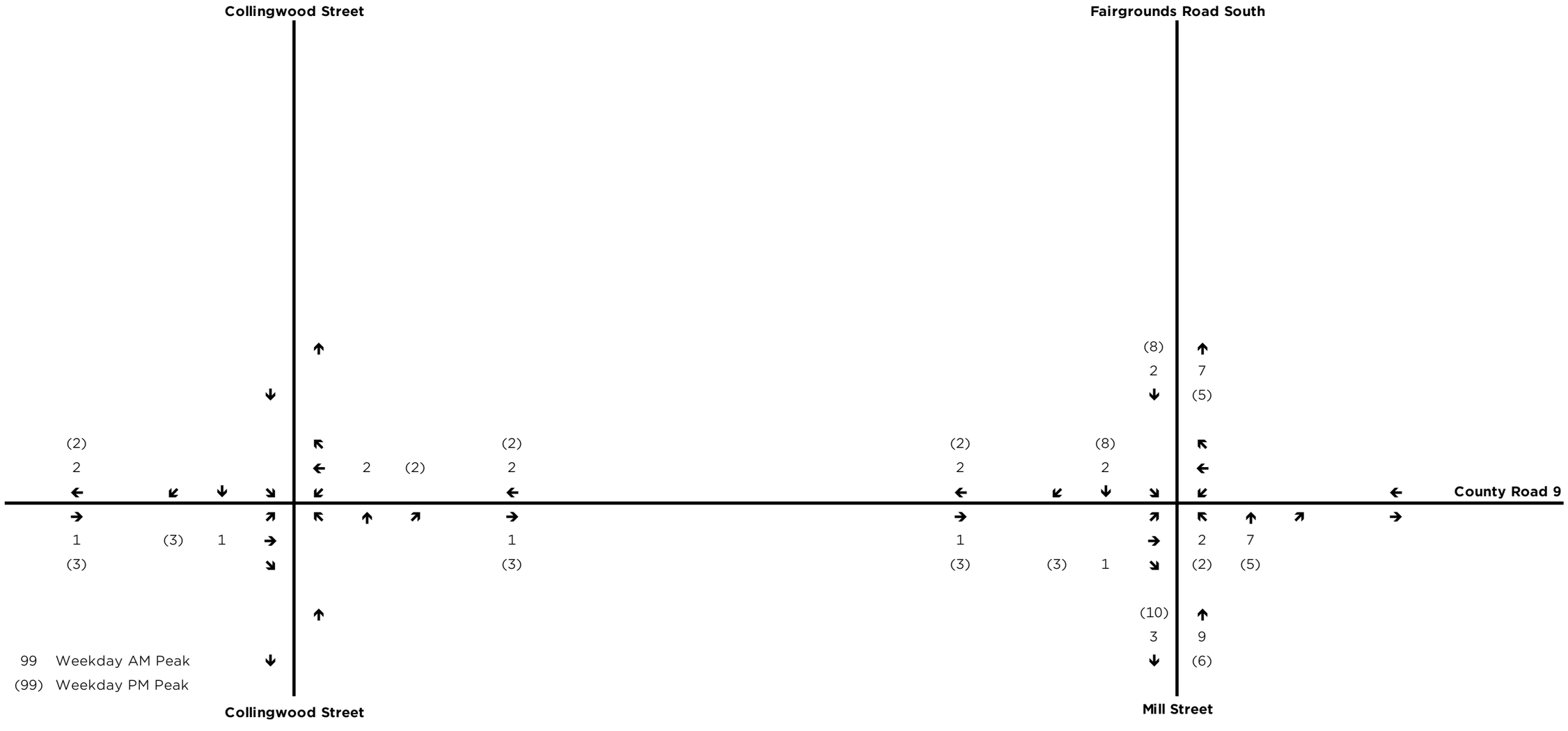
7582 COUNTY ROAD 9 – TRANSPORTATION IMPACT STUDY

Figure 6: Background Development Locations



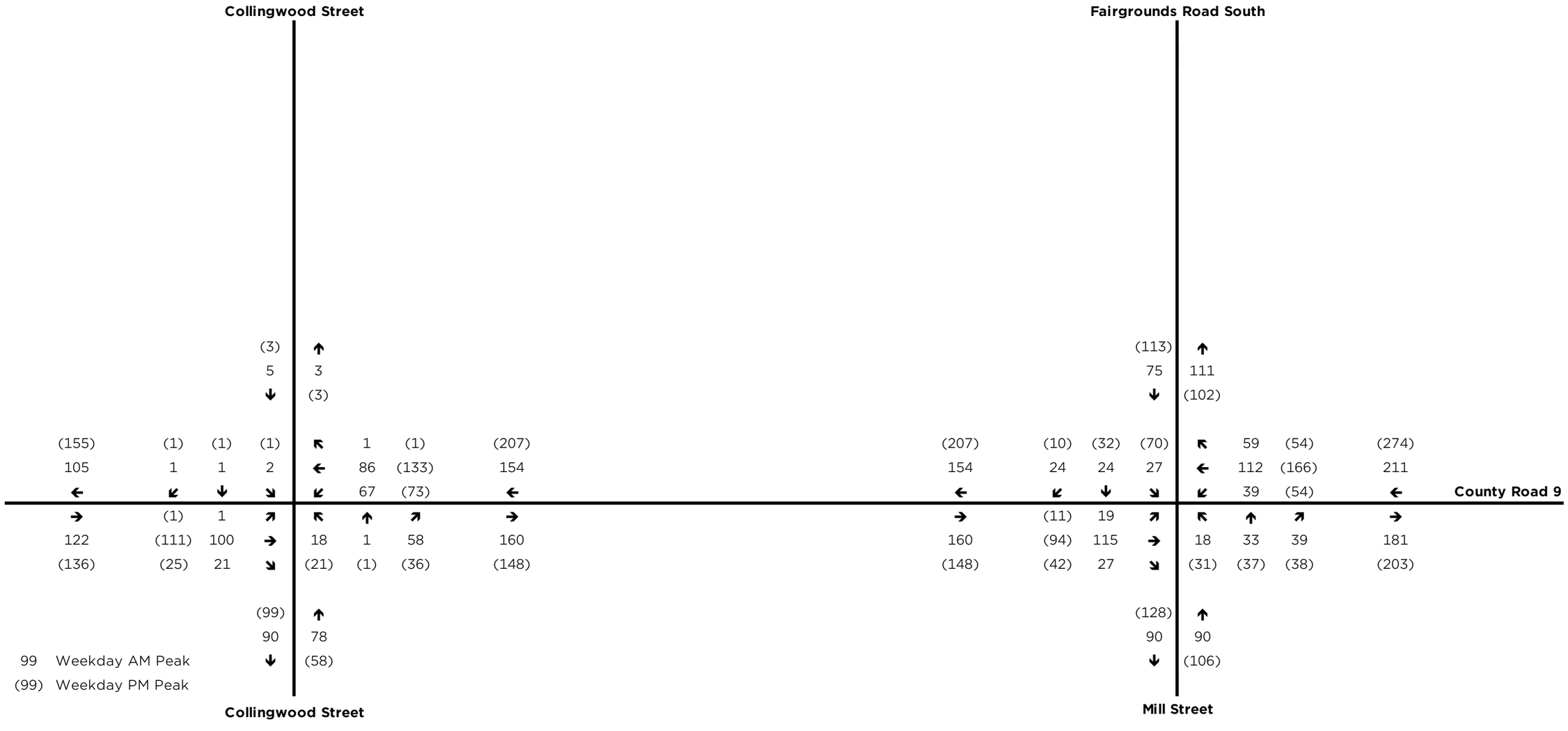
7582 COUNTY ROAD 9 – TRANSPORTATION IMPACT STUDY

Figure 7: Traffic Volumes – Tribute Background Development



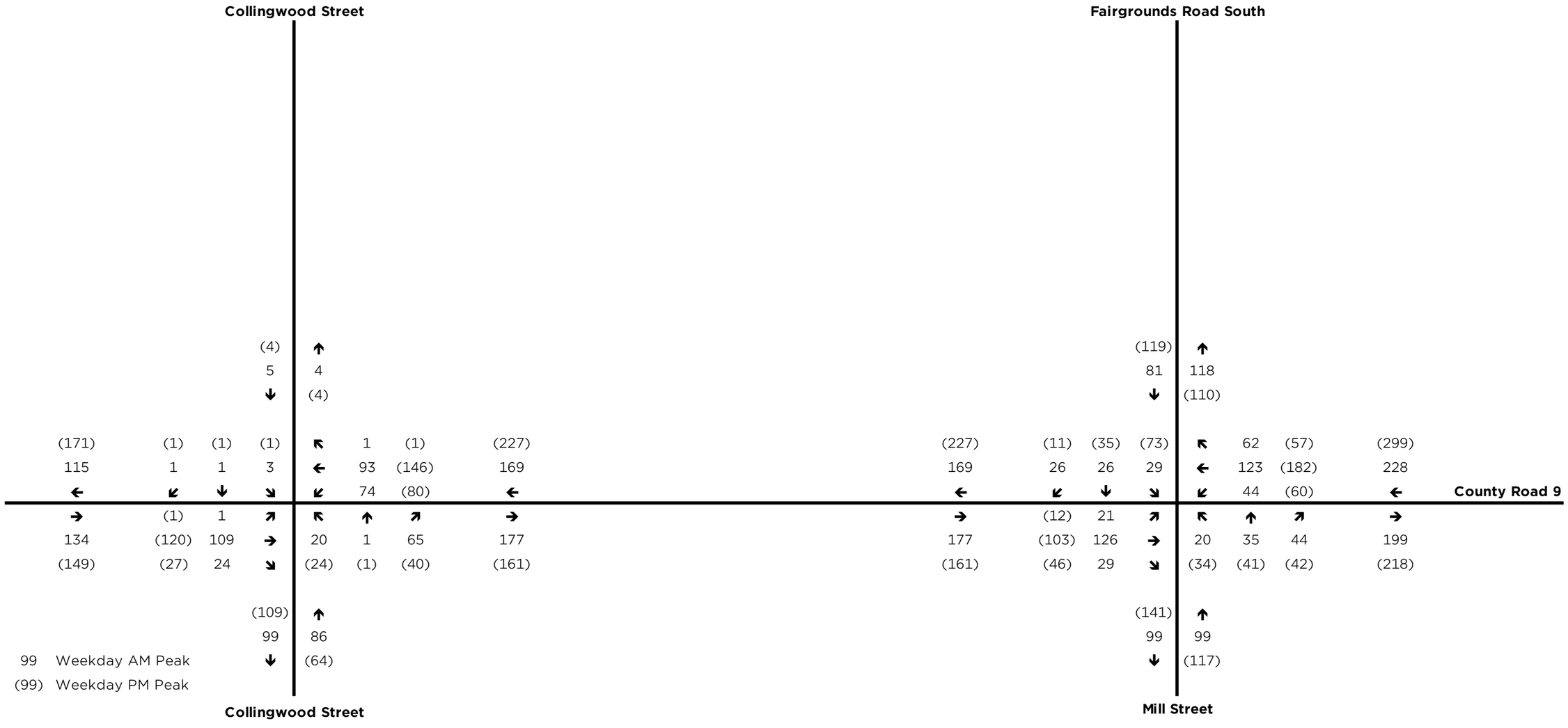
7582 COUNTY ROAD 9 – TRANSPORTATION IMPACT STUDY

Figure 8: Traffic Volumes – Zeng Background Development



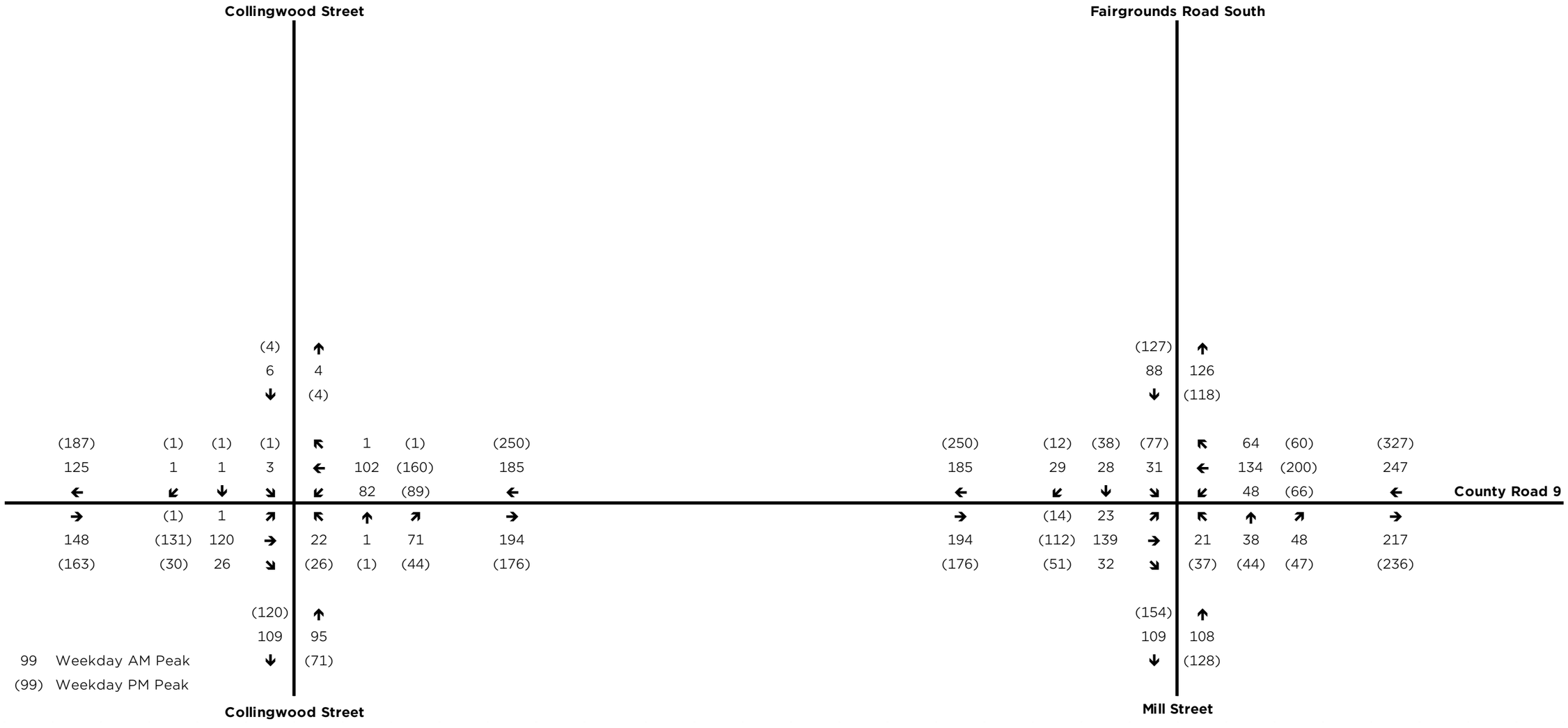
7582 COUNTY ROAD 9 – TRANSPORTATION IMPACT STUDY

Figure 9: Traffic Volumes – 2030 Background



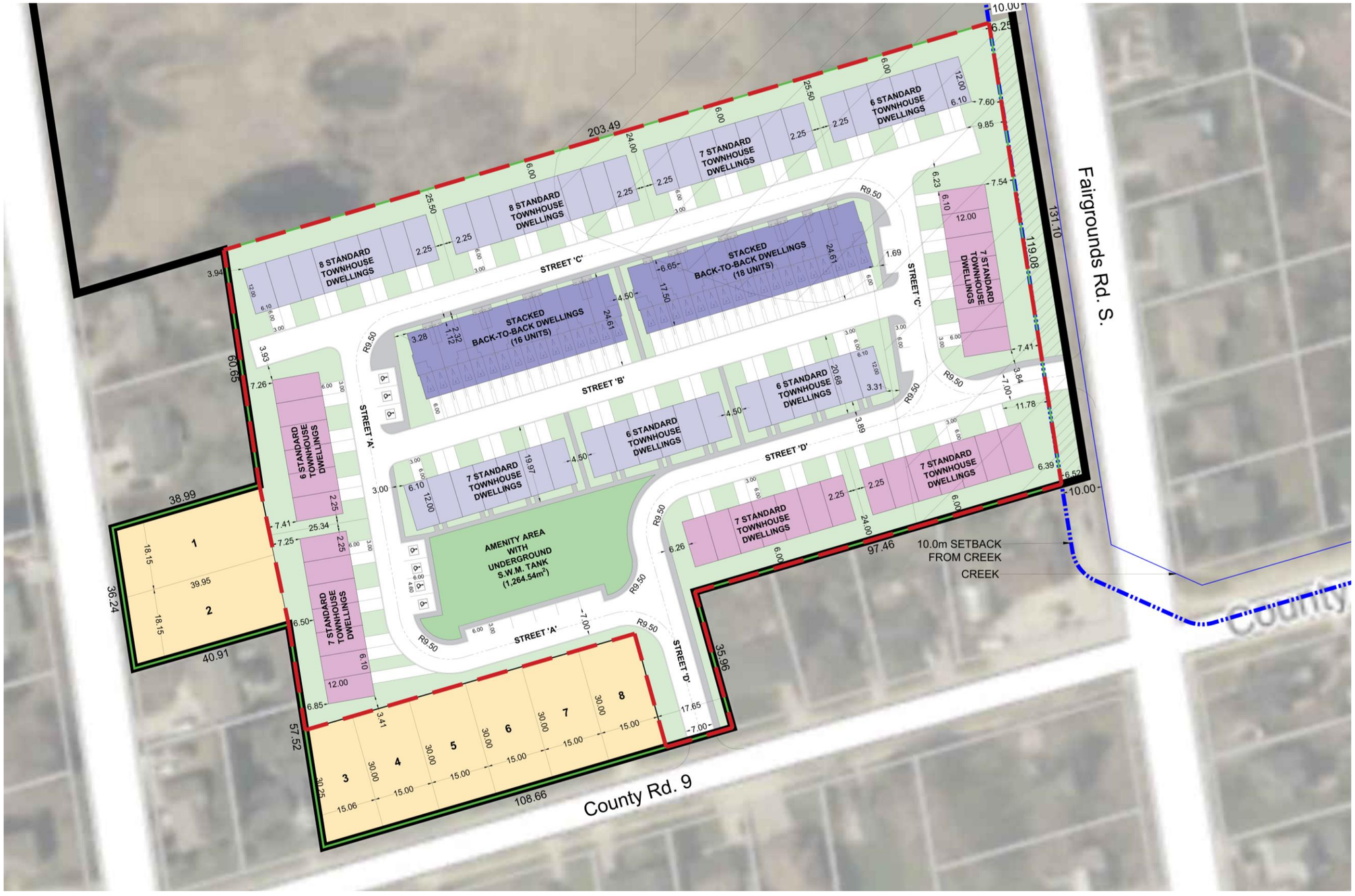
7582 COUNTY ROAD 9 – TRANSPORTATION IMPACT STUDY

Figure 10: Traffic Volumes – 2035 Background



7582 COUNTY ROAD 9 – TRANSPORTATION IMPACT STUDY

Figure 11: Traffic Volumes – 2040 Background



7582 COUNTY ROAD 9 – TRANSPORTATION IMPACT STUDY

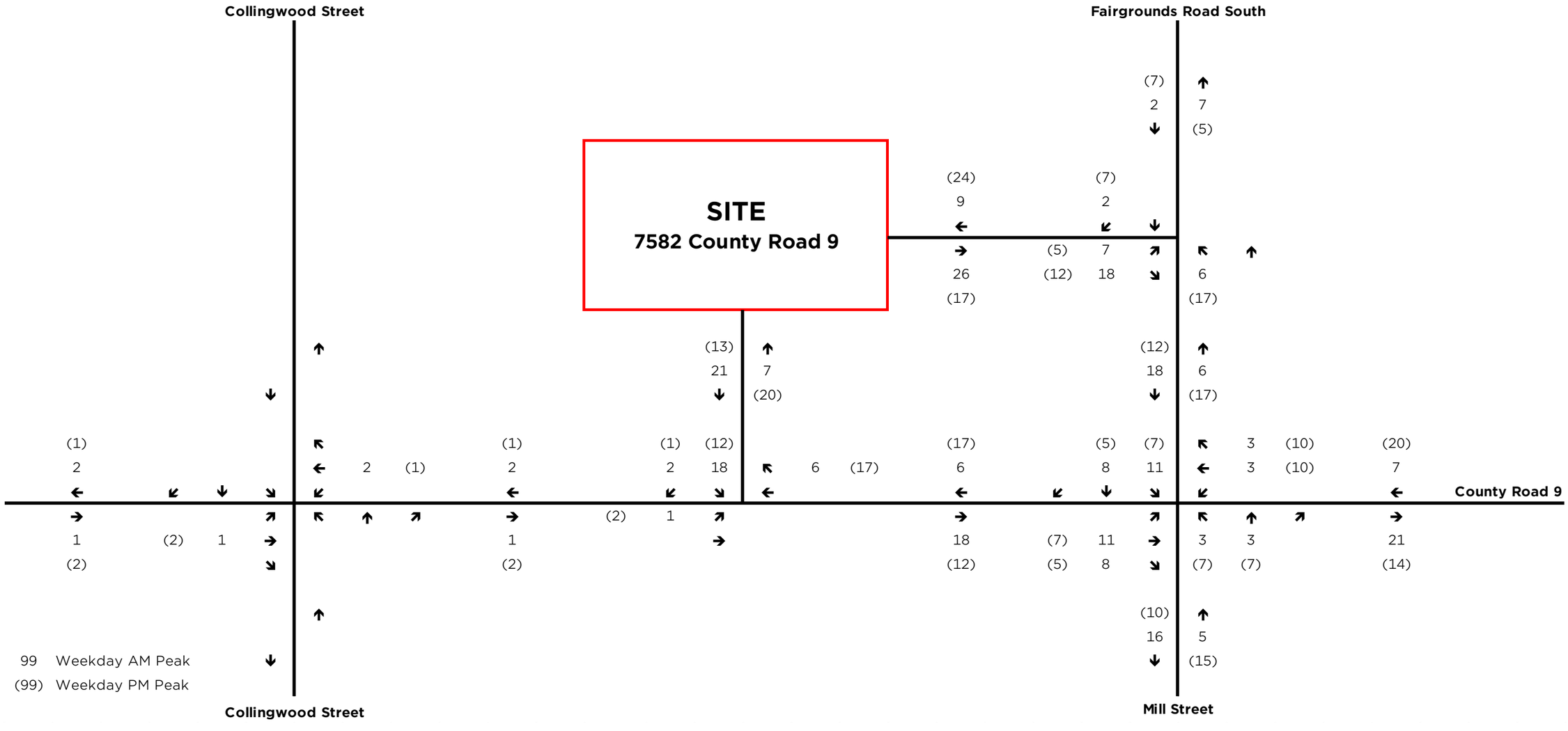
Figure 12: Site Plan

Looking east along County Road 9 from access

Looking west along County Road 9 from access

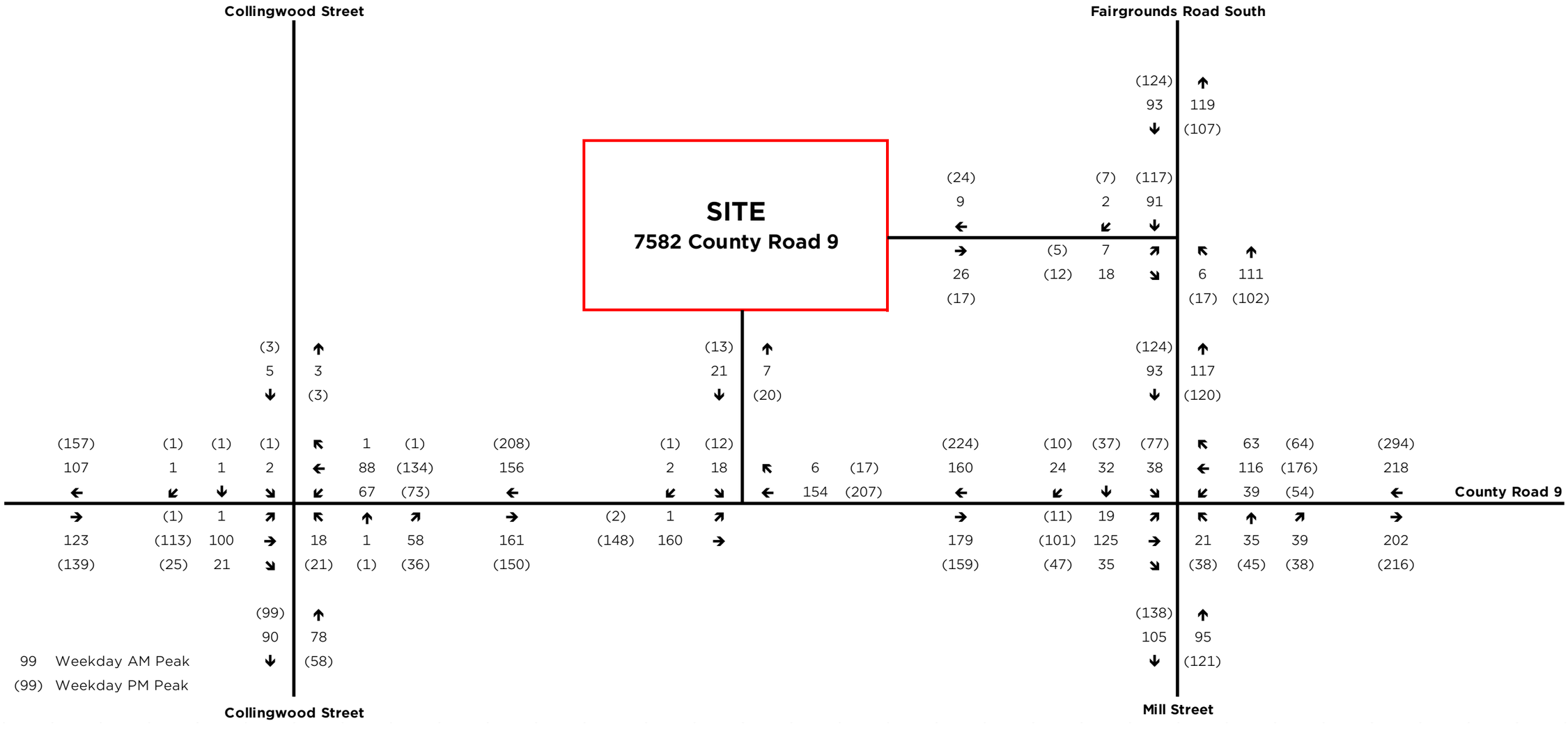
Looking south along Fairgrounds Road South from access

Looking north along Fairgrounds Road South from access



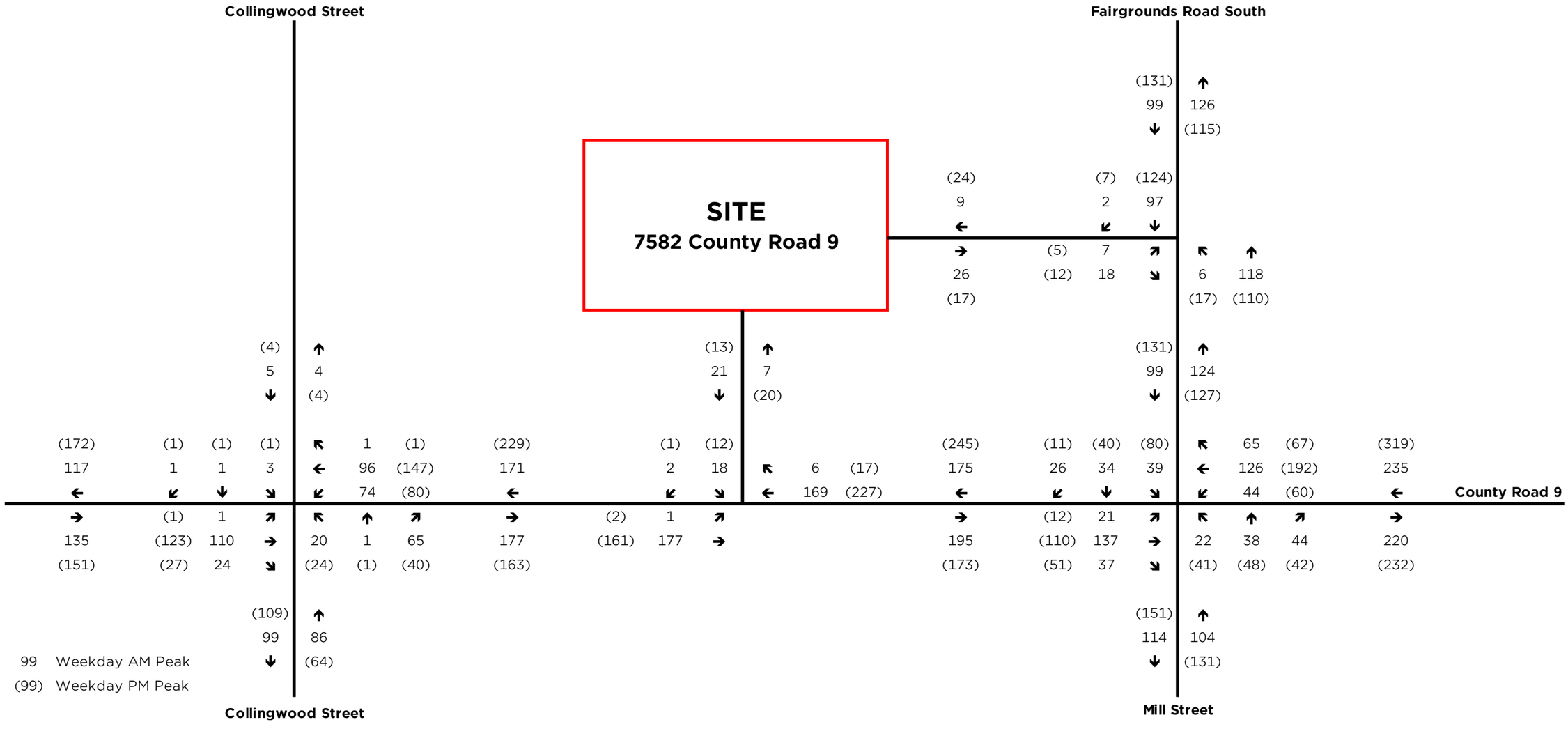
7582 COUNTY ROAD 9 – TRANSPORTATION IMPACT STUDY

Figure 14: Site Generated Traffic



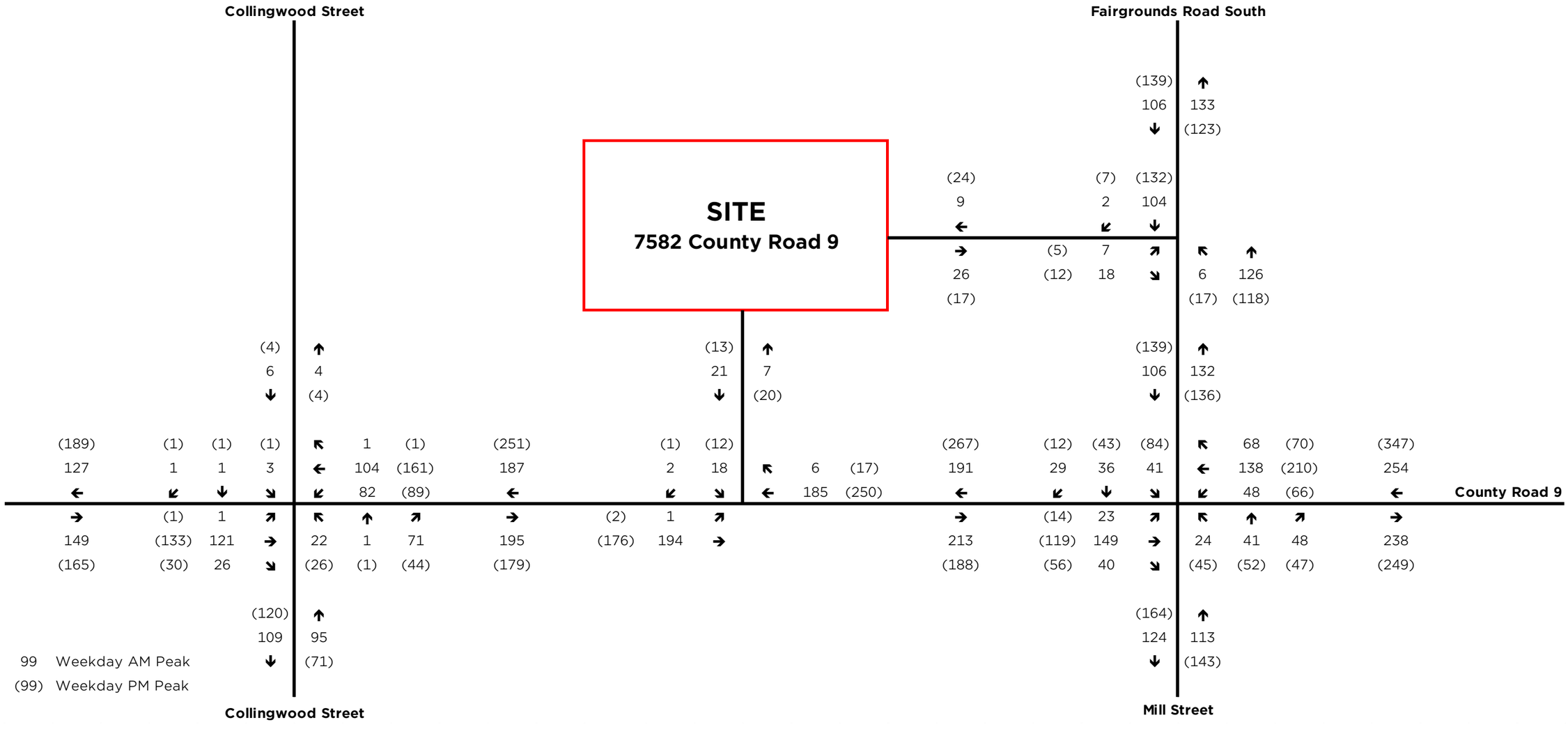
7582 COUNTY ROAD 9 – TRANSPORTATION IMPACT STUDY

Figure 15: Traffic Volumes – 2030 Total



7582 COUNTY ROAD 9 – TRANSPORTATION IMPACT STUDY

Figure 16: Traffic Volumes – 2035 Total



7582 COUNTY ROAD 9 – TRANSPORTATION IMPACT STUDY

Figure 17: Traffic Volumes – 2040 Total

Appendix A:
Terms of Reference

Karolina Kukielka

From: Jennifer Georgas <Jennifer.Georgas@rjburnside.com>
Sent: Thursday, December 5, 2024 11:57 AM
To: Nick Ainley; Patti Kennedy; Christine Taggart
Cc: Dan Perreault; 059520 - 7582 County Road 9; Henry Centen
Subject: RE: Terms of Reference - 7582 County Road 9, Creemore

Hi Nick, we provide the following comments:

Thank you for providing the TOR for the TIS for review. We have provided our comments in **bold and red,** embedded in the originally proposed TOR below.

TIS TOR Comments:

Tatham Engineering Limited was retained to prepare a Transportation Impact Study (TIS) in support of proposed residential development to be located at 7582 County Road 9 in Creemore. The development is proposed to consist of 8 single detached and 130 townhouse units with access to County Road 9 and Fairgrounds Road South (as per the preliminary concept plan which may be subject to change).

Our proposed scope is listed below:

1. The proposed study area is County Road 9 and Fairgrounds Road South and the following intersections:

   - County Road 9 & Fairgrounds Road South; and
   - County Road 9 & Collingwood Street.

2. Existing traffic volumes will be established based on the new counts (if recent traffic data of 2 years or less is not available) and will be adjusted to reflect 2025 summer traffic volumes (accounting for annual and summer growth in traffic). **The applicant to undertake their own new counts at all applicable locations.**

3. The operations assessment will consider weekday AM and PM peak hour volumes.

4. Using projected growth for the area and in consideration of the County of Simcoe's *Transportation Master Plan*, we will identify future background traffic volumes for the study area road network. Consideration will also be given to other planned developments in the area (to be confirmed). Projections will be developed for the year of full build-out of the proposed development (2030) in addition to 5-year (2035) and 10-year (2040) planning horizons beyond full build-out. **Distribute trips to the boundary road network based on Transportation Tomorrow Survey Data. This may be adjusted based on observed travel patterns and previously used trip distributions.**
5. Determine the number of trips to be generated by the proposed development during the relevant peak hour periods and assign such to the road network based on existing traffic patterns, available distribution data and anticipated travel routes. Trip estimates will be based on trip rates published in the *ITE Trip Generation Manual, 11th Edition* for land-uses reflective of the one proposed.

6. Review the existing, background and total operations of the study area intersections and the site access points using Synchro traffic software.
7. Following the traffic analyses, identify any road network improvements/mitigating measures required to support the development and identify the timing of such.
8. Provide an assessment of the available sight lines at the proposed site access points in context of County and/or TAC requirements. **Access points to include the intersections of CR9/Fairgrounds Road, CR9/Site Access, Fairgrounds Road/Site Access. Also include daylighting requirements.**
9. Review the internal layout of the site, discuss: parking provision, access design, autoturn assessment demonstrating appropriate accommodation of emergency vehicles. **Include provisions for visitor parking. Also include AutoTURN analysis for garbage trucks.**
10. Document the above into a TIS for submission to the Municipality/County for review and approval.

In addition to the above TOR can you, please, confirm:

- **background developments (if any) to be included in our study and provide corresponding TIS studies. The background developments should include those included in the TIS for the Tribute Development and Zeng Development. Please contact the Developers directly to obtain these reports.**
- **Preferred background growth rate. Suggest background growth rate of 2.0% per annum on County Road 9 and 1.5% per annum on the other roads. This is consistent with the previous TIS for the Tribute Development.**

Please also include a review of active transportation connectivity (internal and external) in the TIS, plus a review of parking requirements.

Jennifer Georgas, P.Eng.
Manager - Municipal Review
R.J. Burnside & Associates Limited | rjburnside.com
Office: +1 800-265-9662 Direct: +1 705-797-4271

From: Nick Ainley <nainley@clearview.ca>
Sent: Friday, November 29, 2024 9:37 AM
To: Patti Kennedy <pkennedy@clearview.ca>; Jennifer Georgas <Jennifer.Georgas@rjburnside.com>; Christine Taggart <ctaggart@clearview.ca>
Cc: Dan Perreault <dperreault@clearview.ca>
Subject: FW: Terms of Reference - 7582 County Road 9, Creemore

Hi PW Team,

I can confirm that the applicant has paid the required fee for review of the TIS TOR outlined below. As such, when available please proceed with review.

Let me know if you have any questions.

Best regards,
Nick Ainley, *B.U.R.PL*
Community Planner
Township of Clearview
(705) 428-6230 ext. 242
nainley@clearview.ca

From: Karolina Kukielka <kkukielka@tathameng.com>
Sent: November 4, 2024 1:48 PM
To: Rossalyn Workman <rworkman@clearview.ca>

Cc: David Perks <dperks@tathameng.com>
Subject: Terms of Reference - 7582 County Road 9, Creemore

Good afternoon,

Tatham Engineering Limited was retained to prepare a Transportation Impact Study (TIS) in support of proposed residential development to be located at 7582 County Road 9 in Creemore. The development is proposed to consist of 8 single detached and 130 townhouse units with access to County Road 9 and Fairgrounds Road South (as per the preliminary concept plan which may be subject to change).

Our proposed scope is listed below:

1. The proposed study area is County Road 9 and Fairgrounds Road South and the following intersections:

   - County Road 9 & Fairgrounds Road South; and
   - County Road 9 & Collingwood Street.

2. Existing traffic volumes will be established based on the new counts (if recent traffic data of 2 years or less is not available) and will be adjusted to reflect 2025 summer traffic volumes (accounting for annual and summer growth in traffic).

3. The operations assessment will consider weekday AM and PM peak hour volumes.

4. Using projected growth for the area and in consideration of the County of Simcoe's *Transportation Master Plan*, we will identify future background traffic volumes for the study area road network. Consideration will also be given to other planned developments in the area (to be confirmed). Projections will be developed for the year of full build-out of the proposed development (2030) in addition to 5-year (2035) and 10-year (2040) planning horizons beyond full build-out.
5. Determine the number of trips to be generated by the proposed development during the relevant peak hour periods and assign such to the road network based on existing traffic patterns, available distribution data and anticipated travel routes. Trip estimates will be based on trip rates published in the *ITE Trip Generation Manual, 11th Edition* for land-uses reflective of the one proposed.
6. Review the existing, background and total operations of the study area intersections and the site access points using Synchro traffic software.
7. Following the traffic analyses, identify any road network improvements/mitigating measures required to support the development and identify the timing of such.
8. Provide an assessment of the available sight lines at the proposed site access points in context of County and/or TAC requirements.

9. Review the internal layout of the site, discuss: parking provision, access design, autoturn assessment demonstrating appropriate accommodation of emergency vehicles.
10. Document the above into a TIS for submission to the Municipality/County for review and approval.

In addition to the above TOR can you, please, confirm:

- **background developments (if any) to be included in our study and provide corresponding TIS studies.**
- **Preferred background growth rate.**

Please let me know if the above Terms of Reference is acceptable and do not hesitate to contact me if you have any comments/questions.

Regards,

TATHAM ENGINEERING

Karolina Kukielka C.E.T., EIT, rcsi
Engineering Intern

kkukielka@tathameng.com **T** 705-733-9037 x2238
645 Veterans Drive, Unit D, Barrie, Ontario L4N 9H8

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Appendix B:
Traffic Counts

County Road 9 & Collingwood Street

Morning Peak Diagram

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

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

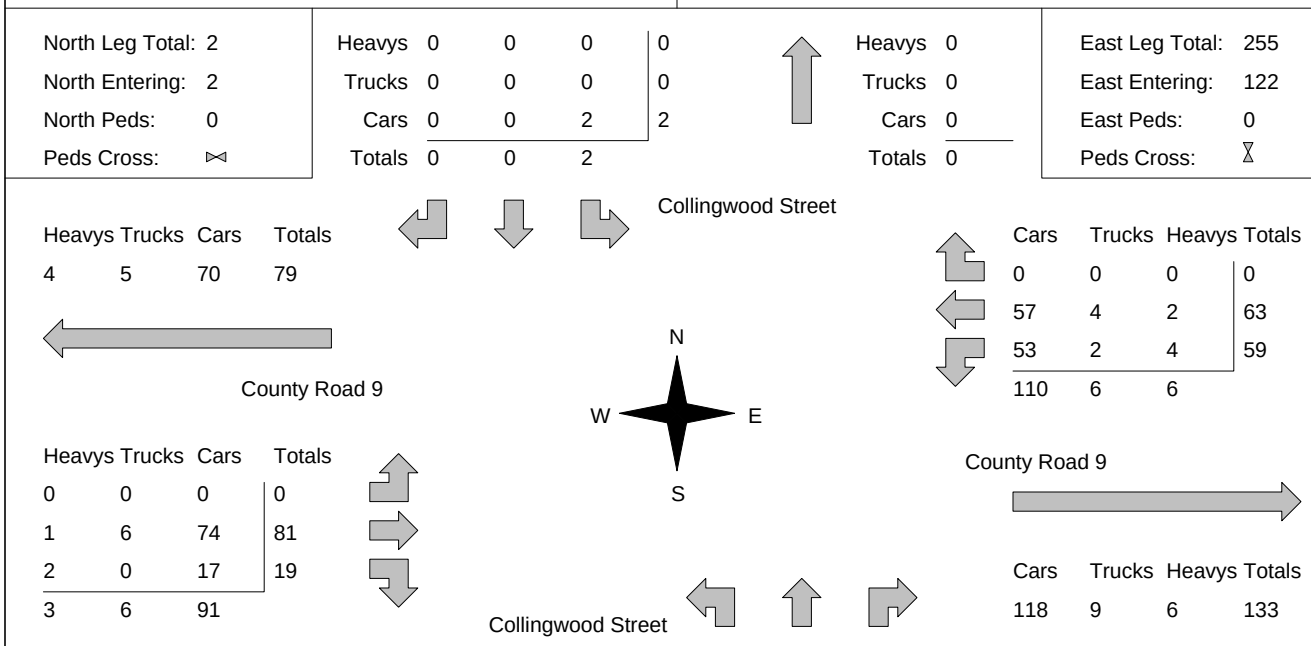
Municipality: Creemore
Site #: 0000003901
Intersection: County Road 9 & Collingwood Stre
TFR File #: 1
Count date: 30-Oct-2024

Weather conditions:
Clear

Person(s) who counted:

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

Major Road: County Road 9 runs W/E



Comments

County Road 9 & Collingwood Street

Mid-day Peak Diagram

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

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

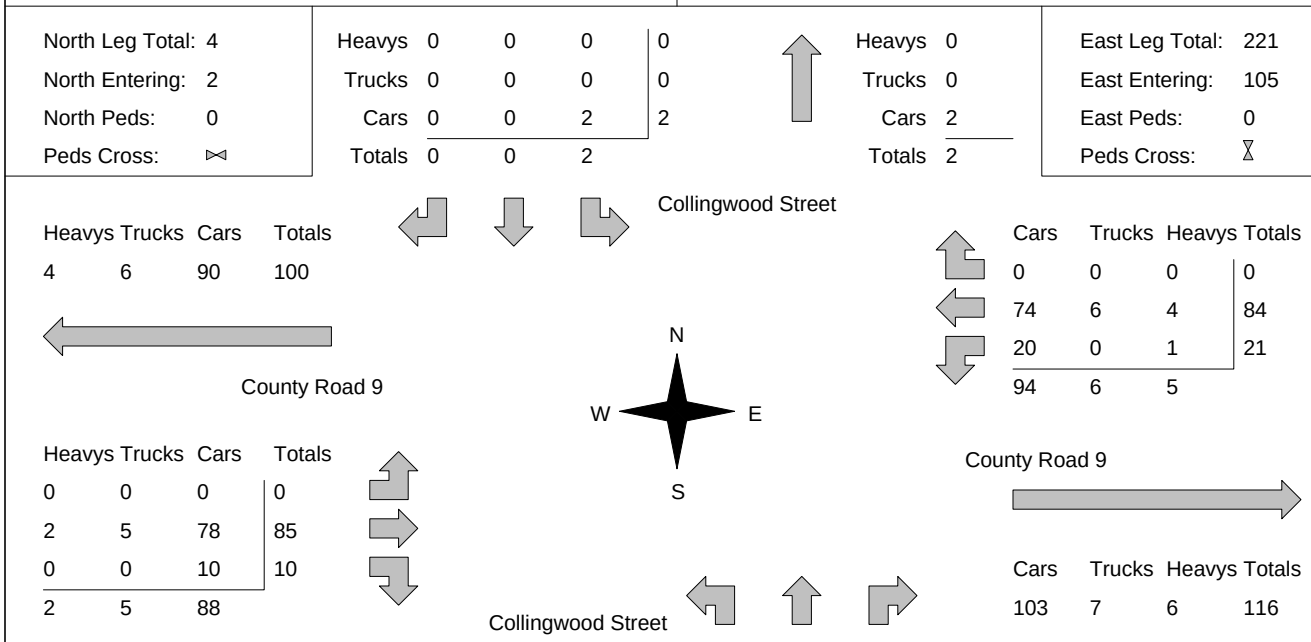
Municipality: Creemore
Site #: 0000003901
Intersection: County Road 9 & Collingwood Stre
TFR File #: 1
Count date: 30-Oct-2024

Weather conditions:
Clear

Person(s) who counted:

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

Major Road: County Road 9 runs W/E



Comments

County Road 9 & Collingwood Street

Afternoon Peak Diagram

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

One Hour Peak
From: 16:30:00
To: 17:30:00

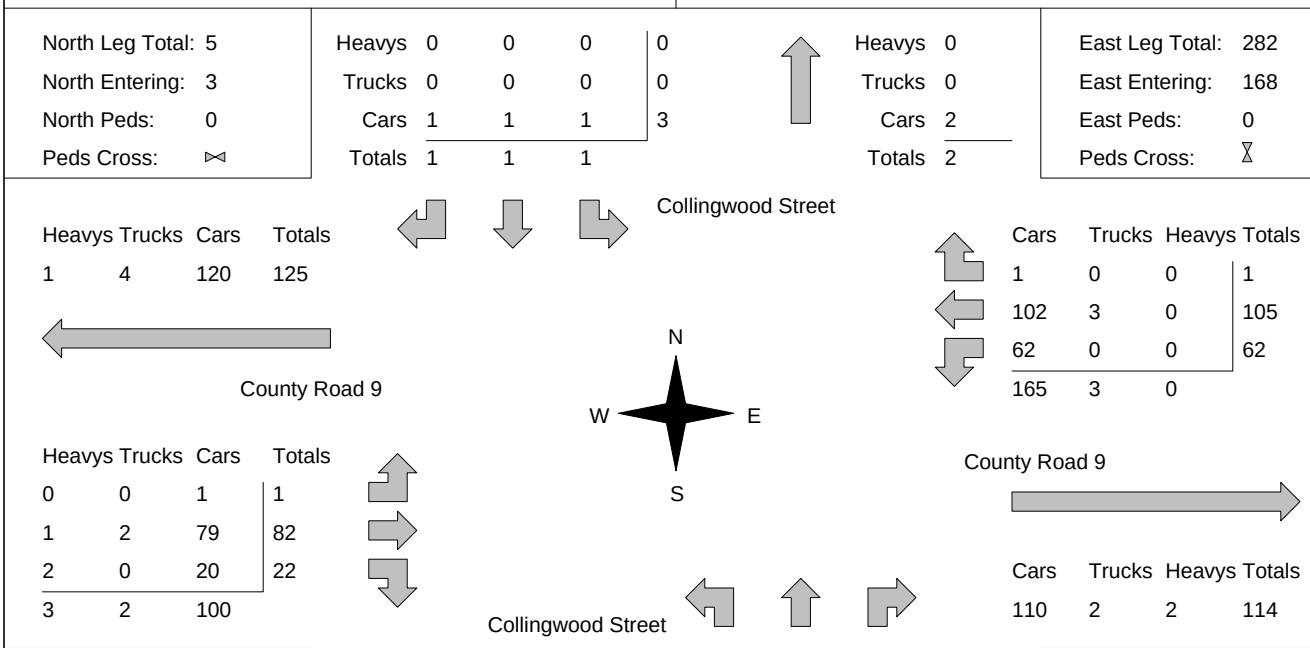
Municipality: Creemore
Site #: 0000003901
Intersection: County Road 9 & Collingwood Stre
TFR File #: 1
Count date: 30-Oct-2024

Weather conditions:
Clear

Person(s) who counted:

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

Major Road: County Road 9 runs W/E



Comments

County Road 9 & Collingwood Street

Total Count Diagram

Municipality: Creemore
Site #: 0000003901
Intersection: County Road 9 & Collingwood Stre
TFR File #: 1
Count date: 30-Oct-2024

Weather conditions:
Clear

Person(s) who counted:

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

Major Road: County Road 9 runs W/E

North Leg Total:	28			
North Entering:	15			
North Peds:	0			
Peds Cross:	⋈			
Heavys	0	0	0	0
Trucks	0	0	0	0
Cars	4	3	8	15
Totals	4	3	8	
Heavys	0			
Trucks	0			
Cars	13			
Totals	13			
East Leg Total:	1818			
East Entering:	928			
East Peds:	0			
Peds Cross:	⧖			

Collingwood Street

Heavys	Trucks	Cars	Totals
27	31	699	757

Cars	Trucks	Heavys	Totals
6	0	0	6
587	27	18	632
266	10	14	290
859	37	32	

County Road 9

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	1	1
16	27	589	632
9	1	112	122
25	28	702	

County Road 9

Cars	Trucks	Heavys	Totals
819	37	34	890

Collingwood Street

Peds Cross:	⧖			
West Peds:	0			
West Entering:	755			
West Leg Total:	1512			
Cars	381			
Trucks	11			
Heavys	23			
Totals	415			
Cars	108	6	222	336
Trucks	4	0	10	14
Heavys	9	0	18	27
Totals	121	6	250	
Peds Cross:	⋈			
South Peds:	0			
South Entering:	377			
South Leg Total:	792			

Comments

County Road 9 & Collingwood Street
Traffic Count Summary

Intersection: County Road 9 & Collingwood Stre | **Count Date:** 30-Oct-2024 | **Municipality:** Creemore

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	1	0	3	4	0	36
9:00:00	2	0	0	2	0	68
11:00:00	0	0	0	0	0	0
12:00:00	0	1	0	1	0	47
13:00:00	2	0	0	2	0	49
14:00:00	0	1	0	1	0	39
15:00:00	0	0	0	0	0	0
16:00:00	1	0	0	1	0	63
17:00:00	1	1	1	3	0	45
18:00:00	1	0	0	1	0	45
Totals:	8	3	4	15	0	392

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	9	1	22	32	0
9:00:00	16	0	50	66	0
11:00:00	0	0	0	0	0
12:00:00	17	1	28	46	0
13:00:00	16	2	29	47	0
14:00:00	13	0	25	38	0
15:00:00	0	0	0	0	0
16:00:00	17	2	43	62	0
17:00:00	14	0	28	42	0
18:00:00	19	0	25	44	0
Totals:	121	6	250	377	0

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	30	55	2	87	0	156
9:00:00	59	63	0	122	0	222
11:00:00	0	0	0	0	0	0
12:00:00	26	84	1	111	0	197
13:00:00	21	84	0	105	0	200
14:00:00	25	59	0	84	0	176
15:00:00	0	0	0	0	0	0
16:00:00	25	101	1	127	0	248
17:00:00	39	102	2	143	0	248
18:00:00	65	84	0	149	0	236
Totals:	290	632	6	928	0	1683

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	0	60	9	69	0
9:00:00	0	81	19	100	0
11:00:00	0	0	0	0	0
12:00:00	0	73	13	86	0
13:00:00	0	85	10	95	0
14:00:00	0	81	11	92	0
15:00:00	0	0	0	0	0
16:00:00	0	101	20	121	0
17:00:00	0	82	23	105	0
18:00:00	1	69	17	87	0
Totals:	1	632	122	755	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	11	18	18	20	14	20	16	20

County Road 9 & Fairgrounds Road South

Morning Peak Diagram

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

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

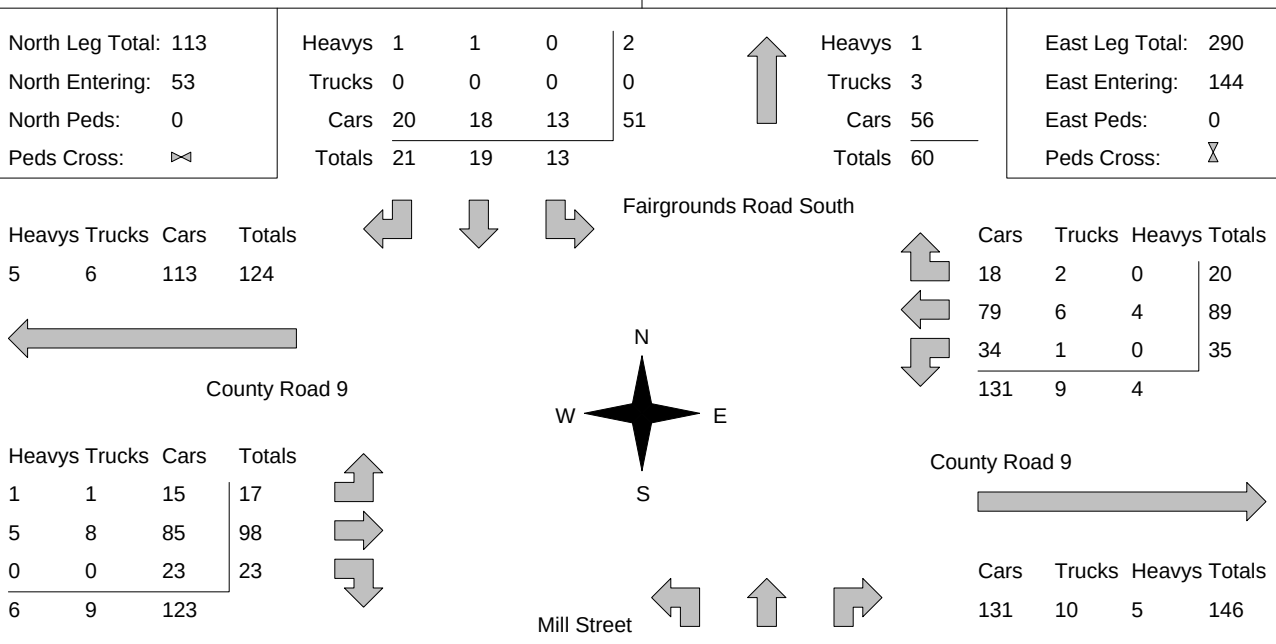
Municipality: Creemore
Site #: 0000003902
Intersection: County Road 9 & Fairgrounds Roac
TFR File #: 1
Count date: 30-Oct-2024

Weather conditions:
Clear

Person(s) who counted:

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

Major Road: County Road 9 runs W/E



Comments

County Road 9 & Fairgrounds Road South

Mid-day Peak Diagram

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

One Hour Peak
From: 11:00:00
To: 12:00:00

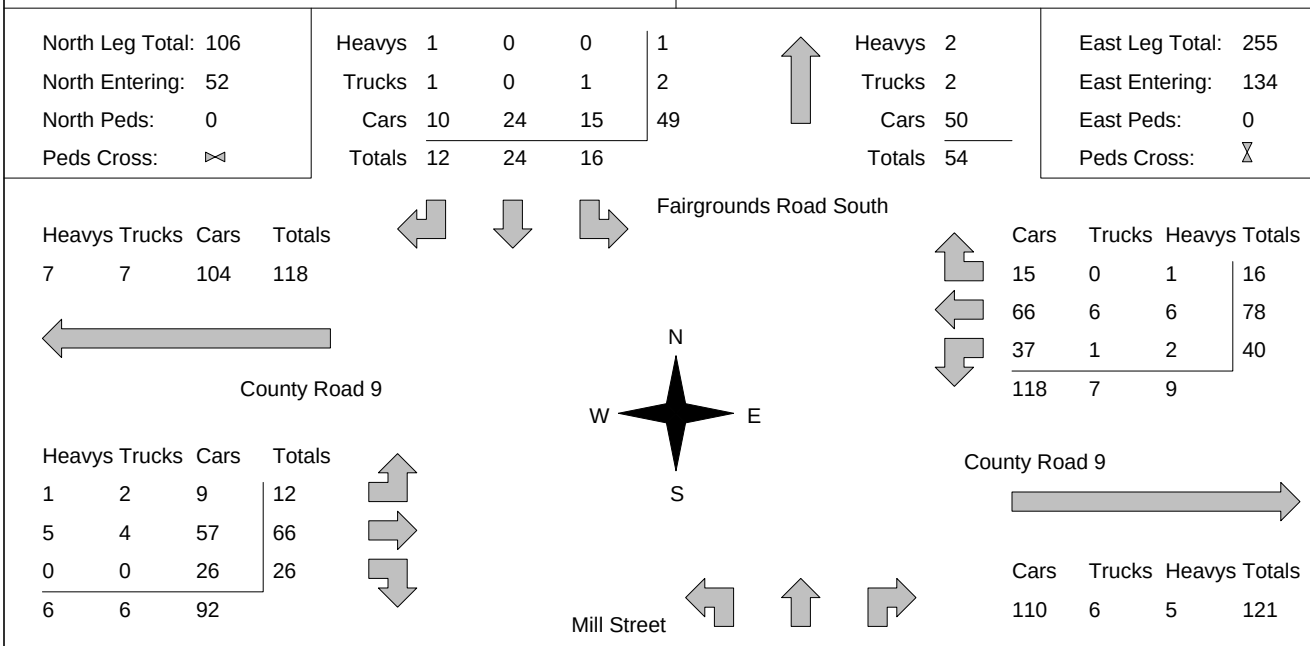
Municipality: Creemore
Site #: 0000003902
Intersection: County Road 9 & Fairgrounds Roac
TFR File #: 1
Count date: 30-Oct-2024

Weather conditions:
Clear

Person(s) who counted:

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

Major Road: County Road 9 runs W/E



Comments

County Road 9 & Fairgrounds Road South

Afternoon Peak Diagram

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

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

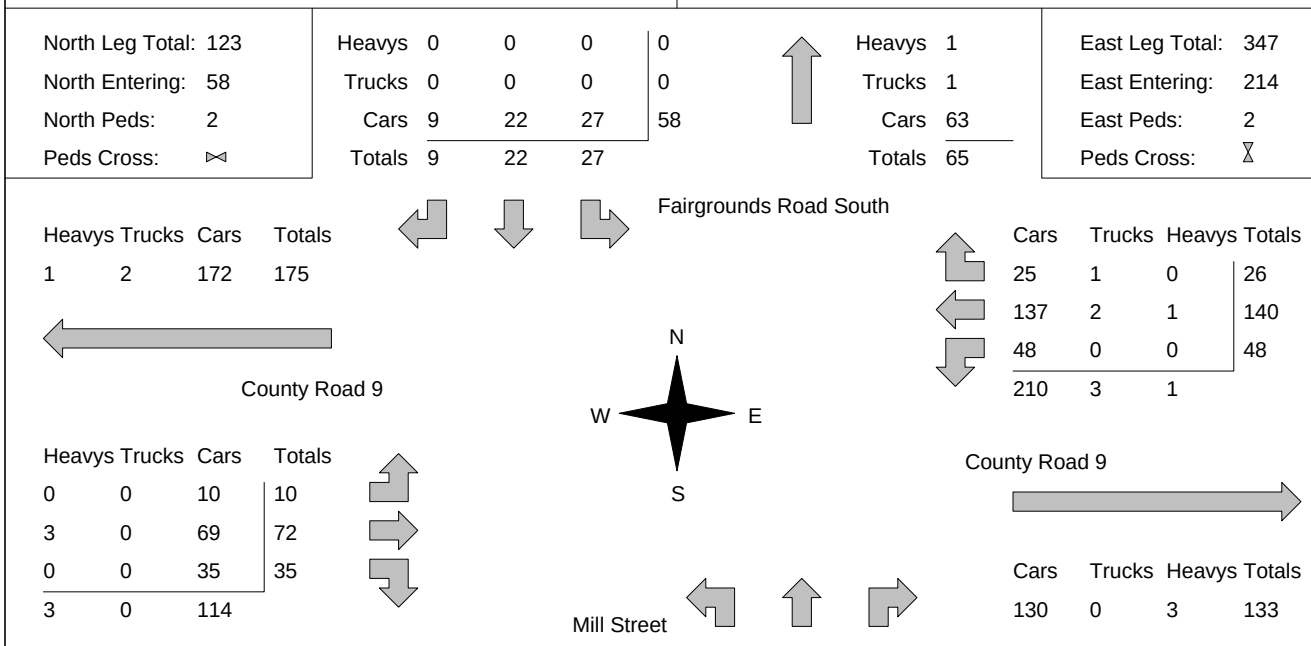
Municipality: Creemore
Site #: 0000003902
Intersection: County Road 9 & Fairgrounds Roac
TFR File #: 1
Count date: 30-Oct-2024

Weather conditions:
Clear

Person(s) who counted:

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

Major Road: County Road 9 runs W/E



Comments

County Road 9 & Fairgrounds Road South

Total Count Diagram

Municipality: Creemore
Site #: 0000003902
Intersection: County Road 9 & Fairgrounds Roa
TFR File #: 1
Count date: 30-Oct-2024

Weather conditions:
Clear

Person(s) who counted:

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

Major Road: County Road 9 runs W/E

North Leg Total:	832			
North Entering:	398			
North Peds:	7			
Peds Cross:	⋈			
Heavys	4	1	0	5
Trucks	1	1	3	5
Cars	95	170	123	388
Totals	100	172	126	
Heavys	7			
Trucks	9			
Cars	418			
Totals	434			
East Leg Total:	2106			
East Entering:	1101			
East Peds:	11			
Peds Cross:	⧖			

Fairgrounds Road South

Heavys	Trucks	Cars	Totals
30	43	898	971

Cars	Trucks	Heavys	Totals
153	4	2	159
629	38	26	693
238	5	6	249
1020	47	34	

County Road 9

N
W E
S

Heavys	Trucks	Cars	Totals
3	4	78	85
29	35	532	596
0	2	237	239
32	41	847	

County Road 9

Cars	Trucks	Heavys	Totals
931	43	31	1005

Mill Street

Peds Cross:	⧖			
West Peds:	14			
West Entering:	920			
West Leg Total:	1891			
Cars	645			
Trucks	8			
Heavys	7			
Totals	660			
Cars	174	187	276	637
Trucks	4	1	5	10
Heavys	0	2	2	4
Totals	178	190	283	
Peds Cross:	⋈			
South Peds:	19			
South Entering:	651			
South Leg Total:	1311			

Comments

County Road 9 & Fairgrounds Road South
Traffic Count Summary

Intersection: County Road 9 & Fairgrounds Roa | **Count Date:** 30-Oct-2024 | **Municipality:** Creemore

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	8	7	12	27	3	70
9:00:00	13	19	21	53	0	125
11:00:00	0	0	0	0	0	0
12:00:00	16	24	12	52	0	145
13:00:00	11	24	5	40	0	134
14:00:00	9	22	10	41	0	129
15:00:00	0	0	0	0	0	0
16:00:00	22	31	11	64	2	170
17:00:00	27	19	10	56	2	146
18:00:00	20	26	19	65	0	130
Totals:	126	172	100	398	7	1049

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	11	13	19	43	2
9:00:00	14	23	35	72	2
11:00:00	0	0	0	0	0
12:00:00	28	26	39	93	0
13:00:00	34	23	37	94	0
14:00:00	22	22	44	88	0
15:00:00	0	0	0	0	0
16:00:00	29	33	44	106	5
17:00:00	25	27	38	90	7
18:00:00	15	23	27	65	3
Totals:	178	190	283	651	19

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	13	65	30	108	2	189
9:00:00	35	89	20	144	0	282
11:00:00	0	0	0	0	0	0
12:00:00	40	78	16	134	0	238
13:00:00	33	75	18	126	0	247
14:00:00	27	56	14	97	0	209
15:00:00	0	0	0	0	0	0
16:00:00	28	91	19	138	5	286
17:00:00	40	120	30	190	4	302
18:00:00	33	119	12	164	0	268
Totals:	249	693	159	1101	11	2021

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	5	66	10	81	2
9:00:00	17	98	23	138	1
11:00:00	0	0	0	0	0
12:00:00	12	66	26	104	0
13:00:00	11	71	39	121	4
14:00:00	10	73	29	112	0
15:00:00	0	0	0	0	0
16:00:00	11	89	48	148	1
17:00:00	11	67	34	112	0
18:00:00	8	66	30	104	6
Totals:	85	596	239	920	14

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	36	51	70	73	53	90	83	67

COUNTY OF SIMCOE

TRANSPORTATION AND ENGINEERING DEPARTMENT
MIDHURST, ON
705-726-9300

County Road 9 - Fall 2024
County Road 42 / Cashtown Corners to Fairgrounds Road

Site Code: 009 04

Date Start: 16-Sep-24
Date End: 19-Sep-24

Start	16-Sep-24		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	4	5	2	4	3	7	4	8	*	*	*	*	*	*	3	6
01:00	0	6	2	6	0	4	1	6	*	*	*	*	*	*	1	6
02:00	1	4	0	4	3	4	1	1	*	*	*	*	*	*	1	3
03:00	4	1	6	1	3	0	5	4	*	*	*	*	*	*	4	2
04:00	21	4	22	1	13	2	14	2	*	*	*	*	*	*	18	2
05:00	37	17	52	30	51	25	43	29	*	*	*	*	*	*	46	25
06:00	81	58	107	65	110	59	100	59	*	*	*	*	*	*	100	60
07:00	132	122	124	121	139	123	133	99	*	*	*	*	*	*	132	116
08:00	**159**	**151**	**176**	**143**	**157**	**154**	**165**	**161**	*	*	*	*	*	*	**164**	**152**
09:00	122	127	122	126	124	144	121	128	*	*	*	*	*	*	122	131
10:00	122	117	124	112	117	122	103	134	*	*	*	*	*	*	116	121
11:00	110	139	126	131	132	136	125	148	*	*	*	*	*	*	123	138
12:00 PM	**155**	138	122	149	117	116	139	126	*	*	*	*	*	*	133	132
01:00	132	124	122	143	135	118	137	150	*	*	*	*	*	*	132	134
02:00	144	147	150	129	138	126	154	142	*	*	*	*	*	*	146	136
03:00	147	140	**163**	157	160	167	161	161	*	*	*	*	*	*	158	156
04:00	146	171	146	159	**177**	188	**166**	**180**	*	*	*	*	*	*	**159**	174
05:00	126	**176**	116	**169**	135	**191**	145	180	*	*	*	*	*	*	130	**179**
06:00	83	137	80	120	89	126	125	127	*	*	*	*	*	*	94	128
07:00	59	68	51	83	57	78	85	86	*	*	*	*	*	*	63	79
08:00	30	44	33	57	43	53	57	66	*	*	*	*	*	*	41	55
09:00	23	41	35	33	26	31	41	42	*	*	*	*	*	*	31	37
10:00	9	9	16	17	10	19	14	20	*	*	*	*	*	*	12	16
11:00	6	11	8	14	4	7	10	7	*	*	*	*	*	*	7	10
Lane	1853	1957	1905	1974	1943	2000	2049	2066	0	0	0	0	0	0	1936	1998
Day	3810		3879		3943		4115		0		0		0		3934	
AM Peak	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	-	-	-	-	-	-	08:00	08:00
Vol.	159	151	176	143	157	154	165	161	-	-	-	-	-	-	164	152
PM Peak	12:00	17:00	15:00	17:00	16:00	17:00	16:00	16:00	-	-	-	-	-	-	16:00	17:00
Vol.	155	176	163	169	177	191	166	180	-	-	-	-	-	-	159	179

Comb. Total	3810	3879	3943	4115	0	0	0	3934

ADT ADT 3,937 AADT 3,937

COUNTY OF SIMCOE

TRANSPORTATION AND ENGINEERING
Midhurst, ON
705-726-9300

County Road 9 - Spring 2024
County Road 42 to
Fairgrounds Road

Site Code: 009 04

Date Start: 29-Apr-24
Date End: 02-May-24

Start	29-Apr-24		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	7	4	3	6	3	9	2	3	*	*	*	*	*	*	4	6
01:00	3	4	2	7	2	4	4	6	*	*	*	*	*	*	3	5
02:00	3	5	3	1	2	3	0	3	*	*	*	*	*	*	2	3
03:00	3	3	4	3	7	1	8	3	*	*	*	*	*	*	6	2
04:00	17	1	15	1	15	4	13	0	*	*	*	*	*	*	15	2
05:00	38	27	47	22	58	26	49	31	*	*	*	*	*	*	48	26
06:00	87	63	97	67	97	62	112	73	*	*	*	*	*	*	98	66
07:00	146	108	134	107	139	106	141	107	*	*	*	*	*	*	140	107
08:00	**176**	**170**	**184**	**158**	**185**	**176**	**161**	**174**	*	*	*	*	*	*	**176**	**170**
09:00	123	125	126	102	121	128	125	129	*	*	*	*	*	*	124	121
10:00	115	119	111	116	125	111	111	121	*	*	*	*	*	*	116	117
11:00	117	113	127	118	143	131	125	127	*	*	*	*	*	*	128	122
12:00 PM	142	134	142	133	126	140	133	143	*	*	*	*	*	*	136	138
01:00	115	119	126	132	135	124	150	141	*	*	*	*	*	*	132	129
02:00	125	144	141	136	134	135	**182**	138	*	*	*	*	*	*	146	138
03:00	**164**	146	**165**	160	142	146	179	143	*	*	*	*	*	*	162	149
04:00	164	**174**	161	**171**	**190**	**200**	176	**199**	*	*	*	*	*	*	**173**	**186**
05:00	115	172	103	167	138	179	141	196	*	*	*	*	*	*	124	178
06:00	61	95	72	110	88	137	123	148	*	*	*	*	*	*	86	122
07:00	43	81	52	72	45	68	67	79	*	*	*	*	*	*	52	75
08:00	33	40	27	44	47	62	38	54	*	*	*	*	*	*	36	50
09:00	27	36	16	29	16	35	30	52	*	*	*	*	*	*	22	38
10:00	14	17	17	21	13	24	17	24	*	*	*	*	*	*	15	22
11:00	3	8	8	9	8	4	11	16	*	*	*	*	*	*	8	9
Lane	1841	1908	1883	1892	1979	2015	2098	2110	0	0	0	0	0	0	1952	1981
Day	3749		3775		3994		4208		0		0		0		3933	
AM Peak	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	-	-	-	-	-	-	08:00	08:00
Vol.	176	170	184	158	185	176	161	174	-	-	-	-	-	-	176	170
PM Peak	15:00	16:00	15:00	16:00	16:00	16:00	14:00	16:00	-	-	-	-	-	-	16:00	16:00
Vol.	164	174	165	171	190	200	182	199	-	-	-	-	-	-	173	186

Comb. Total	3749	3775	3994	4208	0	0	0	3933

ADT ADT 3,932 AADT 3,932

COUNTY OF SIMCOE

TRANSPORTATION AND ENGINEERING
Midhurst, ON
705-726-9300

County Road 9 - Summer 2024
County Road 42 to
Fairgrounds Road

Site Code: 009 04

Date Start: 19-Aug-24
Date End: 22-Aug-24

Start	19-Aug-24		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	2	7	6	17	2	5	3	4	*	*	*	*	*	*	3	8
01:00	1	7	2	4	1	7	1	6	*	*	*	*	*	*	1	6
02:00	1	11	2	7	2	13	1	11	*	*	*	*	*	*	2	10
03:00	1	4	0	5	0	1	1	3	*	*	*	*	*	*	0	3
04:00	7	3	11	3	10	3	8	1	*	*	*	*	*	*	9	2
05:00	22	12	31	14	28	11	31	13	*	*	*	*	*	*	28	12
06:00	65	43	88	40	76	45	79	35	*	*	*	*	*	*	77	41
07:00	98	89	102	79	108	80	119	84	*	*	*	*	*	*	107	83
08:00	99	87	118	92	97	98	113	80	*	*	*	*	*	*	107	89
09:00	106	102	**144**	95	107	103	137	105	*	*	*	*	*	*	124	101
10:00	**134**	108	123	103	**135**	101	131	125	*	*	*	*	*	*	**131**	109
11:00	121	**144**	101	**119**	132	**150**	**145**	**139**	*	*	*	*	*	*	125	**138**
12:00 PM	117	156	119	154	130	169	122	173	*	*	*	*	*	*	122	163
01:00	128	146	121	144	122	146	111	187	*	*	*	*	*	*	120	156
02:00	131	129	125	134	136	143	137	144	*	*	*	*	*	*	132	138
03:00	112	161	128	175	131	169	127	181	*	*	*	*	*	*	124	172
04:00	**160**	**174**	**148**	**186**	**154**	**202**	**172**	195	*	*	*	*	*	*	**158**	**189**
05:00	106	171	124	167	131	156	139	**226**	*	*	*	*	*	*	125	180
06:00	83	95	68	112	84	119	119	173	*	*	*	*	*	*	88	125
07:00	85	95	62	74	48	103	88	117	*	*	*	*	*	*	71	97
08:00	38	58	39	79	42	72	68	117	*	*	*	*	*	*	47	82
09:00	19	50	25	50	41	61	41	74	*	*	*	*	*	*	32	59
10:00	18	21	16	30	13	33	20	47	*	*	*	*	*	*	17	33
11:00	6	11	8	19	12	13	6	18	*	*	*	*	*	*	8	15
Lane	1660	1884	1711	1902	1742	2003	1919	2258	0	0	0	0	0	0	1758	2011
Day	3544		3613		3745		4177		0		0		0		3769	
AM Peak	10:00	11:00	09:00	11:00	10:00	11:00	11:00	11:00	-	-	-	-	-	-	10:00	11:00
Vol.	134	144	144	119	135	150	145	139	-	-	-	-	-	-	131	138
PM Peak	16:00	16:00	16:00	16:00	16:00	16:00	16:00	17:00	-	-	-	-	-	-	16:00	16:00
Vol.	160	174	148	186	154	202	172	226	-	-	-	-	-	-	158	189

Comb. Total	3544	3613	3745	4177	0	0	0	3769

ADT ADT 3,770 AADT 3,770

COUNTY OF SIMCOE

TRANSPORTATION AND ENGINEERING DEPARTMENT
MIDHURST, ON
705-726-9300

County Road 9 - Fall 2024
Fairgrounds Road to
Conc 8 / Clearview

Site Code: 009 05

Date Start: 16-Sep-24
Date End: 19-Sep-24

Start	16-Sep-24		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	1	2	0	1	0	2	0	2	*	*	*	*	*	*	0	2
01:00	0	0	0	0	0	0	2	0	*	*	*	*	*	*	0	0
02:00	0	0	0	1	1	0	0	0	*	*	*	*	*	*	0	0
03:00	0	0	2	0	0	0	0	0	*	*	*	*	*	*	0	0
04:00	4	1	2	0	2	0	2	0	*	*	*	*	*	*	2	0
05:00	11	1	16	3	10	3	15	1	*	*	*	*	*	*	13	2
06:00	23	15	23	10	31	8	25	14	*	*	*	*	*	*	26	12
07:00	30	23	32	24	36	33	39	30	*	*	*	*	*	*	34	28
08:00	**50**	**38**	**41**	25	37	36	37	33	*	*	*	*	*	*	**41**	33
09:00	40	30	40	37	39	**41**	**40**	**39**	*	*	*	*	*	*	40	37
10:00	35	35	39	30	38	39	31	39	*	*	*	*	*	*	36	36
11:00	37	35	36	**47**	**45**	40	32	36	*	*	*	*	*	*	38	**40**
12:00 PM	**56**	41	35	47	28	29	58	53	*	*	*	*	*	*	44	42
01:00	39	38	36	**53**	46	45	49	48	*	*	*	*	*	*	42	46
02:00	47	57	37	40	54	41	39	58	*	*	*	*	*	*	44	49
03:00	39	40	**55**	38	**56**	48	56	53	*	*	*	*	*	*	**52**	45
04:00	37	**60**	52	46	39	**60**	49	**60**	*	*	*	*	*	*	44	**56**
05:00	38	49	45	48	40	51	**59**	47	*	*	*	*	*	*	46	49
06:00	33	44	28	42	31	42	48	41	*	*	*	*	*	*	35	42
07:00	13	26	12	23	23	31	27	27	*	*	*	*	*	*	19	27
08:00	10	11	6	12	13	14	24	20	*	*	*	*	*	*	13	14
09:00	4	15	7	13	6	14	11	19	*	*	*	*	*	*	7	15
10:00	3	2	6	6	2	3	5	9	*	*	*	*	*	*	4	5
11:00	0	1	3	1	2	3	6	2	*	*	*	*	*	*	3	2
Lane	550	564	553	547	579	583	654	631	0	0	0	0	0	0	583	582
Day	1114		1100		1162		1285		0		0		0		1165	
AM Peak	08:00	08:00	08:00	11:00	11:00	09:00	09:00	09:00	-	-	-	-	-	-	08:00	11:00
Vol.	50	38	41	47	45	41	40	39	-	-	-	-	-	-	41	40
PM Peak	12:00	16:00	15:00	13:00	15:00	16:00	17:00	16:00	-	-	-	-	-	-	15:00	16:00
Vol.	56	60	55	53	56	60	59	60	-	-	-	-	-	-	52	56

Comb. Total	1114	1100	1162	1285	0	0	0	1165

ADT ADT 1,165 AADT 1,165

COUNTY OF SIMCOE

TRANSPORTATION AND ENGINEERING
Midhurst, ON
705-726-9300

County Road 9 - Spring 2024
Fairgrounds Road to
8th Concession - Clearview

Site Code: 009 05

Date Start: 29-Apr-24
Date End: 02-May-24

Start	29-Apr-24		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	2	2	0	1	0	0	0	0	*	*	*	*	*	*	0	1
01:00	0	0	0	2	0	1	1	1	*	*	*	*	*	*	0	1
02:00	0	1	0	0	0	0	0	0	*	*	*	*	*	*	0	0
03:00	0	1	0	0	1	0	0	0	*	*	*	*	*	*	0	0
04:00	4	0	2	0	4	1	2	0	*	*	*	*	*	*	3	0
05:00	7	4	11	6	13	5	10	4	*	*	*	*	*	*	10	5
06:00	22	8	22	9	24	9	21	12	*	*	*	*	*	*	22	10
07:00	44	30	**43**	19	47	28	**53**	22	*	*	*	*	*	*	**47**	25
08:00	**53**	32	39	27	44	32	47	**43**	*	*	*	*	*	*	46	34
09:00	38	**37**	39	20	36	28	48	37	*	*	*	*	*	*	40	30
10:00	36	31	34	**47**	34	32	38	29	*	*	*	*	*	*	36	**35**
11:00	38	35	29	35	**49**	**39**	45	32	*	*	*	*	*	*	40	35
12:00 PM	30	33	**47**	26	43	37	44	41	*	*	*	*	*	*	41	34
01:00	33	33	35	39	30	31	50	45	*	*	*	*	*	*	37	37
02:00	33	38	35	37	44	41	**67**	47	*	*	*	*	*	*	45	41
03:00	35	52	31	51	43	50	55	51	*	*	*	*	*	*	41	51
04:00	**44**	**59**	35	46	**46**	**71**	57	**77**	*	*	*	*	*	*	**46**	**63**
05:00	30	50	27	**59**	38	64	54	62	*	*	*	*	*	*	37	59
06:00	17	37	21	38	26	32	58	48	*	*	*	*	*	*	30	39
07:00	17	31	13	20	16	34	25	35	*	*	*	*	*	*	18	30
08:00	6	8	5	18	20	19	11	13	*	*	*	*	*	*	10	14
09:00	7	8	5	6	7	8	6	28	*	*	*	*	*	*	6	12
10:00	3	5	4	2	4	6	4	15	*	*	*	*	*	*	4	7
11:00	1	2	3	2	1	1	2	5	*	*	*	*	*	*	2	2
Lane	500	537	480	510	570	569	698	647	0	0	0	0	0	0	561	565
Day	1037		990		1139		1345		0		0		0		1126	
AM Peak	08:00	09:00	07:00	10:00	11:00	11:00	07:00	08:00	-	-	-	-	-	-	07:00	10:00
Vol.	53	37	43	47	49	39	53	43	-	-	-	-	-	-	47	35
PM Peak	16:00	16:00	12:00	17:00	16:00	16:00	14:00	16:00	-	-	-	-	-	-	16:00	16:00
Vol.	44	59	47	59	46	71	67	77	-	-	-	-	-	-	46	63

Comb. Total	1037	990	1139	1345	0	0	0	1126

ADT ADT 1,128 AADT 1,128

COUNTY OF SIMCOE

TRANSPORTATION AND ENGINEERING
Midhurst, ON
705-726-9300

County Road 9 - Summer 2024
Fairgrounds Road to
Concession 8 Clearview

Site Code: 009 05

Date Start: 06-Aug-24
Date End: 08-Aug-24

Start	05-Aug-24		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	0	1	1	0	0	0	*	*	*	*	*	*	0	0
01:00	*	*	2	0	0	1	2	0	*	*	*	*	*	*	1	0
02:00	*	*	1	1	0	0	2	0	*	*	*	*	*	*	1	0
03:00	*	*	0	1	0	0	0	0	*	*	*	*	*	*	0	0
04:00	*	*	3	2	4	0	2	1	*	*	*	*	*	*	3	1
05:00	*	*	9	2	10	2	14	2	*	*	*	*	*	*	11	2
06:00	*	*	16	8	29	12	25	15	*	*	*	*	*	*	23	12
07:00	*	*	31	22	39	29	34	18	*	*	*	*	*	*	35	23
08:00	*	*	38	39	42	35	38	26	*	*	*	*	*	*	39	33
09:00	*	*	36	23	32	**48**	33	**42**	*	*	*	*	*	*	34	38
10:00	*	*	50	45	42	47	**42**	27	*	*	*	*	*	*	45	40
11:00	*	*	**60**	**58**	**57**	43	38	38	*	*	*	*	*	*	**52**	**46**
12:00 PM	*	*	**56**	60	37	50	51	53	*	*	*	*	*	*	**48**	54
01:00	*	*	52	64	46	60	40	52	*	*	*	*	*	*	46	59
02:00	*	*	43	66	42	51	46	64	*	*	*	*	*	*	44	60
03:00	*	*	39	**69**	45	66	**57**	73	*	*	*	*	*	*	47	69
04:00	*	*	53	67	37	**71**	51	**75**	*	*	*	*	*	*	47	**71**
05:00	*	*	47	57	**51**	57	46	58	*	*	*	*	*	*	48	57
06:00	*	*	26	53	34	52	35	46	*	*	*	*	*	*	32	50
07:00	*	*	19	32	25	40	13	27	*	*	*	*	*	*	19	33
08:00	*	*	13	20	15	19	13	26	*	*	*	*	*	*	14	22
09:00	*	*	12	15	10	12	10	18	*	*	*	*	*	*	11	15
10:00	*	*	6	7	7	6	4	5	*	*	*	*	*	*	6	6
11:00	*	*	0	1	5	3	1	1	*	*	*	*	*	*	2	2
Lane	0	0	612	713	610	704	597	667	0	0	0	0	0	0	608	693
Day	0		1325		1314		1264		0		0		0		1301	
AM Peak	-	-	11:00	11:00	11:00	09:00	10:00	09:00	-	-	-	-	-	-	11:00	11:00
Vol.	-	-	60	58	57	48	42	42	-	-	-	-	-	-	52	46
PM Peak	-	-	12:00	15:00	17:00	16:00	15:00	16:00	-	-	-	-	-	-	12:00	16:00
Vol.	-	-	56	69	51	71	57	75	-	-	-	-	-	-	48	71

Comb. Total	0	1325	1314	1264	0	0	0	1301

ADT ADT 1,295 AADT 1,295

Appendix C:
LOS Definitions

TATHAM ENGINEERING

Level of Service – Unsignalized Intersections

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

The following table describes in detail the characteristics of each level of service, with A being the best and F being the worst.

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

source: 2010 Highway Capacity Manual

TATHAM ENGINEERING

Level of Service – Signalized Intersections

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

The following table describes in detail the characteristics of each level of service, with A being the best and F being the worst.

LOS	EXPECTED DELAY TO STREET TRAFFIC	DELAY (sec/veh)
A	This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all at this LOS. Short cycle lengths may also contribute to low delay.	$0 < d \leq 10$
B	This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop at this level than at LOS A, causing longer average delays.	$10 < d \leq 20$
C	These higher delays may result from fair progression, longer cycle length, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.	$20 < d \leq 35$
D	At this level, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavourable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures become noticeable.	$35 < d \leq 55$
E	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.	$55 < d \leq 80$
F	At this level, oversaturation occurs when arrival flow rates exceed the design capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such high delay levels. LOS F is considered to be unacceptable to most drivers.	$80 < d$

source: 2010 Highway Capacity Manual

Appendix D:
Existing Operations

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	86	19	61	65	1	16	1	53	2	1	1
Future Vol, veh/h	1	86	19	61	65	1	16	1	53	2	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	116	26	82	88	1	22	1	72	3	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	89	0	0	142	0	0	385	384	129	421	397	89
Stage 1	-	-	-	-	-	-	131	131	-	253	253	-
Stage 2	-	-	-	-	-	-	254	253	-	168	144	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1506	-	-	1441	-	-	573	550	921	543	540	969
Stage 1	-	-	-	-	-	-	873	788	-	751	698	-
Stage 2	-	-	-	-	-	-	750	698	-	834	778	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1506	-	-	1441	-	-	544	516	921	477	507	969
Mov Cap-2 Maneuver	-	-	-	-	-	-	544	516	-	477	507	-
Stage 1	-	-	-	-	-	-	872	787	-	750	656	-
Stage 2	-	-	-	-	-	-	703	656	-	767	777	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	3.7	10.2	11.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	787	1506	-	-	1441	-	-	556
HCM Lane V/C Ratio	0.12	0.001	-	-	0.057	-	-	0.01
HCM Control Delay (s)	10.2	7.4	0	-	7.7	0	-	11.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0.2	-	-	0

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	17	100	23	36	91	20	14	23	36	13	19	21
Future Vol, veh/h	17	100	23	36	91	20	14	23	36	13	19	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	125	29	45	114	25	18	29	45	16	24	26

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	139	0	0	154	0	0	424	411	140	436	413	127
Stage 1	-	-	-	-	-	-	182	182	-	217	217	-
Stage 2	-	-	-	-	-	-	242	229	-	219	196	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1445	-	-	1426	-	-	540	531	908	531	529	923
Stage 1	-	-	-	-	-	-	820	749	-	785	723	-
Stage 2	-	-	-	-	-	-	762	715	-	783	739	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1445	-	-	1426	-	-	487	505	908	465	503	923
Mov Cap-2 Maneuver	-	-	-	-	-	-	487	505	-	465	503	-
Stage 1	-	-	-	-	-	-	807	737	-	772	698	-
Stage 2	-	-	-	-	-	-	691	691	-	704	727	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	1.9	11.5	11.8
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	641	1445	-	-	1426	-	-	599
HCM Lane V/C Ratio	0.142	0.015	-	-	0.032	-	-	0.111
HCM Control Delay (s)	11.5	7.5	0	-	7.6	0	-	11.8
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0.4

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	86	22	66	112	1	19	1	32	1	1	1
Future Vol, veh/h	1	86	22	66	112	1	19	1	32	1	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	93	24	72	122	1	21	1	35	1	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	123	0	0	117	0	0	375	374	105	392	386	123
Stage 1	-	-	-	-	-	-	107	107	-	267	267	-
Stage 2	-	-	-	-	-	-	268	267	-	125	119	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1464	-	-	1471	-	-	582	557	949	567	548	928
Stage 1	-	-	-	-	-	-	898	807	-	738	688	-
Stage 2	-	-	-	-	-	-	738	688	-	879	797	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1464	-	-	1471	-	-	556	527	949	523	518	928
Mov Cap-2 Maneuver	-	-	-	-	-	-	556	527	-	523	518	-
Stage 1	-	-	-	-	-	-	897	806	-	737	652	-
Stage 2	-	-	-	-	-	-	697	652	-	845	796	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2.8	10.2	10.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	745	1464	-	-	1471	-	-	610
HCM Lane V/C Ratio	0.076	0.001	-	-	0.049	-	-	0.005
HCM Control Delay (s)	10.2	7.5	0	-	7.6	0	-	10.9
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.2	-	-	0

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	10	73	36	49	143	27	27	30	35	28	22	9
Future Vol, veh/h	10	73	36	49	143	27	27	30	35	28	22	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	76	38	51	149	28	28	31	36	29	23	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	177	0	0	114	0	0	396	394	95	414	399	163
Stage 1	-	-	-	-	-	-	115	115	-	265	265	-
Stage 2	-	-	-	-	-	-	281	279	-	149	134	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1399	-	-	1475	-	-	564	542	962	549	539	882
Stage 1	-	-	-	-	-	-	890	800	-	740	689	-
Stage 2	-	-	-	-	-	-	726	680	-	854	785	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1399	-	-	1475	-	-	521	517	962	486	514	882
Mov Cap-2 Maneuver	-	-	-	-	-	-	521	517	-	486	514	-
Stage 1	-	-	-	-	-	-	883	794	-	734	663	-
Stage 2	-	-	-	-	-	-	667	654	-	783	779	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	1.7	11.7	12.6
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	629	1399	-	-	1475	-	-	533
HCM Lane V/C Ratio	0.152	0.007	-	-	0.035	-	-	0.115
HCM Control Delay (s)	11.7	7.6	0	-	7.5	0	-	12.6
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0.4

Appendix E:
Background Development

TRAFFIC IMPACT STUDY

CREEMORE COMMONS
RESIDENTIAL DEVELOPMENT
TOWNSHIP OF CLEARVIEW

PREPARED FOR:
TRIBUTE (CREEMORE) LIMITED

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ONTARIO
L9Y 1A1

1ST SUBMISSION: APRIL 2023

CFCA FILE NO. 1000-4419

CROZIER
CONSULTING ENGINEERS

REVISION NUMBER	DATE	COMMENTS
Rev. 0	April 2023	Issued for First Submission Official Plan Amendment, Zoning By-law Amendment & Draft Plan of Subdivision

1.0 Executive Summary

C.F. Crozier and Associates Inc. (Crozier) was retained by Tribute (Creemore) Limited (Tribute) to complete a Traffic Impact Study (TIS) for the proposed residential development located at in Part of Lots 8 and 9 Concession 4 (the Site) in the Village of Creemore, within the Township of Clearview (Township), Simcoe County (County).

This TIS has been prepared to support the Official Plan Amendment (OPA), Zoning Bylaw Amendment (ZBA) and Draft Plan of Subdivision Applications for the Site. The residential development proposes a maximum unit yield of 536 units consisting of a variety of lot types ranging from 30 ft to 50 ft lots. The plan allows for flexibility and the residential units could be provided through a mix of single-family homes and townhouse units.

The development includes one north-south collector road (Street "A") which would extend from County Road 9/Louisa Street to its southern terminus. Access to the Site is proposed through one full move access (Street "A") on County Road 9, the extension of Nelson Street, the extension of Wellington Street, and the extension of Francis Street. Francis Street, Wellington Street, and Nelson Street are both located to the west of the site.

The following intersections were assessed in the TIS:

- County Road 9 and Mary Street
- Nelson Street and Mary Street
- Wellington Street and Mary Street
- Francis Street and Mary Street
- Edward Street and Mary Street
- County Road 9 and the future Site Access

Intersection analysis of the existing traffic volumes indicates the following:

- All study intersections are operating with a Level of Service (LOS) "B" or better during the weekday a.m. and p.m. peak hours.

Traffic volumes on the road network were increased using a growth rate of 1.5% on local roads, and 2% on County Road 9. The background traffic volumes also account for trips generated by the Zeng Development (George/Edward Street), the Brix Development (Mary Street), the LAMB Development (Edward Street), and Alliance Homes Development (Phase 1a fronting Mary Street). The horizon years of 2027, 2030, 2035 and 2040 were assessed.

Intersection analysis of the 2040 future background traffic volumes indicates the following:

- The study intersections are expected to continue operating with a LOS "B" or better in the weekday a.m. and p.m. peak hours under 2040 future background traffic volume conditions except for the intersection of County Road 9 and Mary Street which is expected to operate at a LOS "C" during the weekday p.m. period.

- The maximum control delay of 17.0 s (SB) and volume-to-capacity ratio of 0.31 (NB), both forecasted for the intersection of County Road 9 and Mary Street in the p.m. peak hour, indicate that the boundary road network is expected to continue operating acceptably with reserve capacity for increases in traffic volumes.

The development is proposed to be constructed in multiple phases. Phase 1 of the proposed development is forecast to generate 141 and 194 two-way trips in the weekday a.m. and p.m. peak hours, respectively. Full build out of the proposed development is forecast to generate 319 and 425 two-way trips in the weekday a.m. and p.m. peak hours, respectively. As the unit mix and phasing is subject to change, further studies should review the most up to date land uses and phasing information. Trips were distributed to the boundary road network based on Transportation Tomorrow Survey Data.

An auxiliary left-turn lane warrant was completed for the intersection of County Road 9 and the Site Access. It was found that an auxiliary left-turn lane was warranted based on the forecasted 2027 future total traffic volumes and the 80 km/h posted speed limit. Accordingly, 25 m of storage was included in modeling the intersection operations. It is noted that the proposed development will expand the residential area of Creemore. Therefore, it may be appropriate to reduce the posted speed limit of County Road 9 to the eastern limits of the property. Even with a reduced design speed of 60 km/h, a left-turn lane is warranted as of 2030 with a storage length of 15 m.

An auxiliary left-turn lane is warranted in the final horizon year at the intersection of County Road 9 and Mary Street. This warrant was based off on the 2040 future total volumes. As this warrant is not met unit the final horizon year and the volumes are very close to the warrant line, it is recommended that the intersection be monitored as the surrounding developments are being constructed and the requirement be reassessed prior to Phase 2 of the development being constructed.

Intersection analysis of the 2040 future total traffic volumes indicates the following:

- The following intersections are anticipated to continue operating with a LOS "B" in the a.m. and p.m. peak hours:
    - Nelson Street and Mary Street
    - Wellington Street and Mary Street
    - Edward Street and Mary Street
    - County Road 9 and the Site Access

- The intersection of County Road 9 and Mary Street is anticipated to operate with a LOS "C" in the a.m. and p.m. peak hours.
    - The maximum control delay is forecasted to be 18.7 s and the maximum volume-to-capacity ratio is forecasted to be 0.37(SB).

- The Intersection of Francis Street and Mary Street is anticipated to operate at a LOS "C" or better under future total conditions.
    - The maximum control delay is forecasted to be 16.0 s and the maximum volume-to-capacity ratio is forecasted to be 0.22 (EB).

Traffic calming measures on the internal road network were reviewed based on the Township's Draft Traffic Calming Policies and Procedures document. Traffic calming measures which could be considered for future implementation through detailed design and consultation with Township staff and Township Council include on-street parking, lane narrowing through pavement markings, dynamic speed signs (specifically adjacent to the proposed parks), textured crosswalks and/or intersections, and curb bump-outs/curb radii reductions. Details relating to sidewalks, crosswalk locations, and internal traffic calming measures should be reviewed and confirmed through detailed design.

The location of Street A at County Road 9 can be supported from a sight distance perspective.

The key recommendations for the proposed development are as follows:

- An auxiliary left-turn lane is warranted at the intersection of County Road 9 and the Site Access.
    - The left-turn lane dimensions of 15 m of storage, 185 m deceleration length and 160 m of taper length were reviewed and should be confirmed during detailed design.

- An auxiliary left-turn lane is warranted at the intersection of Mary Street and County Road 9 in the final (2040) horizon year.
    - As this warrant is not met unit the final horizon year and the volumes are very close to the warrant line, it is recommended that the intersection be monitored as the surrounding developments are built out and that the requirement for a left-turn lane at Mary Street be reassessed prior to the Phase 2 of the development being constructed.

It is concluded that the traffic generated by the Tribute Creemore Commons development can be supported by the boundary road network, with the noted improvements.

The analysis contained within this report was completed based on the Block Plan dated April 4, 2023. Any minor changes to the plan will not affect the conclusions contained within this report.

4.0 Future Background Conditions

4.1 Horizon Years, Growth Rate & Roadway Improvements

In accordance with the agreed upon Terms of Reference, the Phase 1 build out (2027) and the full build out year (2030) were reviewed, as well as 5 (2035) and 10 years (2040) beyond full build out. A growth rate of 2% was used to forecast future traffic volumes on County Road 9, and a 1.5% growth rate was used for the minor local streets as requested by the Township peer reviewer as part of the Terms of Reference.

No roadway improvements on the external boundary road network have been identified through a review of the development charges background study, Official Plan, and preliminary County Transportation Master Plan.

4.2 Background Developments

The following background developments and their expected dates of full buildout are outlined in **Table 4.** Further details regarding each of the developments, including trip generation and distribution, are outlined in the subsequent sections. **Figures 5 to 9** illustrate the total trip assignment for the background developments.

Table 4: Background Developments

Background Development	Number of Units	Opening Horizon Year of Analysis	Reference
Zeng Development	32 single detached dwelling units and 30 townhouse dwelling units	2024	C.C. Tatham and Associates Ltd. (May 2019)
The Brix Development	72 apartment dwelling unit	Assumed 2027[1]	ISM Architects Inc. (September 2020)
LAMB Development	536 units[2] assumed single detached	Assumed 2027[1]	Township of Clearview (March 2022)
Alliance Homes	1 unoccupied single-detached dwelling units and 10 townhouse dwelling units (in the form of a 4 plex and a 6 plex)	Assumed 2027[1]	Weston Consulting Group Inc. (December 2007)

Note[1]: Exact completion date unknown, 2027 assumed for the purposes of this study.
Note[2]: The LAMB development unit count was taken from the Township of Clearview Creemore Populations Assumptions, provided by Township staff, this assumption is being used for the Master Servicing Study.

4.2.1. Zeng Development (Edward/George Street Residential)

Edward/George Street Residential Development is a proposed residential development located at 101 Edward Street and 111 George Street. Per the Edward/George Street Residential Development Traffic Impact Brief (Tatham, May 2019), this development is proposed to consist of 32 single detached dwelling units and 30 townhouse dwelling units. The development is expected to be built-out prior to the 2024 horizon year. It is noted that the Zeng units have been reduced to only 28 singles since the completion of the study, this reduces the forecasted trip generation by 7 and 10 two-way trips in the a.m. and p.m. peak hours respectively. As this change is minor, the trip generation and assignment of the original Brief prepared by Tatham were referenced. **Table 5** outlines the trip generation estimates, as obtained from the Edward/George Traffic Brief.

Table 5: Edward/George Trip Generation

Peak Hour	Number of Trips		
	Inbound	Outbound	Total
Weekday A.M.	11	33	44
Weekday P.M.	34	22	56

Note: The trip generation above was adopted from the fitted curve equation given in ITE Trip Generation Manual 9th Edition as per the Edward/George Street Residential Development, Traffic Impact Brief (Tatham, May 2019).

The trips generated by the Edward/George Street development were assigned to the boundary road network based on the distribution described in the Edward/George Street Traffic Brief. The Brief assumed that the majority of trips would travel to/from the Creemore built up area. To expand the trip distribution beyond the scope of the original brief it was assumed that one quarter of trips travelling north/south on Mary Street would utilize Caroline Street or Elizabeth Street while the remaining trips would split evenly between the east and west on County Road 9.

Relevant excerpts from the Edward/George Traffic Brief (Tatham, May 2019) have been included in **Appendix F**. The trip assignment for Edward/George Street development is illustrated in **Figure 5**.

4.2.2. Brix Development (121 Mary Street)

The Brix Development includes two 3-storey apartment buildings consisting of 72 apartment dwelling units. Access to the Site is proposed through two full move accesses, one on Mary Street at the western limits of the Site and one on Edward Street in the southeast corner of the site. It was assumed the development would be completed prior to the 2027 horizon year. **Table 6** outlines the associated trip generation calculated using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition, using Land Use Code (LUC) 220: "Multifamily Housing (Low-Rise)".

Table 6: Brix Development Trip Generation

Peak Hour	Number of Trips		
	Inbound	Outbound	Total
Weekday A.M.	11	34	45
Weekday P.M.	32	20	52

The trips generated by the Brix development were assigned to the boundary road network based on the distribution used in Section 5.2. The Brix development Site Plan (ISM Architects Inc., September 2020) has been included in **Appendix F**. The trip assignment for the Brix development is illustrated in **Figure 6**.

4.2.3. LAMB Development (163-164 Edward Street)

163-164 Edward Street LAMB development is a proposed residential development located north and south of Edward Street to the east the proposed development. Based on correspondence with Township staff **(Appendix A)** the Township assumes the development to have 536 units. For the purposes of this study, it was assumed that all units will be single detached dwelling units. It was also assumed that the development would be completed prior to the 2027 horizon year. It is acknowledged that this is an aggressive timeline, however more detail will be investigated through future development studies. **Table 7** summarizes the trip generation estimates, calculated by using the ITE Trip Generation Manual, 11th Edition, LUC 210: "Single-Family Detached Housing".

5.0 Site Generated Traffic

5.1 Trip Generation

The proposed development will result in additional vehicles on the boundary road network that previously did not exist. The trip generation of the proposed development was forecasted using the fitted curve equations provided in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition.

Per the Block Plan, the development proposes a maximum unit yield of 536 units. Estimates on unit mix per phase were provided to assess the trip generation of the development. A total of 365 single-family units and 171 townhouse units were assessed. As the unit mix and phasing is subject to change, further studies should review the most up to date land uses and phasing information. Accordingly, LUC 210 "Single-Family Detached Housing" was used to forecast trips for the single detached units. LUC 215 "Single Family Attached Housing" was used to forecast trips for the townhouse units.

Table 13 and **Table 14** summarize the residential trip generation of the site. **Appendix G** contains relevant excerpts from the ITE Trip Generation Manual

Table 13: Phase 1 Residential Trip Generation

Land Use	Peak Hour	Number of Trips		
		Inbound	Outbound	Total
LUC 210 'Single Family Homes' (203 Units)	Weekday A.M.	35	106	141
	Weekday P.M.	122	72	194

Table 14: Phase 1+2 Residential Trip Generation

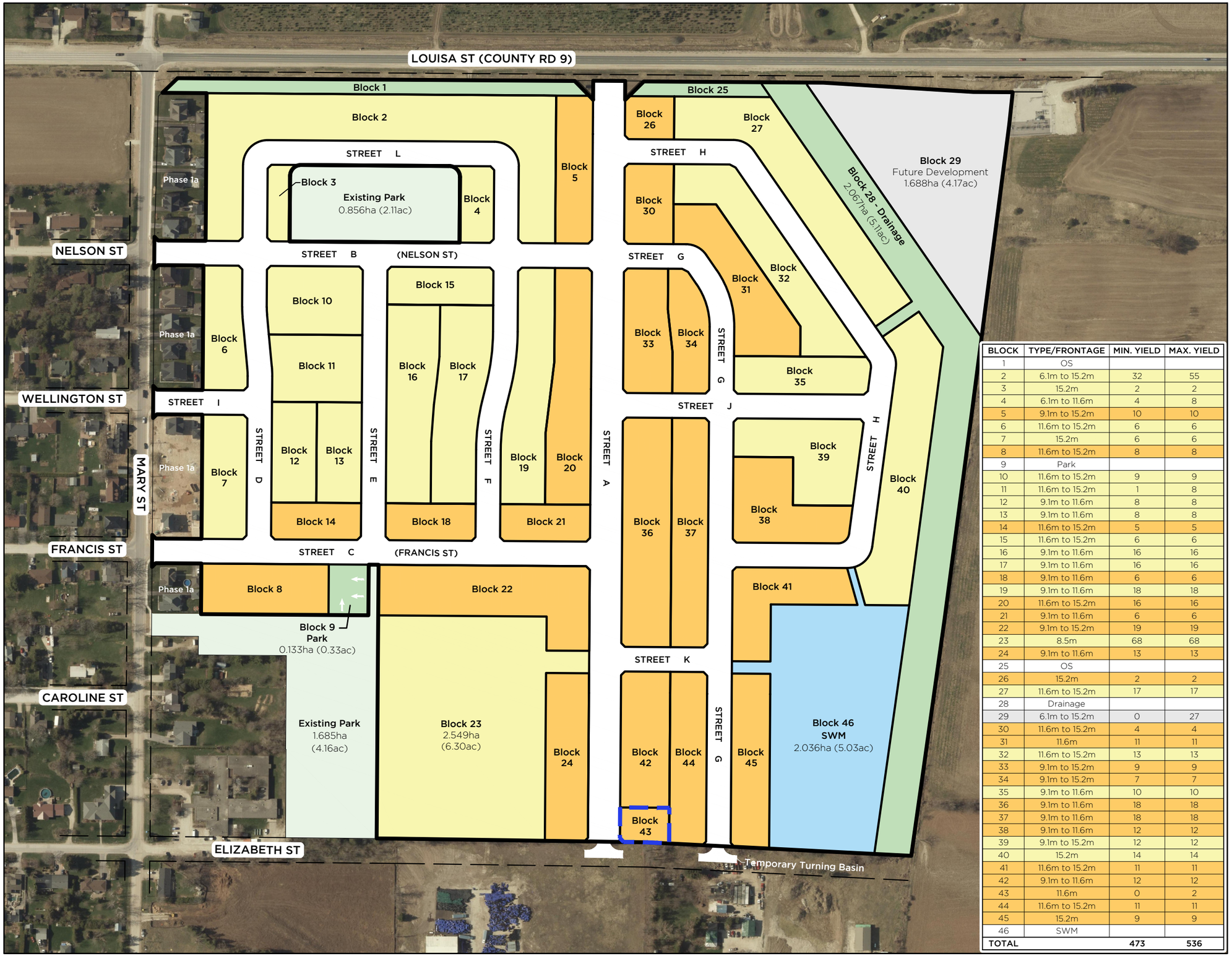
Land Use	Peak Hour	Number of Trips		
		Inbound	Outbound	Total
LUC 210 'Single Family Homes' (365 Units)	Weekday A.M.	60	182	242
	Weekday P.M.	211	125	336
LUC 215 'Single Family Attached Housing ' (171 Units)	Weekday A.M.	21	61	83
	Weekday P.M.	58	41	99
TOTAL	**Weekday P.M.**	**87**	**232**	**319**
	Weekday P.M.	**262**	**163**	**425**

5.2 Trip Distribution and Assignment

The trips generated by the proposed residential development were distributed to the external boundary road network based on 2016 Transportation Tomorrow Survey Data included in **Appendix H**.

The following residential trip distribution was applied for both the a.m. and p.m. peak hours:

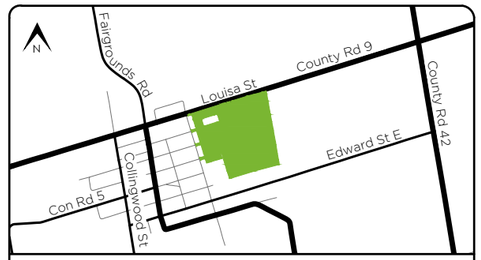
- 40% to/from the east
  - 35% on County Road 9/Louisa Street
  - 5% on Edward Street



BLOCK	TYPE/FRONTAGE	MIN. YIELD	MAX. YIELD
1	OS		
2	6.1m to 15.2m	32	55
3	15.2m	2	2
4	6.1m to 11.6m	4	8
5	9.1m to 15.2m	10	10
6	11.6m to 15.2m	6	6
7	15.2m	6	6
8	11.6m to 15.2m	8	8
9	Park		
10	11.6m to 15.2m	9	9
11	11.6m to 15.2m	1	8
12	9.1m to 11.6m	8	8
13	9.1m to 11.6m	8	8
14	11.6m to 15.2m	5	5
15	11.6m to 15.2m	6	6
16	9.1m to 11.6m	16	16
17	9.1m to 11.6m	16	16
18	9.1m to 11.6m	6	6
19	9.1m to 11.6m	18	18
20	11.6m to 15.2m	16	16
21	9.1m to 11.6m	6	6
22	9.1m to 15.2m	19	19
23	8.5m	68	68
24	9.1m to 11.6m	13	13
25	OS		
26	15.2m	2	2
27	11.6m to 15.2m	17	17
28	Drainage		
29	6.1m to 15.2m	0	27
30	11.6m to 15.2m	4	4
31	11.6m	11	11
32	11.6m to 15.2m	13	13
33	9.1m to 15.2m	9	9
34	9.1m to 15.2m	7	7
35	9.1m to 11.6m	10	10
36	9.1m to 11.6m	18	18
37	9.1m to 11.6m	18	18
38	9.1m to 11.6m	12	12
39	9.1m to 15.2m	12	12
40	15.2m	14	14
41	11.6m to 15.2m	11	11
42	9.1m to 11.6m	12	12
43	11.6m	0	2
44	11.6m to 15.2m	11	11
45	15.2m	9	9
46	SWM		
TOTAL		473	536

BLOCK PLAN
CREEMORE COMMONS
473-536 Units

Part of Lots 8 & 9 Concession 4
Township of Clearview, County of Simcoe



Key Map - Creemore *1 : 50,000*

LEGEND

- Phase 1 Residential
- Phase 2 Residential
- Phase 3 (Future Development)
- Parks & Open Space
- Stormwater Management
- Blocks
- Potential Pumping Station

Note: This drawing is for discussion purposes only.
Sources: 51M-1163, J.D. Barnes Limited, January 17, 2019.
County of Simcoe interactive map.

0 20 40 60 80 100 120m
Scale: 1 : 3,000

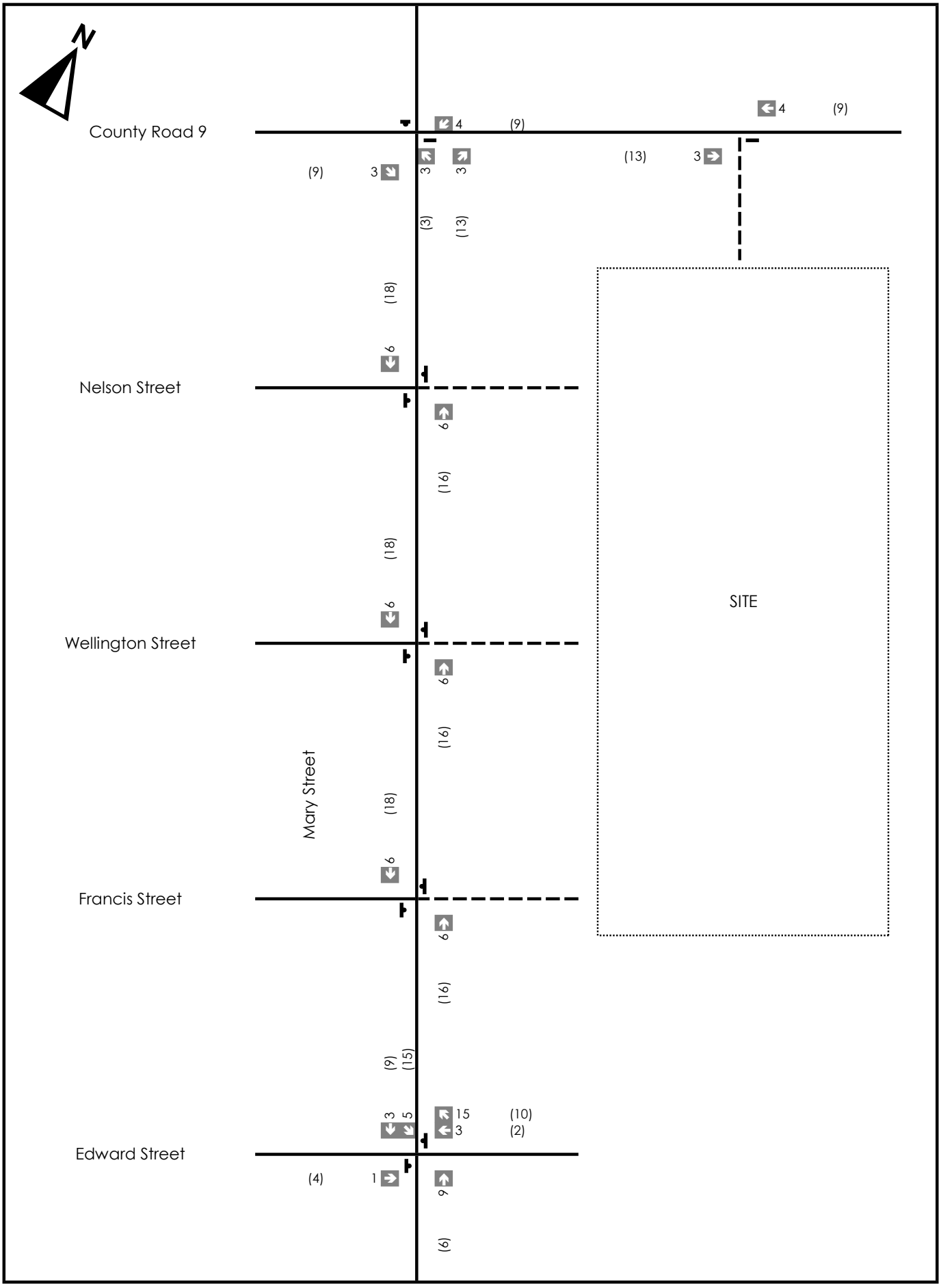
N

Drawn By: A.M.

Date: April 4, 2023

celeste PHILLIPS PLANNING INC.
85 Bayfield Street, Unit 300,
Barrie, Ontario, L4M 3A7
T: 705 797 8977
C: 705 730 8850
celeste@cplan.ca

Legend	Heritage Village - Creemore	CROZIER CONSULTING ENGINEERS	Figure 2
Site Location	Site Location plan		Project No. 1000-4419 Date. 2023/02/03 Analyst. EH



Legend

xx A.M. Peak Hour Traffic Volumes
(xx) P.M. Peak Hour Traffic Volumes
Stop Sign

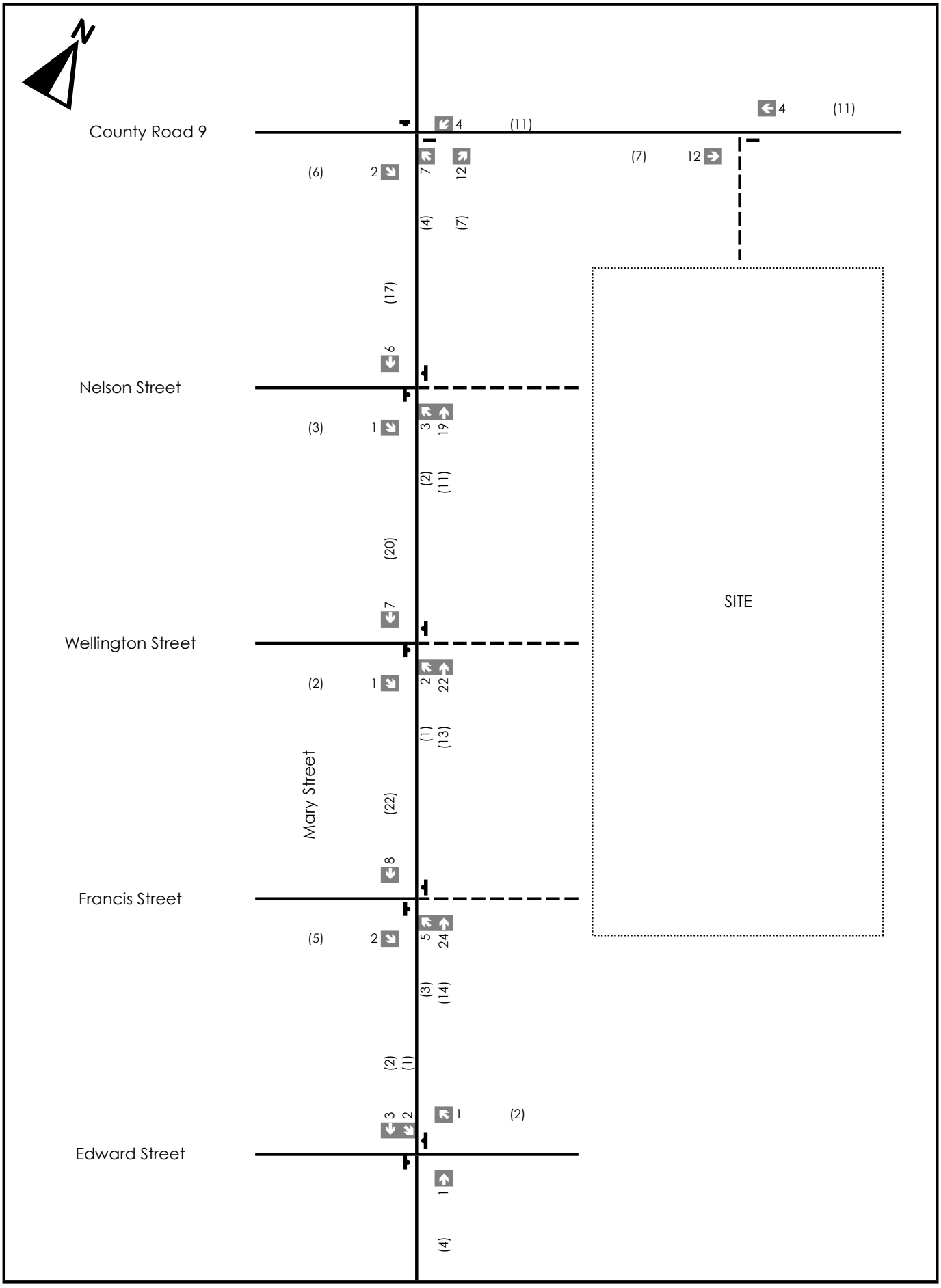
Creemore Commons

Background Development: Zeng Development Trip Assignment

CROZIER CONSULTING ENGINEERS

Figure 5

Project No. 1000-4419
Date. 2023/02/03
Analyst. EH



Legend

xx A.M. Peak Hour Traffic Volumes
(xx) P.M. Peak Hour Traffic Volumes
Stop Sign

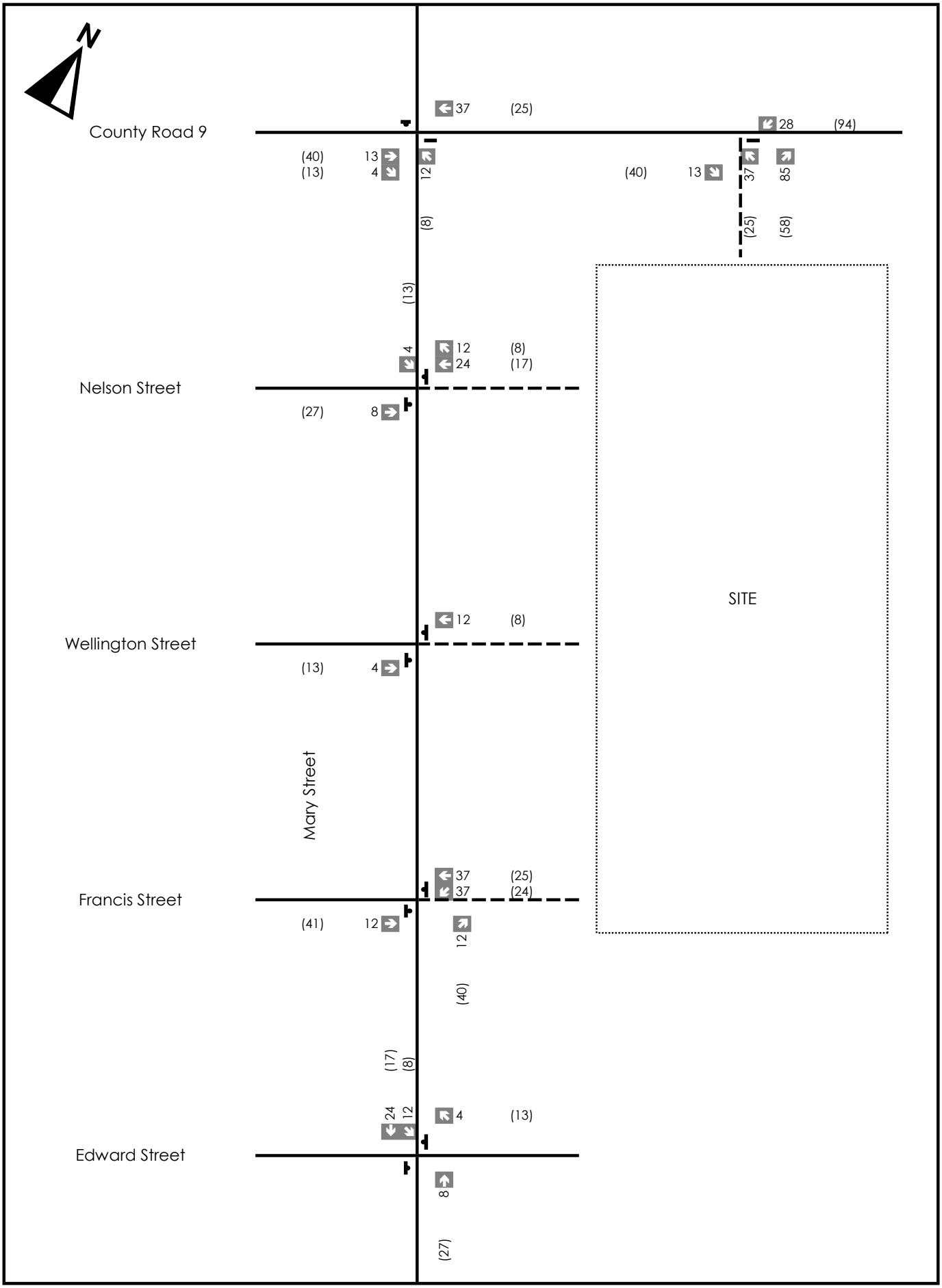
Creemore Commons

Background Development: The Brix Trip Assignment

CROZIER CONSULTING ENGINEERS

Figure 6

Project No. 1000-4419
Date. 2023/02/03
Analyst. EH



Legend

xx A.M. Peak Hour Traffic Volumes
(xx) P.M. Peak Hour Traffic Volumes
Stop Sign

Creemore Commons

Phase 1 + 2 Site Trip Assignment

CROZIER CONSULTING ENGINEERS

Figure 16

Project No. 1000-4419
Date. 2023/02/02
Analyst. EH

TATHAM ENGINEERING

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tathameng.com

File 418426

May 17, 2019

Martin & Linda Zeng
2408969 Ontario Inc.
7831 County Road 9
Creemore, Ontario L0M 1G0

Re: Edward/George Street Residential Development – Creemore, Clearview Township
Traffic Impact Brief

Dear Martin & Linda:

As requested, we have reviewed the site plan for the proposed residential development to be located at 101 Edward Street and 111 George Street in the Village of Creemore, Township of Clearview (as illustrated in Figure 1) from a transportation perspective, addressing site access, site traffic volumes, available sight lines and the potential impacts to the adjacent road system. Our comments are set out in this letter report.

EXISTING CONDITIONS

Existing Site

The subject site has an overall area of 4.71 hectares (11.6 acres) and is bounded by Edward Street to the north, Concession Road 3 to the south, existing residential development to the west and agricultural land to the east. George Street, which runs parallel to Edward Street, divides the site into north and south parcels. The north and south parcels are legally described as Part of Lot 44 and Part of Lot 35 & 36, Township of Clearview, County of Simcoe.

Road Network

Edward Street is an east-west local road under the jurisdiction of the Township. Across the frontage of the site, the road has a two-lane rural cross-section with a gravel surface and open ditches. Immediately west of the site, Edward Street has a two-lane semi-urban cross-section with mountable curb and gutter, and sidewalk on the south side of the road, and gravel shoulders and open ditches on the north side of the road. As a local road, Edward Street has an assumed planning capacity of 400 vehicles per hour per lane (vphpl).

George Street is a collector road to the west of Concession Road 3, and a local road to the east of Concession Road 3. The road has a two-lane rural cross-section with asphalt surface. To the west of Concession Road 3, George Street has an assumed planning capacity of 600 vphpl (typical of a collector

development to the west and agricultural land to the east. The site is municipally known as 101 Edward Street and 111 George Street.

Proposed Land-use

The proposed development will consist of 32 single family residential lots and 30 medium density townhouses units contained within six 5-unit blocks. The single family lots will front Edward Street (18 lots), George Street (10 lots) and Concession Road 3 (4 lots). It is noted that George Street will be extended to the east in order to accommodate the proposed development. The townhouse units will front onto a proposed 8.0 metre laneway with connections to Edward Street and George Street. Build-out of the site is anticipated by 2024.

A draft plan is provided in Figure 4.

Site Access

As previously noted, access to the single family units will be provided via direct driveway connection to Edward Street, George Street and Concession Road 3, whereas the townhouse units will have driveway connections to the proposed 8.0 metre laneway.

Site Trip Generation

The number of vehicle trips to be generated by the proposed development has been determined based on type of use, development size, and trip generation rates. It is noted that the *ITE Trip Generation Manual*[1]*, 10th Edition* has consolidated trip data for several residential land-uses under the new land-use description *multi-family housing low-rise* (ITE code 220) and does not otherwise provide trip rates specific to the townhouse land-use. The trip rates provided in the ITE 10th Edition manual for the *multi-family housing low-rise* land-use are less conservative than the trip rates provided in the 9th Edition manual for the former *low-rise residential condo/townhouse* land-use (ITE code 231). To ensure a conservative approach, the trip rates published in the *ITE Trip Generation Manual, 9th Edition* have been applied to the townhouse units.

The associated trip rates and trip estimates are provided in Table 1 and Table 2, respectively.

As indicated, the proposed development is expected to generate 44 trips during the AM peak hour and 56 trips during the PM peak hour (total of inbound and outbound trips).

[1] *ITE Trip Generation Manual, 10th Edition*. Institute of Transportation Engineers, September 2017.

Table 1: Trip Generation Rates

LAND USE	VARIABLE	AM PEAK HOUR			PM PEAK HOUR		
		IN	OUT	TOTAL	IN	OUT	TOTAL
single family detached (ITE 310)	units	0.19	0.56	0.74	0.62	0.37	0.99
low-rise residential condo/towns (ITE 231)	units	0.17	0.50	0.67	0.45	0.33	0.78

Table 2: Trip Generation Estimates

LAND USE	SIZE	AM PEAK HOUR			PM PEAK HOUR		
		IN	OUT	TOTAL	IN	OUT	TOTAL
single family detached	32	6	48	24	20	12	32
low-rise residential townhouses	30	5	15	20	14	10	24
Total		**11**	**33**	**44**	**34**	**22**	**56**

Trip Distribution & Assignment

To ensure a conservative approach, all generated trips have been assigned to/from the built-up area of Creemore (i.e. through the study area intersections of Mary Street with Edward Street and George Street). The trip assignment to Edward Street and George Street has been developed based on the noted lot frontages and expected travel routes.

The resulting site generated traffic volumes assigned to the road network is illustrated in Figure 5.

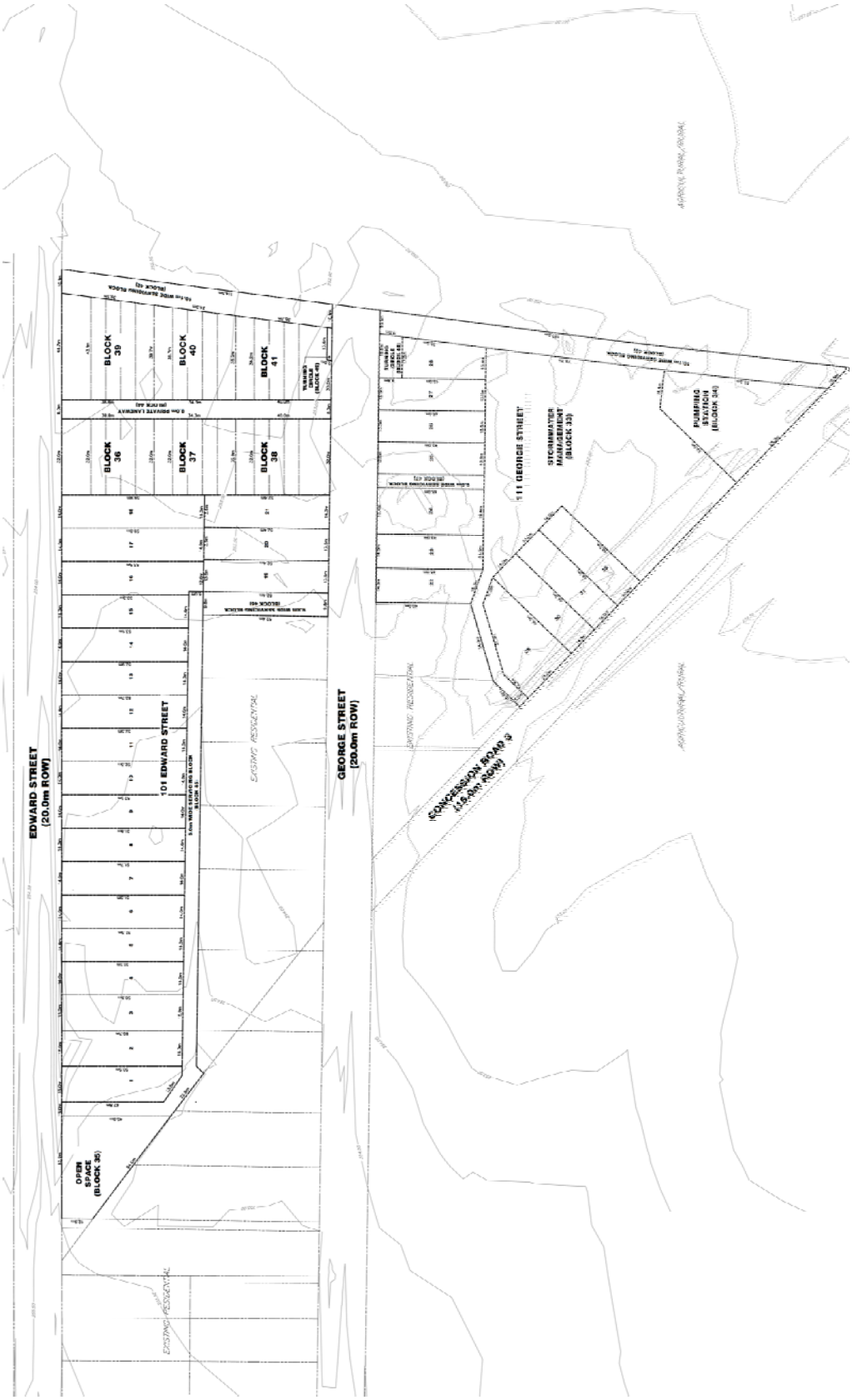
FUTURE CONDITIONS

Population Growth

Population forecasts provided in the *Township of Clearview Official Plan*[2] project an increase in population from 12,575 persons in 1997 to 18,794 persons in 2021, translating to an annual increase of 1.69%.

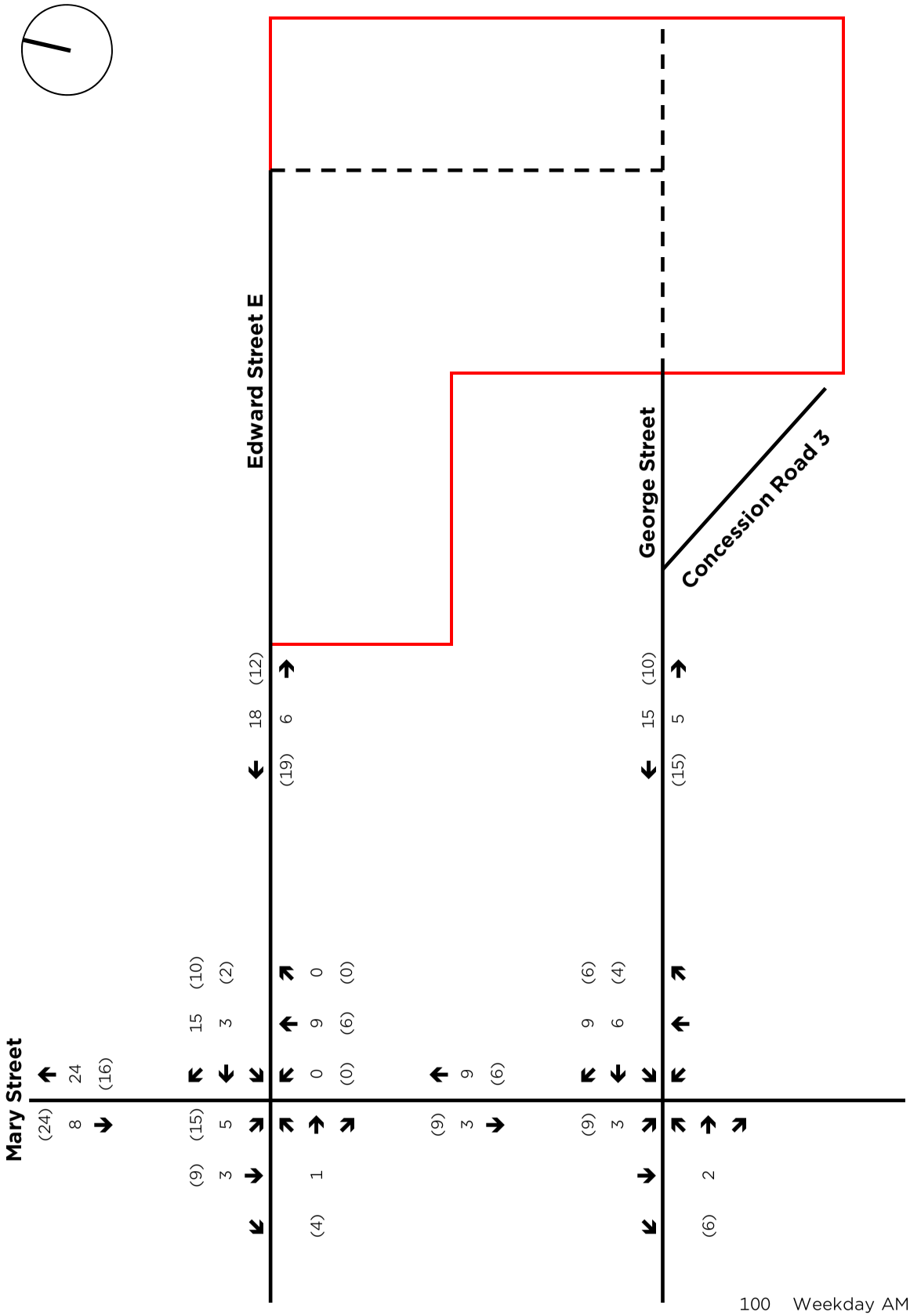
The Statistics Canada 2016 census profile for the village of Creemore indicates population growth from 1,147 to 1,170 for the period 2011 to 2016, translating to an annual growth rate of 0.40%.

[2] *Township of Clearview Official Plan.* Township of Clearview., Consolidated January 2019.



EDWARD / GEORGE STREET RESIDENTIAL DEVELOPMENT

Figure 4: Draft Plan



EDWARD / GEORGE STREET RESIDENTIAL DEVELOPMENT

Figure 5: Site Generated Traffic

Appendix F:
Background Operations

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	112	21	67	86	1	18	1	58	2	1	1
Future Vol, veh/h	1	112	21	67	86	1	18	1	58	2	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	151	28	91	116	1	24	1	78	3	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	117	0	0	179	0	0	467	466	165	506	480	117
Stage 1	-	-	-	-	-	-	167	167	-	299	299	-
Stage 2	-	-	-	-	-	-	300	299	-	207	181	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1471	-	-	1397	-	-	506	494	879	477	485	935
Stage 1	-	-	-	-	-	-	835	760	-	710	666	-
Stage 2	-	-	-	-	-	-	709	666	-	795	750	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1471	-	-	1397	-	-	477	459	879	410	451	935
Mov Cap-2 Maneuver	-	-	-	-	-	-	477	459	-	410	451	-
Stage 1	-	-	-	-	-	-	834	759	-	709	619	-
Stage 2	-	-	-	-	-	-	657	619	-	722	749	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	3.4	10.8	12.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	727	1471	-	-	1397	-	-	490
HCM Lane V/C Ratio	0.143	0.001	-	-	0.065	-	-	0.011
HCM Control Delay (s)	10.8	7.5	0	-	7.8	0	-	12.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0.2	-	-	0

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	19	115	27	39	112	59	18	33	39	27	24	24
Future Vol, veh/h	19	115	27	39	112	59	18	33	39	27	24	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	144	34	49	140	74	23	41	49	34	30	30

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	214	0	0	178	0	0	514	521	161	529	501	177
Stage 1	-	-	-	-	-	-	209	209	-	275	275	-
Stage 2	-	-	-	-	-	-	305	312	-	254	226	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1356	-	-	1398	-	-	471	460	884	460	472	866
Stage 1	-	-	-	-	-	-	793	729	-	731	683	-
Stage 2	-	-	-	-	-	-	705	658	-	750	717	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1356	-	-	1398	-	-	412	433	884	385	444	866
Mov Cap-2 Maneuver	-	-	-	-	-	-	412	433	-	385	444	-
Stage 1	-	-	-	-	-	-	777	714	-	716	656	-
Stage 2	-	-	-	-	-	-	623	632	-	654	703	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	1.4	13.2	14
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	549	1356	-	-	1398	-	-	494
HCM Lane V/C Ratio	0.205	0.018	-	-	0.035	-	-	0.19
HCM Control Delay (s)	13.2	7.7	0	-	7.7	0	-	14
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.8	0.1	-	-	0.1	-	-	0.7

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	111	25	73	133	1	21	1	36	1	1	1
Future Vol, veh/h	1	111	25	73	133	1	21	1	36	1	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	121	27	79	145	1	23	1	39	1	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	146	0	0	148	0	0	442	441	135	461	454	146
Stage 1	-	-	-	-	-	-	137	137	-	304	304	-
Stage 2	-	-	-	-	-	-	305	304	-	157	150	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1436	-	-	1434	-	-	526	510	914	511	502	901
Stage 1	-	-	-	-	-	-	866	783	-	705	663	-
Stage 2	-	-	-	-	-	-	705	663	-	845	773	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1436	-	-	1434	-	-	500	479	914	466	471	901
Mov Cap-2 Maneuver	-	-	-	-	-	-	500	479	-	466	471	-
Stage 1	-	-	-	-	-	-	865	782	-	704	623	-
Stage 2	-	-	-	-	-	-	661	623	-	807	772	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2.7	10.7	11.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	695	1436	-	-	1434	-	-	558
HCM Lane V/C Ratio	0.091	0.001	-	-	0.055	-	-	0.006
HCM Control Delay (s)	10.7	7.5	0	-	7.7	0	-	11.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.2	-	-	0

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	11	94	42	54	166	54	31	37	38	70	32	10
Future Vol, veh/h	11	94	42	54	166	54	31	37	38	70	32	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	98	44	56	173	56	32	39	40	73	33	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	229	0	0	142	0	0	477	483	120	495	477	201
Stage 1	-	-	-	-	-	-	142	142	-	313	313	-
Stage 2	-	-	-	-	-	-	335	341	-	182	164	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1339	-	-	1441	-	-	498	483	931	485	487	840
Stage 1	-	-	-	-	-	-	861	779	-	698	657	-
Stage 2	-	-	-	-	-	-	679	639	-	820	762	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1339	-	-	1441	-	-	446	457	931	417	461	840
Mov Cap-2 Maneuver	-	-	-	-	-	-	446	457	-	417	461	-
Stage 1	-	-	-	-	-	-	853	772	-	692	627	-
Stage 2	-	-	-	-	-	-	606	610	-	739	755	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	1.5	13.1	15.8
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	554	1339	-	-	1441	-	-	449
HCM Lane V/C Ratio	0.199	0.009	-	-	0.039	-	-	0.26
HCM Control Delay (s)	13.1	7.7	0	-	7.6	0	-	15.8
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.7	0	-	-	0.1	-	-	1

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	109	24	74	93	1	20	1	65	3	1	1
Future Vol, veh/h	1	109	24	74	93	1	20	1	65	3	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	147	32	100	126	1	27	1	88	4	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	127	0	0	179	0	0	493	492	163	537	508	127
Stage 1	-	-	-	-	-	-	165	165	-	327	327	-
Stage 2	-	-	-	-	-	-	328	327	-	210	181	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1459	-	-	1397	-	-	486	478	882	455	468	923
Stage 1	-	-	-	-	-	-	837	762	-	686	648	-
Stage 2	-	-	-	-	-	-	685	648	-	792	750	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1459	-	-	1397	-	-	455	441	882	384	431	923
Mov Cap-2 Maneuver	-	-	-	-	-	-	455	441	-	384	431	-
Stage 1	-	-	-	-	-	-	836	761	-	685	598	-
Stage 2	-	-	-	-	-	-	630	598	-	711	749	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	3.4	11	13.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	717	1459	-	-	1397	-	-	446
HCM Lane V/C Ratio	0.162	0.001	-	-	0.072	-	-	0.015
HCM Control Delay (s)	11	7.5	0	-	7.8	0	-	13.2
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0.2	-	-	0

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	21	126	29	44	123	62	20	35	44	29	26	26
Future Vol, veh/h	21	126	29	44	123	62	20	35	44	29	26	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	158	36	55	154	78	25	44	55	36	33	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	232	0	0	194	0	0	564	570	176	581	549	193
Stage 1	-	-	-	-	-	-	228	228	-	303	303	-
Stage 2	-	-	-	-	-	-	336	342	-	278	246	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1336	-	-	1379	-	-	436	431	867	425	443	849
Stage 1	-	-	-	-	-	-	775	715	-	706	664	-
Stage 2	-	-	-	-	-	-	678	638	-	728	703	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1336	-	-	1379	-	-	374	402	867	346	413	849
Mov Cap-2 Maneuver	-	-	-	-	-	-	374	402	-	346	413	-
Stage 1	-	-	-	-	-	-	758	699	-	690	633	-
Stage 2	-	-	-	-	-	-	590	609	-	625	688	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	1.5	14.1	15.1
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	518	1336	-	-	1379	-	-	457
HCM Lane V/C Ratio	0.239	0.02	-	-	0.04	-	-	0.222
HCM Control Delay (s)	14.1	7.7	0	-	7.7	0	-	15.1
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.9	0.1	-	-	0.1	-	-	0.8

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	120	27	80	146	1	24	1	40	1	1	1
Future Vol, veh/h	1	120	27	80	146	1	24	1	40	1	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	130	29	87	159	1	26	1	43	1	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	160	0	0	159	0	0	482	481	145	503	495	160
Stage 1	-	-	-	-	-	-	147	147	-	334	334	-
Stage 2	-	-	-	-	-	-	335	334	-	169	161	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1419	-	-	1420	-	-	495	485	902	479	476	885
Stage 1	-	-	-	-	-	-	856	775	-	680	643	-
Stage 2	-	-	-	-	-	-	679	643	-	833	765	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1419	-	-	1420	-	-	468	452	902	432	444	885
Mov Cap-2 Maneuver	-	-	-	-	-	-	468	452	-	432	444	-
Stage 1	-	-	-	-	-	-	855	774	-	679	600	-
Stage 2	-	-	-	-	-	-	632	600	-	791	764	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2.7	11.1	11.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	664	1419	-	-	1420	-	-	527
HCM Lane V/C Ratio	0.106	0.001	-	-	0.061	-	-	0.006
HCM Control Delay (s)	11.1	7.5	0	-	7.7	0	-	11.9
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0.2	-	-	0

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	12	103	46	60	182	57	34	41	42	73	35	11
Future Vol, veh/h	12	103	46	60	182	57	34	41	42	73	35	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	107	48	63	190	59	35	43	44	76	36	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	249	0	0	155	0	0	526	532	131	547	527	220
Stage 1	-	-	-	-	-	-	157	157	-	346	346	-
Stage 2	-	-	-	-	-	-	369	375	-	201	181	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1317	-	-	1425	-	-	462	453	919	448	456	820
Stage 1	-	-	-	-	-	-	845	768	-	670	635	-
Stage 2	-	-	-	-	-	-	651	617	-	801	750	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1317	-	-	1425	-	-	406	425	919	375	428	820
Mov Cap-2 Maneuver	-	-	-	-	-	-	406	425	-	375	428	-
Stage 1	-	-	-	-	-	-	836	760	-	663	602	-
Stage 2	-	-	-	-	-	-	572	585	-	712	742	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	1.5	14.1	17.5
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	518	1317	-	-	1425	-	-	411
HCM Lane V/C Ratio	0.235	0.009	-	-	0.044	-	-	0.302
HCM Control Delay (s)	14.1	7.8	0	-	7.6	0	-	17.5
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.9	0	-	-	0.1	-	-	1.3

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	120	26	82	102	1	22	1	71	3	1	1
Future Vol, veh/h	1	120	26	82	102	1	22	1	71	3	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	162	35	111	138	1	30	1	96	4	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	139	0	0	197	0	0	544	543	180	591	560	139
Stage 1	-	-	-	-	-	-	182	182	-	361	361	-
Stage 2	-	-	-	-	-	-	362	361	-	230	199	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1445	-	-	1376	-	-	450	447	863	419	437	909
Stage 1	-	-	-	-	-	-	820	749	-	657	626	-
Stage 2	-	-	-	-	-	-	657	626	-	773	736	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1445	-	-	1376	-	-	418	408	863	347	399	909
Mov Cap-2 Maneuver	-	-	-	-	-	-	418	408	-	347	399	-
Stage 1	-	-	-	-	-	-	819	748	-	656	572	-
Stage 2	-	-	-	-	-	-	598	572	-	685	735	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	3.5	11.5	14
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	684	1445	-	-	1376	-	-	408
HCM Lane V/C Ratio	0.186	0.001	-	-	0.081	-	-	0.017
HCM Control Delay (s)	11.5	7.5	0	-	7.8	0	-	14
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.7	0	-	-	0.3	-	-	0.1

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	139	32	48	134	64	21	38	48	31	28	29
Future Vol, veh/h	23	139	32	48	134	64	21	38	48	31	28	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	174	40	60	168	80	26	48	60	39	35	36

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	248	0	0	214	0	0	616	620	194	634	600	208
Stage 1	-	-	-	-	-	-	252	252	-	328	328	-
Stage 2	-	-	-	-	-	-	364	368	-	306	272	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1318	-	-	1356	-	-	403	404	847	392	415	832
Stage 1	-	-	-	-	-	-	752	698	-	685	647	-
Stage 2	-	-	-	-	-	-	655	621	-	704	685	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1318	-	-	1356	-	-	338	373	847	310	383	832
Mov Cap-2 Maneuver	-	-	-	-	-	-	338	373	-	310	383	-
Stage 1	-	-	-	-	-	-	733	681	-	668	613	-
Stage 2	-	-	-	-	-	-	560	589	-	593	668	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	1.5	15.2	16.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	485	1318	-	-	1356	-	-	423
HCM Lane V/C Ratio	0.276	0.022	-	-	0.044	-	-	0.26
HCM Control Delay (s)	15.2	7.8	0	-	7.8	0	-	16.5
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.1	0.1	-	-	0.1	-	-	1

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	131	30	89	160	1	26	1	44	1	1	1
Future Vol, veh/h	1	131	30	89	160	1	26	1	44	1	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	142	33	97	174	1	28	1	48	1	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	175	0	0	175	0	0	531	530	159	554	546	175
Stage 1	-	-	-	-	-	-	161	161	-	369	369	-
Stage 2	-	-	-	-	-	-	370	369	-	185	177	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1401	-	-	1401	-	-	459	455	886	443	445	868
Stage 1	-	-	-	-	-	-	841	765	-	651	621	-
Stage 2	-	-	-	-	-	-	650	621	-	817	753	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1401	-	-	1401	-	-	430	420	886	393	410	868
Mov Cap-2 Maneuver	-	-	-	-	-	-	430	420	-	393	410	-
Stage 1	-	-	-	-	-	-	840	764	-	650	573	-
Stage 2	-	-	-	-	-	-	598	573	-	771	752	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.8	11.5	12.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	631	1401	-	-	1401	-	-	489
HCM Lane V/C Ratio	0.122	0.001	-	-	0.069	-	-	0.007
HCM Control Delay (s)	11.5	7.6	0	-	7.8	0	-	12.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0.2	-	-	0

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	14	112	51	66	200	60	37	44	47	77	38	12
Future Vol, veh/h	14	112	51	66	200	60	37	44	47	77	38	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	117	53	69	208	63	39	46	49	80	40	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	271	0	0	170	0	0	578	583	144	599	578	240
Stage 1	-	-	-	-	-	-	174	174	-	378	378	-
Stage 2	-	-	-	-	-	-	404	409	-	221	200	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1292	-	-	1407	-	-	427	424	903	413	427	799
Stage 1	-	-	-	-	-	-	828	755	-	644	615	-
Stage 2	-	-	-	-	-	-	623	596	-	781	736	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1292	-	-	1407	-	-	368	394	903	337	397	799
Mov Cap-2 Maneuver	-	-	-	-	-	-	368	394	-	337	397	-
Stage 1	-	-	-	-	-	-	817	745	-	636	579	-
Stage 2	-	-	-	-	-	-	538	561	-	684	726	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	1.6	15.2	19.8
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	484	1292	-	-	1407	-	-	374
HCM Lane V/C Ratio	0.275	0.011	-	-	0.049	-	-	0.354
HCM Control Delay (s)	15.2	7.8	0	-	7.7	0	-	19.8
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.1	0	-	-	0.2	-	-	1.6

Appendix G:
TTS Data

TTS Data Summary

TTS 2022 Search Parameters

Cross Tabulation Query Form - Trip - 2022

Row: 2022 TTS zone of destination - tts22_dest

Column: Planning district of origin - pd_orig

Filters:

(2022 TTS zone of destination - tts22_dest In 17144, 17145, 17125)

*Note: Search criteria reflective of inbound travel.

Origin/Destination parameters reversed for outbound travel

Data Outputs

Planning District	Inbound Trips	Outbound Trips	Total Trips	Local Travel Direction
Barrie	23	6	29	east
Blue Mountains	15	15	30	north
Clearview	1,437	1,416	2,853	internal
Collingwood	144	144	288	north
Essa	23	23	46	east
External	-	19	19	external
Grey Highlands	-	16	16	west
Haliburton	-	51	51	east
Halton Hills	26	26	52	south
Innisfil	-	21	21	east
Melancthon	-	12	12	south
Mississauga	31	31	62	south
Mono	78	78	156	south
Mulmur	63	62	125	south
New Tecumseth	27	27	54	south
PD 1 of Toronto	3	-	3	south
PD 2 of Toronto	-	5	5	south
Shelburne	30	30	60	north
Springwater	55	55	110	east
Tiny	23	23	46	north
Wasaga Beach	51	34	85	north
Total	**2,029**	**2,094**	**4,123**	

Travel Summary

Local Direction of Travel

Excludes external and undefined locations

Trip Type	North	South	East	West	Internal	Total
Inbound	263	228	101	0	1,437	2,029
Outbound	216	271	156	16	1,416	2,075
Total	**479**	**499**	**257**	**16**	**2,853**	**4,104**
	12%	**12%**	**6%**	**0%**	**70%**	**100%**

Travel Proportions

Proportion	North	South	East	West	Internal	Total
Calculated	13%	11%	5%	0%	71%	100%

Redistribution of Internal/Local Trips

Trips identified as internal to Clearview are redistributed based on location of the subject site

	North	South	East	West	Internal	Total
Internal Redistribution	40%	50%	5%	5%	-	100%

Revised Local Direction of Travel

Considers redistributed internal/local trips

Trip Type	North	South	East	West	Internal	Total
Inbound	838	947	173	72	-	2,029
Outbound	782	979	227	87	-	2,075
Total	**1,620**	**1,926**	**400**	**159**	**-**	**4,104**

Revised Travel Proportions

Reflective of revised trip distribution established above, these values are considered for new site traffic

Proportion	North	South	East	West	Internal	Total
Calculated	39%	47%	10%	4%	-	100%
Rounded	40%	45%	10%	5%	-	100%

Appendix H:
Total Operations

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	100	21	67	88	1	18	1	58	2	1	1
Future Vol, veh/h	1	100	21	67	88	1	18	1	58	2	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	135	28	91	119	1	24	1	78	3	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	120	0	0	163	0	0	454	453	149	493	467	120
Stage 1	-	-	-	-	-	-	151	151	-	302	302	-
Stage 2	-	-	-	-	-	-	303	302	-	191	165	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1468	-	-	1416	-	-	516	503	898	486	493	931
Stage 1	-	-	-	-	-	-	851	772	-	707	664	-
Stage 2	-	-	-	-	-	-	706	664	-	811	762	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1468	-	-	1416	-	-	487	468	898	419	458	931
Mov Cap-2 Maneuver	-	-	-	-	-	-	487	468	-	419	458	-
Stage 1	-	-	-	-	-	-	850	771	-	706	618	-
Stage 2	-	-	-	-	-	-	655	618	-	738	761	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	3.3	10.6	12.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	743	1468	-	-	1416	-	-	498
HCM Lane V/C Ratio	0.14	0.001	-	-	0.064	-	-	0.011
HCM Control Delay (s)	10.6	7.5	0	-	7.7	0	-	12.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0.2	-	-	0

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	19	125	35	39	116	63	21	35	39	38	32	24
Future Vol, veh/h	19	125	35	39	116	63	21	35	39	38	32	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	156	44	49	145	79	26	44	49	48	40	30

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	224	0	0	200	0	0	544	548	178	556	531	185
Stage 1	-	-	-	-	-	-	226	226	-	283	283	-
Stage 2	-	-	-	-	-	-	318	322	-	273	248	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1345	-	-	1372	-	-	450	444	865	442	454	857
Stage 1	-	-	-	-	-	-	777	717	-	724	677	-
Stage 2	-	-	-	-	-	-	693	651	-	733	701	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1345	-	-	1372	-	-	385	417	865	366	427	857
Mov Cap-2 Maneuver	-	-	-	-	-	-	385	417	-	366	427	-
Stage 1	-	-	-	-	-	-	761	703	-	710	649	-
Stage 2	-	-	-	-	-	-	602	624	-	636	687	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	1.4	14	15.6
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	518	1345	-	-	1372	-	-	455
HCM Lane V/C Ratio	0.229	0.018	-	-	0.036	-	-	0.258
HCM Control Delay (s)	14	7.7	0	-	7.7	0	-	15.6
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.9	0.1	-	-	0.1	-	-	1

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	160	154	6	18	2
Future Vol, veh/h	1	160	154	6	18	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	174	167	7	20	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	174	0	-	0	347	171
Stage 1	-	-	-	-	171	-
Stage 2	-	-	-	-	176	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1403	-	-	-	650	873
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	855	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1403	-	-	-	649	873
Mov Cap-2 Maneuver	-	-	-	-	649	-
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	855	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1403	-	-	-	666
HCM Lane V/C Ratio	0.001	-	-	-	0.033
HCM Control Delay (s)	7.6	0	-	-	10.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	18	6	111	91	2
Future Vol, veh/h	7	18	6	111	91	2
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	20	7	121	99	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	235	100	101	0	-	0
Stage 1	100	-	-	-	-	-
Stage 2	135	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	753	956	1491	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	891	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	749	956	1491	-	-	-
Mov Cap-2 Maneuver	749	-	-	-	-	-
Stage 1	919	-	-	-	-	-
Stage 2	891	-	-	-	-	-

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)	1491	-	887	-	-
HCM Lane V/C Ratio	0.004	-	0.031	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	113	25	73	134	1	21	1	36	1	1	1
Future Vol, veh/h	1	113	25	73	134	1	21	1	36	1	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	123	27	79	146	1	23	1	39	1	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	147	0	0	150	0	0	445	444	137	464	457	147
Stage 1	-	-	-	-	-	-	139	139	-	305	305	-
Stage 2	-	-	-	-	-	-	306	305	-	159	152	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1435	-	-	1431	-	-	523	508	911	508	500	900
Stage 1	-	-	-	-	-	-	864	782	-	705	662	-
Stage 2	-	-	-	-	-	-	704	662	-	843	772	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1435	-	-	1431	-	-	497	477	911	463	470	900
Mov Cap-2 Maneuver	-	-	-	-	-	-	497	477	-	463	470	-
Stage 1	-	-	-	-	-	-	863	781	-	704	622	-
Stage 2	-	-	-	-	-	-	660	622	-	805	771	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2.7	10.7	11.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	692	1435	-	-	1431	-	-	556
HCM Lane V/C Ratio	0.091	0.001	-	-	0.055	-	-	0.006
HCM Control Delay (s)	10.7	7.5	0	-	7.7	0	-	11.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.2	-	-	0

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	11	101	47	54	176	64	38	45	38	77	37	10
Future Vol, veh/h	11	101	47	54	176	64	38	45	38	77	37	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	105	49	56	183	67	40	47	40	80	39	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	250	0	0	154	0	0	505	514	130	524	505	217
Stage 1	-	-	-	-	-	-	152	152	-	329	329	-
Stage 2	-	-	-	-	-	-	353	362	-	195	176	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1316	-	-	1426	-	-	478	464	920	464	470	823
Stage 1	-	-	-	-	-	-	850	772	-	684	646	-
Stage 2	-	-	-	-	-	-	664	625	-	807	753	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1316	-	-	1426	-	-	423	438	920	391	444	823
Mov Cap-2 Maneuver	-	-	-	-	-	-	423	438	-	391	444	-
Stage 1	-	-	-	-	-	-	842	765	-	678	616	-
Stage 2	-	-	-	-	-	-	586	596	-	718	746	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	1.4	14.2	17.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	517	1316	-	-	1426	-	-	424
HCM Lane V/C Ratio	0.244	0.009	-	-	0.039	-	-	0.305
HCM Control Delay (s)	14.2	7.8	0	-	7.6	0	-	17.2
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.9	0	-	-	0.1	-	-	1.3

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	148	207	17	12	1
Future Vol, veh/h	2	148	207	17	12	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	161	225	18	13	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	243	0	-	0	399	234
Stage 1	-	-	-	-	234	-
Stage 2	-	-	-	-	165	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1323	-	-	-	607	805
Stage 1	-	-	-	-	805	-
Stage 2	-	-	-	-	864	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1323	-	-	-	606	805
Mov Cap-2 Maneuver	-	-	-	-	606	-
Stage 1	-	-	-	-	803	-
Stage 2	-	-	-	-	864	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1323	-	-	-	618
HCM Lane V/C Ratio	0.002	-	-	-	0.023
HCM Control Delay (s)	7.7	0	-	-	11
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	12	17	102	117	7
Future Vol, veh/h	5	12	17	102	117	7
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	13	18	111	127	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	278	131	135	0	-	0
Stage 1	131	-	-	-	-	-
Stage 2	147	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	712	919	1449	-	-	-
Stage 1	895	-	-	-	-	-
Stage 2	880	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	703	919	1449	-	-	-
Mov Cap-2 Maneuver	703	-	-	-	-	-
Stage 1	883	-	-	-	-	-
Stage 2	880	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1449	-	843	-	-
HCM Lane V/C Ratio	0.013	-	0.022	-	-
HCM Control Delay (s)	7.5	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	110	24	74	96	1	20	1	65	3	1	1
Future Vol, veh/h	1	110	24	74	96	1	20	1	65	3	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	149	32	100	130	1	27	1	88	4	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	131	0	0	181	0	0	499	498	165	543	514	131
Stage 1	-	-	-	-	-	-	167	167	-	331	331	-
Stage 2	-	-	-	-	-	-	332	331	-	212	183	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1454	-	-	1394	-	-	482	474	879	451	464	919
Stage 1	-	-	-	-	-	-	835	760	-	682	645	-
Stage 2	-	-	-	-	-	-	681	645	-	790	748	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1454	-	-	1394	-	-	452	437	879	381	428	919
Mov Cap-2 Maneuver	-	-	-	-	-	-	452	437	-	381	428	-
Stage 1	-	-	-	-	-	-	834	759	-	681	595	-
Stage 2	-	-	-	-	-	-	626	595	-	709	747	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	3.4	11	13.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	714	1454	-	-	1394	-	-	443
HCM Lane V/C Ratio	0.163	0.001	-	-	0.072	-	-	0.015
HCM Control Delay (s)	11	7.5	0	-	7.8	0	-	13.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0.2	-	-	0

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	21	137	37	44	126	65	22	38	44	39	34	26
Future Vol, veh/h	21	137	37	44	126	65	22	38	44	39	34	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	171	46	55	158	81	28	48	55	49	43	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	239	0	0	217	0	0	593	595	194	607	578	199
Stage 1	-	-	-	-	-	-	246	246	-	309	309	-
Stage 2	-	-	-	-	-	-	347	349	-	298	269	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1328	-	-	1353	-	-	417	417	847	408	427	842
Stage 1	-	-	-	-	-	-	758	703	-	701	660	-
Stage 2	-	-	-	-	-	-	669	633	-	711	687	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1328	-	-	1353	-	-	349	389	847	328	398	842
Mov Cap-2 Maneuver	-	-	-	-	-	-	349	389	-	328	398	-
Stage 1	-	-	-	-	-	-	741	688	-	686	629	-
Stage 2	-	-	-	-	-	-	572	603	-	605	672	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	1.5	15	17.1
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	489	1328	-	-	1353	-	-	421
HCM Lane V/C Ratio	0.266	0.02	-	-	0.041	-	-	0.294
HCM Control Delay (s)	15	7.8	0	-	7.8	0	-	17.1
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.1	0.1	-	-	0.1	-	-	1.2

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	177	169	6	18	2
Future Vol, veh/h	1	177	169	6	18	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	192	184	7	20	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	191	0	-	0	382	188
Stage 1	-	-	-	-	188	-
Stage 2	-	-	-	-	194	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1383	-	-	-	620	854
Stage 1	-	-	-	-	844	-
Stage 2	-	-	-	-	839	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1383	-	-	-	619	854
Mov Cap-2 Maneuver	-	-	-	-	619	-
Stage 1	-	-	-	-	843	-
Stage 2	-	-	-	-	839	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1383	-	-	-	637
HCM Lane V/C Ratio	0.001	-	-	-	0.034
HCM Control Delay (s)	7.6	0	-	-	10.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	18	6	118	97	2
Future Vol, veh/h	7	18	6	118	97	2
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	20	7	128	105	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	248	106	107	0	-	0
Stage 1	106	-	-	-	-	-
Stage 2	142	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	740	948	1484	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	885	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	736	948	1484	-	-	-
Mov Cap-2 Maneuver	736	-	-	-	-	-
Stage 1	913	-	-	-	-	-
Stage 2	885	-	-	-	-	-

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)	1484	-	877	-	-
HCM Lane V/C Ratio	0.004	-	0.031	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	123	27	80	147	1	24	1	40	1	1	1
Future Vol, veh/h	1	123	27	80	147	1	24	1	40	1	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	134	29	87	160	1	26	1	43	1	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	161	0	0	163	0	0	487	486	149	508	500	161
Stage 1	-	-	-	-	-	-	151	151	-	335	335	-
Stage 2	-	-	-	-	-	-	336	335	-	173	165	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1418	-	-	1416	-	-	491	481	898	475	473	884
Stage 1	-	-	-	-	-	-	851	772	-	679	643	-
Stage 2	-	-	-	-	-	-	678	643	-	829	762	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1418	-	-	1416	-	-	464	448	898	428	441	884
Mov Cap-2 Maneuver	-	-	-	-	-	-	464	448	-	428	441	-
Stage 1	-	-	-	-	-	-	850	771	-	678	600	-
Stage 2	-	-	-	-	-	-	631	600	-	787	761	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.7	11.1	11.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	660	1418	-	-	1416	-	-	523
HCM Lane V/C Ratio	0.107	0.001	-	-	0.061	-	-	0.006
HCM Control Delay (s)	11.1	7.5	0	-	7.7	0	-	11.9
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0.2	-	-	0

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	12	110	51	60	192	67	41	48	42	80	40	11
Future Vol, veh/h	12	110	51	60	192	67	41	48	42	80	40	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	115	53	63	200	70	43	50	44	83	42	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	270	0	0	168	0	0	556	564	142	576	555	235
Stage 1	-	-	-	-	-	-	168	168	-	361	361	-
Stage 2	-	-	-	-	-	-	388	396	-	215	194	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1293	-	-	1410	-	-	442	435	906	428	440	804
Stage 1	-	-	-	-	-	-	834	759	-	657	626	-
Stage 2	-	-	-	-	-	-	636	604	-	787	740	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1293	-	-	1410	-	-	383	408	906	351	412	804
Mov Cap-2 Maneuver	-	-	-	-	-	-	383	408	-	351	412	-
Stage 1	-	-	-	-	-	-	825	751	-	650	593	-
Stage 2	-	-	-	-	-	-	552	572	-	691	732	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	1.4	15.4	19.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	483	1293	-	-	1410	-	-	387
HCM Lane V/C Ratio	0.283	0.01	-	-	0.044	-	-	0.353
HCM Control Delay (s)	15.4	7.8	0	-	7.7	0	-	19.3
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.2	0	-	-	0.1	-	-	1.6

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	161	227	17	12	1
Future Vol, veh/h	2	161	227	17	12	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	175	247	18	13	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	265	0	-	0	435	256
Stage 1	-	-	-	-	256	-
Stage 2	-	-	-	-	179	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1299	-	-	-	578	783
Stage 1	-	-	-	-	787	-
Stage 2	-	-	-	-	852	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1299	-	-	-	577	783
Mov Cap-2 Maneuver	-	-	-	-	577	-
Stage 1	-	-	-	-	785	-
Stage 2	-	-	-	-	852	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1299	-	-	-	589
HCM Lane V/C Ratio	0.002	-	-	-	0.024
HCM Control Delay (s)	7.8	0	-	-	11.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	12	17	110	124	7
Future Vol, veh/h	5	12	17	110	124	7
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	13	18	120	135	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	295	139	143	0	-	0
Stage 1	139	-	-	-	-	-
Stage 2	156	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	696	909	1440	-	-	-
Stage 1	888	-	-	-	-	-
Stage 2	872	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	687	909	1440	-	-	-
Mov Cap-2 Maneuver	687	-	-	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	872	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1440	-	830	-	-
HCM Lane V/C Ratio	0.013	-	0.022	-	-
HCM Control Delay (s)	7.5	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	121	26	82	104	1	22	1	71	3	1	1
Future Vol, veh/h	1	121	26	82	104	1	22	1	71	3	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	164	35	111	141	1	30	1	96	4	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	142	0	0	199	0	0	549	548	182	596	565	142
Stage 1	-	-	-	-	-	-	184	184	-	364	364	-
Stage 2	-	-	-	-	-	-	365	364	-	232	201	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1441	-	-	1373	-	-	446	444	861	415	434	906
Stage 1	-	-	-	-	-	-	818	747	-	655	624	-
Stage 2	-	-	-	-	-	-	654	624	-	771	735	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1441	-	-	1373	-	-	414	404	861	343	395	906
Mov Cap-2 Maneuver	-	-	-	-	-	-	414	404	-	343	395	-
Stage 1	-	-	-	-	-	-	817	746	-	654	569	-
Stage 2	-	-	-	-	-	-	594	569	-	683	734	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	3.4	11.5	14.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	681	1441	-	-	1373	-	-	404
HCM Lane V/C Ratio	0.187	0.001	-	-	0.081	-	-	0.017
HCM Control Delay (s)	11.5	7.5	0	-	7.9	0	-	14.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.7	0	-	-	0.3	-	-	0.1

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	23	149	40	48	138	68	24	41	48	41	36	29
Future Vol, veh/h	23	149	40	48	138	68	24	41	48	41	36	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	186	50	60	173	85	30	51	60	51	45	36

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	258	0	0	236	0	0	645	647	211	661	630	216
Stage 1	-	-	-	-	-	-	269	269	-	336	336	-
Stage 2	-	-	-	-	-	-	376	378	-	325	294	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1307	-	-	1331	-	-	385	390	829	376	399	824
Stage 1	-	-	-	-	-	-	737	687	-	678	642	-
Stage 2	-	-	-	-	-	-	645	615	-	687	670	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1307	-	-	1331	-	-	314	360	829	293	368	824
Mov Cap-2 Maneuver	-	-	-	-	-	-	314	360	-	293	368	-
Stage 1	-	-	-	-	-	-	718	669	-	660	608	-
Stage 2	-	-	-	-	-	-	541	582	-	573	653	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	1.5	16.4	19
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	455	1307	-	-	1331	-	-	388
HCM Lane V/C Ratio	0.31	0.022	-	-	0.045	-	-	0.341
HCM Control Delay (s)	16.4	7.8	0	-	7.8	0	-	19
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0.1	-	-	1.5

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	194	185	6	18	2
Future Vol, veh/h	1	194	185	6	18	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	211	201	7	20	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	208	0	-	0	418	205
Stage 1	-	-	-	-	205	-
Stage 2	-	-	-	-	213	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1363	-	-	-	591	836
Stage 1	-	-	-	-	829	-
Stage 2	-	-	-	-	823	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1363	-	-	-	590	836
Mov Cap-2 Maneuver	-	-	-	-	590	-
Stage 1	-	-	-	-	828	-
Stage 2	-	-	-	-	823	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1363	-	-	-	608
HCM Lane V/C Ratio	0.001	-	-	-	0.036
HCM Control Delay (s)	7.6	0	-	-	11.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	18	6	126	104	2
Future Vol, veh/h	7	18	6	126	104	2
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	20	7	137	113	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	265	114	115	0	-	0
Stage 1	114	-	-	-	-	-
Stage 2	151	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	724	939	1474	-	-	-
Stage 1	911	-	-	-	-	-
Stage 2	877	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	720	939	1474	-	-	-
Mov Cap-2 Maneuver	720	-	-	-	-	-
Stage 1	906	-	-	-	-	-
Stage 2	877	-	-	-	-	-

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)	1474	-	865	-	-
HCM Lane V/C Ratio	0.004	-	0.031	-	-
HCM Control Delay (s)	7.5	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	133	30	89	161	1	26	1	44	1	1	1
Future Vol, veh/h	1	133	30	89	161	1	26	1	44	1	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	145	33	97	175	1	28	1	48	1	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	176	0	0	178	0	0	535	534	162	558	550	176
Stage 1	-	-	-	-	-	-	164	164	-	370	370	-
Stage 2	-	-	-	-	-	-	371	370	-	188	180	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1400	-	-	1398	-	-	456	452	883	440	443	867
Stage 1	-	-	-	-	-	-	838	762	-	650	620	-
Stage 2	-	-	-	-	-	-	649	620	-	814	750	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1400	-	-	1398	-	-	427	417	883	391	408	867
Mov Cap-2 Maneuver	-	-	-	-	-	-	427	417	-	391	408	-
Stage 1	-	-	-	-	-	-	837	761	-	649	572	-
Stage 2	-	-	-	-	-	-	597	572	-	768	749	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.8	11.5	12.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	628	1400	-	-	1398	-	-	487
HCM Lane V/C Ratio	0.123	0.001	-	-	0.069	-	-	0.007
HCM Control Delay (s)	11.5	7.6	0	-	7.8	0	-	12.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0.2	-	-	0

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	14	119	56	66	210	70	45	52	47	84	43	12
Future Vol, veh/h	14	119	56	66	210	70	45	52	47	84	43	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	124	58	69	219	73	47	54	49	88	45	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	292	0	0	182	0	0	606	613	153	629	606	256
Stage 1	-	-	-	-	-	-	183	183	-	394	394	-
Stage 2	-	-	-	-	-	-	423	430	-	235	212	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1270	-	-	1393	-	-	409	408	893	395	411	783
Stage 1	-	-	-	-	-	-	819	748	-	631	605	-
Stage 2	-	-	-	-	-	-	609	583	-	768	727	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1270	-	-	1393	-	-	346	379	893	314	381	783
Mov Cap-2 Maneuver	-	-	-	-	-	-	346	379	-	314	381	-
Stage 1	-	-	-	-	-	-	808	738	-	623	569	-
Stage 2	-	-	-	-	-	-	519	548	-	664	718	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	1.5	16.9	22.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	450	1270	-	-	1393	-	-	351
HCM Lane V/C Ratio	0.333	0.011	-	-	0.049	-	-	0.413
HCM Control Delay (s)	16.9	7.9	0	-	7.7	0	-	22.3
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.4	0	-	-	0.2	-	-	2

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	176	250	17	12	1
Future Vol, veh/h	2	176	250	17	12	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	191	272	18	13	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	290	0	-	0	476	281
Stage 1	-	-	-	-	281	-
Stage 2	-	-	-	-	195	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1272	-	-	-	548	758
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	838	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1272	-	-	-	547	758
Mov Cap-2 Maneuver	-	-	-	-	547	-
Stage 1	-	-	-	-	765	-
Stage 2	-	-	-	-	838	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1272	-	-	-	559
HCM Lane V/C Ratio	0.002	-	-	-	0.025
HCM Control Delay (s)	7.8	0	-	-	11.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	1

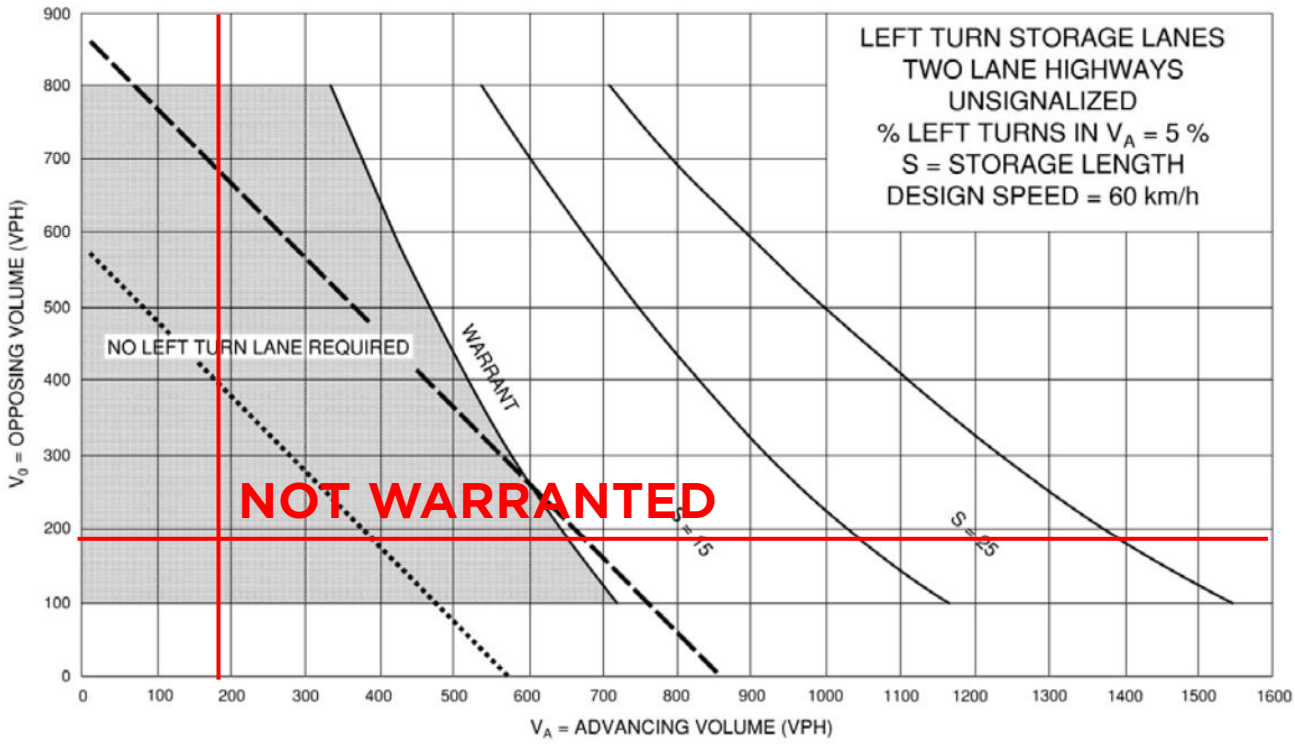
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	12	17	118	132	7
Future Vol, veh/h	5	12	17	118	132	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	13	18	128	143	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	311	147	151	0	-	0
Stage 1	147	-	-	-	-	-
Stage 2	164	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	681	900	1430	-	-	-
Stage 1	880	-	-	-	-	-
Stage 2	865	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	671	900	1430	-	-	-
Mov Cap-2 Maneuver	671	-	-	-	-	-
Stage 1	868	-	-	-	-	-
Stage 2	865	-	-	-	-	-

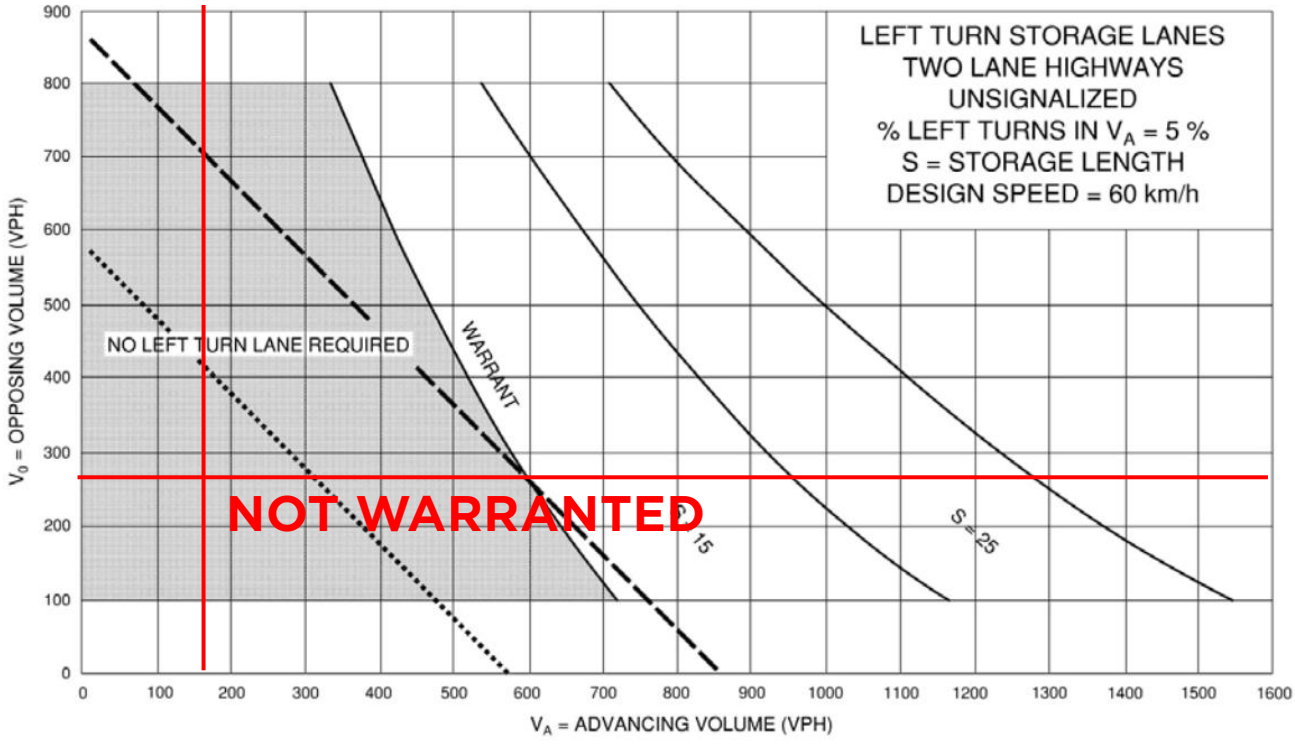
Approach	EB	NB	SB
HCM Control Delay, s	9.5	1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1430	-	818	-	-
HCM Lane V/C Ratio	0.013	-	0.023	-	-
HCM Control Delay (s)	7.5	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

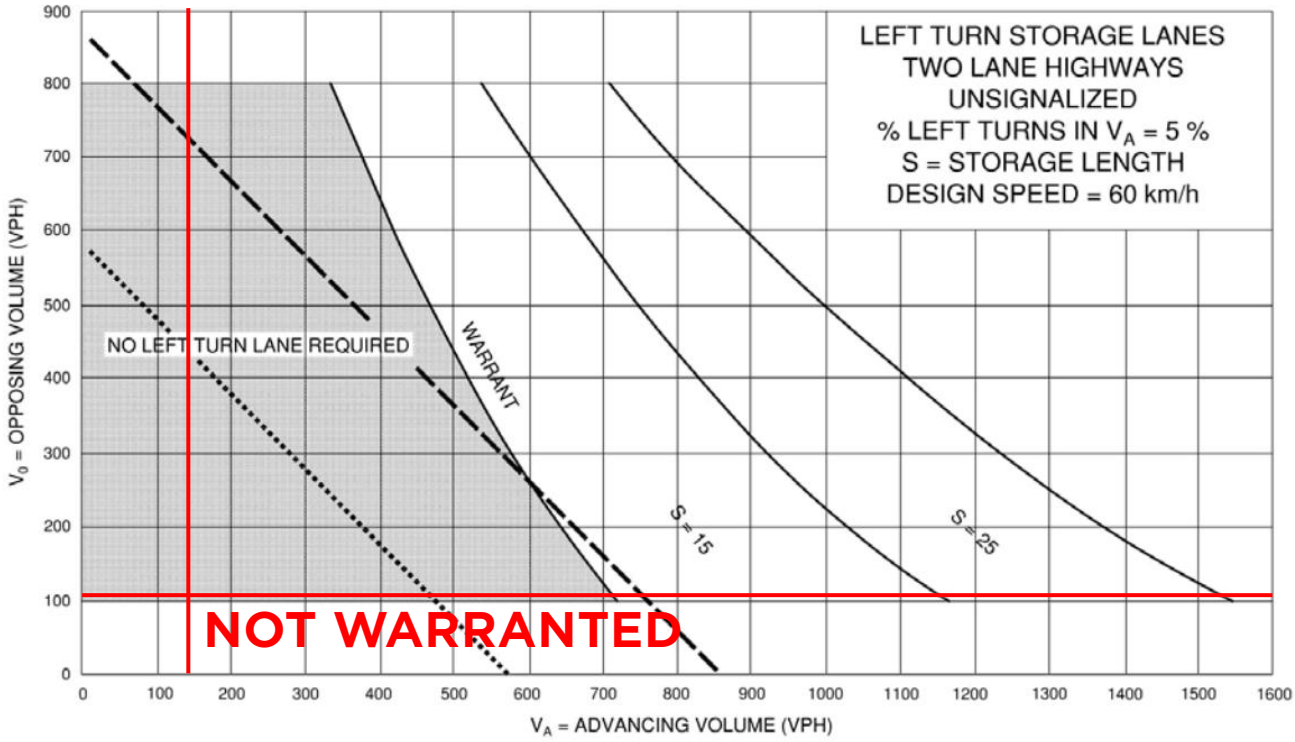
Appendix I:
Left Turn Nomographs



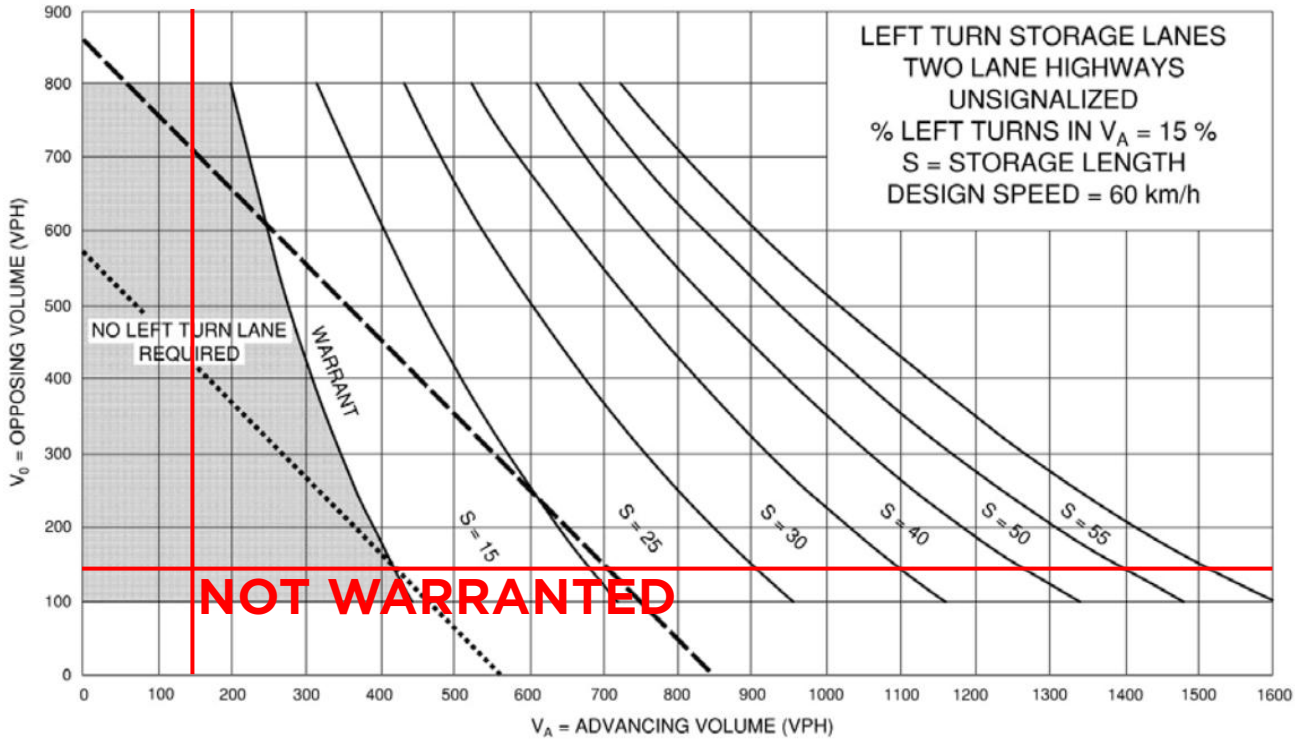
2040 Total Conditions – County Road 9 & Site Access (AM Peak Hour)



2040 Total Conditions – County Road 9 & Site Access (AM Peak Hour)



2040 Total Conditions – Fairgrounds Road South & Site Access (AM Peak Hour)



2040 Total Conditions – Fairgrounds Road South & Site Access (PM Peak Hour)