



# Ainley Subdivision, Elora Transportation Impact Study

Paradigm Transportation Solutions Limited

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## Client

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## Ainley Subdivision, Elora Transportation Impact Study

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Signature

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# Executive Summary

## Content

Paradigm Transportation Solutions Limited (Paradigm) was retained by James Keating Construction (2004) Limited. to conduct this Transportation Impact Study (TIS) for the proposed residential development located in the community of Elora, Township of Centre Wellington, Ontario.

The residential development will include a total of 251 residential units comprised of 126 single-detached, 63 apartments, and 62 townhome units. The build-out of the site is anticipated to occur by 2027. Access to the site is proposed via the extension of Walser Street to Gerrie Road and a new local road that connects to Gerrie Road.

## Conclusions

The conclusions of the study are as follows:

- ▶ The study area intersections are currently operating with satisfactory levels of service during the weekday AM and PM peak hour hours.
- ▶ The proposed residential development is expected to generate a total of 185 AM peak hour trips and 208 PM peak hour trips.
- ▶ The study area intersections are anticipated to operate with satisfactory levels of service during the weekday AM and PM peak hours under 2022 and 2027 future background traffic conditions.
- ▶ The study area intersections are anticipated to operate with satisfactory levels of service during the weekday AM and PM peak hour hours under 2022 and 2027 future total traffic conditions (with full occupancy of the site).
- ▶ Inbound left-turn lanes are not warranted during the weekday AM and PM peak hours under 2022 and 2027 total traffic conditions at the Gerrie Road intersections with Walser Street and Street 1 (one).

## Recommendations

Based on the findings of this study, the following is recommended:

- ▶ The development should be allowed to develop as planned; and
- ▶ The Township of Centre Wellington should install 50 kilometres per hour speed limit signs on Gerrie Road from Colborne Street to north of the proposed intersection of Gerrie Road and Walser Street.





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# 1 Introduction

## 1.1 Background

Paradigm Transportation Solutions Limited (Paradigm) was retained by James Keating Construction (2004) Limited. to conduct this Transportation Impact Study (TIS) for the proposed residential development located in the community of Elora, Township of Centre Wellington, Ontario.

The residential development will include a total of 251 residential units comprised of 126 single-detached, 63 apartments, and 62 townhome units. The build-out of the site is anticipated to occur by 2022. Access to the site is proposed via the extension of Walser Street to Gerrie Road and a new local road that connects to Gerrie Road.

## 1.2 Purpose and Scope

The purpose of the study is to determine the impacts of the development traffic on the surrounding road network and identify any improvements necessary to accommodate this traffic. The scope of the study includes:

- ▶ Determination of the current traffic and site conditions in the vicinity of the development;
- ▶ Estimates of background traffic growth in the area;
- ▶ Estimates of the additional traffic that will be generated by the development;
- ▶ The impact of the site traffic at opening year (2022) and a five-year horizon (2027) following full build-out of the lands; and
- ▶ Recommendations on the remedial measures necessary to accommodate the future traffic in a satisfactory manner.

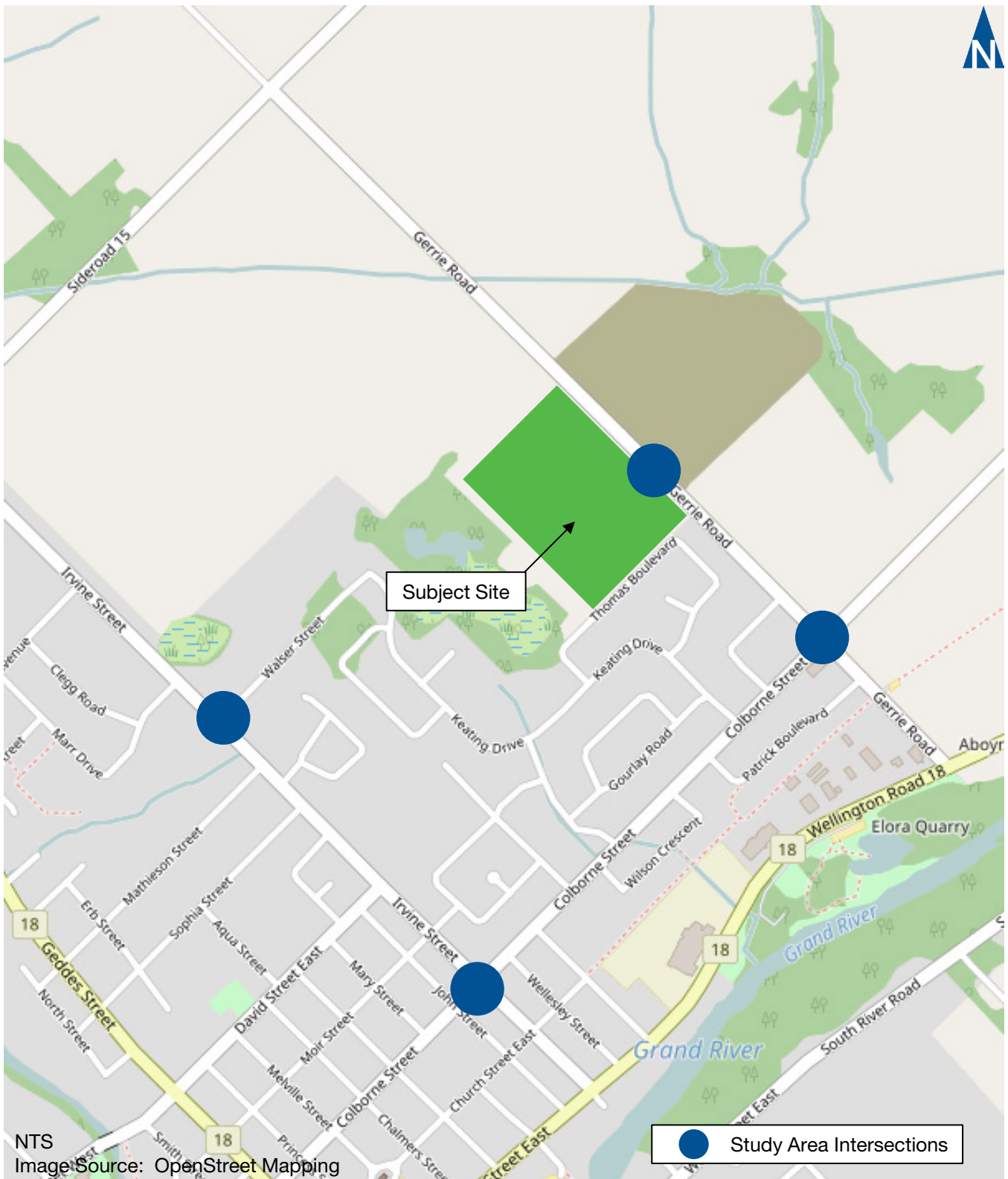
## 1.3 Study Area

The following intersections have been analyzed in this report to examine the impacts of additional traffic due to the development of the subject site:

1. Colborne Street and Irvine Street (all-way stop control);
2. Colborne Street and Gerrie Road (all-way stop control);
3. Irvine Street and Walser Street (stop control);
4. Gerrie Road and Waste Transfer Station Entrance (unsignalized); and
5. Proposed Walser Street and Street 1 (one) connections to Gerrie Road.

**Figure 1.1** illustrates the location of the subject development.





# Development Location and Study Area

## 2 Existing Conditions

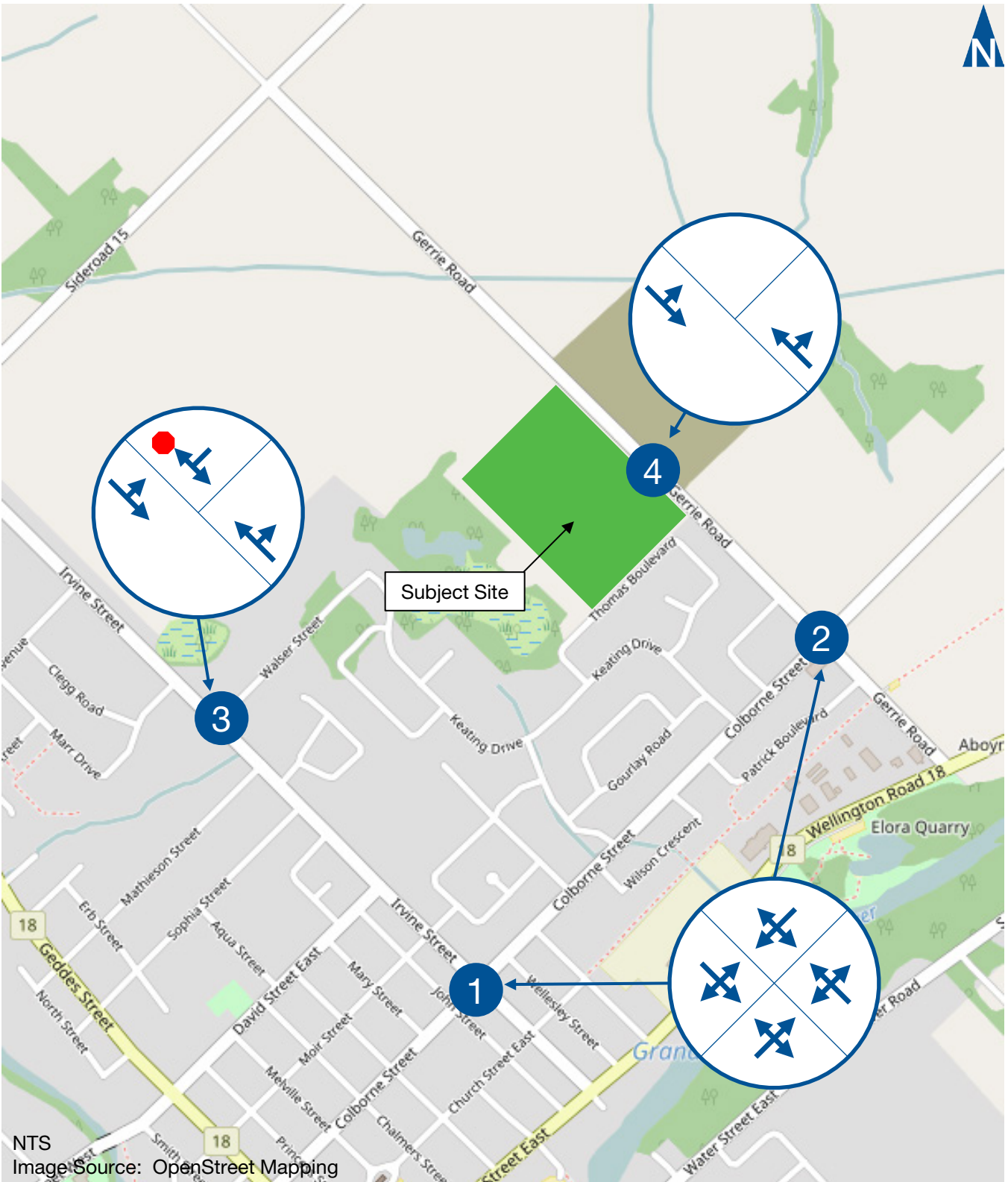
### 2.1 Existing Roadways

The main roadways in the vicinity of the subject site that have been considered in assessing the traffic impacts of the development include Colborne Street, Irvine Street, Gerrie Road, and Walser Street, all under the jurisdiction of the Township of Centre Wellington. Based on the road classification information in the Centre Wellington Official Plan (Schedule B), and a site visit, the characteristics of these roadways are as follows:

- ▶ **Colborne Street** is an east-west collector roadway. Near the subject site, Colborne Street has a two-lane cross-section (one travel lane per direction). The posted maximum speed limit is 50 kilometers per hour east of Gerrie Road and 40 kilometres per hour west of Gerrie Road. The adjacent land uses fronting along Colborne Street are mainly residential. There is a sidewalk present on either one side or both sides of Colborne Street in the study area.
- ▶ **Irvine Street** is a north-south collector roadway from Walser Street to David Street. Between David Street and Colborne Street, Irvine Street is classified as a local road. Near the subject site, Irvine Street has a two-lane cross-section. The adjacent land use is primarily residential with an elementary school. For the most part, the speed limit is not posted (assume statutory 50 km/h maximum speed limit), but there is a 40 kilometres per hour section situated around the elementary school. There is a sidewalk on the east side of the road that runs from north of Walser Street to Colborne Street.
- ▶ **Gerrie Road** is a north-south collector roadway. It has a two-lane cross-section in the study area. The speed limit is not posted (assume statutory 50 km/h maximum speed limit). The adjacent land use is primarily residential, and open space along with a waste transfer station on the east side of road. There are no sidewalks on Gerrie Road north of Colborne Street.
- ▶ **Walser Street** is an east-west local roadway. It has a two-lane cross-section and the speed limit is not posted (assume statutory 50 km/h maximum speed limit). It is stop controlled at Irvine Street. The adjacent land use is primarily residential. There are sidewalks on both sides of the street.

**Figure 2.1** illustrates the existing lane configurations and traffic control at the study area intersections.





## Existing Lane Configuration & Traffic Control

## 2.2 Existing Traffic Volumes

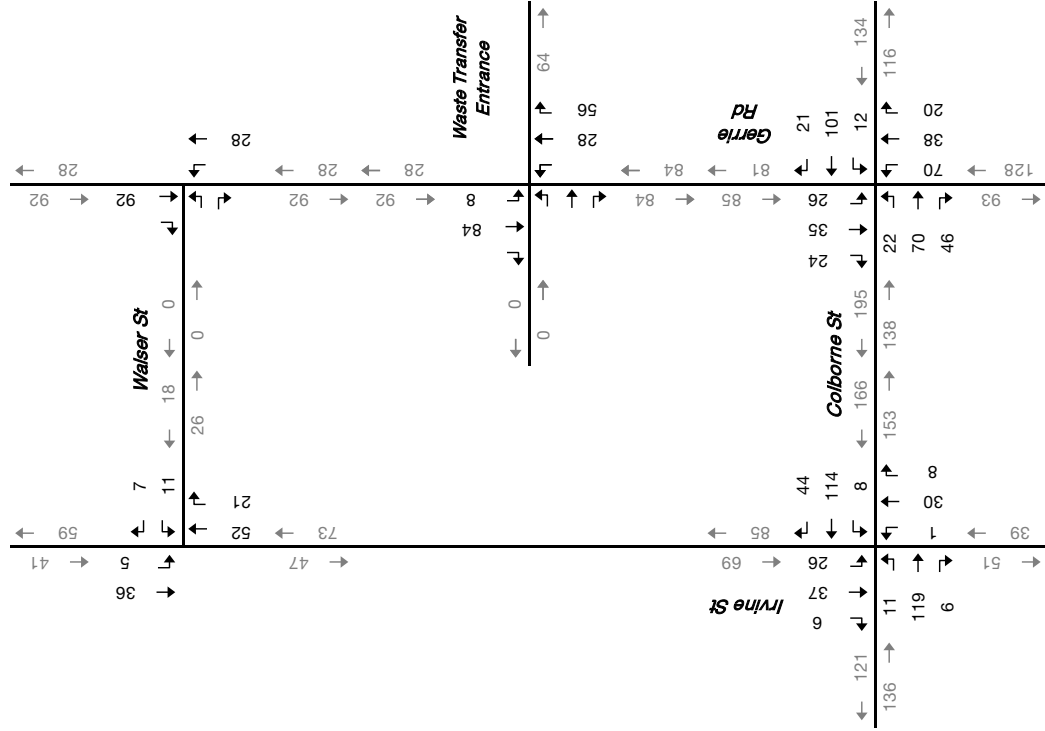
The traffic volumes used to establish existing traffic conditions have been derived from turning movement counts conducted by Paradigm at the study area intersections on June 6, 2017 for the AM and PM peak hours.

**Figure 2.2** illustrates the weekday AM and PM peak hour traffic volumes. Note that these volumes are not balanced due to the nature of the study area with numerous local roads and driveways intersecting the main roadways which contributes to the different volumes between intersections. **Appendix A** contains the complete surveyed traffic data set.

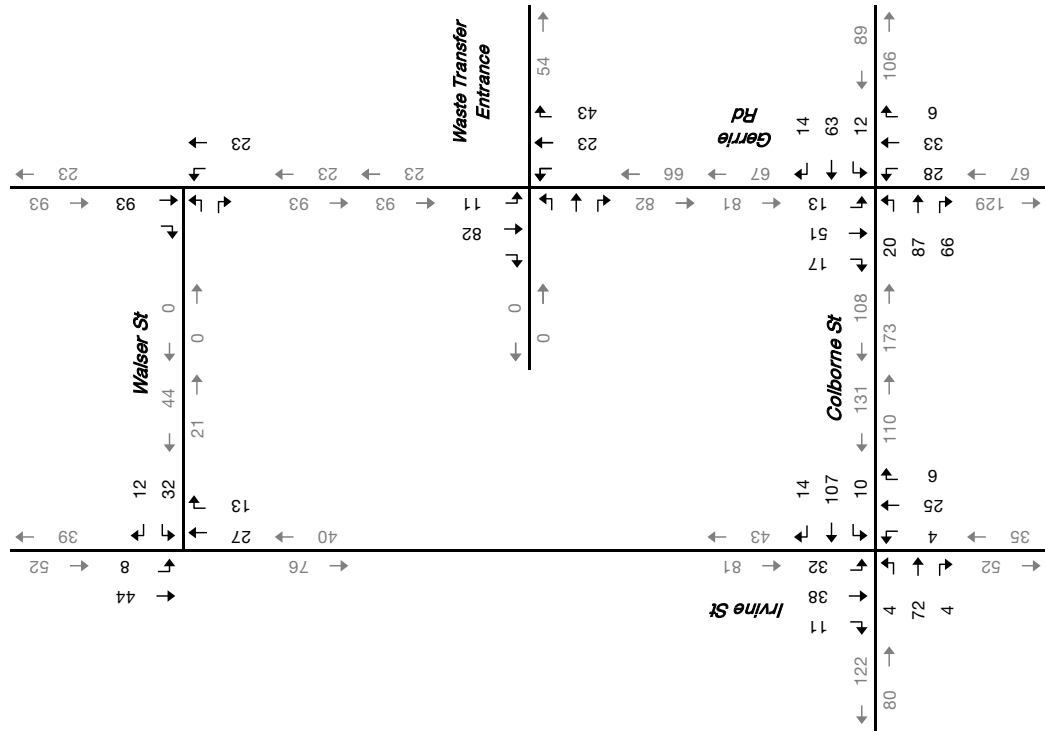




PM PEAK HOUR



AM PEAK HOUR



Existing Traffic Volumes

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170136

Figure 2.2

## 2.3 Existing Traffic Operations

Intersection Level of Service (LOS) is a recognized method of quantifying the efficiency of traffic flow at intersections. It is based on the delay experienced by individual vehicles executing the various movements. The delay is related to the number of vehicles desiring to make a particular movement, compared to the estimated capacity for that movement. The capacity is based on a number of criteria related to the opposing traffic flows, intersection geometry, and the allocation of green time at signalized intersections. The highest possible rating is LOS A, under which the average total delay is equal or less than 10.0 seconds per vehicle. When the average delay exceeds 80 seconds at signalized intersections, the movement is classified as LOS F and remedial measures are usually implemented, if they are feasible. Poor traffic operations are represented by Level of Service (LOS) D and a volume to capacity (v/c) ratio over 0.9.

The operation of the intersections in the study area were evaluated using the existing lane geometry and traffic control, existing peak hour traffic volumes and current County of Wellington signal timing data.

The intersection analysis considered three separate measures of performance:

- ▶ The level of service (LOS) for each turning movement; and
- ▶ The volume to capacity (v/c) ratio for each turning movement.

Based on the above criteria and the entries in **Table 2.1**, the following is noted:

- ▶ **Irvine Street at Colborne Street** – the intersection is currently operating with overall LOS A with all individual turning movements operating at LOS A and v/c ratios of 0.21 or lower during the AM and PM peak hours;
- ▶ **Gerrie Street at Colborne Street** – the intersection is currently operating with overall LOS A and with all individual turning movements operating at LOS A and v/c ratios of 0.23 or lower during the AM and PM peak hours;
- ▶ **Irvine Street at Walser Street** – the intersection is currently operating with overall LOS A and with all individual turning movements operating at LOS A and v/c ratios of 0.05 or lower during the AM and PM peak hours; and
- ▶ **Gerrie Road at Waste Transfer Station Entrance** – the intersection is currently operating with overall LOS A and with all individual turning movements operating at LOS A and v/c ratios of 0.05 or lower during the AM and PM peak hours.

Detailed Synchro 9 output is provided in **Appendix B**.



**TABLE 2.1: EXISTING TRAFFIC OPERATIONS**

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Irvine Street & Colborne Street	AWSC	LOS Delay V/C Q		A 8 0.11		A 8		A 8		A 8		A 8		A 8		A 8		A 8	A 8
	Gerrie Road & Colborne Street	AWSC	LOS Delay V/C Q		A 9 0.23		A 8		A 8		A 8		A 8		A 8		A 8		A 8	A 8
	Irvine Street & Walsler Street	TWSC	LOS Delay V/C Q				A 9 0.05 1		A 9		A 0		A 0		A 0		A 1 0.01 0		A 0	4
	Gerrie Road & Waste Transfer Station Entrance	TWSC	LOS Delay V/C Q								A 0		A 0		A 0		A 1 0.01 0		A 1	1
PM Peak Hour	Irvine Street & Colborne Street	AWSC	LOS Delay V/C Q		A 8 0.18		A 8		A 8		A 8		A 8		A 8		A 8		A 8	A 8
	Gerrie Road & Colborne Street	AWSC	LOS Delay V/C Q		A 9 0.19		A 9		A 9		A 9		A 9		A 9		A 9		A 9	A 9
	Irvine Street & Walsler Street	TWSC	LOS Delay V/C Q				A 9 0.02 1		A 9		A 0		A 0		A 0		A 1 0.00 0		A 1	2
	Gerrie Road & Waste Transfer Station Entrance	TWSC	LOS Delay V/C Q								A 0		A 0		A 0		A 1 0.01 0		A 1	0

MOE - Measure of Effectiveness  
 LOS - Level of Service  
 Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length  
 Ex. - Existing Available Storage  
 Avail. - Available Storage

TCS - Traffic Control Signal  
 TWSC - Two-Way Stop Control  
 AWSC - All-Way Stop Control

RBT - Roundabout





## 3 Development Concept

### 3.1 Site Description

The proposed development is located on the west side of Gerrie Road, north of Thomas Boulevard in the Community of Elora, Township of Centre Wellington, Ontario. The site is currently vacant.

The residential development will include a total of 251 residential units comprised of 126 single-detached, 63 apartments, and 62 townhome units. The build-out of the site is anticipated to occur by 2022. Access to the site is proposed via the extension of Walser Street to Gerrie Road and a new road that connects to Gerrie Road. **Figure 3.1** illustrates the conceptual site plan of the development.

### 3.2 Sight Lines

The sightlines on Gerrie Road at the approximate locations of Walser Street and Street 1 (one) were reviewed in the field. At the Gerrie Road and Walser Street intersection, the sight distance to the north is approximately 400 plus metres and to the south is approximately 240 metres. At the Gerrie Road and Street 1 (one) intersection, the sight distance to the north is approximately 225 metres and to the south is approximately 400 metres.

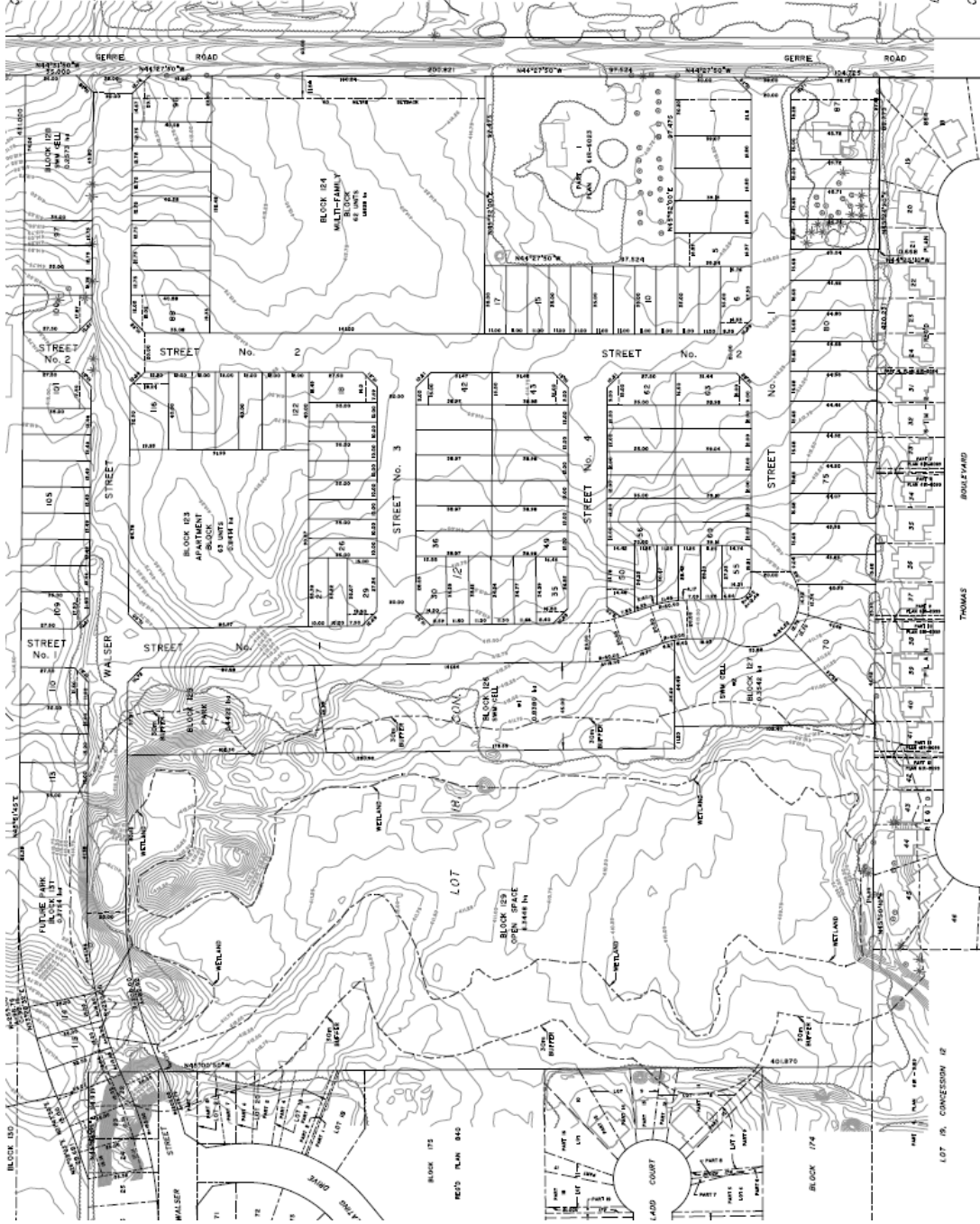
As noted previously, the statutory 50 km/h speed limit was assumed for Gerrie Road, and therefore, a design speed of 60 km/h was used for the analysis. The Transportation Association of Canada (TAC) describes the minimum stopping sight distance for a 60 kilometre per hour design speed to be 55 metres<sup>1</sup>. The minimum decision sight distance for a 60 kilometre per hour design speed is identified as 170 metres and the desirable decision sight distance is identified as 235 metres. Decision sight distance would relate to a motorist approaching the proposed intersection from the north or south.

The available site distance from the Gerrie Road and Walser Street intersection to the north and south is approximately 400 metres and 240 metres, respectively. This distance exceeds the minimum stopping sight distance, minimum decision sight distance, and the desirable decision sight distance for a roadway with a design speed of 60 kilometres per hour.

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<sup>1</sup> Transportation Association of Canada Geometric Design Guide for Canadian Roads – Figure 2.3.3.6 Decision Sight Distance.





# Preliminary Site Plan

Figure 3.1

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The available site distance from the Gerrie Road and Street 1 (one) intersection to the north and south is approximately 225 metres and 400 metres respectively. The sight distance to the south exceeds the minimum stopping sight distance, minimum decision sight distance, and the desirable decision sight distance. The sight distance to the north exceeds the minimum stopping and minimum decision sight distance, but is less than the desirable decision sight distance. The available sight distance to the north would provide the minimum decision sight distance for a design speed of approximately 45 km/h.

In consideration of the site context, and from observation, travel speeds on Gerrie Road along the site frontage tend to be at or above the 50 km/h speed limit. Therefore, under these circumstances and with the available sight distance as measured, it can be concluded that the proposed intersections on Gerrie Road would have sufficient sightlines to function safely if Gerrie Road was posted at 50 kilometers per hour to north of the Walser Street intersection.

### 3.3 Development Trip Generation

The site trip generation for the AM and PM peak hours was estimated using the regression equation and average trip rates published in the Institute of Transportation Engineers (ITE) Trip Generation Manual<sup>2</sup> for the Land Use Code 210 (Single Family Detached Housing), Code 230 (Residential Condominium/Townhouse), and Code 220 (Apartment). This results in the most conservative approach to the trip generation for the site. **Table 3.1** indicates that the subject site is estimated to have a total trip generation of approximately 185 vehicle trips during the AM peak hour and 208 vehicle trips during the PM peak hour.

**TABLE 3.1: ESTIMATED TRIP GENERATION**

Land Use Code	Number of Units	AM Peak Hour			PM Peak Hour				
		Rate	In	Out	Total	Rate	In	Out	Total
210 - Single Family Detached Housing	126	Eq <sup>1</sup>	24	74	98	Eq <sup>2</sup>	81	48	129
230 - Residential Condominium / Townhouse	62	Eq <sup>3</sup>	6	29	35	Eq <sup>4</sup>	27	14	41
220 - Apartment	63	0.46	6	46	52	0.60	27	11	38
<b>Total Trip Generation</b>			<b>36</b>	<b>149</b>	<b>185</b>		<b>135</b>	<b>73</b>	<b>208</b>

$$^1 T = 0.70(X)+9.74$$

$$^2 \ln(T) = 0.90\ln(X)+0.51$$

$$^3 \ln(T) = 0.80\ln(X)+0.26$$

$$^4 \ln(T) = 0.82\ln(X)+0.32$$

### 3.4 Development Trip Distribution and Assignment

The estimated trip generation was assigned to the road network based on the trip patterns evident in the existing traffic volumes (**Figure 2.2**). The estimated trip distribution is summarized in **Table 3.2**.

<sup>2</sup> Trip Generation Manual 9th Edition Institute of Transportation Engineers Washington DC 2012



**TABLE 3.2: ESTIMATED TRIP DISTRIBUTION**

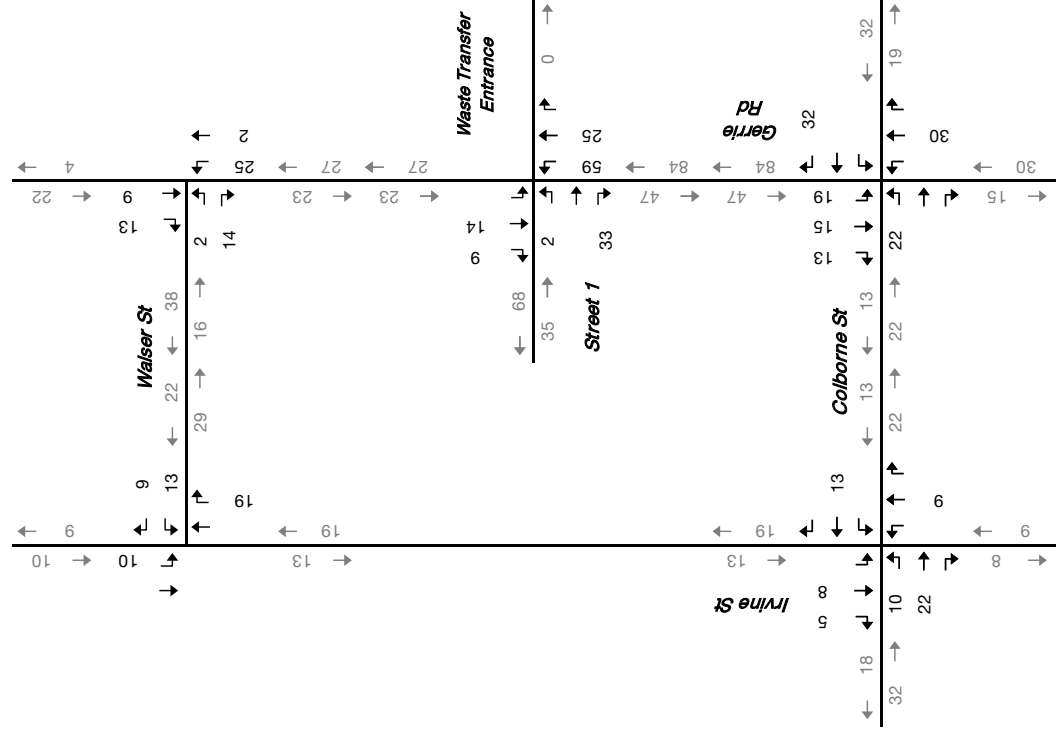
Direction	Route	AM Peak Hour		PM Peak Hour	
		In	Out	In	Out
North	Irvine Street	13%	8%	7%	13%
	Gerrie Road	22%	5%	16%	6%
South	Irvine Street	8%	11%	7%	11%
	Gerrie Road	16%	27%	22%	20%
East	Colborne Street	21%	26%	24%	26%
West	Colborne Street	19%	23%	24%	25%
<b>Total</b>		<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Using the trip generation data provided in **Table 3.1** and the trip distribution provided in **Table 3.2**, the site-generated traffic was assigned to the adjacent road network. The resulting site-generated trip assignment is shown in **Figure 3.2**.

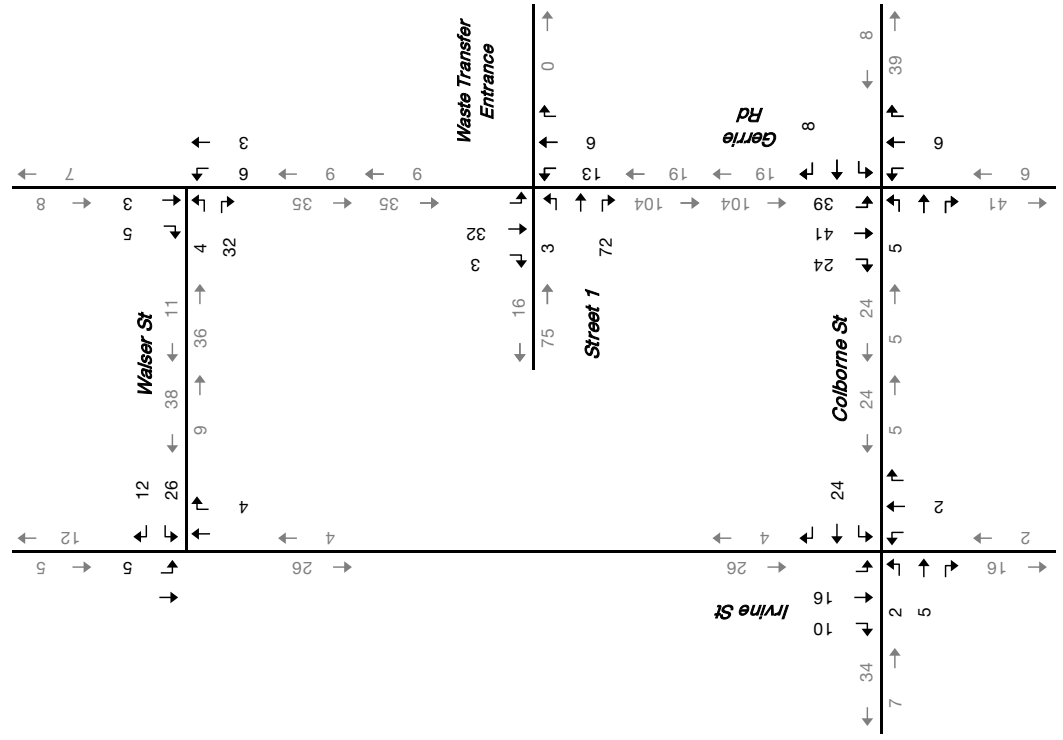




PM PEAK HOUR



AM PEAK HOUR



# Development Generated Traffic Volumes



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Figure 3.2

## 4 Future Traffic Conditions

### 4.1 Background Traffic

#### 4.1.1 General Background Growth

The non-site traffic increase is comprised of generalized traffic growth near the development. The background traffic volumes were determined by applying a growth rate of 2.1% per annum to the existing traffic volumes. This growth rate was determined by the population projections in the Wellington County Official Plan<sup>3</sup> as outlined in **Table 4.1**.

**TABLE 4.1: COMMUNITY OF ELORA POPULATION GROWTH FORECASTS**

Year	Total Population	Total Households	Overall Growth Per Annum
2006	6,640	2,320	--
2011	7,410	2,630	2.2%
2016	8,340	2,970	2.4%
2021	9,210	3,280	2.0%
2026	10,080	3,600	1.8%
2031	10,950	3,920	1.7%

#### 4.1.2 Background Development

In addition to the general background growth, the North-West Fergus Secondary Plan (NWFSP) area has been included in the forecast background traffic. This residential development is situated to the east of the subject property north of Colborne Street. The traffic generated from this development was obtained from the traffic impact study prepared by RJ Burnside & Associates Limited<sup>4</sup>. The site generated traffic from the NWFSP is included in **Appendix C** for the 2022 and 2027 horizon years.

The future background traffic volumes reasonably expected for the 2022 horizon are shown in **Figure 4.1** and for the 2027 horizon in **Figure 4.2**.

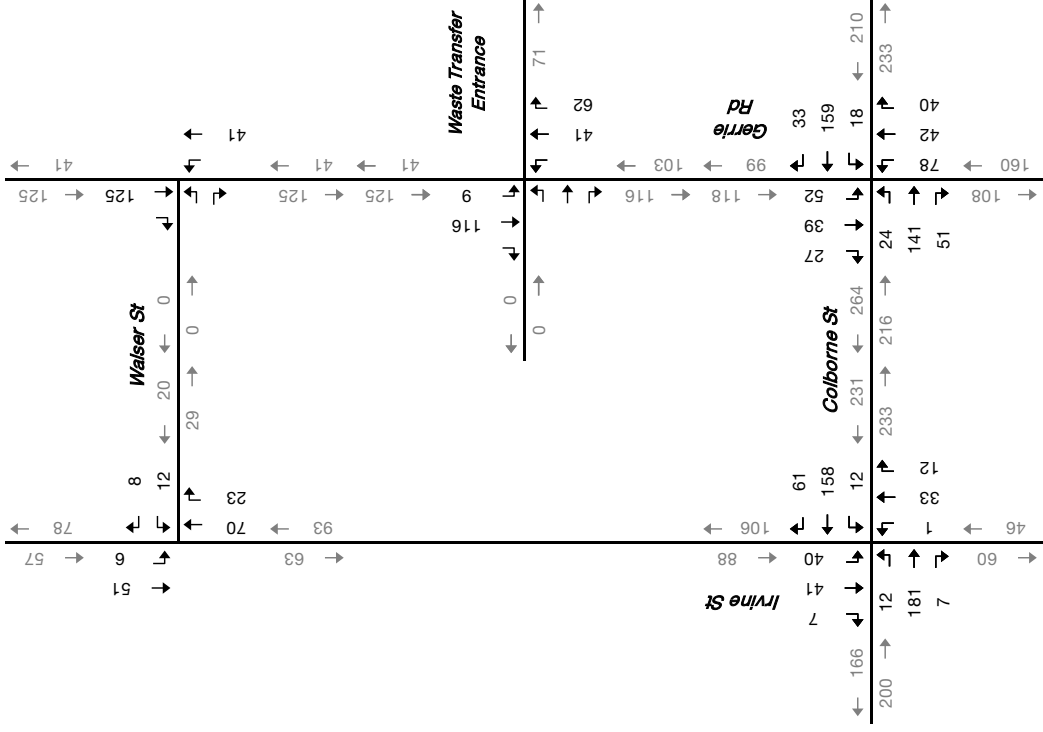
<sup>3</sup> Wellington County Official Plan May 6, 1999 (Last Revision September 1, 2016) Page 13

<sup>4</sup> Traffic Impact Study In Support of Draft Plan Approval (Phases 2 & 3), Township of Centre Wellington North West Fergus Secondary Plan, RJ Burnside & Associates Limited, December 2016

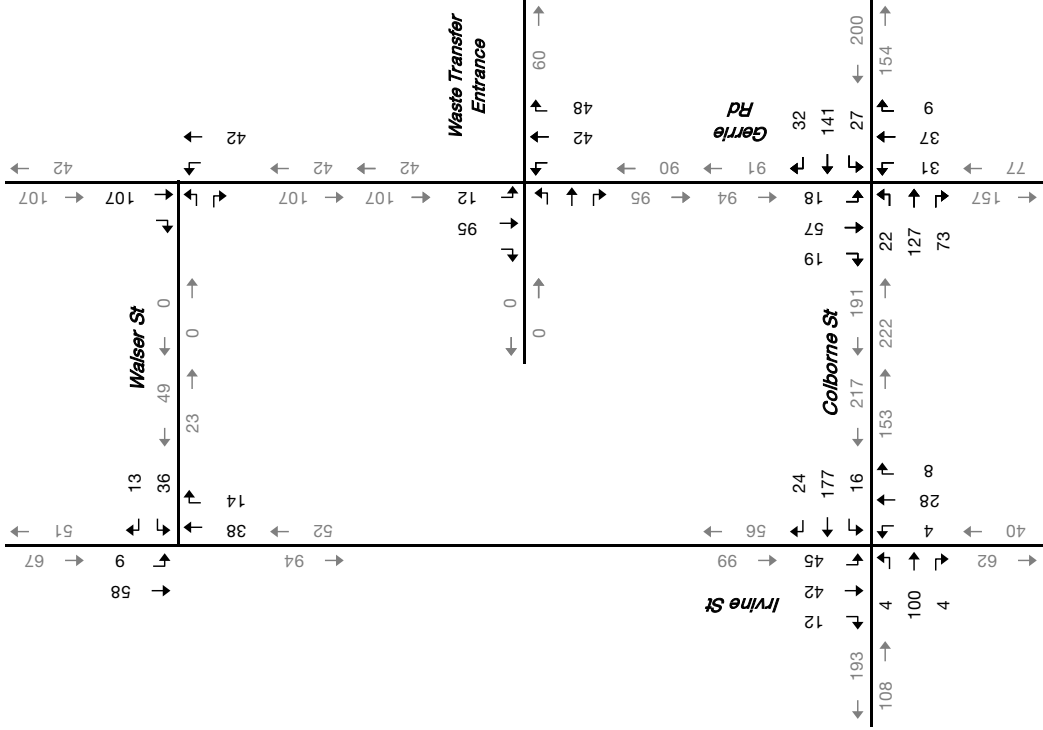




PM PEAK HOUR



AM PEAK HOUR



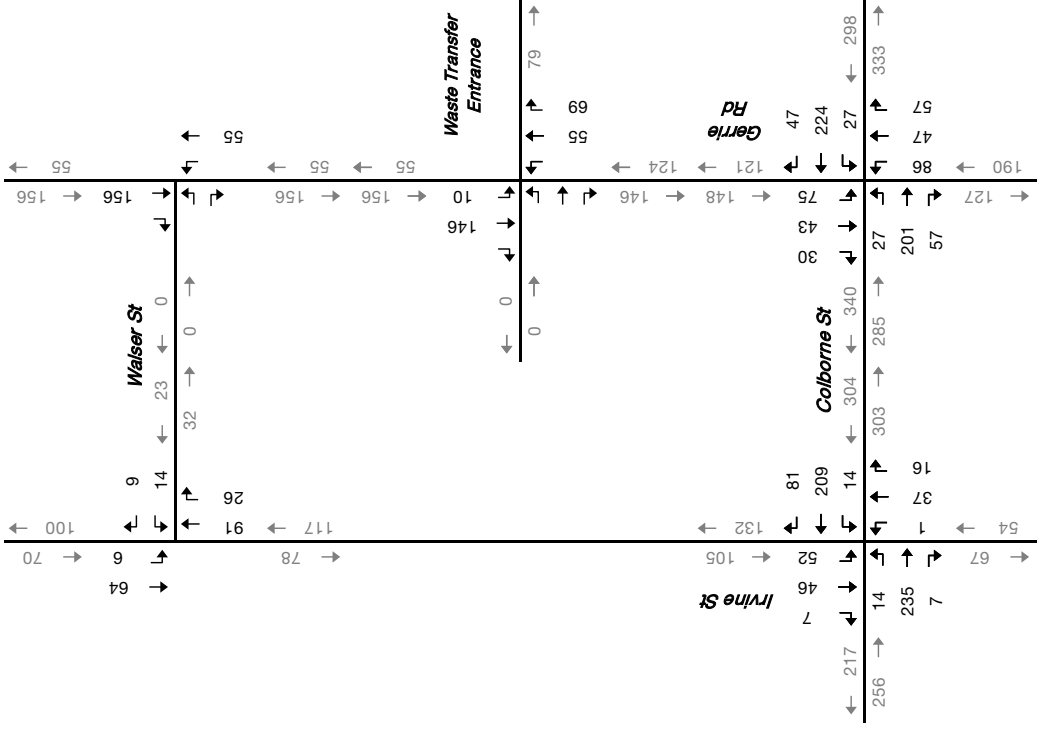
# 2022 Background Traffic Volumes

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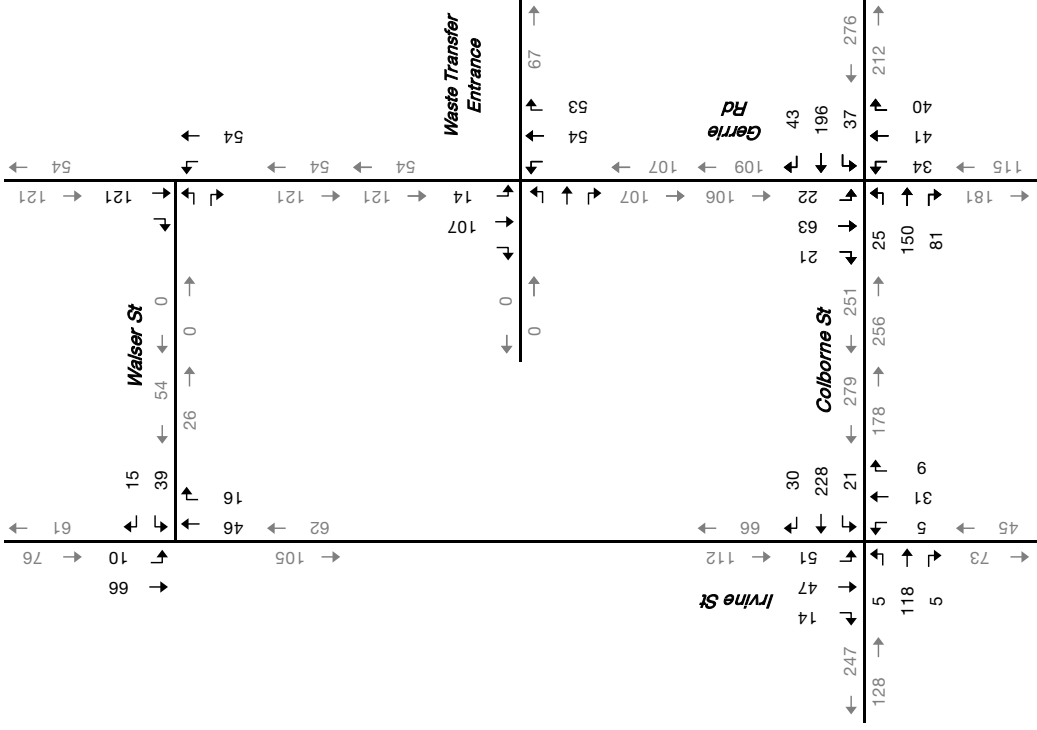
Figure 4.1



PM PEAK HOUR



AM PEAK HOUR



# 2027 Background Traffic Volumes

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Figure 4.2



## 4.2 2022 Background Traffic Operations

The operations of the intersections under the 2022 background traffic conditions were evaluated using the same parameters that were used for the analysis of existing traffic conditions. Poor traffic operations of are represented by Level of Service (LOS) D and a volume to capacity (v/c) ratio over 0.9. The resulting level of service conditions are summarized in **Table 4.2** and the following is noted:

- ▶ **Irvine Street at Colborne Street** – the intersection is forecast to operate at overall LOS A with all individual turning movements at LOS A and v/c ratios of 0.29 or lower during the AM and PM peak hours;
- ▶ **Gerrie Street at Colborne Street** – during the AM peak hour, the intersection is forecast to operate at overall LOS A with all individual turning movements at LOS A and v/c ratios of 0.31 or lower. During the PM peak hour, the intersection is forecast to operate at overall LOS B with all individual turning movements at LOS B or better and v/c ratios of 0.33 or lower;
- ▶ **Irvine Street at Walser Street** – the intersection is forecast to operate at overall LOS A with all individual turning movements operating at LOS A and v/c ratios of 0.06 or lower during the AM and PM peak hours; and
- ▶ **Gerrie Road at Waste Transfer Station Entrance** – the intersection is forecast to operate at overall LOS A with all individual turning movements operating at LOS A and v/c ratios of 0.07 or lower during the AM and PM peak hours.

Detailed Synchro 9 output is provided in **Appendix D**.



**TABLE 4.2: 2022 BACKGROUND TRAFFIC OPERATIONS**

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																			
				Eastbound				Westbound				Northbound				Southbound				Overall			
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach				
AM Peak Hour	Irvine Street & Colborne Street	AWSC	LOS Delay V/C Q		A 9 0.15		A 9		A 9	0.29		A 9		A 8	0.06		A 8		A 9	0.15		A 9	A 9
	Gerrie Road & Colborne Street	AWSC	LOS Delay V/C Q		A 10 0.31		A 10		A 10	0.28		A 10		A 9	0.12		A 9		A 9	0.15		A 9	A 9
	Irvine Street & Waiser Street	TWSC	LOS Delay V/C Q						A 9	0.06		A 9		A 0	0.03		A 0		A 1	0.01		A 0	3
	Gerrie Road & Waste Transfer Station Entrance	TWSC	LOS Delay V/C Q											A 0	0.06		A 0		A 1	0.01		A 1	1
PM Peak Hour	Irvine Street & Colborne Street	AWSC	LOS Delay V/C Q		A 9 0.28		A 9		A 10	0.31		A 10		A 9	0.07		A 9		A 9	0.14		A 9	A 9
	Gerrie Road & Colborne Street	AWSC	LOS Delay V/C Q		B 10 0.33		B 10		B 10	0.32		B 10		B 10	0.26		B 10		A 10	0.19		A 10	B 10
	Irvine Street & Waiser Street	TWSC	LOS Delay V/C Q						A 9	0.03		A 9		A 0	0.06		A 0		A 1	0.00		A 1	1
	Gerrie Road & Waste Transfer Station Entrance	TWSC	LOS Delay V/C Q											A 0	0.07		A 0		A 1	0.01		A 1	0

MOE - Measure of Effectiveness  
 LOS - Level of Service  
 Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length  
 Ex. - Existing Available Storage  
 Avail. - Available Storage

TCS - Traffic Control Signal  
 TWSC - Two-Way Stop Control  
 AWSC - All-Way Stop Control

RBT - Roundabout



### 4.3 2027 Background Traffic Operations

The operations of the intersections under the 2027 background traffic conditions were evaluated using the same parameters that were used for the analysis of existing traffic conditions. Poor traffic operations are represented by Level of Service (LOS) D and a volume to capacity (v/c) ratio over 0.9.

The resulting level of service conditions are summarized in **Table 4.3** and the following is noted:

- ▶ **Irvine Street at Colborne Street** – During the AM peak hour, the intersection is forecast to operate at overall LOS A with all individual turning movements at LOS B or better and v/c ratios of 0.38 or lower. During the PM peak hour, the intersection is forecast to operate at overall LOS B with all individual turning movements at LOS B or better and v/c ratios of 0.43 or lower;
- ▶ **Gerrie Street at Colborne Street** – during the AM peak hour, the intersection is forecast to operate at overall LOS B with all individual turning movements at LOS B and v/c ratios of 0.41 or better. During the PM peak hour, the intersection is forecast to operate at overall LOS B with all individual turning movements at LOS B or better and v/c ratios of 0.50 or better;
- ▶ **Irvine Street at Walsler Street** – the intersection is forecast to operate at overall LOS A with all individual turning movements operating at LOS A and v/c ratios of 0.07 or better during the AM and PM peak hours; and
- ▶ **Gerrie Road at Waste Transfer Station Entrance** – the intersection is forecast to operate at overall LOS A with all individual turning movements operating at LOS A and v/c ratios of 0.08 or better during the AM and PM peak hours.

Detailed Synchro 9 output is provided in **Appendix D**.



**TABLE 4.3: 2027 BACKGROUND TRAFFIC OPERATIONS**

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Irvine Street & Colborne Street	AWSC	LOS Delay V/C Q		A 9 0.18		A 9		B 10 0.38		B 10		A 9 0.07		A 9		A 9 0.17		A 9	A 10
	Gerrie Road & Colborne Street	AWSC	LOS Delay V/C Q		B 11 0.38		B 11		B 11 0.41		B 11		A 10 0.19		A 10		A 10 0.18		A 10	B 11
	Irvine Street & Walser Street	TWSC	LOS Delay V/C Q						A 10 0.07 2		A 10		A 0 0.04 0		A 0		A 1 0.01 0		A 0	3
	Gerrie Road & Waste Transfer Station Entrance	TWSC	LOS Delay V/C Q										A 0 0.07 0		A 0		A 1 0.01 0		A 1	1
PM Peak Hour	Irvine Street & Colborne Street	AWSC	LOS Delay V/C Q		B 11 0.38		B 11		B 11 0.43		B 11		A 9 0.09		A 9		A 10 0.18		A 10	B 11
	Gerrie Road & Colborne Street	AWSC	LOS Delay V/C Q		B 14 0.48		B 14		B 14 0.50		B 14		B 12 0.35		B 12		B 12 0.28		B 12	B 13
	Irvine Street & Walser Street	TWSC	LOS Delay V/C Q						A 10 0.03 1		A 10		A 0 0.07 0		A 0		A 1 0.00 0		A 1	1
	Gerrie Road & Waste Transfer Station Entrance	TWSC	LOS Delay V/C Q										A 0 0.08 0		A 0		A 1 0.01 0		A 1	0

MOE - Measure of Effectiveness  
 LOS - Level of Service  
 Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length  
 Ex. - Existing Available Storage  
 Avail. - Available Storage

TCS - Traffic Control Signal  
 TWSC - Two-Way Stop Control  
 AWSC - All-Way Stop Control

RBT - Roundabout



## 4.4 2022 Future Total Traffic Operations

The future total traffic volumes forecast to occur by 2022 include the 2022 background traffic volumes (**Figure 4.1**) and the site-generated traffic volumes (**Figure 3.2**). The future total traffic for the 2022 horizon is shown in **Figure 4.3**.

The operations of the intersections under the 2022 future total traffic conditions were evaluated using the same parameters that were used for the existing traffic operations analyses. The operational analysis also includes the proposed new Walser Street and Street 1 (one) intersections with Gerrie Road as stop controlled intersections.

The resulting level of service conditions are summarized in **Table 4.4** and the following is noted:

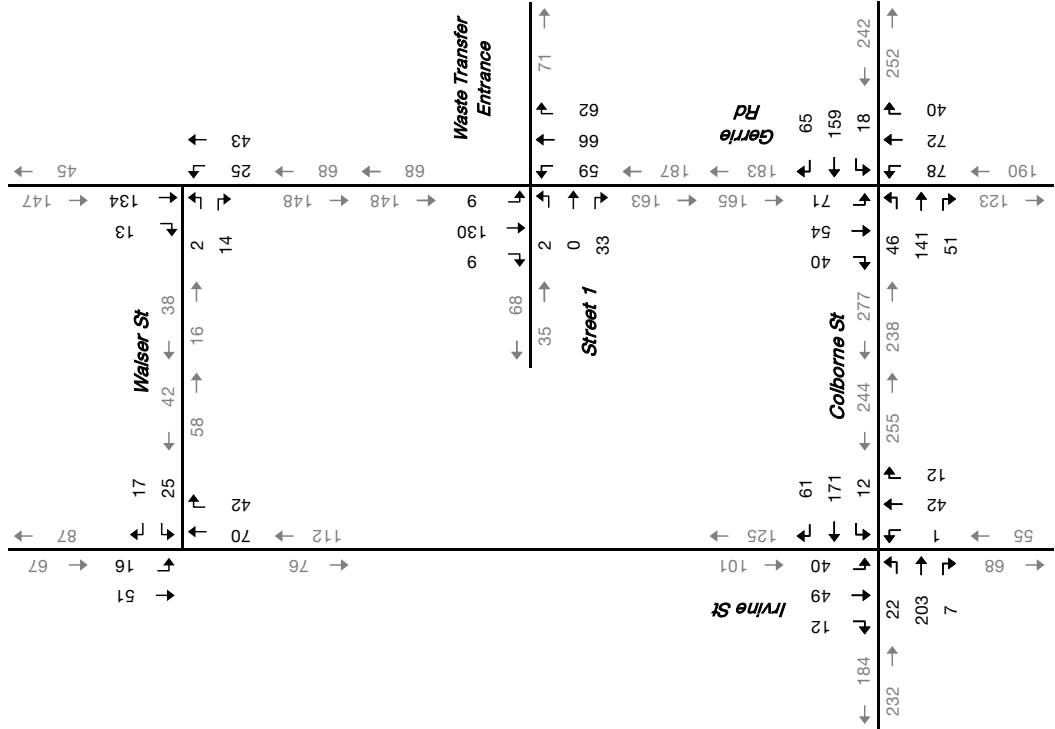
- ▶ **Irvine Street at Colborne Street** – the intersection is forecast to operate at overall LOS A with all individual turning movements at LOS A and v/c ratios of 0.34 or lower during the AM and PM peak hours;
- ▶ **Gerrie Street at Colborne Street** – the intersection is forecast to operate at overall LOS B with all individual turning movements at LOS B or better and v/c ratios of 0.39 or lower during the AM and PM peak hours;
- ▶ **Irvine Street at Walser Street** – the intersection is forecast to operate at overall LOS A with all individual turning movements operating at LOS A and v/c ratios of 0.11 or better during the AM and PM peak hours;
- ▶ **Gerrie Road at Street 1 / Waste Transfer Station Entrance** – the intersection is forecast to operate at overall LOS A with all individual turning movements operating at LOS A and v/c ratios of 0.09 or better during the AM and PM peak hours; and
- ▶ **Gerrie Road at Walser Street** – the intersection is forecast to operate at overall LOS A with all individual turning movements operating at LOS A and v/c ratios of 0.09 or lower during the AM and PM peak hours.

Detailed Synchro 9 output is provided in **Appendix E**.

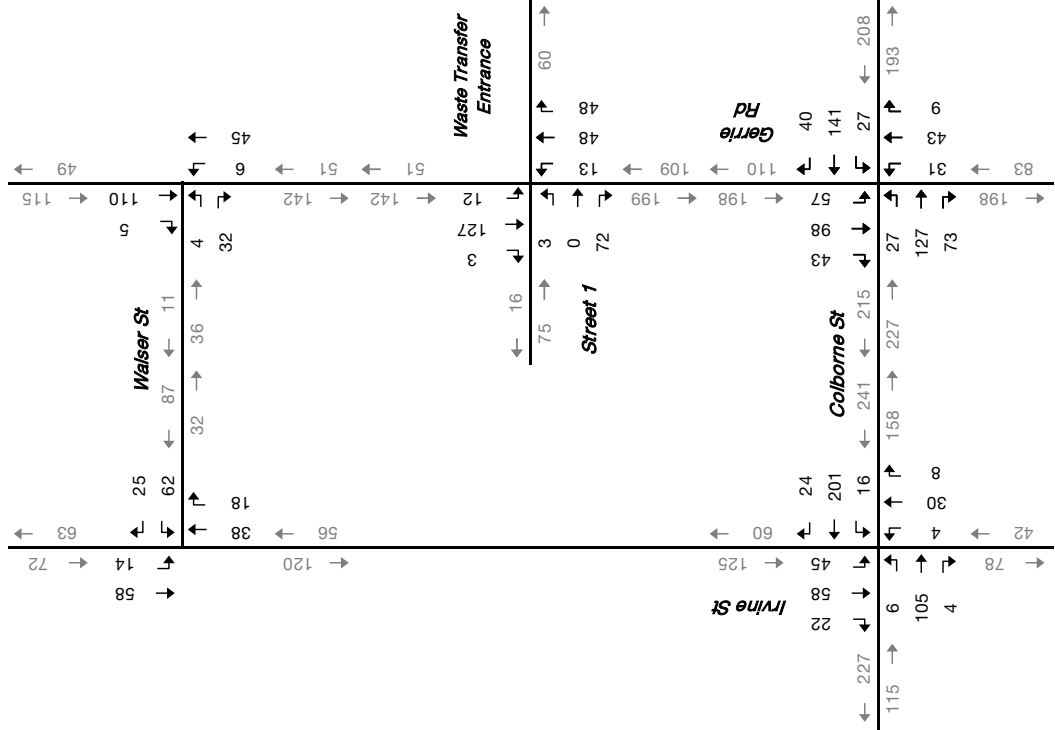




PM PEAK HOUR



AM PEAK HOUR



2022 Total  
Traffic Volumes



Figure 4.3

**TABLE 4.4: 2022 FUTURE TOTAL TRAFFIC OPERATIONS**

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Irvine Street & Colborne Street	AWSC	LOS Delay V/C Q		A 9 0.17		A 9		A 10 0.33		A 10		A 8 0.06		A 8		A 9 0.19		A 9	A 9
	Gerrie Road & Colborne Street	AWSC	LOS Delay V/C Q		B 11 0.34		B 11		B 10 0.32		B 10		A 10 0.14		A 10		B 11 0.32		B 11	B 11
	Irvine Street & Walser Street	TWSC	LOS Delay V/C Q						A 10 0.11 3		A 10		A 0 0.04 0		A 0		A 2 0.01 0		A 2	4
	Gerrie Road & Street 1 / Waste Transfer Station Entrance	TWSC	LOS Delay V/C Q		A 9 0.09 2		A 9						A 1 0.01 0		A 1		A 1 0.01 0		A 1	3
	Gerrie Road & Wasler Street	TWSC	LOS Delay V/C Q	A 9 0.04 1			A 9						A 1 0.00 0		A 1		A 0 0.07 0		A 0	2
PM Peak Hour	Irvine Street & Colborne Street	AWSC	LOS Delay V/C Q		B 10 0.33		B 10		A 10 0.34		A 10		A 9 0.09		A 9		A 9 0.16		A 9	A 10
	Gerrie Road & Colborne Street	AWSC	LOS Delay V/C Q		B 12 0.39		B 12		B 12 0.39		B 12		B 12 0.33		B 12		B 11 0.29		B 11	B 12
	Irvine Street & Walser Street	TWSC	LOS Delay V/C Q						A 10 0.06 1		A 10		A 0 0.07 0		A 0		A 2 0.01 0		A 2	2
	Gerrie Road & Waste Transfer Station Entrance	TWSC	LOS Delay V/C Q		A 9 0.04 1		A 9						A 3 0.04 1		A 3		A 1 0.01 0		A 1	2
	Gerrie Road & Wasler Street	TWSC	LOS Delay V/C Q	A 9 0.02 1			A 9						A 3 0.2 0		A 3		A 0 0.09 0		A 0	2

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length

Ex. - Existing Available Storage

Avail. - Available Storage

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

RBT - Roundabout



## 4.5 2027 Future Total Traffic Operations

The future total traffic volumes anticipated to occur by 2027 include the 2027 background traffic volumes (**Figure 4.2**) and the site-generated traffic volumes (**Figure 3.2**). The future total traffic for the 2027 horizon is shown in **Figure 4.4**.

The operations of the intersections under the 2027 future total traffic conditions were evaluated using the same parameters that were used for the existing and 2025 background traffic operations analyses. The operational analysis also includes the proposed Walser Street and Street 1 (one) intersections with Gerrie Road as stop controlled intersections.

The resulting level of service conditions are summarized in **Table 4.5** and the following is noted:

- ▶ **Irvine Street at Colborne Street** – the intersection is forecast to operate at overall LOS B with all individual turning movements at LOS B or better and v/c ratios of 0.46 or lower during the AM and PM peak hours;
- ▶ **Gerrie Street at Colborne Street** – during the AM peak hour, the intersection is forecast to operate at overall LOS B with all individual turning movements at LOS B and v/c ratios of 0.46 or lower. During the PM peak hour, the intersection is forecast to operate at overall LOS C with all individual turning movements at LOS C or better and v/c ratios of 0.60 or lower;
- ▶ **Irvine Street at Walser Street** – the intersection is forecast to operate at overall LOS A with all individual turning movements operating at LOS B or better and v/c ratios of 0.12 or lower during the AM and PM peak hours;
- ▶ **Gerrie Road at Street 1 / Waste Transfer Station Entrance** – the intersection is forecast to operate at overall LOS A with all individual turning movements operating at LOS A and v/c ratios of 0.09 or lower during the AM and PM peak hours; and
- ▶ **Gerrie Road at Walser Street** – the intersection is forecast to operate at overall LOS A with all individual turning movements operating at LOS A and v/c ratios of 0.11 or lower during the AM and PM peak hours.

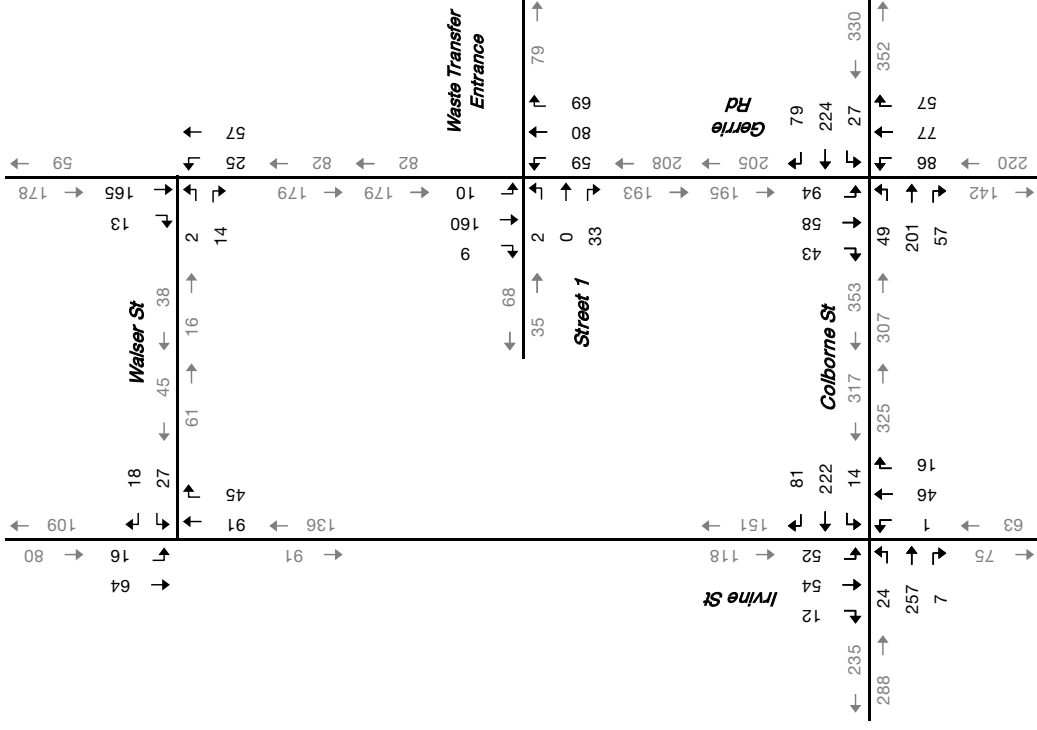
Detailed Synchro 9 output is provided in **Appendix E**.



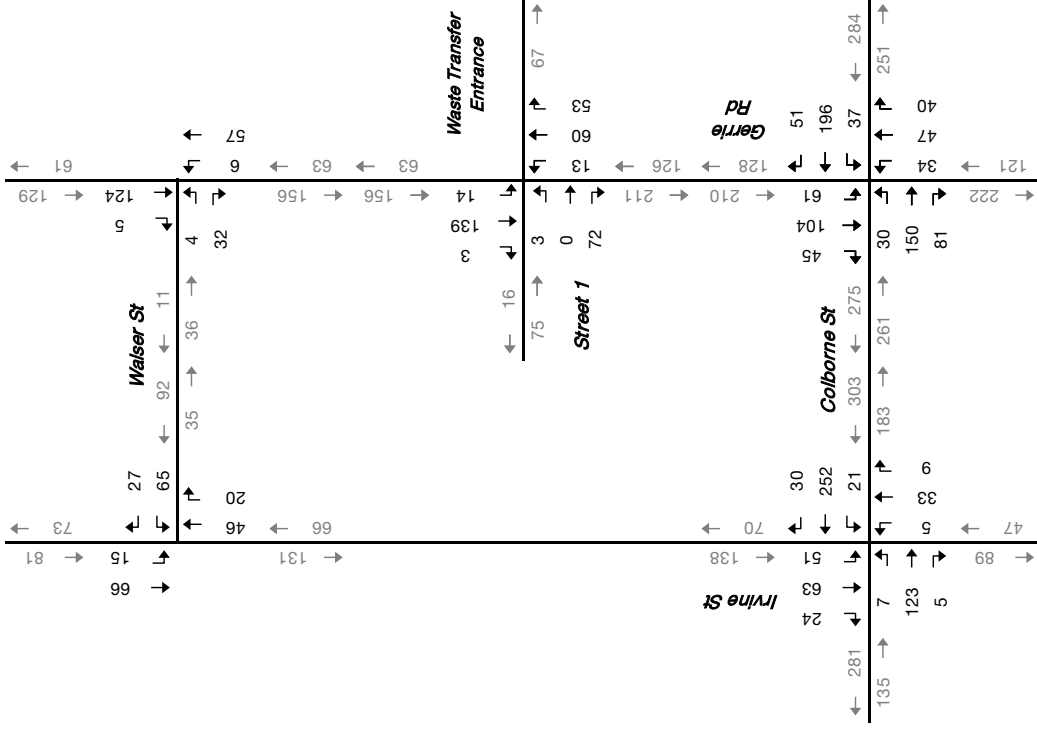




**PM PEAK HOUR**



**AM PEAK HOUR**



**2027 Total  
Traffic Volumes**

**Figure 4.4**

**TABLE 4.5: 2027 FUTURE TOTAL TRAFFIC OPERATIONS**

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Irvine Street & Colborne Street	AWSC	LOS Delay V/C Q		A 9 0.20		A 9		B 11 0.42		B 11		A 9 0.07		A 9		A 10 0.21		A 10	B 10
	Gerrie Road & Colborne Street	AWSC	LOS Delay V/C Q		B 13 0.43		B 13		B 13 0.46		B 13		B 11 0.21		B 11		B 12 0.37		B 12	B 12
	Irvine Street & Walser Street	TWSC	LOS Delay V/C Q						A 10 0.12 3		A 10		A 0 0.04 0		A 0		A 2 0.01 0		A 2	4
	Gerrie Road & Street 1 / Waste Transfer Station Entrance	TWSC	LOS Delay V/C Q		A 10 0.09 2		A 10						A 1 0.01 0		A 1		A 1 0.01 0		A 1	3
	Gerrie Road & Wasler Street	TWSC	LOS Delay V/C Q	A 9 0.04 1			A 9						A 1 0.00 0		A 1		A 0 0.08 0		A 0	2
PM Peak Hour	Irvine Street & Colborne Street	AWSC	LOS Delay V/C Q		B 12 0.44		B 12		B 12 0.46		B 12		A 10 0.11		A 10		B 10 0.21		B 10	B 11
	Gerrie Road & Colborne Street	AWSC	LOS Delay V/C Q		C 17 0.57		C 17		C 18 0.60		C 18		B 15 0.45		B 15		B 14 0.40		B 14	C 16
	Irvine Street & Walser Street	TWSC	LOS Delay V/C Q						B 10 0.06 2		B 10		A 0 0.09 0		A 0		A 2 0.01 0		A 2	2
	Gerrie Road & Waste Transfer Station Entrance	TWSC	LOS Delay V/C Q		A 10 0.05 1		A 10						A 3 0.05 1		A 3		A 1 0.01 0		A 1	2
	Gerrie Road & Wasler Street	TWSC	LOS Delay V/C Q	A 9 0.02 1			A 9						A 3 .02 1		A 3		A 0 0.11 0		A 0	2

MOE - Measure of Effectiveness  
 LOS - Level of Service  
 Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length  
 Ex. - Existing Available Storage  
 Avail. - Available Storage

TCS - Traffic Control Signal  
 TWSC - Two-Way Stop Control  
 AWSC - All-Way Stop Control

RBT - Roundabout



## 5 Remedial Measures

### 5.1 Auxiliary Turn Lanes

The need for an auxiliary inbound left-turn lane at the Gerrie Road at Walser Street and Gerrie Road at Street 1 (one) intersections have been considered using MTO left-turn warrants.

The warrants for left-turn lanes are based on the Ministry of Transportation of Ontario left-turn lane warrants<sup>5</sup>. General traffic engineering practice is to provide for a design speed that is 10 km/h over the posted speed limit in urban conditions. The assumed speed limit on Gerrie Road in the study area is 50 kilometres per hour results in a design speed of 60 kilometres per hour. The nomographs for a design speed of 60 kilometres per hour for two lane highways was used for the left turn warrant assessment.

The percentages of left-turning vehicles in the approaching volume were rounded to the nearest 5%, as nomographs are only provided for 5% increments. The left turn lane warrant nomographs for the Gerrie Road at Walser Street and Gerrie Road at Street 1 (one) intersections for the 2022, and 2027 total traffic conditions are included in **Appendix F**.

At the intersection of Gerrie Road and Walser Street, an inbound left-turn lane is not warranted for the weekday AM and PM peak hours under 2022 and 2027 total traffic conditions.

At the intersection of Gerrie Road and Street 1 (one), an inbound left-turn lane is not warranted for the weekday AM and PM peak hours under 2022 and 2027 total traffic conditions.

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<sup>5</sup>*Geometric Design Manual for Ontario Highways, Queen's Printer for Ontario, 1986*



## 6 Conclusions & Recommendations

### 6.1 Conclusions

The conclusions of the study are as follows:

- ▶ The study area intersections are currently operating with satisfactory levels of service during the weekday AM and PM peak hour hours.
- ▶ The proposed residential development is expected to generate a total of 185 AM peak hour trips and 208 PM peak hour trips.
- ▶ The study area intersections are anticipated to operate with satisfactory levels of service during the weekday AM and PM peak hours under 2022 and 2027 future background traffic conditions.
- ▶ The study area intersections are anticipated to operate with satisfactory levels of service during the weekday AM and PM peak hour hours under 2022 and 2027 future total traffic conditions.
- ▶ Inbound left-turn lanes are not warranted during the weekday AM and PM peak hours under 2022 and 2027 total traffic conditions at the Gerrie Road intersections with Walser Street and Street 1 (one).

### 6.2 Recommendations

Based on the findings of this study, the following is recommended:

- ▶ The development should be allowed to develop as planned; and
- ▶ The Township of Centre Wellington should install 50 kilometres per hour speed limit signs on Gerrie Road from Colborne Street to north of the proposed intersection of Gerrie Road and Walser Street.



# Appendix A

## Existing Count Data







Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Colborne Street & Gerrie Road  
Site Code:  
Start Date: 06/06/2017  
Page No: 1

### Turning Movement Data

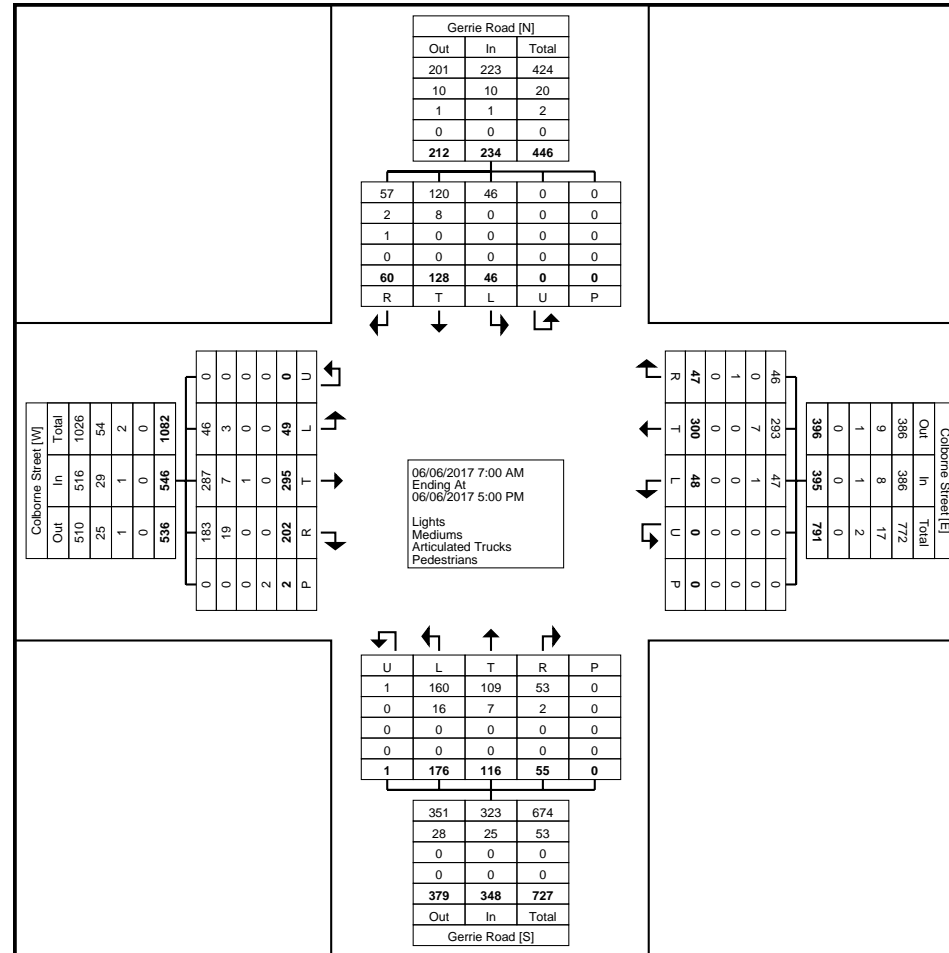
Start Time	Colborne Street Eastbound						Colborne Street Westbound						Gerrie Road Northbound						Gerrie Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	0	8	5	0	2	13	3	8	0	0	0	11	3	2	2	0	0	7	0	4	0	0	0	4	35
7:15 AM	2	11	8	0	0	21	0	9	1	0	0	10	3	1	2	0	0	6	0	1	4	0	0	5	42
7:30 AM	1	15	13	0	0	29	1	6	1	0	0	8	4	6	3	0	0	13	0	6	3	0	0	9	59
7:45 AM	0	16	13	0	0	29	3	11	4	0	0	18	5	7	2	0	0	14	1	10	1	0	0	12	73
Hourly Total	3	50	39	0	2	92	7	34	6	0	0	47	15	16	9	0	0	40	1	21	8	0	0	30	209
8:00 AM	5	21	19	0	0	45	2	17	2	0	0	21	4	8	1	1	0	14	3	17	4	0	0	24	104
8:15 AM	6	19	14	0	0	39	3	17	4	0	0	24	4	6	2	0	0	12	4	8	1	0	0	13	88
8:30 AM	3	26	24	0	0	53	3	9	4	0	0	16	9	11	2	0	0	22	4	11	5	0	0	20	111
8:45 AM	6	21	9	0	0	36	4	20	4	0	0	28	11	8	1	0	0	20	2	15	7	0	0	24	108
Hourly Total	20	87	66	0	0	173	12	63	14	0	0	89	28	33	6	1	0	68	13	51	17	0	0	81	411
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	5	18	9	0	0	32	3	18	10	0	0	31	8	7	5	0	0	20	5	8	9	0	0	22	105
3:15 PM	6	20	16	0	0	42	2	21	4	0	0	27	20	9	6	0	0	35	8	6	2	0	0	16	120
3:30 PM	7	18	11	0	0	36	5	40	5	0	0	50	17	13	5	0	0	35	7	11	9	0	0	27	148
3:45 PM	4	14	10	0	0	28	2	22	2	0	0	26	25	9	4	0	0	38	6	10	4	0	0	20	112
Hourly Total	22	70	46	0	0	138	12	101	21	0	0	134	70	38	20	0	0	128	26	35	24	0	0	85	485
4:00 PM	3	20	11	0	0	34	3	27	0	0	0	30	16	6	5	0	0	27	2	8	2	0	0	12	103
4:15 PM	1	18	8	0	0	27	4	27	0	0	0	31	17	9	4	0	0	30	3	6	5	0	0	14	102
4:30 PM	0	26	17	0	0	43	2	24	3	0	0	29	13	9	5	0	0	27	1	2	1	0	0	4	103
4:45 PM	0	24	15	0	0	39	8	24	3	0	0	35	17	5	6	0	0	28	0	5	3	0	0	8	110
Hourly Total	4	88	51	0	0	143	17	102	6	0	0	125	63	29	20	0	0	112	6	21	11	0	0	38	418
Grand Total	49	295	202	0	2	546	48	300	47	0	0	395	176	116	55	1	0	348	46	128	60	0	0	234	1523
Approach %	9.0	54.0	37.0	0.0	-	-	12.2	75.9	11.9	0.0	-	-	50.6	33.3	15.8	0.3	-	-	19.7	54.7	25.6	0.0	-	-	-
Total %	3.2	19.4	13.3	0.0	-	35.9	3.2	19.7	3.1	0.0	-	25.9	11.6	7.6	3.6	0.1	-	22.8	3.0	8.4	3.9	0.0	-	15.4	-
Lights	46	287	183	0	-	516	47	293	46	0	-	386	160	109	53	1	-	323	46	120	57	0	-	223	1448
% Lights	93.9	97.3	90.6	-	-	94.5	97.9	97.7	97.9	-	-	97.7	90.9	94.0	96.4	100.0	-	92.8	100.0	93.8	95.0	-	-	95.3	95.1
Mediums	3	7	19	0	-	29	1	7	0	0	-	8	16	7	2	0	-	25	0	8	2	0	-	10	72
% Mediums	6.1	2.4	9.4	-	-	5.3	2.1	2.3	0.0	-	-	2.0	9.1	6.0	3.6	0.0	-	7.2	0.0	6.3	3.3	-	-	4.3	4.7
Articulated Trucks	0	1	0	0	-	1	0	0	1	0	-	1	0	0	0	0	-	0	0	0	1	0	-	1	3
% Articulated Trucks	0.0	0.3	0.0	-	-	0.2	0.0	0.0	2.1	-	-	0.3	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	1.7	-	-	0.4	0.2
Pedestrians	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Count Name: Colborne Street & Gerrie Road  
Site Code:  
Start Date: 06/06/2017  
Page No: 2



Turning Movement Data Plot





Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
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Count Name: Colborne Street & Gerrie Road  
Site Code:  
Start Date: 06/06/2017  
Page No: 3

### Turning Movement Peak Hour Data (8:00 AM)

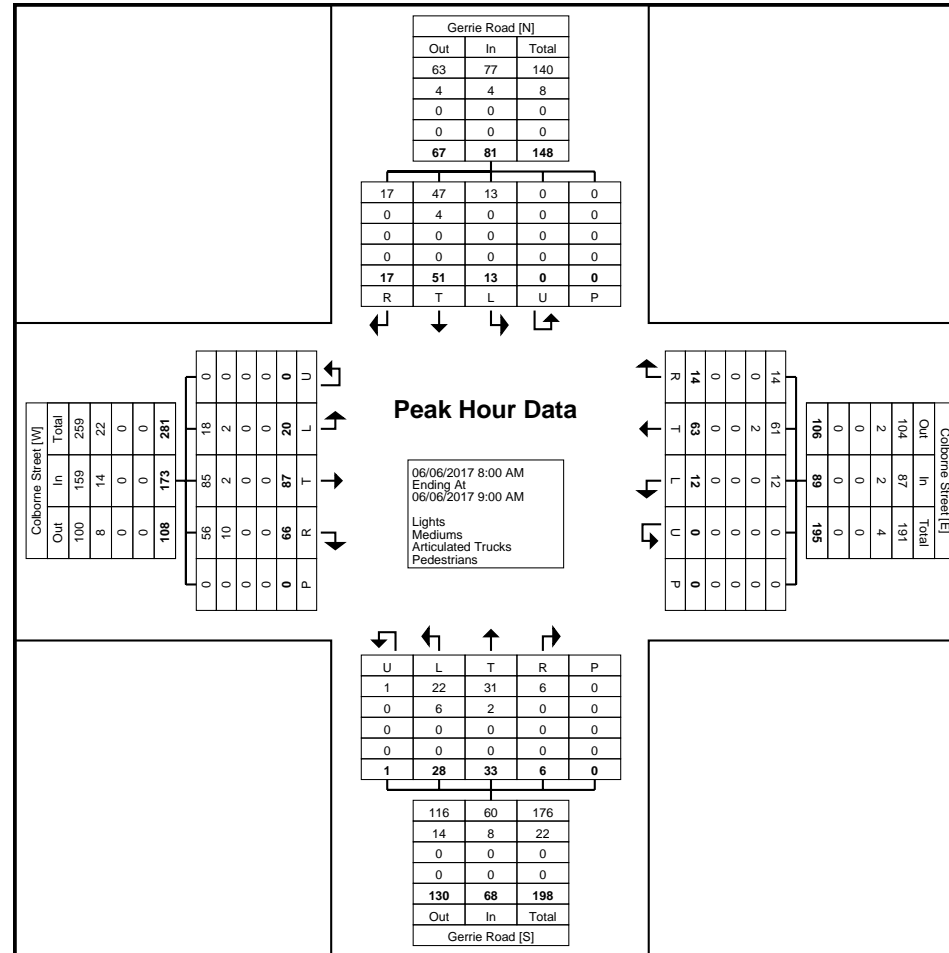
Start Time	Colborne Street Eastbound						Colborne Street Westbound						Gerrie Road Northbound						Gerrie Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
8:00 AM	5	21	19	0	0	45	2	17	2	0	0	21	4	8	1	1	0	14	3	17	4	0	0	24	104
8:15 AM	6	19	14	0	0	39	3	17	4	0	0	24	4	6	2	0	0	12	4	8	1	0	0	13	88
8:30 AM	3	26	24	0	0	53	3	9	4	0	0	16	9	11	2	0	0	22	4	11	5	0	0	20	111
8:45 AM	6	21	9	0	0	36	4	20	4	0	0	28	11	8	1	0	0	20	2	15	7	0	0	24	108
Total	20	87	66	0	0	173	12	63	14	0	0	89	28	33	6	1	0	68	13	51	17	0	0	81	411
Approach %	11.6	50.3	38.2	0.0	-	-	13.5	70.8	15.7	0.0	-	-	41.2	48.5	8.8	1.5	-	-	16.0	63.0	21.0	0.0	-	-	-
Total %	4.9	21.2	16.1	0.0	-	42.1	2.9	15.3	3.4	0.0	-	21.7	6.8	8.0	1.5	0.2	-	16.5	3.2	12.4	4.1	0.0	-	19.7	-
PHF	0.833	0.837	0.688	0.000	-	0.816	0.750	0.788	0.875	0.000	-	0.795	0.636	0.750	0.750	0.250	-	0.773	0.813	0.750	0.607	0.000	-	0.844	0.926
Lights	18	85	56	0	-	159	12	61	14	0	-	87	22	31	6	1	-	60	13	47	17	0	-	77	383
% Lights	90.0	97.7	84.8	-	-	91.9	100.0	96.8	100.0	-	-	97.8	78.6	93.9	100.0	100.0	-	88.2	100.0	92.2	100.0	-	-	95.1	93.2
Mediums	2	2	10	0	-	14	0	2	0	0	-	2	6	2	0	0	-	8	0	4	0	0	-	4	28
% Mediums	10.0	2.3	15.2	-	-	8.1	0.0	3.2	0.0	-	-	2.2	21.4	6.1	0.0	0.0	-	11.8	0.0	7.8	0.0	-	-	4.9	6.8
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited  
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Count Name: Colborne Street & Gerrie Road  
Site Code:  
Start Date: 06/06/2017  
Page No: 4



Turning Movement Peak Hour Data Plot (8:00 AM)



Paradigm Transportation Solutions Limited  
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Count Name: Colborne Street & Gerrie Road  
Site Code:  
Start Date: 06/06/2017  
Page No: 5

### Turning Movement Peak Hour Data (3:00 PM)

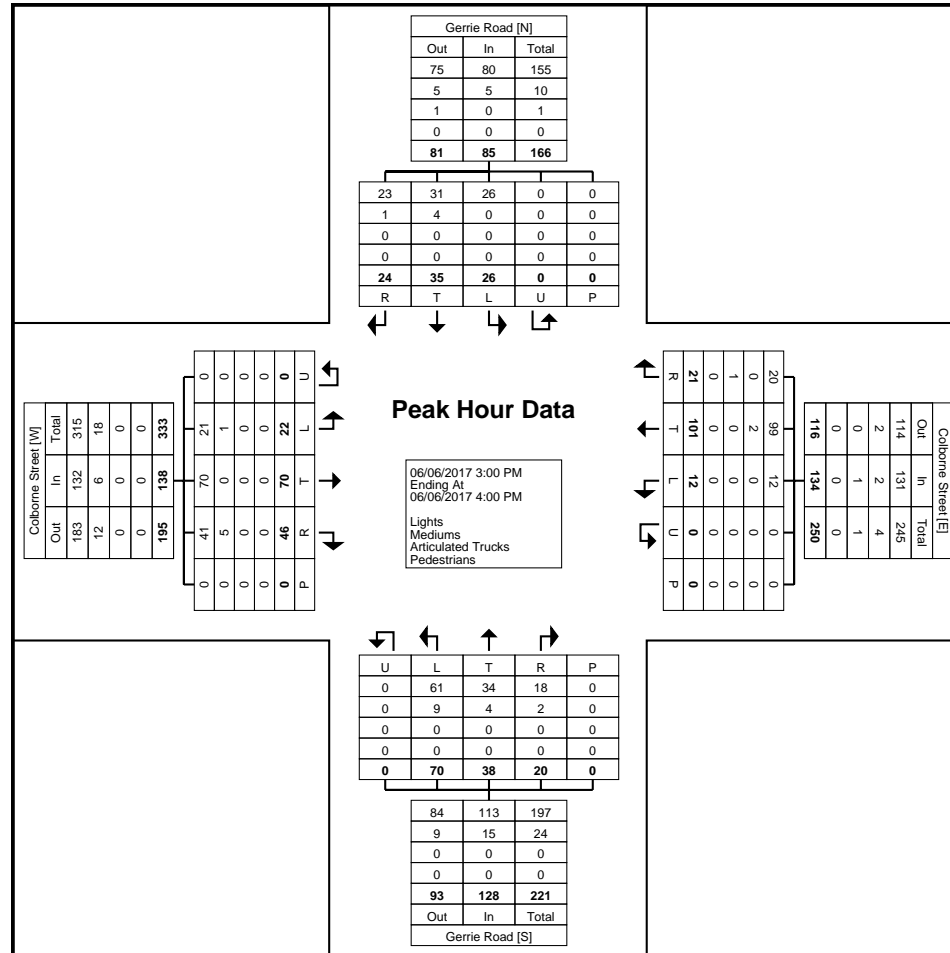
Start Time	Colborne Street Eastbound						Colborne Street Westbound						Gerrie Road Northbound						Gerrie Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
3:00 PM	5	18	9	0	0	32	3	18	10	0	0	31	8	7	5	0	0	20	5	8	9	0	0	22	105
3:15 PM	6	20	16	0	0	42	2	21	4	0	0	27	20	9	6	0	0	35	8	6	2	0	0	16	120
3:30 PM	7	18	11	0	0	36	5	40	5	0	0	50	17	13	5	0	0	35	7	11	9	0	0	27	148
3:45 PM	4	14	10	0	0	28	2	22	2	0	0	26	25	9	4	0	0	38	6	10	4	0	0	20	112
Total	22	70	46	0	0	138	12	101	21	0	0	134	70	38	20	0	0	128	26	35	24	0	0	85	485
Approach %	15.9	50.7	33.3	0.0	-	-	9.0	75.4	15.7	0.0	-	-	54.7	29.7	15.6	0.0	-	-	30.6	41.2	28.2	0.0	-	-	-
Total %	4.5	14.4	9.5	0.0	-	28.5	2.5	20.8	4.3	0.0	-	27.6	14.4	7.8	4.1	0.0	-	26.4	5.4	7.2	4.9	0.0	-	17.5	-
PHF	0.786	0.875	0.719	0.000	-	0.821	0.600	0.631	0.525	0.000	-	0.670	0.700	0.731	0.833	0.000	-	0.842	0.813	0.795	0.667	0.000	-	0.787	0.819
Lights	21	70	41	0	-	132	12	99	20	0	-	131	61	34	18	0	-	113	26	31	23	0	-	80	456
% Lights	95.5	100.0	89.1	-	-	95.7	100.0	98.0	95.2	-	-	97.8	87.1	89.5	90.0	-	-	88.3	100.0	88.6	95.8	-	-	94.1	94.0
Mediums	1	0	5	0	-	6	0	2	0	0	-	2	9	4	2	0	-	15	0	4	1	0	-	5	28
% Mediums	4.5	0.0	10.9	-	-	4.3	0.0	2.0	0.0	-	-	1.5	12.9	10.5	10.0	-	-	11.7	0.0	11.4	4.2	-	-	5.9	5.8
Articulated Trucks	0	0	0	0	-	0	0	0	1	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	4.8	-	-	0.7	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.2
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Count Name: Colborne Street & Gerrie Road  
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Start Date: 06/06/2017  
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Turning Movement Peak Hour Data Plot (3:00 PM)



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Count Name: Colborne Street & Gerrie Road  
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Paradigm Transportation Solutions Limited  
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Count Name: Colborne Street & Irvine Street  
Site Code:  
Start Date: 06/06/2017  
Page No: 1

### Turning Movement Data

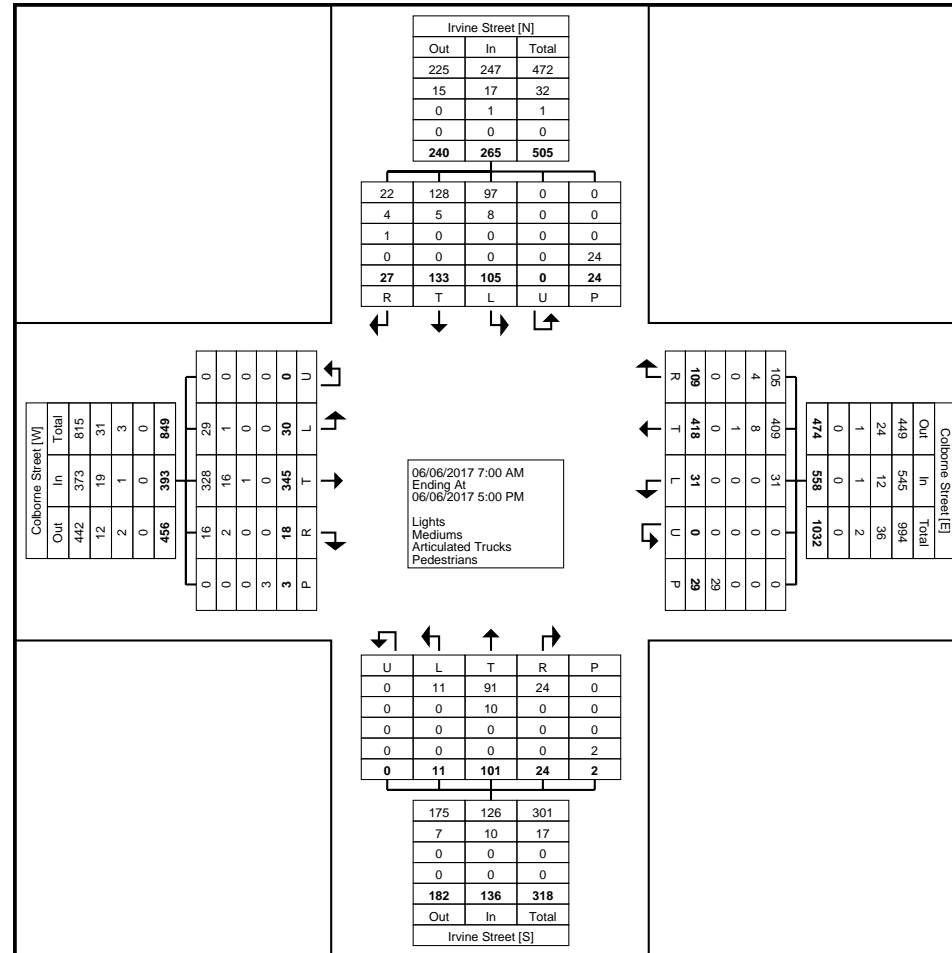
Start Time	Colborne Street Eastbound						Colborne Street Westbound						Irvine Street Northbound						Irvine Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	0	6	1	0	0	7	1	22	1	0	0	24	1	2	0	0	0	3	2	4	1	0	2	7	41
7:15 AM	1	4	1	0	0	6	1	22	5	0	0	28	2	3	1	0	0	6	6	11	1	0	0	18	58
7:30 AM	1	16	0	0	0	17	1	32	0	0	0	33	0	0	1	0	0	1	5	6	1	0	0	12	63
7:45 AM	1	8	1	0	0	10	2	33	6	0	0	41	1	4	1	0	0	6	7	8	3	0	2	18	75
Hourly Total	3	34	3	0	0	40	5	109	12	0	0	126	4	9	3	0	0	16	20	29	6	0	4	55	237
8:00 AM	0	19	0	0	0	19	3	35	2	0	1	40	0	2	2	0	0	4	12	7	2	0	2	21	84
8:15 AM	1	10	1	0	1	12	0	20	5	0	3	25	0	4	1	0	0	5	7	5	3	0	4	15	57
8:30 AM	3	19	2	0	0	24	2	20	2	0	2	24	0	11	3	0	0	14	5	11	2	0	4	18	80
8:45 AM	0	24	1	0	0	25	5	32	5	0	0	42	4	8	0	0	0	12	8	15	4	0	0	27	106
Hourly Total	4	72	4	0	1	80	10	107	14	0	6	131	4	25	6	0	0	35	32	38	11	0	10	81	327
9:00 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	2
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	2
3:00 PM	4	22	1	0	2	27	2	19	13	0	3	34	0	10	1	0	0	11	6	5	0	0	0	11	83
3:15 PM	2	24	1	0	0	27	2	27	5	0	11	34	0	9	2	0	0	11	5	10	0	0	0	15	87
3:30 PM	5	31	0	0	0	36	2	29	18	0	8	49	1	14	1	0	1	16	5	9	0	0	2	14	115
3:45 PM	3	27	1	0	0	31	2	23	10	0	0	35	0	5	2	0	0	7	6	9	4	0	1	19	92
Hourly Total	14	104	3	0	2	121	8	98	46	0	22	152	1	38	6	0	1	45	22	33	4	0	3	59	377
4:00 PM	0	34	4	0	0	38	1	28	9	0	1	38	0	4	5	0	0	9	4	8	1	0	5	13	98
4:15 PM	3	27	1	0	0	31	3	34	7	0	0	44	0	7	0	0	1	7	11	11	1	0	2	23	105
4:30 PM	4	34	1	0	0	39	3	23	9	0	0	35	2	9	3	0	0	14	11	8	2	0	0	21	109
4:45 PM	2	40	2	0	0	44	1	19	11	0	0	31	0	9	1	0	0	10	5	5	2	0	0	12	97
Hourly Total	9	135	8	0	0	152	8	104	36	0	1	148	2	29	9	0	1	40	31	32	6	0	7	69	409
Grand Total	30	345	18	0	3	393	31	418	109	0	29	558	11	101	24	0	2	136	105	133	27	0	24	265	1352
Approach %	7.6	87.8	4.6	0.0	-	-	5.6	74.9	19.5	0.0	-	-	8.1	74.3	17.6	0.0	-	-	39.6	50.2	10.2	0.0	-	-	-
Total %	2.2	25.5	1.3	0.0	-	29.1	2.3	30.9	8.1	0.0	-	41.3	0.8	7.5	1.8	0.0	-	10.1	7.8	9.8	2.0	0.0	-	19.6	-
Lights	29	328	16	0	-	373	31	409	105	0	-	545	11	91	24	0	-	126	97	128	22	0	-	247	1291
% Lights	96.7	95.1	88.9	-	-	94.9	100.0	97.8	96.3	-	-	97.7	100.0	90.1	100.0	-	-	92.6	92.4	96.2	81.5	-	-	93.2	95.5
Mediums	1	16	2	0	-	19	0	8	4	0	-	12	0	10	0	0	-	10	8	5	4	0	-	17	58
% Mediums	3.3	4.6	11.1	-	-	4.8	0.0	1.9	3.7	-	-	2.2	0.0	9.9	0.0	-	-	7.4	7.6	3.8	14.8	-	-	6.4	4.3
Articulated Trucks	0	1	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	0	0	1	0	-	1	3
% Articulated Trucks	0.0	0.3	0.0	-	-	0.3	0.0	0.2	0.0	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	0.0	3.7	-	-	0.4	0.2
Pedestrians	-	-	-	-	3	-	-	-	-	-	29	-	-	-	-	-	2	-	-	-	-	-	24	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



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Count Name: Colborne Street & Irvine Street  
Site Code:  
Start Date: 06/06/2017  
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Turning Movement Data Plot



Paradigm Transportation Solutions Limited  
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Count Name: Colborne Street & Irvine Street  
Site Code:  
Start Date: 06/06/2017  
Page No: 3

### Turning Movement Peak Hour Data (8:00 AM)

Start Time	Colborne Street Eastbound						Colborne Street Westbound						Irvine Street Northbound						Irvine Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
8:00 AM	0	19	0	0	0	19	3	35	2	0	1	40	0	2	2	0	0	4	12	7	2	0	2	21	84
8:15 AM	1	10	1	0	1	12	0	20	5	0	3	25	0	4	1	0	0	5	7	5	3	0	4	15	57
8:30 AM	3	19	2	0	0	24	2	20	2	0	2	24	0	11	3	0	0	14	5	11	2	0	4	18	80
8:45 AM	0	24	1	0	0	25	5	32	5	0	0	42	4	8	0	0	0	12	8	15	4	0	0	27	106
Total	4	72	4	0	1	80	10	107	14	0	6	131	4	25	6	0	0	35	32	38	11	0	10	81	327
Approach %	5.0	90.0	5.0	0.0	-	-	7.6	81.7	10.7	0.0	-	-	11.4	71.4	17.1	0.0	-	-	39.5	46.9	13.6	0.0	-	-	-
Total %	1.2	22.0	1.2	0.0	-	24.5	3.1	32.7	4.3	0.0	-	40.1	1.2	7.6	1.8	0.0	-	10.7	9.8	11.6	3.4	0.0	-	24.8	-
PHF	0.333	0.750	0.500	0.000	-	0.800	0.500	0.764	0.700	0.000	-	0.780	0.250	0.568	0.500	0.000	-	0.625	0.667	0.633	0.688	0.000	-	0.750	0.771
Lights	4	67	3	0	-	74	10	105	14	0	-	129	4	20	6	0	-	30	26	36	8	0	-	70	303
% Lights	100.0	93.1	75.0	-	-	92.5	100.0	98.1	100.0	-	-	98.5	100.0	80.0	100.0	-	-	85.7	81.3	94.7	72.7	-	-	86.4	92.7
Mediums	0	5	1	0	-	6	0	2	0	0	-	2	0	5	0	0	-	5	6	2	3	0	-	11	24
% Mediums	0.0	6.9	25.0	-	-	7.5	0.0	1.9	0.0	-	-	1.5	0.0	20.0	0.0	-	-	14.3	18.8	5.3	27.3	-	-	13.6	7.3
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	-	1	-	-	-	-	-	6	-	-	-	-	-	0	-	-	-	-	-	10	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

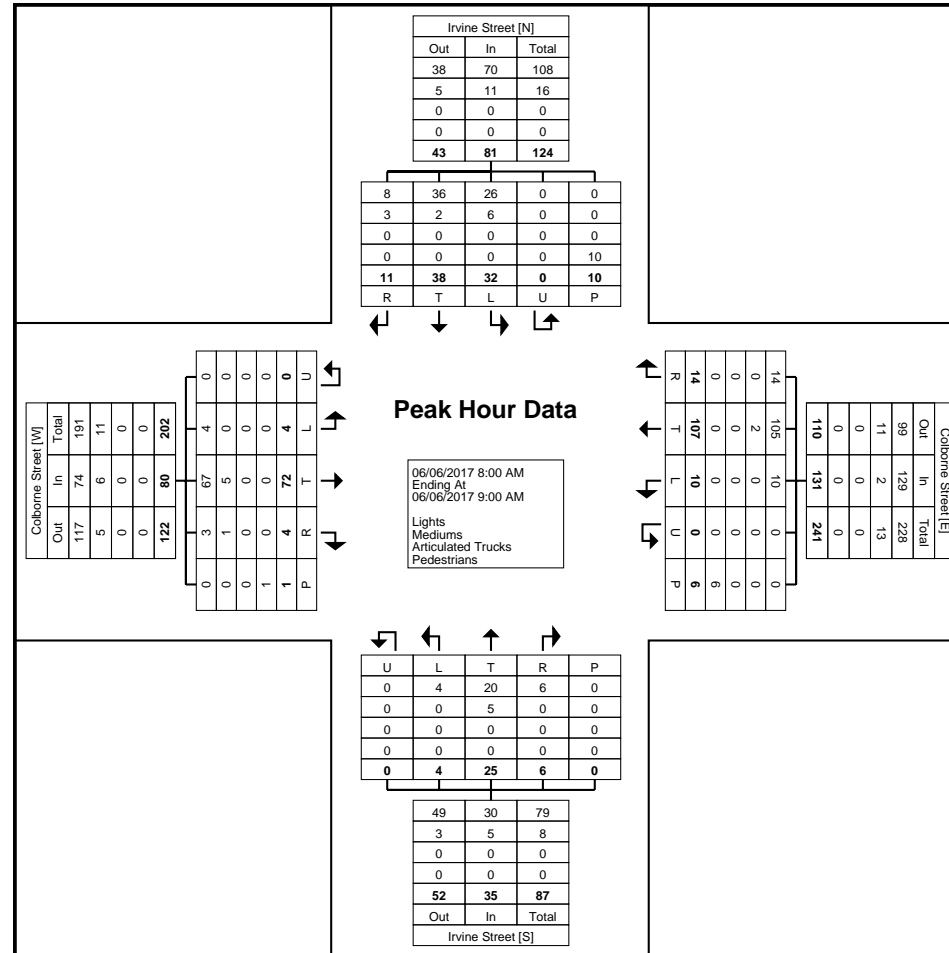




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Count Name: Colborne Street & Irvine Street  
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Turning Movement Peak Hour Data Plot (8:00 AM)



Paradigm Transportation Solutions Limited  
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Count Name: Colborne Street & Irvine Street  
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Page No: 5

### Turning Movement Peak Hour Data (3:30 PM)

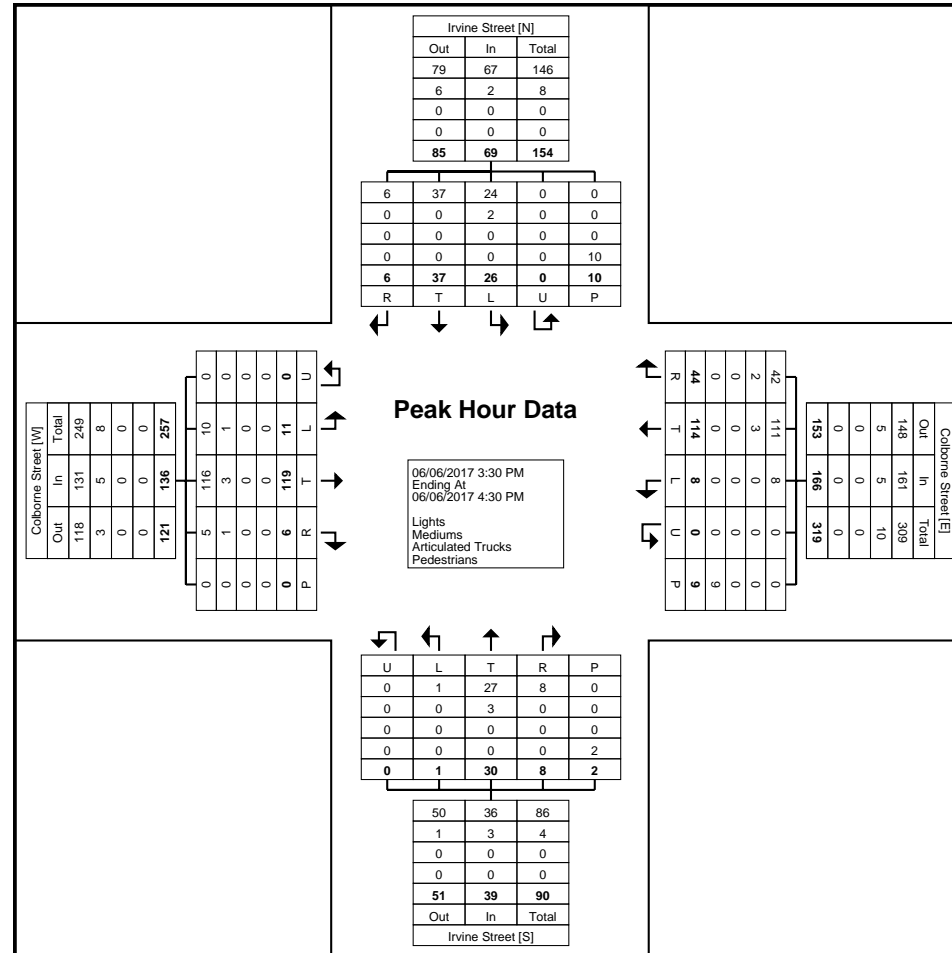
Start Time	Colborne Street Eastbound						Colborne Street Westbound						Irvine Street Northbound						Irvine Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
3:30 PM	5	31	0	0	0	36	2	29	18	0	8	49	1	14	1	0	1	16	5	9	0	0	2	14	115
3:45 PM	3	27	1	0	0	31	2	23	10	0	0	35	0	5	2	0	0	7	6	9	4	0	1	19	92
4:00 PM	0	34	4	0	0	38	1	28	9	0	1	38	0	4	5	0	0	9	4	8	1	0	5	13	98
4:15 PM	3	27	1	0	0	31	3	34	7	0	0	44	0	7	0	0	1	7	11	11	1	0	2	23	105
<b>Total</b>	11	119	6	0	0	136	8	114	44	0	9	166	1	30	8	0	2	39	26	37	6	0	10	69	410
Approach %	8.1	87.5	4.4	0.0	-	-	4.8	68.7	26.5	0.0	-	-	2.6	76.9	20.5	0.0	-	-	37.7	53.6	8.7	0.0	-	-	-
Total %	2.7	29.0	1.5	0.0	-	33.2	2.0	27.8	10.7	0.0	-	40.5	0.2	7.3	2.0	0.0	-	9.5	6.3	9.0	1.5	0.0	-	16.8	-
PHF	0.550	0.875	0.375	0.000	-	0.895	0.667	0.838	0.611	0.000	-	0.847	0.250	0.536	0.400	0.000	-	0.609	0.591	0.841	0.375	0.000	-	0.750	0.891
Lights	10	116	5	0	-	131	8	111	42	0	-	161	1	27	8	0	-	36	24	37	6	0	-	67	395
% Lights	90.9	97.5	83.3	-	-	96.3	100.0	97.4	95.5	-	-	97.0	100.0	90.0	100.0	-	-	92.3	92.3	100.0	100.0	-	-	97.1	96.3
Mediums	1	3	1	0	-	5	0	3	2	0	-	5	0	3	0	0	-	3	2	0	0	0	-	2	15
% Mediums	9.1	2.5	16.7	-	-	3.7	0.0	2.6	4.5	-	-	3.0	0.0	10.0	0.0	-	-	7.7	7.7	0.0	0.0	-	-	2.9	3.7
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	9	-	-	-	-	-	2	-	-	-	-	-	10	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



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Turning Movement Peak Hour Data Plot (3:30 PM)



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Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Gerrie Road & Waste Transfer  
Station Entrance  
Site Code:  
Start Date: 06/06/2017  
Page No: 1

### Turning Movement Data

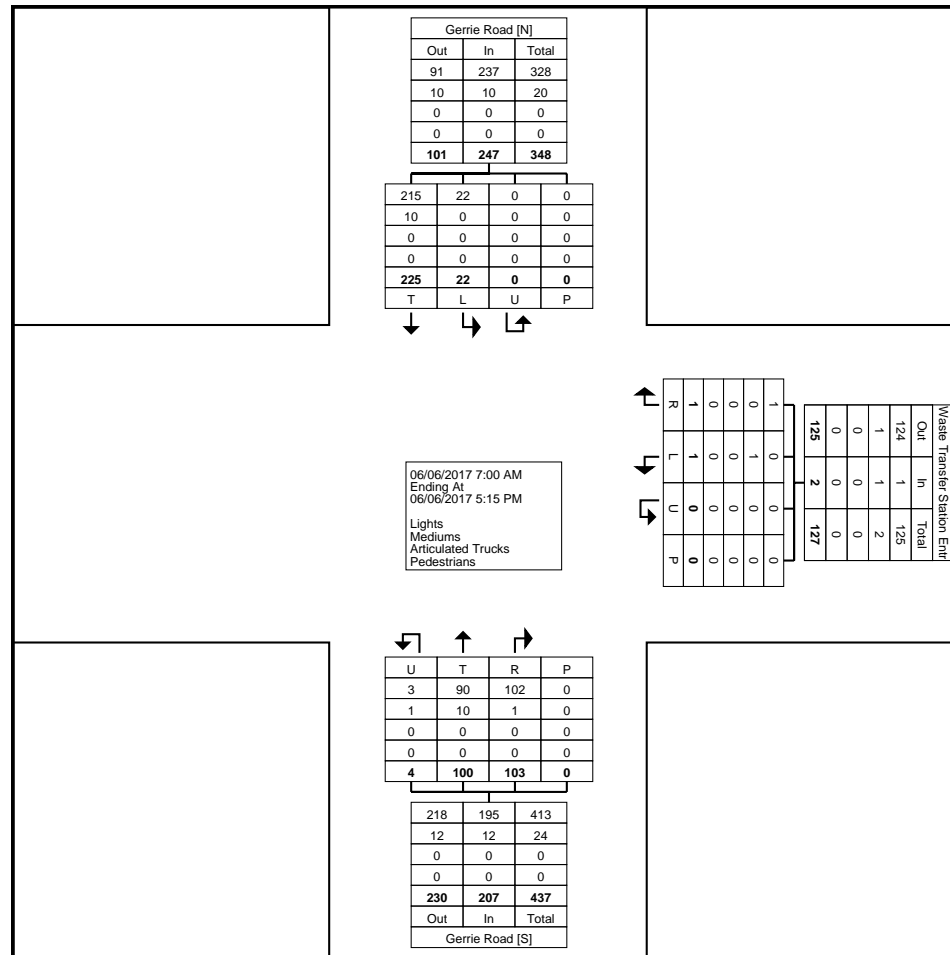
Start Time	Waste Transfer Station Entrance Westbound					Gerrie Road Northbound					Gerrie Road Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	
7:00 AM	0	0	0	0	0	1	0	0	0	1	0	4	0	0	4	5
7:15 AM	0	0	0	0	0	4	0	1	0	5	0	4	0	0	4	9
7:30 AM	0	0	0	0	0	7	0	0	0	7	0	8	0	0	8	15
7:45 AM	0	0	0	0	0	7	4	0	0	11	1	10	0	0	11	22
Hourly Total	0	0	0	0	0	19	4	1	0	24	1	26	0	0	27	51
8:00 AM	0	0	0	0	0	4	12	0	0	16	4	21	0	0	25	41
8:15 AM	0	0	0	0	0	5	9	0	0	14	1	16	0	0	17	31
8:30 AM	0	0	0	0	0	7	10	0	0	17	2	21	0	0	23	40
8:45 AM	0	0	0	0	0	7	12	0	0	19	4	24	0	0	28	47
Hourly Total	0	0	0	0	0	23	43	0	0	66	11	82	0	0	93	159
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	0	0	0	0	0	7	15	0	0	22	2	20	0	0	22	44
3:15 PM	0	0	0	0	0	8	8	0	0	16	3	18	0	0	21	37
3:30 PM	1	1	0	0	2	8	24	0	0	32	2	26	0	0	28	62
3:45 PM	0	0	0	0	0	5	9	0	0	14	1	20	0	0	21	35
Hourly Total	1	1	0	0	2	28	56	0	0	84	8	84	0	0	92	178
4:00 PM	0	0	0	0	0	6	0	0	0	6	1	11	0	0	12	18
4:15 PM	0	0	0	0	0	6	0	2	0	8	1	11	0	0	12	20
4:30 PM	0	0	0	0	0	9	0	0	0	9	0	4	0	0	4	13
4:45 PM	0	0	0	0	0	9	0	1	0	10	0	7	0	0	7	17
Hourly Total	0	0	0	0	0	30	0	3	0	33	2	33	0	0	35	68
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	1	1	0	0	2	100	103	4	0	207	22	225	0	0	247	456
Approach %	50.0	50.0	0.0	-	-	48.3	49.8	1.9	-	-	8.9	91.1	0.0	-	-	-
Total %	0.2	0.2	0.0	-	0.4	21.9	22.6	0.9	-	45.4	4.8	49.3	0.0	-	54.2	-
Lights	0	1	0	-	1	90	102	3	-	195	22	215	0	-	237	433
% Lights	0.0	100.0	-	-	50.0	90.0	99.0	75.0	-	94.2	100.0	95.6	-	-	96.0	95.0
Mediums	1	0	0	-	1	10	1	1	-	12	0	10	0	-	10	23
% Mediums	100.0	0.0	-	-	50.0	10.0	1.0	25.0	-	5.8	0.0	4.4	-	-	4.0	5.0
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Start Date: 06/06/2017  
Page No: 2



Turning Movement Data Plot

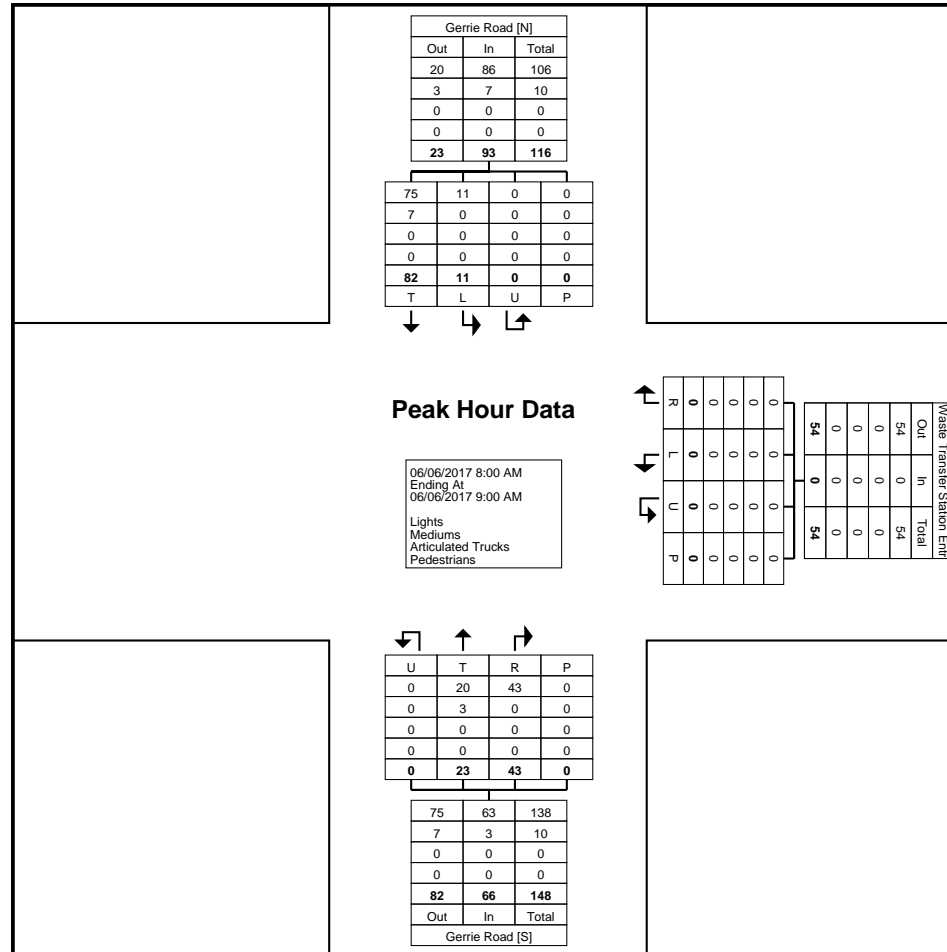




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Count Name: Gerrie Road & Waste Transfer  
Station Entrance  
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Start Date: 06/06/2017  
Page No: 4



Turning Movement Peak Hour Data Plot (8:00 AM)



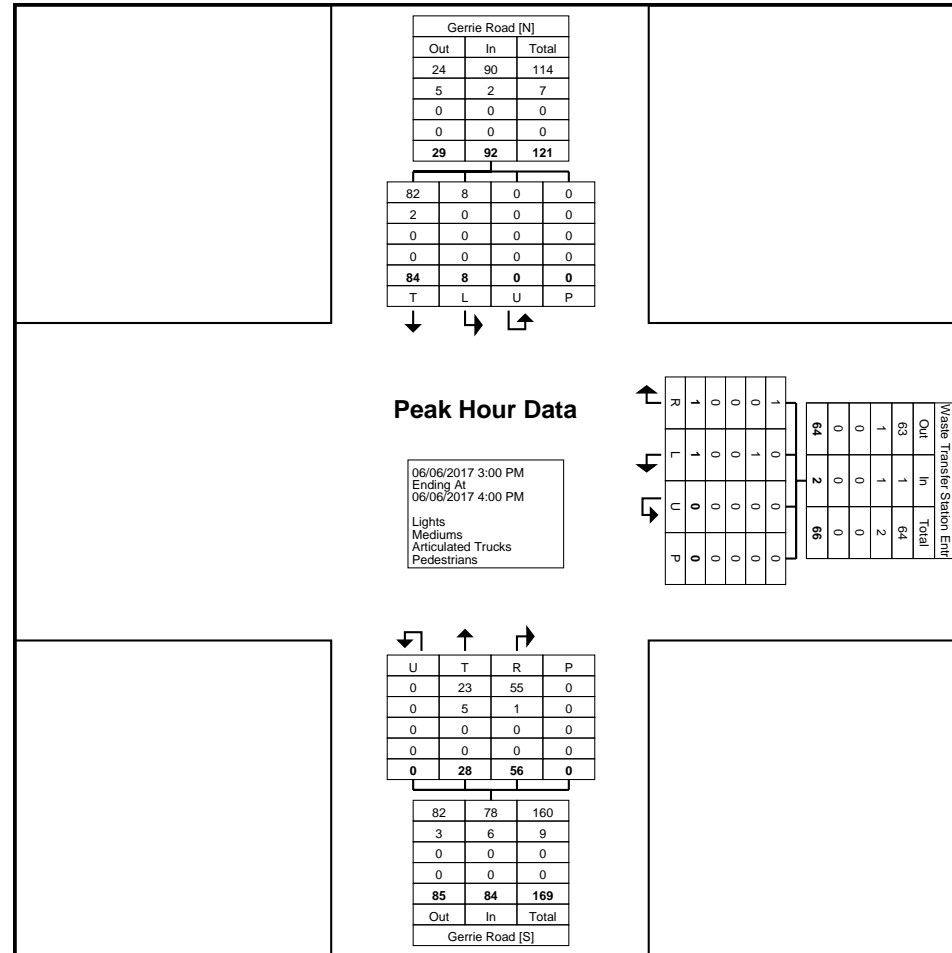




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Count Name: Gerrie Road & Waste Transfer  
Station Entrance  
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Start Date: 06/06/2017  
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Turning Movement Peak Hour Data Plot (3:00 PM)



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Count Name: Gerrie Road & Waste Transfer  
Station Entrance  
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Start Date: 06/06/2017  
Page No: 7



Paradigm Transportation Solutions Limited  
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Count Name: Irvine Street & Walsler Street  
Site Code:  
Start Date: 06/06/2017  
Page No: 1

### Turning Movement Data

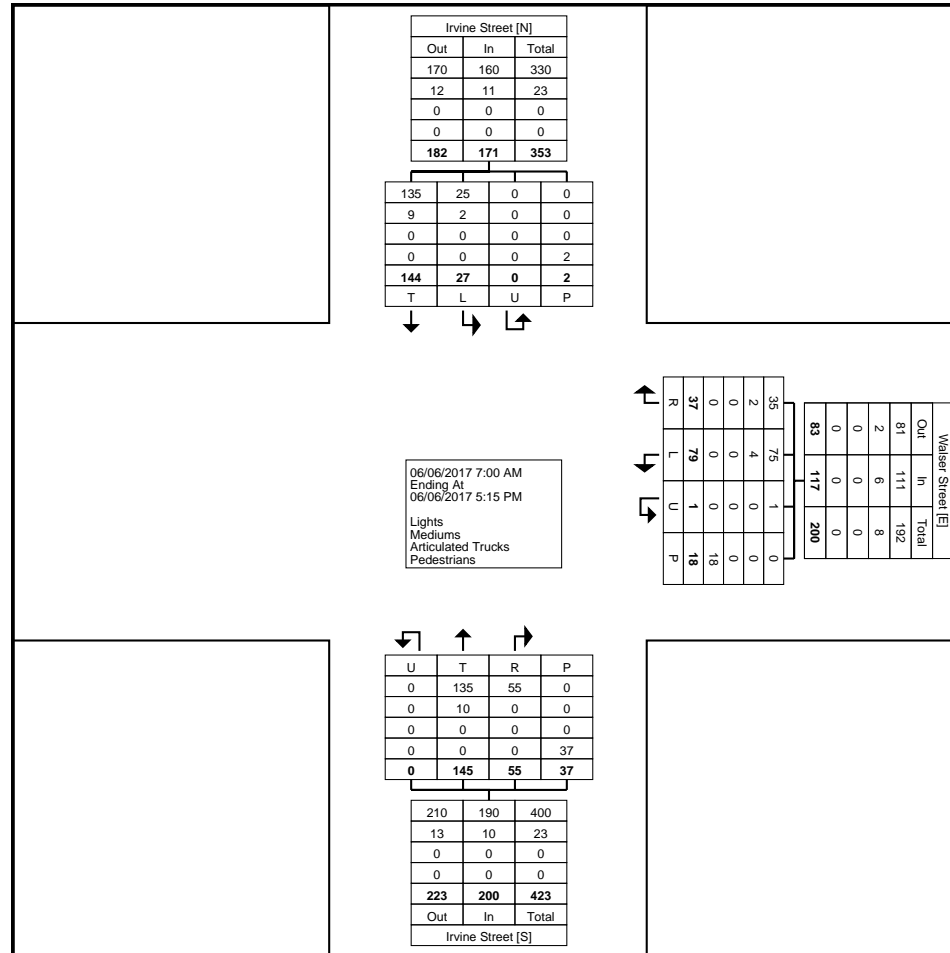
Start Time	Walsler Street Westbound					Irvine Street Northbound					Irvine Street Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	
7:00 AM	6	1	0	0	7	1	0	0	0	1	0	6	0	0	6	14
7:15 AM	9	2	0	0	11	3	0	0	3	3	0	6	0	1	6	20
7:30 AM	9	1	0	0	10	8	0	0	0	8	1	8	0	0	9	27
7:45 AM	3	9	0	0	12	7	1	0	2	8	1	9	0	0	10	30
Hourly Total	27	13	0	0	40	19	1	0	5	20	2	29	0	1	31	91
8:00 AM	10	4	0	0	14	6	1	0	1	7	4	10	0	0	14	35
8:15 AM	8	4	0	2	12	7	2	0	4	9	1	10	0	0	11	32
8:30 AM	9	2	0	0	11	5	2	0	5	7	2	14	0	0	16	34
8:45 AM	5	2	0	0	7	9	8	0	1	17	1	10	0	0	11	35
Hourly Total	32	12	0	2	44	27	13	0	11	40	8	44	0	0	52	136
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	3	1	0	0	4	21	5	0	1	26	3	4	0	0	7	37
3:15 PM	3	0	0	1	3	3	2	0	8	5	1	7	0	0	8	16
3:30 PM	1	3	0	11	4	19	9	0	3	28	1	8	0	0	9	41
3:45 PM	7	2	1	0	10	16	4	0	4	20	0	8	0	0	8	38
Hourly Total	14	6	1	12	21	59	20	0	16	79	5	27	0	0	32	132
4:00 PM	1	0	0	3	1	8	5	0	2	13	1	6	0	0	7	21
4:15 PM	2	2	0	1	4	9	3	0	3	12	3	14	0	0	17	33
4:30 PM	0	2	0	0	2	11	8	0	0	19	6	11	0	0	17	38
4:45 PM	3	2	0	0	5	12	5	0	0	17	2	13	0	1	15	37
Hourly Total	6	6	0	4	12	40	21	0	5	61	12	44	0	1	56	129
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	79	37	1	18	117	145	55	0	37	200	27	144	0	2	171	488
Approach %	67.5	31.6	0.9	-	-	72.5	27.5	0.0	-	-	15.8	84.2	0.0	-	-	-
Total %	16.2	7.6	0.2	-	24.0	29.7	11.3	0.0	-	41.0	5.5	29.5	0.0	-	35.0	-
Lights	75	35	1	-	111	135	55	0	-	190	25	135	0	-	160	461
% Lights	94.9	94.6	100.0	-	94.9	93.1	100.0	-	-	95.0	92.6	93.8	-	-	93.6	94.5
Mediums	4	2	0	-	6	10	0	0	-	10	2	9	0	-	11	27
% Mediums	5.1	5.4	0.0	-	5.1	6.9	0.0	-	-	5.0	7.4	6.3	-	-	6.4	5.5
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	18	-	-	-	-	37	-	-	-	-	2	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-



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Count Name: Irvine Street & Walsler Street  
Site Code:  
Start Date: 06/06/2017  
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Turning Movement Data Plot



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Count Name: Irvine Street & Walsler Street  
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Page No: 3

### Turning Movement Peak Hour Data (8:00 AM)

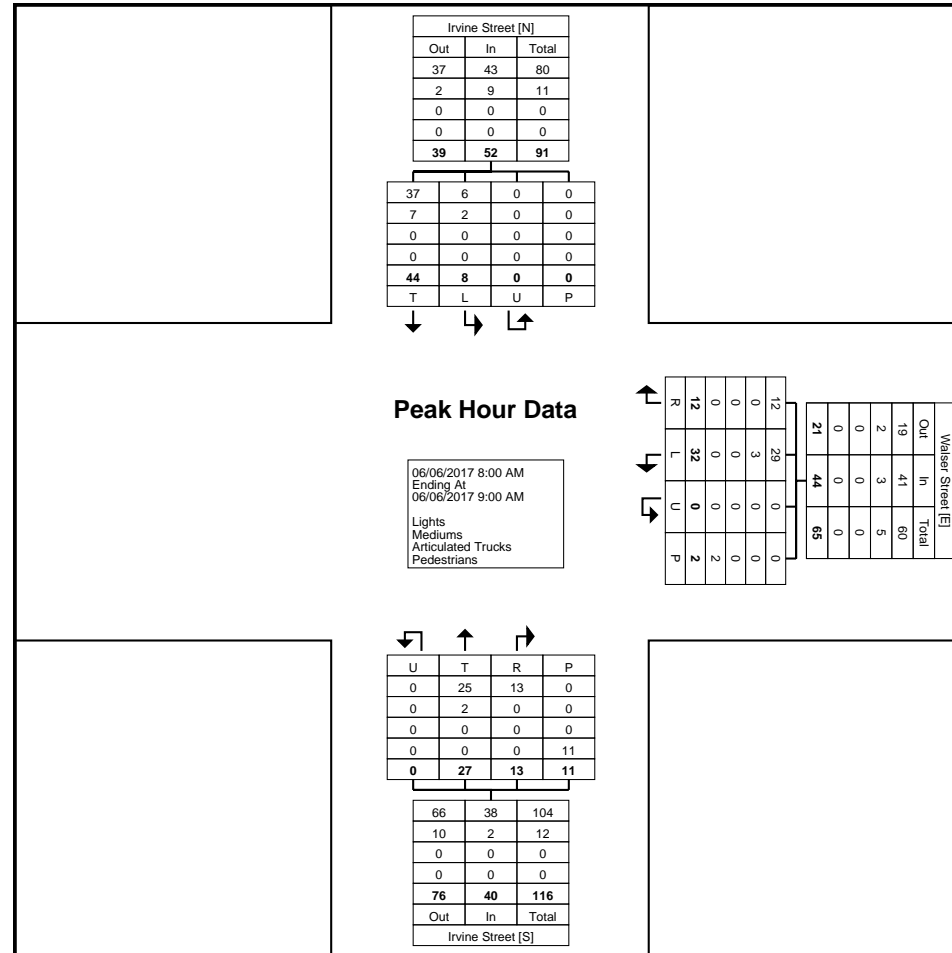
Start Time	Walsler Street Westbound					Irvine Street Northbound					Irvine Street Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	
8:00 AM	10	4	0	0	14	6	1	0	1	7	4	10	0	0	14	35
8:15 AM	8	4	0	2	12	7	2	0	4	9	1	10	0	0	11	32
8:30 AM	9	2	0	0	11	5	2	0	5	7	2	14	0	0	16	34
8:45 AM	5	2	0	0	7	9	8	0	1	17	1	10	0	0	11	35
Total	32	12	0	2	44	27	13	0	11	40	8	44	0	0	52	136
Approach %	72.7	27.3	0.0	-	-	67.5	32.5	0.0	-	-	15.4	84.6	0.0	-	-	-
Total %	23.5	8.8	0.0	-	32.4	19.9	9.6	0.0	-	29.4	5.9	32.4	0.0	-	38.2	-
PHF	0.800	0.750	0.000	-	0.786	0.750	0.406	0.000	-	0.588	0.500	0.786	0.000	-	0.813	0.971
Lights	29	12	0	-	41	25	13	0	-	38	6	37	0	-	43	122
% Lights	90.6	100.0	-	-	93.2	92.6	100.0	-	-	95.0	75.0	84.1	-	-	82.7	89.7
Mediums	3	0	0	-	3	2	0	0	-	2	2	7	0	-	9	14
% Mediums	9.4	0.0	-	-	6.8	7.4	0.0	-	-	5.0	25.0	15.9	-	-	17.3	10.3
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	2	-	-	-	-	11	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	-



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Count Name: Irvine Street & Walsler Street  
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Turning Movement Peak Hour Data Plot (8:00 AM)



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Count Name: Irvine Street & Walsler Street  
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Start Date: 06/06/2017  
Page No: 5

### Turning Movement Peak Hour Data (3:30 PM)

Start Time	Walsler Street Westbound					Irvine Street Northbound					Irvine Street Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	
3:30 PM	1	3	0	11	4	19	9	0	3	28	1	8	0	0	9	41
3:45 PM	7	2	1	0	10	16	4	0	4	20	0	8	0	0	8	38
4:00 PM	1	0	0	3	1	8	5	0	2	13	1	6	0	0	7	21
4:15 PM	2	2	0	1	4	9	3	0	3	12	3	14	0	0	17	33
Total	11	7	1	15	19	52	21	0	12	73	5	36	0	0	41	133
Approach %	57.9	36.8	5.3	-	-	71.2	28.8	0.0	-	-	12.2	87.8	0.0	-	-	-
Total %	8.3	5.3	0.8	-	14.3	39.1	15.8	0.0	-	54.9	3.8	27.1	0.0	-	30.8	-
PHF	0.393	0.583	0.250	-	0.475	0.684	0.583	0.000	-	0.652	0.417	0.643	0.000	-	0.603	0.811
Lights	11	5	1	-	17	46	21	0	-	67	5	36	0	-	41	125
% Lights	100.0	71.4	100.0	-	89.5	88.5	100.0	-	-	91.8	100.0	100.0	-	-	100.0	94.0
Mediums	0	2	0	-	2	6	0	0	-	6	0	0	0	-	0	8
% Mediums	0.0	28.6	0.0	-	10.5	11.5	0.0	-	-	8.2	0.0	0.0	-	-	0.0	6.0
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	15	-	-	-	-	12	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	-

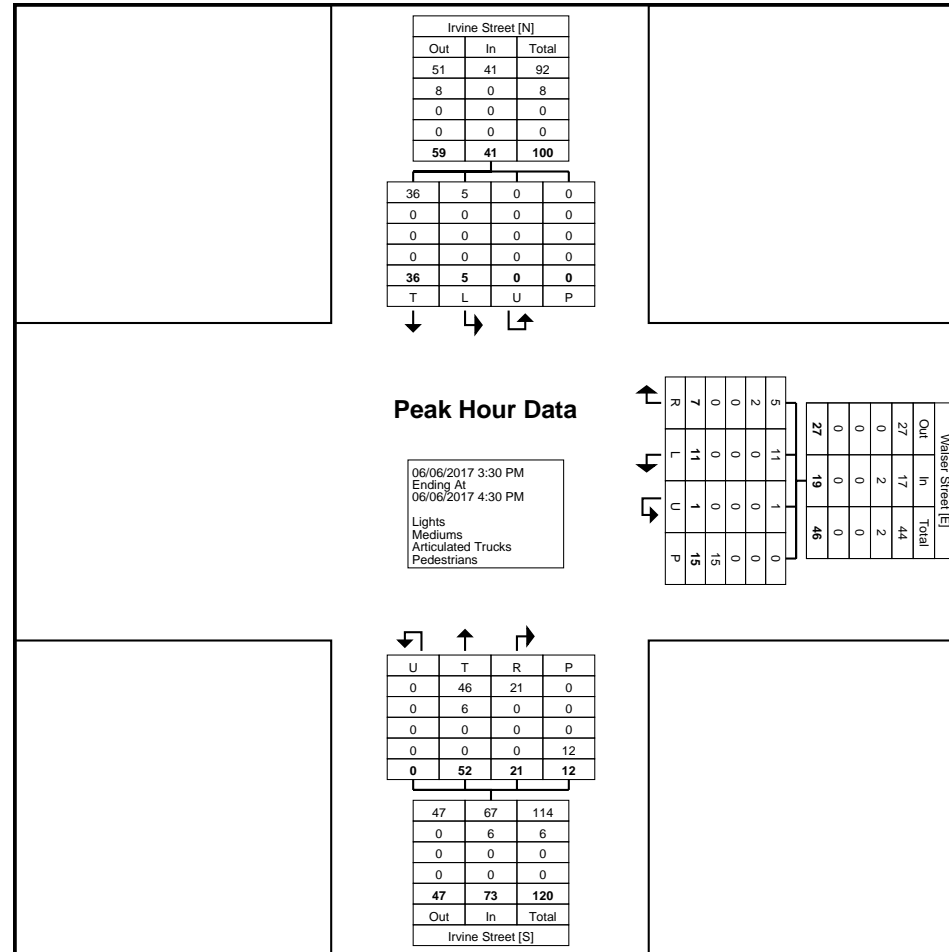




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Turning Movement Peak Hour Data Plot (3:30 PM)



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Count Name: Irvine Street & Walsler Street  
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# Appendix B

## Existing Traffic Operational Conditions





HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 101: Irvine St & Colborne St      Existing (2017)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	4	72	4	10	107	14	4	25	6	32	38	11
Future Volume (vph)	4	72	4	10	107	14	4	25	6	32	38	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	78	4	11	116	15	4	27	7	35	41	12
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total (vph)	86	142	38	88								
Volume Left (vph)	4	11	4	35								
Volume Right (vph)	4	15	7	12								
Hadj (s)	0.11	-0.02	-0.03	0.06								
Departure Headway (s)	4.5	4.3	4.5	4.5								
Degree Utilization, x	0.11	0.17	0.05	0.11								
Capacity (veh/h)	776	814	750	746								
Control Delay (s)	8.0	8.1	7.7	8.1								
Approach Delay (s)	8.0	8.1	7.7	8.1								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				8.0								
Level of Service				A								
Intersection Capacity Utilization			28.4%	ICU Level of Service				A				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 102: Gerrie Rd & Colborne St      Existing (2017)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	20	87	66	12	63	14	28	33	6	13	51	17
Future Volume (vph)	20	87	66	12	63	14	28	33	6	13	51	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	95	72	13	68	15	30	36	7	14	55	18
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total (vph)	189	96	73	87								
Volume Left (vph)	22	13	30	14								
Volume Right (vph)	72	15	7	18								
Hadj (s)	-0.07	-0.03	0.08	-0.01								
Departure Headway (s)	4.3	4.5	4.7	4.6								
Degree Utilization, x	0.23	0.12	0.10	0.11								
Capacity (veh/h)	799	759	707	719								
Control Delay (s)	8.6	8.1	8.3	8.2								
Approach Delay (s)	8.6	8.1	8.3	8.2								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				8.4								
Level of Service				A								
Intersection Capacity Utilization			27.0%	ICU Level of Service				A				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis     Ainley Subdivision (Colborne), Elora TIS  
 103: Irvine St & Waiser St     Existing (2017)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	32	12	27	13	8	44
Future Volume (Veh/h)	32	12	27	13	8	44
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	13	29	14	9	48
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	104	38			45	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	104	38			45	
IC, single (s)	6.5	6.2			4.3	
IC, 2 stage (s)						
IF (s)	3.6	3.3			2.4	
p0 queue free %	96	99			99	
cM capacity (veh/h)	870	1038			1425	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	48	43	57			
Volume Left	35	0	9			
Volume Right	13	14	0			
cSH	910	1700	1425			
Volume to Capacity	0.05	0.03	0.01			
Queue Length 95th (m)	1.3	0.0	0.1			
Control Delay (s)	9.2	0.0	1.2			
Lane LOS	A		A			
Approach Delay (s)	9.2	0.0	1.2			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			3.5			
Intersection Capacity Utilization		19.1%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis     Ainley Subdivision (Colborne), Elora TIS  
 104: Gerrie Rd & Waste Transfer Entrance     Existing (2017)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	23	43	11	82
Future Volume (Veh/h)	0	0	23	43	11	82
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	25	47	12	89
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	162	48			72	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	162	48			72	
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	828	1026			1541	
<b>Direction, Lane #</b>	<b>NB 1</b>	<b>SB 1</b>				
Volume Total	72	101				
Volume Left	0	12				
Volume Right	47	0				
cSH	1700	1541				
Volume to Capacity	0.04	0.01				
Queue Length 95th (m)	0.0	0.2				
Control Delay (s)	0.0	0.9				
Lane LOS		A				
Approach Delay (s)	0.0	0.9				
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization		14.9%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 101: Irvine St & Colborne St      Existing (2017)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	11	119	6	8	114	44	1	30	8	26	37	6
Future Volume (vph)	11	119	6	8	114	44	1	30	8	26	37	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	129	7	9	124	48	1	33	9	28	40	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	148	181	43	75								
Volume Left (vph)	12	9	1	28								
Volume Right (vph)	7	48	9	7								
Hadj (s)	0.06	-0.09	0.01	0.07								
Departure Headway (s)	4.4	4.3	4.8	4.8								
Degree Utilization, x	0.18	0.21	0.06	0.10								
Capacity (veh/h)	780	806	699	696								
Control Delay (s)	8.4	8.4	8.0	8.3								
Approach Delay (s)	8.4	8.4	8.0	8.3								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay	8.4											
Level of Service	A											
Intersection Capacity Utilization	28.9%		ICU Level of Service	A								
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 102: Gerrie Rd & Colborne St      Existing (2017)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	22	70	46	12	101	21	70	38	20	26	35	24
Future Volume (vph)	22	70	46	12	101	21	70	38	20	26	35	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	76	50	13	110	23	76	41	22	28	38	26
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	150	146	139	92								
Volume Left (vph)	24	13	76	28								
Volume Right (vph)	50	23	22	26								
Hadj (s)	-0.09	-0.05	0.22	-0.01								
Departure Headway (s)	4.6	4.6	4.9	4.8								
Degree Utilization, x	0.19	0.19	0.19	0.12								
Capacity (veh/h)	735	729	683	694								
Control Delay (s)	8.6	8.7	9.1	8.5								
Approach Delay (s)	8.6	8.7	9.1	8.5								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay	8.7											
Level of Service	A											
Intersection Capacity Utilization	31.5%		ICU Level of Service	A								
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis     Ainley Subdivision (Colborne), Elora TIS  
 103: Irvine St & Waiser St     Existing (2017)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	7	52	21	5	36
Future Volume (Veh/h)	11	7	52	21	5	36
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	8	57	23	5	39
Pedestrians	15					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	1					
Right turn flare (veh)						
Median type		None		None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	132	84			95	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	132	84			95	
IC, single (s)	6.4	6.5			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.6			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	851	893			1489	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	20	80	44			
Volume Left	12	0	5			
Volume Right	8	23	0			
cSH	867	1700	1489			
Volume to Capacity	0.02	0.05	0.00			
Queue Length 95th (m)	0.5	0.0	0.1			
Control Delay (s)	9.3	0.0	0.9			
Lane LOS	A		A			
Approach Delay (s)	9.3	0.0	0.9			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			1.5			
Intersection Capacity Utilization		17.9%		ICU Level of Service	A	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis     Ainley Subdivision (Colborne), Elora TIS  
 104: Gerrie Rd & Waste Transfer Entrance     Existing (2017)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	28	56	8	84
Future Volume (Veh/h)	0	0	28	56	8	84
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	30	61	9	91
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None		None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	170	60			91	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	170	60			91	
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	820	1010			1517	
<b>Direction, Lane #</b>	<b>NB 1</b>		<b>SB 1</b>			
Volume Total	91		100			
Volume Left	0		9			
Volume Right	61		0			
cSH	1700		1517			
Volume to Capacity	0.05		0.01			
Queue Length 95th (m)	0.0		0.1			
Control Delay (s)	0.0		0.7			
Lane LOS	A		A			
Approach Delay (s)	0.0		0.7			
Approach LOS	A		A			
<b>Intersection Summary</b>						
Average Delay			0.4			
Intersection Capacity Utilization	14.4%		ICU Level of Service			
Analysis Period (min)	15					

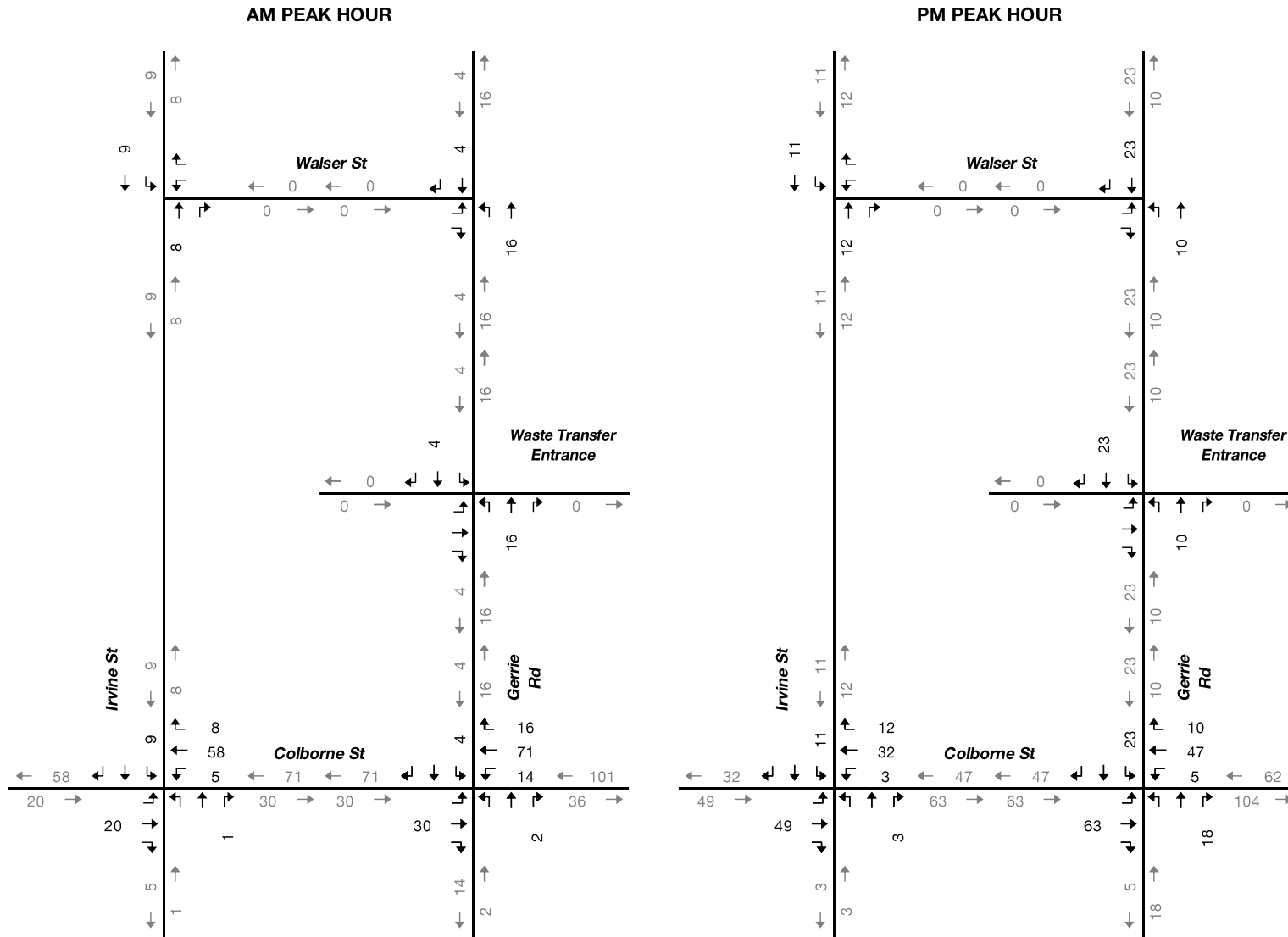


# Appendix C

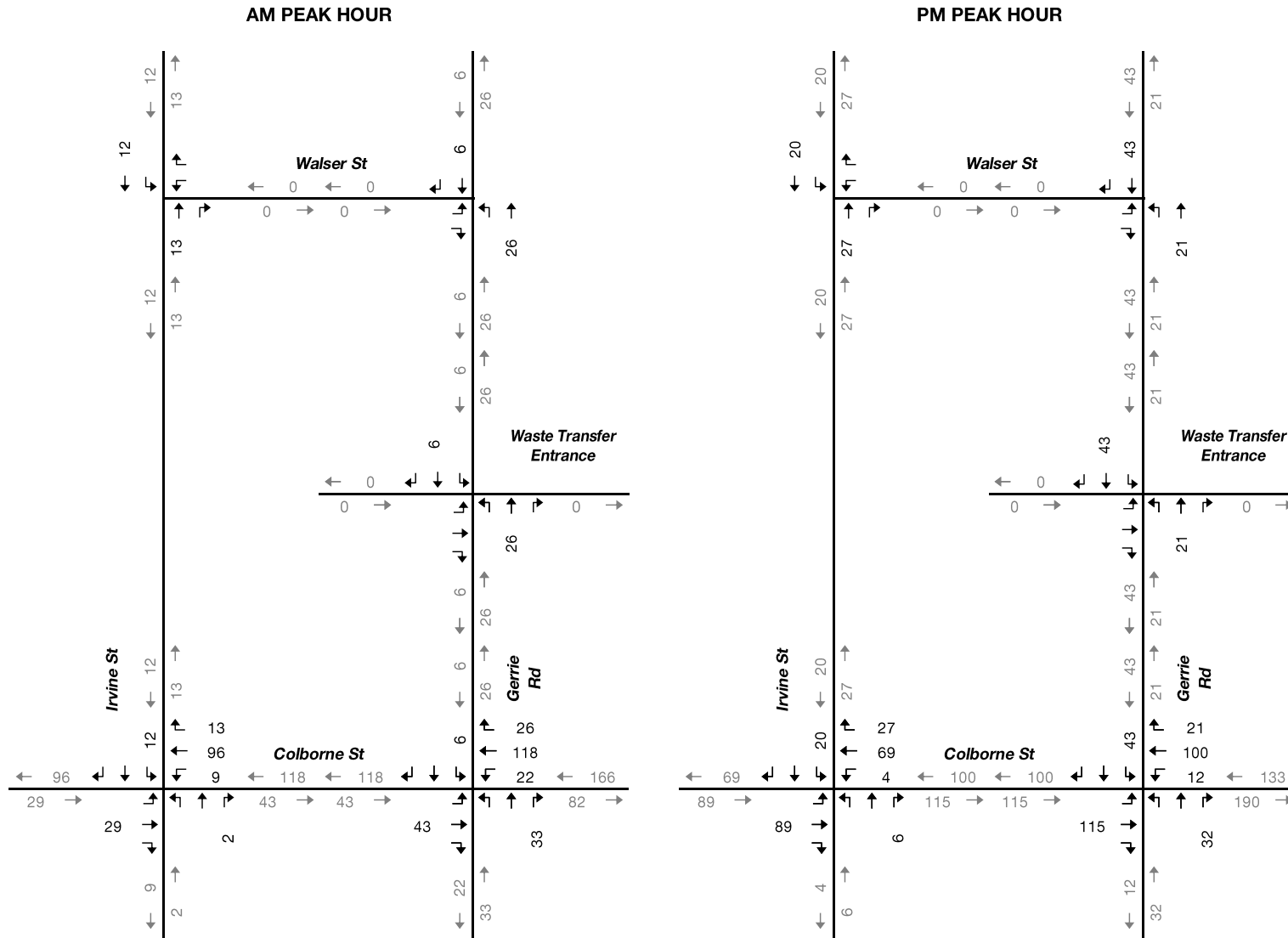
## Background Development Traffic







# 2022 Background Development Traffic Volumes



# 2027 Background Development Traffic Volumes

# Appendix D

## Background Traffic Operational Conditions





HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 101: Irvine St & Colborne St      Background (2022)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	4	100	4	16	177	24	4	28	8	45	42	12
Future Volume (vph)	4	100	4	16	177	24	4	28	8	45	42	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	109	4	17	192	26	4	30	9	49	46	13
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total (vph)	117	235	43	108								
Volume Left (vph)	4	17	4	49								
Volume Right (vph)	4	26	9	13								
Hadj (s)	0.11	-0.02	-0.05	0.09								
Departure Headway (s)	4.7	4.4	4.8	4.9								
Degree Utilization, x	0.15	0.29	0.06	0.15								
Capacity (veh/h)	738	782	684	684								
Control Delay (s)	8.5	9.2	8.1	8.7								
Approach Delay (s)	8.5	9.2	8.1	8.7								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				8.8								
Level of Service				A								
Intersection Capacity Utilization				36.2%	ICU Level of Service							A
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 102: Gerrie Rd & Colborne St      Background (2022)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	22	127	73	27	141	32	31	37	9	18	57	19
Future Volume (vph)	22	127	73	27	141	32	31	37	9	18	57	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	138	79	29	153	35	34	40	10	20	62	21
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total (vph)	241	217	84	103								
Volume Left (vph)	24	29	34	20								
Volume Right (vph)	79	35	10	21								
Hadj (s)	-0.06	-0.03	0.07	0.00								
Departure Headway (s)	4.6	4.7	5.2	5.1								
Degree Utilization, x	0.31	0.28	0.12	0.15								
Capacity (veh/h)	737	731	624	635								
Control Delay (s)	9.7	9.5	8.9	9.0								
Approach Delay (s)	9.7	9.5	8.9	9.0								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				9.4								
Level of Service				A								
Intersection Capacity Utilization				30.5%	ICU Level of Service							A
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis     Ainley Subdivision (Colborne), Elora TIS  
 103: Irvine St & Waiser St     Background (2022)


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	36	13	38	14	9	58
Future Volume (Veh/h)	36	13	38	14	9	58
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	14	41	15	10	63
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type		None		None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	134	50			58	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	134	50			58	
IC, single (s)	6.5	6.2			4.3	
IC, 2 stage (s)						
IF (s)	3.6	3.3			2.4	
p0 queue free %	95	99			99	
cM capacity (veh/h)	836	1021			1409	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	53	56	73			
Volume Left	39	0	10			
Volume Right	14	15	0			
cSH	878	1700	1409			
Volume to Capacity	0.06	0.03	0.01			
Queue Length 95th (m)	1.5	0.0	0.2			
Control Delay (s)	9.4	0.0	1.1			
Lane LOS	A		A			
Approach Delay (s)	9.4	0.0	1.1			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			3.2			
Intersection Capacity Utilization		20.2%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis     Ainley Subdivision (Colborne), Elora TIS  
 104: Gerrie Rd & Waste Transfer Entrance     Background (2022)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	42	48	12	95
Future Volume (Veh/h)	0	0	42	48	12	95
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	46	52	13	103
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None		None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	201	72			98	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	201	72			98	
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	785	996			1508	
<b>Direction, Lane #</b>	<b>NB 1</b>	<b>SB 1</b>				
Volume Total	98	116				
Volume Left	0	13				
Volume Right	52	0				
cSH	1700	1508				
Volume to Capacity	0.06	0.01				
Queue Length 95th (m)	0.0	0.2				
Control Delay (s)	0.0	0.9				
Lane LOS		A				
Approach Delay (s)	0.0	0.9				
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization		15.7%		ICU Level of Service		A
Analysis Period (min)		15				




HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 101: Irvine St & Colborne St      Background (2022)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	12	181	7	12	158	61	1	33	12	40	41	7
Future Volume (vph)	12	181	7	12	158	61	1	33	12	40	41	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	197	8	13	172	66	1	36	13	43	45	8
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total (vph)	218	251	50	96								
Volume Left (vph)	13	13	1	43								
Volume Right (vph)	8	66	13	8								
Hadj (s)	0.06	-0.09	-0.03	0.10								
Departure Headway (s)	4.6	4.5	5.1	5.2								
Degree Utilization, x	0.28	0.31	0.07	0.14								
Capacity (veh/h)	746	770	631	631								
Control Delay (s)	9.4	9.5	8.5	9.0								
Approach Delay (s)	9.4	9.5	8.5	9.0								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				9.3								
Level of Service				A								
Intersection Capacity Utilization			34.3%	ICU Level of Service				A				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 102: Gerrie Rd & Colborne St      Background (2022)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	24	141	51	18	159	33	78	42	40	52	39	27
Future Volume (vph)	24	141	51	18	159	33	78	42	40	52	39	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	153	55	20	173	36	85	46	43	57	42	29
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total (vph)	234	229	174	128								
Volume Left (vph)	26	20	85	57								
Volume Right (vph)	55	36	43	29								
Hadj (s)	-0.07	-0.05	0.15	0.03								
Departure Headway (s)	5.0	5.0	5.5	5.4								
Degree Utilization, x	0.33	0.32	0.26	0.19								
Capacity (veh/h)	667	665	595	597								
Control Delay (s)	10.4	10.4	10.4	9.7								
Approach Delay (s)	10.4	10.4	10.4	9.7								
Approach LOS	B	B	B	A								
<b>Intersection Summary</b>												
Delay				10.3								
Level of Service				B								
Intersection Capacity Utilization			35.4%	ICU Level of Service				A				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis     Ainley Subdivision (Colborne), Elora TIS  
 103: Irvine St & Waiser St     Background (2022)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	8	70	23	6	51
Future Volume (Veh/h)	12	8	70	23	6	51
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	9	76	25	7	55
Pedestrians	15					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	1					
Right turn flare (veh)						
Median type		None		None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	172	104			116	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	172	104			116	
IC, single (s)	6.4	6.5			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.6			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	806	870			1463	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	22	101	62			
Volume Left	13	0	7			
Volume Right	9	25	0			
cSH	831	1700	1463			
Volume to Capacity	0.03	0.06	0.00			
Queue Length 95th (m)	0.6	0.0	0.1			
Control Delay (s)	9.4	0.0	0.9			
Lane LOS	A		A			
Approach Delay (s)	9.4	0.0	0.9			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			1.4			
Intersection Capacity Utilization		18.6%		ICU Level of Service	A	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis     Ainley Subdivision (Colborne), Elora TIS  
 104: Gerrie Rd & Waste Transfer Entrance     Background (2022)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	41	62	9	116
Future Volume (Veh/h)	0	0	41	62	9	116
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	45	67	10	126
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None		None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	224	78			112	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	224	78			112	
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	763	988			1490	
<b>Direction, Lane #</b>	<b>NB 1</b>	<b>SB 1</b>				
Volume Total	112	136				
Volume Left	0	10				
Volume Right	67	0				
cSH	1700	1490				
Volume to Capacity	0.07	0.01				
Queue Length 95th (m)	0.0	0.2				
Control Delay (s)	0.0	0.6				
Lane LOS		A				
Approach Delay (s)	0.0	0.6				
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization		16.6%		ICU Level of Service	A	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 101: Irvine St & Colborne St      Background (2027)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	5	118	5	21	228	30	5	31	9	51	47	14
Future Volume (vph)	5	118	5	21	228	30	5	31	9	51	47	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	128	5	23	248	33	5	34	10	55	51	15
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	138	304	49	121								
Volume Left (vph)	5	23	5	55								
Volume Right (vph)	5	33	10	15								
Hadj (s)	0.11	-0.02	-0.04	0.08								
Departure Headway (s)	4.8	4.5	5.1	5.1								
Degree Utilization, x	0.18	0.38	0.07	0.17								
Capacity (veh/h)	700	765	635	644								
Control Delay (s)	8.9	10.2	8.5	9.2								
Approach Delay (s)	8.9	10.2	8.5	9.2								
Approach LOS	A	B	A	A								
<b>Intersection Summary</b>												
Delay				9.6								
Level of Service				A								
Intersection Capacity Utilization				41.8%	ICU Level of Service							A
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 102: Gerrie Rd & Colborne St      Background (2027)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	25	150	81	37	196	43	34	41	40	22	63	21
Future Volume (vph)	25	150	81	37	196	43	34	41	40	22	63	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	163	88	40	213	47	37	45	43	24	68	23
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	278	300	125	115								
Volume Left (vph)	27	40	37	24								
Volume Right (vph)	88	47	43	23								
Hadj (s)	-0.05	-0.03	-0.10	0.00								
Departure Headway (s)	5.0	4.9	5.5	5.6								
Degree Utilization, x	0.38	0.41	0.19	0.18								
Capacity (veh/h)	685	692	581	570								
Control Delay (s)	11.0	11.4	9.7	9.8								
Approach Delay (s)	11.0	11.4	9.7	9.8								
Approach LOS	B	B	A	A								
<b>Intersection Summary</b>												
Delay				10.8								
Level of Service				B								
Intersection Capacity Utilization				38.5%	ICU Level of Service							A
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis     Ainley Subdivision (Colborne), Elora TIS  
 103: Irvine St & Waiser St     Background (2027)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	39	15	46	16	10	66
Future Volume (Veh/h)	39	15	46	16	10	66
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	16	50	17	11	72
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type		None		None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	154	60			69	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	154	60			69	
IC, single (s)	6.5	6.2			4.3	
IC, 2 stage (s)						
IF (s)	3.6	3.3			2.4	
p0 queue free %	95	98			99	
cM capacity (veh/h)	813	1008			1395	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	58	67	83			
Volume Left	42	0	11			
Volume Right	16	17	0			
cSH	859	1700	1395			
Volume to Capacity	0.07	0.04	0.01			
Queue Length 95th (m)	1.6	0.0	0.2			
Control Delay (s)	9.5	0.0	1.1			
Lane LOS	A		A			
Approach Delay (s)	9.5	0.0	1.1			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			3.1			
Intersection Capacity Utilization		20.7%		ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis     Ainley Subdivision (Colborne), Elora TIS  
 104: Gerrie Rd & Waste Transfer Entrance     Background (2027)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	54	53	14	107
Future Volume (Veh/h)	0	0	54	53	14	107
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	59	58	15	116
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None		None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	234	88			117	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	234	88			117	
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	751	976			1484	
<b>Direction, Lane #</b>	<b>NB 1</b>	<b>SB 1</b>				
Volume Total	117	131				
Volume Left	0	15				
Volume Right	58	0				
cSH	1700	1484				
Volume to Capacity	0.07	0.01				
Queue Length 95th (m)	0.0	0.2				
Control Delay (s)	0.0	0.9				
Lane LOS		A				
Approach Delay (s)	0.0	0.9				
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization		16.4%		ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 101: Irvine St & Colborne St      Background (2027)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	14	235	7	14	209	81	1	37	16	52	46	7
Future Volume (vph)	14	235	7	14	209	81	1	37	16	52	46	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	255	8	15	227	88	1	40	17	57	50	8
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	278	330	58	115								
Volume Left (vph)	15	15	1	57								
Volume Right (vph)	8	88	17	8								
Hadj (s)	0.06	-0.09	-0.06	0.12								
Departure Headway (s)	4.9	4.7	5.5	5.6								
Degree Utilization, x	0.38	0.43	0.09	0.18								
Capacity (veh/h)	702	739	560	576								
Control Delay (s)	10.8	11.1	9.1	9.8								
Approach Delay (s)	10.8	11.1	9.1	9.8								
Approach LOS	B	B	A	A								
<b>Intersection Summary</b>												
Delay				10.7								
Level of Service				B								
Intersection Capacity Utilization				39.9%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 102: Gerrie Rd & Colborne St      Background (2027)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	27	201	57	27	224	47	86	47	57	75	43	30
Future Volume (vph)	27	201	57	27	224	47	86	47	57	75	43	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	218	62	29	243	51	93	51	62	82	47	33
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	309	323	206	162								
Volume Left (vph)	29	29	93	82								
Volume Right (vph)	62	51	62	33								
Hadj (s)	-0.06	-0.05	0.11	0.05								
Departure Headway (s)	5.6	5.6	6.1	6.2								
Degree Utilization, x	0.48	0.50	0.35	0.28								
Capacity (veh/h)	601	607	522	498								
Control Delay (s)	13.6	13.9	12.4	11.5								
Approach Delay (s)	13.6	13.9	12.4	11.5								
Approach LOS	B	B	B	B								
<b>Intersection Summary</b>												
Delay				13.1								
Level of Service				B								
Intersection Capacity Utilization				40.6%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis     Ainley Subdivision (Colborne), Elora TIS  
 103: Irvine St & Waiser St     Background (2027)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	14	9	91	26	6	64
Future Volume (Veh/h)	14	9	91	26	6	64
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	10	99	28	7	70
Pedestrians	15					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	1					
Right turn flare (veh)						
Median type		None		None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	212	128			142	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	212	128			142	
IC, single (s)	6.4	6.5			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.6			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	766	842			1432	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	25	127	77			
Volume Left	15	0	7			
Volume Right	10	28	0			
cSH	794	1700	1432			
Volume to Capacity	0.03	0.07	0.00			
Queue Length 95th (m)	0.7	0.0	0.1			
Control Delay (s)	9.7	0.0	0.7			
Lane LOS	A		A			
Approach Delay (s)	9.7	0.0	0.7			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			1.3			
Intersection Capacity Utilization			19.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis     Ainley Subdivision (Colborne), Elora TIS  
 104: Gerrie Rd & Waste Transfer Entrance     Background (2027)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	55	69	10	146
Future Volume (Veh/h)	0	0	55	69	10	146
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	60	75	11	159
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None		None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	278	98			135	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	278	98			135	
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	710	964			1462	
<b>Direction, Lane #</b>	<b>NB 1</b>	<b>SB 1</b>				
Volume Total	135	170				
Volume Left	0	11				
Volume Right	75	0				
cSH	1700	1462				
Volume to Capacity	0.08	0.01				
Queue Length 95th (m)	0.0	0.2				
Control Delay (s)	0.0	0.5				
Lane LOS		A				
Approach Delay (s)	0.0	0.5				
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization			19.2%	ICU Level of Service		A
Analysis Period (min)			15			

# Appendix E

## Future Total Traffic Operational Condition







HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 101: Irvine St & Colborne St      Total (2022)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	6	105	4	16	201	24	4	30	8	45	58	22
Future Volume (vph)	6	105	4	16	201	24	4	30	8	45	58	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	114	4	17	218	26	4	33	9	49	63	24
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total (vph)	125	261	46	136								
Volume Left (vph)	7	17	4	49								
Volume Right (vph)	4	26	9	24								
Hadj (s)	0.11	-0.02	-0.04	0.03								
Departure Headway (s)	4.8	4.5	5.0	4.9								
Degree Utilization, x	0.17	0.33	0.06	0.19								
Capacity (veh/h)	704	762	656	676								
Control Delay (s)	8.7	9.7	8.3	9.0								
Approach Delay (s)	8.7	9.7	8.3	9.0								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				9.2								
Level of Service				A								
Intersection Capacity Utilization				37.7%	ICU Level of Service							A
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 102: Gerrie Rd & Colborne St      Total (2022)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	27	127	73	27	141	40	31	43	9	57	98	43
Future Volume (vph)	27	127	73	27	141	40	31	43	9	57	98	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	138	79	29	153	43	34	47	10	62	107	47
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total (vph)	246	225	91	216								
Volume Left (vph)	29	29	34	62								
Volume Right (vph)	79	43	10	47								
Hadj (s)	-0.05	-0.05	0.06	-0.01								
Departure Headway (s)	5.0	5.1	5.6	5.3								
Degree Utilization, x	0.34	0.32	0.14	0.32								
Capacity (veh/h)	667	662	570	629								
Control Delay (s)	10.7	10.4	9.5	10.7								
Approach Delay (s)	10.7	10.4	9.5	10.7								
Approach LOS	B	B	A	B								
<b>Intersection Summary</b>												
Delay				10.5								
Level of Service				B								
Intersection Capacity Utilization				36.2%	ICU Level of Service							A
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis     Ainley Subdivision (Colborne), Elora TIS  
 103: Irvine St & Waiser St     Total (2022)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↔
Traffic Volume (veh/h)	62	25	38	18	14	58
Future Volume (Veh/h)	62	25	38	18	14	58
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	27	41	20	15	63
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type		None		None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	146	53			63	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	146	53			63	
IC, single (s)	6.5	6.2			4.3	
IC, 2 stage (s)						
IF (s)	3.6	3.3			2.4	
p0 queue free %	92	97			99	
cM capacity (veh/h)	820	1018			1402	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	94	61	78			
Volume Left	67	0	15			
Volume Right	27	20	0			
cSH	868	1700	1402			
Volume to Capacity	0.11	0.04	0.01			
Queue Length 95th (m)	2.8	0.0	0.2			
Control Delay (s)	9.6	0.0	1.5			
Lane LOS	A		A			
Approach Delay (s)	9.6	0.0	1.5			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay		4.4				
Intersection Capacity Utilization		22.1%	ICU Level of Service	A		
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis     Ainley Subdivision (Colborne), Elora TIS  
 104: Gerrie Rd & Street 1/Waste Transfer Entrance     Total (2022)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔						↔			↔	
Traffic Volume (veh/h)	3	0	72	0	0	0	13	48	48	12	127	3
Future Volume (Veh/h)	3	0	72	0	0	0	13	48	48	12	127	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	0	78	0	0	0	14	52	52	13	138	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	272	298	140	350	273	78	141			104		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	272	298	140	350	273	78	141			104		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	91	100	100	100	99			99		
cM capacity (veh/h)	676	606	914	549	622	988	1455			1500		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>									
Volume Total	81	118	154									
Volume Left	3	14	13									
Volume Right	78	52	3									
cSH	902	1455	1500									
Volume to Capacity	0.09	0.01	0.01									
Queue Length 95th (m)	2.2	0.2	0.2									
Control Delay (s)	9.4	1.0	0.7									
Lane LOS	A	A	A									
Approach Delay (s)	9.4	1.0	0.7									
Approach LOS	A											
<b>Intersection Summary</b>												
Average Delay			2.8									
Intersection Capacity Utilization		20.5%	ICU Level of Service	A								
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 301: Gerrie Rd & Walser St      Total (2022)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↕	↕	
Traffic Volume (veh/h)	4	32	6	45	110	5
Future Volume (Veh/h)	4	32	6	45	110	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	35	7	49	120	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	186	122	125			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	186	122	125			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free. %	100	96	100			
cM capacity (veh/h)	804	934	1474			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	39	56	125			
Volume Left	4	7	0			
Volume Right	35	0	5			
cSH	919	1474	1700			
Volume to Capacity	0.04	0.00	0.07			
Queue Length 95th (m)	1.0	0.1	0.0			
Control Delay (s)	9.1	1.0	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.1	1.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay		1.9				
Intersection Capacity Utilization		17.4%		ICU Level of Service	A	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 101: Irvine St & Colborne St      Total (2022)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	↔
Sign Control	Stop			Stop			Stop			Stop		Stop
Traffic Volume (vph)	22	203	7	12	171	61	1	42	12	40	49	12
Future Volume (vph)	22	203	7	12	171	61	1	42	12	40	49	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	221	8	13	186	66	1	46	13	43	53	13
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total (vph)	253	265	60	109								
Volume Left (vph)	24	13	1	43								
Volume Right (vph)	8	66	13	13								
Hadj (s)	0.07	-0.08	0.00	0.06								
Departure Headway (s)	4.8	4.6	5.3	5.3								
Degree Utilization, x	0.33	0.34	0.09	0.16								
Capacity (veh/h)	718	745	602	613								
Control Delay (s)	10.1	9.9	8.8	9.3								
Approach Delay (s)	10.1	9.9	8.8	9.3								
Approach LOS	B	A	A	A								
<b>Intersection Summary</b>												
Delay				9.8								
Level of Service				A								
Intersection Capacity Utilization				37.9%		ICU Level of Service				A		
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 102: Gerrie Rd & Colborne St      Total (2022)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	46	141	51	18	159	65	78	72	40	71	54	40
Future Volume (vph)	46	141	51	18	159	65	78	72	40	71	54	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	153	55	20	173	71	85	78	43	77	59	43
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	258	264	206	179								
Volume Left (vph)	50	20	85	77								
Volume Right (vph)	55	71	43	43								
Hadj (s)	-0.04	-0.12	0.15	0.02								
Departure Headway (s)	5.5	5.4	5.8	5.8								
Degree Utilization, x	0.39	0.39	0.33	0.29								
Capacity (veh/h)	609	620	556	558								
Control Delay (s)	11.9	11.8	11.7	11.1								
Approach Delay (s)	11.9	11.8	11.7	11.1								
Approach LOS	B	B	B	B								
<b>Intersection Summary</b>												
Delay	11.7											
Level of Service	B											
Intersection Capacity Utilization	44.7%			ICU Level of Service	A							
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 103: Irvine St & Waiser St      Total (2022)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕		↕	
Traffic Volume (veh/h)	25	17	70	42	16	51
Future Volume (Veh/h)	25	17	70	42	16	51
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	18	76	46	17	55
Pedestrians	15					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	1					
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	203	114			137	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	203	114			137	
IC, single (s)	6.4	6.5			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.6			2.2	
p0 queue free %	96	98			99	
cM capacity (veh/h)	769	858			1438	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	45	122	72			
Volume Left	27	0	17			
Volume Right	18	46	0			
cSH	802	1700	1438			
Volume to Capacity	0.06	0.07	0.01			
Queue Length 95th (m)	1.4	0.0	0.3			
Control Delay (s)	9.8	0.0	1.8			
Lane LOS	A		A			
Approach Delay (s)	9.8	0.0	1.8			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay	2.4					
Intersection Capacity Utilization	20.2%		ICU Level of Service	A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 104: Gerrie Rd & Street 1/Waste Transfer Entrance      Total (2022)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔						↔			↔	
Traffic Volume (veh/h)	2	0	33	0	0	0	59	66	62	9	130	9
Future Volume (Veh/h)	2	0	33	0	0	0	59	66	62	9	130	9
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	0	36	0	0	0	64	72	67	10	141	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	400	433	146	436	404	106	151			139		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	400	433	146	436	404	106	151			139		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	96	100	100	100	96			99		
cM capacity (veh/h)	543	492	906	493	508	954	1442			1457		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>									
Volume Total	38	203	161									
Volume Left	2	64	10									
Volume Right	36	67	10									
cSH	876	1442	1457									
Volume to Capacity	0.04	0.04	0.01									
Queue Length 95th (m)	1.0	1.1	0.2									
Control Delay (s)	9.3	2.7	0.5									
Lane LOS	A	A	A									
Approach Delay (s)	9.3	2.7	0.5									
Approach LOS	A											
<b>Intersection Summary</b>												
Average Delay			2.4									
Intersection Capacity Utilization			31.7%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 301: Gerrie Rd & Walser St      Total (2022)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	2	14	25	43	134	13
Future Volume (Veh/h)	2	14	25	43	134	13
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	15	27	47	146	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	254	153	160			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	254	153	160			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	98			
cM capacity (veh/h)	725	898	1432			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	17	74	160			
Volume Left	2	27	0			
Volume Right	15	0	14			
cSH	874	1432	1700			
Volume to Capacity	0.02	0.02	0.09			
Queue Length 95th (m)	0.5	0.4	0.0			
Control Delay (s)	9.2	2.9	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.2	2.9	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			1.5			
Intersection Capacity Utilization			24.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 101: Irvine St & Colborne St      Total (2027)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	7	123	5	21	252	30	5	33	9	51	63	24
Future Volume (vph)	7	123	5	21	252	30	5	33	9	51	63	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	134	5	23	274	33	5	36	10	55	68	26
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	147	330	51	149								
Volume Left (vph)	8	23	5	55								
Volume Right (vph)	5	33	10	26								
Hadj (s)	0.11	-0.02	-0.04	0.03								
Departure Headway (s)	5.0	4.6	5.3	5.2								
Degree Utilization, x	0.20	0.42	0.07	0.21								
Capacity (veh/h)	678	746	609	635								
Control Delay (s)	9.2	11.0	8.7	9.6								
Approach Delay (s)	9.2	11.0	8.7	9.6								
Approach LOS	A	B	A	A								
<b>Intersection Summary</b>												
Delay				10.1								
Level of Service				B								
Intersection Capacity Utilization				43.2%	ICU Level of Service							A
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 102: Gerrie Rd & Colborne St      Total (2027)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	30	150	81	37	196	51	34	47	40	61	104	45
Future Volume (vph)	30	150	81	37	196	51	34	47	40	61	104	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	163	88	40	213	55	37	51	43	66	113	49
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	284	308	131	228								
Volume Left (vph)	33	40	37	66								
Volume Right (vph)	88	55	43	49								
Hadj (s)	-0.04	-0.05	-0.10	0.00								
Departure Headway (s)	5.4	5.4	5.9	5.8								
Degree Utilization, x	0.43	0.46	0.21	0.37								
Capacity (veh/h)	614	623	526	563								
Control Delay (s)	12.5	13.0	10.5	12.1								
Approach Delay (s)	12.5	13.0	10.5	12.1								
Approach LOS	B	B	B	B								
<b>Intersection Summary</b>												
Delay				12.3								
Level of Service				B								
Intersection Capacity Utilization				43.6%	ICU Level of Service							A
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis     Ainley Subdivision (Colborne), Elora TIS  
 103: Irvine St & Waiser St     Total (2027)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕			↕
Traffic Volume (veh/h)	65	27	46	20	15	66
Future Volume (Veh/h)	65	27	46	20	15	66
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	29	50	22	16	72
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type		None		None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	167	63			74	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	167	63			74	
IC, single (s)	6.5	6.2			4.3	
IC, 2 stage (s)						
IF (s)	3.6	3.3			2.4	
p0 queue free %	91	97			99	
cM capacity (veh/h)	797	1005			1389	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	100	72	88			
Volume Left	71	0	16			
Volume Right	29	22	0			
cSH	848	1700	1389			
Volume to Capacity	0.12	0.04	0.01			
Queue Length 95th (m)	3.0	0.0	0.3			
Control Delay (s)	9.8	0.0	1.5			
Lane LOS	A		A			
Approach Delay (s)	9.8	0.0	1.5			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay		4.3				
Intersection Capacity Utilization		22.9%		ICU Level of Service	A	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis     Ainley Subdivision (Colborne), Elora TIS  
 104: Gerrie Rd & Street 1/Waste Transfer Entrance     Total (2027)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔						↕				↕
Traffic Volume (veh/h)	3	0	72	0	0	0	13	60	53	14	139	3
Future Volume (Veh/h)	3	0	72	0	0	0	13	60	53	14	139	3
Sign Control		Stop			Stop			Free				Free
Grade		0%			0%			0%				0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	0	78	0	0	0	14	65	58	15	151	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None					None
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	304	334	152	382	306	94	154			123		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304	334	152	382	306	94	154			123		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	91	100	100	100	99			99		
cM capacity (veh/h)	642	578	899	521	596	968	1439			1477		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>									
Volume Total	81	137	169									
Volume Left	3	14	15									
Volume Right	78	58	3									
cSH	886	1439	1477									
Volume to Capacity	0.09	0.01	0.01									
Queue Length 95th (m)	2.3	0.2	0.2									
Control Delay (s)	9.5	0.8	0.7									
Lane LOS	A	A	A									
Approach Delay (s)	9.5	0.8	0.7									
Approach LOS	A											
<b>Intersection Summary</b>												
Average Delay			2.6									
Intersection Capacity Utilization			21.8%		ICU Level of Service	A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 301: Gerrie Rd & Walser St      Total (2027)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↑	↑	
Traffic Volume (veh/h)	4	32	6	57	124	5
Future Volume (Veh/h)	4	32	6	57	124	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	35	7	62	135	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	214	138	140			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	214	138	140			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free. %	99	96	100			
cM capacity (veh/h)	776	916	1456			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	39	69	140			
Volume Left	4	7	0			
Volume Right	35	0	5			
cSH	900	1456	1700			
Volume to Capacity	0.04	0.00	0.08			
Queue Length 95th (m)	1.0	0.1	0.0			
Control Delay (s)	9.2	0.8	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.2	0.8	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay		1.7				
Intersection Capacity Utilization		18.0%		ICU Level of Service	A	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 101: Irvine St & Colborne St      Total (2027)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	↔
Sign Control	Stop			Stop			Stop			Stop		Stop
Traffic Volume (vph)	24	257	7	14	222	81	1	46	16	52	54	12
Future Volume (vph)	24	257	7	14	222	81	1	46	16	52	54	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	279	8	15	241	88	1	50	17	57	59	13
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total (vph)	313	344	68	129								
Volume Left (vph)	26	15	1	57								
Volume Right (vph)	8	88	17	13								
Hadj (s)	0.07	-0.09	-0.02	0.09								
Departure Headway (s)	5.0	4.8	5.8	5.7								
Degree Utilization, x	0.44	0.46	0.11	0.21								
Capacity (veh/h)	683	714	534	557								
Control Delay (s)	11.8	11.9	9.5	10.2								
Approach Delay (s)	11.8	11.9	9.5	10.2								
Approach LOS	B	B	A	B								
<b>Intersection Summary</b>												
Delay		11.4										
Level of Service		B										
Intersection Capacity Utilization		42.8%		ICU Level of Service	A							
Analysis Period (min)		15										



HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 102: Gerrie Rd & Colborne St      Total (2027)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	49	201	57	27	224	79	86	77	57	94	58	43
Future Volume (vph)	49	201	57	27	224	79	86	77	57	94	58	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	218	62	29	243	86	93	84	62	102	63	47
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	333	358	239	212								
Volume Left (vph)	53	29	93	102								
Volume Right (vph)	62	86	62	47								
Hadj (s)	-0.03	-0.10	0.12	0.03								
Departure Headway (s)	6.2	6.1	6.7	6.7								
Degree Utilization, x	0.57	0.60	0.45	0.40								
Capacity (veh/h)	541	547	476	466								
Control Delay (s)	17.1	17.9	15.0	14.0								
Approach Delay (s)	17.1	17.9	15.0	14.0								
Approach LOS	C	C	B	B								

Intersection Summary				
Delay	16.3			
Level of Service	C			
Intersection Capacity Utilization	49.9%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 103: Irvine St & Waiser St      Total (2027)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Volume (veh/h)	27	18	91	45	16	64
Future Volume (Veh/h)	27	18	91	45	16	64
Sign Control	Stop		Free		Free	Free
Grade	0%		0%		0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	20	99	49	17	70
Pedestrians	15					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	1					
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	242	138			163	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	242	138			163	
IC, single (s)	6.4	6.5			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.6			2.2	
p0 queue free %	96	98			99	
cM capacity (veh/h)	730	830			1407	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	49	148	87			
Volume Left	29	0	17			
Volume Right	20	49	0			
cSH	768	1700	1407			
Volume to Capacity	0.06	0.09	0.01			
Queue Length 95th (m)	1.6	0.0	0.3			
Control Delay (s)	10.0	0.0	1.6			
Lane LOS	B		A			
Approach Delay (s)	10.0	0.0	1.6			
Approach LOS	B					

Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	27.2%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 104: Gerrie Rd & Street 1/Waste Transfer Entrance      Total (2027)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔						↔			↔	
Traffic Volume (veh/h)	2	0	33	0	0	0	59	80	69	10	160	9
Future Volume (Veh/h)	2	0	33	0	0	0	59	80	69	10	160	9
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	0	36	0	0	0	64	87	75	11	174	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	454	491	179	490	458	124	184			162		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	454	491	179	490	458	124	184			162		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	96	100	100	100	95			99		
cM capacity (veh/h)	499	456	869	453	473	932	1403			1429		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>									
Volume Total	38	226	195									
Volume Left	2	64	11									
Volume Right	36	75	10									
cSH	836	1403	1429									
Volume to Capacity	0.05	0.05	0.01									
Queue Length 95th (m)	1.1	1.1	0.2									
Control Delay (s)	9.5	2.5	0.5									
Lane LOS	A	A	A									
Approach Delay (s)	9.5	2.5	0.5									
Approach LOS	A											
<b>Intersection Summary</b>												
Average Delay			2.2									
Intersection Capacity Utilization			34.5%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis      Ainley Subdivision (Colborne), Elora TIS  
 301: Gerrie Rd & Walser St      Total (2027)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	2	14	25	57	165	13
Future Volume (Veh/h)	2	14	25	57	165	13
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	15	27	62	179	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	302	186	193			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	302	186	193			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	98			
cM capacity (veh/h)	680	861	1392			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	17	89	193			
Volume Left	2	27	0			
Volume Right	15	0	14			
cSH	835	1392	1700			
Volume to Capacity	0.02	0.02	0.11			
Queue Length 95th (m)	0.5	0.5	0.0			
Control Delay (s)	9.4	2.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.4	2.4	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			1.3			
Intersection Capacity Utilization			27.2%	ICU Level of Service	A	
Analysis Period (min)			15			

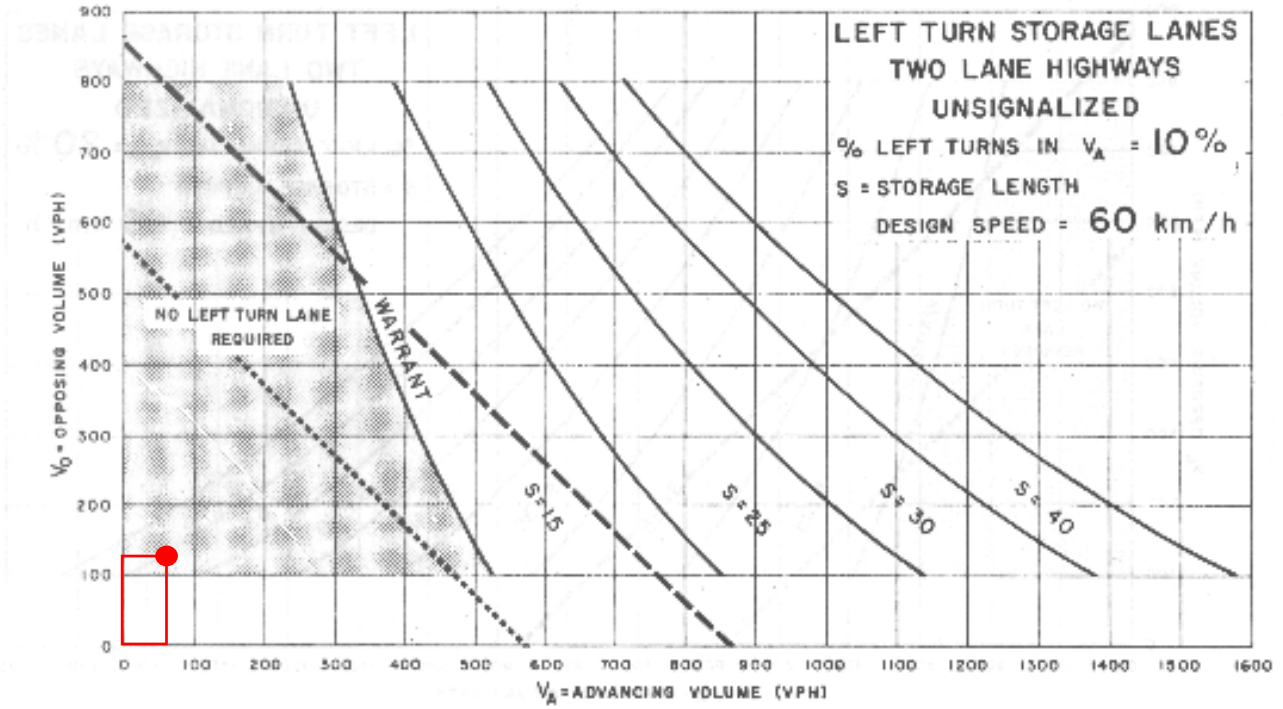
# Appendix F

## Left-Turn Lane Warrant Nomographs

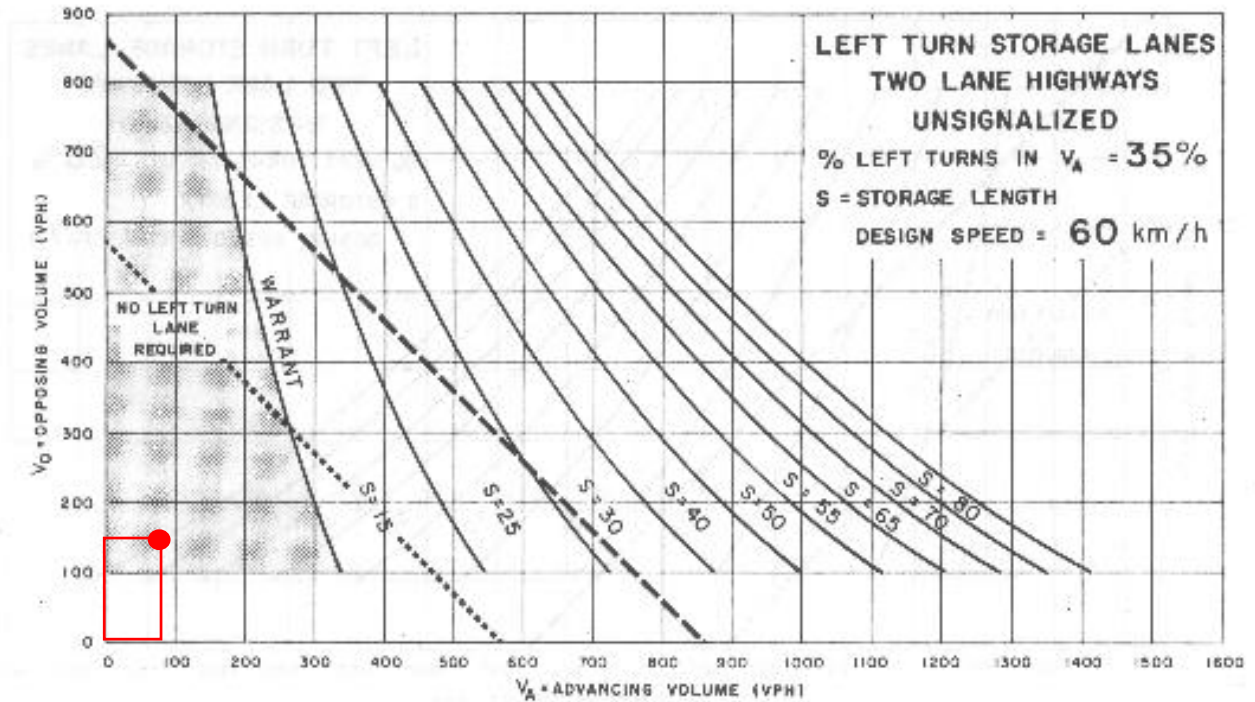




### AM Peak Hour

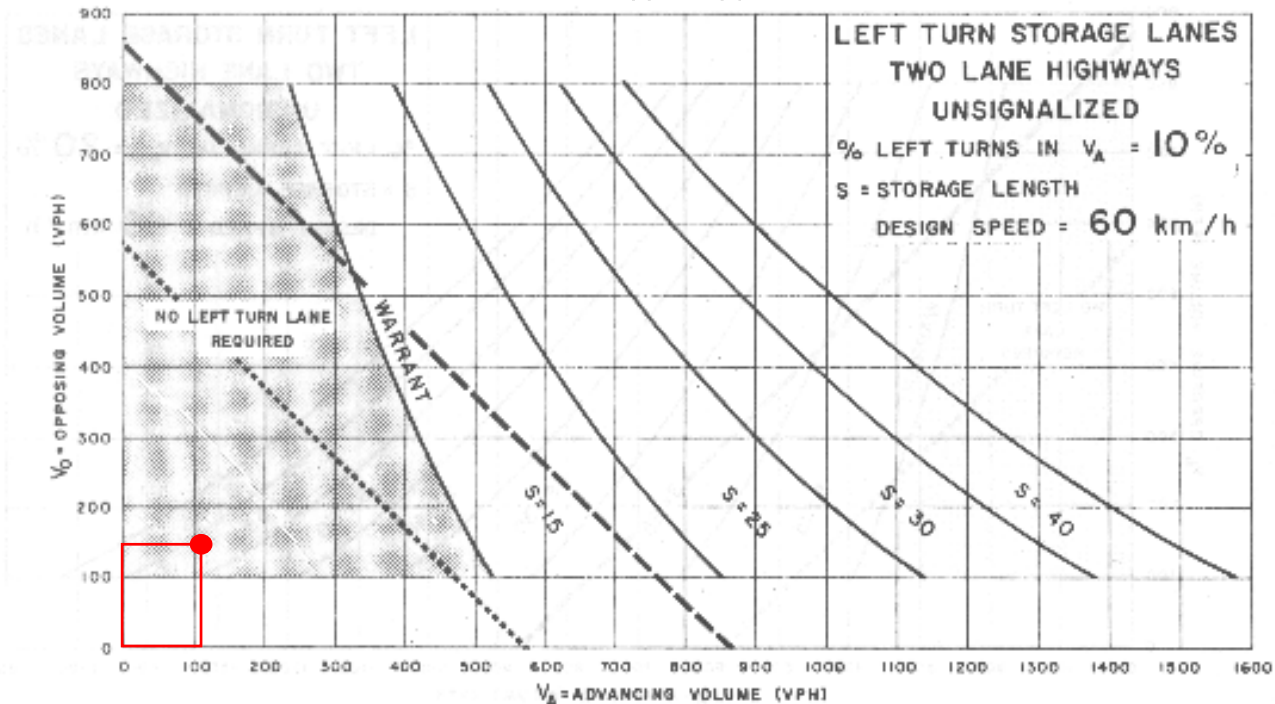


### PM Peak Hour

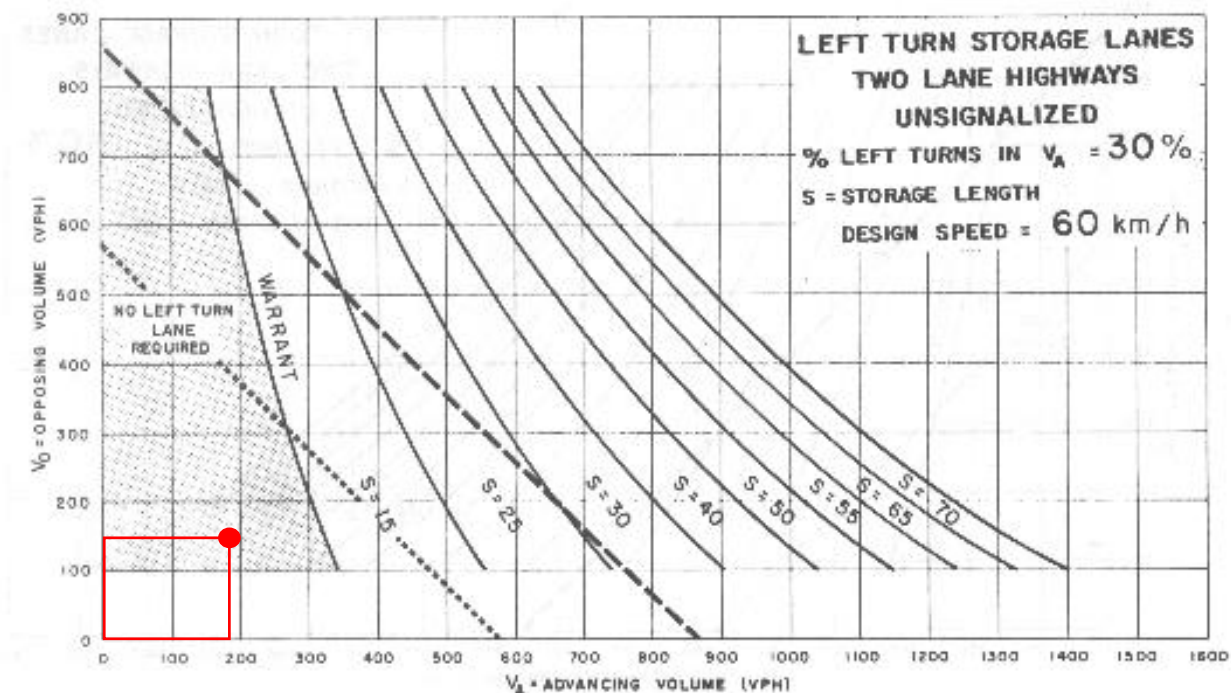


## Left-Turn Lane Warrant Nomograph Gerrie Road at Wasler Street 2022 Total Traffic

### AM Peak Hour

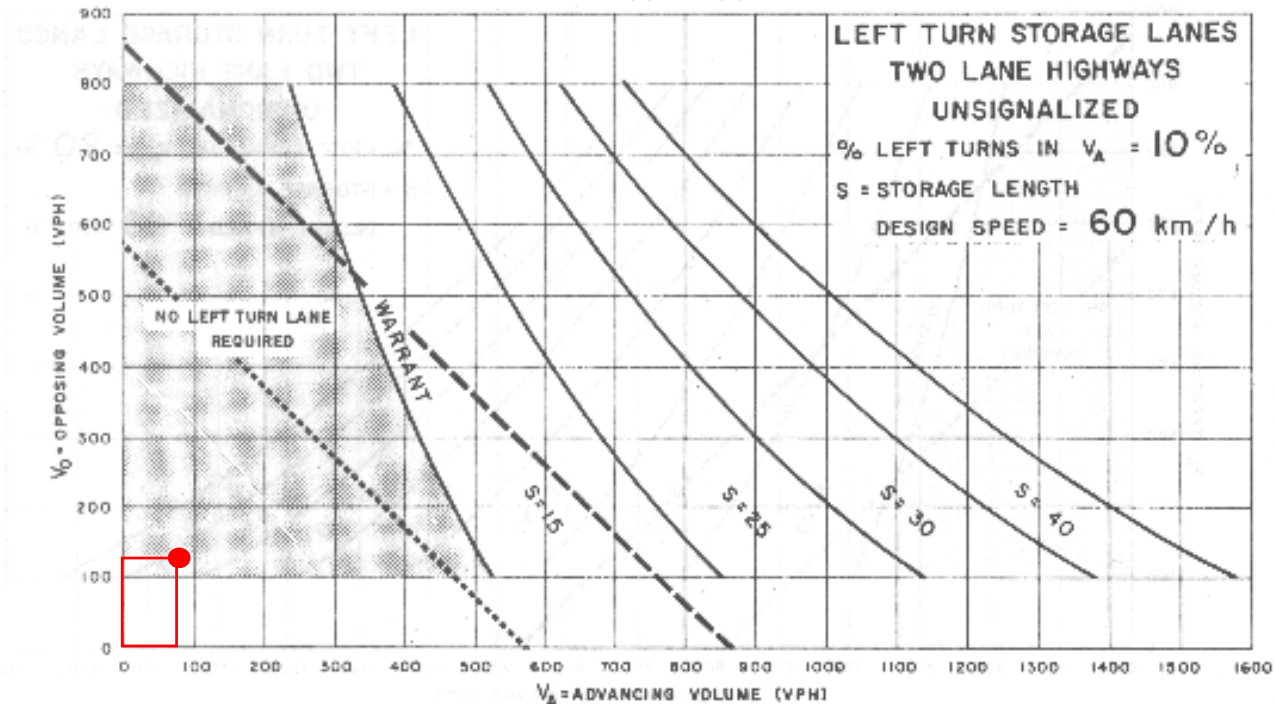


### PM Peak Hour

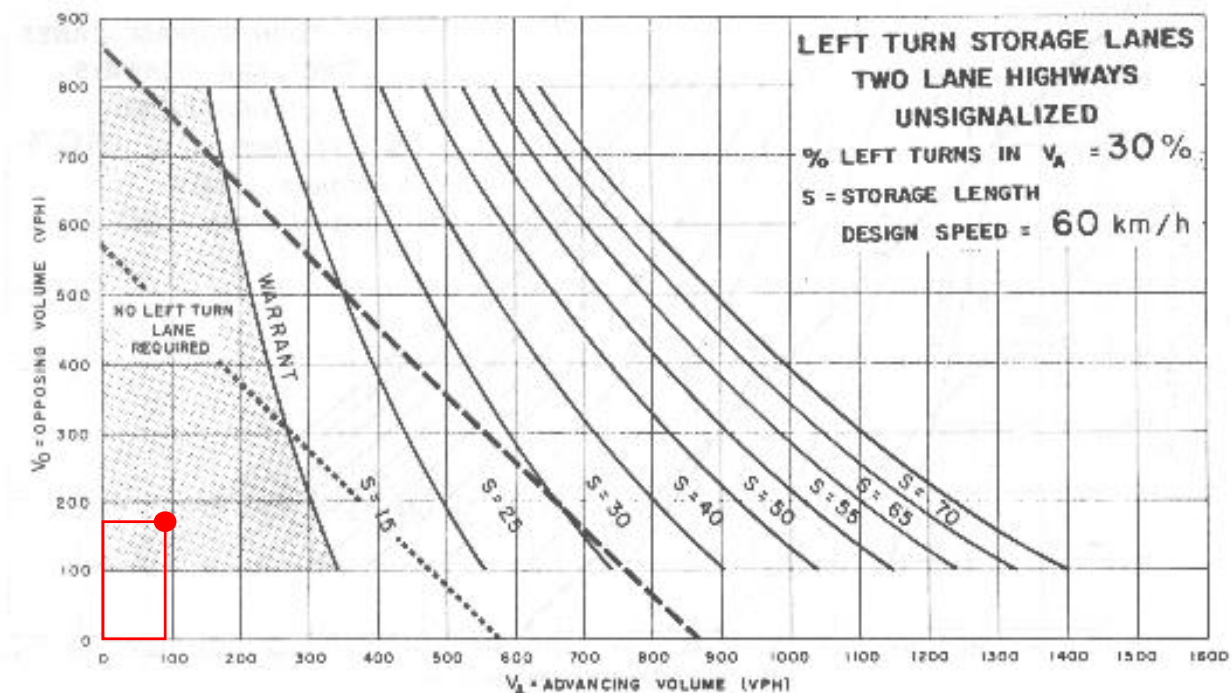


## Left-Turn Lane Warrant Nomograph Gerrie Road at Street 1 (One) 2022 Total Traffic

### AM Peak Hour

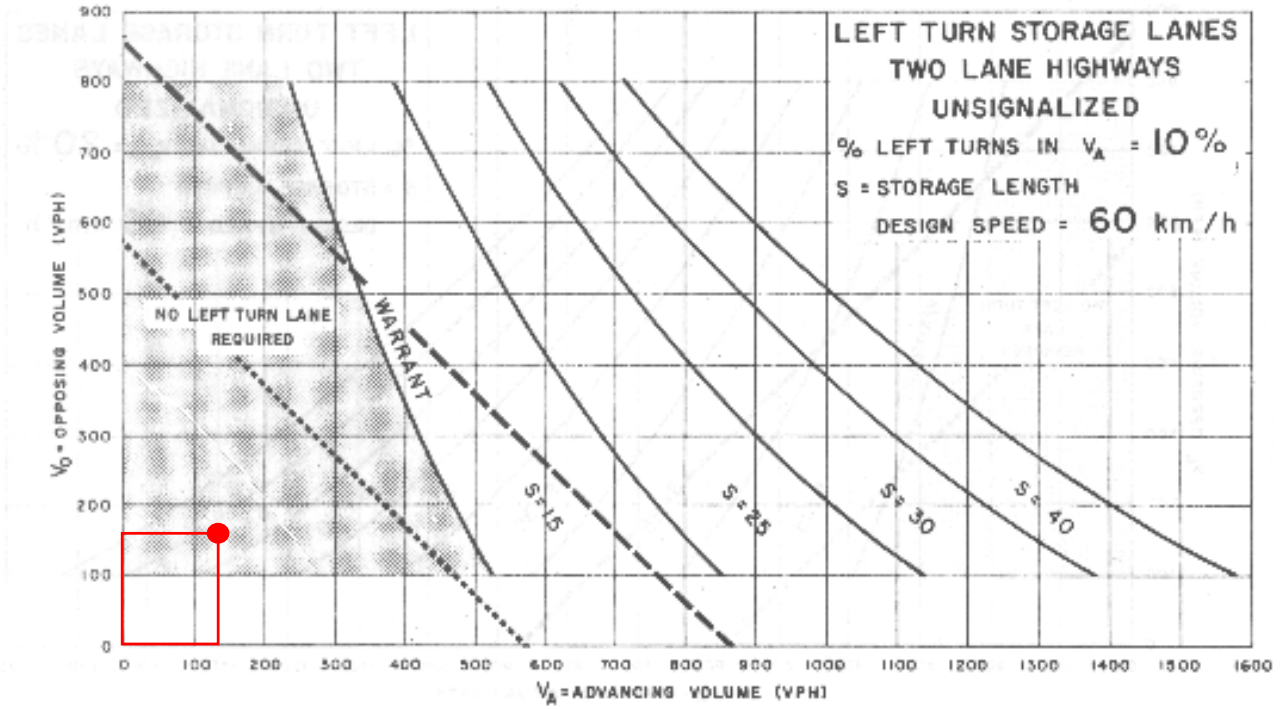


### PM Peak Hour

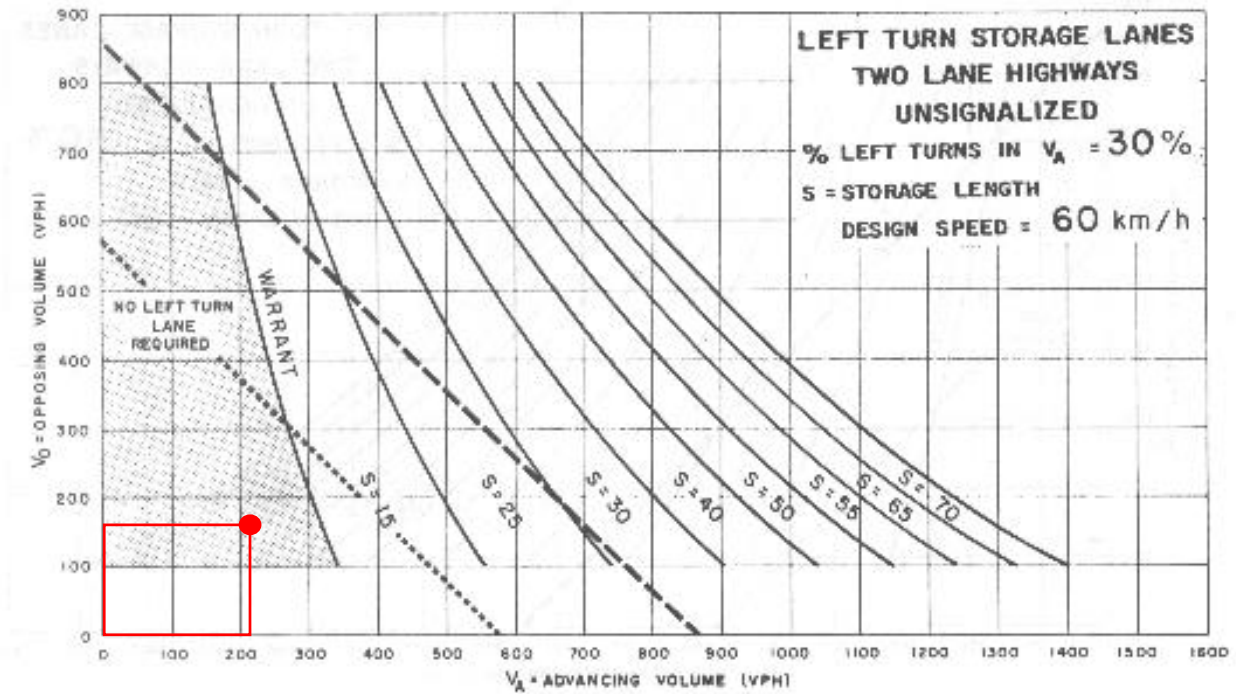


## Left-Turn Lane Warrant Nomograph Gerrie Road at Wasler Street 2027 Total Traffic

### AM Peak Hour



### PM Peak Hour



## Left-Turn Lane Warrant Nomograph Gerrie Road at Street 1 (One) 2027 Total Traffic