127 First Line, Elora, ON Transportation Impact Study

Paradigm Transportation Solutions Limited

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Project Summary

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127 First Line, Elora, ON Transportation Impact Study



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Executive Summary

Content

Elora Greens Housing Developers retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact Study for a proposed development at 127 First Line in the community of Elora, Township of Centre-Wellington. The subject site is on the south side of First Line east of Bridge Street.

This Transportation Impact Study (TIS) includes an analysis of existing traffic conditions, a description of the proposed development, traffic forecasts for a five-year and ten-year horizon, and a review of potential remedial measures to manage future traffic conditions.

Site Description and Development Concept

The subject site is on vacant lands known municipally as 127 First Line, on the south side of First Line, east of Bridge Street. Land uses to the north are predominantly residential, while employment/industrial land uses are located to the west (on the north side of First Line). The lands along the south side of First Line are exclusively agricultural, save for a handful of low-density residential lots.

Development of the site is proposed to include a mix of residential uses and commercial/office uses consisting of:

- Up to 200 mixed-use residential units with approximately 1,860 m^2 (20,021 sq. ft.) of commercial/office space;
- 202 to 472 low-density residential units; and
- 60 to 131 multifamily residential units.

Vehicle access is proposed via a new street connection (herein referred to as Street A) to First Line, opposite Spencer Drive. The concept plan also includes an internal connection to future development east of the property.

Findings

Based on the investigations carried out, the findings of this study are as follows:

- **Existing Traffic Conditions:** All study area intersections (First Line at Wellington Road 7, First Line at Bridge Street, First Line at Spencer Drive, and First Line at South River Road) are operating at acceptable levels of service during both the

weekday AM peak hour and weekday PM peak hour. No critical movements are noted.

- **Development Trip Generation:** Development of the site is estimated to generate 520 trips in the weekday AM peak hour and 617 trips in the weekday PM peak hour. These estimates are inclusive of trip reductions related to pass-by trips and trips internal to the site (for example, between the residential and commercial/office uses).
- **Background Traffic Conditions (Five and Ten-Year Horizon):** The study intersections are forecast to operate at acceptable levels of service during both the weekday AM peak hour and weekday PM peak hour. No critical movements are noted.
- **Total Traffic Conditions (Five- and Ten-Year Horizon):** The study area intersections are forecast to generally operate at acceptable levels of service, similar to existing and future background traffic conditions. The northbound approach on Street A at First Line is forecast to operate at LOS F in both the weekday AM peak hour and weekday PM peak hour. In addition, the southbound approach at First Line and Bridge Street is forecast to operate at LOS E during the weekday PM peak hour, but with a v/c ratio between 0.60 to 0.70. Both critical movements are forecast under both the five and ten-year horizons. These operations also reflect the volume of east-west traffic on First Line which provides limited gaps for side-street traffic to enter First Line.
- **Sight Distance Assessment:** The proposed Street A connection to First Line meets the minimum stopping and intersection sight distances defined by the Transportation Association of Canada (TAC).
- **Traffic Control Signal Warrant:** Traffic control signals are unlikely to be warranted on First Line at both Spencer Drive/Street A and Bridge Street under ten-year total traffic conditions.
- **Left-Turn Lane Warrant:** Under five-year and ten-year total traffic conditions, eastbound and westbound left-turn lanes with 15 metres of storage are warranted on First Line at Spencer Drive/Street A. In addition to the warranted storage length of 15 metres, the proposed eastbound and westbound left-turn lanes at the intersection of First Line and Spencer Drive/Street A, would both require an approach taper of 85 metres.

Conclusions

Based on the findings of this study, it is concluded that development of the site (assuming the upper limit of the development yield) is not forecast to significantly impact traffic operations at any of the study intersections. Only two movements in the entire study area are forecast to reach critical movement thresholds, one of which is the proposed connection to First Line. The southbound approach at First Line and Bridge Street is forecast to operate at LOS E, but with a maximum v/c ratio of 0.67.

Given the proposed range of the residential yield (462 to 803 units), it is recommended that the analyses and review of potential remedial measures in this study be updated as the unit count is better established. This study assumes the upper limit of this development yield (803 units) such that a lower residential yield may result in improvements to forecast traffic operations on Street A, and/or a revised need (or lack thereof) for auxiliary turn lanes on First Line.

Contents

1 Introduction 1

1.1 Overview 1
1.2 Purpose and Scope 1

2 Existing Conditions 3

2.1 Road Characteristics 3
2.2 Transit Service 4
2.3 Active Transportation 6
2.4 Traffic Volumes 9
2.5 Traffic Operations 11

3 Site Description and Development Concept 13

3.1 Site Description 13
3.2 Development Description 13
3.3 Sight Distance Assessment 15

4 Future Conditions 17

4.1 Horizon Years 17
4.2 Road Improvements 17
4.3 Forecast Background Traffic 17
4.4 Forecast Site Traffic 21
4.4.1 Trip Generation 21
4.4.2 Trip Distribution and Assignment 23
4.5 Future Total Traffic 23

5 Traffic Operations Assessment 27

5.1 Background Traffic Operations 27
5.1.1 Five-Year Horizon 27
5.1.2 Ten-Year Horizon 27
5.2 Total Traffic Operations 30
5.2.1 Five-Year Horizon 30
5.2.2 Ten-Year Horizon 30
5.3 Remedial Measures 34
5.3.1 Traffic Control Signal Warrant 34
5.3.2 Left-Turn Lane Warrants 34
5.3.3 Site Access Arrangement 35
5.3.4 Summary of Remedial Measures 36

6 Findings and Conclusions 38

6.1 Findings 38
6.2 Conclusions 39

Appendices

Appendix A	Pre-Study Consultation Materials
Appendix B	Traffic Data
Appendix C	Base Year Traffic Operations Reports
Appendix D	Background Development Material
Appendix E	Internal Capture Calculations Worksheets
Appendix F	Five-Year Background Traffic Operations Reports
Appendix G	Ten-Year Background Traffic Operations Reports
Appendix H	Five-Year Total Traffic Operations Reports
Appendix I	Ten-Year Total Traffic Operations Reports
Appendix J	Traffic Control Signal Warrant Worksheets
Appendix K	Left-Turn Lane Warrants

Figures

Figure 1.1: Location of Subject Site 2
Figure 2.1: Existing Lane Configuration and Traffic Control 5
Figure 2.2: Existing Trail Network 7
Figure 2.3: Proposed Active Transportation Network 8
Figure 2.4: Base Year Traffic Volumes 10
Figure 3.1: Draft Plan of Subdivision 14
Figure 4.1: Five-Year Background Traffic Volumes 19
Figure 4.2: Ten-Year Background Traffic Volumes 20
Figure 4.3: Site-Generated Traffic Volumes 24
Figure 4.4: Five-Year Total Traffic Volumes 25
Figure 4.5: Ten-Year Total Traffic Volumes 26

Tables

Table 2.1: Base Year Operations 12
Table 3.1: Minimum Sight Distances – TAC 15
Table 3.2: Observed Sight Distances 16
Table 4.1: Estimated Trip Generation 22
Table 4.2: Estimated Trip Distribution 23
Table 5.1: Five-Year Background Operations 28
Table 5.2: Ten-Year Background Operations 29
Table 5.3: Five-Year Total Operations 32
Table 5.4: Ten-Year Total Operations 33
Table 5.5: Westbound Left-Turn Lane Warrant Summary 37
Table 5.6: Eastbound Left-Turn Lane Warrant Summary 37

1 Introduction

1.1 Overview

Elora Greens Housing Developers retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact Study for a proposed development at 127 First Line in the community of Elora, Township of Centre-Wellington. **Figure 1.1** illustrates the location of the subject site on the south side of First Line, east of Bridge Street.

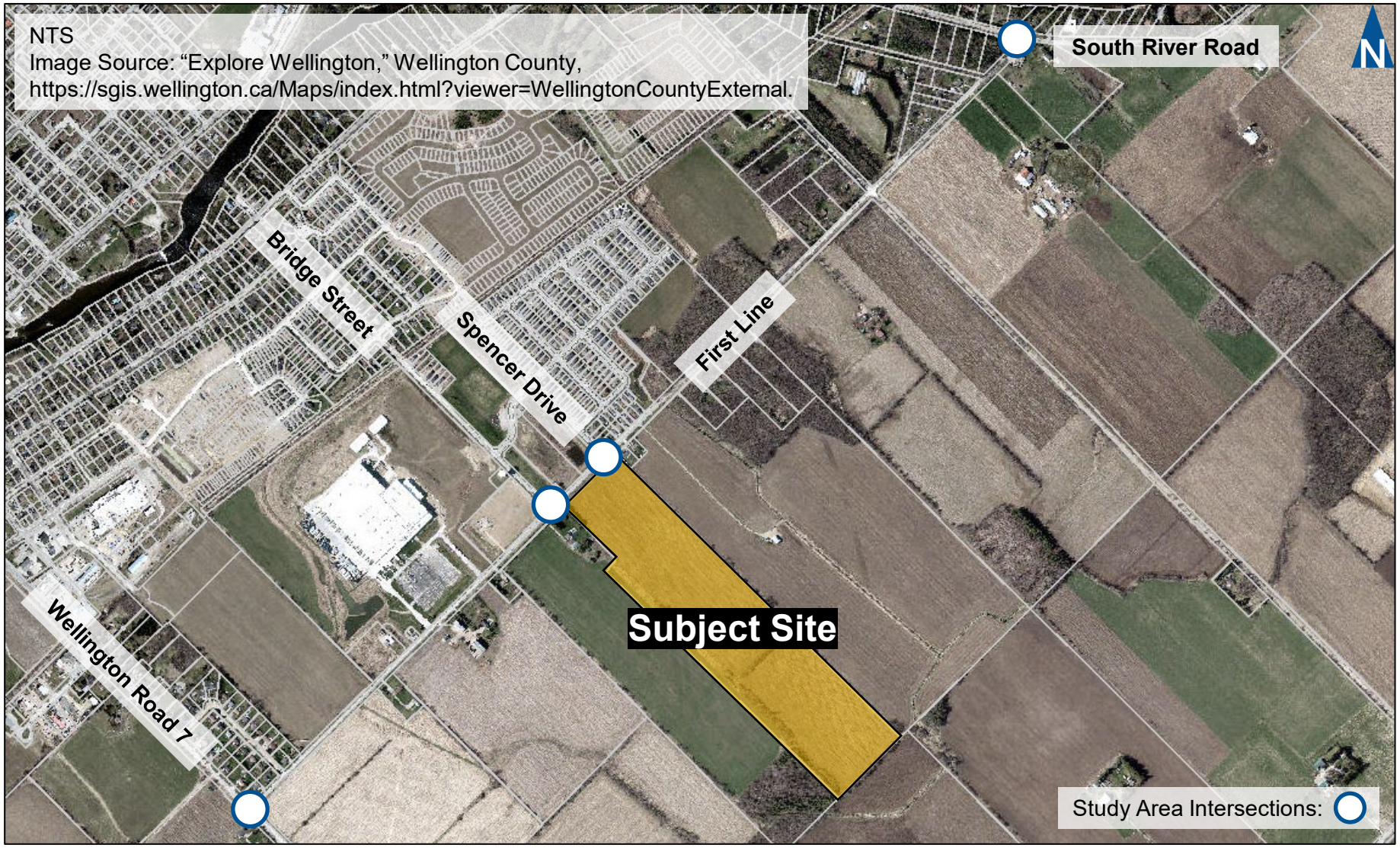
1.2 Purpose and Scope

The purpose of this study is to identify and assess the potential transportation impact(s) of the development on the surrounding transportation network. The scope of this study includes:

- An assessment of current and future traffic volumes and traffic operations at
  - First Line and Wellington Road 7 (roundabout);
  - First Line and Bridge Street (unsignalized);
  - First Line and Spencer Drive/Street A (unsignalized); and
  - First Line and South River Road (unsignalized).
- Estimates of future non-development (background) traffic growth and traffic generated by the proposed development (site-generated traffic);
- Analyses of future traffic operations and impacts on the surrounding road network at two horizon years: five- and ten-years from the date of this study; and
- The identification and/or recommendation of any necessary mitigation measures to manage future traffic conditions.

Paradigm attempted to confirm the scope of this study with Township and County staff via e-mail in July 2025 but was advised this request was considered premature given the nature of the application. In the absence of this pre-consultation with the Township and County, Paradigm has prepared this study in general accordance with the Wellington County *Traffic Impact Study Guidelines*.[1] **Appendix A** contains the pre-study consultation correspondence with the Township and County for reference.

[1] Dillon Consulting, *Wellington County Road Action Master Plan: Appendix G Traffic Impact Study Guidelines,* (Guelph: Wellington County, 2021).



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Location of Subject Site

127 First Line, Elora TIS
250480

Figure 1.1

2 Existing Conditions

2.1 Road Characteristics

The roads of interest in the study area include Township of Centre Wellington-governed First Line, South River Road, Bridge Street, and Spencer Drive and Wellington County governed Wellington Road 7. Each road is generally described as follows:

- **Wellington Road 7** is a two-lane arterial road[2] with one general purpose travel lane per direction. The road has a posted speed limit of 50 km/h at First Line but transitions to 80 km/h approximately 310 metres south of First Line. The road generally has a rural cross-section with no sidewalks provided on either side of the road. Between 160 Wellington Road 7 and 6412 Wellington Road 7, the road has an urban cross-section with sidewalks provided on both sides of the road;
- **First Line** is a two-lane collector road[3] with one general purpose travel lane per direction. Between Wellington Road 7 and 166 First Line, the road has a posted speed limit of 40 km/h. East of 166 First Line, the road has a posted speed limit of 60 km/h. In general, the road has a rural cross-section with no sidewalks provided on either side of the road. However, between Wellington Road 7 and Hill Street, the road has an urban cross-section with sidewalks provided on both sides of the road. Between 86 First Line and 154 First Line, the road features a partial urban cross-section with a sidewalk provided on the north side of the road;
- **South River Road** is a two-lane, collector road with one general purpose travel lane per direction. The road has a rural cross-section with no sidewalks provided on either side of the road. The posted speed limit is 50 km/h;
- **Bridge Street** is a two-lane local road with one general purpose travel lane per direction. The road has an urban cross-section with a sidewalk provided on the east side of the road. Between First Line and South Ridge Park, the speed limit is 50 km/h. North of South Ridge Park, the speed limit is 40 km/h; and
- **Spencer Drive** is a two-lane, local road with one general purpose travel lane per direction. The road has an urban cross-

[2] County of Wellington, *Official Plan Schedule B1 – Land Use Centre Wellington,* (Guelph: County of Wellington, 2025).

[3] WSP, *Township of Centre Wellington Transportation Master Plan Figure 12. Principal roadway classification in Elora and Fergus,* (Elora: Township of Centre Wellington, 2019).

section with a sidewalk provided on one side of the road. The posted speed limit is 50 km/h.

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

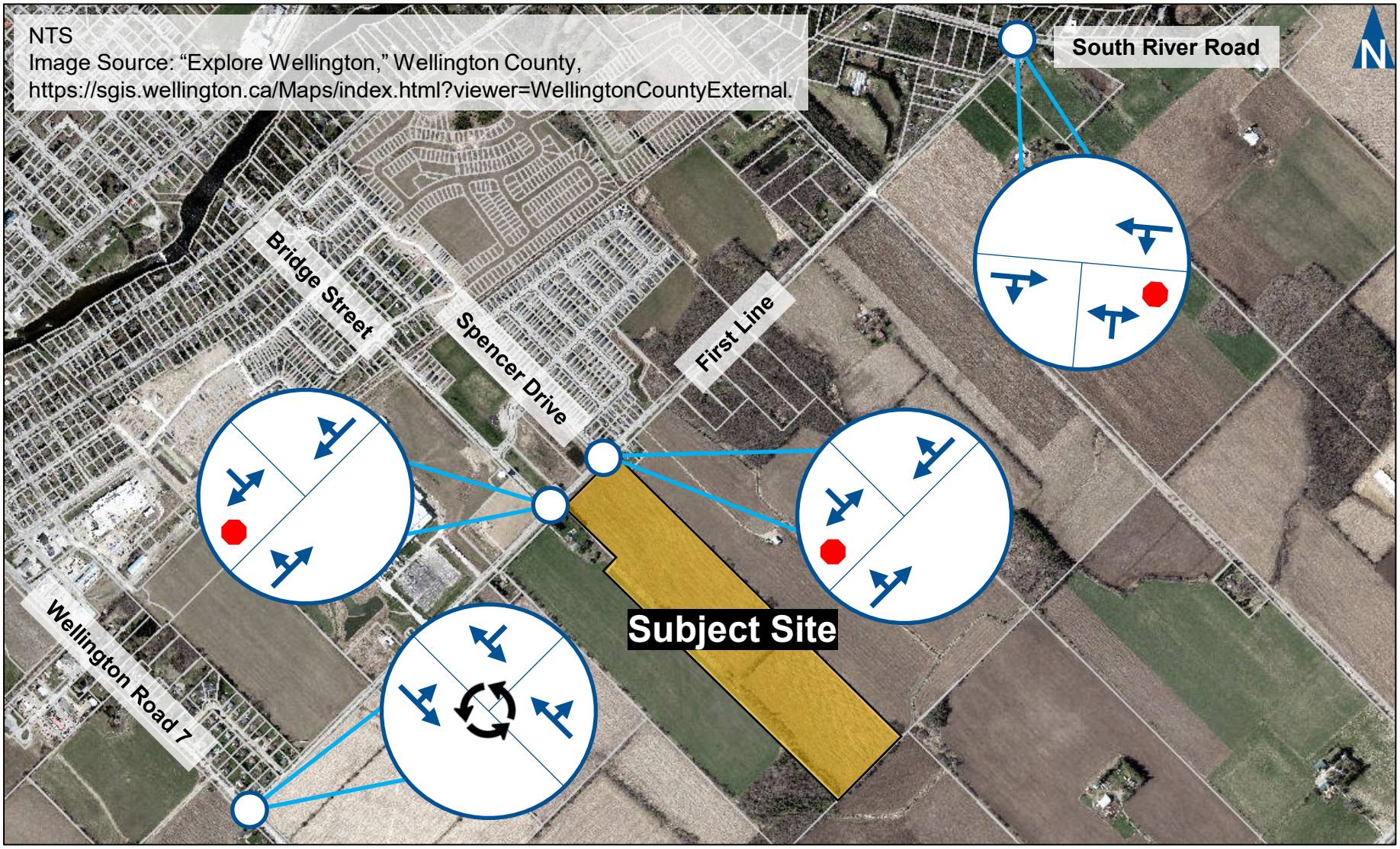
2.2 Transit Service

Guelph Owen Sound Transportation[4] provides public transit services between Guelph Central Station and the Owen Sound Transit Terminal, via stops in Elora, Fergus, Arthur, Mount Forest, Durham, Williamsford, and Chatsworth. The route operates every day of the week from 7:30 AM to 9:55 AM, 10:35 AM to 1:00 PM, 2:30 PM to 5:00 PM, and 5:30 PM to 7:50 PM. The closest bus stop is approximately 2.1 km northwest of the subject site (30-minute walk) at 25 Metcalfe Street.

Wellington County operates a county-wide on-demand based transit service, known as Ride Well.[5] This service is available to all residents and visitors. It uses a rideshare model to provide on-demand shared rides and operates Monday to Friday from 6:00 AM to 7:00 PM with bookings made from any address in Wellington County.

[4] "Guelph Owen Sound Transit (GOST)," City of Owen Sound, 2026, https://www.owensound.ca/roads-transportation/public-transit/guelph-owen-sound-transit-gost/.

[5] "Ride Well," County of Wellington, 2026, https://www.wellington.ca/programmes-services/transportation/ride-well.



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Existing Lane Configuration and Traffic Control

2.3 Active Transportation

Figure 2.2 and **Figure 2.3** illustrate the existing and proposed active transportation network near the subject site, respectively. The existing network includes:

- Paved shoulders on South River Road, which form part of the River Loop;
- A connection to the Grand Valley Trail and the Trails Loop along Bridge Street to the south of Murray Drive/Clarke Street;
- A north-south multi-use trail traversing through South Ridge Park;
- A recreation trail connecting First Line and McGowan Street; and
- A cycle lane running along the east side of Bridge Street between the Grand Valley Trail/the Trails Loop connection and First Line.

The proposed future network, as illustrated in the *Township of Centre Wellington Active Transportation and Mobility Plan*[6] is expected to include:

- A northward extension of the bicycle lane along Bridge Street to McNab Street;
- A multi-use path running along Wellington Road 7; and
- Neighbourhood bikeways running along Spencer Drive and McGowan Street.

[6] WSP and Stuckless Consulting Inc., *Township of Centre Wellington Active Transportation and Mobility Plan,* (Elora: Township of Centre Wellington, 2025).



NTS
Image Source: "Trails and Parks Dashboard," Township of Centre Wellington, https://centrewellington.maps.arcgis.com/apps/dashboards/1971e3fe4d134674ba35552697a1cec5.

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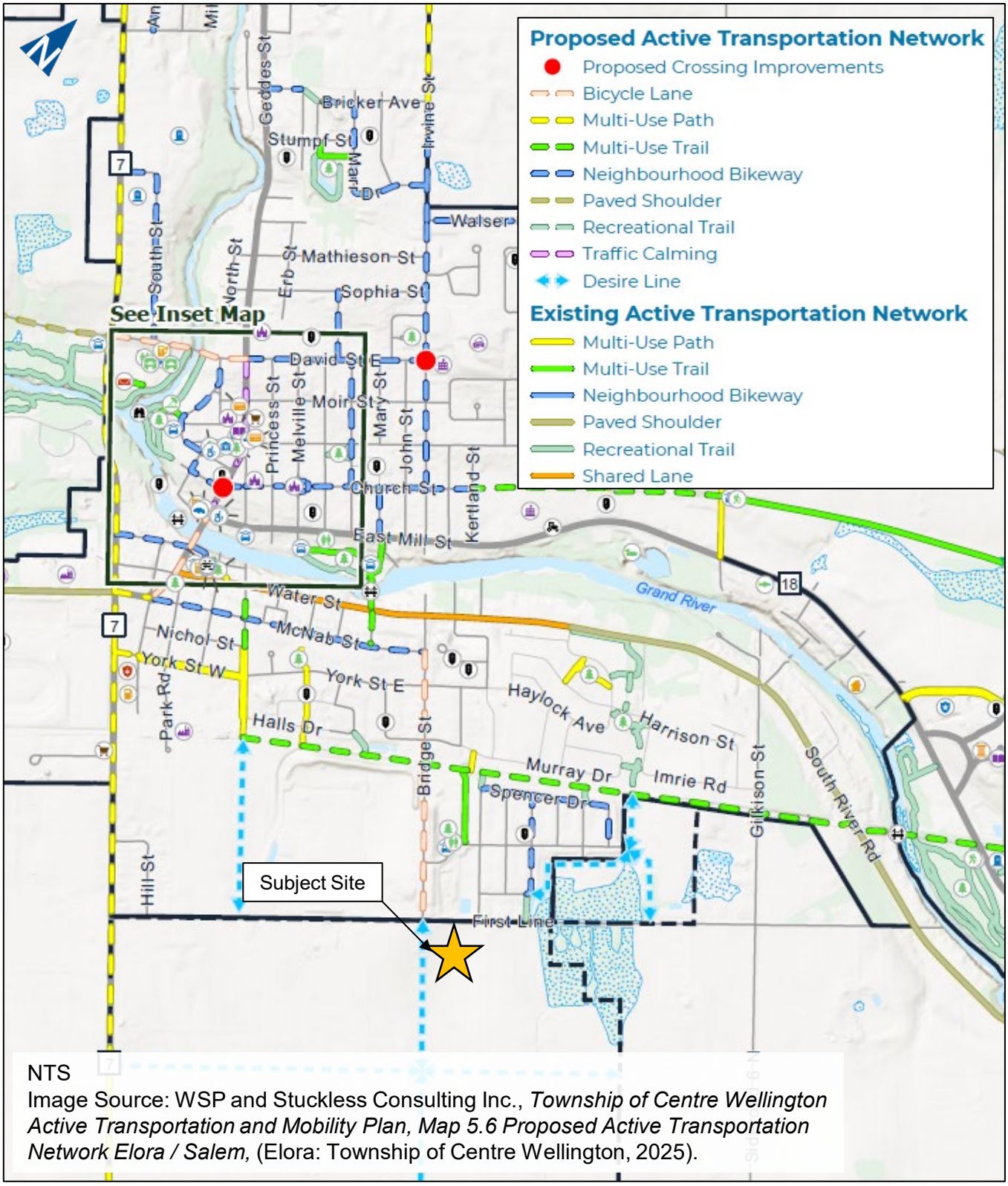
Existing Trail Network



NTS

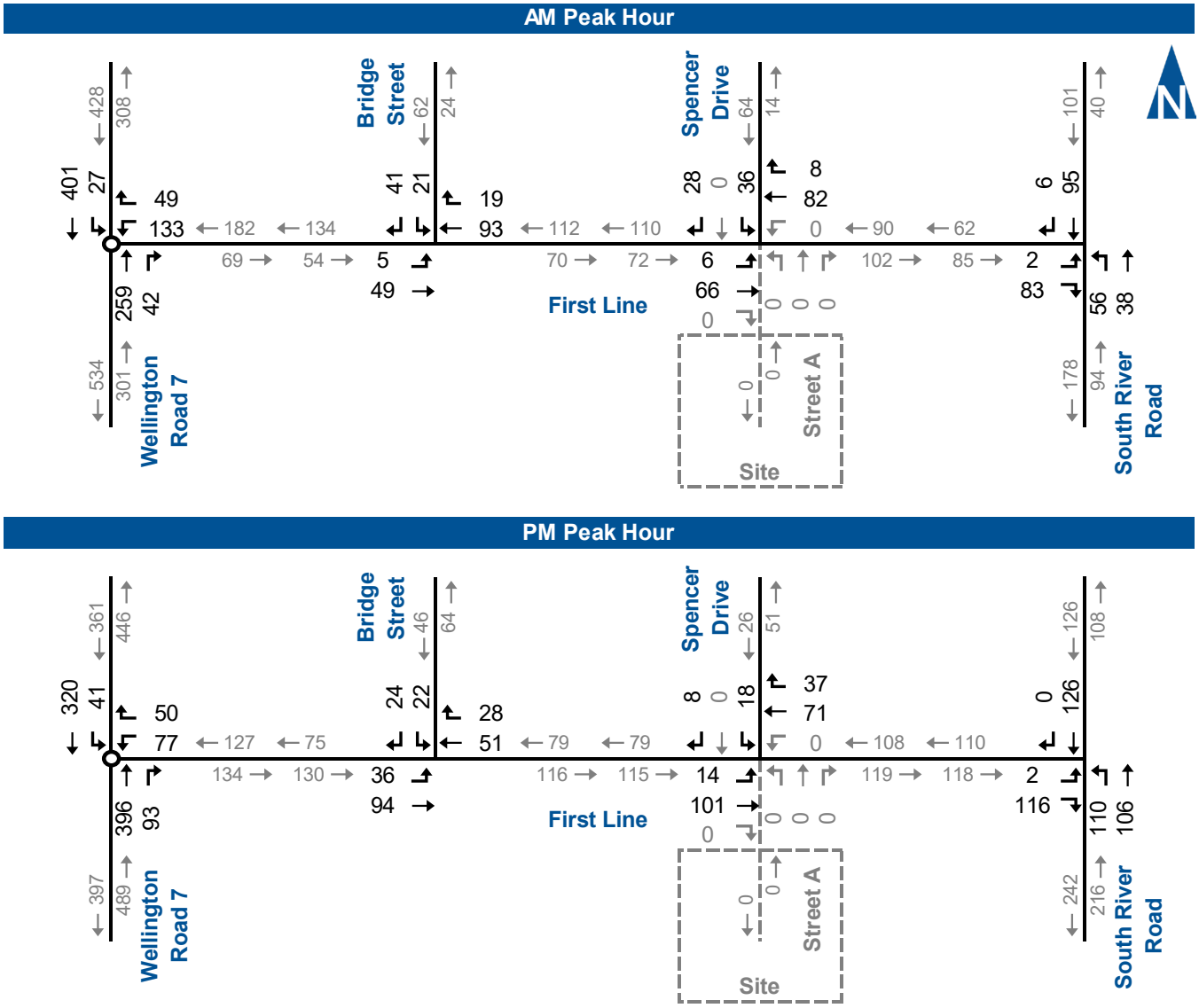
Image Source: WSP and Stuckless Consulting Inc., *Township of Centre Wellington Active Transportation and Mobility Plan, Map 5.6 Proposed Active Transportation Network Elora / Salem,* (Elora: Township of Centre Wellington, 2025).

Proposed Active Transportation Network

2.4 Traffic Volumes

Paradigm undertook eight-hour turning movement counts (TMCs) at the study area intersections on Wednesday, November 12, 2025, from 7:00 AM to 10:00 AM, 11:30 AM to 1:30 PM, and 3:00 PM to 6:00 PM. All vehicle, pedestrian, and cyclist movements were recorded in 15-minute intervals and vehicles classified by type. **Appendix B** contains the raw turning movement count data.

Figure 2.4 illustrates the 2025 base year weekday AM and weekday PM peak hour traffic volumes. No volume balancing has been applied to the existing traffic volumes because of the number of intersecting driveways and intersections between the study intersections (including Gilkison Street) which would be expected to account for any differences in traffic volumes throughout the study area.



Base Year Traffic Volumes

127 First Line, Elora TIS
250480

Figure 2.4

2.5 Traffic Operations

Intersection level of service (LOS) is a recognized method of quantifying the average delay experienced by drivers 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 intending 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 and intersection geometry.

The highest possible rating is LOS A, under which the average total delay is equal to or less than 10.0 seconds per vehicle. When the average delay exceeds 80 seconds for signalized intersections, 50 seconds for unsignalized intersections, or when the volume to capacity (v/c) ratio is greater than 1.00, the movement is classed as LOS F and remedial measures are usually implemented if they are feasible.

The existing level of service conditions have been assessed using Synchro 12 and Arcady 8, the latter of which is specific to roundabout analyses. The operational analyses reflect the existing lane configurations and traffic control at each intersection, and the base year traffic peak hour volumes. As noted in the Wellington County TIS guidelines, movements are considered critical where:

- Volume to capacity ratios for overall intersection operations, through movements or shared through/turning movements exceed 0.85 (signalized intersections);
- V/C ratios for dedicated turning movements exceed 0.90 (signalized intersections);
- LOS E or F for the global performance at unsignalized intersections; and
- 95th percentile queue lengths for individual movements exceed available lane storage.[7]

Table 2.1 summarizes the existing intersection operations in the weekday AM peak hour and weekday PM peak hour. The entries in the table indicate the level of service (LOS), delay, volume to capacity (v/c) ratio, and 95th percentile queue for each movement.

The results of the analysis indicate all study area intersections are operating at acceptable levels of service during both the weekday AM peak hour and weekday PM peak hour. No critical movements are noted. **Appendix C** contains the detailed Synchro and Arcady reports.

[7] Dillon Consulting, *Wellington County Road Action Master Plan: Appendix G Traffic Impact Study Guidelines,* (Guelph: Wellington County, 2021), 7.

TABLE 2.1: BASE YEAR 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	South River Road & First Line	TWSC	LOS Delay V/C Q	A 9 0.113		> > > >	**A** **9**					A 8 0.041	A 0 0.000		**A** **4**		A 0 0.000	A 0 0.000	**A** **0**	
	First Line & Spencer Drive	TWSC	LOS Delay V/C Q	A 8 0.010	A 0 0.000		**A** **1**		A 0 0.000	A 0 0.000	**A** **0**					A 10 0.092		> > > >	**A** **10**	
	First Line & Bridge Street	TWSC	LOS Delay V/C Q	A 8 0.000	A 0 0.000		**A** **1**		A 0 0.000	A 0 0.000	**A** **0**					A 9 0.082		> > > >	**A** **9**	
	Wellington Road 7 & First Line	Roundabout	LOS Delay V/C Q					A 4 0.168		> > > >	**A** **4**		A 4 0.248	> > > >	**A** **4**	< < < <	A 5 0.368		**A** **5**	**A** **4**
PM Peak Hour	South River Road & First Line	TWSC	LOS Delay V/C Q	A 10 0.144		> > > >	**A** **10**					A 8 0.082	A 0 0.000		**A** **4**		A 0 0.000	A 0 0.000	**A** **0**	
	First Line & Spencer Drive	TWSC	LOS Delay V/C Q	A 7 0.010	A 0 0.000		**A** **1**		A 0 0.000	A 0 0.000	**A** **0**					A 10 0.031		> > > >	**A** **10**	
	First Line & Bridge Street	TWSC	LOS Delay V/C Q	A 7 0.021	A 0 0.000		**A** **2**		A 0 0.000	A 0 0.000	**A** **0**					A 10 0.062		> > > >	**A** **9**	
	Wellington Road 7 & First Line	Roundabout	LOS Delay V/C Q					A 4 0.128		> > > >	**A** **4**		A 5 0.388	> > > >	**A** **5**	< < < <	A 4 0.288		**A** **4**	**A** **4**

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared Movement

3 Site Description and Development Concept

3.1 Site Description

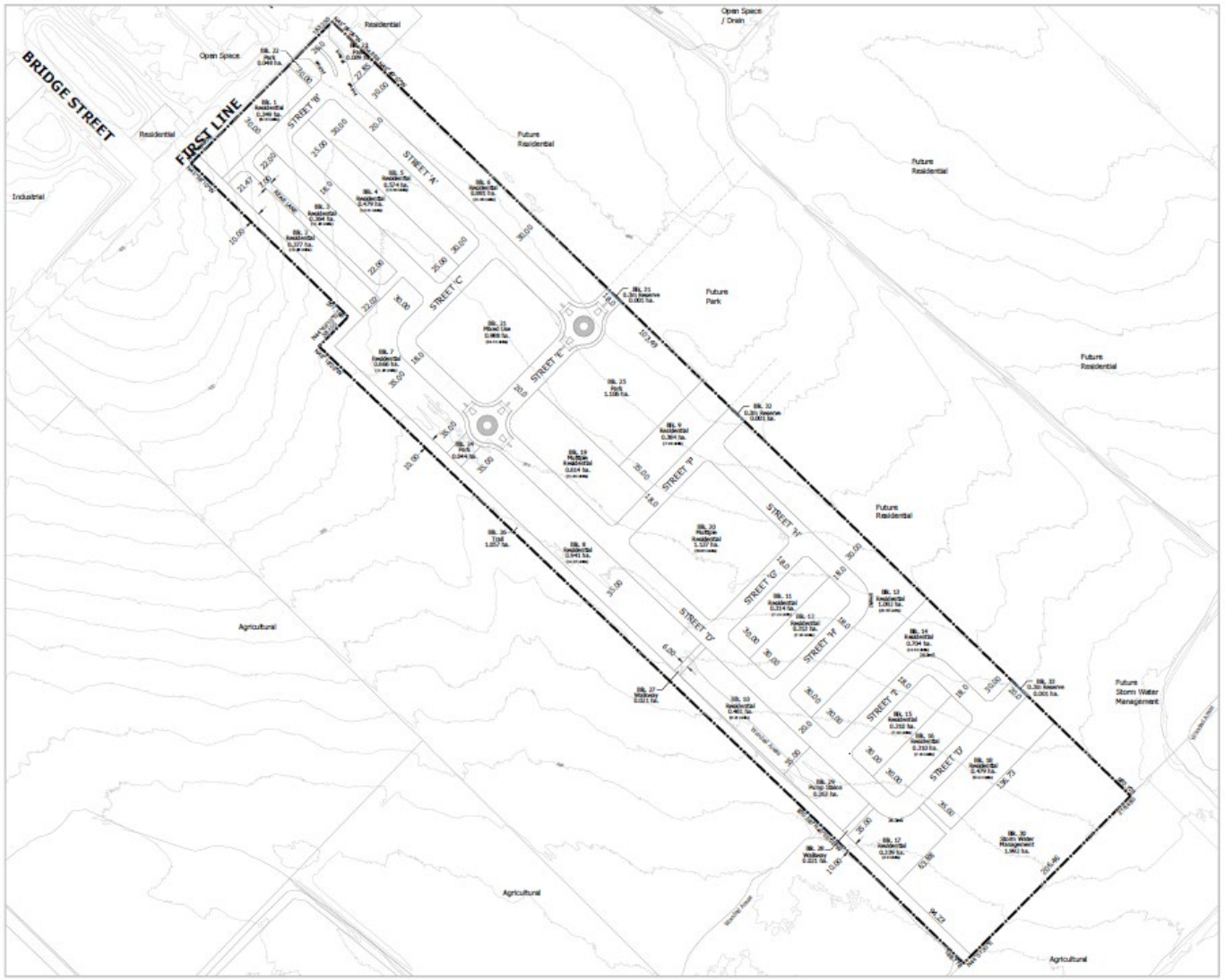
The subject site is on vacant lands known municipally as 127 First Line, on the south side of First Line, east of Bridge Street in Elora, ON. Land uses to the north are predominantly residential, while employment/industrial land uses are located to the west (on the north side of First Line). The lands along the south side of First Line are exclusively agricultural, save for a handful of low-density residential lots.

3.2 Development Description

Development of the subject site is proposed to include a mix of residential uses and commercial uses consisting of:

- Up to 200 mixed-use residential units with approximately 1,860 m^2 (20,021 sq. ft.) of commercial/office space;
- 202 to 472 low-density residential units; and
- 60 to 131 multifamily residential units.

Vehicle access is proposed via a new street connection to First Line (herein referred to as Street A). This connection is proposed opposite Spencer Drive, with an additional internal connection to future development east of the property. **Figure 3.1** illustrates the draft plan of subdivision for the site.



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Draft Plan of Subdivision

127 First Line, Elora TIS
250480

Figure 3.1

3.3 Sight Distance Assessment

Paradigm has assessed the available sight distance at the proposed Street A connection to First Line in accordance with guidance published in the Transportation Association of Canada (TAC) *Geometric Design Guide for Canadian Roads (*TAC *GDGCR)*.[8]

The TAC *GDGCR* defines minimum sight distances based on the design speed of the road; typically, 10 km/h to 20 km/h above the posted or default speed limit. TAC publishes both stopping sight distance (representing that for vehicles on First Line approaching Street A) and intersection sight distance (for vehicles exiting Street A). Intersection sight distances are based on applicable time gaps for both the specific movement (left-turn, right-turn, crossing road) and the design vehicle (passenger car, single unit truck, and combination truck).

Table 3.1 summarizes the minimum sight distances published by TAC at a design speed of 50 km/h, which is 10 km/h above the posted speed limit on First Line.

TABLE 3.1: MINIMUM SIGHT DISTANCES – TAC

Sight Distance Measurement	Minimum Sight Distance (50 km/h Design Speed)
Minimum Stopping Sight Distance[9]	65 metres
Intersection Sight Distance[10] (Left Turn from Stop)	105 metres
Intersection Sight Distance[11] (Right Turn from Stop)	95 metres
Intersection Sight Distance[12] (Left Turn from Major Road)	80 metres

Paradigm staff conducted a site visit on Tuesday, October 28, 2025, to review the available sight distance at the proposed Street A

8 TAC, "Intersections," Chap. 9 in *Geometric Design Guide for Canadian Roads,* (Ottawa: TAC, 2017).
9 Ibid. *Table 2.5.2: Stopping Sight Distance on Level Roadways for Automobiles.*
10 Ibid. *Table 9.9.4: Design Intersection Sight Distance – Case B1, Left Turn from Stop.*
11 Ibid. *Table 9.9.6: Design Intersection Sight Distance – Case B2, Right Turn from Stop.*
12 Ibid. *Table 9.9.4: Design Intersection Sight Distance – Case F, Left Turn from the Major Road.*

connection. The assessments reflect the following parameters as defined by TAC:

- Object Height (vehicle tail or brake light): 0.60 metres
- Driver Eye Height (Passenger Car): 1.08 metres; and
- Top of (Passenger) Car: 1.30 metres

West of Spencer Drive, First Line is relatively straight; however, a vertical curve is present at the intersection with Bridge Street. East of Spencer Drive, First Line has a relatively straight and flat profile.

Table 3.2 summarizes the observed sight distances. The findings of the assessment indicate that the proposed Street A connection to the intersection of First Line and Spencer Drive meets the minimum sight distances defined by TAC.

TABLE 3.2: OBSERVED SIGHT DISTANCES

Sight Distance Measurement	Field Measurement	Meets Minimum Sight Distance
Minimum Stopping Sight Distance (westbound)	>160 metres	Yes
Minimum Stopping Sight Distance (eastbound)	190 metres	Yes
Intersection Sight Distance (Left Turn from Stop)	>160 metres (looking right) 190 metres (looking left)	Yes
Intersection Sight Distance (Right Turn from Stop)	190 metres (looking left)	Yes
Intersection Sight Distance (Left Turn from Major Road)	190 metres (looking west)	Yes

4 Future Conditions

4.1 Horizon Years

The assessment of the future traffic conditions reflects two horizon years: five-years from the date of this study (2031) and ten-years from the date of this study (2036).

4.2 Road Improvements

The future road network shown in the Township of Centre Wellington *Transportation Master Plan (TMP)* includes a planned collector road between Elora and Fergus intended as an extension of Gilkison Street, and which will parallel South River Road eastward to Fergus.[13] This additional road connection would be expected to alter traffic volumes and travel patterns at both South River Road and First Line, and Gilkison Street/Sideroad 6 North and First Line by diverting traffic away from First Line and South River Road.

The TMP does not specify the design characteristics of the road (for example, the number of lanes) or the anticipated timing. For the purposes of this study, no changes to the existing lane configurations and traffic control at the study area intersections are assumed under future conditions.

4.3 Forecast Background Traffic

The future background traffic volumes estimated in this study reflect an annual growth rate of 2.34% applied to the base year volumes. This growth rate is based on (and consistent with) that used in the 2017 TIS[14] for the nearby Youngblood and Haylock subdivision, which is located north of the study area between South River Road and the Trestle Bridge Trail.

It is acknowledged that additional development is planned within the Youngblood and Haylock subdivision because the subdivision was not fully built out at the time of writing. It is assumed that the 2.34% growth rate captures outstanding development of the subdivision, as well as potential development outside of the study area.

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[13] WSP, *Township of Centre Wellington Transportation Master Plan Figure 35. Preferred 2041 Road Network for Centre Wellington,* (Elora: Township of Centre Wellington, 2019), 73.

[14] Paradigm Transportation Solutions Limited, *Haylock and Youngblood – Elora Transportation Impact Study Update,* (Waterloo: PTSL, 2017).



In addition to this generalized background traffic growth rate, the background traffic forecasts include traffic generated from the proposed development of the neighbouring lands at 159 First Line directly east of the subject site. Based on the development statistics from a preliminary concept plan obtained by Paradigm staff, the development of 159 First Line is understood to consist of 413 to 542 residential units (comprising 351 to 480 low-density units and 62 medium-density units).

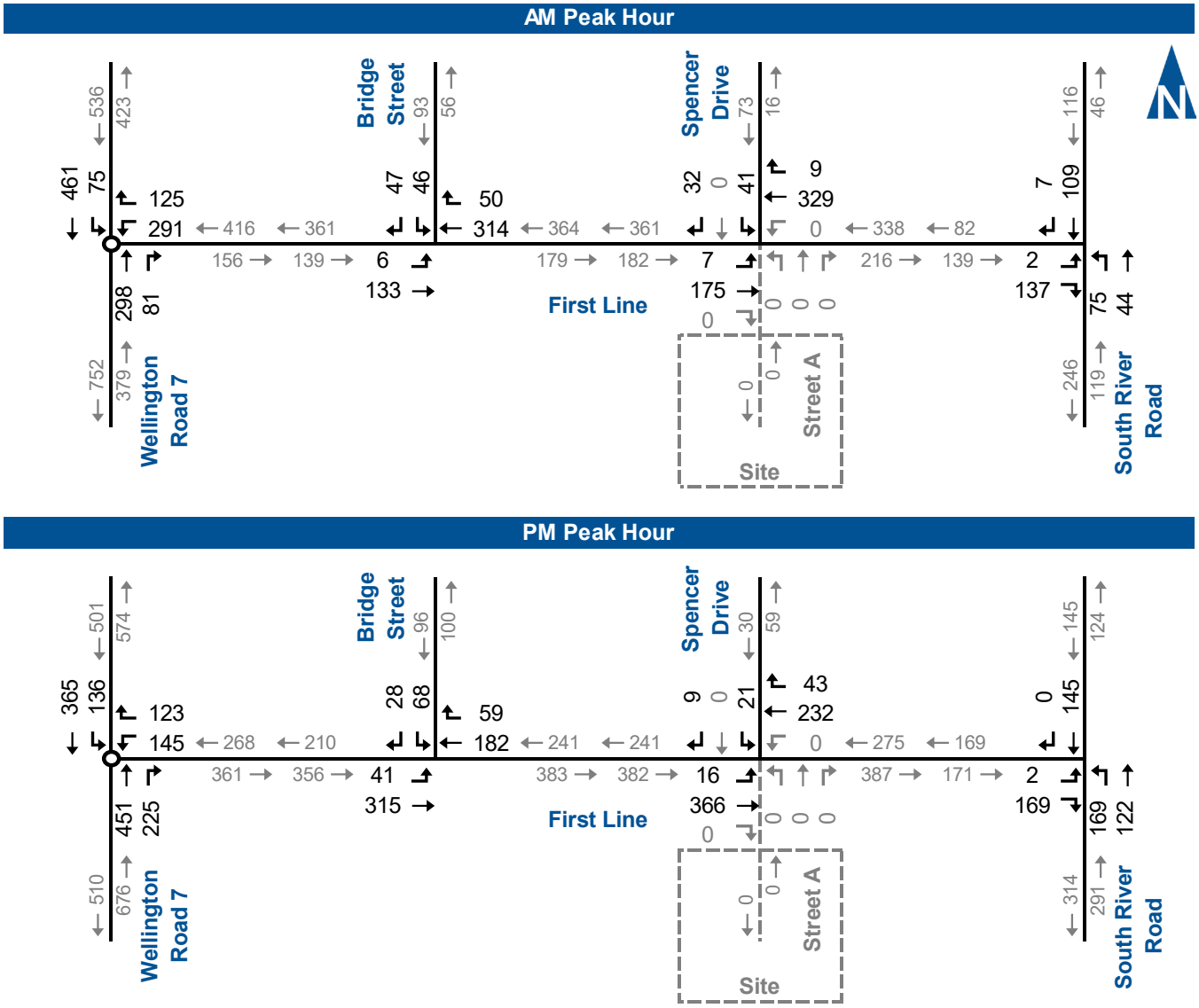
The mixed-use blocks for 159 First Line are planned to include an unknown area of commercial uses. However, Township of Centre Wellington Zoning By-Law 2009-045[15] specifies that developments inside Neighbourhood Commercial (C3) zones are permitted up to 40% lot coverage. With the mixed-use blocks proposed at a combined total of 1.75 hectares, the gross floor area (GFA) for the commercial component could approach 75,347 sq. ft., assuming a single storey of commercial land uses.

Given the small-town setting of the study area, the general proportion of residential to non-residential blocks, and the incorporation of only low to medium-density residential uses, it is considered unlikely that the commercial land use(s) on the mixed-use blocks for 159 First Line would be in the range of 75,000 sq. ft. GFA. To estimate the trip generation activity for the commercial land use(s) at 159 First Line, Paradigm has assumed a total gross floor area of 9,000 sq. ft. which is the minimum GFA that will fit within industry published data boundaries for the applicable land use during both the weekday AM and weekday PM peak hours.

Trip generation estimates developed for 159 First Line (based on the ITE *Trip Generation Manual*) indicate this development is forecast to generate 387 trips in the weekday AM peak hour and 465 trips in the weekday PM peak hour. These estimates reflect the upper limit of the residential unit count. **Appendix D** contains the background development traffic volumes and material.

Figure 4.1 and **Figure 4.2** illustrate the estimated weekday AM peak hour and weekday PM peak hour traffic volumes at the five-year background traffic horizon and ten-year background traffic horizon, respectively. The assignment of site-generated traffic for 159 First Line follows the trip distribution methodology described in **Section 4.4.2**.

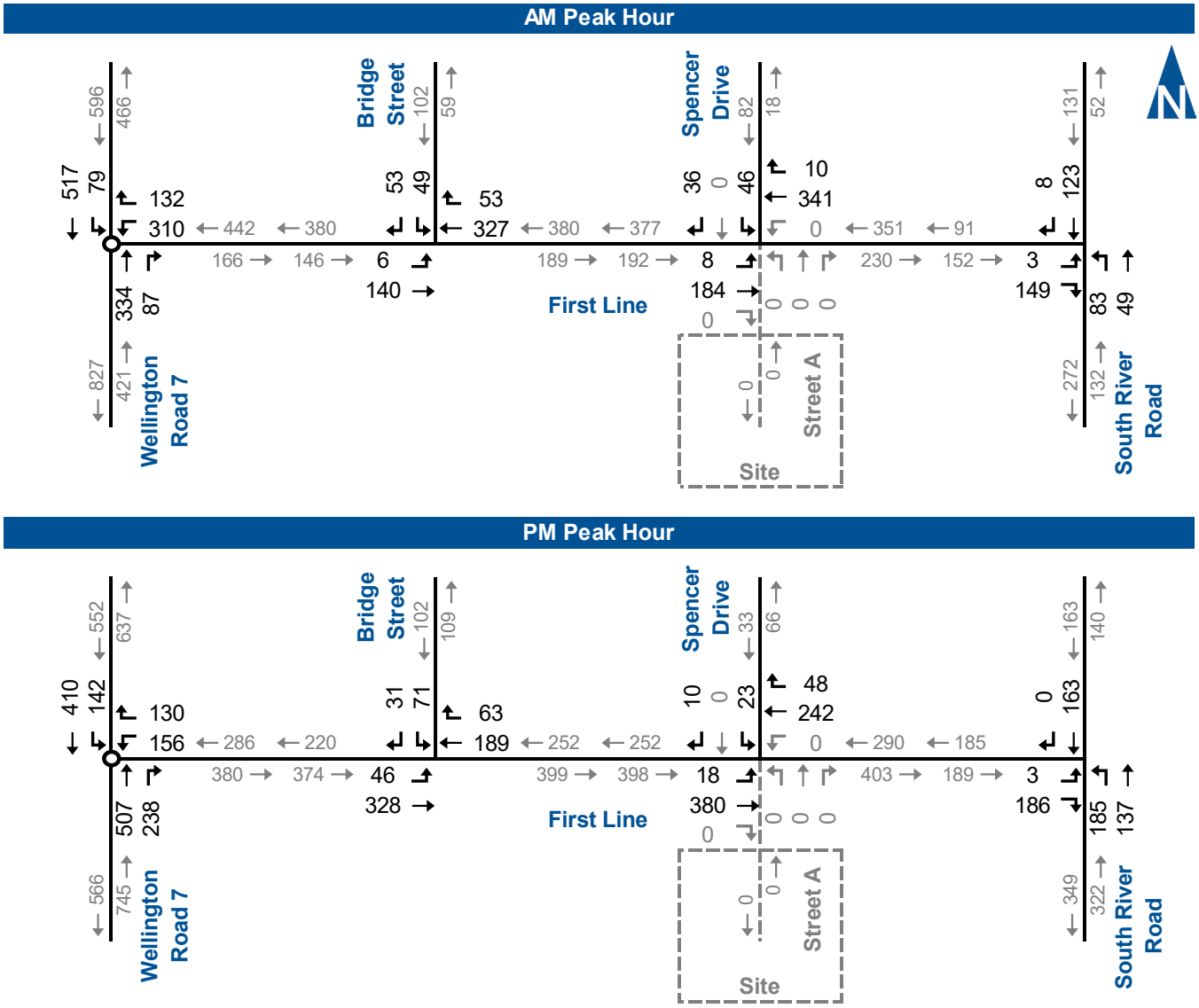
[15] Township of Centre Wellington Zoning By-Law 2009-045, Part 10 Commercial Zones.



Five-Year Background Traffic Volumes

127 First Line, Elora TIS
250480

Figure 4.1



Ten-Year Background Traffic Volumes

127 First Line, Elora TIS
250480

Figure 4.2

4.4 Forecast Site Traffic

4.4.1 Trip Generation

The estimated site trip generation is based on data published in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*.[16] The following land use codes (LUCs) have been used in developing the estimates:

- LUC 210 – Single-Family Detached Housing for the low-density residential units;
- LUC 220 – Multifamily Housing (Low-Rise) for the mixed-use and multifamily residential units; and
- LUC 822 – Strip Retail Plaza (<40k) for the commercial/office uses.

To present a conservative estimate of the site trip generation for the residential component, the upper limit of the residential unit count has been considered in the calculations.

The base trip generation estimates for the residential land uses reflect the regression equations published for both LUC 210 and LUC 220, whereas average rates have been used for LUC 822. ITE does not publish a regression equation for LUC 822 during the weekday AM peak hour, and the published regression equation for LUC 822 during the weekday PM peak hour has a coefficient of determination (R^2 value) with an undesirable fit.

Given the mixed-use nature of the development, the trip generation calculations include an estimate of trips internal to the site. These are trips completed between the residential and commercial/office land uses, but which remain within the site. An example is a resident walking to the site's commercial area. These trips do not add vehicular traffic to the surrounding road network. Estimates of internal trips are based on the National Cooperative Highway Research Program (NCHRP) 8-51 Internal Capture Estimation Tool. **Appendix E** contains the internal capture calculations for the development.

The trip generation estimates also include a calculation of pass-by trips, which are a subset of trip generation that only apply to commercial and retail land uses. Pass-by trips represent a portion of the existing traffic using a road that may stop at a business along a route, for example, a motorist driving home from work and stopping at a coffee shop. They do not load additional traffic onto the road network

[16] Institute of Transportation Engineers, *Trip Generation Manual,* 12th ed., (Washington DC: ITE, 2025).

but represent a reassignment of existing traffic on a road. ITE does not publish pass-by rates for LUC 822 but does for LUC 821. Both land use codes reflect commercial shopping plaza type land uses but categorized by size. In the absence of a pass-by rate for LUC 822, Paradigm has applied the published pass-by rate for LUC 821 (40%). Pass-by rates are only published for the weekday PM peak hour.

Table 4.1 summarizes the trip generation estimates and indicates the site is forecast to generate 520 trips in the weekday AM peak hour and 617 trips in the weekday PM peak hour.

TABLE 4.1: ESTIMATED TRIP GENERATION

LUC	Size	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
210	472 Units	87	235	**322**	249	152	**401**
220	331 Units	31	98	**129**	103	63	**166**
822	20,021 sq. ft.	43	36	**79**	63	63	**126**
Total Trip Generation		**161**	**369**	**530**	**415**	**278**	**693**
Internal Capture		*-5*	*-5*	***-10***	*-22*	*-22*	***-44***
Pass-by Trips		*0*	*0*	***0***	*-16*	*-16*	***-32***
Net Trip Generation		***156***	***364***	***520***	***377***	***240***	***617***

LUC 210: AM – T = 0.67(X) + 5.59 | PM – Ln(T) = 0.92 Ln(X) + 0.33
LUC 220: AM – T = 0.35(X) + 12.93 | PM – T = 0.48(X) + 7.35
LUC 822: AM – Average Rate = 3.93 | PM – Average Rate = 6.29

4.4.2 Trip Distribution and Assignment

The trip distribution used for this study is based on the existing travel patterns observed from the turning movement count data outlined in **Section 2.4**. The use of existing travel patterns is considered appropriate because the land uses of the proposed development are consistent with the existing land uses adjacent to the site. The existing travel patterns are also reflective of general commuter travel patterns in Elora. **Table 4.2** summarizes the estimated trip distribution.

TABLE 4.2: ESTIMATED TRIP DISTRIBUTION

Origin/Destination	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
North via Wellington Road 7	40%	25%	30%	35%
North via Bridge Street	20%	10%	15%	15%
South via Wellington Road 7	30%	50%	40%	30%
South via South River Road	10%	15%	15%	20%
Total	**100%**	**100%**	**100%**	**100%**

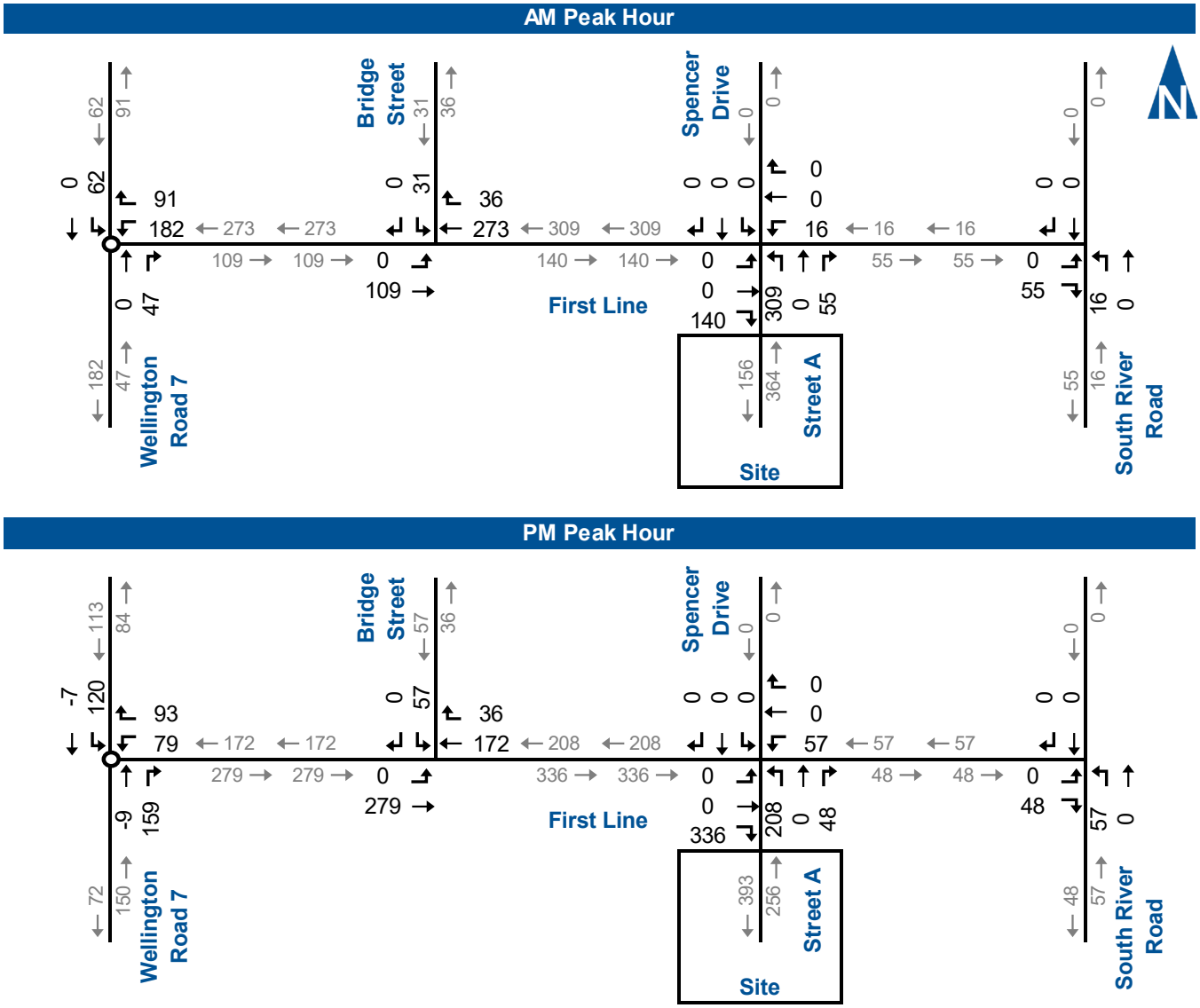
The trip distribution and assignment do not illustrate trips to or from the north via South River Road because these trips are assumed to use Bridge Street as a more direct route. Use of South River Road for these trips would represent backtracking via First Line.

To provide a conservative analysis of traffic operations on Street A, the trip assignment assumes no internal connection with the neighbouring lands at 159 First Line. The timing of that development remains unknown, such that this connection may or may not be available as an alternate route to First Line. **Figure 4.3** illustrates the trip assignments for the weekday AM peak hour and weekday PM peak hour.

4.5 Future Total Traffic

The future total traffic volumes represent the sum of the site-generated traffic volumes (**Figure 4.3**) and the background traffic volumes (**Figure 4.1** and **Figure 4.2**).

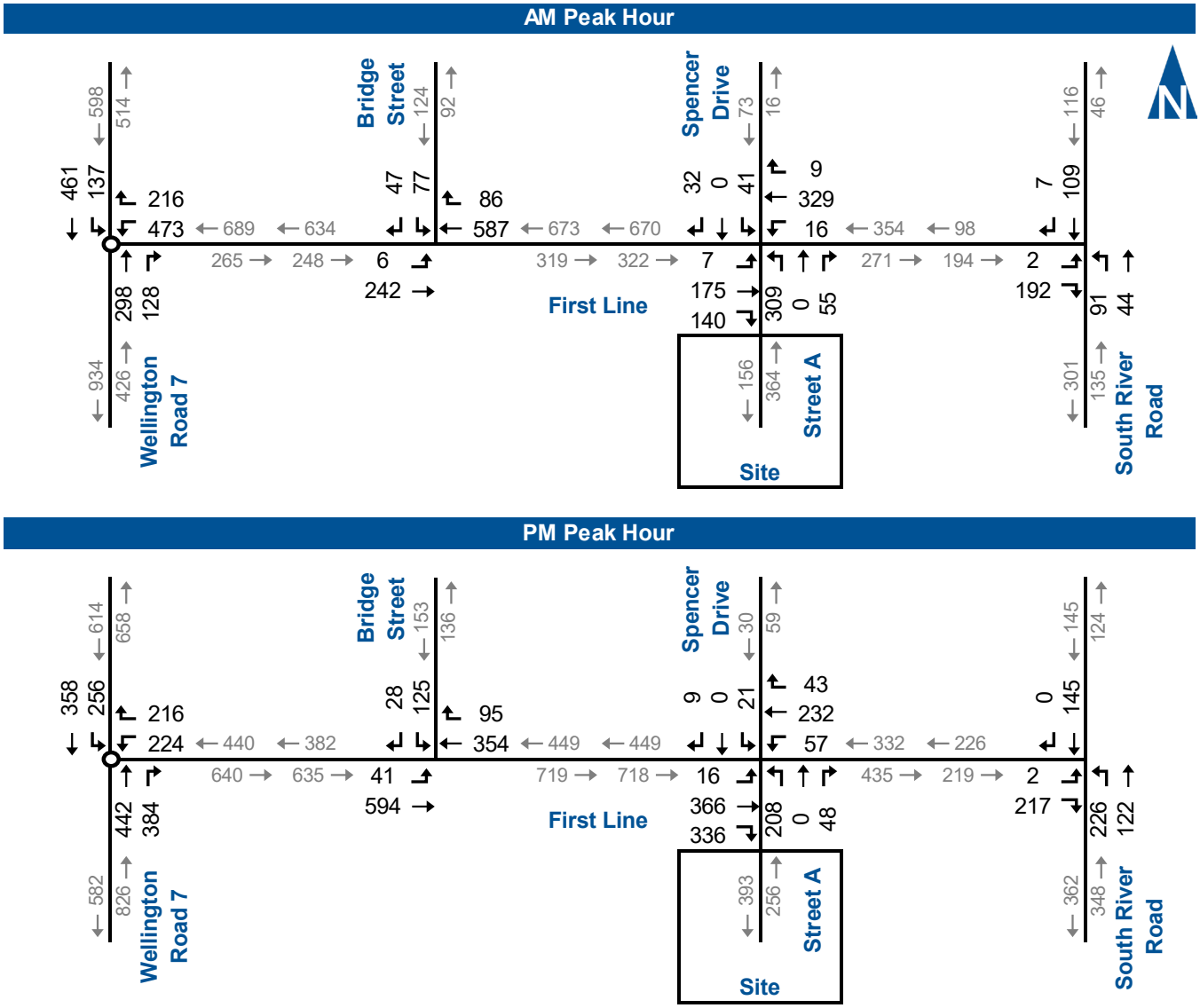
Figure 4.4 and **Figure 4.5** illustrate the estimated weekday AM peak hour and weekday PM peak hour traffic volumes at the five-year total traffic horizon and ten-year total traffic horizon, respectively.



Site-Generated Traffic Volumes

127 First Line, Elora TIS
250480

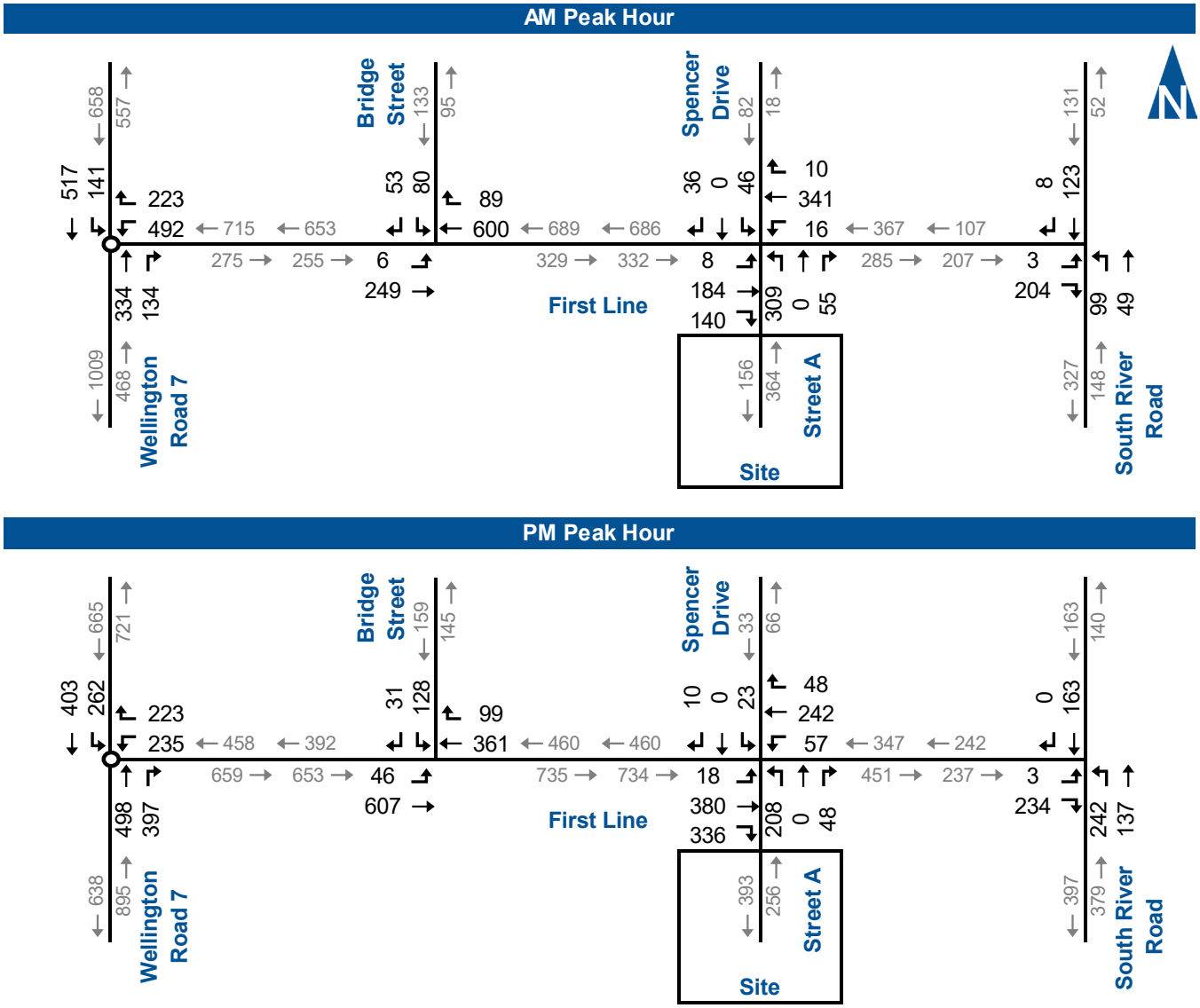
Figure 4.3



Five-Year Total Traffic Volumes

127 First Line, Elora TIS
250480

Figure 4.4



Ten-Year Total Traffic Volumes

127 First Line, Elora TIS
250480

Figure 4.5

5 Traffic Operations Assessment

5.1 Background Traffic Operations

The analysis of background traffic conditions uses the same methodology as existing traffic conditions. The following sub-sections summarize the estimated background traffic operations at each horizon year.

5.1.1 Five-Year Horizon

Table 5.1 summarizes the five-year background traffic level of service conditions. All study area intersections are forecast to operate at acceptable levels of service, and within capacity, during both the weekday AM peak hour and weekday PM peak hour. No critical movements are forecast at any of the study intersections. **Appendix F** contains the detailed Synchro and Arcady reports.

5.1.2 Ten-Year Horizon

Table 5.2 summarizes the ten-year background traffic level of service conditions. All study area intersections are forecast to operate at acceptable levels of service, and within capacity, during both the weekday AM peak hour and weekday PM peak hour. No critical movements are forecast at any of the study intersections. **Appendix G** contains the detailed Synchro and Arcady reports.

TABLE 5.1: FIVE-YEAR BACKGROUND 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	South River Road & First Line	TWSC	LOS Delay V/C Q	A 10 0.18 5		> > > >	**A** **10**					A 8 0.06 2	A 0 0.00 0		**A** **5**		A 0 0.00 0	A 0 0.00 0	**A** **0**	
	First Line & Spencer Drive	TWSC	LOS Delay V/C Q	A 9 0.01 0	A 0 0.00 0		**A** **0**		A 0 0.00 0	A 0 0.00 0	**A** **0**					B 13 0.16 4		> > > >	**B** **13**	
	First Line & Bridge Street	TWSC	LOS Delay V/C Q	A 8 0.01 0	A 0 0.00 0		**A** **0**		A 0 0.00 0	A 0 0.00 0	**A** **0**					B 13 0.18 5		> > > >	**B** **13**	
	Wellington Road 7 & First Line	Roundabout	LOS Delay V/C Q					A 6 0.38 8		> > > >	**A** **6**		A 4 0.31 8	> > > >	**A** **4**	< < < <	A 7 0.48 8		**A** **7**	**A** **6**
PM Peak Hour	South River Road & First Line	TWSC	LOS Delay V/C Q	B 10 0.20 6		> > > >	**B** **10**					A 8 0.12 3	A 0 0.00 0		**A** **5**		A 0 0.00 0	A 0 0.00 0	**A** **0**	
	First Line & Spencer Drive	TWSC	LOS Delay V/C Q	A 8 0.01 0	A 0 0.00 0		**A** **0**		A 0 0.00 0	A 0 0.00 0	**A** **0**					B 13 0.06 2		> > > >	**B** **13**	
	First Line & Bridge Street	TWSC	LOS Delay V/C Q	A 8 0.03 1	A 0 0.00 0		**A** **1**		A 0 0.00 0	A 0 0.00 0	**A** **0**					B 14 0.19 5		> > > >	**B** **14**	
	Wellington Road 7 & First Line	Roundabout	LOS Delay V/C Q					A 5 0.25 8		> > > >	**A** **5**		A 7 0.55 10	> > > >	**A** **7**	< < < <	A 5 0.41 8		**A** **5**	**A** **6**

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared Movement

TABLE 5.2: TEN-YEAR BACKGROUND 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	South River Road & First Line	TWSC	LOS	B		>	**B**					A	A		**A**		A	A	**A**	
			Delay	10		>	**10**					8	0		**5**		0	0	**0**	
			V/C	0.20		>						0.07	0.00				0.00	0.00		
			Q	6		>						2	0				0	0		
	First Line & Spencer Drive	TWSC	LOS	A	A		**A**		A	A	**A**					B		>	**B**	
			Delay	9	0		**0**		0	0	**0**					14		>	**14**	
			V/C	0.01	0.00				0.00	0.00						0.18		>		
			Q	0	0				0	0						5		>		
	First Line & Bridge Street	TWSC	LOS	A	A		**A**		A	A	**A**					B		>	**B**	
			Delay	8	0		**0**		0	0	**0**					13		>	**13**	
			V/C	0.01	0.00				0.00	0.00						0.21		>		
			Q	0	0				0	0						6		>		
	Wellington Road 7 & First Line	Roundabout	LOS					A		>	**A**		A	>	**A**	<	A		**A**	**A**
			Delay					6		>	**6**		5	>	**5**	<	7		**7**	**6**
			V/C					0.41		>			0.34	>		<	0.54			
			Q					8		>			8	>		<	10			
PM Peak Hour	South River Road & First Line	TWSC	LOS	B		>	**B**					A	A		**A**		A	A	**A**	
			Delay	10		>	**10**					8	0		**5**		0	0	**0**	
			V/C	0.23		>						0.14	0.00				0.00	0.00		
			Q	7		>						4	0				0	0		
	First Line & Spencer Drive	TWSC	LOS	A	A		**A**		A	A	**A**					B		>	**B**	
			Delay	8	0		**0**		0	0	**0**					13		>	**13**	
			V/C	0.01	0.00				0.00	0.00						0.07		>		
			Q	0	0				0	0						2		>		
	First Line & Bridge Street	TWSC	LOS	A	A		**A**		A	A	**A**					B		>	**B**	
			Delay	8	0		**1**		0	0	**0**					14		>	**14**	
			V/C	0.04	0.00				0.00	0.00						0.21		>		
			Q	1	0				0	0						6		>		
	Wellington Road 7 & First Line	Roundabout	LOS					A		>	**A**		A	>	**A**	<	A		**A**	**A**
			Delay					5		>	**5**		8	>	**8**	<	5		**5**	**6**
			V/C					0.28		>			0.60	>		<	0.45			
			Q					8		>			16	>		<	8			

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared Movement

5.2 Total Traffic Operations

The analysis of total traffic conditions uses the same methodology as existing and background traffic conditions. Street A is assumed to comprise a shared inbound travel and shared outbound travel lane, with vehicles on Street A yielding to motorists on First Line via stop control. As indicated in **Section 4.4.2**, operations under total traffic conditions assume all site traffic uses Street A.

It is acknowledged that some traffic generated from 127 First Line might use the neighbouring connection to the 159 First Line, specifically in situations where the Street A approach to First Line operates poorly or with high levels of delay.

5.2.1 Five-Year Horizon

Table 5.3 summarizes the estimated five-year total traffic level of service conditions. All study area intersections are forecast to generally operate at acceptable levels of service and within capacity. In both the weekday AM peak hour and weekday PM peak hour, the northbound approach on Street A at First Line is forecast to operate at LOS F with v/c ratios ranging from 1.08 (in the weekday PM peak hour) to 1.20 (in the weekday AM peak hour). In addition, the southbound approach at First Line and Bridge Street is forecast to operate at LOS E during the weekday PM peak hour, albeit with a v/c ratio of 0.61.

These operations reflect the shared lane configurations on both Bridge Street and Street A, whereby delays to left-turning traffic are imparted onto vehicles queued behind this left-turning vehicle. These operations also reflect the volume of east-west traffic on First Line which provides limited gaps for side-street traffic from Bridge Street and Street A to enter First Line.

With the addition of the site-generated traffic volumes under the five-year horizon, the existing approach delays at the study area intersections are forecast to increase by no more than 25 seconds as compared to five-year background traffic conditions. **Appendix H** contains the detailed Synchro and Arcady reports.

5.2.2 Ten-Year Horizon

Table 5.4 summarizes the estimated ten-year total traffic level of service conditions. All study area intersections are forecast to generally operate at acceptable levels of service and within capacity. In both the weekday AM peak hour and weekday PM peak hour, the northbound approach at First Line and Spencer Drive/Street A is forecast to continue to operate at LOS F with v/c ratios ranging from 1.14 (in the



weekday PM peak hour) to 1.26 (in the weekday AM peak hour). In addition, the southbound approach at First Line and Bridge Street is forecast to operate at LOS E during the weekday PM peak hour, albeit with a v/c ratio of 0.67.

These operations reflect the shared lane configurations on both Bridge Street and Street A, whereby delays to left-turning traffic are imparted onto vehicles queued behind this left-turning vehicle. Both critical movements identified under ten-year total traffic conditions were previously identified as critical under five-year total traffic conditions. These operations also reflect the volume of east-west traffic on First Line which provides limited gaps for side-street traffic from Bridge Street and Street A to enter First Line.

With the addition of the site-generated traffic volumes under the ten-year horizon, the existing approach delays at the study area intersections are forecast to increase by no more than 31 seconds as compared to ten-year background traffic conditions. **Appendix I** contains the detailed Synchro and Arcady reports.

TABLE 5.3: FIVE-YEAR TOTAL 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	South River Road & First Line	TWSC	LOS Delay V/C Q	B 10 0.25 8		> > > >	**B** **10**					A 8 0.07 2	A 0 0.00 0		**A** **5**		A 0 0.00 0	A 0 0.00 0	**A** **0**	
	Street A/Spencer Drive & First Line	TWSC	LOS Delay V/C Q	A 9 0.01 0	A 0 0.00 0	A 0 0.00 0	**A** **0**	A 8 0.01 0	A 0 0.00 0	A 0 0.00 0	**A** **0**	< < < <	F 148 1.20 132	> > > >	**F** **148**	< < < <	C 15 0.19 5	> > > >	**C** **15**	
	First Line & Bridge Street	TWSC	LOS Delay V/C Q	A 9 0.01 0	A 0 0.00 0		**A** **0**		A 0 0.00 0	A 0 0.00 0	**A** **0**					D 26 0.45 16		> > > >	**D** **26**	
	Wellington Road 7 & First Line	Roundabout	LOS Delay V/C Q					A 9 0.62 17		> > > >	**A** **9**		A 5 0.36 9	> > > >	**A** **5**	< < < <	A 9 0.60 17		**A** **9**	**A** **8**
PM Peak Hour	South River Road & First Line	TWSC	LOS Delay V/C Q	B 10 0.26 8		> > > >	**B** **11**					A 8 0.17 4	A 0 0.00 0		**A** **5**		A 0 0.00 0	A 0 0.00 0	**A** **0**	
	Street A/Spencer Drive & First Line	TWSC	LOS Delay V/C Q	A 8 0.01 0	A 0 0.00 0	A 0 0.00 0	**A** **0**	A 9 0.07 2	A 0 0.00 0	A 0 0.00 0	**A** **2**	< < < <	F 125 1.08 85	> > > >	**F** **125**	< < < <	C 18 0.10 2	> > > >	**C** **18**	
	First Line & Bridge Street	TWSC	LOS Delay V/C Q	A 8 0.04 1	A 0 0.00 0		**A** **1**		A 0 0.00 0	A 0 0.00 0	**A** **0**					E 40 0.61 28		> > > >	**E** **39**	
	Wellington Road 7 & First Line	Roundabout	LOS Delay V/C Q					A 6 0.41 8		> > > >	**A** **6**		B 11 0.71 48	> > > >	**B** **11**	< < < <	A 6 0.52 8		**A** **6**	**A** **8**

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared Movement

TABLE 5.4: TEN-YEAR TOTAL 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	South River Road & First Line	TWSC	LOS	B		>	B					A	A		A		A	A	A	
			Delay	11		>	11					8	0		5		0	0	0	
			V/C	0.28		>						0.08	0.00				0.00	0.00		
			Q	8		>						2	0				0	0		
	Street A/Spencer Drive & First Line	TWSC	LOS	A	A	A	A	A	A	A	A	<	F	>	F	<	C	>	C	
			Delay	9	0	0	0	8	0	0	0	<	172	>	173	<	16	>	16	
			V/C	0.01	0.00	0.00		0.02	0.00	0.00		<	1.26	>		<	0.22	>		
			Q	0	0	0		0	0	0		<	143	>		<	6	>		
	First Line & Bridge Street	TWSC	LOS	A	A		A		A	A	A					D		>	D	
			Delay	9	0		0		0	0	0					28		>	28	
			V/C	0.01	0.00				0.00	0.00						0.49		>		
			Q	0	0				0	0						19		>		
	Wellington Road 7 & First Line	Roundabout	LOS					B		>	B		A	>	A	<	B		B	A
			Delay					10		>	10		5	>	5	<	11		11	9
			V/C					0.66		>			0.39	>		<	0.66			
			Q					34		>			8	>		<	34			
PM Peak Hour	South River Road & First Line	TWSC	LOS	B		>	B					A	A		A		A	A	A	
			Delay	11		>	11					8	0		5		0	0	0	
			V/C	0.29		>						0.18	0.00				0.00	0.00		
			Q	9		>						5	0				0	0		
	Street A/Spencer Drive & First Line	TWSC	LOS	A	A	A	A	A	A	A	A	<	F	>	F	<	C	>	C	
			Delay	8	0	0	0	9	0	0	2	<	146	>	146	<	18	>	18	
			V/C	0.01	0.00	0.00		0.07	0.00	0.00		<	1.14	>		<	0.11	>		
			Q	0	0	0		2	0	0		<	92	>		<	3	>		
	First Line & Bridge Street	TWSC	LOS	A	A		A		A	A	A					E		>	E	
			Delay	8	0		1		0	0	0					45		>	45	
			V/C	0.04	0.00				0.00	0.00						0.67		>		
			Q	1	0				0	0						32		>		
	Wellington Road 7 & First Line	Roundabout	LOS					A		>	A		B	>	B	<	A		A	A
			Delay					7		>	7		14	>	14	<	7		7	10
			V/C					0.44		>			0.77	>		<	0.56			
			Q					8		>			80	>		<	10			

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared Movement

5.3 Remedial Measures

The results of the analyses in **Section 5** indicate the development of the site is not forecast to significantly impact traffic operations at the study area intersections as only two movements are forecast to reach critical movement thresholds under total traffic conditions, one of which is the proposed Street A connection to First Line. The following sub-sections explore potential remedial measures to address these critical movements, and that of the site-generated traffic forecast on First Line.

5.3.1 Traffic Control Signal Warrant

The shared northbound left-turn/through/right-turn movement on Street A is forecast to operate beyond capacity (v/c ratios > 1.00) under both five-year and ten-year total traffic conditions; however, this analysis assumes the upper limit of the development yield, and no internal connection with the neighbouring lands at 159 First Line. The southbound left-turn/right-turn movement on Bridge Street at the intersection with First Line is also projected to operate at LOS E under five- and ten-year total traffic conditions (with the addition of site generated traffic). The forecast v/c ratios for this movement indicate that the shared movement has some residual capacity despite the increase in southbound left turns generated from the site.

To address these forecast traffic operations, Paradigm has evaluated whether a traffic control signal would be warranted at both intersections. The warrant assessment is based on Ontario Traffic Manual (OTM) Book 12 – Justification 7 procedures.[17] Provision of traffic control signals would alternate the right-of-way along First Line at Spencer Drive/Street A and at Bridge Street, which will provide dedicated opportunities (gaps) for traffic from Spencer Drive/Street A and Bridge Street to enter First Line.

Appendix J contains the warrant analysis and indicates traffic control signals are unlikely to be warranted at both intersections based on the forecast traffic volumes under ten-year total traffic conditions.

5.3.2 Left-Turn Lane Warrants

The intersection of First Line at Spencer Drive/Street A has been assessed to determine if the projected traffic volumes warrant the installation of left-turn lanes on First Line. The warrants for left-turn lanes follow the guidance published in the Ministry of Transportation (MTO) *Design Supplement to the TAC Geometric Design Guide for*

[17] Ontario Ministry of Transportation, *Ontario Traffic Manual Book 12: Traffic Signals,* (Toronto: King's Printer for Ontario, 2024).

Canadian Roads.[18] The analysis reflects a design speed of 50 km/h which is 10 km/h above the posted speed limit on First Line.

Table 5.5 and **Table 5.6** summarize the left-turn lane warrants for the westbound and eastbound left-turn movements, respectively. The percentages of left-turning vehicles in the approaching volume have been rounded to the nearest 5%, because nomographs are only provided in 5% increments. Where left-turn percentages are between 2% to 5%, Paradigm has rounded up to the nearest 5%.

Appendix K contains the left-turn lane warrant nomographs which indicate that westbound and eastbound left-turn lanes with 15 metres of storage are warranted under total traffic conditions. These lanes are warranted based on projected traffic volumes but not projected traffic operations. An eastbound left-turn lane is not warranted under background traffic conditions.

In addition to the 15 metres of storage warranted for both the eastbound and westbound left-turn lanes along First Line at the intersection with Spencer Drive/Street A, an approach taper would be needed. Based on a design speed of 50 km/h for First Line, the proposed eastbound and westbound left-turn lanes at the intersection of First Line and Spencer Drive/Street A, would both require an approach taper of 85 metres as listed within MTO's *Design Supplement to the TAC Geometric Design Guide for Canadian Roads*.[19]

5.3.3 Site Access Arrangement

As noted in **Section 3.2**, the draft plan of subdivision includes internal connections to the neighbouring lands at 159 First Line, such that site generated traffic from 127 First Line could connect to First Line through the neighbouring lands. As the Street A approach serving 127 First Line is forecast to operate poorly, it is conceivable that some site traffic may choose to connect to First Line through 159 First Line.

This study has not assessed the traffic operations for the proposed street connection from First Line serving 159 First Line. If the transportation impact study for the neighbouring property estimates that connection to operate poorly, there would likely be no advantage of site traffic generated from 127 First Line using the 159 First Line access and vice versa.

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[18] Ontario Ministry of Transportation, *MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads,* (Toronto: King's Printer for Ontario, 2023).

[19] Ontario Ministry of Transportation, *MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads Exhibit 9-R,* (Toronto: King's Printer for Ontario, 2023), 28.

Since the Street A approach to First Line does operate poorly, there is the potential for mitigation measures such as geometric improvements and/or traffic operational upgrades to be implemented under future conditions, despite them being unlikely to be warranted (see **Section 5.3.1**). If traffic control at one of the connections to 127 First Line or 159 First Line were to be improved, it is conceivable a larger proportion of site traffic for both properties might choose to use one connection over another.

Ultimately, from a traffic planning perspective, it is a reasonable assumption to assign all site traffic from 127 First Line to the Street A connection because the progression of development (or approval of a development application) for 159 First Line could be delayed. In this case, site-generated traffic from 127 First Line would not be provided with a secondary access connection to First Line via the neighbouring property.

5.3.4 Summary of Remedial Measures

The review of potential remedial measures in this section indicates that traffic control signals are not likely to be warranted on First Line at either Spencer Drive/Street A or Bridge Street under ten-year total traffic conditions. Providing separate left-turn lanes on Street A may improve traffic operations, but this lane configuration would be inconsistent with the opposing lane configuration on Spencer Drive. The addition of an exclusive left-turn lane on Street A could also create situations where left-turn and right-turn motorists are competing for sight lines.

A westbound left-turn lane with 15 metres of storage is warranted on First Line at Street A under both five-year and ten-year total traffic conditions; however, the need for this lane is based on projected traffic volumes as opposed to projected traffic operations. An eastbound left-turn lane is not warranted under background traffic conditions (without the site) but is warranted under both five- and ten-year total traffic conditions.

Given the current range of potential development, for both the subject site and the adjacent development at 159 First Line, the need for geometric and traffic control improvements should be re-evaluated and further discussed as site statistics are better established for both properties.

TABLE 5.5: WESTBOUND LEFT-TURN LANE WARRANT SUMMARY

Roadway	First Line			
Intersection	Spencer Drive/Street A			
Approach Direction	Westbound			
Design Speed	50 km/h			
Horizon	Total 2036		Total 2031	
Peak Hour	AM	PM	AM	PM
Advancing Volume	367	347	354	332
Opposing Volume	332	734	322	718
Left Turning Traffic	16	57	16	57
% of Left Turning Traffic	4%	16%	5%	17%
Figure Used*	9A-3	9A-4	9A-3	9A-4
Warranted	No	Yes	No	Yes
Storage Length Required	-	15 m	-	15 m

*Ontario Ministry of Transportation, *MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads,* (Toronto: Kings Printer for Ontario, 2023).

TABLE 5.6: EASTBOUND LEFT-TURN LANE WARRANT SUMMARY

Roadway	First Line							
Intersection	Spencer Drive/Street A							
Approach Direction	Eastbound							
Design Speed	50 km/h							
Horizon	Total 2036		Background 2036		Total 2031		Background 2031	
Peak Hour	AM	PM	AM	PM	AM	PM	AM	PM
Advancing Volume	332	734	192	398	322	718	182	382
Opposing Volume	367	347	351	290	354	332	338	275
Left Turning Traffic	8	18	8	18	7	16	7	16
% of Left Turning Traffic	2%	2%	4%	5%	2%	2%	4%	4%
Figure Used*	9A-3	9A-3	9A-3	9A-3	9A-3	9A-3	9A-3	9A-3
Warranted	No	Yes	No	No	No	Yes	No	No
Storage Length Required	-	15 m	-	-	-	15 m	-	-

*Ontario Ministry of Transportation, *MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads,* (Toronto: Kings Printer for Ontario, 2023).

6 Findings and Conclusions

6.1 Findings

Based on the investigations carried out, the findings of this study are as follows:

- **Existing Traffic Conditions:** All study area intersections (First Line at Wellington Road 7, First Line at Bridge Street, First Line at Spencer Drive, and First Line at South River Road) are operating at acceptable levels of service during both the weekday AM peak hour and weekday PM peak hour. No critical movements are noted.
- **Development Trip Generation:** Development of the site is estimated to generate 520 trips in the weekday AM peak hour and 617 trips in the weekday PM peak hour. These estimates are inclusive of trip reductions related to pass-by trips and trips internal to the site (for example, between the residential and commercial/office uses).
- **Background Traffic Conditions (Five and Ten-Year Horizon):** The study intersections are forecast to operate at acceptable levels of service during both the weekday AM peak hour and weekday PM peak hour. No critical movements are noted.
- **Total Traffic Conditions (Five- and Ten-Year Horizon):** The study area intersections are forecast to generally operate at acceptable levels of service, similar to existing and future background traffic conditions. The northbound approach on Street A at First Line is forecast to operate at LOS F in both the weekday AM peak hour and weekday PM peak hour. In addition, the southbound approach at First Line and Bridge Street is forecast to operate at LOS E during the weekday PM peak hour, but with a v/c ratio between 0.60 to 0.70. Both critical movements are forecast under both the five and ten-year horizons. These operations also reflect the volume of east-west traffic on First Line which provides limited gaps for side-street traffic to enter First Line.
- **Sight Distance Assessment:** The proposed Street A connection to First Line meets the minimum stopping and intersection sight distances defined by the Transportation Association of Canada (TAC).
- **Traffic Control Signal Warrant:** Traffic control signals are unlikely to be warranted on First Line at both Spencer



Drive/Street A and Bridge Street under ten-year total traffic conditions.

- **Left-Turn Lane Warrant:** Under five-year and ten-year total traffic conditions, eastbound and westbound left-turn lanes with 15 metres of storage are warranted on First Line at Spencer Drive/Street A. In addition to the warranted storage length of 15 metres, the proposed eastbound and westbound left-turn lanes at the intersection of First Line and Spencer Drive/Street A, would both require an approach taper of 85 metres.

6.2 Conclusions

Based on the findings of this study, it is concluded that development of the site (assuming the upper limit of the development yield) is not forecast to significantly impact traffic operations at any of the study intersections. Only two movements in the entire study area are forecast to reach critical movement thresholds, one of which is the proposed connection to First Line. The southbound approach at First Line and Bridge Street is forecast to operate at LOS E, but with a maximum v/c ratio of 0.67.

Given the proposed range of the residential yield (462 to 803 units), it is recommended that the analyses and review of potential remedial measures in this study be updated as the unit count is better established. This study assumes the upper limit of this development yield (803 units) such that a lower residential yield may result in improvements to forecast traffic operations on Street A, and/or a revised need (or lack thereof) for auxiliary turn lanes on First Line.



Appendix A

Pre-Study Consultation Materials

From: Andrew Steinsky
Sent: November 6, 2025 1:58 PM
To: Lee Wheildon; Andrew Orr
Cc: Pasquale Costanzo
Subject: RE: 250480 (127 First Line, Elora) TIS and ACR - Terms of Reference for TIS

Hi Lee,

Thank you for letting us know. For clarity, we are not looking for comments on the TIS itself nor are we requesting a peer review because the report has not yet been written.

At this time, we are seeking feedback on our work plan in an effort to minimize any comments that may come from the Township, County, or peer reviewer once the TIS is submitted for review. If the Township or County do have any comments on the work plan, we would rather address them from the onset of our study, rather than later on.

That being said, if the Township prefers to provide comments only after the report is submitted for review, then we will proceed with the work plan we've outlined to date. We can then address any comments once the study has been submitted and gone through the formal review process.

Thanks,

Andrew Steinsky, P.Eng., PTOE, PTP, RSP1
Project Manager, Associate
(he/him)

paradigm TRANSPORTATION SOLUTIONS LIMITED

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Office Hours: 07:30 – 17:30 Eastern Standard Time (EST) Monday to Thursday. Paradigm's offices are closed on Fridays.

From: Lee Wheildon <LWheildon@centrewellington.ca>
Sent: November 6, 2025 10:45 AM
To: Andrew Orr <aorr@ptsl.com>
Cc: Andrew Steinsky <asteinsky@ptsl.com>; Pasquale Costanzo <pasqualec@wellington.ca>
Subject: RE: 250480 (127 First Line, Elora) TIS and ACR

Morning Andrew,

Further to the pre-consultation letter dated September 19, 2025 (attached), Staff maintain that the request for technical commenting on various studies (including TIS) remains premature at this time.

Having noted the above, should the applicant continue to request a review at this time, Township Staff will have the document(s) peer reviewed and charge back the cost to the applicant. Please review/confirm with your client and advise Township Staff on how they wish to proceed.

Should you have any questions or concerns, please do not hesitate to contact me.

Regards,

Lee Wheildon
Supervisor of Development Engineering | Planning & Development
1 MacDonald Square. Elora ON, N0B 1S0
T: 519.846.9691 X253 www.centrewellington.ca

From: Andrew Orr <aorr@ptsl.com>
Sent: October 28, 2025 4:30 PM
To: Lee Wheildon <LWheildon@centrewellington.ca>; Pasquale Costanzo <pasqualec@wellington.ca>
Cc: Andrew Steinsky <asteinsky@ptsl.com>
Subject: RE: 250480 (127 First Line, Elora) TIS and ACR

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Hi Pasquale and Lee,

Are the County and Township now in a position to provide comments on the terms of reference for the 127 First Line, Elora traffic study?

I've attached the pre-study letter for the proposed 127 First Line development to this email.

Best Regards,

Andrew Orr, M.A.Sc., EIT
Transportation Consultant, Associate
(He/Him)

5A-150 Pinebush Road, Cambridge ON, N1R 8J8
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From: Lee Wheildon <LWheildon@centrewellington.ca>
Sent: September 4, 2025 11:51 AM
To: Andrew Orr <aorr@ptsl.com>

Cc: Andrew Steinsky <asteinsky@ptsl.com>; Pasquale Costanzo <pasqualec@wellington.ca>
Subject: RE: 250480 (127 First Line, Elora) TIS and ACR

Andrew,

A pre-consultation discussion was completed last week with Township Staff (I was not in attendance at that meeting). Please note, the request for technical commenting on various studies (including TIS) remains premature at this time.

Should you have any questions or concerns, please do not hesitate to contact me.

Regards,

Lee Wheildon
Supervisor of Development Engineering | Planning & Development
1 MacDonald Square. Elora ON, N0B 1S0
T: 519.846.9691 X253 www.centrewellington.ca

From: Andrew Orr <aorr@ptsl.com>
Sent: September 4, 2025 9:06 AM
To: Lee Wheildon <LWheildon@centrewellington.ca>; Pasquale Costanzo <pasqualec@wellington.ca>
Cc: Andrew Steinsky <asteinsky@ptsl.com>
Subject: RE: 250480 (127 First Line, Elora) TIS and ACR

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Hi Pasquale and Lee,

Are the County and Township able to provide comments on the terms of reference for the 127 First Line, Elora traffic study?

Best Regards,

Andrew Orr, M.A.Sc., EIT
Transportation Consultant, Associate
(He/Him)

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From: Lee Wheildon <LWheildon@centrewellington.ca>
Sent: August 5, 2025 11:23 AM
To: Andrew Orr <aorr@ptsl.com>; Pasquale Costanzo <pasqualec@wellington.ca>
Cc: Andrew Steinsky <asteinsky@ptsl.com>
Subject: RE: 250480 (127 First Line, Elora) TIS and ACR

Andrew,

Township Staff have a pre-consultation meeting scheduled with the developer in the coming weeks and will discuss various aspects of the application (including the TIS) at that time.

Township Staff will not be providing feedback for the TOR prior to the pre-consultation meeting on August 27th.

Should you have any questions or concerns, please do not hesitate to contact me.

Regards,

Lee Wheildon
Supervisor of Development Engineering |
Planning & Development
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Centre Wellington

From: Andrew Orr <aorr@ptsl.com>
Sent: August 5, 2025 10:25 AM
To: Pasquale Costanzo <pasqualec@wellington.ca>; Lee Wheildon <LWheildon@centrewellington.ca>
Cc: Andrew Steinsky <asteinsky@ptsl.com>
Subject: RE: 250480 (127 First Line, Elora) TIS and ACR

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Pasquale and Lee,

I'm following up on the terms of reference sent on July 10th.

Best Regards,

Andrew Orr, M.A.Sc., EIT
Transportation Consultant, Associate
(He/Him)

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From: Andrew Orr
Sent: July 24, 2025 11:50 AM
To: Pasquale Costanzo <pasqualec@wellington.ca>; Lee Wheildon <lwheildon@centrewellington.ca>
Cc: Andrew Steinsky <asteinsky@ptsl.com>
Subject: RE: 250480 (127 First Line, Elora) TIS and ACR

Hi Pasquale and Lee,

I'm following up on the request below.

Best Regards,

Andrew Orr, M.A.Sc., EIT
Transportation Consultant, Associate
(He/Him)

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p: 519.896.3163 x210
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From: Andrew Orr
Sent: July 10, 2025 1:11 PM
To: Pasquale Costanzo <pasqualec@wellington.ca>; Lee Wheildon <lwheildon@centrewellington.ca>
Cc: Andrew Steinsky <asteinsky@ptsl.com>
Subject: 250480 (127 First Line, Elora) TIS and ACR

Hello Pasquale and Lee,

Paradigm Transportation Solutions Limited (Paradigm) has been retained to conduct this Transportation Impact Study (TIS) and Access and Circulation Review (ACR) for a proposed development located at 127 First Line (south of First Line and east of Bridge Street) in Elora (Township of Centre Wellington). The subject site is proposed to include a combination of residential unit types and a quantity of mixed-use development at the north edge of the property.

Vehicle access is proposed via a new street connection to First Line opposite of Spencer Drive, with additional internal connections to future development east and west of the property (concept attached).

We'd like to prepare our report based on the following scope, subject to your comments:

PROPOSED TERMS OF REFERENCE

Study Area Intersections:

- First Line at Spencer Drive/New Street;
- First Line at Bridge Street;
- First Line at Wellington Road 7; and
- First Line at South River Road.

Analysis Periods:

- Weekday AM peak hour
- Weekday PM peak hour

Existing Data:

- Existing 8-hour TMC data collected from the above intersections. **Please advise if summer counts are acceptable**

Horizon Year:

- Opening year of the full build-out; and
- Five-years from the full build-out date.

Analysis:

- Synchro 12, HCM 7 analysis

Background Traffic:

- Background traffic annual growth rate. **Please confirm**
- Developments to include in background. **Please confirm**

Future Road Improvements:

- **Please confirm**

Trip Generation:

- ITE Trip Generation Data 11th Edition.

Site Traffic Distribution:

- Existing Traffic Patterns and 2022 Transportation Tomorrow Survey (TTS) Data.

Access and Circulation Review:

- Sight distance assessment at First Line and Spencer Drive/New Street

Best Regards,

Andrew Orr, M.A.Sc., EIT
Transportation Consultant, Associate
(He/Him)

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Appendix B

Traffic Data

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Bridge Street
Site Code: 250480
Start Date: 11/12/2025

Turning Movement Data

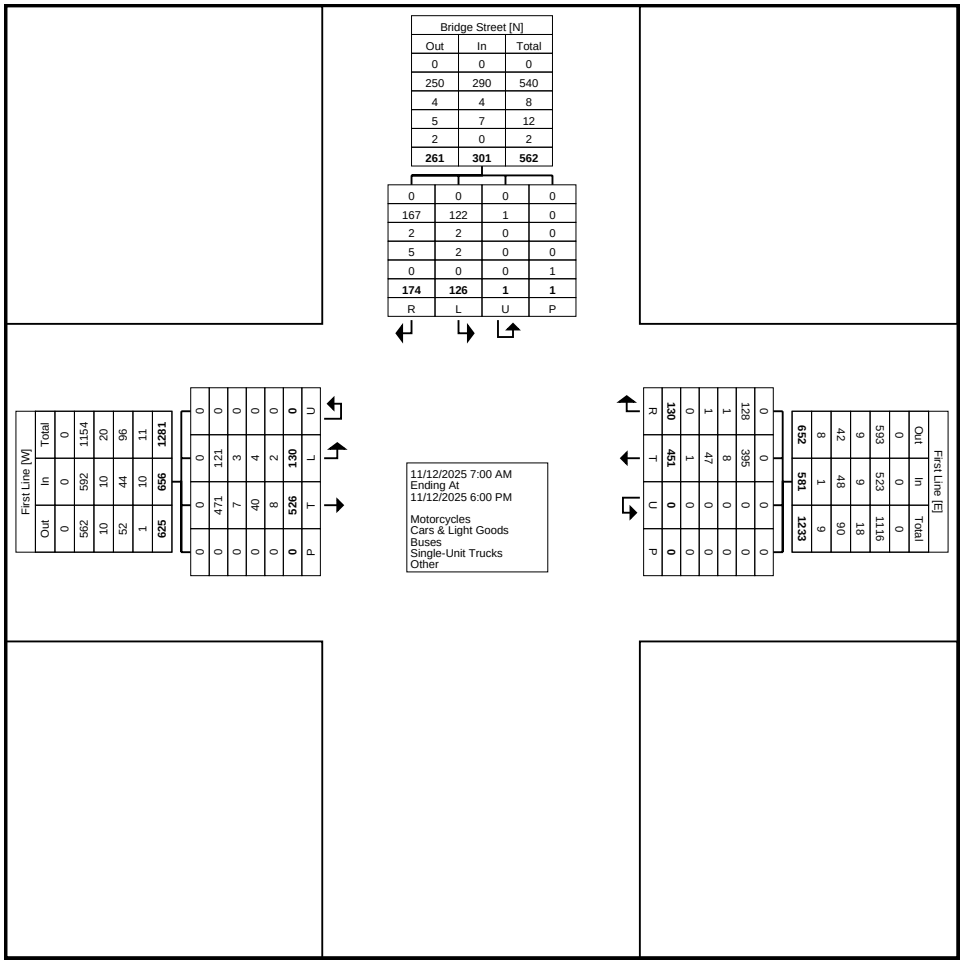
Start Time	First Line Eastbound					First Line Westbound					Bridge Street Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:00 AM	1	11	0	0	12	17	1	0	0	18	4	7	0	0	11	41
7:15 AM	2	7	0	0	9	29	1	0	0	30	6	10	0	0	16	55
7:30 AM	0	15	0	0	15	23	1	0	0	24	6	8	0	0	14	53
7:45 AM	4	14	0	0	18	23	7	0	0	30	4	8	0	0	12	60
Hourly Total	7	47	0	0	54	92	10	0	0	102	20	33	0	0	53	209
8:00 AM	1	8	0	0	9	21	4	0	0	25	3	10	0	0	13	47
8:15 AM	0	15	0	0	15	27	5	0	0	32	6	11	0	0	17	64
8:30 AM	0	12	0	0	12	22	3	0	0	25	8	12	0	0	20	57
8:45 AM	2	9	0	0	11	8	1	0	0	9	4	5	0	0	9	29
Hourly Total	3	44	0	0	47	78	13	0	0	91	21	38	0	0	59	197
9:00 AM	2	9	0	0	11	12	1	0	0	13	3	1	0	0	4	28
9:15 AM	2	8	0	0	10	9	5	0	0	14	4	7	0	0	11	35
9:30 AM	2	14	0	0	16	11	1	0	0	12	1	8	0	0	9	37
9:45 AM	2	10	0	0	12	8	2	0	0	10	4	3	0	0	7	29
Hourly Total	8	41	0	0	49	40	9	0	0	49	12	19	0	0	31	129
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	3	11	0	0	14	12	6	0	0	18	3	1	0	0	4	36
11:45 AM	6	11	0	0	17	18	6	0	0	24	4	9	0	0	13	54
Hourly Total	9	22	0	0	31	30	12	0	0	42	7	10	0	0	17	90
12:00 PM	2	12	0	0	14	10	1	0	0	11	2	4	0	0	6	31
12:15 PM	2	14	0	0	16	10	5	0	0	15	4	8	0	0	12	43
12:30 PM	8	22	0	0	30	11	2	0	0	13	3	6	0	0	9	52
12:45 PM	3	14	0	0	17	8	3	0	0	11	2	3	0	1	5	33
Hourly Total	15	62	0	0	77	39	11	0	0	50	11	21	0	1	32	159
1:00 PM	3	11	0	0	14	8	5	0	0	13	2	5	0	0	7	34
1:15 PM	0	22	0	0	22	12	1	0	0	13	3	3	0	0	6	41
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	3	33	0	0	36	20	6	0	0	26	5	8	0	0	13	75
3:00 PM	4	29	0	0	33	12	4	0	0	16	4	5	0	0	9	58
3:15 PM	9	27	0	0	36	19	6	0	0	25	6	5	0	0	11	72
3:30 PM	8	24	0	0	32	15	4	0	0	19	7	1	0	0	8	59
3:45 PM	5	15	0	0	20	17	4	0	0	21	2	2	0	0	4	45
Hourly Total	26	95	0	0	121	63	18	0	0	81	19	13	0	0	32	234
4:00 PM	5	29	0	0	34	14	6	0	0	20	5	1	0	0	6	60
4:15 PM	6	23	0	0	29	12	8	0	0	20	5	11	0	0	16	65
4:30 PM	10	23	0	0	33	16	5	0	0	21	7	4	0	0	11	65

4:45 PM	12	23	0	0	35	15	6	0	0	21	3	3	1	0	7	63
Hourly Total	33	98	0	0	131	57	25	0	0	82	20	19	1	0	40	253
5:00 PM	8	25	0	0	33	8	9	0	0	17	6	6	0	0	12	62
5:15 PM	8	28	0	0	36	4	6	0	0	10	1	4	0	0	5	51
5:30 PM	5	21	0	0	26	8	6	0	0	14	2	1	0	0	3	43
5:45 PM	5	10	0	0	15	12	5	0	0	17	2	2	0	0	4	36
Hourly Total	26	84	0	0	110	32	26	0	0	58	11	13	0	0	24	192
Grand Total	130	526	0	0	656	451	130	0	0	581	126	174	1	1	301	1538
Approach %	19.8	80.2	0.0	-	-	77.6	22.4	0.0	-	-	41.9	57.8	0.3	-	-	-
Total %	8.5	34.2	0.0	-	42.7	29.3	8.5	0.0	-	37.8	8.2	11.3	0.1	-	19.6	-
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Cars & Light Goods	121	471	0	-	592	395	128	0	-	523	122	167	1	-	290	1405
% Cars & Light Goods	93.1	89.5	-	-	90.2	87.6	98.5	-	-	90.0	96.8	96.0	100.0	-	96.3	91.4
Buses	3	7	0	-	10	8	1	0	-	9	2	2	0	-	4	23
% Buses	2.3	1.3	-	-	1.5	1.8	0.8	-	-	1.5	1.6	1.1	0.0	-	1.3	1.5
Single-Unit Trucks	4	40	0	-	44	47	1	0	-	48	2	5	0	-	7	99
% Single-Unit Trucks	3.1	7.6	-	-	6.7	10.4	0.8	-	-	8.3	1.6	2.9	0.0	-	2.3	6.4
Articulated Trucks	0	8	0	-	8	1	0	0	-	1	0	0	0	-	0	9
% Articulated Trucks	0.0	1.5	-	-	1.2	0.2	0.0	-	-	0.2	0.0	0.0	0.0	-	0.0	0.6
Bicycles on Road	2	0	0	-	2	0	0	0	-	0	0	0	0	-	0	2
% Bicycles on Road	1.5	0.0	-	-	0.3	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Bridge Street
Site Code: 250480
Start Date: 11/12/2025



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Bridge Street
Site Code: 250480
Start Date: 11/12/2025

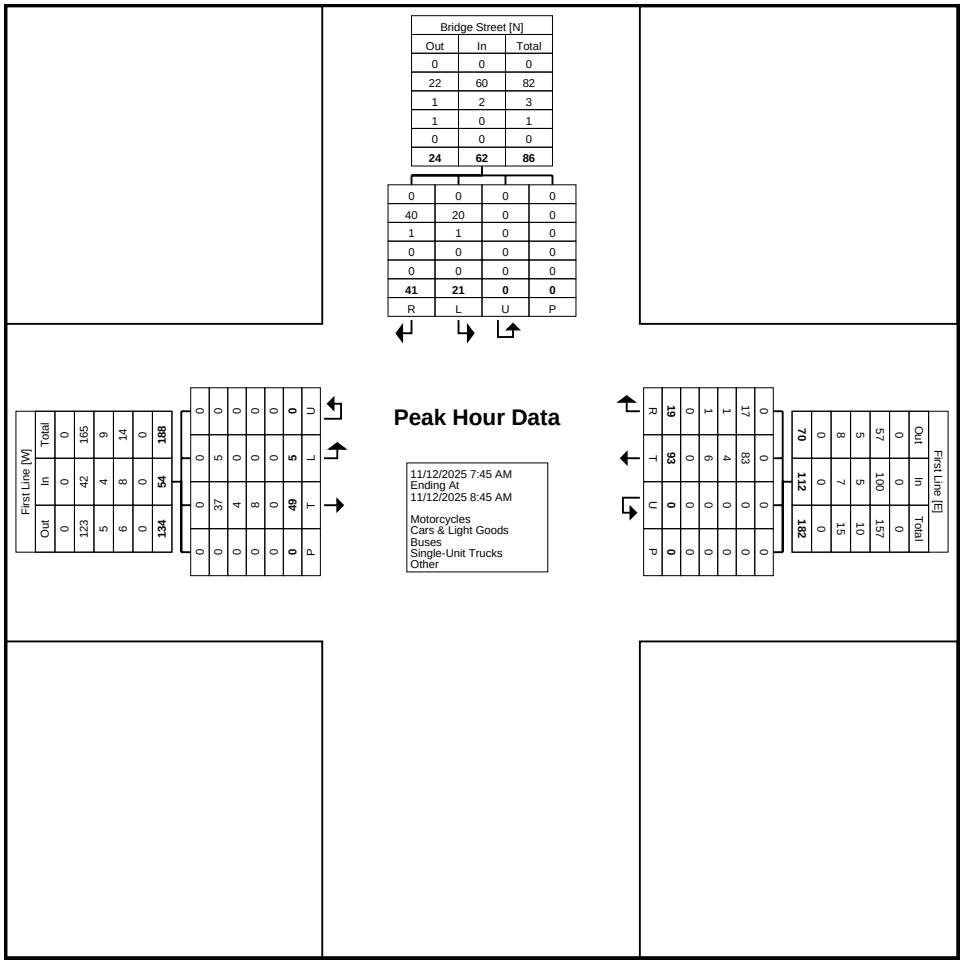
Turning Movement Peak Hour Data (7:45 AM)

Start Time	First Line Eastbound					First Line Westbound					Bridge Street Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:45 AM	4	14	0	0	18	23	7	0	0	30	4	8	0	0	12	60
8:00 AM	1	8	0	0	9	21	4	0	0	25	3	10	0	0	13	47
8:15 AM	0	15	0	0	15	27	5	0	0	32	6	11	0	0	17	64
8:30 AM	0	12	0	0	12	22	3	0	0	25	8	12	0	0	20	57
Total	5	49	0	0	54	93	19	0	0	112	21	41	0	0	62	228
Approach %	9.3	90.7	0.0	-	-	83.0	17.0	0.0	-	-	33.9	66.1	0.0	-	-	-
Total %	2.2	21.5	0.0	-	23.7	40.8	8.3	0.0	-	49.1	9.2	18.0	0.0	-	27.2	-
PHF	0.313	0.817	0.000	-	0.750	0.861	0.679	0.000	-	0.875	0.656	0.854	0.000	-	0.775	0.891
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	5	37	0	-	42	83	17	0	-	100	20	40	0	-	60	202
% Cars & Light Goods	100.0	75.5	-	-	77.8	89.2	89.5	-	-	89.3	95.2	97.6	-	-	96.8	88.6
Buses	0	4	0	-	4	4	1	0	-	5	1	1	0	-	2	11
% Buses	0.0	8.2	-	-	7.4	4.3	5.3	-	-	4.5	4.8	2.4	-	-	3.2	4.8
Single-Unit Trucks	0	8	0	-	8	6	1	0	-	7	0	0	0	-	0	15
% Single-Unit Trucks	0.0	16.3	-	-	14.8	6.5	5.3	-	-	6.3	0.0	0.0	-	-	0.0	6.6
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
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Bridge Street
Site Code: 250480
Start Date: 11/12/2025



Turning Movement Peak Hour Data Plot (7:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Bridge Street
Site Code: 250480
Start Date: 11/12/2025

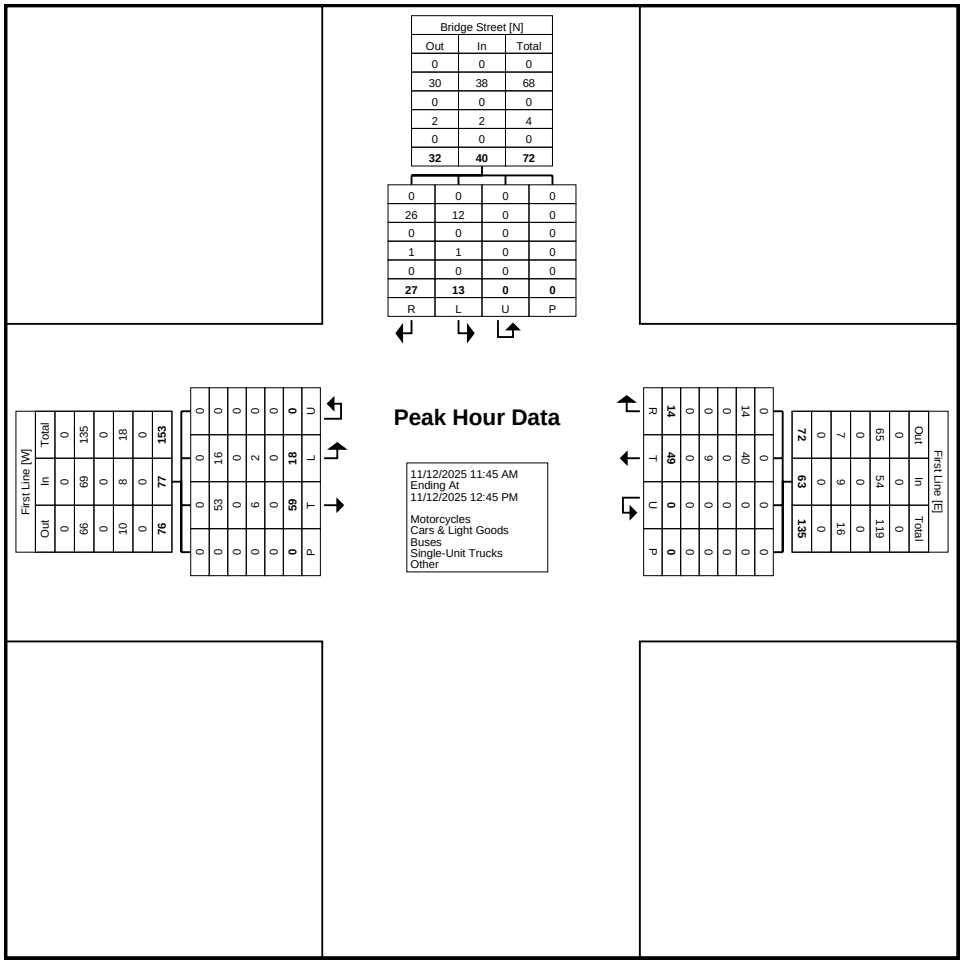
Turning Movement Peak Hour Data (11:45 AM)

Start Time	First Line Eastbound					First Line Westbound					Bridge Street Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
11:45 AM	6	11	0	0	17	18	6	0	0	24	4	9	0	0	13	54
12:00 PM	2	12	0	0	14	10	1	0	0	11	2	4	0	0	6	31
12:15 PM	2	14	0	0	16	10	5	0	0	15	4	8	0	0	12	43
12:30 PM	8	22	0	0	30	11	2	0	0	13	3	6	0	0	9	52
Total	18	59	0	0	77	49	14	0	0	63	13	27	0	0	40	180
Approach %	23.4	76.6	0.0	-	-	77.8	22.2	0.0	-	-	32.5	67.5	0.0	-	-	-
Total %	10.0	32.8	0.0	-	42.8	27.2	7.8	0.0	-	35.0	7.2	15.0	0.0	-	22.2	-
PHF	0.563	0.670	0.000	-	0.642	0.681	0.583	0.000	-	0.656	0.813	0.750	0.000	-	0.769	0.833
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	16	53	0	-	69	40	14	0	-	54	12	26	0	-	38	161
% Cars & Light Goods	88.9	89.8	-	-	89.6	81.6	100.0	-	-	85.7	92.3	96.3	-	-	95.0	89.4
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	2	6	0	-	8	9	0	0	-	9	1	1	0	-	2	19
% Single-Unit Trucks	11.1	10.2	-	-	10.4	18.4	0.0	-	-	14.3	7.7	3.7	-	-	5.0	10.6
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
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Bridge Street
Site Code: 250480
Start Date: 11/12/2025



Turning Movement Peak Hour Data Plot (11:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Bridge Street
Site Code: 250480
Start Date: 11/12/2025

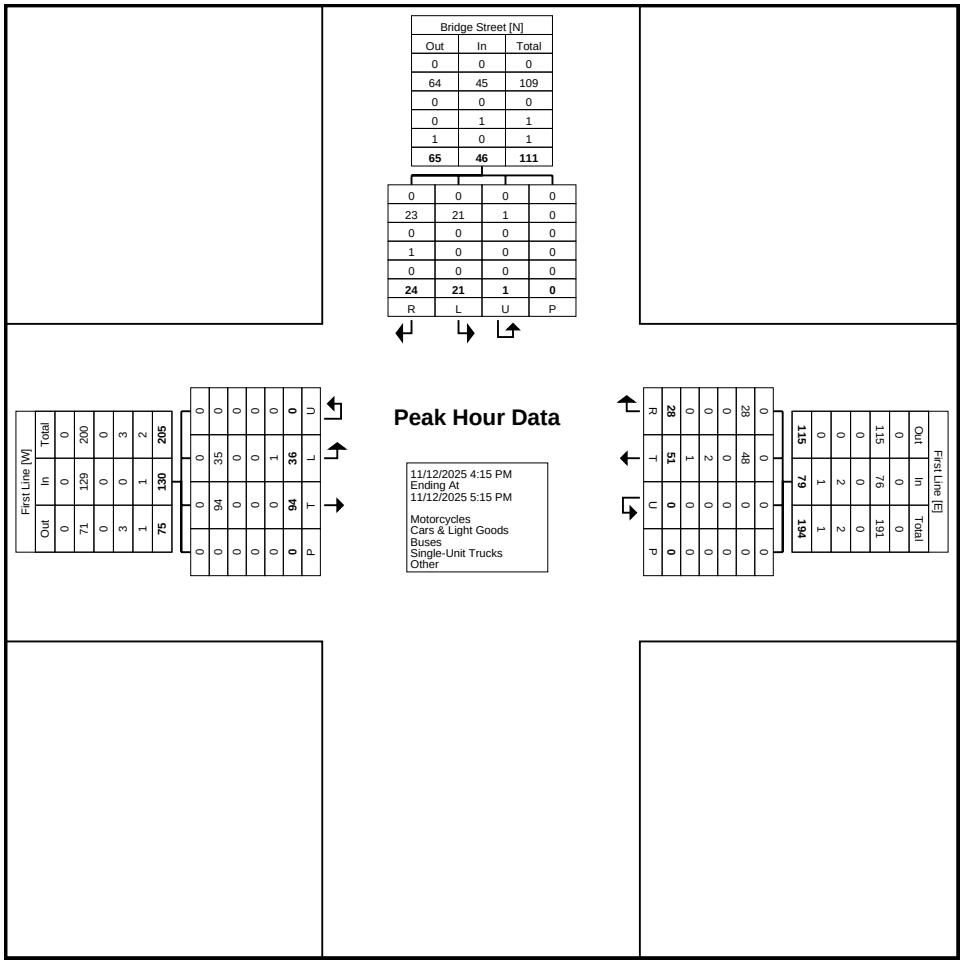
Turning Movement Peak Hour Data (4:15 PM)

Start Time	First Line Eastbound					First Line Westbound					Bridge Street Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
4:15 PM	6	23	0	0	29	12	8	0	0	20	5	11	0	0	16	65
4:30 PM	10	23	0	0	33	16	5	0	0	21	7	4	0	0	11	65
4:45 PM	12	23	0	0	35	15	6	0	0	21	3	3	1	0	7	63
5:00 PM	8	25	0	0	33	8	9	0	0	17	6	6	0	0	12	62
Total	36	94	0	0	130	51	28	0	0	79	21	24	1	0	46	255
Approach %	27.7	72.3	0.0	-	-	64.6	35.4	0.0	-	-	45.7	52.2	2.2	-	-	-
Total %	14.1	36.9	0.0	-	51.0	20.0	11.0	0.0	-	31.0	8.2	9.4	0.4	-	18.0	-
PHF	0.750	0.940	0.000	-	0.929	0.797	0.778	0.000	-	0.940	0.750	0.545	0.250	-	0.719	0.981
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Cars & Light Goods	35	94	0	-	129	48	28	0	-	76	21	23	1	-	45	250
% Cars & Light Goods	97.2	100.0	-	-	99.2	94.1	100.0	-	-	96.2	100.0	95.8	100.0	-	97.8	98.0
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Single-Unit Trucks	0	0	0	-	0	2	0	0	-	2	0	1	0	-	1	3
% Single-Unit Trucks	0.0	0.0	-	-	0.0	3.9	0.0	-	-	2.5	0.0	4.2	0.0	-	2.2	1.2
Articulated Trucks	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	2.0	0.0	-	-	1.3	0.0	0.0	0.0	-	0.0	0.4
Bicycles on Road	1	0	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	2.8	0.0	-	-	0.8	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.4
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Bridge Street
Site Code: 250480
Start Date: 11/12/2025



Turning Movement Peak Hour Data Plot (4:15 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & South River Road
Site Code: 250480
Start Date: 11/12/2025

Turning Movement Data

Start Time	First Line Eastbound					South River Street Northbound					South River Street Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	0	11	0	0	11	15	9	0	0	24	7	0	0	0	7	42
7:15 AM	0	11	0	0	11	12	12	0	0	24	10	0	0	0	10	45
7:30 AM	0	21	0	0	21	10	11	0	0	21	16	2	0	0	18	60
7:45 AM	0	17	0	0	17	20	7	0	0	27	22	2	0	0	24	68
Hourly Total	0	60	0	0	60	57	39	0	0	96	55	4	0	0	59	215
8:00 AM	0	17	0	0	17	11	7	0	0	18	15	0	0	0	15	50
8:15 AM	2	24	0	0	26	15	12	0	0	27	27	2	0	0	29	82
8:30 AM	0	25	0	0	25	10	12	0	0	22	31	2	0	0	33	80
8:45 AM	0	14	0	0	14	7	21	0	0	28	22	0	0	0	22	64
Hourly Total	2	80	0	0	82	43	52	0	0	95	95	4	0	0	99	276
9:00 AM	0	14	0	0	14	9	12	0	0	21	13	1	0	0	14	49
9:15 AM	1	15	0	0	16	12	12	0	0	24	14	1	0	0	15	55
9:30 AM	1	10	0	0	11	10	16	0	0	26	19	0	0	0	19	56
9:45 AM	0	19	0	0	19	10	19	0	0	29	22	0	0	0	22	70
Hourly Total	2	58	0	0	60	41	59	0	0	100	68	2	0	0	70	230
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	1	17	0	0	18	20	32	0	0	52	18	1	0	0	19	89
11:45 AM	2	13	0	0	15	22	24	0	0	46	28	3	0	0	31	92
Hourly Total	3	30	0	0	33	42	56	0	0	98	46	4	0	0	50	181
12:00 PM	0	14	0	0	14	12	18	0	0	30	27	0	0	0	27	71
12:15 PM	1	15	0	0	16	16	30	0	0	46	20	1	0	0	21	83
12:30 PM	0	23	0	0	23	14	15	0	0	29	22	0	0	0	22	74
12:45 PM	1	16	0	0	17	9	22	0	0	31	17	2	0	0	19	67
Hourly Total	2	68	0	0	70	51	85	0	0	136	86	3	0	0	89	295
1:00 PM	0	16	0	0	16	12	25	0	0	37	12	0	0	0	12	65
1:15 PM	0	21	0	0	21	9	25	0	0	34	15	2	0	0	17	72
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	37	0	0	37	21	50	0	0	71	27	2	0	0	29	137
3:00 PM	2	26	0	0	28	23	24	0	0	47	26	2	0	0	28	103
3:15 PM	1	31	0	0	32	24	22	0	0	46	29	0	0	0	29	107
3:30 PM	2	19	0	0	21	21	30	0	0	51	21	1	0	0	22	94
3:45 PM	0	21	0	0	21	27	24	0	0	51	21	1	0	0	22	94
Hourly Total	5	97	0	0	102	95	100	0	0	195	97	4	0	0	101	398
4:00 PM	1	28	0	0	29	23	25	0	0	48	30	0	0	0	30	107
4:15 PM	1	25	0	0	26	28	35	0	0	63	32	0	0	0	32	121
4:30 PM	0	34	0	0	34	22	21	0	0	43	39	0	0	0	39	116

4:45 PM	0	29	0	0	29	37	25	0	0	62	25	0	0	0	25	116
Hourly Total	2	116	0	0	118	110	106	0	0	216	126	0	0	0	126	460
5:00 PM	2	23	0	0	25	23	29	0	0	52	16	1	0	0	17	94
5:15 PM	2	26	0	0	28	17	17	0	0	34	29	0	0	0	29	91
5:30 PM	1	19	0	0	20	12	16	0	0	28	23	0	0	0	23	71
5:45 PM	0	4	0	0	4	20	16	0	0	36	16	0	0	0	16	56
Hourly Total	5	72	0	0	77	72	78	0	0	150	84	1	0	0	85	312
Grand Total	21	618	0	0	639	532	625	0	0	1157	684	24	0	0	708	2504
Approach %	3.3	96.7	0.0	-	-	46.0	54.0	0.0	-	-	96.6	3.4	0.0	-	-	-
Total %	0.8	24.7	0.0	-	25.5	21.2	25.0	0.0	-	46.2	27.3	1.0	0.0	-	28.3	-
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	21	602	0	-	623	524	605	0	-	1129	670	20	0	-	690	2442
% Cars & Light Goods	100.0	97.4	-	-	97.5	98.5	96.8	-	-	97.6	98.0	83.3	-	-	97.5	97.5
Buses	0	2	0	-	2	1	11	0	-	12	9	2	0	-	11	25
% Buses	0.0	0.3	-	-	0.3	0.2	1.8	-	-	1.0	1.3	8.3	-	-	1.6	1.0
Single-Unit Trucks	0	13	0	-	13	6	9	0	-	15	5	2	0	-	7	35
% Single-Unit Trucks	0.0	2.1	-	-	2.0	1.1	1.4	-	-	1.3	0.7	8.3	-	-	1.0	1.4
Articulated Trucks	0	1	0	-	1	1	0	0	-	1	0	0	0	-	0	2
% Articulated Trucks	0.0	0.2	-	-	0.2	0.2	0.0	-	-	0.1	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
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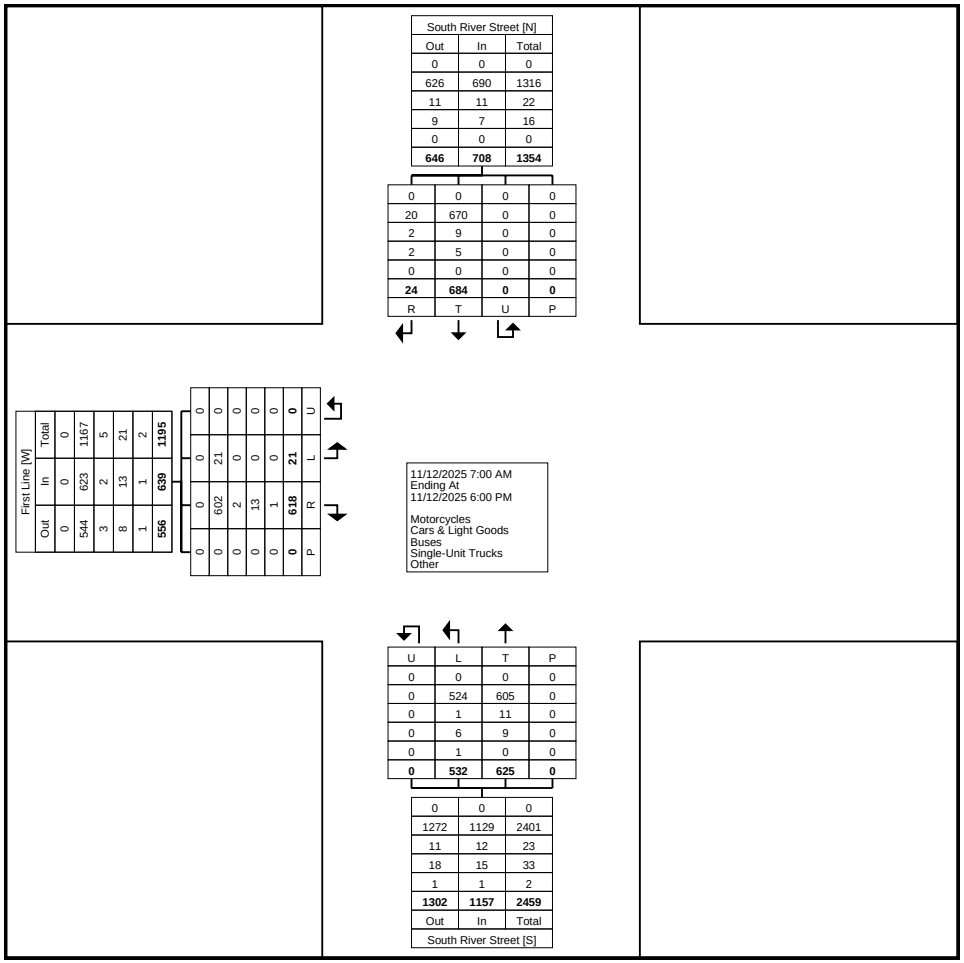
Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & South River Road
Site Code: 250480
Start Date: 11/12/2025



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & South River Road
Site Code: 250480
Start Date: 11/12/2025

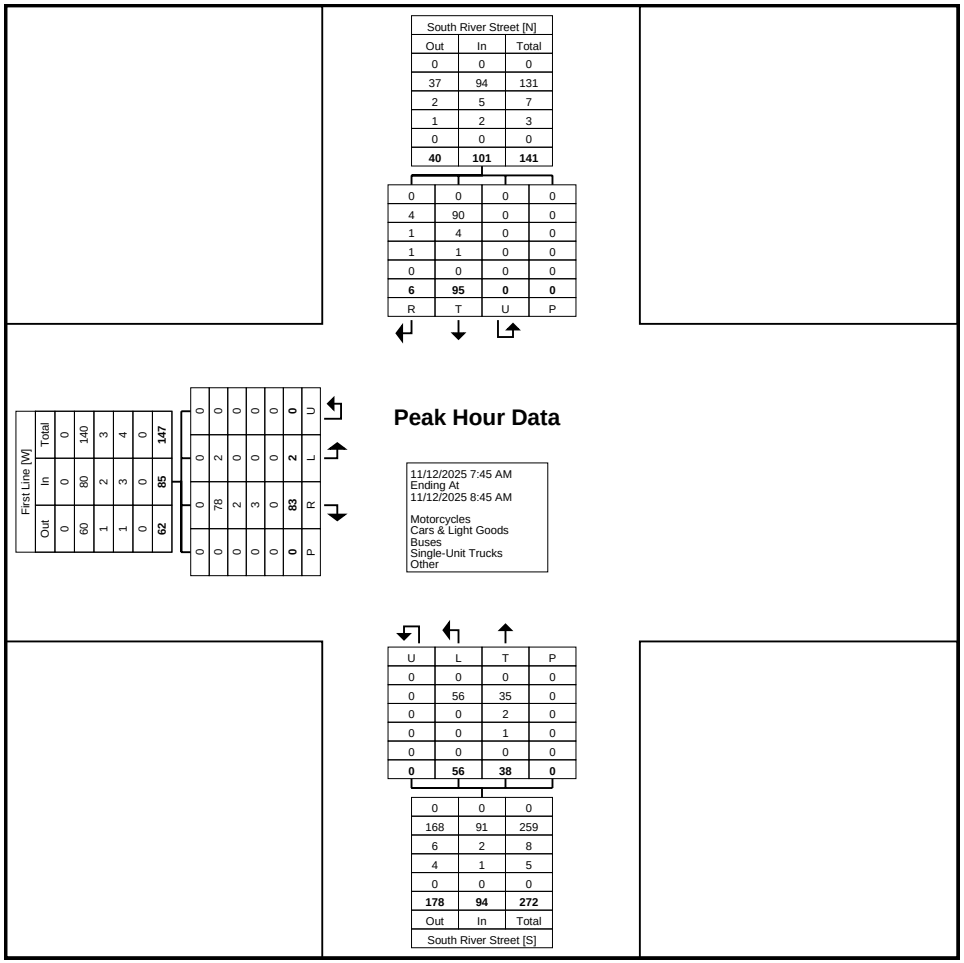
Turning Movement Peak Hour Data (7:45 AM)

Start Time	First Line Eastbound					South River Street Northbound					South River Street Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:45 AM	0	17	0	0	17	20	7	0	0	27	22	2	0	0	24	68
8:00 AM	0	17	0	0	17	11	7	0	0	18	15	0	0	0	15	50
8:15 AM	2	24	0	0	26	15	12	0	0	27	27	2	0	0	29	82
8:30 AM	0	25	0	0	25	10	12	0	0	22	31	2	0	0	33	80
Total	2	83	0	0	85	56	38	0	0	94	95	6	0	0	101	280
Approach %	2.4	97.6	0.0	-	-	59.6	40.4	0.0	-	-	94.1	5.9	0.0	-	-	-
Total %	0.7	29.6	0.0	-	30.4	20.0	13.6	0.0	-	33.6	33.9	2.1	0.0	-	36.1	-
PHF	0.250	0.830	0.000	-	0.817	0.700	0.792	0.000	-	0.870	0.766	0.750	0.000	-	0.765	0.854
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	2	78	0	-	80	56	35	0	-	91	90	4	0	-	94	265
% Cars & Light Goods	100.0	94.0	-	-	94.1	100.0	92.1	-	-	96.8	94.7	66.7	-	-	93.1	94.6
Buses	0	2	0	-	2	0	2	0	-	2	4	1	0	-	5	9
% Buses	0.0	2.4	-	-	2.4	0.0	5.3	-	-	2.1	4.2	16.7	-	-	5.0	3.2
Single-Unit Trucks	0	3	0	-	3	0	1	0	-	1	1	1	0	-	2	6
% Single-Unit Trucks	0.0	3.6	-	-	3.5	0.0	2.6	-	-	1.1	1.1	16.7	-	-	2.0	2.1
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
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & South River Road
Site Code: 250480
Start Date: 11/12/2025



Turning Movement Peak Hour Data Plot (7:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & South River Road
Site Code: 250480
Start Date: 11/12/2025

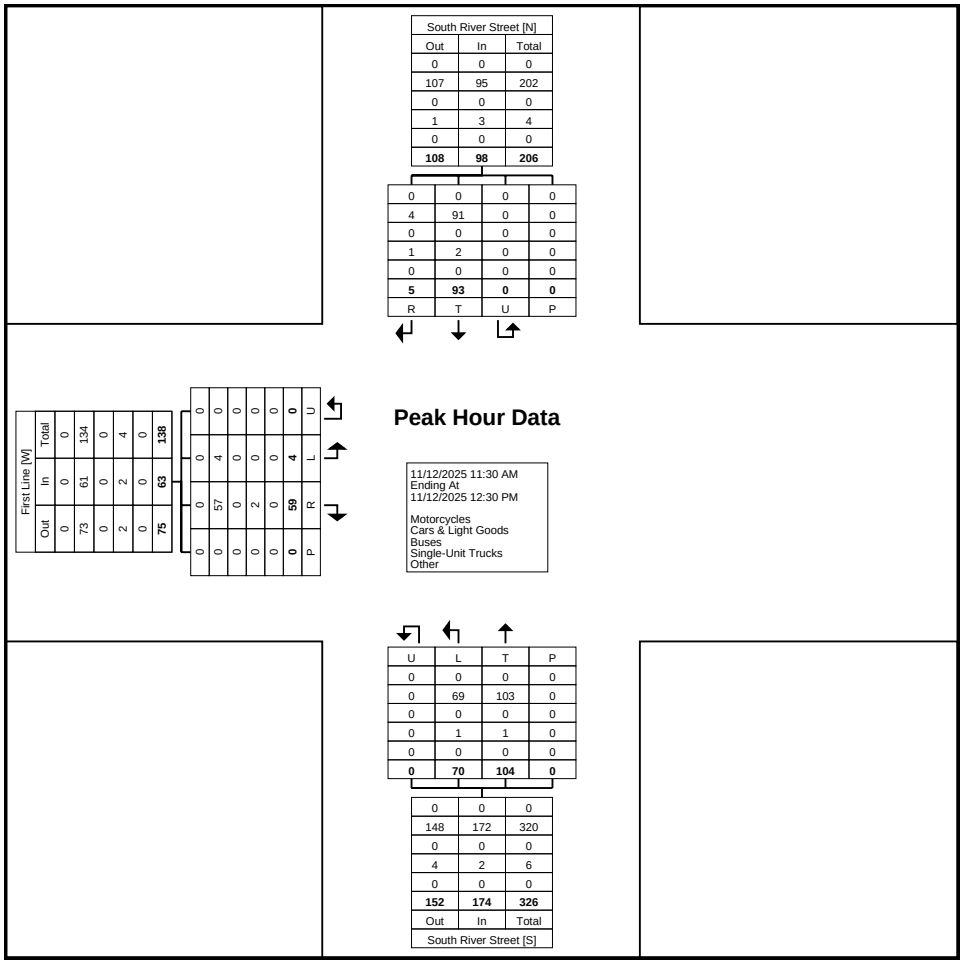
Turning Movement Peak Hour Data (11:30 AM)

Start Time	First Line Eastbound					South River Street Northbound					South River Street Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
11:30 AM	1	17	0	0	18	20	32	0	0	52	18	1	0	0	19	89
11:45 AM	2	13	0	0	15	22	24	0	0	46	28	3	0	0	31	92
12:00 PM	0	14	0	0	14	12	18	0	0	30	27	0	0	0	27	71
12:15 PM	1	15	0	0	16	16	30	0	0	46	20	1	0	0	21	83
Total	4	59	0	0	63	70	104	0	0	174	93	5	0	0	98	335
Approach %	6.3	93.7	0.0	-	-	40.2	59.8	0.0	-	-	94.9	5.1	0.0	-	-	-
Total %	1.2	17.6	0.0	-	18.8	20.9	31.0	0.0	-	51.9	27.8	1.5	0.0	-	29.3	-
PHF	0.500	0.868	0.000	-	0.875	0.795	0.813	0.000	-	0.837	0.830	0.417	0.000	-	0.790	0.910
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	4	57	0	-	61	69	103	0	-	172	91	4	0	-	95	328
% Cars & Light Goods	100.0	96.6	-	-	96.8	98.6	99.0	-	-	98.9	97.8	80.0	-	-	96.9	97.9
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	0	2	0	-	2	1	1	0	-	2	2	1	0	-	3	7
% Single-Unit Trucks	0.0	3.4	-	-	3.2	1.4	1.0	-	-	1.1	2.2	20.0	-	-	3.1	2.1
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
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & South River Road
Site Code: 250480
Start Date: 11/12/2025



Turning Movement Peak Hour Data Plot (11:30 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & South River Road
Site Code: 250480
Start Date: 11/12/2025

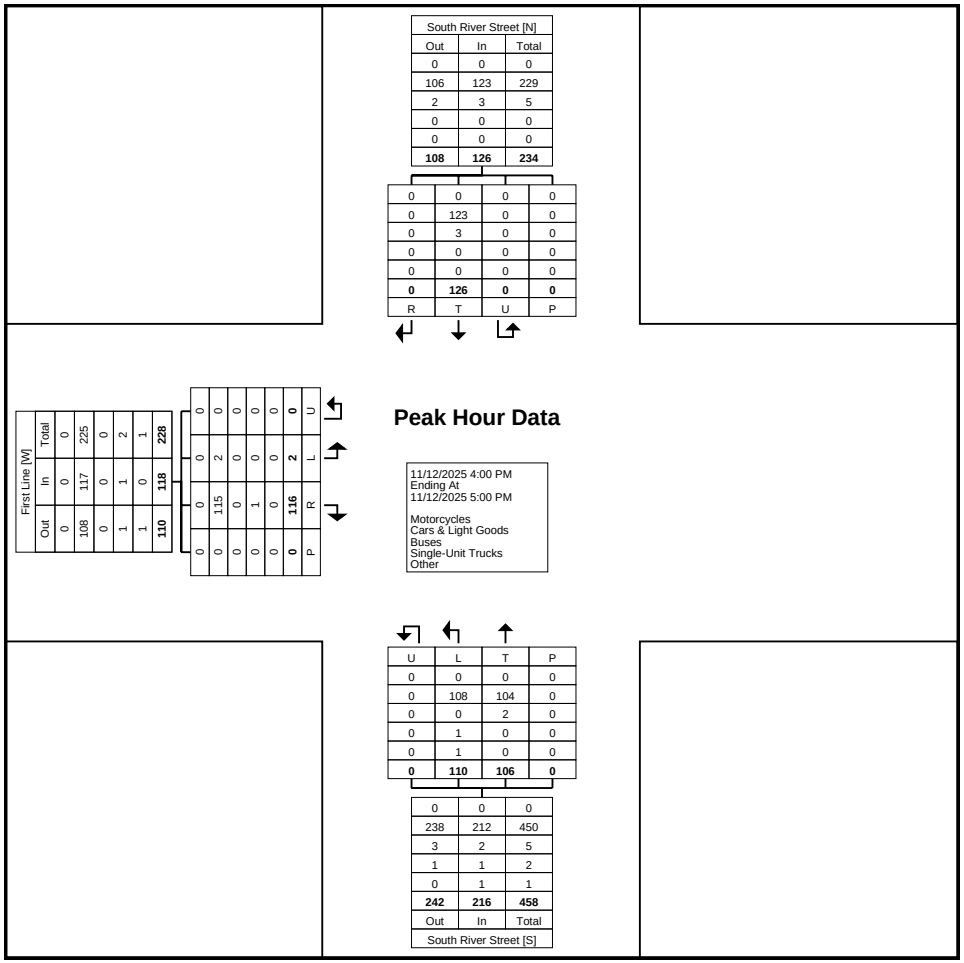
Turning Movement Peak Hour Data (4:00 PM)

Start Time	First Line Eastbound					South River Street Northbound					South River Street Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
4:00 PM	1	28	0	0	29	23	25	0	0	48	30	0	0	0	30	107
4:15 PM	1	25	0	0	26	28	35	0	0	63	32	0	0	0	32	121
4:30 PM	0	34	0	0	34	22	21	0	0	43	39	0	0	0	39	116
4:45 PM	0	29	0	0	29	37	25	0	0	62	25	0	0	0	25	116
Total	2	116	0	0	118	110	106	0	0	216	126	0	0	0	126	460
Approach %	1.7	98.3	0.0	-	-	50.9	49.1	0.0	-	-	100.0	0.0	0.0	-	-	-
Total %	0.4	25.2	0.0	-	25.7	23.9	23.0	0.0	-	47.0	27.4	0.0	0.0	-	27.4	-
PHF	0.500	0.853	0.000	-	0.868	0.743	0.757	0.000	-	0.857	0.808	0.000	0.000	-	0.808	0.950
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	-	-	-	0.0	0.0
Cars & Light Goods	2	115	0	-	117	108	104	0	-	212	123	0	0	-	123	452
% Cars & Light Goods	100.0	99.1	-	-	99.2	98.2	98.1	-	-	98.1	97.6	-	-	-	97.6	98.3
Buses	0	0	0	-	0	0	2	0	-	2	3	0	0	-	3	5
% Buses	0.0	0.0	-	-	0.0	0.0	1.9	-	-	0.9	2.4	-	-	-	2.4	1.1
Single-Unit Trucks	0	1	0	-	1	1	0	0	-	1	0	0	0	-	0	2
% Single-Unit Trucks	0.0	0.9	-	-	0.8	0.9	0.0	-	-	0.5	0.0	-	-	-	0.0	0.4
Articulated Trucks	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.9	0.0	-	-	0.5	0.0	-	-	-	0.0	0.2
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	-	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & South River Road
Site Code: 250480
Start Date: 11/12/2025



Turning Movement Peak Hour Data Plot (4:00 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Spencer Drive
Site Code: 250480
Start Date: 11/12/2025

Turning Movement Data

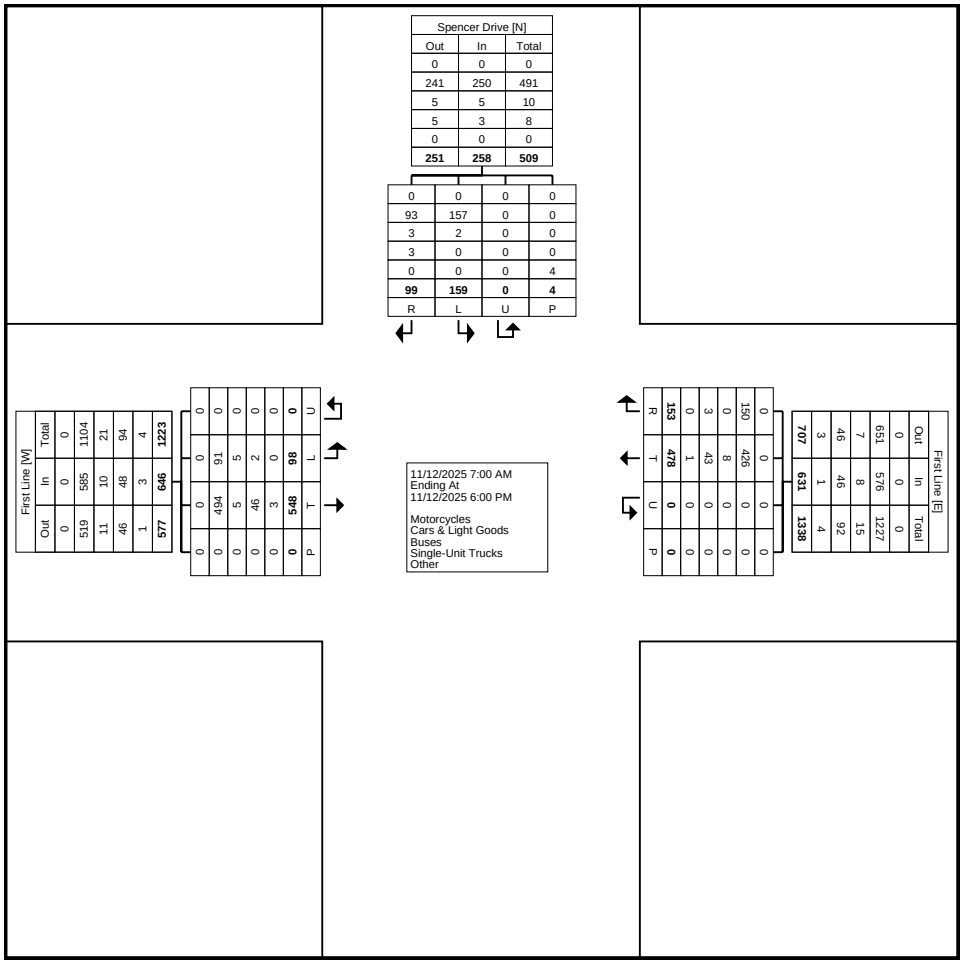
Start Time	First Line Eastbound					First Line Westbound					Spencer Drive Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:00 AM	1	13	0	0	14	13	0	0	0	13	3	8	0	0	11	38
7:15 AM	0	13	0	0	13	22	0	0	0	22	3	6	0	1	9	44
7:30 AM	3	19	0	0	22	14	1	0	0	15	10	9	0	0	19	56
7:45 AM	0	18	0	0	18	24	5	0	0	29	7	6	0	1	13	60
Hourly Total	4	63	0	0	67	73	6	0	0	79	23	29	0	2	52	198
8:00 AM	0	10	0	0	10	19	0	0	0	19	10	6	0	0	16	45
8:15 AM	3	19	0	0	22	25	2	0	0	27	9	7	0	0	16	65
8:30 AM	2	18	0	0	20	17	3	0	0	20	7	7	0	0	14	54
8:45 AM	0	13	0	0	13	6	2	0	0	8	3	3	0	0	6	27
Hourly Total	5	60	0	0	65	67	7	0	0	74	29	23	0	0	52	191
9:00 AM	3	9	0	0	12	9	2	0	0	11	5	4	0	0	9	32
9:15 AM	1	11	0	0	12	11	4	0	0	15	3	3	0	1	6	33
9:30 AM	0	15	0	0	15	11	5	0	0	16	1	1	0	0	2	33
9:45 AM	2	12	0	0	14	9	1	0	0	10	7	2	0	0	9	33
Hourly Total	6	47	0	0	53	40	12	0	0	52	16	10	0	1	26	131
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	2	12	0	0	14	17	4	0	0	21	5	0	0	0	5	40
11:45 AM	2	13	0	0	15	23	3	0	0	26	4	1	0	0	5	46
Hourly Total	4	25	0	0	29	40	7	0	0	47	9	1	0	0	10	86
12:00 PM	1	13	0	0	14	7	4	0	0	11	4	4	0	0	8	33
12:15 PM	2	16	0	0	18	14	4	0	0	18	2	1	0	0	3	39
12:30 PM	5	20	0	0	25	11	6	0	0	17	4	2	0	0	6	48
12:45 PM	4	12	0	0	16	10	4	0	0	14	10	1	0	0	11	41
Hourly Total	12	61	0	0	73	42	18	0	0	60	20	8	0	0	28	161
1:00 PM	3	10	0	0	13	11	8	0	0	19	5	2	0	0	7	39
1:15 PM	5	18	0	0	23	11	3	0	0	14	5	2	0	0	7	44
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	8	28	0	0	36	22	11	0	0	33	10	4	0	0	14	83
3:00 PM	6	27	0	0	33	16	6	0	0	22	3	0	0	0	3	58
3:15 PM	7	26	0	0	33	22	8	0	0	30	5	4	0	0	9	72
3:30 PM	9	20	0	0	29	16	7	0	0	23	4	3	0	0	7	59
3:45 PM	4	15	0	0	19	20	5	0	0	25	8	1	0	0	9	53
Hourly Total	26	88	0	0	114	74	26	0	0	100	20	8	0	0	28	242
4:00 PM	5	29	0	0	34	17	9	0	0	26	1	2	0	0	3	63
4:15 PM	3	25	0	0	28	17	9	0	0	26	8	2	0	0	10	64
4:30 PM	1	26	0	0	27	18	5	0	0	23	5	3	0	0	8	58

4:45 PM	5	21	0	0	26	19	14	0	0	33	4	1	0	1	5	64
Hourly Total	14	101	0	0	115	71	37	0	0	108	18	8	0	1	26	249
5:00 PM	5	26	0	0	31	17	9	0	0	26	3	0	0	0	3	60
5:15 PM	6	22	0	0	28	8	6	0	0	14	9	2	0	0	11	53
5:30 PM	3	20	0	0	23	12	7	0	0	19	2	2	0	0	4	46
5:45 PM	5	7	0	0	12	12	7	0	0	19	0	4	0	0	4	35
Hourly Total	19	75	0	0	94	49	29	0	0	78	14	8	0	0	22	194
Grand Total	98	548	0	0	646	478	153	0	0	631	159	99	0	4	258	1535
Approach %	15.2	84.8	0.0	-	-	75.8	24.2	0.0	-	-	61.6	38.4	0.0	-	-	-
Total %	6.4	35.7	0.0	-	42.1	31.1	10.0	0.0	-	41.1	10.4	6.4	0.0	-	16.8	-
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	91	494	0	-	585	426	150	0	-	576	157	93	0	-	250	1411
% Cars & Light Goods	92.9	90.1	-	-	90.6	89.1	98.0	-	-	91.3	98.7	93.9	-	-	96.9	91.9
Buses	5	5	0	-	10	8	0	0	-	8	2	3	0	-	5	23
% Buses	5.1	0.9	-	-	1.5	1.7	0.0	-	-	1.3	1.3	3.0	-	-	1.9	1.5
Single-Unit Trucks	2	46	0	-	48	43	3	0	-	46	0	3	0	-	3	97
% Single-Unit Trucks	2.0	8.4	-	-	7.4	9.0	2.0	-	-	7.3	0.0	3.0	-	-	1.2	6.3
Articulated Trucks	0	3	0	-	3	1	0	0	-	1	0	0	0	-	0	4
% Articulated Trucks	0.0	0.5	-	-	0.5	0.2	0.0	-	-	0.2	0.0	0.0	-	-	0.0	0.3
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Spencer Drive
Site Code: 250480
Start Date: 11/12/2025



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Spencer Drive
Site Code: 250480
Start Date: 11/12/2025

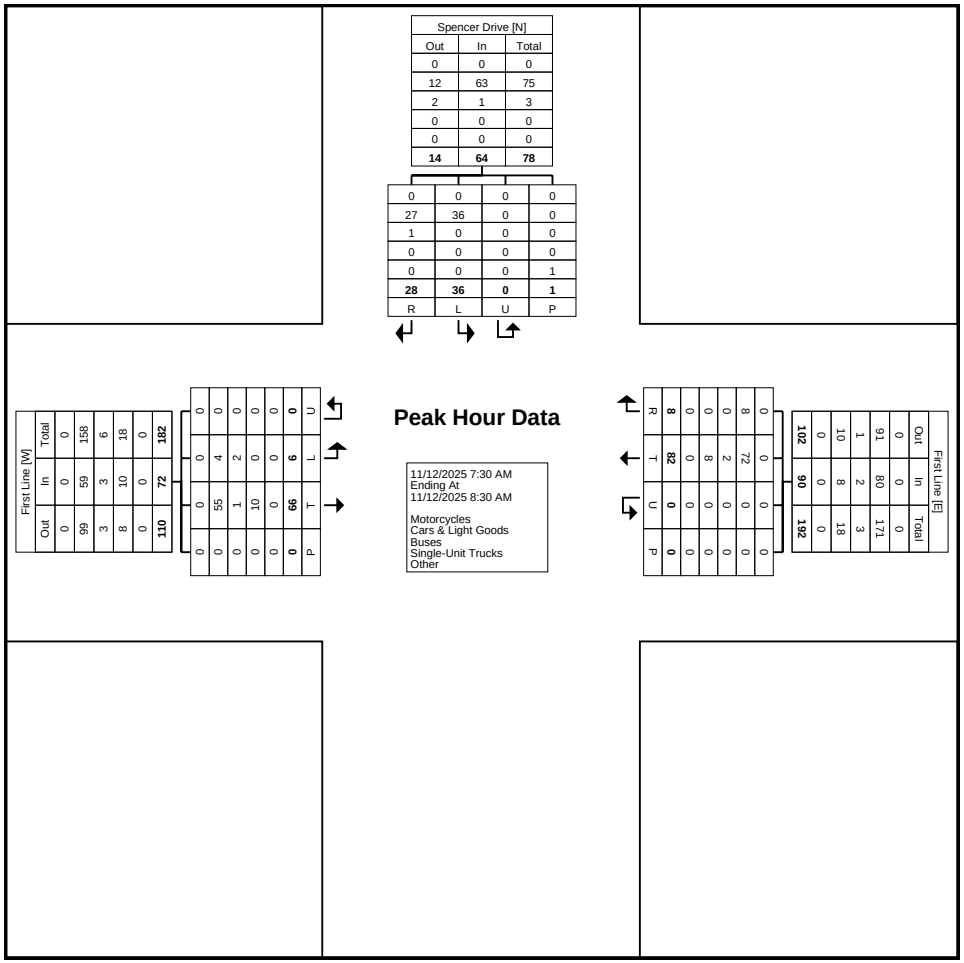
Turning Movement Peak Hour Data (7:30 AM)

Start Time	First Line Eastbound					First Line Westbound					Spencer Drive Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:30 AM	3	19	0	0	22	14	1	0	0	15	10	9	0	0	19	56
7:45 AM	0	18	0	0	18	24	5	0	0	29	7	6	0	1	13	60
8:00 AM	0	10	0	0	10	19	0	0	0	19	10	6	0	0	16	45
8:15 AM	3	19	0	0	22	25	2	0	0	27	9	7	0	0	16	65
Total	6	66	0	0	72	82	8	0	0	90	36	28	0	1	64	226
Approach %	8.3	91.7	0.0	-	-	91.1	8.9	0.0	-	-	56.3	43.8	0.0	-	-	-
Total %	2.7	29.2	0.0	-	31.9	36.3	3.5	0.0	-	39.8	15.9	12.4	0.0	-	28.3	-
PHF	0.500	0.868	0.000	-	0.818	0.820	0.400	0.000	-	0.776	0.900	0.778	0.000	-	0.842	0.869
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	4	55	0	-	59	72	8	0	-	80	36	27	0	-	63	202
% Cars & Light Goods	66.7	83.3	-	-	81.9	87.8	100.0	-	-	88.9	100.0	96.4	-	-	98.4	89.4
Buses	2	1	0	-	3	2	0	0	-	2	0	1	0	-	1	6
% Buses	33.3	1.5	-	-	4.2	2.4	0.0	-	-	2.2	0.0	3.6	-	-	1.6	2.7
Single-Unit Trucks	0	10	0	-	10	8	0	0	-	8	0	0	0	-	0	18
% Single-Unit Trucks	0.0	15.2	-	-	13.9	9.8	0.0	-	-	8.9	0.0	0.0	-	-	0.0	8.0
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
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Spencer Drive
Site Code: 250480
Start Date: 11/12/2025



Turning Movement Peak Hour Data Plot (7:30 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Spencer Drive
Site Code: 250480
Start Date: 11/12/2025

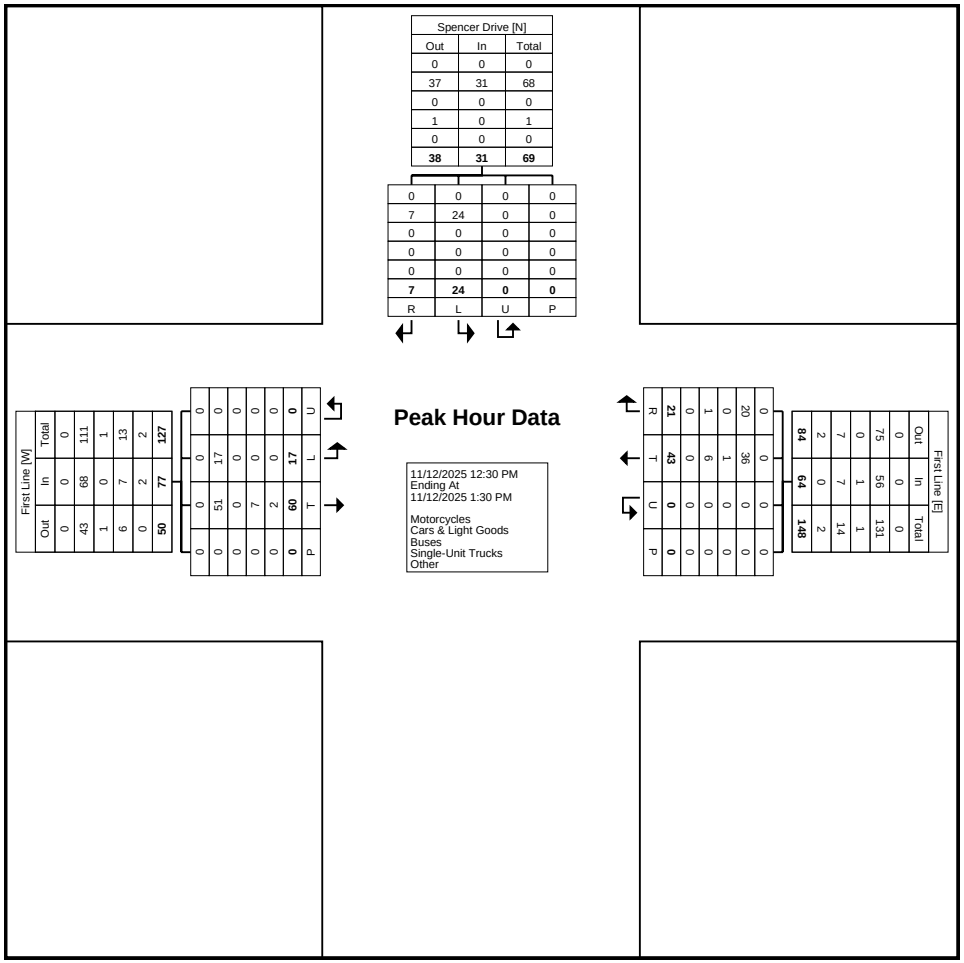
Turning Movement Peak Hour Data (12:30 PM)

Start Time	First Line Eastbound					First Line Westbound					Spencer Drive Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
12:30 PM	5	20	0	0	25	11	6	0	0	17	4	2	0	0	6	48
12:45 PM	4	12	0	0	16	10	4	0	0	14	10	1	0	0	11	41
1:00 PM	3	10	0	0	13	11	8	0	0	19	5	2	0	0	7	39
1:15 PM	5	18	0	0	23	11	3	0	0	14	5	2	0	0	7	44
Total	17	60	0	0	77	43	21	0	0	64	24	7	0	0	31	172
Approach %	22.1	77.9	0.0	-	-	67.2	32.8	0.0	-	-	77.4	22.6	0.0	-	-	-
Total %	9.9	34.9	0.0	-	44.8	25.0	12.2	0.0	-	37.2	14.0	4.1	0.0	-	18.0	-
PHF	0.850	0.750	0.000	-	0.770	0.977	0.656	0.000	-	0.842	0.600	0.875	0.000	-	0.705	0.896
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	17	51	0	-	68	36	20	0	-	56	24	7	0	-	31	155
% Cars & Light Goods	100.0	85.0	-	-	88.3	83.7	95.2	-	-	87.5	100.0	100.0	-	-	100.0	90.1
Buses	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Buses	0.0	0.0	-	-	0.0	2.3	0.0	-	-	1.6	0.0	0.0	-	-	0.0	0.6
Single-Unit Trucks	0	7	0	-	7	6	1	0	-	7	0	0	0	-	0	14
% Single-Unit Trucks	0.0	11.7	-	-	9.1	14.0	4.8	-	-	10.9	0.0	0.0	-	-	0.0	8.1
Articulated Trucks	0	2	0	-	2	0	0	0	-	0	0	0	0	-	0	2
% Articulated Trucks	0.0	3.3	-	-	2.6	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	1.2
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Spencer Drive
Site Code: 250480
Start Date: 11/12/2025



Turning Movement Peak Hour Data Plot (12:30 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Spencer Drive
Site Code: 250480
Start Date: 11/12/2025

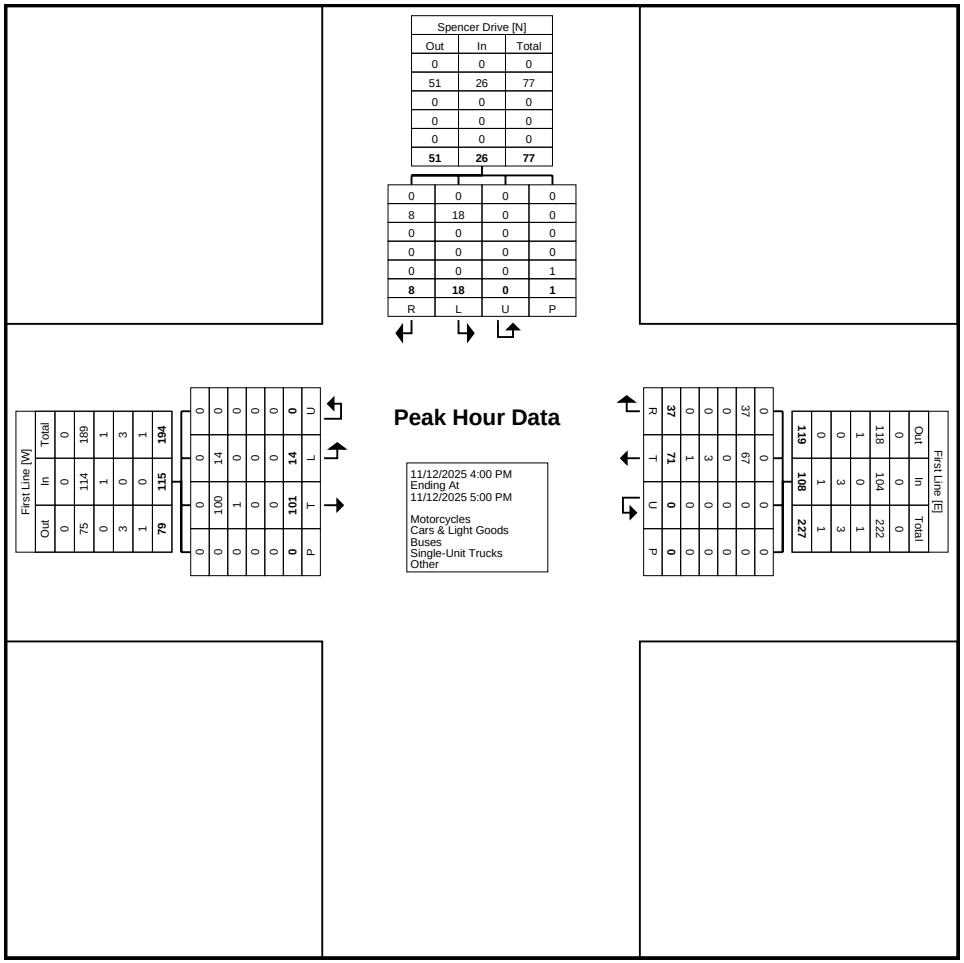
Turning Movement Peak Hour Data (4:00 PM)

Start Time	First Line Eastbound					First Line Westbound					Spencer Drive Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
4:00 PM	5	29	0	0	34	17	9	0	0	26	1	2	0	0	3	63
4:15 PM	3	25	0	0	28	17	9	0	0	26	8	2	0	0	10	64
4:30 PM	1	26	0	0	27	18	5	0	0	23	5	3	0	0	8	58
4:45 PM	5	21	0	0	26	19	14	0	0	33	4	1	0	1	5	64
Total	14	101	0	0	115	71	37	0	0	108	18	8	0	1	26	249
Approach %	12.2	87.8	0.0	-	-	65.7	34.3	0.0	-	-	69.2	30.8	0.0	-	-	-
Total %	5.6	40.6	0.0	-	46.2	28.5	14.9	0.0	-	43.4	7.2	3.2	0.0	-	10.4	-
PHF	0.700	0.871	0.000	-	0.846	0.934	0.661	0.000	-	0.818	0.563	0.667	0.000	-	0.650	0.973
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	14	100	0	-	114	67	37	0	-	104	18	8	0	-	26	244
% Cars & Light Goods	100.0	99.0	-	-	99.1	94.4	100.0	-	-	96.3	100.0	100.0	-	-	100.0	98.0
Buses	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Buses	0.0	1.0	-	-	0.9	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.4
Single-Unit Trucks	0	0	0	-	0	3	0	0	-	3	0	0	0	-	0	3
% Single-Unit Trucks	0.0	0.0	-	-	0.0	4.2	0.0	-	-	2.8	0.0	0.0	-	-	0.0	1.2
Articulated Trucks	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	1.4	0.0	-	-	0.9	0.0	0.0	-	-	0.0	0.4
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Spencer Drive
Site Code: 250480
Start Date: 11/12/2025



Turning Movement Peak Hour Data Plot (4:00 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Wellington Road 7
Site Code: 250480
Start Date: 11/12/2025

Turning Movement Data

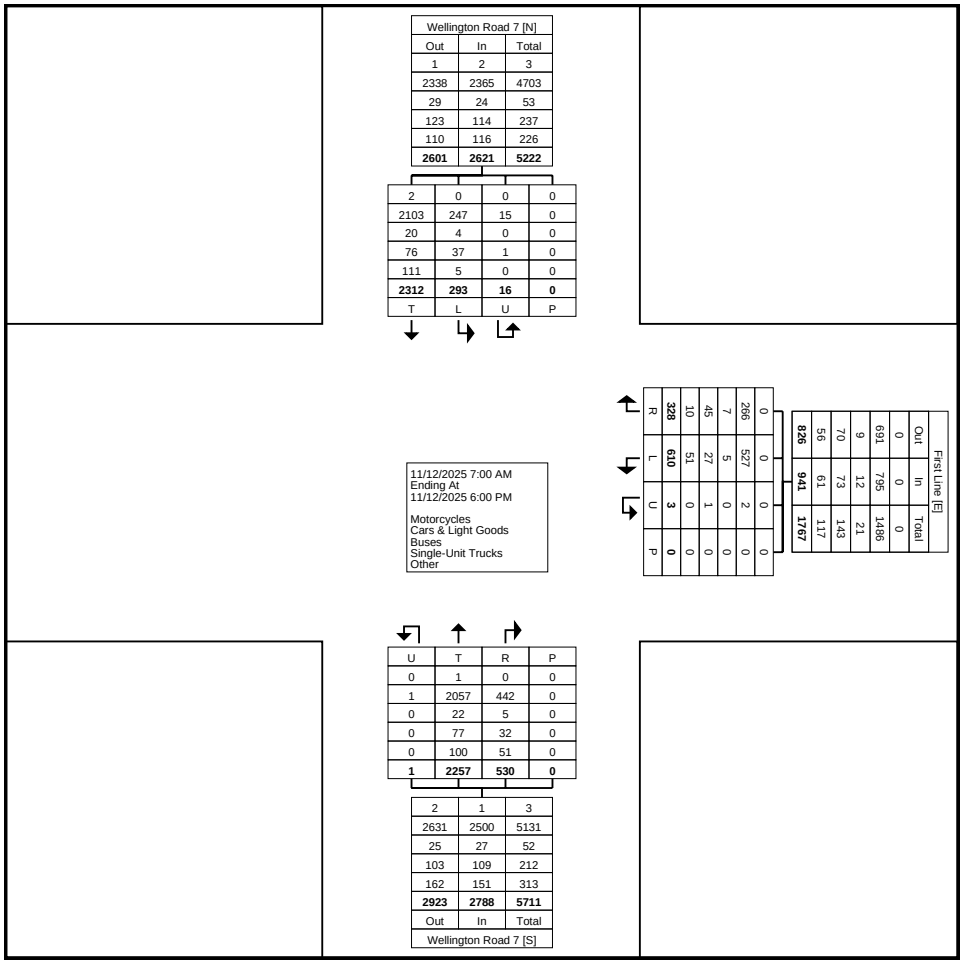
Start Time	First Line Westbound					Wellington Road 7 Northbound					Wellington Road 7 Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	
7:00 AM	18	12	0	0	30	40	18	0	0	58	9	70	0	0	79	167
7:15 AM	28	10	0	0	38	48	26	0	0	74	8	88	0	0	96	208
7:30 AM	46	17	0	0	63	45	11	0	0	56	5	108	0	0	113	232
7:45 AM	30	9	0	0	39	75	17	0	0	92	3	82	0	0	85	216
Hourly Total	122	48	0	0	170	208	72	0	0	280	25	348	0	0	373	823
8:00 AM	31	14	1	0	46	71	3	0	0	74	9	114	0	0	123	243
8:15 AM	25	9	0	0	34	68	11	0	0	79	9	97	1	0	107	220
8:30 AM	28	8	0	0	36	50	8	0	0	58	9	91	1	0	101	195
8:45 AM	17	5	1	0	23	60	12	0	0	72	10	78	3	0	91	186
Hourly Total	101	36	2	0	139	249	34	0	0	283	37	380	5	0	422	844
9:00 AM	8	6	0	0	14	46	12	0	0	58	5	73	2	0	80	152
9:15 AM	11	8	0	0	19	51	10	0	0	61	5	53	0	0	58	138
9:30 AM	13	8	1	0	22	59	10	0	0	69	13	63	2	0	78	169
9:45 AM	9	7	0	0	16	57	8	0	0	65	6	60	0	0	66	147
Hourly Total	41	29	1	0	71	213	40	0	0	253	29	249	4	0	282	606
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	7	11	0	0	18	76	14	0	0	90	11	54	2	0	67	175
11:45 AM	17	14	0	0	31	68	11	0	0	79	11	45	0	0	56	166
Hourly Total	24	25	0	0	49	144	25	0	0	169	22	99	2	0	123	341
12:00 PM	9	11	0	0	20	46	9	0	0	55	6	76	0	0	82	157
12:15 PM	16	8	0	0	24	53	15	1	0	69	11	72	0	0	83	176
12:30 PM	14	13	0	0	27	55	20	0	0	75	12	52	1	0	65	167
12:45 PM	10	4	0	0	14	53	9	0	0	62	14	50	0	0	64	140
Hourly Total	49	36	0	0	85	207	53	1	0	261	43	250	1	0	294	640
1:00 PM	9	12	0	0	21	55	11	0	0	66	6	78	0	0	84	171
1:15 PM	12	6	0	0	18	50	11	0	0	61	8	60	0	0	68	147
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	21	18	0	0	39	105	22	0	0	127	14	138	0	0	152	318
3:00 PM	54	15	0	0	69	74	36	0	0	110	14	65	0	0	79	258
3:15 PM	26	15	0	0	41	73	36	0	0	109	13	68	0	0	81	231
3:30 PM	16	17	0	0	33	101	27	0	0	128	7	70	0	0	77	238
3:45 PM	19	15	0	0	34	112	17	0	0	129	12	61	0	0	73	236
Hourly Total	115	62	0	0	177	360	116	0	0	476	46	264	0	0	310	963
4:00 PM	14	10	0	0	24	105	35	0	0	140	9	74	1	0	84	248
4:15 PM	20	17	0	0	37	88	24	0	0	112	10	71	0	0	81	230
4:30 PM	20	11	0	0	31	94	12	0	0	106	12	96	1	0	109	246

4:45 PM	23	12	0	0	35	109	22	0	0	131	7	79	1	0	87	253
Hourly Total	77	50	0	0	127	396	93	0	0	489	38	320	3	0	361	977
5:00 PM	26	14	0	0	40	98	21	0	0	119	10	70	0	0	80	239
5:15 PM	12	5	0	0	17	91	28	0	0	119	13	76	0	0	89	225
5:30 PM	13	1	0	0	14	113	14	0	0	127	11	59	0	0	70	211
5:45 PM	9	4	0	0	13	73	12	0	0	85	5	59	1	0	65	163
Hourly Total	60	24	0	0	84	375	75	0	0	450	39	264	1	0	304	838
Grand Total	610	328	3	0	941	2257	530	1	0	2788	293	2312	16	0	2621	6350
Approach %	64.8	34.9	0.3	-	-	81.0	19.0	0.0	-	-	11.2	88.2	0.6	-	-	-
Total %	9.6	5.2	0.0	-	14.8	35.5	8.3	0.0	-	43.9	4.6	36.4	0.3	-	41.3	-
Motorcycles	0	0	0	-	0	1	0	0	-	1	0	2	0	-	2	3
% Motorcycles	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.1	0.0	-	0.1	0.0
Cars & Light Goods	527	266	2	-	795	2057	442	1	-	2500	247	2103	15	-	2365	5660
% Cars & Light Goods	86.4	81.1	66.7	-	84.5	91.1	83.4	100.0	-	89.7	84.3	91.0	93.8	-	90.2	89.1
Buses	5	7	0	-	12	22	5	0	-	27	4	20	0	-	24	63
% Buses	0.8	2.1	0.0	-	1.3	1.0	0.9	0.0	-	1.0	1.4	0.9	0.0	-	0.9	1.0
Single-Unit Trucks	27	45	1	-	73	77	32	0	-	109	37	76	1	-	114	296
% Single-Unit Trucks	4.4	13.7	33.3	-	7.8	3.4	6.0	0.0	-	3.9	12.6	3.3	6.3	-	4.3	4.7
Articulated Trucks	51	10	0	-	61	100	51	0	-	151	5	111	0	-	116	328
% Articulated Trucks	8.4	3.0	0.0	-	6.5	4.4	9.6	0.0	-	5.4	1.7	4.8	0.0	-	4.4	5.2
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Wellington Road 7
Site Code: 250480
Start Date: 11/12/2025



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Wellington Road 7
Site Code: 250480
Start Date: 11/12/2025

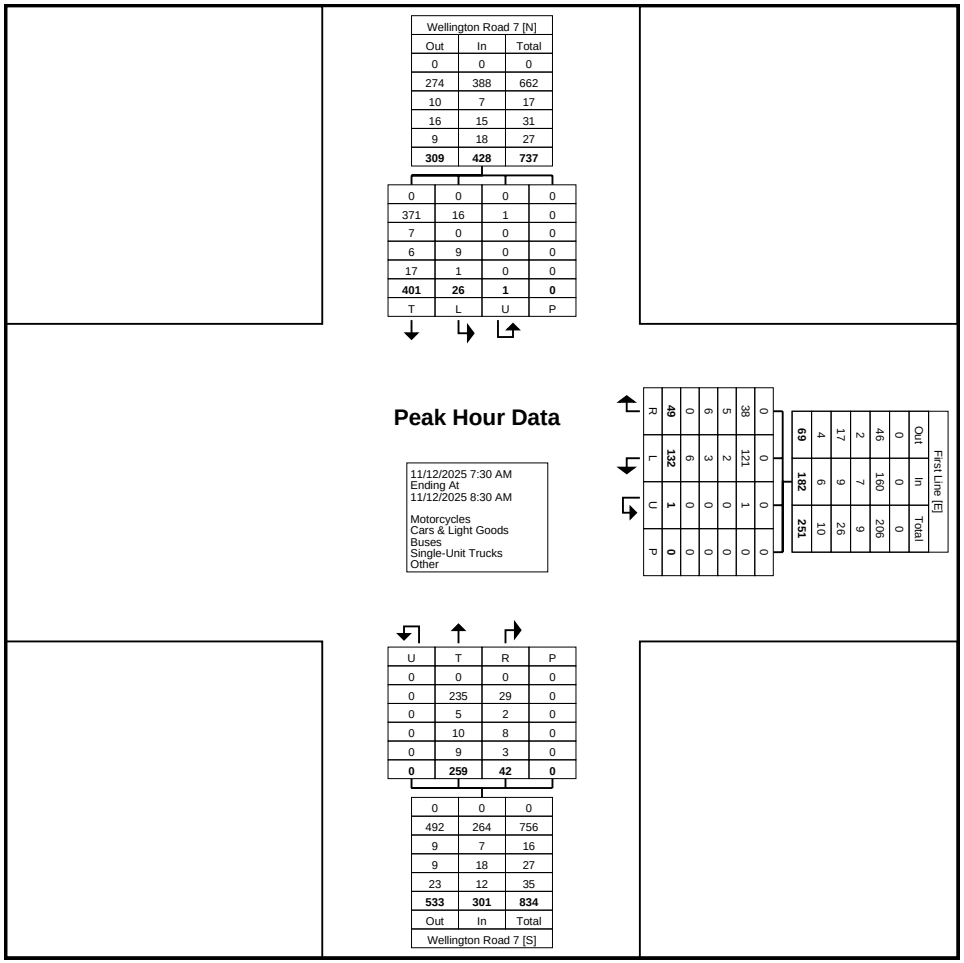
Turning Movement Peak Hour Data (7:30 AM)

Start Time	First Line Westbound					Wellington Road 7 Northbound					Wellington Road 7 Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
7:30 AM	46	17	0	0	63	45	11	0	0	56	5	108	0	0	113	232
7:45 AM	30	9	0	0	39	75	17	0	0	92	3	82	0	0	85	216
8:00 AM	31	14	1	0	46	71	3	0	0	74	9	114	0	0	123	243
8:15 AM	25	9	0	0	34	68	11	0	0	79	9	97	1	0	107	220
Total	132	49	1	0	182	259	42	0	0	301	26	401	1	0	428	911
Approach %	72.5	26.9	0.5	-	-	86.0	14.0	0.0	-	-	6.1	93.7	0.2	-	-	-
Total %	14.5	5.4	0.1	-	20.0	28.4	4.6	0.0	-	33.0	2.9	44.0	0.1	-	47.0	-
PHF	0.717	0.721	0.250	-	0.722	0.863	0.618	0.000	-	0.818	0.722	0.879	0.250	-	0.870	0.937
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Cars & Light Goods	121	38	1	-	160	235	29	0	-	264	16	371	1	-	388	812
% Cars & Light Goods	91.7	77.6	100.0	-	87.9	90.7	69.0	-	-	87.7	61.5	92.5	100.0	-	90.7	89.1
Buses	2	5	0	-	7	5	2	0	-	7	0	7	0	-	7	21
% Buses	1.5	10.2	0.0	-	3.8	1.9	4.8	-	-	2.3	0.0	1.7	0.0	-	1.6	2.3
Single-Unit Trucks	3	6	0	-	9	10	8	0	-	18	9	6	0	-	15	42
% Single-Unit Trucks	2.3	12.2	0.0	-	4.9	3.9	19.0	-	-	6.0	34.6	1.5	0.0	-	3.5	4.6
Articulated Trucks	6	0	0	-	6	9	3	0	-	12	1	17	0	-	18	36
% Articulated Trucks	4.5	0.0	0.0	-	3.3	3.5	7.1	-	-	4.0	3.8	4.2	0.0	-	4.2	4.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Wellington Road 7
Site Code: 250480
Start Date: 11/12/2025



Turning Movement Peak Hour Data Plot (7:30 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Wellington Road 7
Site Code: 250480
Start Date: 11/12/2025

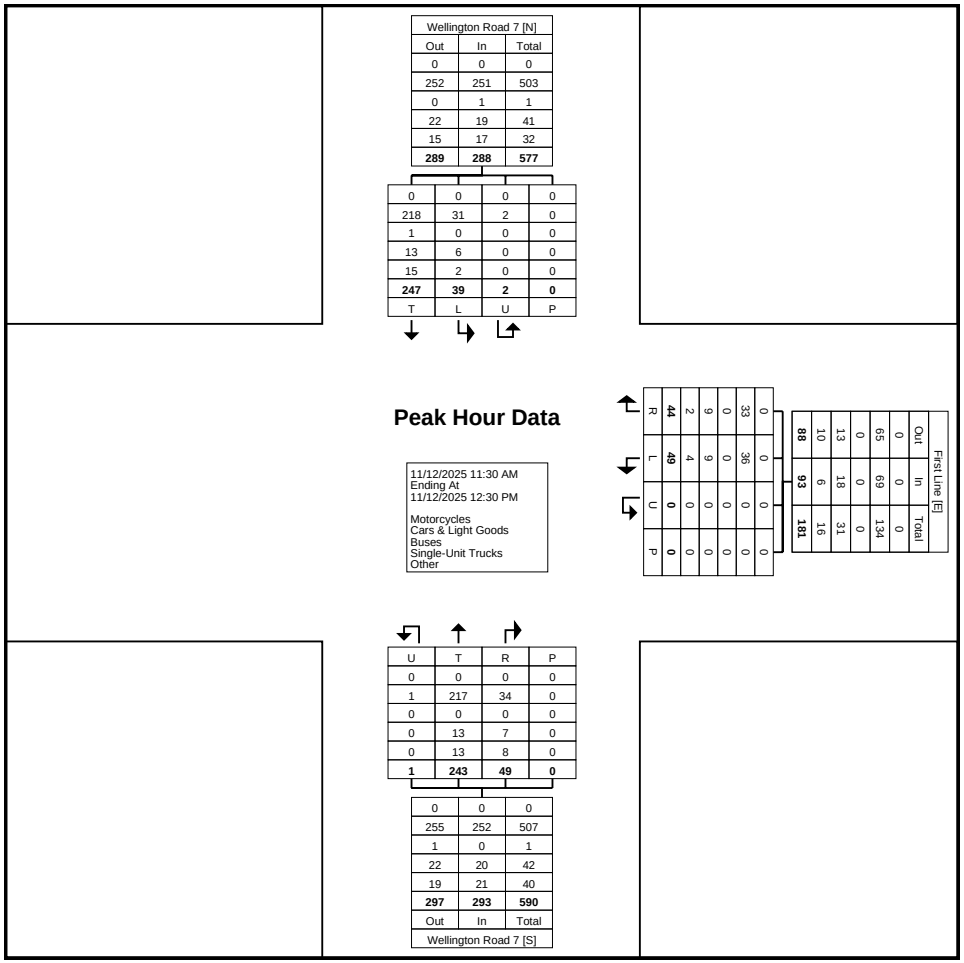
Turning Movement Peak Hour Data (11:30 AM)

Start Time	First Line Westbound					Wellington Road 7 Northbound					Wellington Road 7 Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
11:30 AM	7	11	0	0	18	76	14	0	0	90	11	54	2	0	67	175
11:45 AM	17	14	0	0	31	68	11	0	0	79	11	45	0	0	56	166
12:00 PM	9	11	0	0	20	46	9	0	0	55	6	76	0	0	82	157
12:15 PM	16	8	0	0	24	53	15	1	0	69	11	72	0	0	83	176
Total	49	44	0	0	93	243	49	1	0	293	39	247	2	0	288	674
Approach %	52.7	47.3	0.0	-	-	82.9	16.7	0.3	-	-	13.5	85.8	0.7	-	-	-
Total %	7.3	6.5	0.0	-	13.8	36.1	7.3	0.1	-	43.5	5.8	36.6	0.3	-	42.7	-
PHF	0.721	0.786	0.000	-	0.750	0.799	0.817	0.250	-	0.814	0.886	0.813	0.250	-	0.867	0.957
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Cars & Light Goods	36	33	0	-	69	217	34	1	-	252	31	218	2	-	251	572
% Cars & Light Goods	73.5	75.0	-	-	74.2	89.3	69.4	100.0	-	86.0	79.5	88.3	100.0	-	87.2	84.9
Buses	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	1
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.4	0.0	-	0.3	0.1
Single-Unit Trucks	9	9	0	-	18	13	7	0	-	20	6	13	0	-	19	57
% Single-Unit Trucks	18.4	20.5	-	-	19.4	5.3	14.3	0.0	-	6.8	15.4	5.3	0.0	-	6.6	8.5
Articulated Trucks	4	2	0	-	6	13	8	0	-	21	2	15	0	-	17	44
% Articulated Trucks	8.2	4.5	-	-	6.5	5.3	16.3	0.0	-	7.2	5.1	6.1	0.0	-	5.9	6.5
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Wellington Road 7
Site Code: 250480
Start Date: 11/12/2025



Turning Movement Peak Hour Data Plot (11:30 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Wellington Road 7
Site Code: 250480
Start Date: 11/12/2025

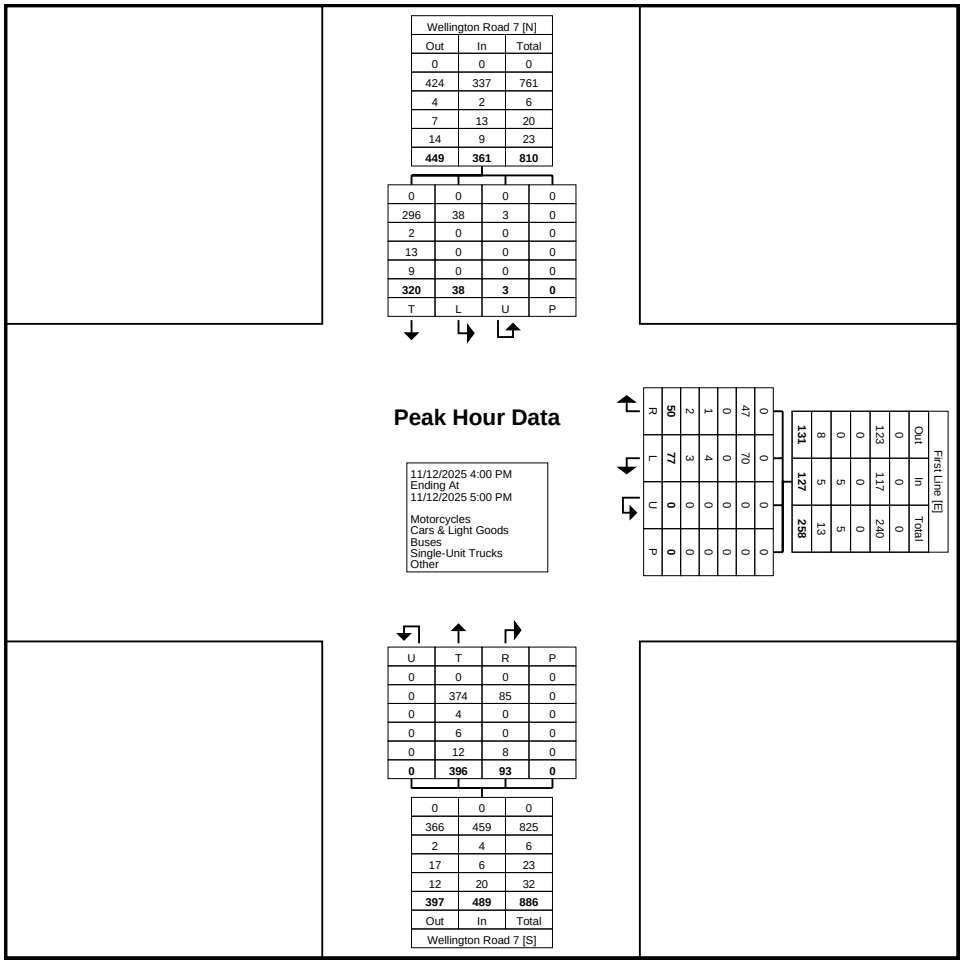
Turning Movement Peak Hour Data (4:00 PM)

Start Time	First Line Westbound					Wellington Road 7 Northbound					Wellington Road 7 Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
4:00 PM	14	10	0	0	24	105	35	0	0	140	9	74	1	0	84	248
4:15 PM	20	17	0	0	37	88	24	0	0	112	10	71	0	0	81	230
4:30 PM	20	11	0	0	31	94	12	0	0	106	12	96	1	0	109	246
4:45 PM	23	12	0	0	35	109	22	0	0	131	7	79	1	0	87	253
Total	77	50	0	0	127	396	93	0	0	489	38	320	3	0	361	977
Approach %	60.6	39.4	0.0	-	-	81.0	19.0	0.0	-	-	10.5	88.6	0.8	-	-	-
Total %	7.9	5.1	0.0	-	13.0	40.5	9.5	0.0	-	50.1	3.9	32.8	0.3	-	36.9	-
PHF	0.837	0.735	0.000	-	0.858	0.908	0.664	0.000	-	0.873	0.792	0.833	0.750	-	0.828	0.965
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Cars & Light Goods	70	47	0	-	117	374	85	0	-	459	38	296	3	-	337	913
% Cars & Light Goods	90.9	94.0	-	-	92.1	94.4	91.4	-	-	93.9	100.0	92.5	100.0	-	93.4	93.4
Buses	0	0	0	-	0	4	0	0	-	4	0	2	0	-	2	6
% Buses	0.0	0.0	-	-	0.0	1.0	0.0	-	-	0.8	0.0	0.6	0.0	-	0.6	0.6
Single-Unit Trucks	4	1	0	-	5	6	0	0	-	6	0	13	0	-	13	24
% Single-Unit Trucks	5.2	2.0	-	-	3.9	1.5	0.0	-	-	1.2	0.0	4.1	0.0	-	3.6	2.5
Articulated Trucks	3	2	0	-	5	12	8	0	-	20	0	9	0	-	9	34
% Articulated Trucks	3.9	4.0	-	-	3.9	3.0	8.6	-	-	4.1	0.0	2.8	0.0	-	2.5	3.5
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: First Line & Wellington Road 7
Site Code: 250480
Start Date: 11/12/2025



Turning Movement Peak Hour Data Plot (4:00 PM)

Appendix C

Base Year Traffic Operations Reports





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	83	56	38	95	6
Future Volume (vph)	2	83	56	38	95	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.868				0.992	
Flt Protected	0.999			0.971		
Satd. Flow (prot)	1556	0	0	1787	1767	0
Flt Permitted	0.999			0.971		
Satd. Flow (perm)	1556	0	0	1787	1767	0
Link Speed (k/h)	60			50	50	
Link Distance (m)	545.8			255.4	392.8	
Travel Time (s)	32.7			18.4	28.3	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	6%	0%	8%	5%	33%
Adj. Flow (vph)	2	98	66	45	112	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	100	0	0	111	119	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.7%		ICU Level of Service A	
Analysis Period (min) 15			

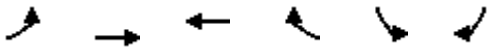
Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	83	56	38	95	6
Future Vol, veh/h	2	83	56	38	95	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	6	0	8	5	33
Mvmt Flow	2	98	66	45	112	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	292	115	119	0	-	0
Stage 1	115	-	-	-	-	-
Stage 2	176	-	-	-	-	-
Critical Hdwy	6.4	6.26	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.354	2.2	-	-	-
Pot Cap-1 Maneuver	703	926	1482	-	-	-
Stage 1	915	-	-	-	-	-
Stage 2	859	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	671	926	1482	-	-	-
Mov Cap-2 Maneuver	671	-	-	-	-	-
Stage 1	873	-	-	-	-	-
Stage 2	859	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.4	4.49	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1072	-	918	-	-
HCM Lane V/C Ratio	0.044	-	0.109	-	-
HCM Ctrl Dly (s/v)	7.5	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	66	82	8	36	28
Future Volume (vph)	6	66	82	8	36	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.988		0.941	
Flt Protected		0.996			0.973	
Satd. Flow (prot)	0	1599	1692	0	1710	0
Flt Permitted		0.996			0.973	
Satd. Flow (perm)	0	1599	1692	0	1710	0
Link Speed (k/h)		40	40		50	
Link Distance (m)		191.6	204.5		250.6	
Travel Time (s)		17.2	18.4		18.0	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	33%	17%	12%	0%	0%	4%
Adj. Flow (vph)	7	76	94	9	41	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	83	103	0	73	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 18.8%		ICU Level of Service A	
Analysis Period (min) 15			

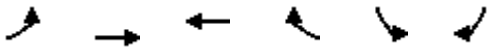
Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	66	82	8	36	28
Future Vol, veh/h	6	66	82	8	36	28
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	33	17	12	0	0	4
Mvmt Flow	7	76	94	9	41	32

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	104	0	-	0	190	100
Stage 1	-	-	-	-	100	-
Stage 2	-	-	-	-	90	-
Critical Hdwy	4.43	-	-	-	6.4	6.24
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.497	-	-	-	3.5	3.336
Pot Cap-1 Maneuver	1314	-	-	-	804	950
Stage 1	-	-	-	-	929	-
Stage 2	-	-	-	-	939	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1313	-	-	-	799	949
Mov Cap-2 Maneuver	-	-	-	-	799	-
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	939	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.65	0	9.59
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	150	-	-	-	858
HCM Lane V/C Ratio	0.005	-	-	-	0.086
HCM Ctrl Dly (s/v)	7.8	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.3



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	49	93	19	21	41
Future Volume (vph)	5	49	93	19	21	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.977		0.911	
Flt Protected		0.995			0.983	
Satd. Flow (prot)	0	1543	1672	0	1651	0
Flt Permitted		0.995			0.983	
Satd. Flow (perm)	0	1543	1672	0	1651	0
Link Speed (k/h)		40	40		50	
Link Distance (m)		234.4	191.6		193.9	
Travel Time (s)		21.1	17.2		14.0	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	25%	11%	11%	5%	2%
Adj. Flow (vph)	6	55	104	21	24	46
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	61	125	0	70	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 17.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	49	93	19	21	41
Future Vol, veh/h	5	49	93	19	21	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	25	11	11	5	2
Mvmt Flow	6	55	104	21	24	46

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	126	0	-	0	181	115
Stage 1	-	-	-	-	115	-
Stage 2	-	-	-	-	66	-
Critical Hdwy	4.1	-	-	-	6.45	6.22
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.2	-	-	-	3.545	3.318
Pot Cap-1 Maneuver	1473	-	-	-	801	937
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	949	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1473	-	-	-	798	937
Mov Cap-2 Maneuver	-	-	-	-	798	-
Stage 1	-	-	-	-	899	-
Stage 2	-	-	-	-	949	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.69	0	9.42
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	167	-	-	-	885
HCM Lane V/C Ratio	0.004	-	-	-	0.079
HCM Ctrl Dly (s/v)	7.5	0	-	-	9.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]
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Filename: Wellington Road 7 & First Line.arc8
Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Project Files\2025\250480-Arcady
Report generation date: 2026-07-13 12:49:20 PM

« (Default Analysis Set) - Base Year, AM
» Intersection Network
» Legs
» Traffic Flows
» Entry Flows
» Turning Proportions
» Vehicle Mix
» Results

Summary of intersection performance

	AM						
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
	A1 - Base Year						
Leg North	0.60	1.09	4.76	0.36	A	4.33	A
Leg South	0.35	~1	3.94	0.24	A		
Leg East	0.21	~1	3.99	0.16	A		

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages.

"D1 - Base Year, AM " model duration: 8:00 AM - 9:00 AM
"D2 - Base Year, PM" model duration: 4:30 PM - 5:30 PM
"D3 - Background 2031, AM" model duration: 8:00 AM - 9:00 AM
"D4 - Background 2031, PM" model duration: 4:30 PM - 5:30 PM
"D5 - Background 2036, AM" model duration: 8:00 AM - 9:00 AM
"D6 - Background 2036, PM" model duration: 4:30 PM - 5:30 PM
"D7 - Total 2031, AM" model duration: 8:00 AM - 9:00 AM
"D8 - Total 2031, PM" model duration: 4:30 PM - 5:30 PM
"D9 - Total 2036, AM" model duration: 8:00 AM - 9:00 AM
"D10 - Total 2036, PM" model duration: 4:30 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2026-07-13 12:49:20 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2026-07-13
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	AdamMorrison
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	V/C Ratio Threshold	Average Delay Threshold (s)	Queue Threshold (PCE)
7.50	✓		N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCE	PCE	perHour	s	-Min	perMin

(Default Analysis Set) - Base Year, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
Base Year, AM	Base Year	AM		PHF	08:00	09:00	60	15				✓		

Intersection Network

Intersections

Intersection	Name	Intersection Type	Leg Order	Grade Separated	Large Roundabout	Do Geometric Delay	Intersection Delay (s)	Intersection LOS
1	(untitled)	Roundabout	North,South,East				4.33	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Wellington Road 7	
South	South	First Line	
East	East	Wellington Road 7	

Capacity Options

Leg	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
North	0.00	99999.00		0.00
South	0.00	99999.00		0.00
East	0.00	99999.00		0.00

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
North	3.50	4.50	30.00	20.00	40.00	25.00	
South	3.50	4.50	30.00	20.00	40.00	25.00	
East	3.50	4.50	30.00	20.00	40.00	25.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Enter slope and intercept directly	Entered slope	Entered intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
North		(calculated)	(calculated)	0.579	1357.445
South		(calculated)	(calculated)	0.579	1357.445
East		(calculated)	(calculated)	0.579	1357.445

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	Truck Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Leg	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)
North	PHF	✓	428.00	100.000
South	PHF	✓	301.00	100.000
East	PHF	✓	182.00	100.000

Peak Hour Factor Data

Leg	Hourly Volume (PCE/hr)	Peak Hour Factor	Peak Time Segment
North	428.00	0.94	SecondQuarter
South	301.00	0.94	SecondQuarter
East	182.00	0.94	SecondQuarter

Turning Proportions

Turning Counts / Proportions (PCE/hr) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.000	401.000	27.000
	South	259.000	0.000	42.000
	East	49.000	133.000	0.000

Turning Proportions (PCE) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.00	0.94	0.06
	South	0.86	0.00	0.14
	East	0.27	0.73	0.00

Vehicle Mix

Average PCE Per Vehicle - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	1.000	1.070	1.380
	South	1.090	1.000	1.310
	East	1.220	1.080	1.000

Truck Percentages - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.0	7.0	38.0
	South	9.0	0.0	31.0
	East	22.0	8.0	0.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Total Queueing Delay (PCE-min)	Inclusive Average Queueing Delay (s)
North	0.36	4.76	0.60	1.09	A	428.00	428.00	32.57	4.57	0.54	32.57	4.57
South	0.24	3.94	0.35	~1	A	301.00	301.00	19.30	3.85	0.32	19.30	3.85
East	0.16	3.99	0.21	~1	A	182.00	182.00	11.83	3.90	0.20	11.83	3.90

Main Results for each time segment

Main results: (08:00-08:15)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	409.79	102.45	407.77	293.65	126.80	0.00	1284.06	1061.08	0.319	0.00	0.51	4.449	A
South	288.19	72.05	286.98	508.84	25.72	0.00	1342.56	1318.70	0.215	0.00	0.30	3.804	A
East	174.26	43.56	173.51	65.77	246.93	0.00	1214.53	700.73	0.143	0.00	0.19	3.851	A

Main results: (08:15-08:30)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	455.32	113.83	454.95	327.48	141.41	0.00	1275.60	1061.08	0.357	0.51	0.60	4.759	A
South	320.21	80.05	320.03	567.66	28.70	0.00	1340.83	1318.70	0.239	0.30	0.35	3.936	A
East	193.62	48.40	193.51	73.36	275.38	0.00	1198.07	700.73	0.162	0.19	0.21	3.993	A

Main results: (08:30-08:45)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	437.11	109.28	437.23	314.61	135.86	0.00	1278.82	1061.08	0.342	0.60	0.57	4.643	A
South	307.40	76.85	307.46	545.50	27.58	0.00	1341.48	1318.70	0.229	0.35	0.33	3.887	A
East	185.87	46.47	185.91	70.48	264.56	0.00	1204.33	700.73	0.154	0.21	0.20	3.940	A

Main results: (08:45-09:00)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	409.79	102.45	410.01	295.00	127.39	0.00	1283.72	1061.08	0.319	0.57	0.51	4.474	A
South	288.19	72.05	288.30	511.53	25.86	0.00	1342.48	1318.70	0.215	0.33	0.31	3.811	A
East	174.26	43.56	174.32	66.09	248.07	0.00	1213.87	700.73	0.144	0.20	0.19	3.859	A

Queueing Delay Results for each time segment

Queueing Delay results: (08:00-08:15)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	7.37	0.49	4.449	A	A
South	4.45	0.30	3.804	A	A
East	2.73	0.18	3.851	A	A

Queueing Delay results: (08:15-08:30)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	8.81	0.59	4.759	A	A
South	5.16	0.34	3.936	A	A
East	3.17	0.21	3.993	A	A

Queueing Delay results: (08:30-08:45)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	8.60	0.57	4.643	A	A
South	5.04	0.34	3.887	A	A
East	3.09	0.21	3.940	A	A

Queueing Delay results: (08:45-09:00)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	7.79	0.52	4.474	A	A
South	4.65	0.31	3.811	A	A
East	2.84	0.19	3.859	A	A

Queue Variation Results for each time segment

Queue Variation results: (08:00-08:15)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.51	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.30	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.19	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:15-08:30)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.60	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.35	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.21	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:30-08:45)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.57	0.00	0.00	0.00	1.09			N/A	N/A
South	0.33	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.20	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:45-09:00)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.51	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.31	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.19	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	116	110	106	126	0
Future Volume (vph)	2	116	110	106	126	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.867					
Flt Protected	0.999			0.975		
Satd. Flow (prot)	1630	0	0	1816	1863	0
Flt Permitted	0.999			0.975		
Satd. Flow (perm)	1630	0	0	1816	1863	0
Link Speed (k/h)	60			50	50	
Link Distance (m)	545.8			255.4	392.8	
Travel Time (s)	32.7			18.4	28.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	2%	2%	2%	0%
Adj. Flow (vph)	2	122	116	112	133	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	124	0	0	228	133	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.6%		ICU Level of Service A	
Analysis Period (min) 15			

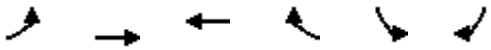
Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	116	110	106	126	0
Future Vol, veh/h	2	116	110	106	126	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	1	2	2	2	0
Mvmt Flow	2	122	116	112	133	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	476	133	133	0	-	0
Stage 1	133	-	-	-	-	-
Stage 2	343	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.218	-	-	-
Pot Cap-1 Maneuver	551	919	1452	-	-	-
Stage 1	899	-	-	-	-	-
Stage 2	723	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	505	919	1452	-	-	-
Mov Cap-2 Maneuver	505	-	-	-	-	-
Stage 1	822	-	-	-	-	-
Stage 2	723	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.6	3.92	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	917	-	907	-	-
HCM Lane V/C Ratio	0.08	-	0.137	-	-
HCM Ctrl Dly (s/v)	7.7	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.3	-	0.5	-	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	14	101	71	37	18	8
Future Volume (vph)	14	101	71	37	18	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.954		0.960	
Flt Protected		0.994			0.966	
Satd. Flow (prot)	0	1872	1744	0	1762	0
Flt Permitted		0.994			0.966	
Satd. Flow (perm)	0	1872	1744	0	1762	0
Link Speed (k/h)		40	40		50	
Link Distance (m)		191.6	204.5		250.6	
Travel Time (s)		17.2	18.4		18.0	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	1%	6%	0%	0%	0%
Adj. Flow (vph)	14	104	73	38	19	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	118	111	0	27	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 22.8%		ICU Level of Service A	
Analysis Period (min) 15			

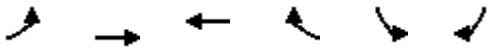
Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	101	71	37	18	8
Future Vol, veh/h	14	101	71	37	18	8
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	1	6	0	0	0
Mvmt Flow	14	104	73	38	19	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	112	0	-	0	226	93
Stage 1	-	-	-	-	93	-
Stage 2	-	-	-	-	133	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1490	-	-	-	766	969
Stage 1	-	-	-	-	935	-
Stage 2	-	-	-	-	898	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1488	-	-	-	758	968
Mov Cap-2 Maneuver	-	-	-	-	758	-
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	898	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.91	0	9.58
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	219	-	-	-	812
HCM Lane V/C Ratio	0.01	-	-	-	0.033
HCM Ctrl Dly (s/v)	7.4	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	36	94	51	28	22	24
Future Volume (vph)	36	94	51	28	22	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.952		0.930	
Flt Protected		0.986			0.977	
Satd. Flow (prot)	0	1873	1742	0	1691	0
Flt Permitted		0.986			0.977	
Satd. Flow (perm)	0	1873	1742	0	1691	0
Link Speed (k/h)		40	40		50	
Link Distance (m)		234.4	191.6		193.9	
Travel Time (s)		21.1	17.2		14.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	6%	0%	0%	4%
Adj. Flow (vph)	37	96	52	29	22	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	133	81	0	46	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	36	94	51	28	22	24
Future Vol, veh/h	36	94	51	28	22	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	6	0	0	4
Mvmt Flow	37	96	52	29	22	24

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	81	0	-	0	236	66
Stage 1	-	-	-	-	66	-
Stage 2	-	-	-	-	169	-
Critical Hdwy	4.1	-	-	-	6.4	6.24
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.336
Pot Cap-1 Maneuver	1530	-	-	-	757	992
Stage 1	-	-	-	-	962	-
Stage 2	-	-	-	-	865	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1530	-	-	-	738	992
Mov Cap-2 Maneuver	-	-	-	-	738	-
Stage 1	-	-	-	-	937	-
Stage 2	-	-	-	-	865	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	2.05	0	9.47
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	498	-	-	-	852
HCM Lane V/C Ratio	0.024	-	-	-	0.055
HCM Ctrl Dly (s/v)	7.4	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]
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Filename: Wellington Road 7 & First Line.arc8
Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Project Files\2025\250480-Arcady
Report generation date: 2026-07-13 12:49:01 PM

« (Default Analysis Set) - Base Year, PM
» Intersection Network
» Legs
» Traffic Flows
» Entry Flows
» Turning Proportions
» Vehicle Mix
» Results

Summary of intersection performance

	PM						
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
	A1 - Base Year						
Leg North	0.42	~1	4.10	0.28	A	4.34	A
Leg South	0.64	~1	4.63	0.38	A		
Leg East	0.14	~1	3.92	0.12	A		

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages.

"D1 - Base Year, AM" model duration: 8:00 AM - 9:00 AM
"D2 - Base Year, PM " model duration: 4:30 PM - 5:30 PM
"D3 - Background 2031, AM" model duration: 8:00 AM - 9:00 AM
"D4 - Background 2031, PM" model duration: 4:30 PM - 5:30 PM
"D5 - Background 2036, AM" model duration: 8:00 AM - 9:00 AM
"D6 - Background 2036, PM" model duration: 4:30 PM - 5:30 PM
"D7 - Total 2031, AM" model duration: 8:00 AM - 9:00 AM
"D8 - Total 2031, PM" model duration: 4:30 PM - 5:30 PM
"D9 - Total 2036, AM" model duration: 8:00 AM - 9:00 AM
"D10 - Total 2036, PM" model duration: 4:30 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2026-07-13 12:49:01 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2026-07-13
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	AdamMorrison
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	V/C Ratio Threshold	Average Delay Threshold (s)	Queue Threshold (PCE)
7.50	✓		N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCE	PCE	perHour	s	-Min	perMin

(Default Analysis Set) - Base Year, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
Base Year, PM	Base Year	PM		PHF	16:30	17:30	60	15				✓		

Intersection Network

Intersections

Intersection	Name	Intersection Type	Leg Order	Grade Separated	Large Roundabout	Do Geometric Delay	Intersection Delay (s)	Intersection LOS
1	(untitled)	Roundabout	North,South,East				4.34	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Wellington Road 7	
South	South	First Line	
East	East	Wellington Road 7	

Capacity Options

Leg	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
North	0.00	99999.00		0.00
South	0.00	99999.00		0.00
East	0.00	99999.00		0.00

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
North	3.50	4.50	30.00	20.00	40.00	25.00	
South	3.50	4.50	30.00	20.00	40.00	25.00	
East	3.50	4.50	30.00	20.00	40.00	25.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Enter slope and intercept directly	Entered slope	Entered intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
North		(calculated)	(calculated)	0.579	1357.445
South		(calculated)	(calculated)	0.579	1357.445
East		(calculated)	(calculated)	0.579	1357.445

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	Truck Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Leg	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)
North	PHF	✓	361.00	100.000
South	PHF	✓	489.00	100.000
East	PHF	✓	127.00	100.000

Peak Hour Factor Data

Leg	Hourly Volume (PCE/hr)	Peak Hour Factor	Peak Time Segment
North	361.00	0.97	SecondQuarter
South	489.00	0.97	SecondQuarter
East	127.00	0.97	SecondQuarter

Turning Proportions

Turning Counts / Proportions (PCE/hr) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.000	320.000	41.000
	South	396.000	0.000	93.000
	East	50.000	77.000	0.000

Turning Proportions (PCE) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.00	0.89	0.11
	South	0.81	0.00	0.19
	East	0.39	0.61	0.00

Vehicle Mix

Average PCE Per Vehicle - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	1.000	1.080	1.000
	South	1.060	1.000	1.090
	East	1.060	1.090	1.000

Truck Percentages - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.0	8.0	0.0
	South	6.0	0.0	9.0
	East	6.0	9.0	0.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Total Queueing Delay (PCE-min)	Inclusive Average Queueing Delay (s)
North	0.28	4.10	0.42	~1	A	361.00	361.00	24.22	4.03	0.40	24.22	4.03
South	0.38	4.63	0.64	~1	A	489.00	489.00	36.76	4.51	0.61	36.77	4.51
East	0.12	3.92	0.14	~1	A	127.00	127.00	8.16	3.86	0.14	8.17	3.86

Main Results for each time segment

Main results: (16:30-16:45)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	353.56	88.39	351.99	434.68	75.09	0.00	1313.99	1092.54	0.269	0.00	0.39	3.998	A
South	478.92	119.73	476.55	387.11	39.98	0.00	1334.31	1285.63	0.359	0.00	0.59	4.462	A
East	124.38	31.10	123.85	130.61	385.92	0.00	1134.09	754.88	0.110	0.00	0.13	3.840	A

Main results: (16:45-17:00)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	372.16	93.04	372.05	459.61	79.36	0.00	1311.52	1092.54	0.284	0.39	0.42	4.101	A
South	504.12	126.03	503.92	409.15	42.25	0.00	1332.99	1285.63	0.378	0.59	0.64	4.625	A
East	130.93	32.73	130.89	138.09	408.08	0.00	1121.26	754.88	0.117	0.13	0.14	3.918	A

Main results: (17:00-17:15)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	364.72	91.18	364.75	450.64	77.80	0.00	1312.42	1092.54	0.278	0.42	0.41	4.065	A
South	494.04	123.51	494.09	401.13	41.43	0.00	1333.47	1285.63	0.370	0.64	0.63	4.570	A
East	128.31	32.08	128.32	135.39	400.12	0.00	1125.87	754.88	0.114	0.14	0.14	3.890	A

Main results: (17:15-17:30)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	353.56	88.39	353.63	436.91	75.43	0.00	1313.79	1092.54	0.269	0.41	0.40	4.012	A
South	478.92	119.73	479.04	388.89	40.16	0.00	1334.20	1285.63	0.359	0.63	0.60	4.486	A
East	124.38	31.10	124.40	131.27	387.93	0.00	1132.93	754.88	0.110	0.14	0.13	3.849	A

Queueing Delay Results for each time segment

Queueing Delay results: (16:30-16:45)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	5.73	0.38	3.998	A	A
South	8.62	0.57	4.462	A	A
East	1.94	0.13	3.840	A	A

Queueing Delay results: (16:45-17:00)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	6.26	0.42	4.101	A	A
South	9.53	0.64	4.625	A	A
East	2.11	0.14	3.918	A	A

Queueing Delay results: (17:00-17:15)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	6.24	0.42	4.065	A	A
South	9.52	0.63	4.570	A	A
East	2.10	0.14	3.890	A	A

Queueing Delay results: (17:15-17:30)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	5.99	0.40	4.012	A	A
South	9.10	0.61	4.486	A	A
East	2.02	0.13	3.849	A	A

Queue Variation Results for each time segment

Queue Variation results: (16:30-16:45)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.39	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.59	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.13	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (16:45-17:00)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.42	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.64	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.14	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (17:00-17:15)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.41	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.63	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.14	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (17:15-17:30)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.40	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.60	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.13	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Appendix D

Background Development Material

LAND USE SCHEDULE

USE	BLOCKS	AREA	UNITS/LOTS
LOW DENSITY RESIDENTIAL	1-34	20.23	351-480
MEDIUM DENSITY /COMMERCIAL	35-36	1.75	±62
COMMUNITY AMENITY AREA	37	0.31	
PARK / WALKWAY	38-41	2.80	
OPEN SPACE / LANDSCAPE	42	6.96	
STORMWATER MANAGEMENT	43	2.52	
ROW		7.72	
TOTAL		42.29	413-542

TOTAL AREA: 43.4ha.
DEVELOPABLE AREA: 35.3ha.
(EXCLUDING WOODLOT & DRAIN)

FIRST LINE
ENTRY FEATURE
BLOCK 1 LDR 0.43ha. 5-7 lots
BLOCK 40 6m Walkway 0.05ha.
BLOCK 2 Low Density Residential 1.40ha. 23-32 lots
BLOCK 3 Low Density Residential 0.26ha. 5-7 lots
BLK 39 PARKETTE 0.15ha.
BLOCK 4 LDR 0.28ha. 6-8 lots
BLOCK 5 LDR 0.32ha. 6-7 lots
BLOCK 6 LDR 0.71ha. 13-18 lots
PROPOSED DRAIN RE-ALIGNMENT
BLOCK 42 OPEN SPACE / DRAIN 6.96ha.
WETLAND LIMIT
5.0m WETLAND BUFFER TO DRAIN
BLOCK 7 Low Density Residential 0.29ha. 5-7 lots
STREET I (18.0m ROW)
STREET A (20.0m ROW)
STREET H (18.0m ROW)
BLOCK 8 Low Density Residential 0.33ha. 6-8 lots
BLOCK 9 Low Density Residential 0.34ha. 6-9 lots
BLOCK 10 Low Density Residential 0.76ha. 14-19 lots
STREET B (18.0m ROW)
BLOCK 35 STACKED / BACK-TO-BACK TOWNS/ MIXED-USE 0.88ha. ±31 units
BLOCK 38 PARK 1.70ha.
Ex. Drive Shed
BLOCK 37 COMMUNITY AMENITY AREA 0.31ha.
12.0m Pedestrian Shared ROW (Woonerft Street)
BLOCK 36 MEDIUM DENSITY / MIXED-USE 0.87ha. ± 31 units
BLOCK 12 Low Density Residential 0.39ha. 8-10lots
BLOCK 11 Low Density Residential 1.08ha. 17-23 lots
BLOCK 13 Low Density Residential 0.43ha. 8-11 lots
BLOCK 14 Low Density Residential 0.91ha. 12-16 lots
BLOCK 21 Low Density Residential 0.87ha. 14-19 lots
STREET G (18.0m ROW)
BLOCK 15 LDR 0.61ha. 11-15 lots
BLOCK 22 Low Density Residential 0.38ha. 7-10 lots
BLOCK 23 Low Density Residential 0.38ha. 7-9 lots
BLOCK 24 LDR 0.24ha. 5-6 lots
BLOCK 16 LDR 1.50ha. 25-35 lots
STREET D (18.0m ROW)
BLOCK 25 Low Density Residential 0.88ha. 14-19lots
BLOCK 26 Low Density Residential 1.05ha. 17-24 lots
STREET F (18.0m ROW)
BLOCK 17 LDR 0.51ha. 10-13 lots
BLOCK 18 LDR 0.50ha. 9-13 lots
STREET E (18.0m ROW)
BLOCK 19 LDR 0.87ha. 14-19 lots
BLOCK 20 LDR 0.85ha. 16-22lots
BLOCK 27 Low Density Residential 0.41ha. 8-11 lots
BLOCK 28 Low Density Residential 0.42ha. 8-11 lots
BLOCK 29 LDR 0.24ha. 5-6 lots
BLOCK 41 6m Walkway 0.90ha.
STREET C (18.0m ROW)
BLOCK 31 Low Density Residential 0.31ha. 6-8 lots
BLOCK 32 LDR 0.24ha. 5-6 lots
BLOCK 33 Low Density Residential 0.30ha. 6-8 lots
BLOCK 30 LDR 0.24ha. 5-6 lots
BLOCK 43 SWM 2.52ha.
BLOCK 34 Low Density Residential 1.50ha. 24-34 lots
±0.21ha
±0.39ha
±0.33ha
±0.31ha
±1.24ha
±0.70ha
±0.49ha
COMMUNITY AMENITY AREA (±0.36ha)
PARK (±0.28ha)
MULTIPLE RESIDENTIAL (±1.46ha)
SWM (±2.00ha)
Trail Connection

0 50 100 150
Meters

NOTE: This concept should be considered as a preliminary demonstration model that illustrates an 'order of magnitude' development scenario for the site. The number of units, floor area and parking supply are approximate and subject to more detailed design as well as municipal planning approvals.

SUBDIVISION CONCEPT

WrightHaven Homes

159 First Line, Elora

Scale 1:3000 | October 30, 2025 | Project No. 25013 | Drawn By: MN

GSP group

Background Development (159 First Line)

Land Use Code (LUC)	Size	AM Peak Hour				PM Peak Hour			
		Rate	In	Out	Total	Rate	In	Out	Total
LUC 210 - Single-Family Detached Housing	480 Units	Eq	88	239	**327**	Eq	253	154	**407**
LUC 220 - Mulitfamily Housing (Low-Rise)	62 Units	Eq	8	27	**35**	Eq	23	14	**37**
LUC 822- Strip Retail Plaza (<40k)	9.00 ft2/1000	Avg	19	16	**35**	Avg	28	29	**57**
Total Trip Generation			**115**	**282**	**397**		**304**	**197**	**501**
Internal Capture			*5*	*5*	*10*		*11*	*11*	*22*
Pass-by Trips (LUC 822 per LUC 821)		*0*	*0*	*0*	*0*	*0.4*	*7*	*7*	*14*
Net Trip Generation			***110***	***277***	***387***		***286***	***179***	***465***

LUC 210 - AM: T = 0.67(X) + 5.59 | PM: Ln(T) = 0.92 Ln(X) + 0.33

LUC 220 - AM: T = 0.35(X) + 12.93 | PM: T = 0.48(X) + 7.35

LUC 822 - AM: Average Rate = 3.93 | PM: Average Rate = 6.29

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	159 First Line	**Organization:**	PTSL (250480)
Project Location:	Elora	**Performed By:**	
Scenario Description:		**Date:**	
Analysis Year:		**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	9,000		35	19	16
Restaurant				0		
Cinema/Entertainment				0		
Residential	210/220		542	362	96	266
Hotel				0		
All Other Land Uses[2]				0		
Total				397	115	282

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail	1.00			1.00		
Restaurant						
Cinema/Entertainment						
Residential	1.00			1.00		
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	2	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	3	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	397	115	282
Internal Capture Percentage	3%	4%	2%
External Vehicle-Trips[3]	387	110	277
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	16%	13%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	2%	1%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	159 First Line
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	19	19	1.00	16	16
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	96	96	1.00	266	266
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	5		2	0	2	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	5	3	53	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		6	0	0	0	0
Retail	0		0	0	2	0
Restaurant	0	2		0	5	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	3	0	0		0
Hotel	0	1	0	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	3	16	19	16	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	2	94	96	94	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	2	14	16	14	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	3	263	266	263	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	159 First Line	**Organization:**	PTSL (250480)
Project Location:	Elora	**Performed By:**	
Scenario Description:		**Date:**	
Analysis Year:		**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	9,000		57	28	29
Restaurant				0		
Cinema/Entertainment				0		
Residential	210/220		542	444	276	168
Hotel				0		
All Other Land Uses[2]				0		
Total				501	304	197

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail	1.00			1.00		
Restaurant						
Cinema/Entertainment						
Residential	1.00			1.00		
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	8	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	3	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	501	304	197
Internal Capture Percentage	4%	4%	6%
External Vehicle-Trips[3]	479	293	186
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	11%	28%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	3%	2%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	159 First Line
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	28	28	1.00	29	29
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	276	276	1.00	168	168
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	1		8	1	8	1
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	7	71	35	0		5
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		2	0	0	11	0
Retail	0		0	0	127	0
Restaurant	0	14		0	44	0
Cinema/Entertainment	0	1	0		11	0
Residential	0	3	0	0		0
Hotel	0	1	0	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	3	25	28	25	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	8	268	276	268	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	8	21	29	21	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	3	165	168	165	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

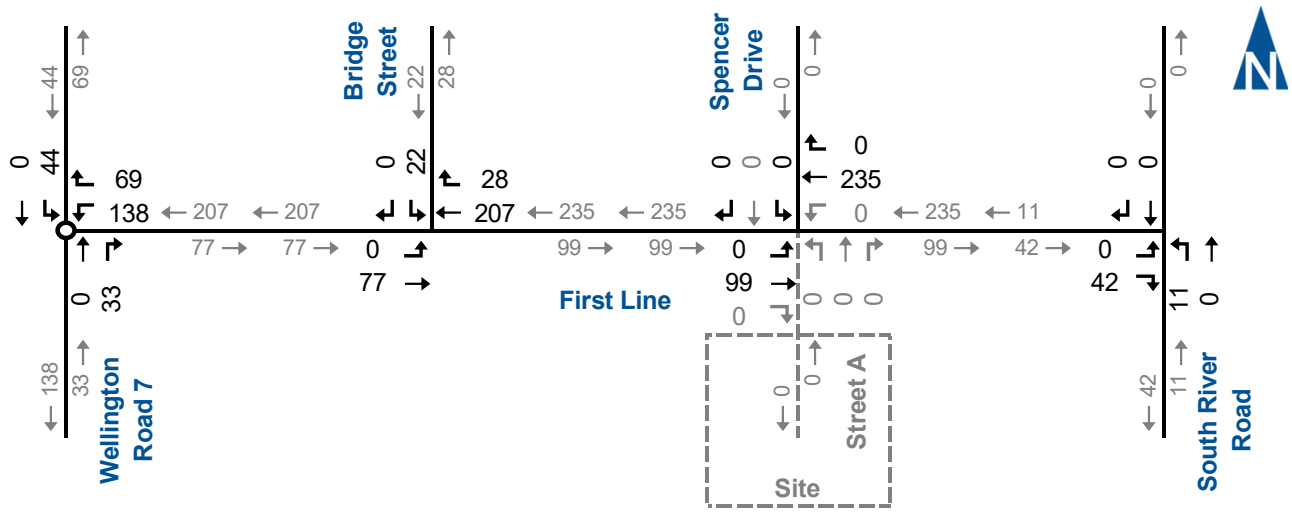
[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

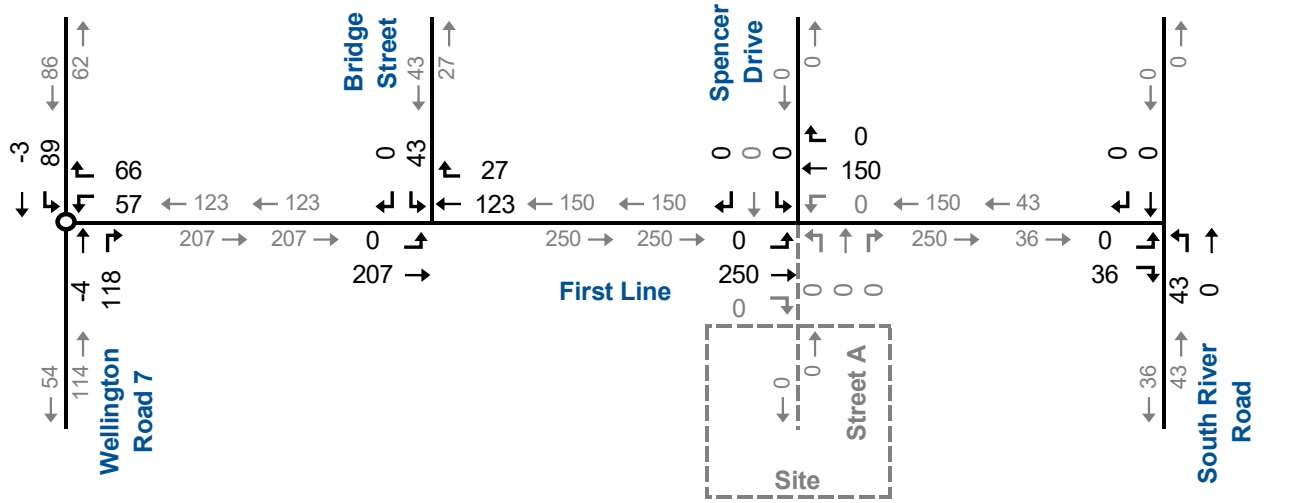
[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

AM Peak Hour



PM Peak Hour



Background Development Traffic Volumes

Appendix E

Internal Capture Calculations Worksheets

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	127 First Line	**Organization:**	PTSL (250480)
Project Location:	Elora	**Performed By:**	
Scenario Description:		**Date:**	
Analysis Year:		**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	20,021		79	43	36
Restaurant				0		
Cinema/Entertainment				0		
Residential	210/220		803	451	118	333
Hotel				0		
All Other Land Uses[2]				0		
Total				530	161	369

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail	1.00			1.00		
Restaurant						
Cinema/Entertainment						
Residential	1.00			1.00		
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	2	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	3	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	530	161	369
Internal Capture Percentage	2%	3%	1%
External Vehicle-Trips[3]	520	156	364
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	7%	6%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	2%	1%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	127 First Line
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	43	43	1.00	36	36
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	118	118	1.00	333	333
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	10		5	0	5	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	7	3	67	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		14	0	0	0	0
Retail	0		0	0	2	0
Restaurant	0	3		0	6	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	7	0	0		0
Hotel	0	2	0	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	3	40	43	40	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	2	116	118	116	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	2	34	36	34	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	3	330	333	330	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	127 First Line	**Organization:**	PTSL (250480)
Project Location:	Elora	**Performed By:**	
Scenario Description:		**Date:**	
Analysis Year:		**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	20,021		126	63	63
Restaurant				0		
Cinema/Entertainment				0		
Residential	210/220		803	567	352	215
Hotel				0		
All Other Land Uses[2]				0		
Total				693	415	278

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail	1.00			1.00		
Restaurant						
Cinema/Entertainment						
Residential	1.00			1.00		
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	16	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	6	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	693	415	278
Internal Capture Percentage	6%	5%	8%
External Vehicle-Trips[3]	649	393	256
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	10%	25%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	5%	3%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	127 First Line
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	63	63	1.00	63	63
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	352	352	1.00	215	215
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	1		18	3	16	3
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	9	90	45	0		6
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		5	0	0	14	0
Retail	0		0	0	162	0
Restaurant	0	32		0	56	0
Cinema/Entertainment	0	3	0		14	0
Residential	0	6	0	0		0
Hotel	0	1	0	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	6	57	63	57	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	16	336	352	336	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	16	47	63	47	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	6	209	215	209	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

Appendix F

Five-Year Background Traffic Operations Reports



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	137	75	44	109	7
Future Volume (vph)	2	137	75	44	109	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.867				0.992	
Flt Protected	0.999			0.970		
Satd. Flow (prot)	1554	0	0	1790	1767	0
Flt Permitted	0.999			0.970		
Satd. Flow (perm)	1554	0	0	1790	1767	0
Link Speed (k/h)	60			50	50	
Link Distance (m)	545.8			255.4	392.8	
Travel Time (s)	32.7			18.4	28.3	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	6%	0%	8%	5%	33%
Adj. Flow (vph)	2	161	88	52	128	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	163	0	0	140	136	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.4%		ICU Level of Service A	
Analysis Period (min) 15			

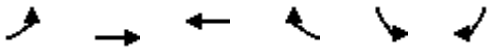
Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	137	75	44	109	7
Future Vol, veh/h	2	137	75	44	109	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	6	0	8	5	33
Mvmt Flow	2	161	88	52	128	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	361	132	136	0	-	0
Stage 1	132	-	-	-	-	-
Stage 2	228	-	-	-	-	-
Critical Hdwy	6.4	6.26	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.354	2.2	-	-	-
Pot Cap-1 Maneuver	642	906	1460	-	-	-
Stage 1	899	-	-	-	-	-
Stage 2	814	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	602	906	1460	-	-	-
Mov Cap-2 Maneuver	602	-	-	-	-	-
Stage 1	843	-	-	-	-	-
Stage 2	814	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.89	4.81	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1134	-	900	-	-
HCM Lane V/C Ratio	0.06	-	0.182	-	-
HCM Ctrl Dly (s/v)	7.6	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.7	-	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	7	175	329	9	41	32
Future Volume (vph)	7	175	329	9	41	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.997		0.941	
Flt Protected		0.998			0.973	
Satd. Flow (prot)	0	1612	1696	0	1710	0
Flt Permitted		0.998			0.973	
Satd. Flow (perm)	0	1612	1696	0	1710	0
Link Speed (k/h)		40	40		50	
Link Distance (m)		191.6	204.5		250.6	
Travel Time (s)		17.2	18.4		18.0	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	33%	17%	12%	0%	0%	4%
Adj. Flow (vph)	8	201	378	10	47	37
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	209	388	0	84	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.8%		ICU Level of Service A	
Analysis Period (min) 15			

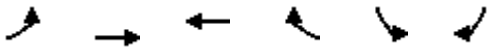
Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	175	329	9	41	32
Future Vol, veh/h	7	175	329	9	41	32
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	33	17	12	0	0	4
Mvmt Flow	8	201	378	10	47	37

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	390	0	-	0	602	384
Stage 1	-	-	-	-	384	-
Stage 2	-	-	-	-	217	-
Critical Hdwy	4.43	-	-	-	6.4	6.24
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.497	-	-	-	3.5	3.336
Pot Cap-1 Maneuver	1019	-	-	-	466	659
Stage 1	-	-	-	-	693	-
Stage 2	-	-	-	-	824	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1018	-	-	-	462	658
Mov Cap-2 Maneuver	-	-	-	-	462	-
Stage 1	-	-	-	-	686	-
Stage 2	-	-	-	-	824	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.33	0	13.05
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	69	-	-	-	531
HCM Lane V/C Ratio	0.008	-	-	-	0.158
HCM Ctrl Dly (s/v)	8.6	0	-	-	13
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.6



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	133	314	50	46	47
Future Volume (vph)	6	133	314	50	46	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.982		0.932	
Flt Protected		0.998			0.976	
Satd. Flow (prot)	0	1531	1681	0	1670	0
Flt Permitted		0.998			0.976	
Satd. Flow (perm)	0	1531	1681	0	1670	0
Link Speed (k/h)		40	40		50	
Link Distance (m)		234.4	191.6		193.9	
Travel Time (s)		21.1	17.2		14.0	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	25%	11%	11%	5%	2%
Adj. Flow (vph)	7	149	353	56	52	53
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	156	409	0	105	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.7%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	133	314	50	46	47
Future Vol, veh/h	6	133	314	50	46	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	25	11	11	5	2
Mvmt Flow	7	149	353	56	52	53

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	409	0	-	0	544	381
Stage 1	-	-	-	-	381	-
Stage 2	-	-	-	-	163	-
Critical Hdwy	4.1	-	-	-	6.45	6.22
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.2	-	-	-	3.545	3.318
Pot Cap-1 Maneuver	1161	-	-	-	495	666
Stage 1	-	-	-	-	684	-
Stage 2	-	-	-	-	859	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1161	-	-	-	492	666
Mov Cap-2 Maneuver	-	-	-	-	492	-
Stage 1	-	-	-	-	680	-
Stage 2	-	-	-	-	859	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.35	0	12.78
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	78	-	-	-	567
HCM Lane V/C Ratio	0.006	-	-	-	0.184
HCM Ctrl Dly (s/v)	8.1	0	-	-	12.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.7

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]
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Filename: Wellington Road 7 & First Line.arc8
Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Project Files\2025\250480-Arcady
Report generation date: 2026-07-13 12:47:56 PM

« (Default Analysis Set) - Background 2031, AM
» Intersection Network
» Legs
» Traffic Flows
» Entry Flows
» Turning Proportions
» Vehicle Mix
» Results

Summary of intersection performance

	AM						
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
	A1 - Background 2031						
Leg North	1.02	?	6.52	0.48	A	5.62	A
Leg South	0.50	~1	4.48	0.31	A		
Leg East	0.67	~1	5.50	0.38	A		

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages.

"D1 - Base Year, AM" model duration: 8:00 AM - 9:00 AM
"D2 - Base Year, PM" model duration: 4:30 PM - 5:30 PM
"D3 - Background 2031, AM " model duration: 8:00 AM - 9:00 AM
"D4 - Background 2031, PM" model duration: 4:30 PM - 5:30 PM
"D5 - Background 2036, AM" model duration: 8:00 AM - 9:00 AM
"D6 - Background 2036, PM" model duration: 4:30 PM - 5:30 PM
"D7 - Total 2031, AM" model duration: 8:00 AM - 9:00 AM
"D8 - Total 2031, PM" model duration: 4:30 PM - 5:30 PM
"D9 - Total 2036, AM" model duration: 8:00 AM - 9:00 AM
"D10 - Total 2036, PM" model duration: 4:30 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2026-07-13 12:47:56 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2026-07-13
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	AdamMorrison
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	V/C Ratio Threshold	Average Delay Threshold (s)	Queue Threshold (PCE)
7.50	✓		N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCE	PCE	perHour	s	-Min	perMin

(Default Analysis Set) - Background 2031, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Re
Background 2031, AM	Background 2031	AM		PHF	08:00	09:00	60	15				✓		

Intersection Network

Intersections

Intersection	Name	Intersection Type	Leg Order	Grade Separated	Large Roundabout	Do Geometric Delay	Intersection Delay (s)	Intersection LOS
1	(untitled)	Roundabout	North,South,East				5.62	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Wellington Road 7	
South	South	First Line	
East	East	Wellington Road 7	

Capacity Options

Leg	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
North	0.00	99999.00		0.00
South	0.00	99999.00		0.00
East	0.00	99999.00		0.00

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
North	3.50	4.50	30.00	20.00	40.00	25.00	
South	3.50	4.50	30.00	20.00	40.00	25.00	
East	3.50	4.50	30.00	20.00	40.00	25.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Enter slope and intercept directly	Entered slope	Entered intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
North		(calculated)	(calculated)	0.579	1357.445
South		(calculated)	(calculated)	0.579	1357.445
East		(calculated)	(calculated)	0.579	1357.445

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	Truck Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Leg	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)
North	PHF	✓	536.00	100.000
South	PHF	✓	379.00	100.000
East	PHF	✓	416.00	100.000

Peak Hour Factor Data

Leg	Hourly Volume (PCE/hr)	Peak Hour Factor	Peak Time Segment
North	536.00	0.94	SecondQuarter
South	379.00	0.94	SecondQuarter
East	416.00	0.94	SecondQuarter

Turning Proportions

Turning Counts / Proportions (PCE/hr) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.000	461.000	75.000
	South	298.000	0.000	81.000
	East	125.000	291.000	0.000

Turning Proportions (PCE) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.00	0.86	0.14
	South	0.79	0.00	0.21
	East	0.30	0.70	0.00

Vehicle Mix

Average PCE Per Vehicle - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	1.000	1.070	1.380
	South	1.090	1.000	1.310
	East	1.220	1.080	1.000

Truck Percentages - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.0	7.0	38.0
	South	9.0	0.0	31.0
	East	22.0	8.0	0.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Total Queueing Delay (PCE-min)	Inclusive Average Queueing Delay (s)
North	0.48	6.52	1.02	?	A	536.00	536.00	54.17	6.06	0.90	54.19	6.07
South	0.31	4.48	0.50	~1	A	379.00	379.00	27.38	4.34	0.46	27.39	4.34
East	0.38	5.50	0.67	~1	A	416.00	416.00	36.16	5.22	0.60	36.17	5.22

Main Results for each time segment

Main results: (08:00-08:15)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	513.19	128.30	509.91	402.99	277.06	0.00	1197.09	1042.42	0.429	0.00	0.82	5.760	A
South	362.87	90.72	361.16	715.62	71.35	0.00	1316.15	1273.03	0.276	0.00	0.43	4.254	A
East	398.30	99.57	396.07	148.54	283.97	0.00	1193.09	778.13	0.334	0.00	0.56	5.038	A

Main results: (08:15-08:30)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	570.21	142.55	569.40	449.64	309.25	0.00	1178.46	1042.42	0.484	0.82	1.02	6.519	A
South	403.19	100.80	402.91	798.98	79.67	0.00	1311.33	1273.03	0.307	0.43	0.50	4.479	A
East	442.55	110.64	442.10	165.78	316.80	0.00	1174.10	778.13	0.377	0.56	0.67	5.497	A

Main results: (08:30-08:45)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	547.40	136.85	547.66	432.12	297.30	0.00	1185.38	1042.42	0.462	1.02	0.96	6.241	A
South	387.06	96.77	387.16	768.32	76.63	0.00	1313.09	1273.03	0.295	0.50	0.48	4.397	A
East	424.85	106.21	425.00	159.37	304.41	0.00	1181.26	778.13	0.360	0.67	0.63	5.327	A

Main results: (08:45-09:00)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	513.19	128.30	513.67	405.21	278.81	0.00	1196.08	1042.42	0.429	0.96	0.84	5.833	A
South	362.87	90.72	363.04	720.60	71.88	0.00	1315.85	1273.03	0.276	0.48	0.43	4.273	A
East	398.30	99.57	398.57	149.46	285.45	0.00	1192.24	778.13	0.334	0.63	0.57	5.077	A

Queueing Delay Results for each time segment

Queueing Delay results: (08:00-08:15)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	11.83	0.79	5.760	A	A
South	6.25	0.42	4.254	A	A
East	8.08	0.54	5.038	A	A

Queueing Delay results: (08:15-08:30)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	14.93	1.00	6.519	A	A
South	7.36	0.49	4.479	A	A
East	9.86	0.66	5.497	A	A

Queueing Delay results: (08:30-08:45)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	14.58	0.97	6.241	A	A
South	7.20	0.48	4.397	A	A
East	9.61	0.64	5.327	A	A

Queueing Delay results: (08:45-09:00)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	12.83	0.86	5.833	A	A
South	6.58	0.44	4.273	A	A
East	8.62	0.57	5.077	A	A

Queue Variation Results for each time segment

Queue Variation results: (08:00-08:15)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.82	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.43	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.56	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:15-08:30)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.02	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.50	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.67	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:30-08:45)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.96	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.48	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.63	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:45-09:00)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.84	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.43	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.57	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	169	169	122	145	0
Future Volume (vph)	2	169	169	122	145	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.866					
Flt Protected	0.999			0.972		
Satd. Flow (prot)	1628	0	0	1811	1863	0
Flt Permitted	0.999			0.972		
Satd. Flow (perm)	1628	0	0	1811	1863	0
Link Speed (k/h)	60			50	50	
Link Distance (m)	545.8			255.4	392.8	
Travel Time (s)	32.7			18.4	28.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	2%	2%	2%	0%
Adj. Flow (vph)	2	178	178	128	153	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	180	0	0	306	153	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 44.0%		ICU Level of Service A	
Analysis Period (min) 15			

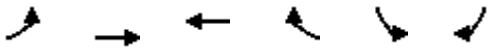
Intersection	
Int Delay, s/veh	5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	169	169	122	145	0
Future Vol, veh/h	2	169	169	122	145	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	1	2	2	2	0
Mvmt Flow	2	178	178	128	153	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	637	153	153	0	-	0
Stage 1	153	-	-	-	-	-
Stage 2	484	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.218	-	-	-
Pot Cap-1 Maneuver	445	896	1428	-	-	-
Stage 1	880	-	-	-	-	-
Stage 2	624	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	385	896	1428	-	-	-
Mov Cap-2 Maneuver	385	-	-	-	-	-
Stage 1	762	-	-	-	-	-
Stage 2	624	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.12	4.58	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1045	-	882	-	-
HCM Lane V/C Ratio	0.125	-	0.204	-	-
HCM Ctrl Dly (s/v)	7.9	0	10.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.8	-	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	16	366	232	43	21	9
Future Volume (vph)	16	366	232	43	21	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.979		0.961	
Flt Protected		0.998			0.966	
Satd. Flow (prot)	0	1878	1770	0	1764	0
Flt Permitted		0.998			0.966	
Satd. Flow (perm)	0	1878	1770	0	1764	0
Link Speed (k/h)		40	40		50	
Link Distance (m)		191.6	204.5		250.6	
Travel Time (s)		17.2	18.4		18.0	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	1%	6%	0%	0%	0%
Adj. Flow (vph)	16	377	239	44	22	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	393	283	0	31	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 42.3%		ICU Level of Service A	
Analysis Period (min) 15			

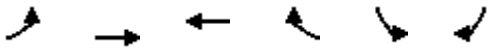
Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	366	232	43	21	9
Future Vol, veh/h	16	366	232	43	21	9
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	1	6	0	0	0
Mvmt Flow	16	377	239	44	22	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	285	0	-	0	673	262
Stage 1	-	-	-	-	262	-
Stage 2	-	-	-	-	410	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1289	-	-	-	424	781
Stage 1	-	-	-	-	786	-
Stage 2	-	-	-	-	674	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1288	-	-	-	417	780
Mov Cap-2 Maneuver	-	-	-	-	417	-
Stage 1	-	-	-	-	773	-
Stage 2	-	-	-	-	674	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.33	0	12.94
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	75	-	-	-	484
HCM Lane V/C Ratio	0.013	-	-	-	0.064
HCM Ctrl Dly (s/v)	7.8	0	-	-	12.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	41	315	182	59	68	28
Future Volume (vph)	41	315	182	59	68	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.967		0.960	
Flt Protected		0.994			0.966	
Satd. Flow (prot)	0	1889	1758	0	1741	0
Flt Permitted		0.994			0.966	
Satd. Flow (perm)	0	1889	1758	0	1741	0
Link Speed (k/h)		40	40		50	
Link Distance (m)		234.4	191.6		193.9	
Travel Time (s)		21.1	17.2		14.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	6%	0%	0%	4%
Adj. Flow (vph)	42	321	186	60	69	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	363	246	0	98	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	41	315	182	59	68	28
Future Vol, veh/h	41	315	182	59	68	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	6	0	0	4
Mvmt Flow	42	321	186	60	69	29

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	246	0	-	0	621	216
Stage 1	-	-	-	-	216	-
Stage 2	-	-	-	-	405	-
Critical Hdwy	4.1	-	-	-	6.4	6.24
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.336
Pot Cap-1 Maneuver	1332	-	-	-	454	819
Stage 1	-	-	-	-	825	-
Stage 2	-	-	-	-	678	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1332	-	-	-	437	819
Mov Cap-2 Maneuver	-	-	-	-	437	-
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	678	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.9	0	13.82
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	207	-	-	-	506
HCM Lane V/C Ratio	0.031	-	-	-	0.194
HCM Ctrl Dly (s/v)	7.8	0	-	-	13.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]
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Filename: Wellington Road 7 & First Line.arc8
Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Project Files\2025\250480-Arcady
Report generation date: 2026-07-13 12:46:15 PM

« (Default Analysis Set) - Background 2031, PM
» Intersection Network
» Legs
» Traffic Flows
» Entry Flows
» Turning Proportions
» Vehicle Mix
» Results

Summary of intersection performance

	PM						
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
	A1 - Background 2031						
Leg North	0.72	~1	5.04	0.41	A	5.73	A
Leg South	1.27	?	6.63	0.55	A		
Leg East	0.36	~1	4.77	0.25	A		

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages.

"D1 - Base Year, AM" model duration: 8:00 AM - 9:00 AM
"D2 - Base Year, PM" model duration: 4:30 PM - 5:30 PM
"D3 - Background 2031, AM" model duration: 8:00 AM - 9:00 AM
"D4 - Background 2031, PM " model duration: 4:30 PM - 5:30 PM
"D5 - Background 2036, AM" model duration: 8:00 AM - 9:00 AM
"D6 - Background 2036, PM" model duration: 4:30 PM - 5:30 PM
"D7 - Total 2031, AM" model duration: 8:00 AM - 9:00 AM
"D8 - Total 2031, PM" model duration: 4:30 PM - 5:30 PM
"D9 - Total 2036, AM" model duration: 8:00 AM - 9:00 AM
"D10 - Total 2036, PM" model duration: 4:30 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2026-07-13 12:46:14 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2026-07-13
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	AdamMorrison
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	V/C Ratio Threshold	Average Delay Threshold (s)	Queue Threshold (PCE)
7.50	✓		N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCE	PCE	perHour	s	-Min	perMin

(Default Analysis Set) - Background 2031, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Re
Background 2031, PM	Background 2031	PM		PHF	16:30	17:30	60	15				✓		

Intersection Network

Intersections

Intersection	Name	Intersection Type	Leg Order	Grade Separated	Large Roundabout	Do Geometric Delay	Intersection Delay (s)	Intersection LOS
1	(untitled)	Roundabout	North,South,East				5.73	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Wellington Road 7	
South	South	First Line	
East	East	Wellington Road 7	

Capacity Options

Leg	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
North	0.00	99999.00		0.00
South	0.00	99999.00		0.00
East	0.00	99999.00		0.00

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
North	3.50	4.50	30.00	20.00	40.00	25.00	
South	3.50	4.50	30.00	20.00	40.00	25.00	
East	3.50	4.50	30.00	20.00	40.00	25.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Enter slope and intercept directly	Entered slope	Entered intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
North		(calculated)	(calculated)	0.579	1357.445
South		(calculated)	(calculated)	0.579	1357.445
East		(calculated)	(calculated)	0.579	1357.445

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	Truck Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Leg	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)
North	PHF	✓	501.00	100.000
South	PHF	✓	676.00	100.000
East	PHF	✓	268.00	100.000

Peak Hour Factor Data

Leg	Hourly Volume (PCE/hr)	Peak Hour Factor	Peak Time Segment
North	501.00	0.97	SecondQuarter
South	676.00	0.97	SecondQuarter
East	268.00	0.97	SecondQuarter

Turning Proportions

Turning Counts / Proportions (PCE/hr) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.000	365.000	136.000
	South	451.000	0.000	225.000
	East	123.000	145.000	0.000

Turning Proportions (PCE) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.00	0.73	0.27
	South	0.67	0.00	0.33
	East	0.46	0.54	0.00

Vehicle Mix

Average PCE Per Vehicle - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	1.000	1.080	1.000
	South	1.060	1.000	1.090
	East	1.060	1.090	1.000

Truck Percentages - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.0	8.0	0.0
	South	6.0	0.0	9.0
	East	6.0	9.0	0.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Total Queueing Delay (PCE-min)	Inclusive Average Queueing Delay (s)
North	0.41	5.04	0.72	~1	A	501.00	501.00	40.83	4.89	0.68	40.84	4.89
South	0.55	6.63	1.27	?	A	676.00	676.00	71.21	6.32	1.19	71.25	6.32
East	0.25	4.77	0.36	~1	A	268.00	268.00	20.75	4.65	0.35	20.76	4.65

Main Results for each time segment

Main results: (16:30-16:45)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	490.67	122.67	488.05	558.54	141.29	0.00	1275.67	1076.06	0.385	0.00	0.66	4.816	A
South	662.06	165.52	657.55	496.85	132.48	0.00	1280.77	1188.39	0.517	0.00	1.13	6.136	A
East	262.47	65.62	261.14	351.34	438.69	0.00	1103.55	898.58	0.238	0.00	0.33	4.590	A

Main results: (16:45-17:00)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	516.49	129.12	516.25	591.33	149.42	0.00	1270.97	1076.07	0.406	0.66	0.72	5.041	A
South	696.91	174.23	696.35	525.53	140.14	0.00	1276.34	1188.39	0.546	1.13	1.27	6.632	A
East	276.29	69.07	276.17	371.91	464.58	0.00	1088.57	898.58	0.254	0.33	0.36	4.768	A

Main results: (17:00-17:15)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	506.16	126.54	506.22	580.00	146.51	0.00	1272.65	1076.07	0.398	0.72	0.70	4.967	A
South	682.97	170.74	683.08	515.32	137.42	0.00	1277.91	1188.39	0.534	1.27	1.24	6.478	A
East	270.76	67.69	270.79	364.77	455.72	0.00	1093.69	898.58	0.248	0.36	0.36	4.707	A

Main results: (17:15-17:30)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	490.67	122.67	490.82	562.41	142.05	0.00	1275.23	1076.06	0.385	0.70	0.67	4.853	A
South	662.06	165.52	662.39	499.63	133.24	0.00	1280.33	1188.39	0.517	1.24	1.16	6.238	A
East	262.47	65.62	262.54	353.70	441.92	0.00	1101.68	898.58	0.238	0.36	0.34	4.616	A

Queueing Delay Results for each time segment

Queueing Delay results: (16:30-16:45)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	9.52	0.63	4.816	A	A
South	16.19	1.08	6.136	A	A
East	4.87	0.32	4.590	A	A

Queueing Delay results: (16:45-17:00)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	10.61	0.71	5.041	A	A
South	18.63	1.24	6.632	A	A
East	5.39	0.36	4.768	A	A

Queueing Delay results: (17:00-17:15)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	10.60	0.71	4.967	A	A
South	18.74	1.25	6.478	A	A
East	5.37	0.36	4.707	A	A

Queueing Delay results: (17:15-17:30)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	10.10	0.67	4.853	A	A
South	17.66	1.18	6.238	A	A
East	5.12	0.34	4.616	A	A

Queue Variation Results for each time segment

Queue Variation results: (16:30-16:45)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.66	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	1.13	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.33	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (16:45-17:00)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.72	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	1.27	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.36	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (17:00-17:15)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.70	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	1.24	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.36	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (17:15-17:30)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.67	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	1.16	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.34	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Appendix G

Ten-Year Background Traffic Operations Reports



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	149	83	49	123	8
Future Volume (vph)	3	149	83	49	123	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.868				0.992	
Flt Protected	0.999			0.970		
Satd. Flow (prot)	1556	0	0	1790	1768	0
Flt Permitted	0.999			0.970		
Satd. Flow (perm)	1556	0	0	1790	1768	0
Link Speed (k/h)	60			50	50	
Link Distance (m)	545.8			255.4	392.8	
Travel Time (s)	32.7			18.4	28.3	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	6%	0%	8%	5%	33%
Adj. Flow (vph)	4	175	98	58	145	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	179	0	0	156	154	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.5%		ICU Level of Service A	
Analysis Period (min) 15			

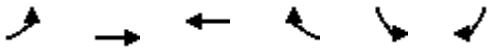
Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	149	83	49	123	8
Future Vol, veh/h	3	149	83	49	123	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	6	0	8	5	33
Mvmt Flow	4	175	98	58	145	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	402	149	154	0	-	0
Stage 1	149	-	-	-	-	-
Stage 2	253	-	-	-	-	-
Critical Hdwy	6.4	6.26	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.354	2.2	-	-	-
Pot Cap-1 Maneuver	608	887	1439	-	-	-
Stage 1	883	-	-	-	-	-
Stage 2	794	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	565	887	1439	-	-	-
Mov Cap-2 Maneuver	565	-	-	-	-	-
Stage 1	821	-	-	-	-	-
Stage 2	794	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.15	4.83	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1132	-	877	-	-
HCM Lane V/C Ratio	0.068	-	0.204	-	-
HCM Ctrl Dly (s/v)	7.7	0	10.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.8	-	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	8	184	341	10	46	36
Future Volume (vph)	8	184	341	10	46	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.941	
Flt Protected		0.998			0.973	
Satd. Flow (prot)	0	1612	1695	0	1710	0
Flt Permitted		0.998			0.973	
Satd. Flow (perm)	0	1612	1695	0	1710	0
Link Speed (k/h)		40	40		50	
Link Distance (m)		191.6	204.5		250.6	
Travel Time (s)		17.2	18.4		18.0	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	33%	17%	12%	0%	0%	4%
Adj. Flow (vph)	9	211	392	11	53	41
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	220	403	0	94	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 30.0%		ICU Level of Service A	
Analysis Period (min) 15			

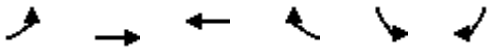
Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	184	341	10	46	36
Future Vol, veh/h	8	184	341	10	46	36
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	33	17	12	0	0	4
Mvmt Flow	9	211	392	11	53	41

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	404	0	-	0	629	399
Stage 1	-	-	-	-	399	-
Stage 2	-	-	-	-	230	-
Critical Hdwy	4.43	-	-	-	6.4	6.24
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.497	-	-	-	3.5	3.336
Pot Cap-1 Maneuver	1005	-	-	-	450	647
Stage 1	-	-	-	-	682	-
Stage 2	-	-	-	-	813	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1004	-	-	-	445	646
Mov Cap-2 Maneuver	-	-	-	-	445	-
Stage 1	-	-	-	-	675	-
Stage 2	-	-	-	-	813	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.36	0	13.55
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	75	-	-	-	515
HCM Lane V/C Ratio	0.009	-	-	-	0.183
HCM Ctrl Dly (s/v)	8.6	0	-	-	13.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.7



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	140	327	53	49	53
Future Volume (vph)	6	140	327	53	49	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.981		0.930	
Flt Protected		0.998			0.977	
Satd. Flow (prot)	0	1530	1679	0	1669	0
Flt Permitted		0.998			0.977	
Satd. Flow (perm)	0	1530	1679	0	1669	0
Link Speed (k/h)		40	40		50	
Link Distance (m)		234.4	191.6		193.9	
Travel Time (s)		21.1	17.2		14.0	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	25%	11%	11%	5%	2%
Adj. Flow (vph)	7	157	367	60	55	60
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	164	427	0	115	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	140	327	53	49	53
Future Vol, veh/h	6	140	327	53	49	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	25	11	11	5	2
Mvmt Flow	7	157	367	60	55	60

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	427	0	-	0	568	397
Stage 1	-	-	-	-	397	-
Stage 2	-	-	-	-	171	-
Critical Hdwy	4.1	-	-	-	6.45	6.22
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.2	-	-	-	3.545	3.318
Pot Cap-1 Maneuver	1143	-	-	-	479	652
Stage 1	-	-	-	-	673	-
Stage 2	-	-	-	-	852	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1143	-	-	-	476	652
Mov Cap-2 Maneuver	-	-	-	-	476	-
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	852	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.34	0	13.19
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	74	-	-	-	554
HCM Lane V/C Ratio	0.006	-	-	-	0.207
HCM Ctrl Dly (s/v)	8.2	0	-	-	13.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.8

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]
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Filename: Wellington Road 7 & First Line.arc8
Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Project Files\2025\250480-Arcady
Report generation date: 2026-07-13 12:45:49 PM

« (Default Analysis Set) - Background 2036, AM
» Intersection Network
» Legs
» Traffic Flows
» Entry Flows
» Turning Proportions
» Vehicle Mix
» Results

Summary of intersection performance

	AM						
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
	A1 - Background 2036						
Leg North	1.29	1.10	7.42	0.54	A	6.18	A
Leg South	0.58	1.13	4.72	0.34	A		
Leg East	0.76	~1	5.89	0.41	A		

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages.

"D1 - Base Year, AM" model duration: 8:00 AM - 9:00 AM
"D2 - Base Year, PM" model duration: 4:30 PM - 5:30 PM
"D3 - Background 2031, AM" model duration: 8:00 AM - 9:00 AM
"D4 - Background 2031, PM" model duration: 4:30 PM - 5:30 PM
"D5 - Background 2036, AM " model duration: 8:00 AM - 9:00 AM
"D6 - Background 2036, PM" model duration: 4:30 PM - 5:30 PM
"D7 - Total 2031, AM" model duration: 8:00 AM - 9:00 AM
"D8 - Total 2031, PM" model duration: 4:30 PM - 5:30 PM
"D9 - Total 2036, AM" model duration: 8:00 AM - 9:00 AM
"D10 - Total 2036, PM" model duration: 4:30 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2026-07-13 12:45:48 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2026-07-13
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	AdamMorrison
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	V/C Ratio Threshold	Average Delay Threshold (s)	Queue Threshold (PCE)
7.50	✓		N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCE	PCE	perHour	s	-Min	perMin

(Default Analysis Set) - Background 2036, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Re
Background 2036, AM	Background 2036	AM		PHF	08:00	09:00	60	15				✓		

Intersection Network

Intersections

Intersection	Name	Intersection Type	Leg Order	Grade Separated	Large Roundabout	Do Geometric Delay	Intersection Delay (s)	Intersection LOS
1	(untitled)	Roundabout	North,South,East				6.18	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Wellington Road 7	
South	South	First Line	
East	East	Wellington Road 7	

Capacity Options

Leg	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
North	0.00	99999.00		0.00
South	0.00	99999.00		0.00
East	0.00	99999.00		0.00

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
North	3.50	4.50	30.00	20.00	40.00	25.00	
South	3.50	4.50	30.00	20.00	40.00	25.00	
East	3.50	4.50	30.00	20.00	40.00	25.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Enter slope and intercept directly	Entered slope	Entered intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
North		(calculated)	(calculated)	0.579	1357.445
South		(calculated)	(calculated)	0.579	1357.445
East		(calculated)	(calculated)	0.579	1357.445

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	Truck Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Leg	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)
North	PHF	✓	596.00	100.000
South	PHF	✓	421.00	100.000
East	PHF	✓	442.00	100.000

Peak Hour Factor Data

Leg	Hourly Volume (PCE/hr)	Peak Hour Factor	Peak Time Segment
North	596.00	0.94	SecondQuarter
South	421.00	0.94	SecondQuarter
East	442.00	0.94	SecondQuarter

Turning Proportions

Turning Counts / Proportions (PCE/hr) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.000	517.000	79.000
	South	334.000	0.000	87.000
	East	132.000	310.000	0.000

Turning Proportions (PCE) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.00	0.87	0.13
	South	0.79	0.00	0.21
	East	0.30	0.70	0.00

Vehicle Mix

Average PCE Per Vehicle - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	1.000	1.070	1.380
	South	1.090	1.000	1.310
	East	1.220	1.080	1.000

Truck Percentages - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.0	7.0	38.0
	South	9.0	0.0	31.0
	East	22.0	8.0	0.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Total Queueing Delay (PCE-min)	Inclusive Average Queueing Delay (s)
North	0.54	7.42	1.29	1.10	A	596.00	596.00	67.47	6.79	1.12	67.49	6.79
South	0.34	4.72	0.58	1.13	A	421.00	421.00	31.89	4.54	0.53	31.89	4.55
East	0.41	5.89	0.76	~1	A	442.00	442.00	40.90	5.55	0.68	40.91	5.55

Main Results for each time segment

Main results: (08:00-08:15)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	570.64	142.66	566.61	443.85	295.05	0.00	1186.68	1044.50	0.481	0.00	1.01	6.363	A
South	403.09	100.77	401.10	786.56	75.10	0.00	1313.98	1277.32	0.307	0.00	0.50	4.443	A
East	423.19	105.80	420.69	157.99	318.21	0.00	1173.28	770.95	0.361	0.00	0.63	5.333	A

Main results: (08:15-08:30)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	634.04	158.51	632.91	495.30	329.40	0.00	1166.80	1044.50	0.543	1.01	1.29	7.419	A
South	447.87	111.97	447.53	878.42	83.89	0.00	1308.89	1277.32	0.342	0.50	0.58	4.717	A
East	470.21	117.55	469.66	176.37	355.04	0.00	1151.96	770.95	0.408	0.63	0.76	5.895	A

Main results: (08:30-08:45)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	608.68	152.17	609.03	476.06	316.72	0.00	1174.14	1044.50	0.518	1.29	1.20	7.030	A
South	429.96	107.49	430.07	845.02	80.73	0.00	1310.72	1277.32	0.328	0.58	0.55	4.616	A
East	451.40	112.85	451.58	169.60	341.20	0.00	1159.98	770.95	0.389	0.76	0.72	5.686	A

Main results: (08:45-09:00)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	570.64	142.66	571.31	446.43	297.04	0.00	1185.53	1044.50	0.481	1.20	1.04	6.470	A
South	403.09	100.77	403.29	792.62	75.73	0.00	1313.62	1277.32	0.307	0.55	0.50	4.468	A
East	423.19	105.80	423.52	159.07	319.95	0.00	1172.27	770.95	0.361	0.72	0.64	5.378	A

Queueing Delay Results for each time segment

Queueing Delay results: (08:00-08:15)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	14.46	0.96	6.363	A	A
South	7.24	0.48	4.443	A	A
East	9.07	0.60	5.333	A	A

Queueing Delay results: (08:15-08:30)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	18.75	1.25	7.419	A	A
South	8.60	0.57	4.717	A	A
East	11.20	0.75	5.895	A	A

Queueing Delay results: (08:30-08:45)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	18.34	1.22	7.030	A	A
South	8.40	0.56	4.616	A	A
East	10.91	0.73	5.686	A	A

Queueing Delay results: (08:45-09:00)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	15.91	1.06	6.470	A	A
South	7.65	0.51	4.468	A	A
East	9.72	0.65	5.378	A	A

Queue Variation Results for each time segment

Queue Variation results: (08:00-08:15)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.01	0.00	0.00	0.00	1.10			N/A	N/A
South	0.50	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.63	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:15-08:30)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.29	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.58	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.76	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:30-08:45)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.20	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.55	0.00	0.00	0.00	1.13			N/A	N/A
East	0.72	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:45-09:00)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.04	0.00	0.00	1.10	1.10			N/A	N/A
South	0.50	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.64	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	186	185	137	163	0
Future Volume (vph)	3	186	185	137	163	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.867					
Flt Protected	0.999			0.972		
Satd. Flow (prot)	1630	0	0	1811	1863	0
Flt Permitted	0.999			0.972		
Satd. Flow (perm)	1630	0	0	1811	1863	0
Link Speed (k/h)	60			50	50	
Link Distance (m)	545.8			255.4	392.8	
Travel Time (s)	32.7			18.4	28.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	2%	2%	2%	0%
Adj. Flow (vph)	3	196	195	144	172	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	199	0	0	339	172	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.7%		ICU Level of Service A	
Analysis Period (min) 15			

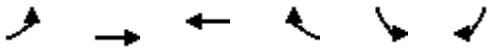
Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	186	185	137	163	0
Future Vol, veh/h	3	186	185	137	163	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	1	2	2	2	0
Mvmt Flow	3	196	195	144	172	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	705	172	172	0	-	0
Stage 1	172	-	-	-	-	-
Stage 2	534	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.218	-	-	-
Pot Cap-1 Maneuver	406	875	1405	-	-	-
Stage 1	863	-	-	-	-	-
Stage 2	592	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	345	875	1405	-	-	-
Mov Cap-2 Maneuver	345	-	-	-	-	-
Stage 1	733	-	-	-	-	-
Stage 2	592	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.49	4.58	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1034	-	854	-	-
HCM Lane V/C Ratio	0.139	-	0.233	-	-
HCM Ctrl Dly (s/v)	8	0	10.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.5	-	0.9	-	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	18	380	242	48	23	10
Future Volume (vph)	18	380	242	48	23	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.978		0.960	
Flt Protected		0.998			0.966	
Satd. Flow (prot)	0	1878	1769	0	1762	0
Flt Permitted		0.998			0.966	
Satd. Flow (perm)	0	1878	1769	0	1762	0
Link Speed (k/h)		40	40		50	
Link Distance (m)		191.6	204.5		250.6	
Travel Time (s)		17.2	18.4		18.0	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	1%	6%	0%	0%	0%
Adj. Flow (vph)	19	392	249	49	24	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	411	298	0	34	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 44.6%		ICU Level of Service A	
Analysis Period (min) 15			

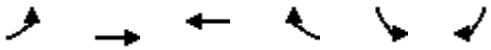
Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	380	242	48	23	10
Future Vol, veh/h	18	380	242	48	23	10
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	1	6	0	0	0
Mvmt Flow	19	392	249	49	24	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	300	0	-	0	704	275
Stage 1	-	-	-	-	275	-
Stage 2	-	-	-	-	429	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1273	-	-	-	406	768
Stage 1	-	-	-	-	776	-
Stage 2	-	-	-	-	661	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1271	-	-	-	398	768
Mov Cap-2 Maneuver	-	-	-	-	398	-
Stage 1	-	-	-	-	761	-
Stage 2	-	-	-	-	661	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.36	0	13.33
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	81	-	-	-	466
HCM Lane V/C Ratio	0.015	-	-	-	0.073
HCM Ctrl Dly (s/v)	7.9	0	-	-	13.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	46	328	189	63	71	31
Future Volume (vph)	46	328	189	63	71	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.966		0.958	
Flt Protected		0.994			0.967	
Satd. Flow (prot)	0	1889	1756	0	1739	0
Flt Permitted		0.994			0.967	
Satd. Flow (perm)	0	1889	1756	0	1739	0
Link Speed (k/h)		40	40		50	
Link Distance (m)		234.4	191.6		193.9	
Travel Time (s)		21.1	17.2		14.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	6%	0%	0%	4%
Adj. Flow (vph)	47	335	193	64	72	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	382	257	0	104	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 49.4%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	46	328	189	63	71	31
Future Vol, veh/h	46	328	189	63	71	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	6	0	0	4
Mvmt Flow	47	335	193	64	72	32

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	257	0	-	0	654	225
Stage 1	-	-	-	-	225	-
Stage 2	-	-	-	-	429	-
Critical Hdwy	4.1	-	-	-	6.4	6.24
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.336
Pot Cap-1 Maneuver	1319	-	-	-	435	809
Stage 1	-	-	-	-	817	-
Stage 2	-	-	-	-	661	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1319	-	-	-	416	809
Mov Cap-2 Maneuver	-	-	-	-	416	-
Stage 1	-	-	-	-	781	-
Stage 2	-	-	-	-	661	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.96	0	14.37
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	221	-	-	-	488
HCM Lane V/C Ratio	0.036	-	-	-	0.213
HCM Ctrl Dly (s/v)	7.8	0	-	-	14.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]
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Filename: Wellington Road 7 & First Line.arc8
Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Project Files\2025\250480-Arcady
Report generation date: 2026-07-13 12:44:53 PM

« (Default Analysis Set) - Background 2036, PM
» Intersection Network
» Legs
» Traffic Flows
» Entry Flows
» Turning Proportions
» Vehicle Mix
» Results

Summary of intersection performance

	PM						
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
	A1 - Background 2036						
Leg North	0.86	~1	5.47	0.45	A	6.41	A
Leg South	1.60	2.14	7.60	0.60	A		
Leg East	0.41	~1	5.09	0.28	A		

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages.

"D1 - Base Year, AM" model duration: 8:00 AM - 9:00 AM
"D2 - Base Year, PM" model duration: 4:30 PM - 5:30 PM
"D3 - Background 2031, AM" model duration: 8:00 AM - 9:00 AM
"D4 - Background 2031, PM" model duration: 4:30 PM - 5:30 PM
"D5 - Background 2036, AM" model duration: 8:00 AM - 9:00 AM
"D6 - Background 2036, PM " model duration: 4:30 PM - 5:30 PM
"D7 - Total 2031, AM" model duration: 8:00 AM - 9:00 AM
"D8 - Total 2031, PM" model duration: 4:30 PM - 5:30 PM
"D9 - Total 2036, AM" model duration: 8:00 AM - 9:00 AM
"D10 - Total 2036, PM" model duration: 4:30 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2026-07-13 12:44:52 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2026-07-13
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	AdamMorrison
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	V/C Ratio Threshold	Average Delay Threshold (s)	Queue Threshold (PCE)
7.50	✓		N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCE	PCE	perHour	s	-Min	perMin

(Default Analysis Set) - Background 2036, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Re
Background 2036, PM	Background 2036	PM		PHF	16:30	17:30	60	15				✓		

Intersection Network

Intersections

Intersection	Name	Intersection Type	Leg Order	Grade Separated	Large Roundabout	Do Geometric Delay	Intersection Delay (s)	Intersection LOS
1	(untitled)	Roundabout	North,South,East				6.41	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Wellington Road 7	
South	South	First Line	
East	East	Wellington Road 7	

Capacity Options

Leg	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
North	0.00	99999.00		0.00
South	0.00	99999.00		0.00
East	0.00	99999.00		0.00

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
North	3.50	4.50	30.00	20.00	40.00	25.00	
South	3.50	4.50	30.00	20.00	40.00	25.00	
East	3.50	4.50	30.00	20.00	40.00	25.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Enter slope and intercept directly	Entered slope	Entered intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
North		(calculated)	(calculated)	0.579	1357.445
South		(calculated)	(calculated)	0.579	1357.445
East		(calculated)	(calculated)	0.579	1357.445

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	Truck Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Leg	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)
North	PHF	✓	552.00	100.000
South	PHF	✓	745.00	100.000
East	PHF	✓	286.00	100.000

Peak Hour Factor Data

Leg	Hourly Volume (PCE/hr)	Peak Hour Factor	Peak Time Segment
North	552.00	0.97	SecondQuarter
South	745.00	0.97	SecondQuarter
East	286.00	0.97	SecondQuarter

Turning Proportions

Turning Counts / Proportions (PCE/hr) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.000	410.000	142.000
	South	507.000	0.000	238.000
	East	130.000	156.000	0.000

Turning Proportions (PCE) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.00	0.74	0.26
	South	0.68	0.00	0.32
	East	0.45	0.55	0.00

Vehicle Mix

Average PCE Per Vehicle - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	1.000	1.080	1.000
	South	1.060	1.000	1.090
	East	1.060	1.090	1.000

Truck Percentages - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.0	8.0	0.0
	South	6.0	0.0	9.0
	East	6.0	9.0	0.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Total Queueing Delay (PCE-min)	Inclusive Average Queueing Delay (s)
North	0.45	5.47	0.86	~1	A	552.00	552.00	48.60	5.28	0.81	48.62	5.28
South	0.60	7.60	1.60	2.14	A	745.00	745.00	88.98	7.17	1.48	89.03	7.17
East	0.28	5.09	0.41	~1	A	286.00	286.00	23.57	4.95	0.39	23.58	4.95

Main Results for each time segment

Main results: (16:30-16:45)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	540.62	135.15	537.51	619.37	151.96	0.00	1269.50	1077.75	0.426	0.00	0.78	5.183	A
South	729.64	182.41	724.04	551.20	138.27	0.00	1277.42	1196.99	0.571	0.00	1.40	6.889	A
East	280.10	70.03	278.59	369.58	492.74	0.00	1072.27	885.99	0.261	0.00	0.38	4.872	A

Main results: (16:45-17:00)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	569.07	142.27	568.75	656.10	160.75	0.00	1264.41	1077.75	0.450	0.78	0.86	5.473	A
South	768.04	192.01	767.25	583.19	146.31	0.00	1272.77	1196.99	0.603	1.40	1.60	7.602	A
East	294.85	73.71	294.70	391.42	522.14	0.00	1055.25	885.99	0.279	0.38	0.41	5.092	A

Main results: (17:00-17:15)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	557.69	139.42	557.76	643.68	157.63	0.00	1266.22	1077.75	0.440	0.86	0.84	5.377	A
South	752.68	188.17	752.82	571.91	143.48	0.00	1274.40	1196.99	0.591	1.60	1.56	7.386	A
East	288.95	72.24	288.98	383.98	512.32	0.00	1060.93	885.99	0.272	0.41	0.41	5.018	A

Main results: (17:15-17:30)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	540.62	135.15	540.81	624.22	152.83	0.00	1268.99	1077.75	0.426	0.84	0.79	5.232	A
South	729.64	182.41	730.10	554.52	139.12	0.00	1276.93	1196.99	0.571	1.56	1.45	7.047	A
East	280.10	70.03	280.19	372.36	496.86	0.00	1069.88	885.99	0.262	0.41	0.38	4.907	A

Queueing Delay Results for each time segment

Queueing Delay results: (16:30-16:45)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	11.25	0.75	5.183	A	A
South	19.91	1.33	6.889	A	A
East	5.51	0.37	4.872	A	A

Queueing Delay results: (16:45-17:00)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	12.66	0.84	5.473	A	A
South	23.36	1.56	7.602	A	A
East	6.13	0.41	5.092	A	A

Queueing Delay results: (17:00-17:15)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	12.67	0.84	5.377	A	A
South	23.61	1.57	7.386	A	A
East	6.11	0.41	5.018	A	A

Queueing Delay results: (17:15-17:30)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	12.03	0.80	5.232	A	A
South	22.10	1.47	7.047	A	A
East	5.82	0.39	4.907	A	A

Queue Variation Results for each time segment

Queue Variation results: (16:30-16:45)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.78	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	1.40	0.00	0.00	2.14	2.14			N/A	N/A
East	0.38	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (16:45-17:00)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.86	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	1.60	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.41	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (17:00-17:15)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.84	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	1.56	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.41	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (17:15-17:30)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.79	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	1.45	0.00	0.00	2.14	2.14			N/A	N/A
East	0.38	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Appendix H

Five-Year Total Traffic Operations Reports



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	192	91	44	109	7
Future Volume (vph)	2	192	91	44	109	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.866				0.992	
Flt Protected				0.967		
Satd. Flow (prot)	1553	0	0	1790	1767	0
Flt Permitted				0.967		
Satd. Flow (perm)	1553	0	0	1790	1767	0
Link Speed (k/h)	60			50	50	
Link Distance (m)	545.8			255.4	392.8	
Travel Time (s)	32.7			18.4	28.3	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	6%	0%	8%	5%	33%
Adj. Flow (vph)	2	226	107	52	128	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	228	0	0	159	136	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 32.7%		ICU Level of Service A	
Analysis Period (min) 15			

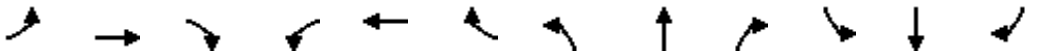
Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	192	91	44	109	7
Future Vol, veh/h	2	192	91	44	109	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	6	0	8	5	33
Mvmt Flow	2	226	107	52	128	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	398	132	136	0	-	0
Stage 1	132	-	-	-	-	-
Stage 2	266	-	-	-	-	-
Critical Hdwy	6.4	6.26	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.354	2.2	-	-	-
Pot Cap-1 Maneuver	611	906	1460	-	-	-
Stage 1	899	-	-	-	-	-
Stage 2	783	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	565	906	1460	-	-	-
Mov Cap-2 Maneuver	565	-	-	-	-	-
Stage 1	831	-	-	-	-	-
Stage 2	783	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.35	5.16	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1213	-	901	-	-
HCM Lane V/C Ratio	0.073	-	0.253	-	-
HCM Ctrl Dly (s/v)	7.7	0	10.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	175	140	16	329	9	309	0	55	41	0	32
Future Volume (vph)	7	175	140	16	329	9	309	0	55	41	0	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.941			0.997			0.980			0.941	
Flt Protected		0.999			0.998			0.959			0.973	
Satd. Flow (prot)	0	1612	0	0	1699	0	0	1751	0	0	1710	0
Flt Permitted		0.999			0.998			0.959			0.973	
Satd. Flow (perm)	0	1612	0	0	1699	0	0	1751	0	0	1710	0
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		191.6			204.5			148.0			250.6	
Travel Time (s)		17.2			18.4			10.7			18.0	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	33%	17%	2%	2%	12%	0%	2%	2%	2%	0%	2%	4%
Adj. Flow (vph)	8	201	161	18	378	10	355	0	63	47	0	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	370	0	0	406	0	0	418	0	0	84	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 59.7%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	49.5

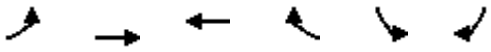
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	175	140	16	329	9	309	0	55	41	0	32
Future Vol, veh/h	7	175	140	16	329	9	309	0	55	41	0	32
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	33	17	2	2	12	0	2	2	2	0	2	4
Mvmt Flow	8	201	161	18	378	10	355	0	63	47	0	37

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	390	0	0	362	0	0	713	724	282	638	799	384
Stage 1	-	-	-	-	-	-	298	298	-	421	421	-
Stage 2	-	-	-	-	-	-	415	426	-	217	378	-
Critical Hdwy	4.43	-	-	4.12	-	-	7.12	6.52	6.22	7.1	6.52	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Follow-up Hdwy	2.497	-	-	2.218	-	-	3.518	4.018	3.318	3.5	4.018	3.336
Pot Cap-1 Maneuver	1019	-	-	1197	-	-	~ 347	352	757	392	318	659
Stage 1	-	-	-	-	-	-	711	667	-	614	589	-
Stage 2	-	-	-	-	-	-	615	586	-	790	615	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1018	-	-	1197	-	-	~ 318	341	757	348	309	658
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 318	341	-	348	309	-
Stage 1	-	-	-	-	-	-	704	660	-	601	577	-
Stage 2	-	-	-	-	-	-	569	574	-	716	609	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.19	0.36	147.72	15.13
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	349	36	-	-	81	-	-	439
HCM Lane V/C Ratio	1.201	0.008	-	-	0.015	-	-	0.191
HCM Ctrl Dly (s/v)	147.7	8.6	0	-	8.1	0	-	15.1
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	17.6	0	-	-	0	-	-	0.7

Notes	
~: Volume exceeds capacity	$: Delay exceeds 300s
+: Computation Not Defined	*: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	242	587	86	77	47
Future Volume (vph)	6	242	587	86	77	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.983		0.949	
Flt Protected		0.999			0.970	
Satd. Flow (prot)	0	1526	1683	0	1684	0
Flt Permitted		0.999			0.970	
Satd. Flow (perm)	0	1526	1683	0	1684	0
Link Speed (k/h)		40	40		50	
Link Distance (m)		234.4	191.6		193.9	
Travel Time (s)		21.1	17.2		14.0	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	25%	11%	11%	5%	2%
Adj. Flow (vph)	7	272	660	97	87	53
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	279	757	0	140	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 49.9%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	242	587	86	77	47
Future Vol, veh/h	6	242	587	86	77	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	25	11	11	5	2
Mvmt Flow	7	272	660	97	87	53

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	756	0	-	0	993	708
Stage 1	-	-	-	-	708	-
Stage 2	-	-	-	-	285	-
Critical Hdwy	4.1	-	-	-	6.45	6.22
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.2	-	-	-	3.545	3.318
Pot Cap-1 Maneuver	864	-	-	-	269	435
Stage 1	-	-	-	-	483	-
Stage 2	-	-	-	-	756	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	864	-	-	-	266	435
Mov Cap-2 Maneuver	-	-	-	-	266	-
Stage 1	-	-	-	-	478	-
Stage 2	-	-	-	-	756	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.22	0	25.53
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	44	-	-	-	312
HCM Lane V/C Ratio	0.008	-	-	-	0.447
HCM Ctrl Dly (s/v)	9.2	0	-	-	25.5
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	2.2

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]
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Filename: Wellington Road 7 & First Line.arc8
Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Project Files\2025\250480-Arcady\2026-09-16
Report generation date: 2026-09-16 4:25:53 PM

« (Default Analysis Set) - Total 2031, AM
» Intersection Network
» Legs
» Traffic Flows
» Entry Flows
» Turning Proportions
» Vehicle Mix
» Results

Summary of intersection performance

	AM						
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
	A1 - Total 2031						
Leg North	1.63	2.26	9.35	0.60	A	8.16	A
Leg South	0.63	1.15	5.03	0.36	A		
Leg East	1.82	2.24	9.06	0.62	A		

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages.

"D1 - Base Year, AM" model duration: 8:00 AM - 9:00 AM
"D2 - Base Year, PM" model duration: 4:30 PM - 5:30 PM
"D3 - Background 2031, AM" model duration: 8:00 AM - 9:00 AM
"D4 - Background 2031, PM" model duration: 4:30 PM - 5:30 PM
"D5 - Background 2036, AM" model duration: 8:00 AM - 9:00 AM
"D6 - Background 2036, PM" model duration: 4:30 PM - 5:30 PM
"D7 - Total 2031, AM " model duration: 8:00 AM - 9:00 AM
"D8 - Total 2031, PM" model duration: 4:30 PM - 5:30 PM
"D9 - Total 2036, AM" model duration: 8:00 AM - 9:00 AM
"D10 - Total 2036, PM" model duration: 4:30 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2026-09-16 4:25:53 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2026-07-13
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	AdamMorrison
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	V/C Ratio Threshold	Average Delay Threshold (s)	Queue Threshold (PCE)
7.50	✓		N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCE	PCE	perHour	s	-Min	perMin

(Default Analysis Set) - Total 2031, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
Total 2031, AM	Total 2031	AM		PHF	08:00	09:00	60	15				✓		

Intersection Network

Intersections

Intersection	Name	Intersection Type	Leg Order	Grade Separated	Large Roundabout	Do Geometric Delay	Intersection Delay (s)	Intersection LOS
1	(untitled)	Roundabout	North,South,East				8.16	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Wellington Road 7	
South	South	First Line	
East	East	Wellington Road 7	

Capacity Options

Leg	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
North	0.00	99999.00		0.00
South	0.00	99999.00		0.00
East	0.00	99999.00		0.00

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
North	3.50	4.50	30.00	20.00	40.00	25.00	
South	3.50	4.50	30.00	20.00	40.00	25.00	
East	3.50	4.50	30.00	20.00	40.00	25.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Enter slope and intercept directly	Entered slope	Entered intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
North		(calculated)	(calculated)	0.579	1357.445
South		(calculated)	(calculated)	0.579	1357.445
East		(calculated)	(calculated)	0.579	1357.445

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	Truck Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Leg	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)
North	PHF	✓	598.00	100.000
South	PHF	✓	426.00	100.000
East	PHF	✓	689.00	100.000

Peak Hour Factor Data

Leg	Hourly Volume (PCE/hr)	Peak Hour Factor	Peak Time Segment
North	598.00	0.94	SecondQuarter
South	426.00	0.94	SecondQuarter
East	689.00	0.94	SecondQuarter

Turning Proportions

Turning Counts / Proportions (PCE/hr) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.000	461.000	137.000
	South	298.000	0.000	128.000
	East	216.000	473.000	0.000

Turning Proportions (PCE) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.00	0.77	0.23
	South	0.70	0.00	0.30
	East	0.31	0.69	0.00

Vehicle Mix

Average PCE Per Vehicle - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	1.000	1.070	1.380
	South	1.090	1.000	1.310
	East	1.220	1.080	1.000

Truck Percentages - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.0	7.0	38.0
	South	9.0	0.0	31.0
	East	22.0	8.0	0.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Total Queueing Delay (PCE-min)	Inclusive Average Queueing Delay (s)
North	0.60	9.35	1.63	2.26	A	598.00	598.00	83.00	8.33	1.38	83.04	8.33
South	0.36	5.03	0.63	1.15	A	426.00	426.00	34.28	4.83	0.57	34.29	4.83
East	0.62	9.06	1.82	2.24	A	689.00	689.00	92.96	8.10	1.55	93.01	8.10

Main Results for each time segment

Main results: (08:00-08:15)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	572.55	143.14	567.72	488.94	449.14	0.00	1097.50	1014.82	0.522	0.00	1.21	7.598	A
South	407.87	101.97	405.75	886.79	130.06	0.00	1282.17	1222.89	0.318	0.00	0.53	4.704	A
East	659.68	164.92	654.24	251.98	283.83	0.00	1193.17	862.35	0.553	0.00	1.36	7.411	A

Main results: (08:15-08:30)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	636.17	159.04	634.50	545.96	501.94	0.00	1066.94	1014.82	0.596	1.21	1.63	9.351	A
South	453.19	113.30	452.80	991.08	145.36	0.00	1273.32	1222.89	0.356	0.53	0.63	5.034	A
East	732.98	183.24	731.16	281.41	316.75	0.00	1174.12	862.35	0.624	1.36	1.82	9.065	A

Main results: (08:30-08:45)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	610.72	152.68	611.22	525.19	483.43	0.00	1077.65	1014.82	0.567	1.63	1.50	8.718	A
South	435.06	108.77	435.19	954.62	140.03	0.00	1276.40	1222.89	0.341	0.63	0.60	4.913	A
East	703.66	175.91	704.20	270.79	304.43	0.00	1181.25	862.35	0.596	1.82	1.68	8.466	A

Main results: (08:45-09:00)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	572.55	143.14	573.53	492.63	453.61	0.00	1094.91	1014.82	0.523	1.50	1.26	7.806	A
South	407.87	101.97	408.10	895.75	131.40	0.00	1281.40	1222.89	0.318	0.60	0.54	4.734	A
East	659.68	164.92	660.76	254.02	285.48	0.00	1192.22	862.35	0.553	1.68	1.41	7.607	A

Queueing Delay Results for each time segment

Queueing Delay results: (08:00-08:15)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	17.20	1.15	7.598	A	A
South	7.74	0.52	4.704	A	A
East	19.32	1.29	7.411	A	A

Queueing Delay results: (08:15-08:30)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	23.41	1.56	9.351	A	A
South	9.27	0.62	5.034	A	A
East	26.13	1.74	9.065	A	A

Queueing Delay results: (08:30-08:45)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	22.98	1.53	8.718	A	A
South	9.06	0.60	4.913	A	A
East	25.72	1.71	8.466	A	A

Queueing Delay results: (08:45-09:00)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	19.40	1.29	7.806	A	A
South	8.21	0.55	4.734	A	A
East	21.79	1.45	7.607	A	A

Queue Variation Results for each time segment

Queue Variation results: (08:00-08:15)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.21	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.53	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	1.36	0.00	0.00	1.12	2.24			N/A	N/A

Queue Variation results: (08:15-08:30)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.63	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.63	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	1.82	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:30-08:45)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.50	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.60	0.00	0.00	0.00	1.15			N/A	N/A
East	1.68	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:45-09:00)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.26	0.00	0.00	1.13	2.26			N/A	N/A
South	0.54	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	1.41	0.00	0.00	2.24	2.24			N/A	N/A



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	217	226	122	145	0
Future Volume (vph)	2	217	226	122	145	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.866					
Flt Protected				0.969		
Satd. Flow (prot)	1629	0	0	1805	1863	0
Flt Permitted				0.969		
Satd. Flow (perm)	1629	0	0	1805	1863	0
Link Speed (k/h)	60			50	50	
Link Distance (m)	545.8			255.4	392.8	
Travel Time (s)	32.7			18.4	28.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	2%	2%	2%	0%
Adj. Flow (vph)	2	228	238	128	153	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	230	0	0	366	153	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 50.1%		ICU Level of Service A	
Analysis Period (min) 15			

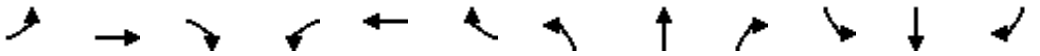
Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	217	226	122	145	0
Future Vol, veh/h	2	217	226	122	145	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	1	2	2	2	0
Mvmt Flow	2	228	238	128	153	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	757	153	153	0	-	0
Stage 1	153	-	-	-	-	-
Stage 2	604	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.218	-	-	-
Pot Cap-1 Maneuver	378	896	1428	-	-	-
Stage 1	880	-	-	-	-	-
Stage 2	549	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	310	896	1428	-	-	-
Mov Cap-2 Maneuver	310	-	-	-	-	-
Stage 1	722	-	-	-	-	-
Stage 2	549	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.53	5.21	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1169	-	881	-	-
HCM Lane V/C Ratio	0.167	-	0.262	-	-
HCM Ctrl Dly (s/v)	8	0	10.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.6	-	1	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	366	336	57	232	43	208	0	48	21	0	9
Future Volume (vph)	16	366	336	57	232	43	208	0	48	21	0	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.937			0.983			0.975			0.961	
Flt Protected		0.999			0.991			0.961			0.966	
Satd. Flow (prot)	0	1753	0	0	1771	0	0	1745	0	0	1764	0
Flt Permitted		0.999			0.991			0.961			0.966	
Satd. Flow (perm)	0	1753	0	0	1771	0	0	1745	0	0	1764	0
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		191.6			204.5			148.0			250.6	
Travel Time (s)		17.2			18.4			10.7			18.0	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	1%	2%	2%	6%	0%	2%	2%	2%	0%	2%	0%
Adj. Flow (vph)	16	377	346	59	239	44	214	0	49	22	0	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	739	0	0	342	0	0	263	0	0	31	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 70.6%		ICU Level of Service C	
Analysis Period (min) 15			

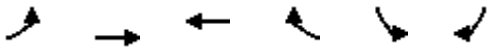
Intersection	
Int Delay, s/veh	24.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	16	366	336	57	232	43	208	0	48	21	0	9
Future Vol, veh/h	16	366	336	57	232	43	208	0	48	21	0	9
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	1	2	2	6	0	2	2	2	0	2	0
Mvmt Flow	16	377	346	59	239	44	214	0	49	22	0	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	285	0	0	724	0	0	940	986	551	790	1137	262
Stage 1	-	-	-	-	-	-	584	584	-	380	380	-
Stage 2	-	-	-	-	-	-	357	402	-	410	757	-
Critical Hdwy	4.1	-	-	4.12	-	-	7.12	6.52	6.22	7.1	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Follow-up Hdwy	2.2	-	-	2.218	-	-	3.518	4.018	3.318	3.5	4.018	3.3
Pot Cap-1 Maneuver	1289	-	-	879	-	-	244	248	534	310	202	781
Stage 1	-	-	-	-	-	-	498	498	-	646	614	-
Stage 2	-	-	-	-	-	-	661	600	-	622	416	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1288	-	-	879	-	-	216	223	534	253	181	780
Mov Cap-2 Maneuver	-	-	-	-	-	-	216	223	-	253	181	-
Stage 1	-	-	-	-	-	-	487	487	-	594	564	-
Stage 2	-	-	-	-	-	-	601	552	-	552	406	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.17	1.61	125.41	17.58
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	244	37	-	-	300	-	-	317
HCM Lane V/C Ratio	1.083	0.013	-	-	0.067	-	-	0.098
HCM Ctrl Dly (s/v)	125.4	7.8	0	-	9.4	0	-	17.6
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	11.3	0	-	-	0.2	-	-	0.3



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	41	594	354	95	125	28
Future Volume (vph)	41	594	354	95	125	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.971		0.975	
Flt Protected		0.997			0.961	
Satd. Flow (prot)	0	1894	1762	0	1767	0
Flt Permitted		0.997			0.961	
Satd. Flow (perm)	0	1894	1762	0	1767	0
Link Speed (k/h)		40	40		50	
Link Distance (m)		234.4	191.6		193.9	
Travel Time (s)		21.1	17.2		14.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	6%	0%	0%	4%
Adj. Flow (vph)	42	606	361	97	128	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	648	458	0	157	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 76.6%		ICU Level of Service D	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	41	594	354	95	125	28
Future Vol, veh/h	41	594	354	95	125	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	6	0	0	4
Mvmt Flow	42	606	361	97	128	29

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	458	0	-	0	1099	410
Stage 1	-	-	-	-	410	-
Stage 2	-	-	-	-	690	-
Critical Hdwy	4.1	-	-	-	6.4	6.24
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.336
Pot Cap-1 Maneuver	1113	-	-	-	237	638
Stage 1	-	-	-	-	674	-
Stage 2	-	-	-	-	502	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1113	-	-	-	224	638
Mov Cap-2 Maneuver	-	-	-	-	224	-
Stage 1	-	-	-	-	636	-
Stage 2	-	-	-	-	502	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.54	0	39.46
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	116	-	-	-	254
HCM Lane V/C Ratio	0.038	-	-	-	0.615
HCM Ctrl Dly (s/v)	8.4	0	-	-	39.5
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	-	3.7

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]
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Filename: Wellington Road 7 & First Line.arc8
Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Project Files\2025\250480-Arcady\2026-09-16
Report generation date: 2026-09-16 4:25:17 PM

« (Default Analysis Set) - Total 2031, PM
» Intersection Network
» Legs
» Traffic Flows
» Entry Flows
» Turning Proportions
» Vehicle Mix
» Results

Summary of intersection performance

	PM						
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
	A1 - Total 2031						
Leg North	1.10	1.05	6.36	0.52	A	8.25	A
Leg South	2.50	6.44	10.83	0.71	B		
Leg East	0.75	~1	6.04	0.41	A		

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages.

"D1 - Base Year, AM" model duration: 8:00 AM - 9:00 AM
"D2 - Base Year, PM" model duration: 4:30 PM - 5:30 PM
"D3 - Background 2031, AM" model duration: 8:00 AM - 9:00 AM
"D4 - Background 2031, PM" model duration: 4:30 PM - 5:30 PM
"D5 - Background 2036, AM" model duration: 8:00 AM - 9:00 AM
"D6 - Background 2036, PM" model duration: 4:30 PM - 5:30 PM
"D7 - Total 2031, AM" model duration: 8:00 AM - 9:00 AM
"D8 - Total 2031, PM " model duration: 4:30 PM - 5:30 PM
"D9 - Total 2036, AM" model duration: 8:00 AM - 9:00 AM
"D10 - Total 2036, PM" model duration: 4:30 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2026-09-16 4:25:17 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2026-07-13
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	AdamMorrison
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	V/C Ratio Threshold	Average Delay Threshold (s)	Queue Threshold (PCE)
7.50	✓		N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCE	PCE	perHour	s	-Min	perMin

(Default Analysis Set) - Total 2031, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
Total 2031, PM	Total 2031	PM		PHF	16:30	17:30	60	15				✓		

Intersection Network

Intersections

Intersection	Name	Intersection Type	Leg Order	Grade Separated	Large Roundabout	Do Geometric Delay	Intersection Delay (s)	Intersection LOS
1	(untitled)	Roundabout	North,South,East				8.25	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Wellington Road 7	
South	South	First Line	
East	East	Wellington Road 7	

Capacity Options

Leg	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
North	0.00	99999.00		0.00
South	0.00	99999.00		0.00
East	0.00	99999.00		0.00

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
North	3.50	4.50	30.00	20.00	40.00	25.00	
South	3.50	4.50	30.00	20.00	40.00	25.00	
East	3.50	4.50	30.00	20.00	40.00	25.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Enter slope and intercept directly	Entered slope	Entered intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
North		(calculated)	(calculated)	0.579	1357.445
South		(calculated)	(calculated)	0.579	1357.445
East		(calculated)	(calculated)	0.579	1357.445

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	Truck Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Leg	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)
North	PHF	✓	614.00	100.000
South	PHF	✓	826.00	100.000
East	PHF	✓	440.00	100.000

Peak Hour Factor Data

Leg	Hourly Volume (PCE/hr)	Peak Hour Factor	Peak Time Segment
North	614.00	0.97	SecondQuarter
South	826.00	0.97	SecondQuarter
East	440.00	0.97	SecondQuarter

Turning Proportions

Turning Counts / Proportions (PCE/hr) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.000	358.000	256.000
	South	442.000	0.000	384.000
	East	216.000	224.000	0.000

Turning Proportions (PCE) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.00	0.58	0.42
	South	0.54	0.00	0.46
	East	0.49	0.51	0.00

Vehicle Mix

Average PCE Per Vehicle - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	1.000	1.080	1.000
	South	1.060	1.000	1.090
	East	1.060	1.090	1.000

Truck Percentages - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.0	8.0	0.0
	South	6.0	0.0	9.0
	East	6.0	9.0	0.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Total Queueing Delay (PCE-min)	Inclusive Average Queueing Delay (s)
North	0.52	6.36	1.10	1.05	A	614.00	614.00	62.10	6.07	1.04	62.13	6.07
South	0.71	10.83	2.50	6.44	B	826.00	826.00	136.04	9.88	2.27	136.17	9.89
East	0.41	6.04	0.75	~1	A	440.00	440.00	42.51	5.80	0.71	42.52	5.80

Main Results for each time segment

Main results: (16:30-16:45)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	601.34	150.34	597.40	638.65	218.01	0.00	1231.27	1058.05	0.488	0.00	0.99	5.899	A
South	808.97	202.24	800.64	566.33	249.08	0.00	1213.29	1102.13	0.667	0.00	2.08	9.192	A
East	430.93	107.73	428.22	621.29	428.43	0.00	1109.49	1016.12	0.388	0.00	0.68	5.655	A

Main results: (16:45-17:00)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	632.99	158.25	632.51	677.31	230.77	0.00	1223.88	1058.05	0.517	0.99	1.10	6.356	A
South	851.55	212.89	849.88	599.56	263.72	0.00	1204.82	1102.13	0.707	2.08	2.50	10.828	B
East	453.61	113.40	453.30	658.82	454.78	0.00	1094.24	1016.12	0.415	0.68	0.75	6.035	A

Main results: (17:00-17:15)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	620.33	155.08	620.43	664.93	226.34	0.00	1226.45	1058.05	0.506	1.10	1.08	6.212	A
South	834.52	208.63	834.72	588.09	258.68	0.00	1207.73	1102.13	0.691	2.50	2.45	10.377	B
East	444.54	111.13	444.60	646.74	446.67	0.00	1098.93	1016.12	0.405	0.75	0.74	5.917	A

Main results: (17:15-17:30)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	601.34	150.34	601.62	645.03	219.47	0.00	1230.42	1058.05	0.489	1.08	1.01	5.988	A
South	808.97	202.24	809.92	570.25	250.84	0.00	1212.27	1102.13	0.667	2.45	2.21	9.636	A
East	430.93	107.73	431.11	627.36	433.40	0.00	1106.61	1016.12	0.389	0.74	0.69	5.730	A

Queueing Delay Results for each time segment

Queueing Delay results: (16:30-16:45)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	14.17	0.94	5.899	A	A
South	28.98	1.93	9.192	A	A
East	9.78	0.65	5.655	A	A

Queueing Delay results: (16:45-17:00)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	16.25	1.08	6.356	A	A
South	36.03	2.40	10.828	B	B
East	11.11	0.74	6.035	A	A

Queueing Delay results: (17:00-17:15)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	16.32	1.09	6.212	A	A
South	37.01	2.47	10.377	B	B
East	11.12	0.74	5.917	A	A

Queueing Delay results: (17:15-17:30)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	15.37	1.02	5.988	A	A
South	34.02	2.27	9.636	A	A
East	10.51	0.70	5.730	A	A

Queue Variation Results for each time segment

Queue Variation results: (16:30-16:45)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.99	0.00	0.00	0.00	1.05			N/A	N/A
South	2.08	0.00	0.00	4.29	5.37			N/A	N/A
East	0.68	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (16:45-17:00)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.10	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	2.50	0.00	0.00	0.00	4.29			N/A	N/A
East	0.75	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (17:00-17:15)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.08	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	2.45	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.74	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (17:15-17:30)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.01	0.00	0.00	0.00	1.05			N/A	N/A
South	2.21	0.00	0.00	4.29	6.44			N/A	N/A
East	0.69	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Appendix I

Ten-Year Total Traffic Operations Reports



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	204	99	49	123	8
Future Volume (vph)	3	204	99	49	123	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.867				0.992	
Flt Protected	0.999			0.968		
Satd. Flow (prot)	1554	0	0	1791	1768	0
Flt Permitted	0.999			0.968		
Satd. Flow (perm)	1554	0	0	1791	1768	0
Link Speed (k/h)	60			50	50	
Link Distance (m)	545.8			255.4	392.8	
Travel Time (s)	32.7			18.4	28.3	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	6%	0%	8%	5%	33%
Adj. Flow (vph)	4	240	116	58	145	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	244	0	0	174	154	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 37.8%		ICU Level of Service A	
Analysis Period (min) 15			

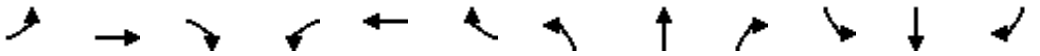
Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	204	99	49	123	8
Future Vol, veh/h	3	204	99	49	123	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	6	0	8	5	33
Mvmt Flow	4	240	116	58	145	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	440	149	154	0	-	0
Stage 1	149	-	-	-	-	-
Stage 2	291	-	-	-	-	-
Critical Hdwy	6.4	6.26	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.354	2.2	-	-	-
Pot Cap-1 Maneuver	578	887	1439	-	-	-
Stage 1	883	-	-	-	-	-
Stage 2	764	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	530	887	1439	-	-	-
Mov Cap-2 Maneuver	530	-	-	-	-	-
Stage 1	809	-	-	-	-	-
Stage 2	764	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.67	5.17	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1204	-	878	-	-
HCM Lane V/C Ratio	0.081	-	0.277	-	-
HCM Ctrl Dly (s/v)	7.7	0	10.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1.1	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	184	140	16	341	10	309	0	55	46	0	36
Future Volume (vph)	8	184	140	16	341	10	309	0	55	46	0	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.943			0.996			0.980			0.941	
Flt Protected		0.999			0.998			0.959			0.973	
Satd. Flow (prot)	0	1612	0	0	1697	0	0	1751	0	0	1710	0
Flt Permitted		0.999			0.998			0.959			0.973	
Satd. Flow (perm)	0	1612	0	0	1697	0	0	1751	0	0	1710	0
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		191.6			204.5			148.0			250.6	
Travel Time (s)		17.2			18.4			10.7			18.0	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	33%	17%	2%	2%	12%	0%	2%	2%	2%	0%	2%	4%
Adj. Flow (vph)	9	211	161	18	392	11	355	0	63	53	0	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	381	0	0	421	0	0	418	0	0	94	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 60.1%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	56.2

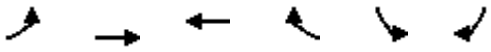
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	184	140	16	341	10	309	0	55	46	0	36
Future Vol, veh/h	8	184	140	16	341	10	309	0	55	46	0	36
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	33	17	2	2	12	0	2	2	2	0	2	4
Mvmt Flow	9	211	161	18	392	11	355	0	63	53	0	41

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	404	0	0	372	0	0	739	752	292	665	826	399
Stage 1	-	-	-	-	-	-	310	310	-	435	435	-
Stage 2	-	-	-	-	-	-	429	441	-	230	391	-
Critical Hdwy	4.43	-	-	4.12	-	-	7.12	6.52	6.22	7.1	6.52	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Follow-up Hdwy	2.497	-	-	2.218	-	-	3.518	4.018	3.318	3.5	4.018	3.336
Pot Cap-1 Maneuver	1005	-	-	1186	-	-	~ 333	339	747	376	307	647
Stage 1	-	-	-	-	-	-	700	659	-	603	580	-
Stage 2	-	-	-	-	-	-	604	577	-	777	607	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1004	-	-	1186	-	-	~ 302	328	747	333	297	646
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 302	328	-	333	297	-
Stage 1	-	-	-	-	-	-	692	651	-	591	568	-
Stage 2	-	-	-	-	-	-	554	565	-	703	600	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.21	0.35	172.53	15.93
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	332	40	-	-	78	-	-	423
HCM Lane V/C Ratio	1.261	0.009	-	-	0.016	-	-	0.223
HCM Ctrl Dly (s/v)	172.5	8.6	0	-	8.1	0	-	15.9
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	19.1	0	-	-	0	-	-	0.8

Notes	
~: Volume exceeds capacity	$: Delay exceeds 300s
+: Computation Not Defined	*: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	249	600	89	80	53
Future Volume (vph)	6	249	600	89	80	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.983		0.946	
Flt Protected		0.999			0.971	
Satd. Flow (prot)	0	1526	1683	0	1681	0
Flt Permitted		0.999			0.971	
Satd. Flow (perm)	0	1526	1683	0	1681	0
Link Speed (k/h)		40	40		50	
Link Distance (m)		234.4	191.6		193.9	
Travel Time (s)		21.1	17.2		14.0	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	25%	11%	11%	5%	2%
Adj. Flow (vph)	7	280	674	100	90	60
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	287	774	0	150	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 51.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	249	600	89	80	53
Future Vol, veh/h	6	249	600	89	80	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	25	11	11	5	2
Mvmt Flow	7	280	674	100	90	60

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	774	0	-	0	1017	724
Stage 1	-	-	-	-	724	-
Stage 2	-	-	-	-	293	-
Critical Hdwy	4.1	-	-	-	6.45	6.22
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.2	-	-	-	3.545	3.318
Pot Cap-1 Maneuver	850	-	-	-	260	426
Stage 1	-	-	-	-	475	-
Stage 2	-	-	-	-	750	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	850	-	-	-	257	426
Mov Cap-2 Maneuver	-	-	-	-	257	-
Stage 1	-	-	-	-	470	-
Stage 2	-	-	-	-	750	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.22	0	27.57
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	42	-	-	-	305
HCM Lane V/C Ratio	0.008	-	-	-	0.489
HCM Ctrl Dly (s/v)	9.3	0	-	-	27.6
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	2.5

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]
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Filename: Wellington Road 7 & First Line.arc8
Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Project Files\2025\250480-Arcady\2026-09-16
Report generation date: 2026-09-16 4:24:34 PM

« (Default Analysis Set) - Total 2036, AM
» Intersection Network
» Legs
» Traffic Flows
» Entry Flows
» Turning Proportions
» Vehicle Mix
» Results

Summary of intersection performance

	AM						
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
	A1 - Total 2036						
Leg North	2.14	4.50	11.22	0.66	B	9.32	A
Leg South	0.73	~1	5.32	0.39	A		
Leg East	2.11	4.48	10.18	0.66	B		

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages.

"D1 - Base Year, AM" model duration: 8:00 AM - 9:00 AM
"D2 - Base Year, PM" model duration: 4:30 PM - 5:30 PM
"D3 - Background 2031, AM" model duration: 8:00 AM - 9:00 AM
"D4 - Background 2031, PM" model duration: 4:30 PM - 5:30 PM
"D5 - Background 2036, AM" model duration: 8:00 AM - 9:00 AM
"D6 - Background 2036, PM" model duration: 4:30 PM - 5:30 PM
"D7 - Total 2031, AM" model duration: 8:00 AM - 9:00 AM
"D8 - Total 2031, PM" model duration: 4:30 PM - 5:30 PM
"D9 - Total 2036, AM " model duration: 8:00 AM - 9:00 AM
"D10 - Total 2036, PM" model duration: 4:30 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2026-09-16 4:24:34 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2026-07-13
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	AdamMorrison
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	V/C Ratio Threshold	Average Delay Threshold (s)	Queue Threshold (PCE)
7.50	✓		N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCE	PCE	perHour	s	-Min	perMin

(Default Analysis Set) - Total 2036, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
Total 2036, AM	Total 2036	AM		PHF	08:00	09:00	60	15				✓		

Intersection Network

Intersections

Intersection	Name	Intersection Type	Leg Order	Grade Separated	Large Roundabout	Do Geometric Delay	Intersection Delay (s)	Intersection LOS
1	(untitled)	Roundabout	North,South,East				9.32	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Wellington Road 7	
South	South	First Line	
East	East	Wellington Road 7	

Capacity Options

Leg	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
North	0.00	99999.00		0.00
South	0.00	99999.00		0.00
East	0.00	99999.00		0.00

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
North	3.50	4.50	30.00	20.00	40.00	25.00	
South	3.50	4.50	30.00	20.00	40.00	25.00	
East	3.50	4.50	30.00	20.00	40.00	25.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Enter slope and intercept directly	Entered slope	Entered intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
North		(calculated)	(calculated)	0.579	1357.445
South		(calculated)	(calculated)	0.579	1357.445
East		(calculated)	(calculated)	0.579	1357.445

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	Truck Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Leg	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)
North	PHF	✓	658.00	100.000
South	PHF	✓	468.00	100.000
East	PHF	✓	715.00	100.000

Peak Hour Factor Data

Leg	Hourly Volume (PCE/hr)	Peak Hour Factor	Peak Time Segment
North	658.00	0.94	SecondQuarter
South	468.00	0.94	SecondQuarter
East	715.00	0.94	SecondQuarter

Turning Proportions

Turning Counts / Proportions (PCE/hr) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.000	517.000	141.000
	South	334.000	0.000	134.000
	East	223.000	492.000	0.000

Turning Proportions (PCE) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.00	0.79	0.21
	South	0.71	0.00	0.29
	East	0.31	0.69	0.00

Vehicle Mix

Average PCE Per Vehicle - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	1.000	1.070	1.380
	South	1.090	1.000	1.310
	East	1.220	1.080	1.000

Truck Percentages - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.0	7.0	38.0
	South	9.0	0.0	31.0
	East	22.0	8.0	0.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Total Queueing Delay (PCE-min)	Inclusive Average Queueing Delay (s)
North	0.66	11.22	2.14	4.50	B	658.00	658.00	106.64	9.72	1.78	106.71	9.73
South	0.39	5.32	0.73	~1	A	468.00	468.00	39.62	5.08	0.66	39.63	5.08
East	0.66	10.18	2.11	4.48	B	715.00	715.00	106.54	8.94	1.78	106.61	8.95

Main Results for each time segment

Main results: (08:00-08:15)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	630.00	157.50	623.94	529.64	466.84	0.00	1087.26	1019.34	0.579	0.00	1.51	8.626	A
South	448.09	112.02	445.64	957.08	133.70	0.00	1280.06	1231.03	0.350	0.00	0.61	4.927	A
East	684.57	171.14	678.43	261.30	318.04	0.00	1173.38	848.97	0.583	0.00	1.54	8.050	A

Main results: (08:15-08:30)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	700.00	175.00	697.50	591.49	521.82	0.00	1055.44	1019.34	0.663	1.51	2.14	11.219	B
South	497.87	124.47	497.40	1069.85	149.46	0.00	1270.94	1231.03	0.392	0.61	0.73	5.325	A
East	760.64	190.16	758.33	291.88	354.98	0.00	1152.00	848.97	0.660	1.54	2.11	10.178	B

Main results: (08:30-08:45)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	672.00	168.00	672.71	569.17	502.92	0.00	1066.37	1019.34	0.630	2.14	1.96	10.307	B
South	477.96	119.49	478.11	1031.48	144.15	0.00	1274.02	1231.03	0.375	0.73	0.69	5.179	A
East	730.21	182.55	730.88	281.05	341.21	0.00	1159.96	848.97	0.630	2.11	1.95	9.418	A

Main results: (08:45-09:00)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	630.00	157.50	631.48	533.93	472.00	0.00	1084.27	1019.34	0.581	1.96	1.59	8.968	A
South	448.09	112.02	448.37	968.17	135.32	0.00	1279.13	1231.03	0.350	0.69	0.62	4.965	A
East	684.57	171.14	685.94	263.70	319.99	0.00	1172.25	848.97	0.584	1.95	1.60	8.316	A

Queueing Delay Results for each time segment

Queueing Delay results: (08:00-08:15)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	21.33	1.42	8.626	A	A
South	8.89	0.59	4.927	A	A
East	21.69	1.45	8.050	A	A

Queueing Delay results: (08:15-08:30)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	30.44	2.03	11.219	B	B
South	10.75	0.72	5.325	A	A
East	30.17	2.01	10.178	B	B

Queueing Delay results: (08:30-08:45)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	30.12	2.01	10.307	B	B
South	10.51	0.70	5.179	A	A
East	29.82	1.99	9.418	A	A

Queueing Delay results: (08:45-09:00)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	24.75	1.65	8.968	A	A
South	9.48	0.63	4.965	A	A
East	24.86	1.66	8.316	A	A

Queue Variation Results for each time segment

Queue Variation results: (08:00-08:15)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.51	0.00	0.00	2.25	3.37			N/A	N/A
South	0.61	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	1.54	0.00	0.00	2.24	3.36			N/A	N/A

Queue Variation results: (08:15-08:30)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	2.14	0.00	0.00	0.00	2.25			N/A	N/A
South	0.73	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	2.11	0.00	0.00	0.00	2.24			N/A	N/A

Queue Variation results: (08:30-08:45)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.96	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.69	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	1.95	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:45-09:00)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.59	0.00	0.00	2.25	4.50			N/A	N/A
South	0.62	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	1.60	0.00	0.00	2.24	4.48			N/A	N/A



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	234	242	137	163	0
Future Volume (vph)	3	234	242	137	163	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.867					
Flt Protected	0.999			0.969		
Satd. Flow (prot)	1630	0	0	1805	1863	0
Flt Permitted	0.999			0.969		
Satd. Flow (perm)	1630	0	0	1805	1863	0
Link Speed (k/h)	60			50	50	
Link Distance (m)	545.8			255.4	392.8	
Travel Time (s)	32.7			18.4	28.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	2%	2%	2%	0%
Adj. Flow (vph)	3	246	255	144	172	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	249	0	0	399	172	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.8%		ICU Level of Service A	
Analysis Period (min) 15			

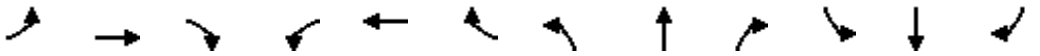
Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	234	242	137	163	0
Future Vol, veh/h	3	234	242	137	163	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	1	2	2	2	0
Mvmt Flow	3	246	255	144	172	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	825	172	172	0	-	0
Stage 1	172	-	-	-	-	-
Stage 2	654	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.218	-	-	-
Pot Cap-1 Maneuver	345	875	1405	-	-	-
Stage 1	863	-	-	-	-	-
Stage 2	521	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	277	875	1405	-	-	-
Mov Cap-2 Maneuver	277	-	-	-	-	-
Stage 1	693	-	-	-	-	-
Stage 2	521	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.97	5.19	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1149	-	851	-	-
HCM Lane V/C Ratio	0.181	-	0.293	-	-
HCM Ctrl Dly (s/v)	8.1	0	11	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.7	-	1.2	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	380	336	57	242	48	208	0	48	23	0	10
Future Volume (vph)	18	380	336	57	242	48	208	0	48	23	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.938			0.981			0.975			0.960	
Flt Protected		0.999			0.992			0.961			0.966	
Satd. Flow (prot)	0	1755	0	0	1769	0	0	1745	0	0	1762	0
Flt Permitted		0.999			0.992			0.961			0.966	
Satd. Flow (perm)	0	1755	0	0	1769	0	0	1745	0	0	1762	0
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		191.6			204.5			148.0			250.6	
Travel Time (s)		17.2			18.4			10.7			18.0	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	1%	2%	2%	6%	0%	2%	2%	2%	0%	2%	0%
Adj. Flow (vph)	19	392	346	59	249	49	214	0	49	24	0	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	757	0	0	357	0	0	263	0	0	34	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 70.3%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	28.2

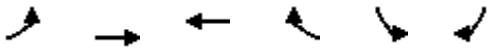
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	18	380	336	57	242	48	208	0	48	23	0	10
Future Vol, veh/h	18	380	336	57	242	48	208	0	48	23	0	10
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	1	2	2	6	0	2	2	2	0	2	0
Mvmt Flow	19	392	346	59	249	49	214	0	49	24	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	300	0	0	738	0	0	969	1020	565	822	1168	275
Stage 1	-	-	-	-	-	-	602	602	-	393	393	-
Stage 2	-	-	-	-	-	-	367	417	-	429	775	-
Critical Hdwy	4.1	-	-	4.12	-	-	7.12	6.52	6.22	7.1	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Follow-up Hdwy	2.2	-	-	2.218	-	-	3.518	4.018	3.318	3.5	4.018	3.3
Pot Cap-1 Maneuver	1273	-	-	868	-	-	233	237	524	295	193	768
Stage 1	-	-	-	-	-	-	486	489	-	636	606	-
Stage 2	-	-	-	-	-	-	653	591	-	608	408	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1271	-	-	868	-	-	~ 205	211	524	239	173	768
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 205	211	-	239	173	-
Stage 1	-	-	-	-	-	-	474	476	-	583	556	-
Stage 2	-	-	-	-	-	-	591	542	-	536	397	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.19	1.55	146.1	18.43
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	232	40	-	-	286	-	-	302
HCM Lane V/C Ratio	1.138	0.015	-	-	0.068	-	-	0.113
HCM Ctrl Dly (s/v)	146.1	7.9	0	-	9.4	0	-	18.4
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	12.2	0	-	-	0.2	-	-	0.4

Notes	
~: Volume exceeds capacity	$: Delay exceeds 300s
+: Computation Not Defined	*: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	46	607	361	99	128	31
Future Volume (vph)	46	607	361	99	128	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.971		0.973	
Flt Protected		0.996			0.961	
Satd. Flow (prot)	0	1892	1762	0	1763	0
Flt Permitted		0.996			0.961	
Satd. Flow (perm)	0	1892	1762	0	1763	0
Link Speed (k/h)		40	40		50	
Link Distance (m)		234.4	191.6		193.9	
Travel Time (s)		21.1	17.2		14.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	6%	0%	0%	4%
Adj. Flow (vph)	47	619	368	101	131	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	666	469	0	163	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 78.5%		ICU Level of Service D	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	46	607	361	99	128	31
Future Vol, veh/h	46	607	361	99	128	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	6	0	0	4
Mvmt Flow	47	619	368	101	131	32

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	469	0	-	0	1132	419
Stage 1	-	-	-	-	419	-
Stage 2	-	-	-	-	713	-
Critical Hdwy	4.1	-	-	-	6.4	6.24
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.336
Pot Cap-1 Maneuver	1103	-	-	-	227	630
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	489	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1103	-	-	-	212	630
Mov Cap-2 Maneuver	-	-	-	-	212	-
Stage 1	-	-	-	-	625	-
Stage 2	-	-	-	-	489	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.59	0	45.06
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	127	-	-	-	243
HCM Lane V/C Ratio	0.043	-	-	-	0.666
HCM Ctrl Dly (s/v)	8.4	0	-	-	45.1
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	-	4.2

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]
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Filename: Wellington Road 7 & First Line.arc8
Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Project Files\2025\250480-Arcady\2026-09-16
Report generation date: 2026-09-16 4:24:12 PM

« (Default Analysis Set) - Total 2036, PM
» Intersection Network
» Legs
» Traffic Flows
» Entry Flows
» Turning Proportions
» Vehicle Mix
» Results

Summary of intersection performance

	PM						
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
	A1 - Total 2036						
Leg North	1.33	?	7.07	0.56	A	9.84	A
Leg South	3.37	10.73	13.57	0.77	B		
Leg East	0.85	~1	6.56	0.44	A		

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages.

"D1 - Base Year, AM" model duration: 8:00 AM - 9:00 AM
"D2 - Base Year, PM" model duration: 4:30 PM - 5:30 PM
"D3 - Background 2031, AM" model duration: 8:00 AM - 9:00 AM
"D4 - Background 2031, PM" model duration: 4:30 PM - 5:30 PM
"D5 - Background 2036, AM" model duration: 8:00 AM - 9:00 AM
"D6 - Background 2036, PM" model duration: 4:30 PM - 5:30 PM
"D7 - Total 2031, AM" model duration: 8:00 AM - 9:00 AM
"D8 - Total 2031, PM" model duration: 4:30 PM - 5:30 PM
"D9 - Total 2036, AM" model duration: 8:00 AM - 9:00 AM
"D10 - Total 2036, PM " model duration: 4:30 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2026-09-16 4:24:12 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2026-07-13
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	AdamMorrison
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	V/C Ratio Threshold	Average Delay Threshold (s)	Queue Threshold (PCE)
7.50	✓		N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCE	PCE	perHour	s	-Min	perMin

(Default Analysis Set) - Total 2036, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
Total 2036, PM	Total 2036	PM		PHF	16:30	17:30	60	15				✓		

Intersection Network

Intersections

Intersection	Name	Intersection Type	Leg Order	Grade Separated	Large Roundabout	Do Geometric Delay	Intersection Delay (s)	Intersection LOS
1	(untitled)	Roundabout	North,South,East				9.84	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Wellington Road 7	
South	South	First Line	
East	East	Wellington Road 7	

Capacity Options

Leg	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
North	0.00	99999.00		0.00
South	0.00	99999.00		0.00
East	0.00	99999.00		0.00

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
North	3.50	4.50	30.00	20.00	40.00	25.00	
South	3.50	4.50	30.00	20.00	40.00	25.00	
East	3.50	4.50	30.00	20.00	40.00	25.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Enter slope and intercept directly	Entered slope	Entered intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
North		(calculated)	(calculated)	0.579	1357.445
South		(calculated)	(calculated)	0.579	1357.445
East		(calculated)	(calculated)	0.579	1357.445

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	Truck Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Leg	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)
North	PHF	✓	665.00	100.000
South	PHF	✓	895.00	100.000
East	PHF	✓	458.00	100.000

Peak Hour Factor Data

Leg	Hourly Volume (PCE/hr)	Peak Hour Factor	Peak Time Segment
North	665.00	0.97	SecondQuarter
South	895.00	0.97	SecondQuarter
East	458.00	0.97	SecondQuarter

Turning Proportions

Turning Counts / Proportions (PCE/hr) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.000	403.000	262.000
	South	498.000	0.000	397.000
	East	223.000	235.000	0.000

Turning Proportions (PCE) - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.00	0.61	0.39
	South	0.56	0.00	0.44
	East	0.49	0.51	0.00

Vehicle Mix

Average PCE Per Vehicle - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	1.000	1.080	1.000
	South	1.060	1.000	1.090
	East	1.060	1.090	1.000

Truck Percentages - Intersection 1 (for whole period)

		To		
		North	South	East
From	North	0.0	8.0	0.0
	South	6.0	0.0	9.0
	East	6.0	9.0	0.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Total Queueing Delay (PCE-min)	Inclusive Average Queueing Delay (s)
North	0.56	7.07	1.33	?	A	665.00	665.00	74.21	6.70	1.24	74.25	6.70
South	0.77	13.57	3.37	10.73	B	895.00	895.00	180.31	12.09	3.01	180.52	12.10
East	0.44	6.56	0.85	~1	A	458.00	458.00	47.84	6.27	0.80	47.86	6.27

Main Results for each time segment

Main results: (16:30-16:45)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	651.29	162.82	646.61	698.65	228.60	0.00	1225.14	1061.01	0.532	0.00	1.17	6.464	A
South	876.55	219.14	865.75	620.46	254.75	0.00	1210.00	1115.51	0.724	0.00	2.70	10.907	B
East	448.56	112.14	445.53	638.78	481.73	0.00	1078.64	998.21	0.416	0.00	0.76	6.084	A

Main results: (16:45-17:00)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	685.57	171.39	684.93	741.62	242.07	0.00	1217.34	1061.01	0.563	1.17	1.33	7.070	A
South	922.68	230.67	919.99	657.15	269.85	0.00	1201.26	1115.51	0.768	2.70	3.37	13.573	B
East	472.16	118.04	471.78	677.94	511.91	0.00	1061.17	998.21	0.445	0.76	0.85	6.563	A

Main results: (17:00-17:15)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	671.86	167.96	671.98	728.60	237.46	0.00	1220.01	1061.01	0.551	1.33	1.30	6.882	A
South	904.23	226.06	904.46	644.69	264.75	0.00	1204.22	1115.51	0.751	3.37	3.31	12.918	B
East	462.72	115.68	462.80	665.94	503.26	0.00	1066.18	998.21	0.434	0.85	0.83	6.415	A

Main results: (17:15-17:30)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	651.29	162.82	651.66	707.08	230.27	0.00	1224.18	1061.01	0.532	1.30	1.21	6.590	A
South	876.55	219.14	878.06	625.18	256.74	0.00	1208.85	1115.51	0.725	3.31	2.93	11.751	B
East	448.56	112.14	448.77	646.23	488.57	0.00	1074.68	998.21	0.417	0.83	0.78	6.186	A

Queueing Delay Results for each time segment

Queueing Delay results: (16:30-16:45)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	16.74	1.12	6.464	A	A
South	36.82	2.45	10.907	B	B
East	10.91	0.73	6.084	A	A

Queueing Delay results: (16:45-17:00)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	19.47	1.30	7.070	A	A
South	47.94	3.20	13.573	B	B
East	12.53	0.84	6.563	A	A

Queueing Delay results: (17:00-17:15)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	19.62	1.31	6.882	A	A
South	50.05	3.34	12.918	B	B
East	12.57	0.84	6.415	A	A

Queueing Delay results: (17:15-17:30)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	18.39	1.23	6.590	A	A
South	45.50	3.03	11.751	B	B
East	11.83	0.79	6.186	A	A

Queue Variation Results for each time segment

Queue Variation results: (16:30-16:45)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.17	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	2.70	0.00	0.00	5.37	7.51			N/A	N/A
East	0.76	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (16:45-17:00)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.33	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	3.37	0.00	0.00	1.07	9.66			N/A	N/A
East	0.85	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (17:00-17:15)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.30	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	3.31	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.83	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (17:15-17:30)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.21	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	2.93	0.00	0.00	6.44	10.73			N/A	N/A
East	0.78	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Appendix J

Traffic Control Signal Warrant Worksheets

Signal Justification Calculation for Forecast Volumes
(OTM Book 12 - Justification 7)

Horizon Year: 2036 Total
Municipality: Elora

Project number: 250480

Major Street: First Line
Minor Street: Spencer Drive/Street A

North/South?: N

Number of Approach Lanes: 1
Tee Intersection? N
Flow Conditions: Restricted

PM Forecast Only? N

Warrant Results		
200% Satisfied	No	Case 1: Signal is undoubtedly warranted
100% Satisfied	No	Case 2: Signal might be warranted
		Case 3: Signal warrant is unlikely

	Major Street						Minor Street						
	First Line						Spencer Drive/Street A						
	Eastbound			Westbound			Northbound			Southbound			Peds
Time Period	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Crossing
AM Peak Hour	8	184	140	16	341	10	309	0	55	46	0	36	0
PM Peak Hour	18	380	336	57	242	48	208	0	48	23	0	10	0
verage Hourly Volum	7	141	119	18	146	15	129	0	26	17	0	12	0

Warrant	AHV
1A - All	629
1B - Minor	184
2A - Major	445
2B - Cross	147

Warrant 1 - Minimum Vehicular Volume

	Approach Lanes	1		2 or more		Average
1A	Flow Conditions	Free	Restricted	Free	Restricted	Hourly Volume
			X			
	All Approaches	480	720	600	900	629
					% Fulfilled	87.3%

	Approach Lanes	1		2 or more		Average
1B	Flow Conditions	Free	Restricted	Free	Restricted	Hourly Volume
			X			
	Minor Street Approaches	120	170	120	170	184
					% Fulfilled	108.1%

Warrant 2 - Delay To Cross Traffic

	Approach Lanes	1		2 or more		Average
2A	Flow Conditions	Free	Restricted	Free	Restricted	Hourly Volume
			X			
	Major Street Approaches	480	720	600	900	445
					% Fulfilled	61.8%

	Approach Lanes	1		2 or more		Average
2B	Flow Conditions	Free	Restricted	Free	Restricted	Hourly Volume
			X			
	Traffic Crossing Major Street	50	75	50	75	147
					% Fulfilled	195.3%

Signal Justification Calculation for Forecast Volumes
(OTM Book 12 - Justification 7)

Horizon Year: 2036 Total
Municipality: Elora

Project number: 250480

Major Street: First Line
Minor Street: Bridge Street

North/South?: N

Number of Approach Lanes: 1
Tee Intersection? Y
Flow Conditions: Restricted

PM Forecast Only? N

Warrant Results		
200% Satisfied	No	Case 1: Signal is undoubtedly warranted
100% Satisfied	No	Case 2: Signal might be warranted
		Case 3: Signal warrant is unlikely

	Major Street						Minor Street						
	First Line						Bridge Street						
	Eastbound			Westbound			Northbound			Southbound			Peds
Time Period	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Crossing
AM Peak Hour	6	249	0	0	600	89	0	0	0	80	0	53	0
PM Peak Hour	46	607	0	0	361	99	0	0	0	128	0	31	0
verage Hourly Volum	13	214	0	0	240	47	0	0	0	52	0	21	0

Warrant	AHV
1A - All	587
1B - Minor	73
2A - Major	514
2B - Cross	52

Warrant 1 - Minimum Vehicular Volume

	Approach Lanes	1		2 or more		Average
1A	Flow Conditions	Free	Restricted	Free	Restricted	Hourly Volume
			X			
	All Approaches	480	720	600	900	587
					% Fulfilled	81.6%

	Approach Lanes	1		2 or more		Average
1B	Flow Conditions	Free	Restricted	Free	Restricted	Hourly Volume
			X			
	Minor Street Approaches	180	255	180	255	73
					% Fulfilled	28.6%

Warrant 2 - Delay To Cross Traffic

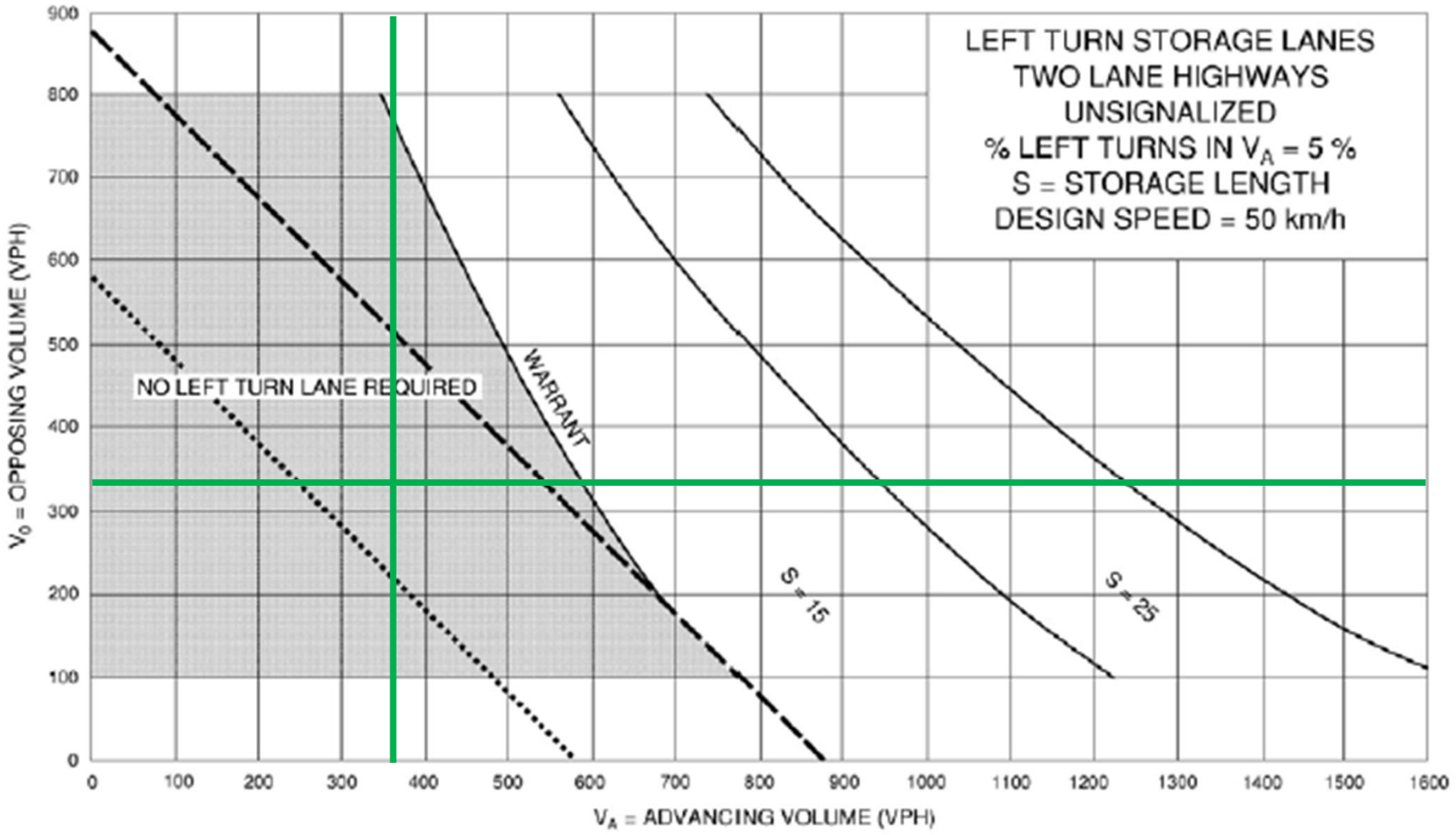
	Approach Lanes	1		2 or more		Average
2A	Flow Conditions	Free	Restricted	Free	Restricted	Hourly Volume
			X			
	Major Street Approaches	480	720	600	900	514
					% Fulfilled	71.4%

	Approach Lanes	1		2 or more		Average
2B	Flow Conditions	Free	Restricted	Free	Restricted	Hourly Volume
			X			
	Traffic Crossing Major Street	50	75	50	75	52
					% Fulfilled	69.3%

Appendix K

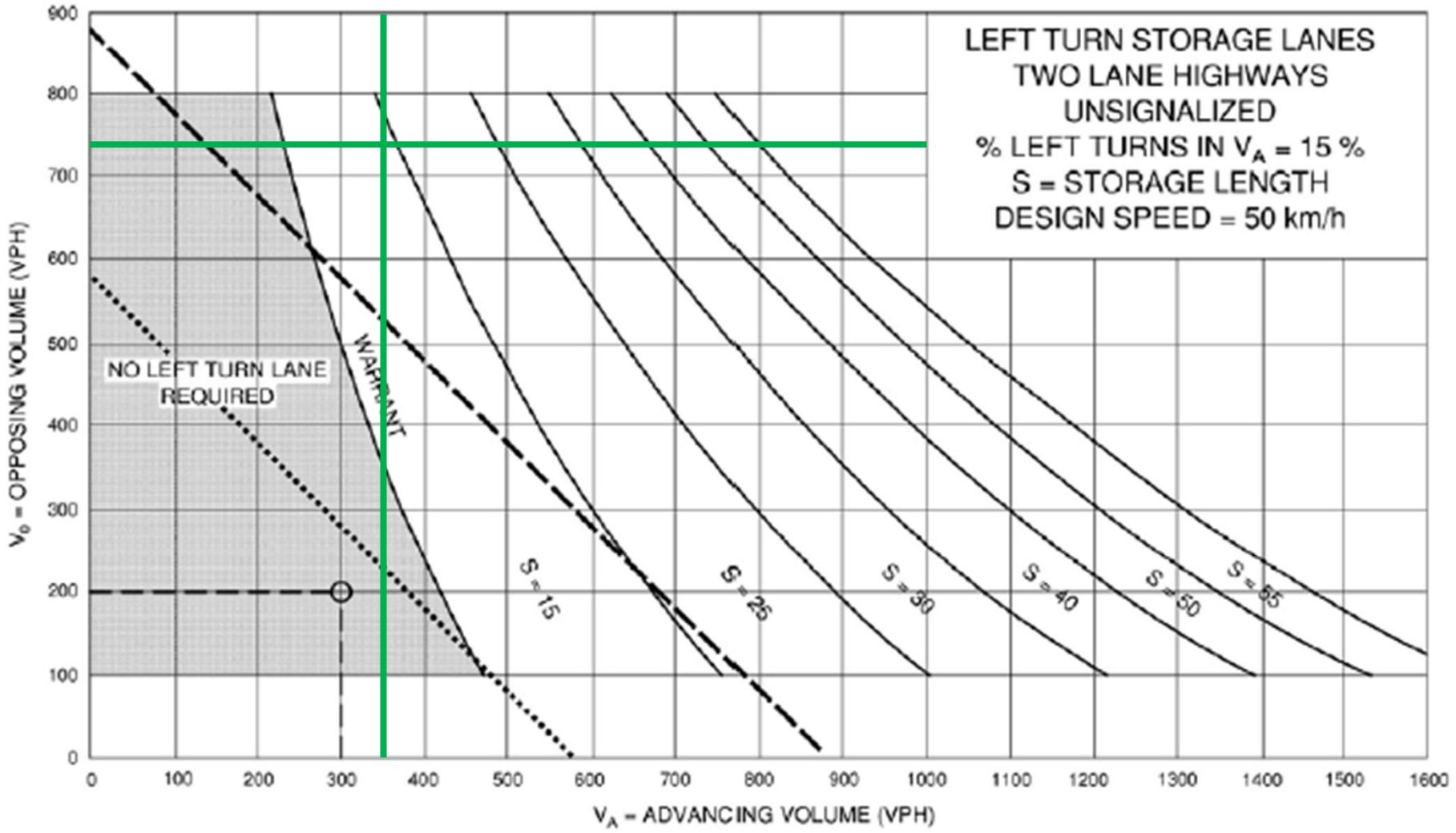
Left-Turn Lane Warrants





First Line at Spencer Drive/Street A
Westbound Left-Turn Lane Warrant

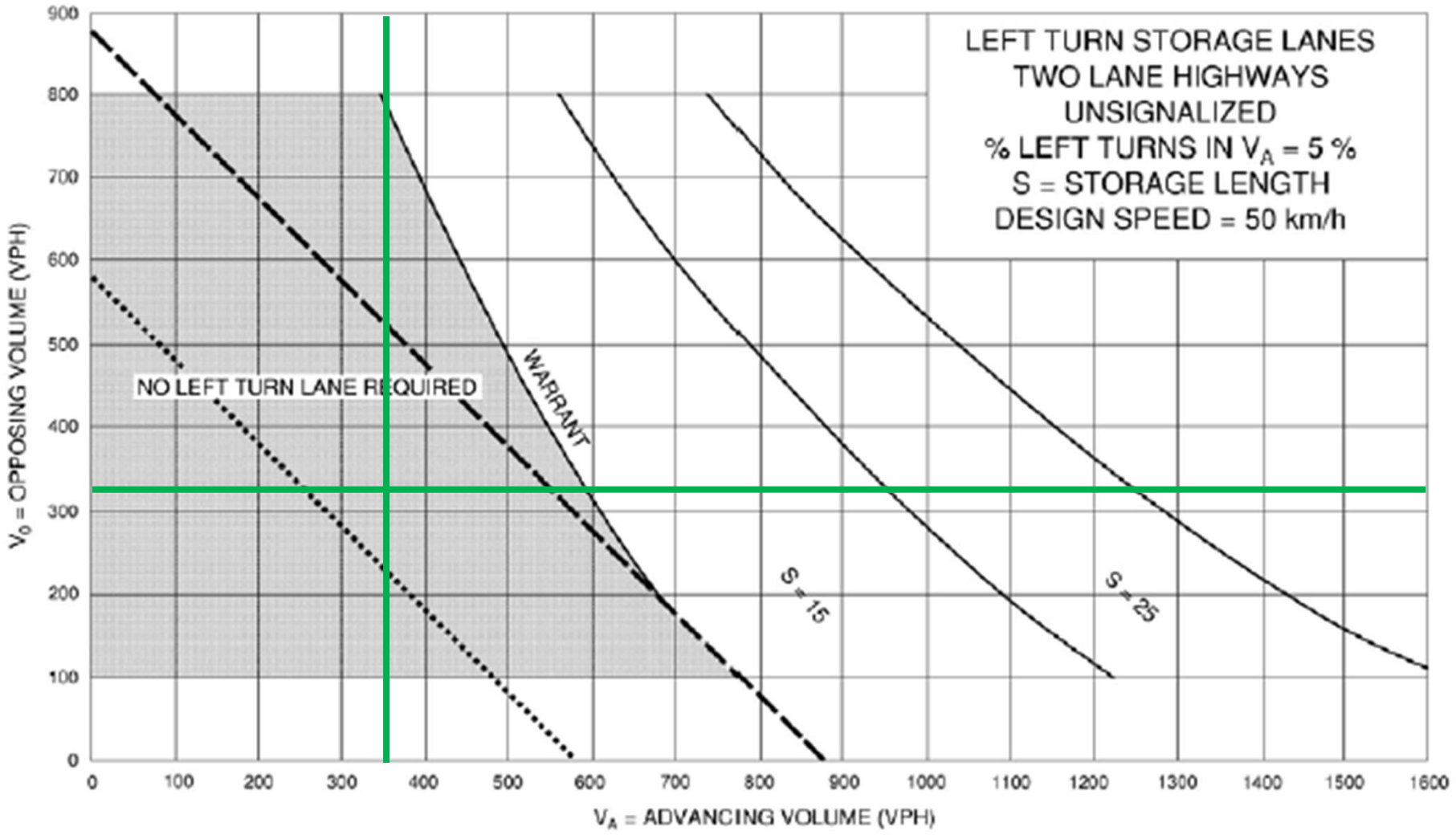
Total 2036 (AM Peak Hour)



paradigm TRANSPORTATION SOLUTIONS LIMITED

First Line at Spencer Drive/Street A
Westbound Left-Turn Lane Warrant

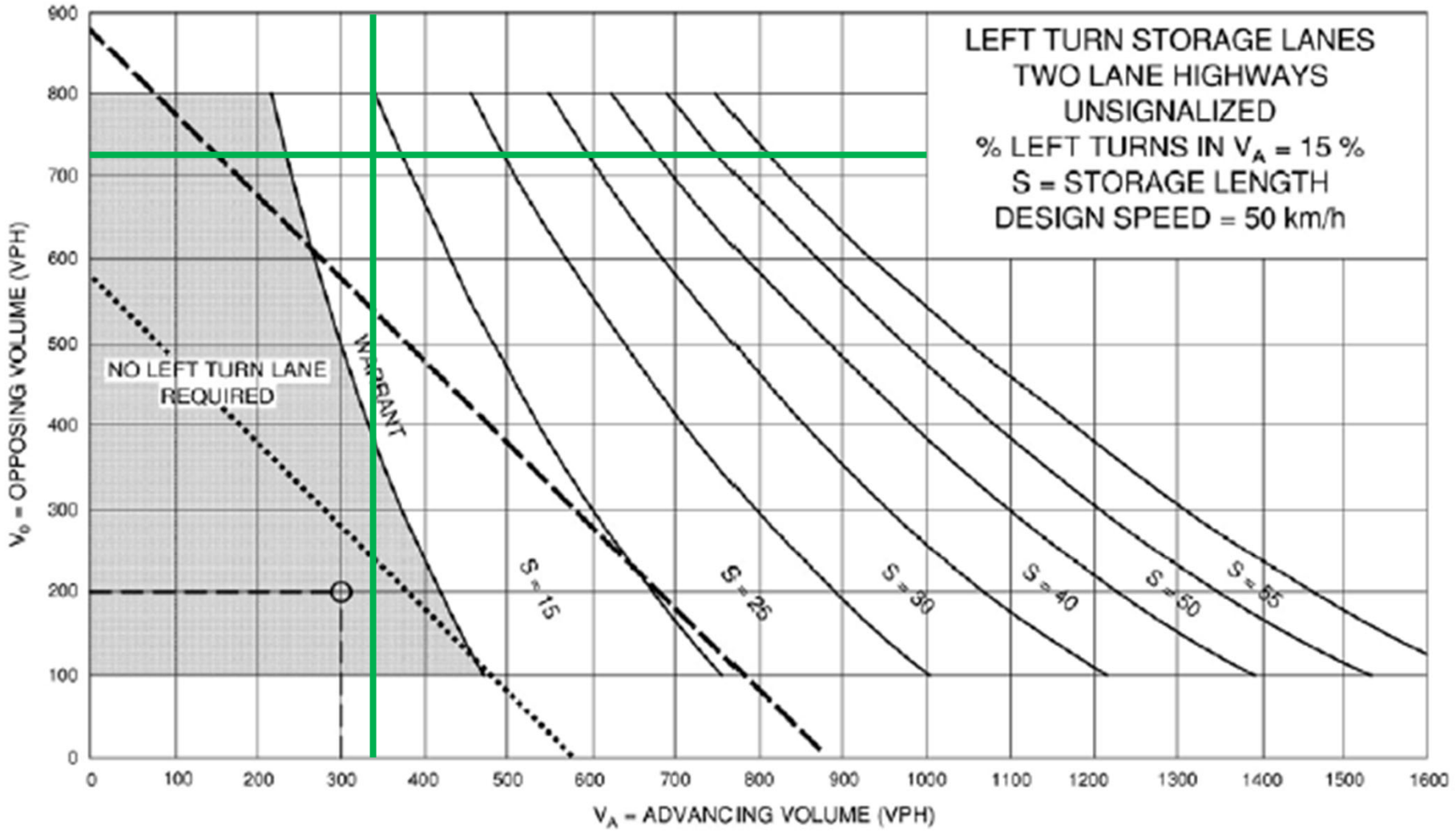
Total 2036 (PM Peak Hour)



paradigm TRANSPORTATION SOLUTIONS LIMITED

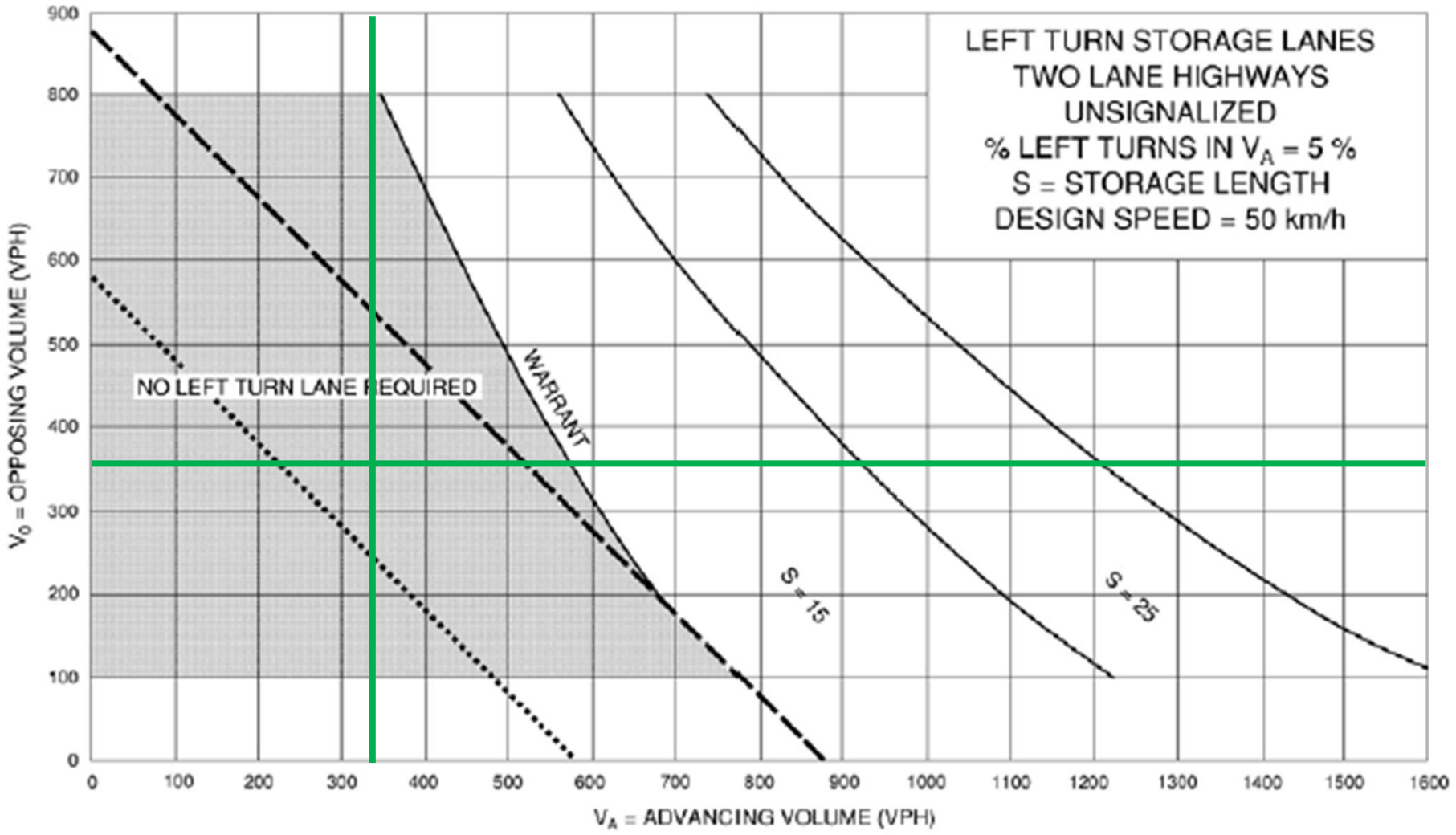
First Line at Spencer Drive/Street A
Westbound Left-Turn Lane Warrant

Total 2031 (AM Peak Hour)



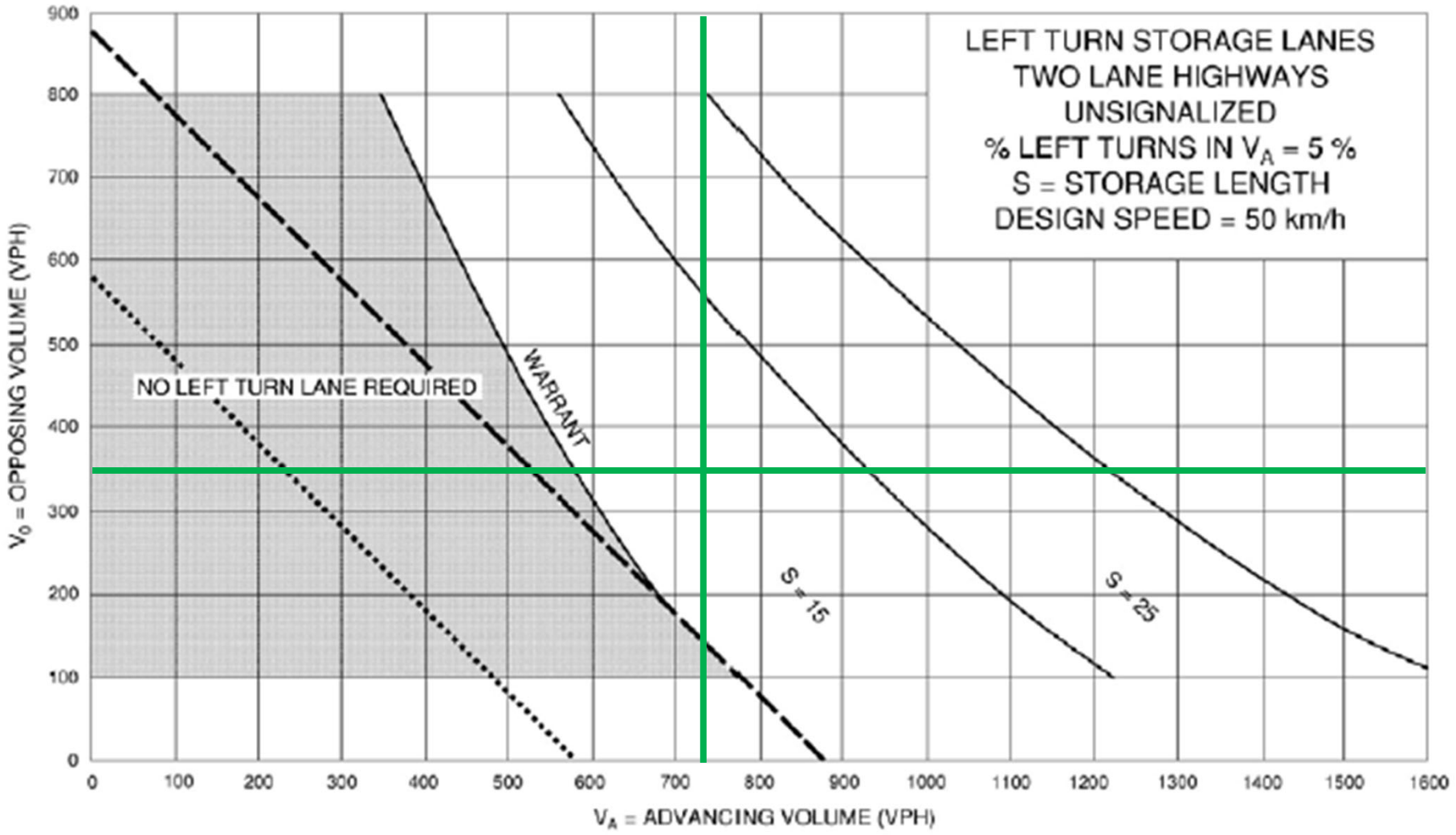
First Line at Spencer Drive/Street A
Westbound Left-Turn Lane Warrant

Total 2031 (PM Peak Hour)



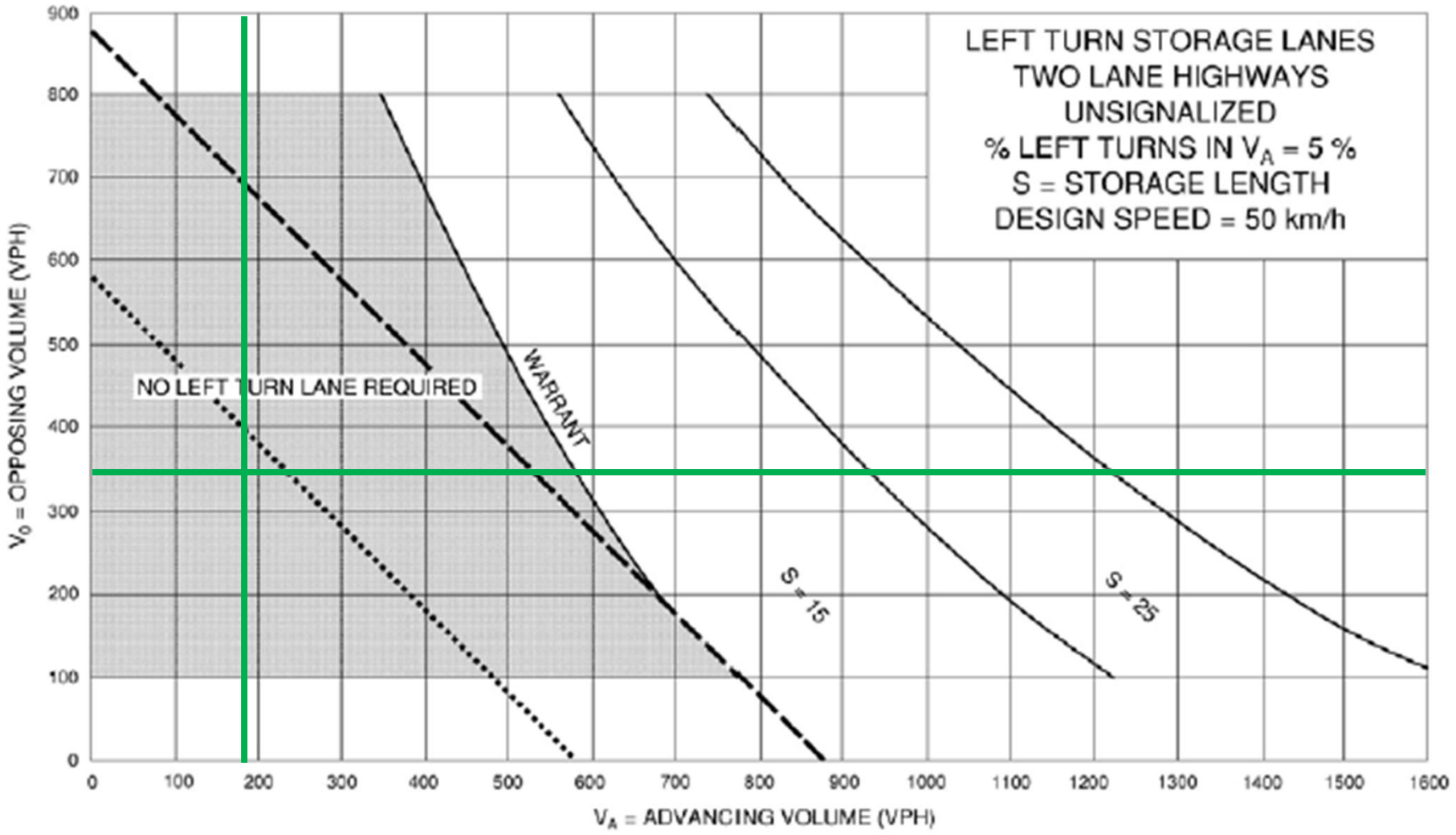
First Line at Spencer Drive/Street A
Eastbound Left-Turn Lane Warrant

Total 2036 (AM Peak Hour)



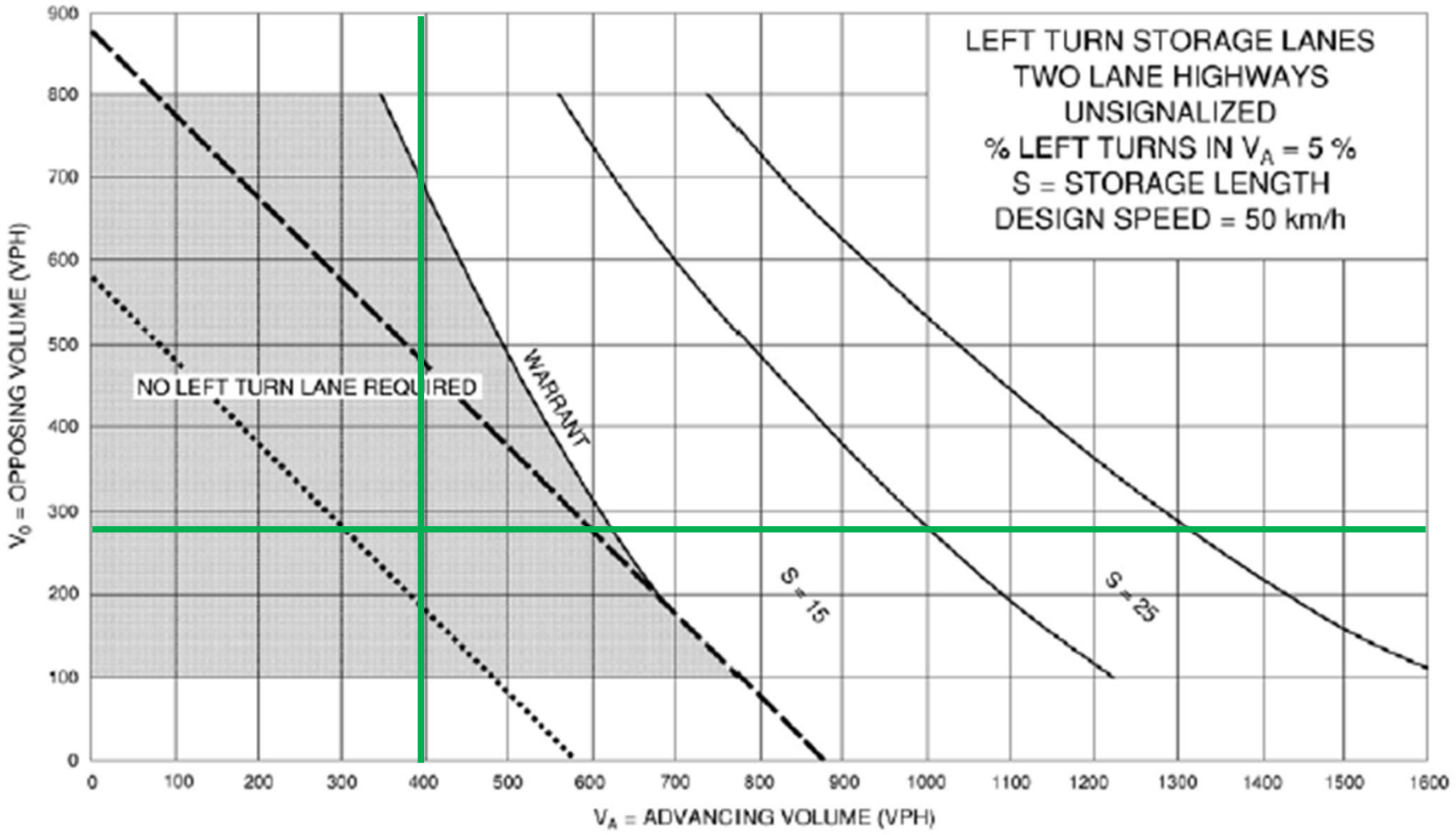
First Line at Spencer Drive/Street A
Eastbound Left-Turn Lane Warrant

Total 2036 (PM Peak Hour)



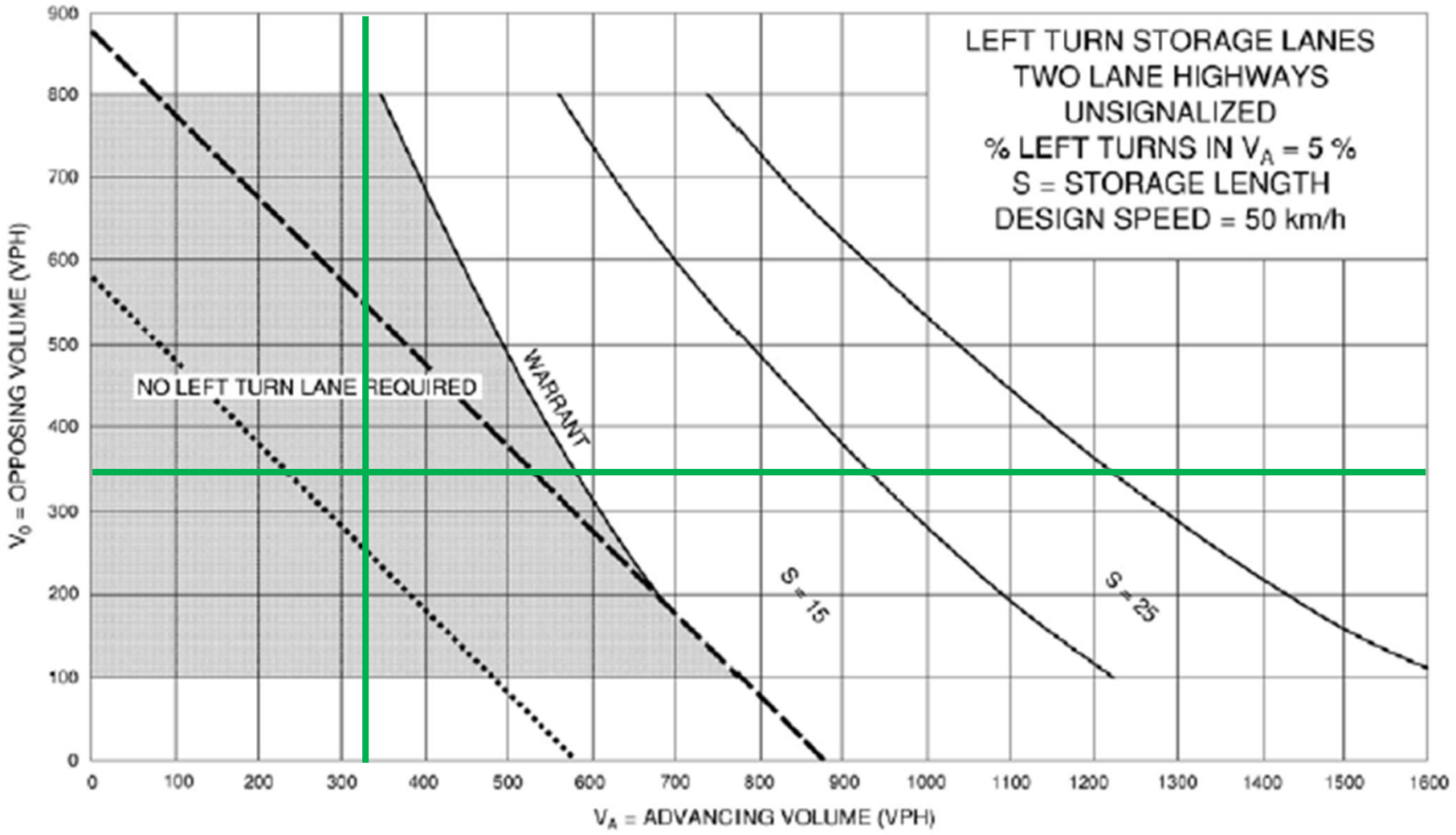
First Line at Spencer Drive/Street A
Eastbound Left-Turn Lane Warrant

Background 2036 (AM Peak Hour)



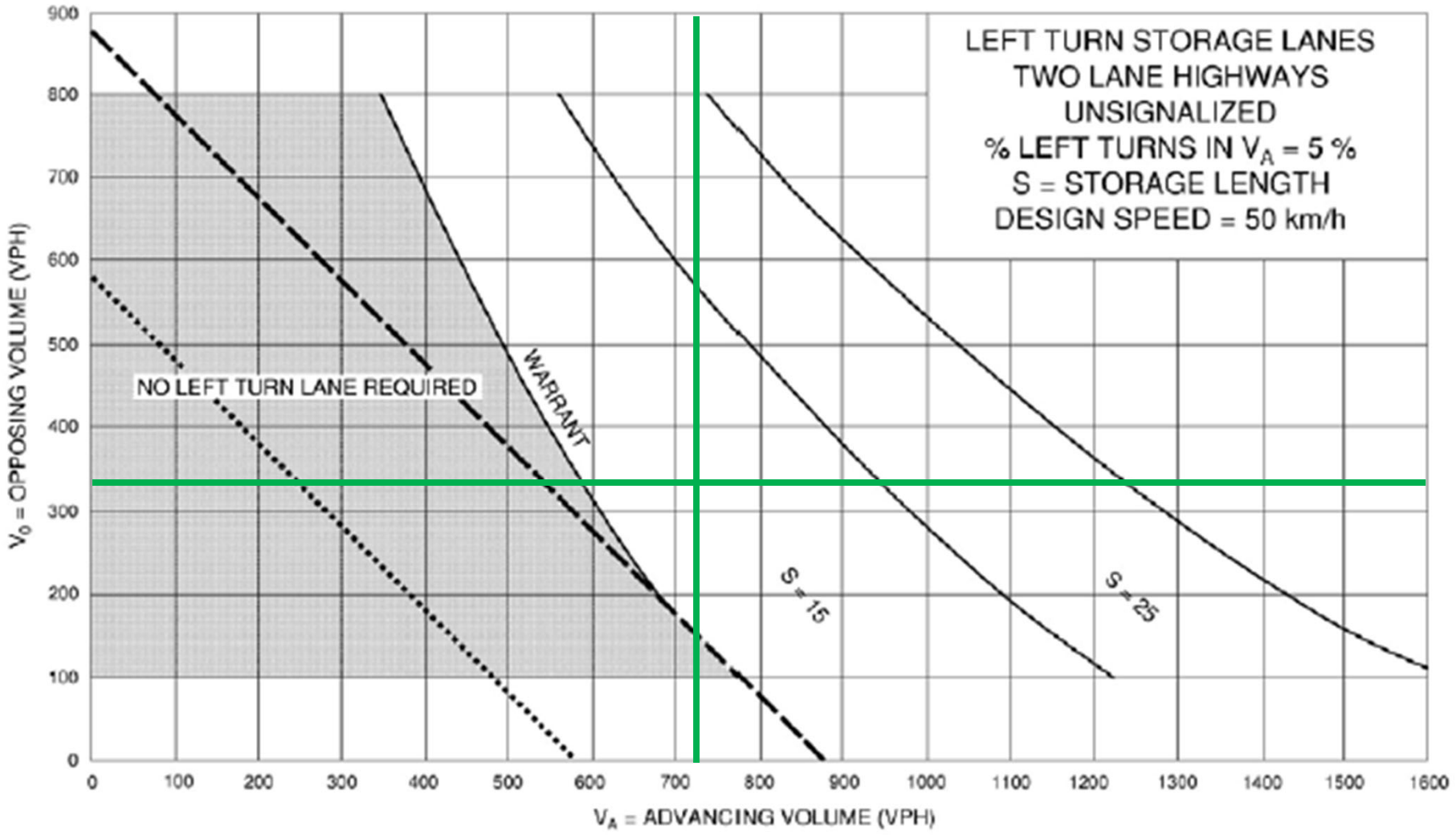
First Line at Spencer Drive/Street A
Eastbound Left-Turn Lane Warrant

Background 2036 (PM Peak Hour)



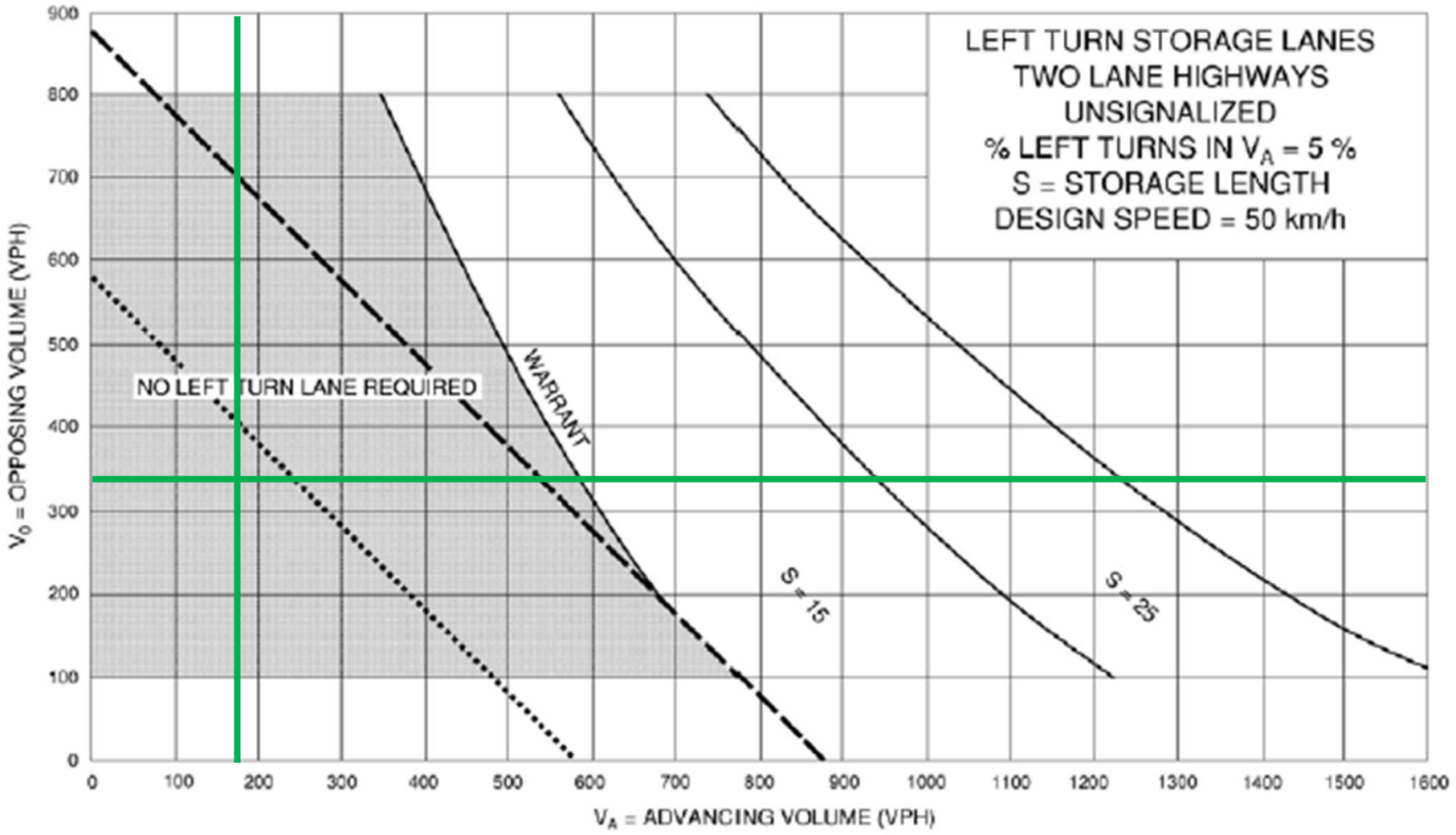
First Line at Spencer Drive/Street A
Eastbound Left-Turn Lane Warrant

Total 2031 (AM Peak Hour)



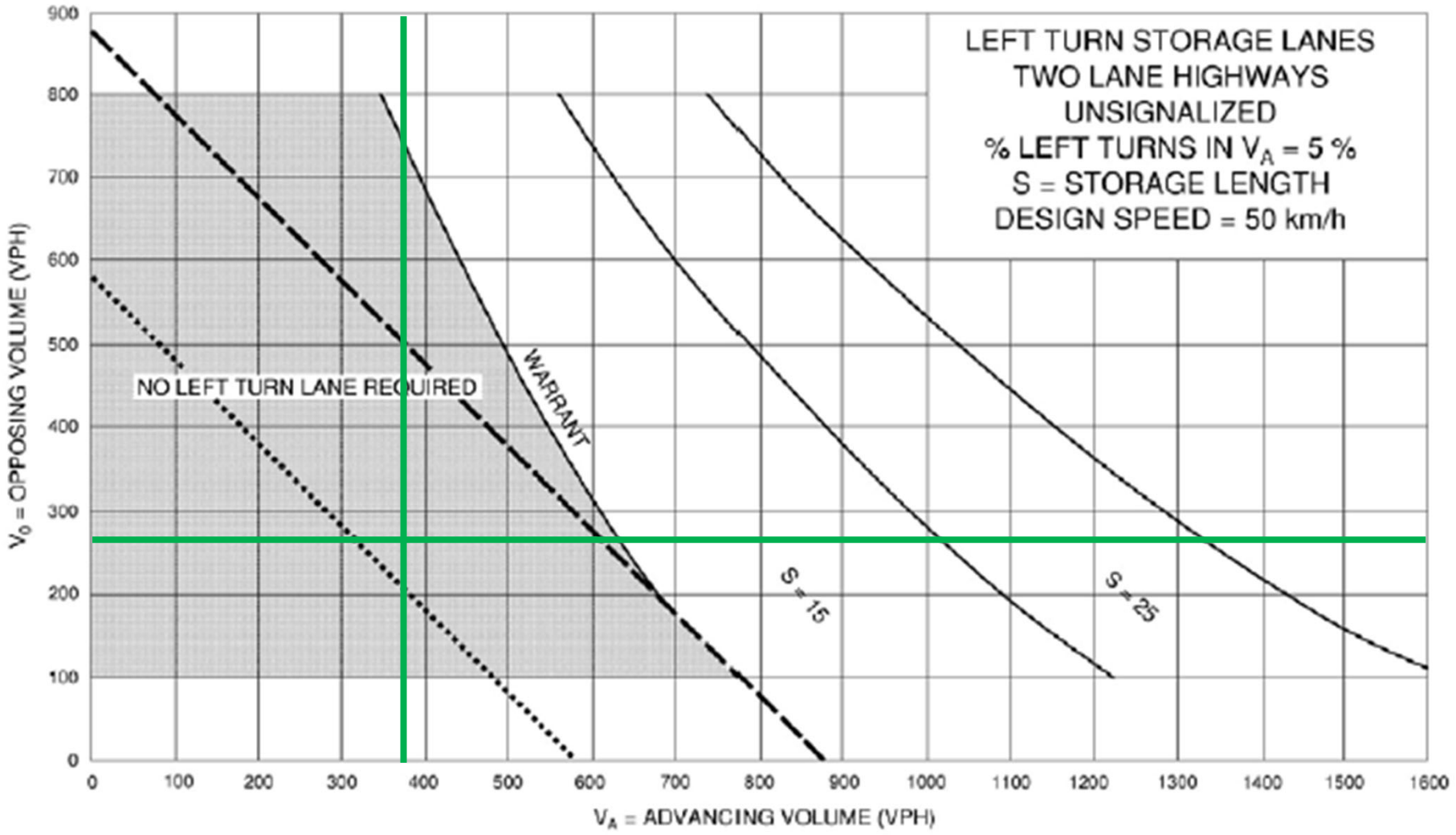
First Line at Spencer Drive/Street A
Eastbound Left-Turn Lane Warrant

Total 2031 (PM Peak Hour)



First Line at Spencer Drive/Street A
Eastbound Left-Turn Lane Warrant

Background 2031 (AM Peak Hour)



First Line at Spencer Drive/Street A
Eastbound Left-Turn Lane Warrant

Background 2031 (PM Peak Hour)