Wellington Road 34 and Concession Road 7, Township of Puslinch, ON Transportation Impact Study

Paradigm Transportation Solutions Limited

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Project Summary

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Client:

Shade Springs Inc.
4 Loyalist Road
Etobicoke, ON M9A 3P3

Michael DeBiasio

Consultant Project Team

Erica Bayley, P.Eng.
Andrew Orr, EIT
Scott Catton, CET

Paradigm Transportation Solutions Limited

5A-150 Pinebush Road
Cambridge ON N1R 8J8
p: 519.896.3163
905.381.2229
416.479.9684
www.ptsl.com

Wellington Road 34 and Concession Road 7, Township of Puslinch, ON
Transportation Impact Study



Erica Bayley, P.Eng.

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Executive Summary

Content

Shade Springs Inc. retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact Study for a proposed residential development located at 7335 Wellington Road 34 on the southeast corner of Wellington Road 34 and Concession Road 7/Wellington Road 54 in the Township of Puslinch, Ontario.

This Transportation Impact Study (TIS) includes an analysis of existing traffic conditions, a description of the proposed development, an access and circulation review, traffic forecasts for five years after the full build-out, and any recommendations required to manage future traffic conditions.

Development Concept

The subject site is proposed to be developed into a 142,917.67 m^2 (1,538,353 sq. ft.) industrial building.

Vehicle access is proposed via two driveway connections to Wellington Road 34 along with a potential third access also proposed to connect with Wellington Road 34.

The full build-out is assumed to be completed by 2027.

Conclusions

Based on the investigations carried out, it is concluded that:

- **Existing Traffic Conditions:** The roundabout at Wellington Road 34 and Concession Road 7 is currently operating within acceptable levels of service with no critical movements during the AM and PM peak hours.
- **Development Trip Generation:** The development is forecast to generate approximately 185 and 231 trips during the AM and PM peak hours, respectively for all vehicles. The site trip generation is also inclusive of 31 heavy vehicle trips during both the AM and PM peak hours.
- **Sight Distance Assessment:** Sightlines have been reviewed along Wellington Road 34 to determine appropriate locations for the accesses. Overall, the proposed locations of all site access connections would satisfy the applicable sight distance requirements. Adjustments are required for the Eastern Access

to ensure appropriate operation and accommodate a combination truck/tractor trailer.

- **Site Circulation Review:** All design vehicles can generally navigate through their intended areas of the site without any geometric conflicts. Although, conflicts with the WB-20 tractor trailer are noted at both site access locations and at some on-site trailer parking spaces. The identified conflicts with the WB-20 tractor trailer can be resolved by increasing the right radius on both sides of the driveways, adding exclusive right-turn lanes along Wellington Road 34, and using a shunting/spotter truck for on-site trailer parking.
- **Background Traffic Conditions:** The roundabout of Wellington Road 34 and Concession Road 7 is forecast to continue to operate at acceptable levels of service with no critical movements during the AM and PM peak hours.
- **Total Traffic Conditions:** The study area intersections are forecast to operate at acceptable levels of service with no critical movements during the AM and PM peak hours.
- **Left-Turn Lanes:** Westbound left-turn lanes are not warranted along Wellington Road 34 at both site access locations.
- **Right-Turn Lanes:** Eastbound right-turn lanes along Wellington Road 34 at both site access locations should be reviewed to help prevent situations where a combination truck/tractor trailer uses the oncoming travel lane along Wellington Road 34 when completing a right-turn movement into the site.

Recommendations

Based on the findings of this study, it is recommended that the development be considered for approval with the following conditions:

- Provide an on-site shunting/spotter truck for trailer parking;
- Increase the size of every right-turn radius provided at both site access locations along Wellington Road 34;
- Further review of the Eastern Site Access be conducted at the Site Plan Review Stage to support appropriate sightlines; and
- The left and right-turn lane warrants be revisited at the Site Plan Review stage when the detailed design of the development is determined.



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1 Introduction

1.1 Overview

Shade Springs Inc. retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact Study for a proposed residential development located at 7335 Wellington Road 34 on the southeast corner of the Wellington Road 34 and Concession Road 7/Wellington Road 54 intersection in the Township of Puslinch, Ontario. **Figure 1.1** illustrates the site location.

The study scope was circulated to the Ministry of Transportation Ontario (MTO), County of Wellington, and the Township of Puslinch and includes:

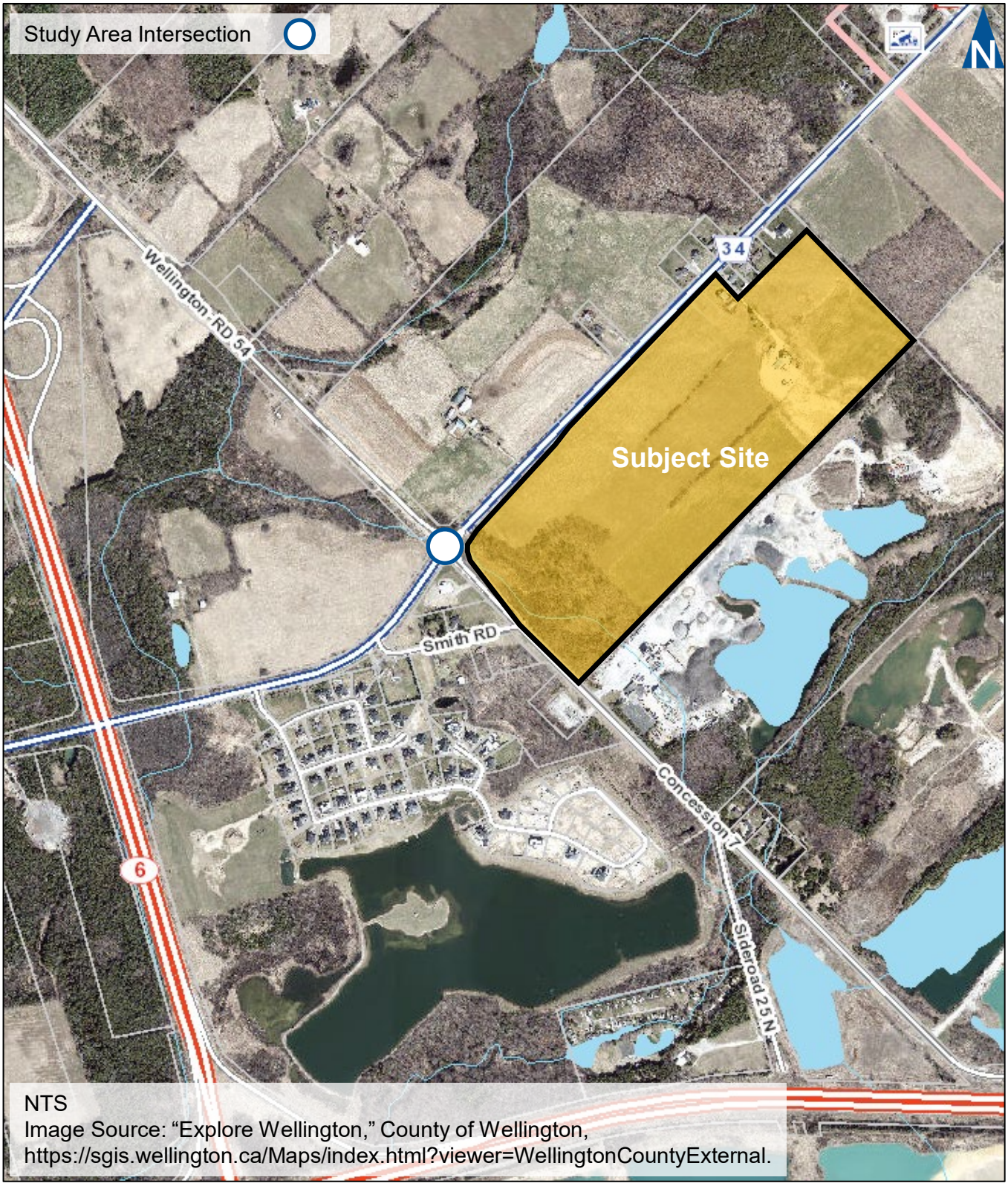
- Assessing current traffic and site conditions within the study area;
- Reviewing on-site heavy vehicle circulation;
- Forecasting future non-development (background) traffic growth;
- Forecasting site-generated traffic;
- Analysing future traffic impacts on the surrounding road network for five years after the full build-out; and
- Recommending any necessary mitigation to manage future traffic conditions.

Appendix A contains the pre-study consultation material and responses.

1.2 Study Area

The intersections assessed in this study include:

- Wellington Road 34 and Concession Road 7/Wellington Road 54 (roundabout); and
- Two driveway connections to Wellington Road 34 (assumed unsignalized).



NTS
Image Source: "Explore Wellington," County of Wellington, https://sgis.wellington.ca/Maps/index.html?viewer=WellingtonCountyExternal.

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Site Location

2 Existing Conditions

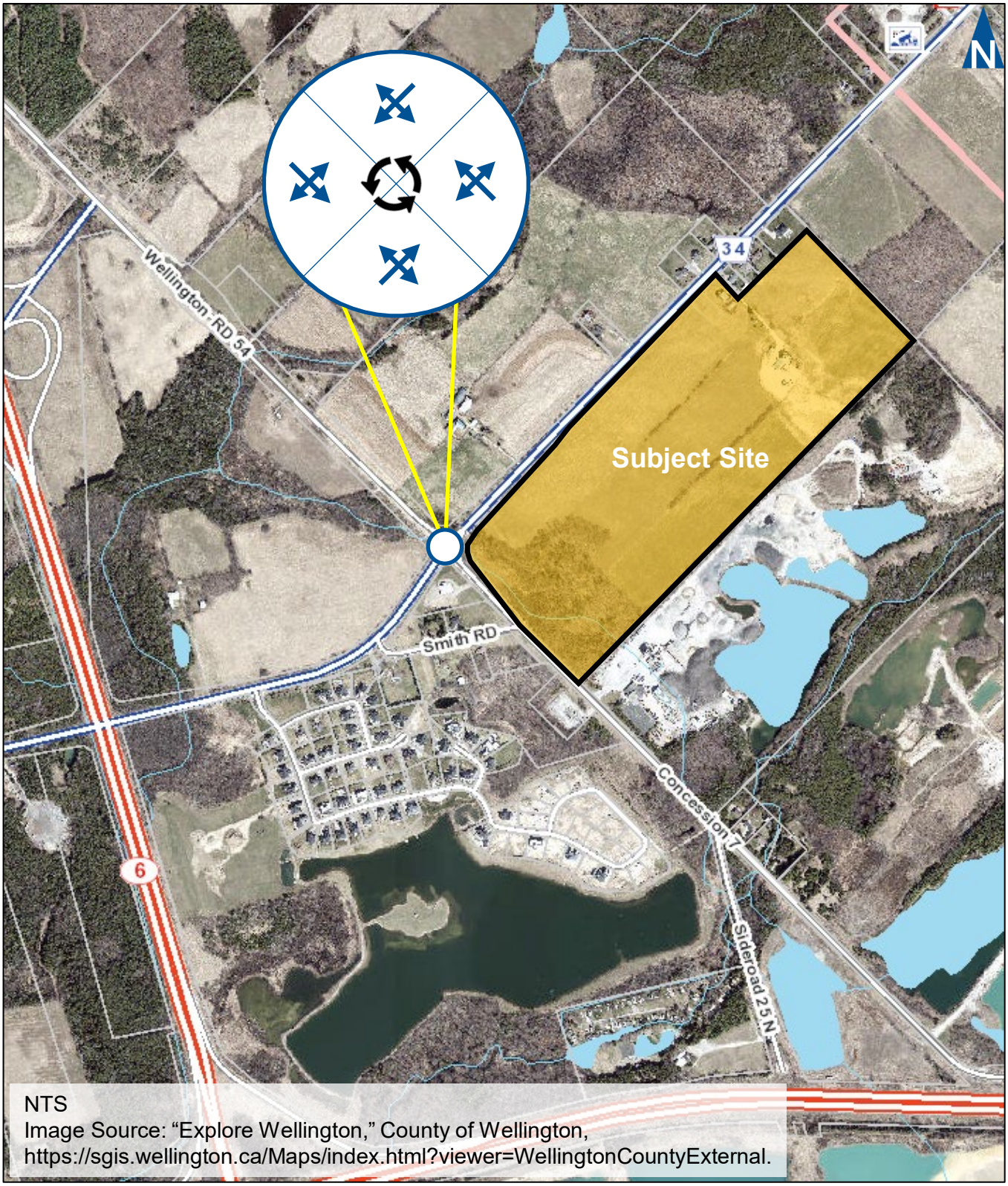
2.1 Road Characteristics

The roadways of interest within the study area include Wellington Road 34, Wellington Road 54, and Concession Road 7. These roadways are generally described as follows[1,2]:

- **Wellington Road 34** is a two-lane county road within the study area and sidewalks are not provided on either side of the roadway. East of 7376 Wellington Road 34, the speed limit is 60 km/h. West of 7376 Wellington Road 34, the speed limit is 80 km/h;
- **Wellington Road 54** is a two-lane, 70 km/h county road within the study area. The roadway is also the segment of Concession Road 7 to the north of Wellington Road 34. There are no sidewalks provided on either side of the roadway; and
- **Concession Road 7** is a two-lane road within the study area. South of Wellington Road 34, the roadway has a speed limit of 60 km/h and is classified as a local road under the jurisdiction of the Township of Puslinch. There are no sidewalks provided on either side of the roadway.

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

[1] County of Wellington, *Official Plan Schedule B7 – Land Use Puslinch,* (Guelph: County of Wellington, 2025).
[2] "Road Maintenance Areas," County of Wellington, https://experience.arcgis.com/experience/1c3c09f3511c4f9cbfa46fae82f77cdb.



NTS
Image Source: "Explore Wellington," County of Wellington, https://sgis.wellington.ca/Maps/index.html?viewer=WellingtonCountyExternal.

Existing Lane Configurations and Traffic Control

2.2 Transit Service

There are no transit stops provided at the intersection of Wellington Road 34 and Concession Road 7/Wellington Road 54. However, GO Transit[3] provides bus service at the intersection of Brock Road South and McLean Road (Aberfoyle GO Park and Ride) which is approximately 3.5 km southeast of the subject site.

GO Transit routes 17 (Waterloo/Hamilton), 25 (Waterloo/Mississauga), 29 (Guelph/Mississauga), and 48 (Hamilton/Pickering) provide service at the closest GO Transit station.

2.3 Traffic Volumes

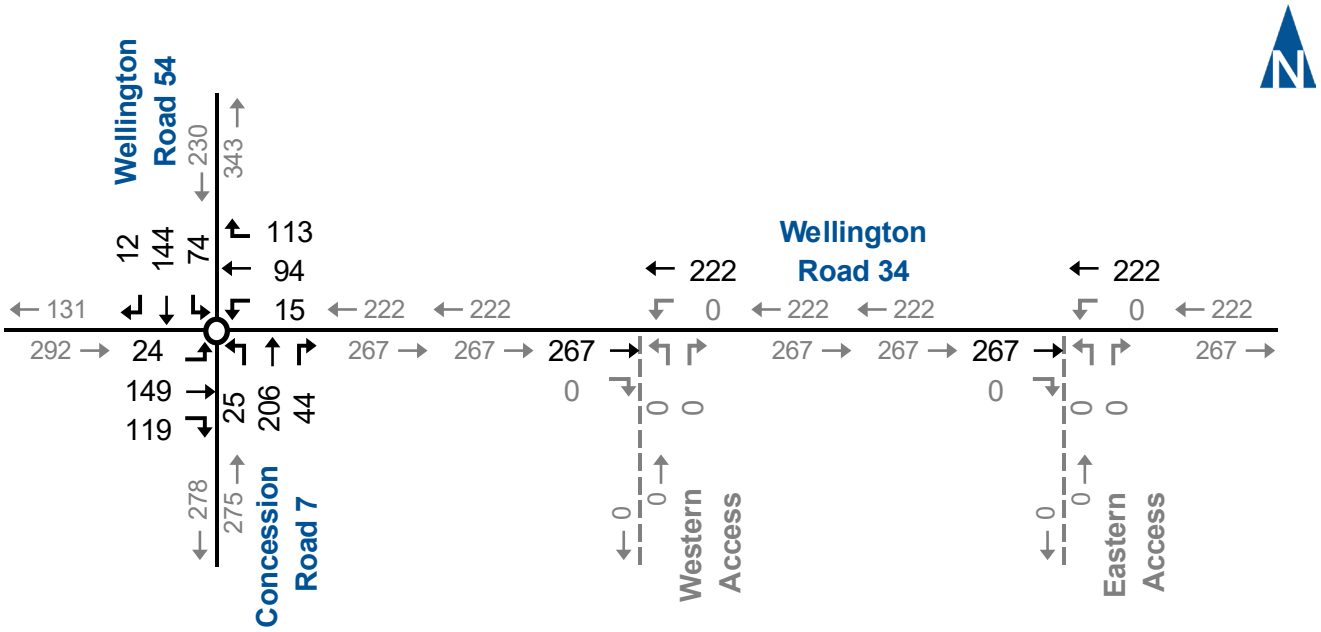
Paradigm undertook turning movement counts at the Wellington Road 34 and Concession Road 7 roundabout in September 2025.

Appendix B contains the observed traffic counts at the Wellington Road 34 and Concession Road 7 roundabout.

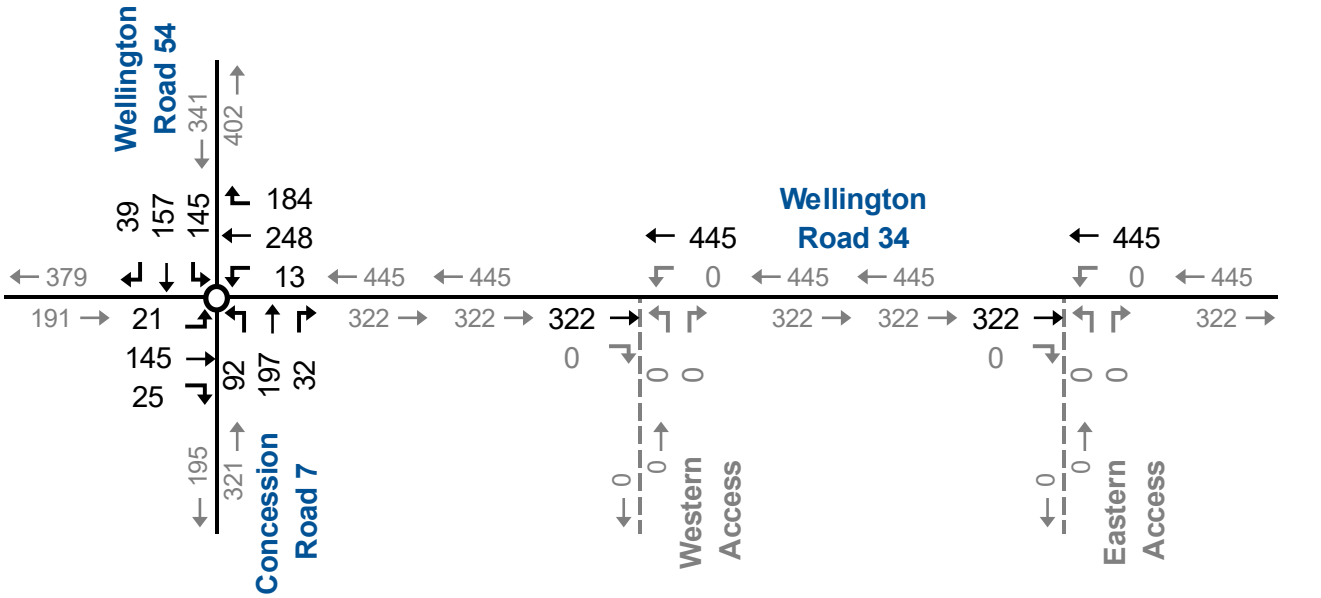
Figure 2.2 illustrates the base year weekday AM and PM peak hour traffic volumes.

[3] "PDF Schedules," GO Transit, https://www.gotransit.com/en/see-schedules/pdf-schedules.

AM Peak Hour



PM Peak Hour



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Base Year Traffic Volumes

2.4 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 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 ratio is greater than 1.0, the movement is classed as LOS F and remedial measures are usually implemented if they are feasible. LOS E is usually used as a guideline for the determination of road improvement needs on through lanes, while LOS F may be acceptable for left-turn movements at peak times, depending on delays.

The operations of the study intersections were evaluated using the existing lane configurations, traffic controls, and the base year traffic peak hour volumes.

The level of service conditions on the road network have been assessed using Synchro 12 and Arcady 8 (for roundabouts).

As noted in Wellington County TIS guidelines[4], movements are considered critical under the following conditions:

- Volume/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 that 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.

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

As noted in MTO TIS guidelines[5], movements are considered critical under the following conditions:

- Movements with v/c ratio greater than 0.85 are deemed to be "critical" in terms of operations. Movements that experience a v/c ratio of 0.85 or greater shall be evaluated for possible operational improvements.

Table 2.1 summarizes the existing intersection operations. The entries in the table indicating the AM and PM peak hour level of service (LOS), volume to capacity ratios (V/C), and 95th percentile queues experienced.

The roundabout of Wellington Road 34 and Concession Road 7 is currently operating at acceptable levels of service during the weekday AM peak hour and weekday PM peak hour with no critical movements noted.

Appendix C contains the detailed Arcady reports.

[5] Ontario Ministry of Transportation, *General Guidelines for the Preparation of Traffic Impact Studies,* (Toronto: King's Printer for Ontario, 2023).

TABLE 2.1: BASE YEAR OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Wellington Road 34 & Concession Road 7	Roundabout	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	**A**
			Delay	<	4	>	**4**	<	4	>	**4**	<	4	>	**4**	<	4	>	**4**	**4**
			V/C	<	0.27	>		<	0.21	>		<	0.26	>		<	0.20	>		
			Q	<	8	>		<	8	>		<	8	>		<	8	>		
PM Peak Hour	Wellington Road 34 & Concession Road 7	Roundabout	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	**A**
			Delay	<	4	>	**4**	<	5	>	**5**	<	5	>	**5**	<	5	>	**5**	**5**
			V/C	<	0.17	>		<	0.41	>		<	0.29	>		<	0.32	>		
			Q	<	8	>		<	8	>		<	8	>		<	8	>		

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

3 Development Concept

3.1 Development Description

The subject site is located at 7335 Wellington Road 34 on the southeast corner of the Wellington Road 34 and Concession Road 7/Wellington Road 54 intersection in the Township of Puslinch, Ontario.

The subject site is proposed to be developed into a 142,917.67 m^2 (1,538,353 sq. ft.) industrial building.

Vehicle access is proposed via two driveway connections to Wellington Road 34 along with a potential third access also proposed to connect with Wellington Road 34.

The full build-out is assumed to be completed by 2027.

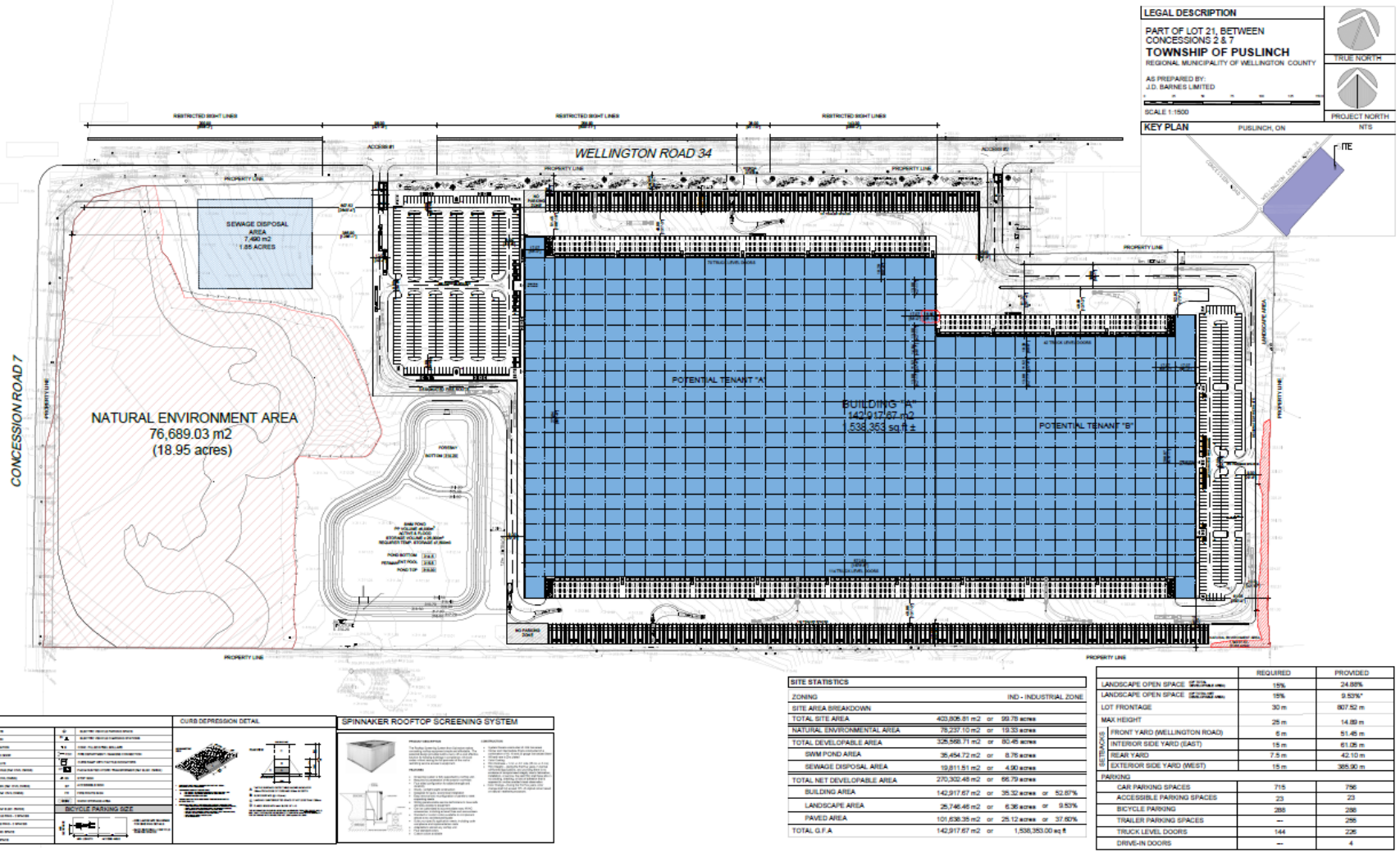
Figure 3.1 shows the proposed concept plan. Within this study, Access #1 and Access #2 as indicated on the site concept plan are referred to as the Western Access and Eastern Access, respectively. The curb return to curb return spacing between the Western Access and Eastern Access is approximately 495 m.

Based on the preliminary site layout, it is assumed that both passenger cars and heavy vehicles can enter/exit the site at both driveway connections. Although, the specific allocation of passenger cars and heavy vehicles at both driveway connections is based on the location of on-site parking with the following noted:

- Allocation of Passenger Cars:
  - 756 on-site passenger car parking spaces are proposed with 36% (270 spaces) and 64% (486 spaces) of the on-site passenger car parking provided within the eastern and western site parking lots, respectively; and
  - As illustrated the site concept plan, the internal roadway connection between the eastern and western parking lots for passenger cars is not overly direct. Therefore, passenger cars allocated to the eastern and western parking lots are assumed to use the Eastern Access and Western Access, respectively to enter/exit the site along Wellington Road 34.
- Allocation of Heavy Vehicles:
  - 255 on-site commercial trailer parking spaces are proposed with 40% (101 spaces) and 60% of the on-site commercial

trailer parking spaces provided along the northern and southern property boundaries, respectively;

- It is assumed that all of the on-site commercial trailer parking spaces along the northern property boundary (101 spaces) and the eastern half of the on-site commercial trailer parking along the southern property boundary (77 spaces) or 70% of all on-site commercial trailer parking (178 spaces) will use the Eastern Access to enter/exit the site along Wellington Road 34; and
- It is assumed that the western half of the on-site commercial trailer parking along the southern property boundary (77 spaces) or 30% of all on-site commercial trailer parking will use the Eastern Access to enter/exit the site along Wellington Road 34.



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Concept Plan

Figure 3.1

3.2 Site Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation manual[6] methods forecast site-generated trips. Land Use Code (LUC) 150 – Warehouse was used to estimate the site trip generation. As the goodness of fit statistics for the fitted curves were poor, the average rates were used to calculate the site-generated trips.

Table 3.1 summarizes the forecast site-generated trips indicating 185 AM peak hour and 231 PM peak hour trips for all vehicles. It is also noted that 31 heavy vehicle trips are forecast in both the AM and PM peak hours (included within the site trip generation for all vehicles).

TABLE 3.1: FORECAST SITE-GENERATED TRIPS

LUC	Gross Floor Area (GFA)	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
150 – All Vehicles	1,538.35 ft^2/1000	142	43	**185**	65	166	**231**
150 - Trucks		16	15	**31**	16	15	**31**

LUC 150 All Vehicles: AM – Average Rate = 0.12 | PM – Average Rate = 0.15
LUC 150 Trucks: AM – Average Rate = 0.02 | PM – Average Rate = 0.02

The trip distribution used for this study was based on the existing distribution. Although, adjustments were made to reduce site trips travelling along Concession Road 7 to the south of Wellington Road 34 to 10% and alternatively increase trips along county road segments. The trip distribution for this study is appropriate for this study because the travel directions provide connections to provincial highways and/or urbanized locations.

Table 3.2 summarizes the estimated trip distribution.

Figure 3.2 illustrates the site-generated traffic for the AM and PM peak hours.

As noted in the development description of this study, a third access to Wellington Road 34 could be considered for this site. However, this analysis assumes that only two site driveways will be permitted along Wellington Road 34.

The vehicle parking (not truck) is proposed at a rate of 1/250 square metres, or approximately 600 spaces. The bylaw requirement is 1/200 square metres or approximately 750 spaces. ITE Parking Generation

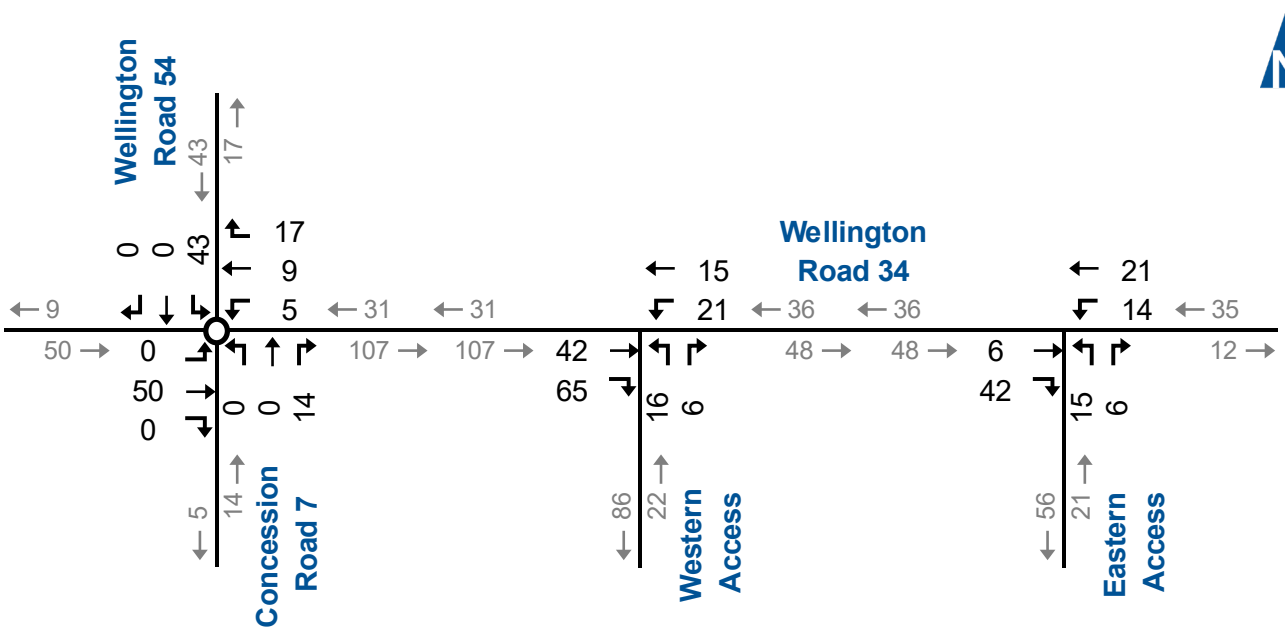
[6] Institute of Transportation Engineers, *Trip Generation Manual,* 12th ed., (Washington DC: ITE, 2025).

for LUC 150 (Warehousing) suggests a range of parking from 569 spaces (weighted average) to 609 spaces (equation rate). This data aligns with a parking supply less than the bylaw requirement. The parking supply will be refined at the Site Plan Application stage when the details of the operations are known.

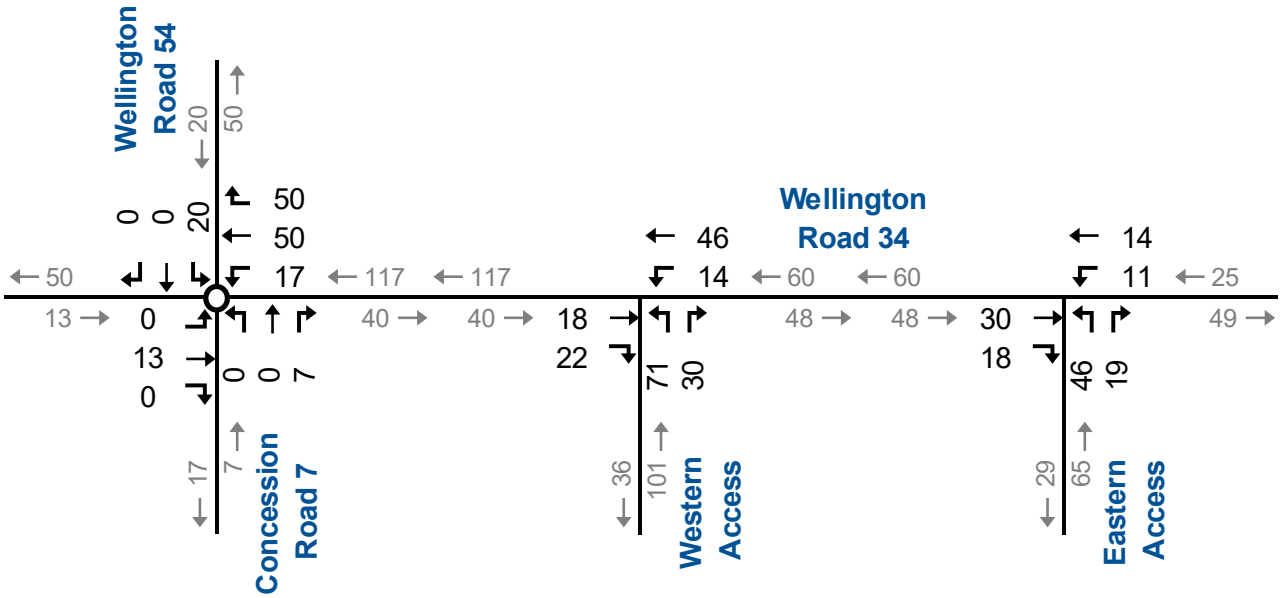
TABLE 3.2: TRIP DISTRIBUTION

Origin/Destination	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
East via Wellington Road 34	25%	30%	40%	30%
West via Wellington Road 34	35%	20%	20%	30%
North via Wellington Road 34	30%	40%	30%	30%
South via Concession Road 7	10%	10%	10%	10%
Total	**100%**	**100%**	**100%**	**100%**

AM Peak Hour



PM Peak Hour



Site-Generated Traffic Volumes

3.3 Sight Distance Assessment

The sight distances for Wellington Road 34 along the site's frontage were reviewed in accordance with the Transportation Association of Canada (TAC) *Geometric Design Guide for Canadian Roads*[7] and the Entrance Policy[8] for Wellington County.

Paradigm conducted a site visit in September 2025 to determine the profile of Wellington Road 34 along the site's frontage. It is noted that Wellington Road 34 has a two-lane cross-section with some vertical curvature and a peak elevation located between the eastern and western property boundaries for the site.

Table 3.3 summarizes the defined parameters for the assessment of sight distance.

TABLE 3.3: SIGHT DISTANCE PARAMETERS

Parameter	Value – Industry/TAC Guide	Value – Wellington County
Vehicle Tail or Brake Light Height	0.60 m	Not Defined
Driver Eye Height (Passenger Car)	1.08 m	1.05 m
Driver Eye Height (Single Unit Truck)	1.80 m	Not Defined
Driver Eye Height (Combination Truck)	2.30 m	Not Defined
Top of Passenger Car	1.30 m	1.30 m

Table 3.4 summarizes the recommended minimum sight distances along Wellington Road 34 at a design speed of 100 km/h and a posted speed of 80 km/h for TAC and Wellington County requirements, respectively.

[7] TAC, "Intersections," Chap. 9 in *Geometric Design Guide for Canadian Roads,* (Ottawa: TAC, 2017).
[8] County of Wellington Engineering Services – Roads Division, *Entrance Policy,* (Guelph: County of Wellington, 2024).

TABLE 3.4: RECOMMENDED SIGHT DISTANCES

Sight Distance Measurement	Recommended Sight Distance	Design or Posted Speed
TAC Minimum Stopping Sight Distance[9]	185 m	100 km/h (Design)
TAC Intersection Sight Distance[10] (Left Turn from Stop – Passenger Car)	210 m	100 km/h (Design)
TAC Intersection Sight Distance[11] (Right Turn from Stop – Passenger Car)	185 m	100 km/h (Design)
TAC Intersection Sight Distance (Left Turn from Stop – Single Unit Truck)	265 m	100 km/h (Design)
TAC Intersection Sight Distance (Right Turn from Stop – Single Unit Truck)	240 m	100 km/h (Design)
TAC Intersection Sight Distance (Left Turn from Stop – Combination Truck)	320 m	100 km/h (Design)
TAC Intersection Sight Distance (Right Turn from Stop – Combination Truck)	295 m	100 km/h (Design)
Minimum Sight Distance (County Entrance Policy)	200 m	80 km/h (Posted)

Appendix D contains the range of acceptable locations to provide site access connections to Wellington Road 34.

Based on the recommended minimum sight distances and the profile of Wellington Road 34, the Western Access meets all minimum requirements. The Eastern Access provides deficient sightlines for a combination truck/tractor trailer and needs further review to determine what accommodations are required to support this location. More specifically, the intersection sight distance right-turn from stop case for a combination truck is limited to just 269 m which is short of the 295 m TAC requirement by 26 m.

It is noted that the proposed location of the potential third site access positioned between the Eastern Access and Western Access would have no site distance restrictions.

[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.*

3.4 Site Circulation Review

The site circulation has been assessed using the following design vehicles:

- WB-20 Tractor Trailer; and
- Pumper Fire Truck.

It is noted that all design vehicles can generally navigate through their intended areas of the site without any geometric conflicts. Although, the following conflicts with the WB-20 tractor trailer are noted

- The WB-20 tractor trailer requires the full width of both site access locations when making a right-turn to exit the property onto Wellington Road 34. The WB-20 tractor trailer also requires the full width of Wellington Road 34 when making a right-turn to enter the property through both site access locations. The conflicts at both site access locations to Wellington Road 34 can be resolved by increasing the right-turn radius on both sides of each access along with adding exclusive right-turn lanes along Wellington Road 34; and
- A WB-20 tractor trailer cannot reverse into the trailer parking space closest to the northwest corner of the site. Additionally, a WB-20 tractor trailer cannot enter or exit the five trailer parking spaces closest to the southeast corner of the site. The conflicts with the trailer parking spaces can be resolved by making use of an on-site shunting/spotter truck to park the trailer component of the WB-20. With the use of the shunting/spotter truck, no conflicts with the trailer parking spaces remain.

Appendix E contains the vehicle maneuvering diagrams. It is noted that all increased right-turn radius values at both site access locations are indicated within the vehicle maneuvering diagrams.

4 Future Conditions

The assessment of the future traffic conditions contained in this section includes the future traffic forecasts as an intersection operational analysis. A five-year horizon (2032) for the anticipated full build-out (2027) has been selected to determine the impact of the subject site.

4.1 Forecast Traffic

Future background traffic volumes reflect an annual growth rate of 2.0% applied to the base year volumes as noted and accepted by the Township's transportation reviewer during pre-consultation.

Additionally, the future background traffic volumes in this study also includes traffic generated from the following developments summarized in **Table 4.1**.

TABLE 4.1: BACKGROUND DEVELOPMENTS

Address/Location	Description	Source
North Side of McLean Road West, west of 7434 McLean Road West	3,584 m^2 (38,578 sq. ft.) truck distribution terminal	[12]
7434 McLean Road West	2,322 m^2 (25,000 sq. ft.) truck terminal	[13]
7545 McLean Road East	77,900 m^2 (838,515 sq. ft.) industrial development	[14]
197 Brock Road South	362 m^2 (3,897 sq. ft) fast-food restaurant with drive-through and a 168 m^2 (1,808 sq. ft.) convenience store with eight fuel pumps	[15]
227 Brock Road South	10,046 m^2 (108,137 sq. ft.) self-storage facility	[16]
West side of Concession Road 7, south of Sideroad 25 North	8,689 m^2 (93,531 sq. ft.) of industrial uses and 1,443 m^2 (15,530 sq. ft.) of office uses	[17]

[12] Paradigm Transportation Solutions Limited, *Truck Distribution Terminal, McLean Road West, Township of Puslinch, ON Transportation Impact Study Peer Review Comment Response,* (Cambridge: PTSL, 2024).
[13] Paradigm Transportation Solutions Limited, *Wheelking, Brock Road & McLean Road, Puslinch, ON Transportation Impact Study – Comment Response,* (Cambridge: PTSL, 2023).
[14] GHD, *7545 McLean Road East Traffic Impact Study,* (GHD, 2023).
[15] Paradigm Transportation Solutions Limited, *197 Brock Road South Commercial Development, Puslinch, ON Transportation Impact Study,* (Cambridge: PTSL, 2021).
[16] Paradigm Transportation Solutions Limited, *Storage Facility, 227 Brock Road South, Puslinch, ON Transportation Impact Study,* (Cambridge: PTSL, 2021).
[17] Proposed Industrial Development, *West Side of Concession Road 7 South of Sideroad 25, Township of Puslinch, Response to Review Agency Comments,* (Cambridge: PTSL, 2025).

Appendix F contains the background development traffic volumes.

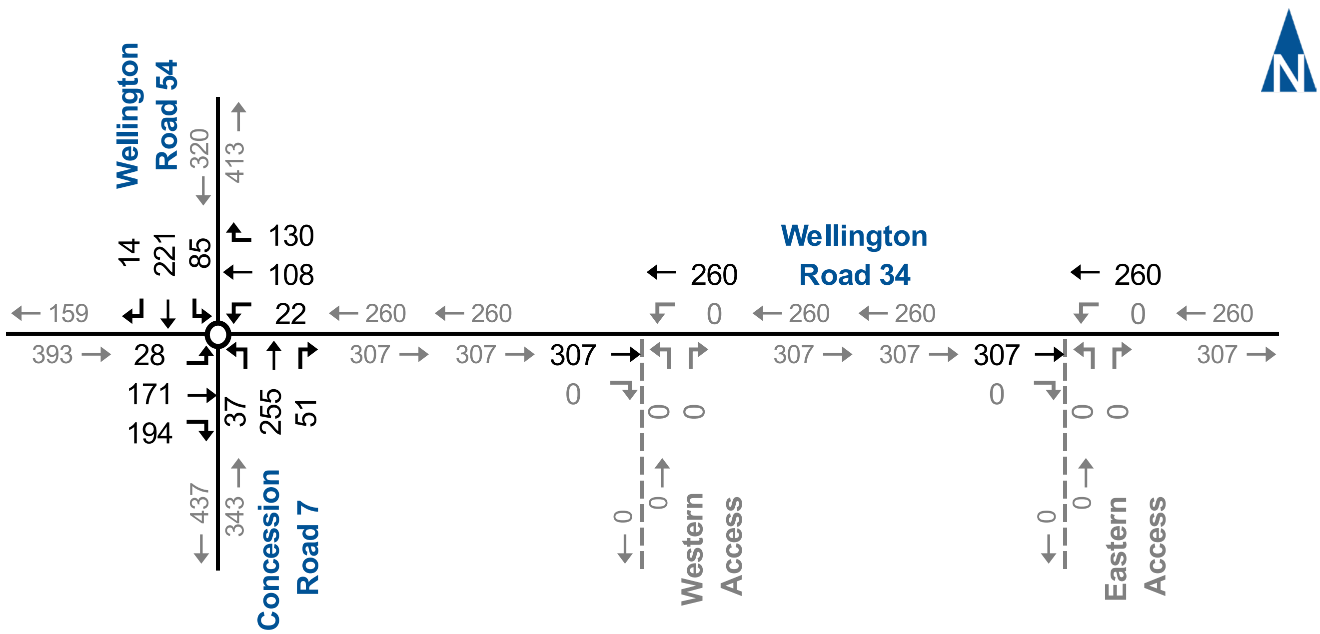
It is also noted that the proposed developments of 128 Brock Road South[18] and 7504 McLean Road[19] are near the background developments listed above although, the traffic studies for 128 Brock Road South and 7504 McLean Road did not consider the roundabout of Wellington Road 34 at Concession Road 7. However, when the 128 Brock Road South and 7504 McLean Road developments were considered as background developments in the Concession Road 7 and Sideroad 25 North traffic study, no site traffic from the 128 Brock Road South and 7504 McLean Road developments was forecast to travel through the roundabout of Wellington Road 34 at Concession Road 7.

Figure 4.1 illustrates the forecast background traffic volumes for the weekday AM and weekday PM peak hours.

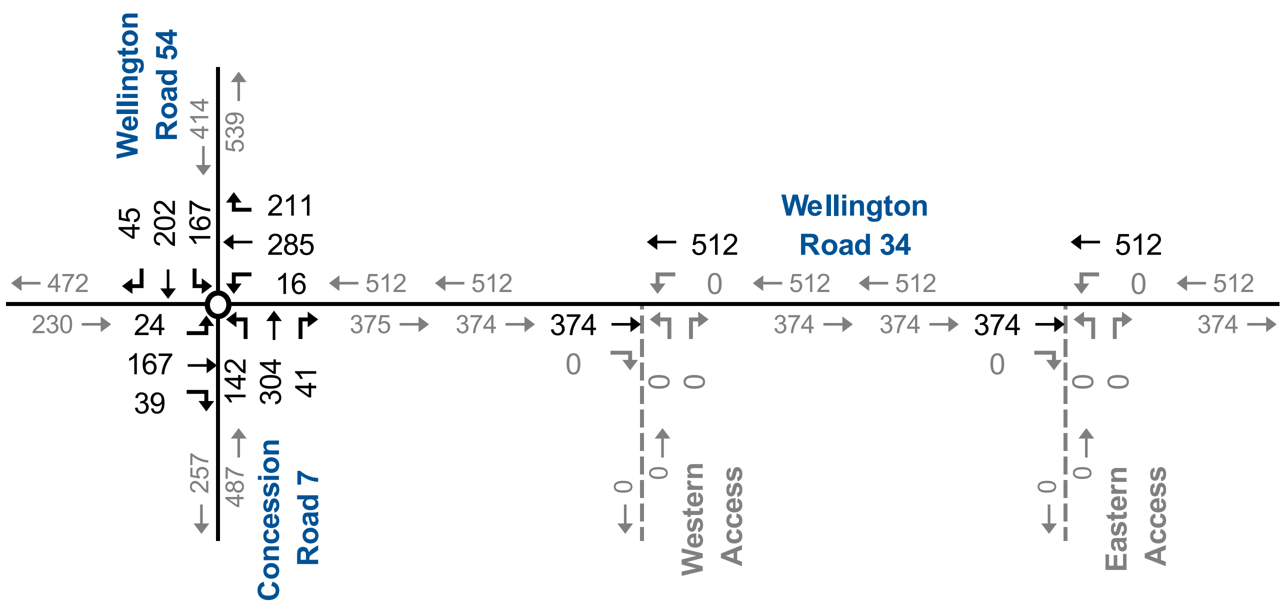
Figure 4.2 illustrates the forecast total (background + site traffic) traffic volumes for the weekday AM and weekday PM peak hours.

[18] Paradigm Transportation Solutions Limited, *128 Brock Road South, Puslinch ON Transportation Impact Study,* (Cambridge: PTSL, 2024).
[19] Paradigm Transportation Solutions Limited, *7504 McLean Road, Puslinch, ON Transportation Impact Study,* (Cambridge: PTSL, 2024).

AM Peak Hour



PM Peak Hour

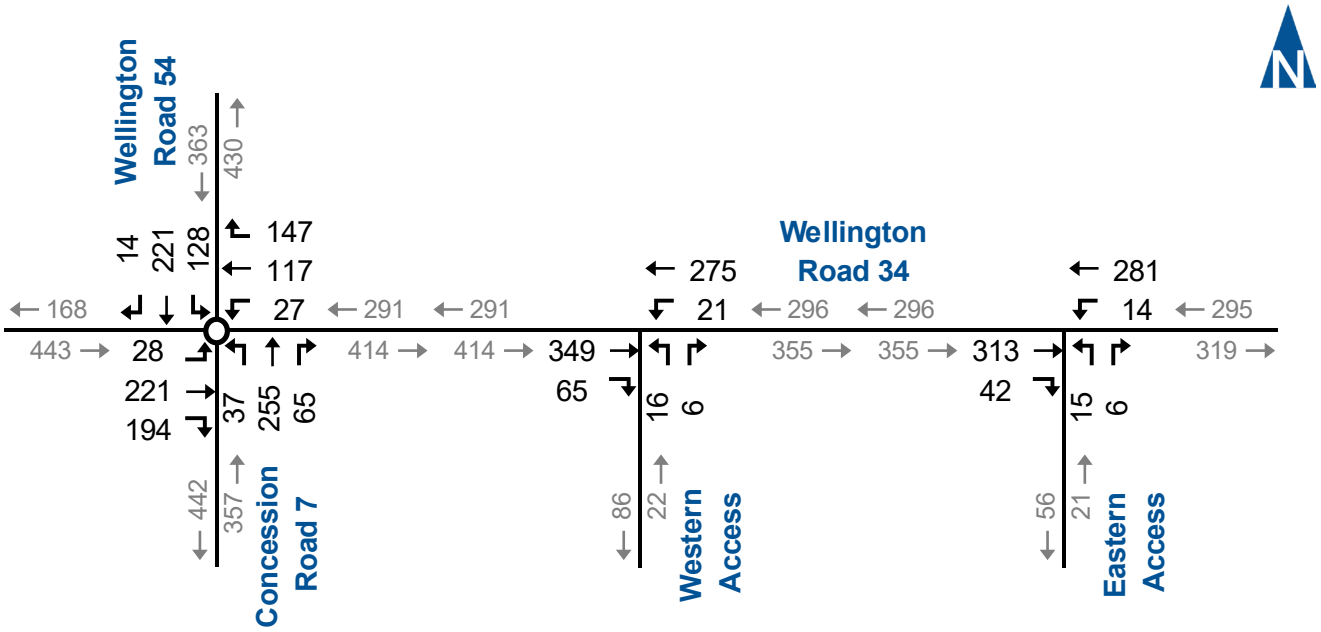


paradigm TRANSPORTATION SOLUTIONS LIMITED

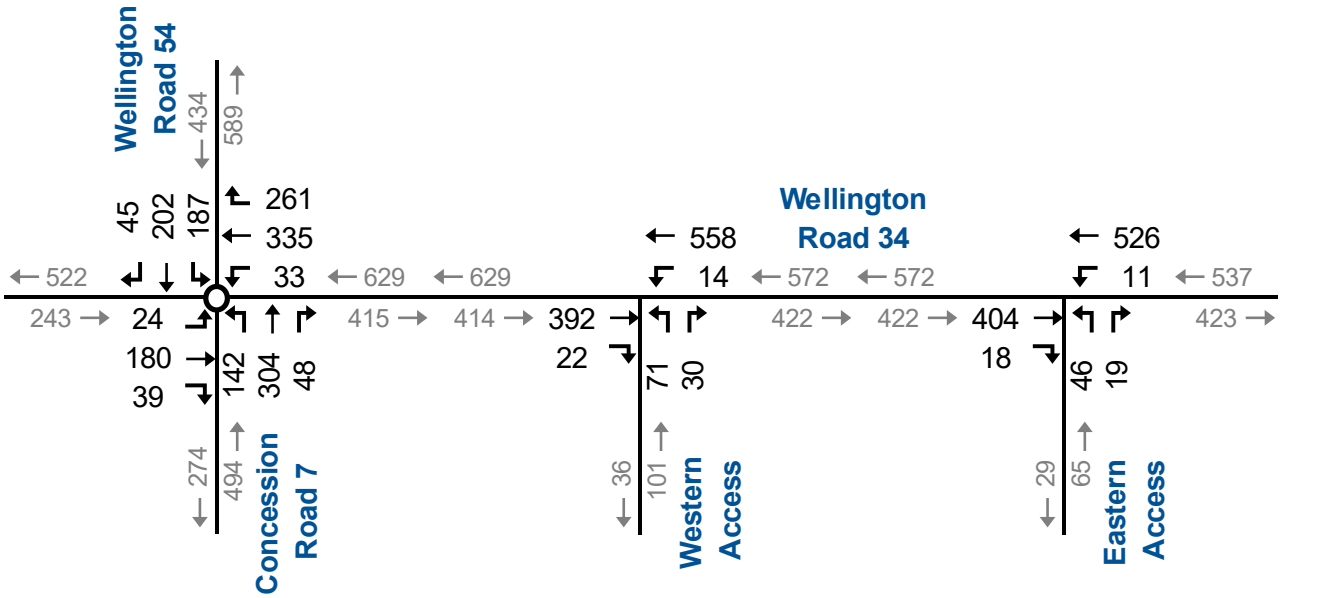
Background Traffic Volumes

Figure 4.1

AM Peak Hour



PM Peak Hour



Total Traffic Volumes

4.2 Background Traffic Operations

Table 4.2 summarizes the five-year background traffic level of service conditions.

The roundabout of Wellington Road 34 and Concession Road 7 is currently operating at acceptable levels of service during the weekday AM peak hour and weekday PM peak hour with no critical movements noted.

Appendix G contains the detailed Arcady reports.



TABLE 4.2: BACKGROUND OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Wellington Road 34 & Concession Road 7	Roundabout	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	**A**
			Delay	<	5	>	**5**	<	4	>	**4**	<	5	>	**5**	<	4	>	**4**	**5**
			V/C	<	0.39	>		<	0.25	>		<	0.33	>		<	0.29	>		
			Q	<	8	>		<	8	>		<	8	>		<	8	>		
PM Peak Hour	Wellington Road 34 & Concession Road 7	Roundabout	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	**A**
			Delay	<	4	>	**4**	<	7	>	**7**	<	6	>	**6**	<	6	>	**6**	**6**
			V/C	<	0.22	>		<	0.51	>		<	0.46	>		<	0.41	>		
			Q	<	8	>		<	8	>		<	8	>		<	8	>		

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

4.3 Total Traffic Operations

Table 4.3 summarizes the five-year total traffic level of service conditions.

To account for heavy vehicle traffic generated by the site, the heavy vehicle percentages were adjusted.

As illustrated on the proposed concept plan for the site, separate northbound left-turn lanes are shown on both site access connections to Welington Road 34. Although to keep the total traffic analysis conservative, both site access (northbound) approaches to Wellington Road 34 are considered to be shared between left and right-turn movements.

The study intersections are forecast to operate at acceptable levels of service during the weekday AM peak hour and the weekday PM peak hour with no critical movements noted.

With the addition of the site generated traffic volumes, the existing approach delays at the roundabout of Wellington Road 34 and Concession Road 7 increase by two seconds or less during the AM and PM peak hours.

Appendix H contains the detailed Synchro and Arcady reports.

TABLE 4.3: TOTAL OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Wellington Road 34 & Concession Road 7	Roundabout	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	**A**
			Delay	<	6	>	**6**	<	5	>	**5**	<	6	>	**6**	<	5	>	**5**	**5**
			V/C	<	0.45	>		<	0.28	>		<	0.36	>		<	0.33	>		
			Q	<	8	>		<	8	>		<	8	>		<	8	>		
	Western Access & Wellington Road 34	TWSC	LOS		A	A	**A**	A	A		**A**	B		>	**B**					
			Delay		0	0	**0**	8	0		**1**	15		>	**15**					
			V/C		0.00	0.00		0.02	0.00			0.06		>						
			Q		0	0		1	0			2		>						
	Eastern Access & Wellington Road 34	TWSC	LOS		A	A	**A**	A	A		**A**	C		>	**C**					
			Delay		0	0	**0**	8	0		**0**	15		>	**15**					
			V/C		0.00	0.00		0.01	0.00			0.06		>						
			Q		0	0		0	0			2		>						
PM Peak Hour	Wellington Road 34 & Concession Road 7	Roundabout	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	**A**
			Delay	<	4	>	**4**	<	9	>	**9**	<	6	>	**6**	<	7	>	**7**	**7**
			V/C	<	0.24	>		<	0.63	>		<	0.47	>		<	0.44	>		
			Q	<	8	>		<	16	>		<	8	>		<	8	>		
	Western Access & Wellington Road 34	TWSC	LOS		A	A	**A**	A	A		**A**	C		>	**C**					
			Delay		0	0	**0**	8	0		**0**	25		>	**25**					
			V/C		0.00	0.00		0.01	0.00			0.38		>						
			Q		0	0		0	0			13		>						
	Eastern Access & Wellington Road 34	TWSC	LOS		A	A	**A**	A	A		**A**	C		>	**C**					
			Delay		0	0	**0**	9	0		**0**	22		>	**22**					
			V/C		0.00	0.00		0.01	0.00			0.25		>						
			Q		0	0		0	0			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 Remedial Measures

5.1 Left-Turn Lanes

Both site access connections to Wellington Road 34 were assessed to determine if the projected traffic volumes warrant installation of a left-turn lane. The warrants for left-turn lanes follow the requirements in the Ministry of Transportation's (MTO) *Design Supplement to the TAC Geometric Design Guide for Canadian Roads.*[20] A design speed of 100 km/h (20 km/h over the assumed speed limit) was used for Wellington Road 34.

The percentages of left-turning vehicles in the approaching volume were rounded to the nearest 5%, as nomographs are only provided for 5% increments. This apparent requirement is due to the nature of the warrant procedure that assumes a minimum of 5% of left turning vehicles in the advancing volume. Therefore, left-turn lanes are automatically not warranted for any left turning volume less than 5%.

Table 5.1 summarizes the left-turn lane warrant for the two site driveway connections to Wellington Road 34. The warrant analysis suggests that westbound left-turn lanes are not warranted at both site access locations under total traffic conditions.

It is noted that the percentage of vehicles making a westbound left-turn movement along Wellington Road 34 at both site access locations is around 2% during the PM peak hour. Therefore, the percentage of westbound left-turns would technically be too low for the consideration of an exclusive left-turn lane. Since Wellington Road 34 is a high speed roadway and given the quantity of traffic opposing the westbound left-turn movements at both site access locations (> 400 vehicles during the PM peak hour) along with the number of trucks entering and exiting the site during the AM and PM peak hours (31 during both peak periods), the installation of westbound left-turn lanes at both site access locations should be reviewed.

It is noted that there are no capacity issues noted under total traffic conditions when the westbound approach along Wellington Road 34 at both site access locations when the movement operates as shared. However, a tractor trailer making a left-turn into the site will likely be slower at completing the turn than a typical passenger car and could cause other drivers travelling westbound along Wellington Road 34 to consider using the gravel shoulder to pass the tractor trailer.

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

With the use of the 5% nomograph at a design speed of 100 km/h, westbound left-turn lanes with 15 m of storage would be warranted along Wellington Road 34 at both site access locations under total traffic conditions.

It also noted that a single WB-20 tractor trailer cannot fit within a designated storage length of 15 m. Therefore, the storage lengths for the westbound left-turn lanes along Wellington Road 34 at both site access locations should be increased to 30 m. In addition to the proposed storage lane length, the westbound left-turn lanes along Wellington Road 34, should also include a 15 m offset, a parallel lane length, and taper lane length. The minimum lengths of the parallel lane length and taper lane length are noted to be 70 m and 160 m[21], respectively to account for deceleration along Wellington Road 34 which brings the length of both westbound left-turn lanes to 275 m.

Given that the development application for the site is still in the initial stages, the overall size and layout (access arrangement) for the proposed development is still subject to change. Therefore, the need for exclusive westbound left-turn lanes along Wellington Road 34 at the site access location(s) should be revaluated at Site Plan Review stage.

TABLE 5.1: LEFT-TURN LANE WARRANT SUMMARY

Roadway	Wellington Road 34			
Intersection	Eastern Access		Western Access	
Approach Direction	Westbound		Westbound	
Design Speed	100 km/h		100 km/h	
Horizon	Total 2032		Total 2032	
Peak Hour	AM	PM	AM	PM
Advancing Volume	295	537	296	572
Opposing Volume	355	422	414	414
Left Turning Traffic	14	11	21	14
% of Left Turning Traffic	5%	2%	7%	2%
Figure Used*	9A-23	9A-23	9A-23	9A-23
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: King's Printer for Ontario, 2023).

Appendix I contains the left-turn lane warrant nomographs.

5.2 Right-Turn Lanes

Although right-turn movements are generally made more efficiently than left-turn movements, exclusive right-turn lanes are often provided for many of the same reasons that left-turn lanes are provided. Consistent with the discussion for left-turn lanes, both site access connections to Wellington Road 34 have been assessed to determine

[21] Ontario Ministry of Transportation, "Intersections," Chap. 9 in *MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads,* (Toronto: King's Printer for Ontario, 2023), 26-28.

if the projected traffic volumes warrant installation of eastbound right-turn lanes along Wellington Road 34.

The MTO Design Supplement to the *TAC Geometric Design Guide for Canadians Roads* suggests "the use of a right-turn auxiliary lane on urban and rural roads, when the volume of decelerating or accelerating vehicles compared to the through traffic volume causes undue hazard."[22] Neither the Design Supplement or the TAC Guide specify a vehicle volume threshold that constitutes or creates a hazard.

As noted under total traffic conditions, there are no capacity issues when the eastbound approach along Wellington Road 34 at both site access locations when the movement operates as shared. However, similar to the case of a tractor trailer making a left-turn, it is generally expected that a tractor trailer will be slower at completing a right-turn movement than a typical passenger car.

Additionally, as indicated within the site circulation review component of this study, the use of exclusive eastbound right-turn lanes along Wellington Road 34 at both site access locations could help prevent a tractor trailer from crossing into the oncoming lane of traffic along Wellington Road 34 when it makes a right-turn into the site. Therefore, the installation of eastbound right-turn lanes along Wellington Road 34 at both site access locations should be reviewed as it would reduce and possibly eliminate any conflicts between tractor trailers turning right into the site and through moving traffic along Wellington Road 34 that are potential safety concerns.

To effectively accommodate tractor trailers turning right into the site at a design speed of 100 km/h, the eastbound right-turn lanes along Wellington Road 34 at both site access locations should have a minimum parallel lane length and taper lane length of 85 m and 80 m[23], respectively bringing the length of both eastbound right-turn lanes along Wellington Road 34 to 165 m.

As mentioned in the previous section, the proposed development is still subject to change. Therefore, the need for exclusive eastbound right-turn lanes along Wellington Road 34 at the site access location(s) should also be revaluated once the development application for this site is at the Site Plan Review stage.

[22] TAC, "Tapers and Auxiliary Lanes," Chap. 9.14 in *Geometric Design Guide for Canadian Roads,* (Ottawa: TAC, 2017), 99.
[23] Ontario Ministry of Transportation, "Intersections," Chap. 9 in *MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads,* (Toronto: King's Printer for Ontario, 2023), 17-18.

6 Conclusions and Recommendations

6.1 Conclusions

Based on the investigations carried out, it is concluded that:

- **Existing Traffic Conditions:** The roundabout at Wellington Road 34 and Concession Road 7 is currently operating within acceptable levels of service with no critical movements during the AM and PM peak hours.
- **Development Trip Generation:** The development is forecast to generate approximately 185 and 231 trips during the AM and PM peak hours, respectively for all vehicles. The site trip generation is also inclusive of 31 heavy vehicle trips during both the AM and PM peak hours.
- **Sight Distance Assessment:** Sightlines have been reviewed along Wellington Road 34 to determine appropriate locations for the accesses. Overall, the proposed locations of all site access connections would satisfy the applicable sight distance requirements. Adjustments would be required for the Eastern Access to ensure appropriate operation and accommodate a combination truck/tractor trailer.
- **Site Circulation Review:** All design vehicles can generally navigate through their intended areas of the site without any geometric conflicts. Although, conflicts with the WB-20 tractor trailer are noted at both site access locations and at some on-site trailer parking spaces. The identified conflicts with the WB-20 tractor trailer can be resolved by increasing the right radius on both sides of the driveways, adding exclusive right-turn lanes along Wellington Road 34, and using a shunting/spotter truck for on-site trailer parking.
- **Background Traffic Conditions:** The roundabout of Wellington Road 34 and Concession Road 7 is forecast to continue to operate at acceptable levels of service with no critical movements during the AM and PM peak hours.
- **Total Traffic Conditions:** The study area intersections are forecast to operate at acceptable levels of service with no critical movements during the AM and PM peak hours.
- **Left-Turn Lanes:** Westbound left-turn lanes are not warranted along Wellington Road 34 at both site access locations.
- **Right-Turn Lanes:** Eastbound right-turn lanes along Wellington Road 34 at both site access locations should be reviewed to help prevent situations where a combination truck/tractor trailer

uses the oncoming travel lane along Wellington Road 34 when completing a right-turn movement into the site.

6.2 Recommendations

Based on the findings of this study, it is recommended that the development be considered for approval with the following conditions:

- Provide an on-site shunting/spotter truck for trailer parking;
- Increase the size of every right-turn radius provided at both site access locations along Wellington Road 34;
- Further review of the Eastern Site Access be conducted at the Site Plan Review Stage to support appropriate sightlines; and
- The left and right-turn lane warrants be revisited at the Site Plan Review stage when the detailed design of the development is determined.

Appendix A

Pre-Study

From: Nembhard, O'Neil (MTO) <O'neil.Nembhard@ontario.ca>
Sent: December 3, 2025 10:33 AM
To: Erica Bayley; Andrew Orr
Subject: RE: (240623) Concession 7 & WR 34, Puslinch TIS

Hi Erica,

Upon further review with MTO Corridor West Head, it has been determined that MTO will not be pursuing a TIS for this development as the only a portion of the property is located within MTO's Permit Control Area, as such MTO has no requirement for the TOR.

Thank you,

O'Neil Nembhard
Corridor Management Planner | Operation West | Operations Division
Ministry of Transportation Ontario | Ontario Public Service
548-388-2571 | o'neil.nembhard @ontario.ca

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Please note the Ministry no longer accepts Land Development review requests though its email system. All Land Development Review requests to the Ministry must be submitted to the Ministry of Transportation through the Highway Corridor Management Online portal at: https://www.hcms.mto.gov.on.ca/landdev/en/land-development

The Land Development Review module is designed to better serve stakeholders through streamlining all land development planning approvals by the Ministry.

From: Erica Bayley <ebayley@ptsl.com>
Sent: Wednesday, December 3, 2025 9:11 AM
To: Andrew Orr <aorr@ptsl.com>; Nembhard, O'Neil (MTO) <O'neil.Nembhard@ontario.ca>
Subject: RE: (240623) Concession 7 & WR 34, Puslinch TIS

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hi O'Neil – following up on the 2 requests highlighted below.

Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)
Vacation Notice: Dec 22, 2025 through Jan 2, 2026
Offices Closed: Dec 25, 2025 through Jan 2, 2026

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
m: 519-635-5349
e: ebayley@ptsl.com

From: Andrew Orr <aorr@ptsl.com>
Sent: November 26, 2025 2:35 PM
To: Nembhard, O'Neil (MTO) <O'neil.Nembhard@ontario.ca>
Cc: Erica Bayley <ebayley@ptsl.com>
Subject: RE: (240623) Concession 7 & WR 34, Puslinch TIS

Hi O'Neil,

As an additional follow up to Erica's request below, could you also provide the signal timings for the Highway 6 ramps connecting to Wellington Road 53?

Best Regards,

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

5A-150 Pinebush Road, Cambridge ON, N1R 8J8
p: 519.896.3163 x210
m: 289-808-8997
e: aorr@ptsl.com
w: www.ptsl.com

From: Erica Bayley <ebayley@ptsl.com>
Sent: November 26, 2025 9:36 AM
To: Nembhard, O'Neil (MTO) <O'neil.Nembhard@ontario.ca>
Cc: Andrew Orr <aorr@ptsl.com>
Subject: RE: (240623) Concession 7 & WR 34, Puslinch TIS

Thx O'Neil.

Can you confirm we can use this data with no adjustments?

There was construction in the area this year so just want to make sure our work won't be sent back for incorrect data.

Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)
Vacation Notice: Dec 22, 2025 through Jan 2, 2026
Offices Closed: Dec 25, 2025 through Jan 2, 2026

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
m: 519-635-5349
e: ebayley@ptsl.com

From: Nembhard, O'Neil (MTO) <O'neil.Nembhard@ontario.ca>
Sent: November 26, 2025 9:28 AM
To: Erica Bayley <ebayley@ptsl.com>
Cc: Andrew Orr <aorr@ptsl.com>
Subject: RE: (240623) Concession 7 & WR 34, Puslinch TIS

Hi Erica,

This is data that I got from MTO traffic.

Thank you,

O'Neil Nembhard
Corridor Management Planner | Operation West | Operations Division
Ministry of Transportation Ontario | Ontario Public Service
548-388-2571 | o'neil.nembhard @ontario.ca

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The Land Development Review module is designed to better serve stakeholders through streamlining all land development planning approvals by the Ministry.

From: Erica Bayley <ebayley@ptsl.com>
Sent: Wednesday, November 26, 2025 9:11 AM
To: Nembhard, O'Neil (MTO) <O'neil.Nembhard@ontario.ca>
Cc: Andrew Orr <aorr@ptsl.com>
Subject: RE: (240623) Concession 7 & WR 34, Puslinch TIS

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hi O'Neil – thanks for your comments.

Regarding the additional intersections you'd like reviewed – do you have any data from post-construction? September 2025 or later?
Otherwise, we'll have to go out in January 2026 to collect.

We have WR34 and CR7 from September 2025 so we can use that to balance any data we get in January, in absence of MTO data.

Please let me know how you'd like us to proceed.

Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)
Vacation Notice: Dec 22, 2025 through Jan 2, 2026

Offices Closed: Dec 25, 2025 through Jan 2, 2026

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
m: 519-635-5349
e: ebayley@ptsl.com

From: Nembhard, O'Neil (MTO) <O'neil.Nembhard@ontario.ca>
Sent: November 24, 2025 12:29 PM
To: Erica Bayley <ebayley@ptsl.com>
Cc: Andrew Orr <aorr@ptsl.com>
Subject: RE: (240623) Concession 7 & WR 34, Puslinch TIS

Hi Erica,

MTO Traffic comments on their TOR in red below and other comments here:

- MTO require the submission of a full TIS (following MTO TIS guidelines and by a RAQS qualified consultant) to assess the future impact of the proposed development to identify if there are any warranted highway/road improvements. Digital Arcady and Synchro version 12 files are required at the time of submission. Both editable/printable and locked version of the TIS is required. Arcady is the choice to analyze roundabouts.
- The consultant is responsible for thoroughly reading and adhering to the MTO TIS guidelines. If any reasonable requirements are missed, it is the consultant's obligation to provide them. The absence of a specific instruction in the TOR does not negate the necessity of fulfilling the reasonable requirement.
- Any data collected for the TIS must be by a RAQS qualified company/consultant. It is the responsibility of the RAQS qualified consultant to ensure the proper data is used (ex. season or non MTO) and seasonal factors applied as appropriate. Winter counts are not accepted. It is the consultants responsibility to update and use proper data. They have proposed Sept 2025 counts which is acceptable. MTO counts attached as well.
- Any functional designs provided in the TIS, are not accepted or approved until P&D/TIMD review once the TIS is approved.
- A summary of the key findings on the transportation impact of the proposed development on the highway corridor shall be presented, along with a summary of the recommended improvements. Any improvements identified in the TIS as warranted within the first five years of the development's operation shall be constructed prior to opening day. Please note that 'monitoring' is not an acceptable recommendation.
- Use simple growth rate for volume projections.
- Use a 3.1% growth rate for MTO infrastructure.
- A site circulation plan is required to ensure that internal blockage does not occur or cause vehicle backups on the roadway.
- As part of the TIS, sightlines must be reviewed and a field measured distance provided and compared to TAC with mitigation measures if the minimum is not met. This includes stopping sight distance and intersection sight distance. We will not accept estimates of sight distance.
- As part of the TIS, a LT warrant analysis and right turn auxiliary lane analysis must be included to determine if mitigation measures are required at study intersections (if there are current LT/RT lanes – they should analyze the lanes to ensure they are appropriate) using TAC and MTO TAC supplemental. For the LTL, if the value of the left turning volume % falls between two charts, the designer should check storage lengths produced using the two warrant charts that it falls between and then select the more conservative value after considering other project-specific factors (for example, if the LTL volume % is 16%, the designer should be using

both the 15% and 20% warrant charts and then select the most conservative storage length of the two. Similarly, for a 28% left turning volume %, the 25% and 30% warrant charts should be looked at and the conservative storage length should be selected). If the left turning volume % is less than 5%, the 5% warrant chart must be used. In a constrained environment (other than cost) where the installation of conservative left turn storage length creates challenges, the designer should review the pros and cons of all elements and document such. If the intersection is being newly proposed, the designer should compare the safety of other similar (traffic volume and geometry) intersections in the corridor or vicinity with the proposed intersection.

- All intersection capacity analysis on impacted intersections or interchanges within MTO facilities must follow MTO/TAC protocols. When evaluating impacts at intersections please refer to the TAC's Geometric Design Guide for Canadian Roads, MTO Design Supplement for TAC's Geometric Design Guide for Canadian Roads (http://www.mto.gov.on.ca/phmpmbp/Reference%20Materials/HwyDes-MTO_DS_TAC_GDG-April2020-Final.pdf) and the OTM Books.)
- Capacity analysis shall be performed at all proposed site access points and intersections in the study network in accordance with the methodology described in the latest edition of the Highway Capacity Manual (HCM). At signalized intersections, movements with a volume/capacity (v/c) ratio greater than 0.85 are deemed to be "critical" in terms of operations. Movements that experience a v/c ratio of 0.85 or greater shall be evaluated for possible operational improvements. For ramps, a v/c ratio for terminal ramp approaches with a value greater than 0.75 would be deemed critical and shall be evaluated for possible operational improvements.

Study Area Intersections:

- Wellington Road 34 and Concession Road 7 (roundabout); and
- Two driveway connections to Wellington Road 34.
- Hwy 6/Wellington Rd 53 ramps must be included in the analysis.
- Wellington Rd 53 and Concession 7

Analysis Periods:

- Weekday AM peak hour; and
- Weekday PM peak hour.
- Weekend analysis or justification why not

Existing Data:

- Existing 8-hour TMC data to be collected by Paradigm (September 23, 2025).

Horizon Year:

- Opening year of the full build-out (Year – TBD);
- Five years from the date of the full build-out; and
- Ten years from the date of the full build-out.

Analysis:

- Synchro 12, HCM 7 analysis. Synchro is not the proper analysis tool for roundabouts, Arcady is.

Background Traffic:

- Background traffic annual growth rate – 2% 3.1% should be used for MTO infrastructure.
- All developments included in the Sideroad 25 North Concession Road 7 TIS confirm.

Future Road Improvements:

- N/A

Trip Generation:

- ITE Trip Generation Data 12th Edition.

Trip Distribution:

- Existing Distribution. Please refer to MTO TIS guidelines/policy, page 16, *Trip Distribution/Assignment*

Please let me know if you have other question.

O'Neil Nembhard
Corridor Management Planner | Operation West | Operations Division
Ministry of Transportation Ontario | Ontario Public Service
548-388-2571 | o'neil.nembhard @ontario.ca

Ontario

Taking pride in strengthening Ontario, its places and its people

Please note the Ministry no longer accepts Land Development review requests though its email system. All Land Development Review requests to the Ministry must be submitted to the Ministry of Transportation through the Highway Corridor Management Online portal at: https://www.hcms.mto.gov.on.ca/landdev/en/land-development

The Land Development Review module is designed to better serve stakeholders through streamlining all land development planning approvals by the Ministry.

From: Erica Bayley <ebayley@ptsl.com>
Sent: Monday, November 10, 2025 3:16 PM
To: Nembhard, O'Neil (MTO) <O'neil.Nembhard@ontario.ca>
Cc: Andrew Orr <aorr@ptsl.com>
Subject: (240623) Concession 7 & WR 34, Puslinch TIS

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hi O'Neil,

Paradigm Transportation Solutions Limited (Paradigm) has been retained to prepare a TIS for a proposed industrial development located on the southeast corner of the Wellington Road 34 and Concession Road 7 in Puslinch ON. The subject site is proposed to be developed into a 134,920 square metre industrial building. Vehicle access is proposed via two driveway connections to Wellington Road 34. We note that the development is not within Permit Control area but we are quite close, so I just wanted to check in to see if you had any comments.

Note that we collected data this Fall after all intersections were open in this area.

PROPOSED TERMS OF REFERENCE

Study Area Intersections:
- Wellington Road 34 and Concession Road 7 (roundabout); and
- Two driveway connections to Wellington Road 34.

Analysis Periods:
- Weekday AM peak hour; and
- Weekday PM peak hour.

Existing Data:

- Existing 8-hour TMC data to be collected by Paradigm (September 23, 2025).

Horizon Year:

- Opening year of the full build-out (Year – TBD);
- Five years from the date of the full build-out; and
- Ten years from the date of the full build-out.

Analysis:

- Synchro 12, HCM 7 analysis.

Background Traffic:

- Background traffic annual growth rate – 2%
- All developments included in the Sideroad 25 North Concession Road 7 TIS

Future Road Improvements:

- N/A

Trip Generation:

- ITE Trip Generation Data 12th Edition.

Trip Distribution:

- Existing Distribution.

Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
p: 519.896.3163 x202
m: 519-635-5349
e: ebayley@ptsl.com
w: www.ptsl.com

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From: Nembhard, O'Neil (MTO) <O'neil.Nembhard@ontario.ca>
Sent: November 18, 2025 1:46 PM
To: Erica Bayley
Cc: Andrew Orr
Subject: RE: (240623) Concession 7 & WR 34, Puslinch TIS

Hi Erica,

I have forwarded the TOR to the Traffic section for review and comments, I will forward those comment to you once I receive them.

Thank you,

O'Neil Nembhard
Corridor Management Planner | Operation West | Operations Division
Ministry of Transportation Ontario | Ontario Public Service
548-388-2571 | o'neil.nembhard @ontario.ca

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From: Erica Bayley <ebayley@ptsl.com>
Sent: Monday, November 10, 2025 3:16 PM
To: Nembhard, O'Neil (MTO) <O'neil.Nembhard@ontario.ca>
Cc: Andrew Orr <aorr@ptsl.com>
Subject: (240623) Concession 7 & WR 34, Puslinch TIS

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Note that we collected data this Fall after all intersections were open in this area.

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- All developments included in the Sideroad 25 North Concession Road 7 TIS

Future Road Improvements:
- N/A

Trip Generation:
- ITE Trip Generation Data 12th Edition.

Trip Distribution:
- Existing Distribution.

Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
p: 519.896.3163 x202
m: 519-635-5349
e: ebayley@ptsl.com
w: www.ptsl.com

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From: Erica Bayley
Sent: November 12, 2025 9:16 AM
To: Pasquale Costanzo
Cc: Andrew Orr
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Pasquale – checking in to see if you had any comments to add.
Thx,

Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
m: 519-635-5349
e: ebayley@ptsl.com

From: Julia Salvini <julia@salviniconsulting.com>
Sent: November 4, 2025 3:46 PM
To: Erica Bayley <ebayley@ptsl.com>
Cc: Andrew Orr <aorr@ptsl.com>; Monika Farncombe <mfarncombe@puslinch.ca>; Pasquale Costanzo <pasqualec@wellington.ca>; Planning <planning@puslinch.ca>
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Erica,

I'm copying Pasquale on my response – I only just now realized it was not circulated to him. Pasquale, could you please comment on behalf of the County? Thank you.

I've included a graphic from the MTO's website showing the permit control area around this site. Have you had any discussions with MTO or are you able to confirm whether or not your client's property falls within the permit control area? I don't have a copy of the proposal or the property area so I'm unsure whether or not it might. If the property is in the MTO permit control area, you will need to circulate the terms of reference to them for comment.

Generally I'm in agreement with the scope you've outlined below. There will be very little impact to the Township roads in the area because access is proposed to WR34. I also expect the traffic generation to be relatively modest for the proposal. A couple of points of confirmation:

- This may be the first study to be completed since the construction of the new highway interchange has been complete and will not need to incorporate forecasts associated with the new interchange but will instead be based on current traffic volume data. It will be interesting to see how the volumes compare. Thank you for confirming your count date.
- A future horizon year of 5-years beyond development is sufficient for my review. The opening day and 10-year horizon years are not required, subject to what the County prefers.
- A general background growth rate of 2% per year is appropriate and consistent with other studies in the area.
- The 7 background developments identified in the scope (from the SR25N/CR7 Study) are appropriate for background development for this site as well. The SR25N/CR7 site should also be included. There is another application that we have reviewed for the old driving range on CR7 near the interchange – I have

been in touch with the consultant on that file and my understanding is that they are not working on a resubmission at this time. That development does not need to be included. Please include the background traffic volume layers in your appendix.

- The Township does not have any road improvements planned in the study area in the planning horizon of the study.

Please reach out with any questions you may have along the way.
Julia



Julia Salvini, MEng PEng FITE
President
julia@salviniconsulting.com
M: 519-591-0426

From: Erica Bayley <ebayley@ptsl.com>
Sent: October 29, 2025 9:23 AM
To: Julia Salvini <julia@salviniconsulting.com>
Cc: Andrew Orr <aorr@ptsl.com>; Monika Farncombe <mfarncombe@puslinch.ca>
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Julia – we had connected back in September on this one and discussed the TIS scope. Adding it in writing here. Please let me know if you have anything to add.

Paradigm Transportation Solutions Limited (Paradigm) has been retained to conduct this Transportation Impact Study (TIS) and Access and Circulation Review (ACR) for a proposed industrial development located on the southeast corner of the Wellington Road 34 and Concession Road 7 intersection in Puslinch ON. The subject site is proposed to be developed into a 134,920 square metre industrial building. Vehicle access is proposed via two driveway connections to Wellington Road 34.

Note that we have completed a field investigation re: sightlines and are working with the client to ensure the driveways meet the requirements.

PROPOSED TERMS OF REFERENCE

Study Area Intersections:
- Wellington Road 34 and Concession Road 7 (roundabout); and
- Two driveway connections to Wellington Road 34.

Analysis Periods:
- Weekday AM peak hour; and
- Weekday PM peak hour.

Existing Data:
- Existing 8-hour TMC data to be collected by Paradigm (September 23, 2025).

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- Ten years from the date of the full build-out.

Analysis:
- Synchro 12, HCM 7 analysis.

Background Traffic:
- Background traffic annual growth rate – 2% **Please Confirm**
- All developments included in the Sideroad 25 North Concession Road 7 TIS
- Any additional developments to include in background?

Future Road Improvements:
- **Please confirm**

Trip Generation:
- ITE Trip Generation Data 12th Edition.

Trip Distribution:
- Existing Distribution.

Access and Circulation Review:
- Sight distance review along Wellington Road 34; and
- AutoTURN analysis for applicable design vehicles.

Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
m: 519-635-5349
e: ebayley@ptsl.com

From: Julia Salvini <julia@salviniconsulting.com>
Sent: September 10, 2025 12:36 PM
To: Erica Bayley <ebayley@ptsl.com>
Cc: Andrew Orr <aorr@ptsl.com>; Monika Farncombe <mfarncombe@puslinch.ca>
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Erica,

Lynne has retired, as I'm sure you've realized by now. Please copy Monika on your correspondence instead (I've copied Monika so you have her contact info). Monika, is there anyone else you would like copied on this general kind of correspondence at the Township?

Yes, WR34 is open. I'm looking forward to seeing what your data tells us. I did reach out to the consultant who is working on the old driving range site on CR7 and they do not have an update or a timeline on that application. As a result, you can leave them out of the background traffic and stick to the other sites we discussed. If you are missing any of that background traffic info, please let me know.

Also, I'm always happy to review things in draft if your timeline allows or if there is something you want to check in with me on along the way. Usually that makes life easier for us both.

Julia

From: Erica Bayley <ebayley@ptsl.com>
Sent: September 10, 2025 10:39 AM
To: Julia Salvini <julia@salviniconsulting.com>
Cc: Lynne Banks <lbanks@puslinch.ca>; Andrew Orr <aorr@ptsl.com>
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Julia – an update on this project: looks like WR34 & Hwy 6 is open now. We are getting our data collection set up this month.

We've done our sightline review and compiling into a letter (inc. TAC and County guidelines as you suggested) and then working through the TIS.

Let me know if you think of any other details we should cover.

Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
m: 519-635-5349
e: ebayley@ptsl.com

From: Julia Salvini <julia@salviniconsulting.com>
Sent: August 5, 2025 2:42 PM
To: Erica Bayley <ebayley@ptsl.com>
Cc: Lynne Banks <lbanks@puslinch.ca>
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

I could do a short meeting Thursday after 1. I'm headed to Orlando Thursday night for ITE so I'm super tight on time this week, but don't want to push this off. Does that still work for you?

Julia

From: Erica Bayley <ebayley@ptsl.com>
Sent: August 5, 2025 11:37 AM
To: Julia Salvini <julia@salviniconsulting.com>
Cc: Lynne Banks <lbanks@puslinch.ca>
Subject: FW: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Julia – do you have time to connect this week to go through the scope for a TIS for this property?

I have time Thursday Aug 7, 11:30-4:00pm.

Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
m: 519-635-5349
e: ebayley@ptsl.com

From: Lynne Banks <lbanks@puslinch.ca>
Sent: August 5, 2025 10:47 AM
To: Erica Bayley <ebayley@ptsl.com>
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Erica –

You can reach out to Julia directly but please ensure that I am cc'd on all correspondence.

Thanks –

Lynne

Lynne Banks
Development and Legislative Coordinator
Township of Puslinch
7404 Wellington Rd 34, Puslinch ON N0B 2J0
519-763-1226 ext. 226 Fax 519-736-5846 www.puslinch.ca

From: Erica Bayley <ebayley@ptsl.com>
Sent: August 5, 2025 8:43 AM
To: Lynne Banks <lbanks@puslinch.ca>
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Lynne – following up on an older project that has some life again.

The client has agreed to cover the cost for us to connect with Julia to discuss the scope of a TIS for this property.

Please advise the best way to proceed.
Thanks,

Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
m: 519-635-5349
e: ebayley@ptsl.com

From: Lynne Banks <lbanks@puslinch.ca>
Sent: October 22, 2024 11:28 AM
To: Erica Bayley <ebayley@ptsl.com>
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Erica –

Can you please confirm that the owner will cover the Township's costs for Julia to review?

Thanks –

Lynne

Lynne Banks
Development and Legislative Coordinator
Township of Puslinch
7404 Wellington Rd 34, Puslinch ON N0B 2J0
519-763-1226 ext. 226 Fax 519-736-5846 www.puslinch.ca

From: Erica Bayley <ebayley@ptsl.com>
Sent: Thursday, October 17, 2024 9:11 AM
To: Lynne Banks <lbanks@puslinch.ca>
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Lynn – following up on the request below.
Thx,

Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
m: 519-635-5349
e: ebayley@ptsl.com

From: Erica Bayley
Sent: October 7, 2024 7:13 PM
To: Lynne Banks <lbanks@puslinch.ca>
Subject: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Lynn – we are assisting the landowner of the parcel on the southeast corner of CR7 and WR34.

To be proactive I was hoping to have a discussion with Julia Salvini as I understand she is the Township's peer reviewer for transportation related work.

Given the big changes to the network and future traffic in the area we want to understand any red flags for the area and what the Township's priorities are.

Please let me know if it's appropriate to reach out to Julia or if there's someone else who may be able to assist.
Thanks,

Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
p: 519.896.3163 x202
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From: Julia Salvini <julia@salviniconsulting.com>
Sent: November 3, 2025 11:22 AM
To: Erica Bayley
Cc: Andrew Orr; Monika Farncombe
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Sorry for the delay in getting back to you. I will review this in the next few days and respond.
Julia

From: Erica Bayley <ebayley@ptsl.com>
Sent: October 29, 2025 9:23 AM
To: Julia Salvini <julia@salviniconsulting.com>
Cc: Andrew Orr <aorr@ptsl.com>; Monika Farncombe <mfarncombe@puslinch.ca>
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- Background traffic annual growth rate – 2% **Please Confirm**

- All developments included in the Sideroad 25 North Concession Road 7 TIS
- Any additional developments to include in background?

Future Road Improvements:

- **Please confirm**

Trip Generation:

- ITE Trip Generation Data 12th Edition.

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- Existing Distribution.

Access and Circulation Review:

- Sight distance review along Wellington Road 34; and
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Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)

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Senior Project Manager, Associate
(She/Her)

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Cc: Lynne Banks <lbanks@puslinch.ca>
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Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
m: 519-635-5349
e: ebayley@ptsl.com

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Sent: August 5, 2025 10:47 AM
To: Erica Bayley <ebayley@ptsl.com>
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

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Lynne

Lynne Banks
Development and Legislative Coordinator
Township of Puslinch
7404 Wellington Rd 34, Puslinch ON N0B 2J0
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Senior Project Manager, Associate
(She/Her)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
m: 519-635-5349
e: ebayley@ptsl.com

From: Lynne Banks <lbanks@puslinch.ca>
Sent: October 22, 2024 11:28 AM
To: Erica Bayley <ebayley@ptsl.com>
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Erica –

Can you please confirm that the owner will cover the Township's costs for Julia to review?

Thanks –

Lynne

Lynne Banks
Development and Legislative Coordinator
Township of Puslinch
7404 Wellington Rd 34, Puslinch ON N0B 2J0
519-763-1226 ext. 226 Fax 519-736-5846 www.puslinch.ca

From: Erica Bayley <ebayley@ptsl.com>
Sent: Thursday, October 17, 2024 9:11 AM
To: Lynne Banks <lbanks@puslinch.ca>
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Lynn – following up on the request below.
Thx,

Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
m: 519-635-5349
e: ebayley@ptsl.com

From: Erica Bayley
Sent: October 7, 2024 7:13 PM
To: Lynne Banks <lbanks@puslinch.ca>
Subject: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Lynn – we are assisting the landowner of the parcel on the southeast corner of CR7 and WR34.

To be proactive I was hoping to have a discussion with Julia Salvini as I understand she is the Township's peer reviewer for transportation related work.

Given the big changes to the network and future traffic in the area we want to understand any red flags for the area and what the Township's priorities are.

Please let me know if it's appropriate to reach out to Julia or if there's someone else who may be able to assist.
Thanks,

Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
p: 519.896.3163 x202
m: 519-635-5349
e: ebayley@ptsl.com
w: www.ptsl.com

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From: Erica Bayley
Sent: September 10, 2025 12:48 PM
To: Monika Farncombe; Julia Salvini
Cc: Andrew Orr; planning@puslinch.ca
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Thanks all. Will keep you posted as we proceed.

Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
m: 519-635-5349
e: ebayley@ptsl.com

From: Monika Farncombe <mfarncombe@puslinch.ca>
Sent: September 10, 2025 12:39 PM
To: Julia Salvini <julia@salviniconsulting.com>; Erica Bayley <ebayley@ptsl.com>
Cc: Andrew Orr <aorr@ptsl.com>
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hello all,
Please CC planning@puslinch.ca on all correspondence along with myself.
Thank you,

Monika Farncombe
Planning and Corporate Services Coordinator
Township of Puslinch
7404 Wellington Rd 34, Puslinch ON N0B 2J0
519-763-1226 ext. 207 Fax 519-736-5846 www.puslinch.ca
My hours may not match your working hours. If you received this email outside of regular business hours, I do not expect an immediate response.

From: Julia Salvini <julia@salviniconsulting.com>
Sent: Wednesday, September 10, 2025 12:36 PM
To: Erica Bayley <ebayley@ptsl.com>
Cc: Andrew Orr <aorr@ptsl.com>; Monika Farncombe <mfarncombe@puslinch.ca>
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Erica,

Lynne has retired, as I'm sure you've realized by now. Please copy Monika on your correspondence instead (I've copied Monika so you have her contact info). Monika, is there anyone else you would like copied on this general kind of correspondence at the Township?

Yes, WR34 is open. I'm looking forward to seeing what your data tells us. I did reach out to the consultant who is working on the old driving range site on CR7 and they do not have an update or a timeline on that application. As a result, you can leave them out of the background traffic and stick to the other sites we discussed. If you are missing any of that background traffic info, please let me know.

Also, I'm always happy to review things in draft if your timeline allows or if there is something you want to check in with me on along the way. Usually that makes life easier for us both.

Julia

From: Erica Bayley <ebayley@ptsl.com>
Sent: September 10, 2025 10:39 AM
To: Julia Salvini <julia@salviniconsulting.com>
Cc: Lynne Banks <lbanks@puslinch.ca>; Andrew Orr <aorr@ptsl.com>
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Julia – an update on this project: looks like WR34 & Hwy 6 is open now. We are getting our data collection set up this month.

We've done our sightline review and compiling into a letter (inc. TAC and County guidelines as you suggested) and then working through the TIS.

Let me know if you think of any other details we should cover.

Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
m: 519-635-5349
e: ebayley@ptsl.com

From: Julia Salvini <julia@salviniconsulting.com>
Sent: August 5, 2025 2:42 PM
To: Erica Bayley <ebayley@ptsl.com>
Cc: Lynne Banks <lbanks@puslinch.ca>
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

I could do a short meeting Thursday after 1. I'm headed to Orlando Thursday night for ITE so I'm super tight on time this week, but don't want to push this off. Does that still work for you?

Julia

From: Erica Bayley <ebayley@ptsl.com>
Sent: August 5, 2025 11:37 AM
To: Julia Salvini <julia@salviniconsulting.com>
Cc: Lynne Banks <lbanks@puslinch.ca>
Subject: FW: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Julia – do you have time to connect this week to go through the scope for a TIS for this property?

I have time Thursday Aug 7, 11:30-4:00pm.

Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road Cambridge ON N1R 8J8
m: 519-635-5349
e: ebayley@ptsl.com

From: Lynne Banks <lbanks@puslinch.ca>
Sent: August 5, 2025 10:47 AM
To: Erica Bayley <ebayley@ptsl.com>
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Erica –

You can reach out to Julia directly but please ensure that I am cc'd on all correspondence.

Thanks –

Lynne

Lynne Banks
Development and Legislative Coordinator
Township of Puslinch
7404 Wellington Rd 34, Puslinch ON N0B 2J0
519-763-1226 ext. 226 Fax 519-736-5846 www.puslinch.ca

From: Erica Bayley <ebayley@ptsl.com>
Sent: August 5, 2025 8:43 AM
To: Lynne Banks <lbanks@puslinch.ca>
Subject: RE: (240623) Concession Rd 7 & Wellington Rd 34 Transportation

Hi Lynne – following up on an older project that has some life again.

The client has agreed to cover the cost for us to connect with Julia to discuss the scope of a TIS for this property.

Please advise the best way to proceed.
Thanks,

Erica Bayley, P.Eng.
Senior Project Manager, Associate
(She/Her)

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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: Wellington Road 34 & Concession Road 7
Site Code: 240623
Start Date: 09/23/2025

Turning Movement Data

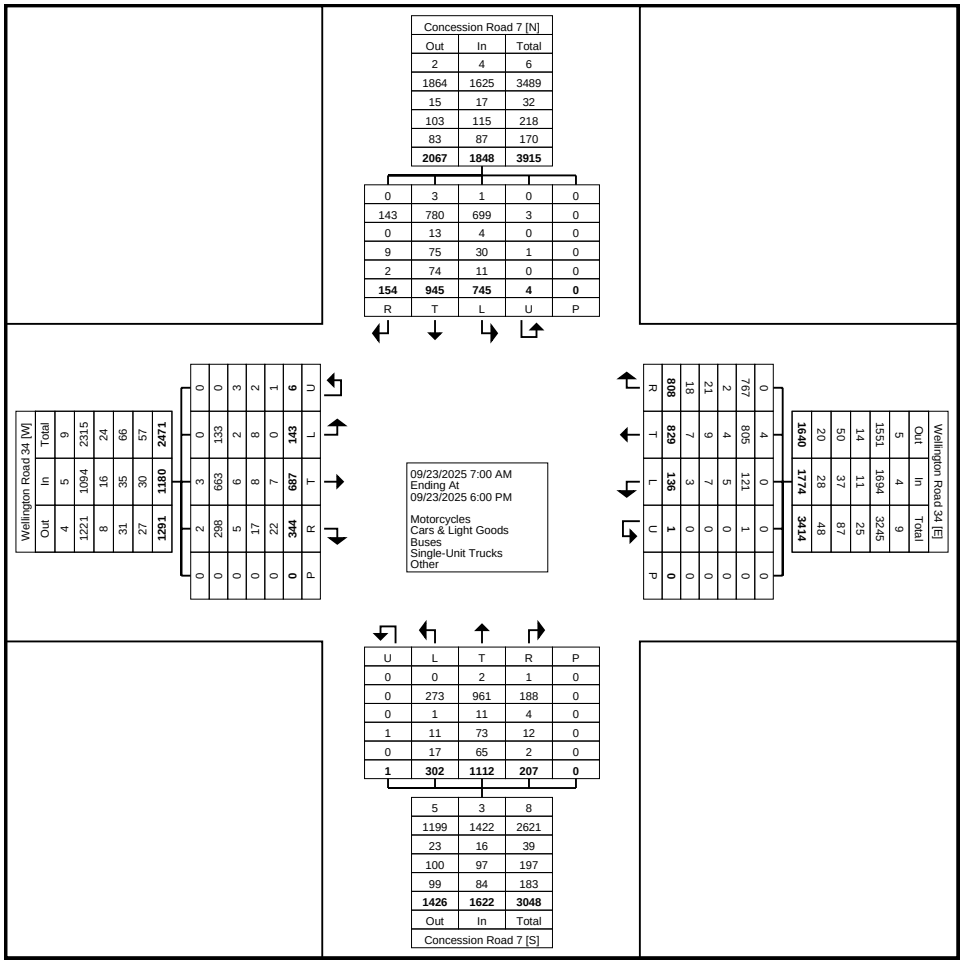
Start Time	Wellington Road 34 Eastbound						Wellington Road 34 Westbound						Concession Road 7 Northbound						Concession Road 7 Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	1	19	11	0	0	31	3	16	14	0	0	33	4	19	3	0	0	26	13	31	3	0	0	47	137
7:15 AM	1	30	32	0	0	63	9	19	24	0	0	52	11	25	2	0	0	38	17	35	1	0	0	53	206
7:30 AM	3	29	30	0	0	62	5	23	33	0	0	61	6	43	6	0	0	55	14	40	3	2	0	59	237
7:45 AM	5	33	37	0	0	75	5	32	36	0	0	73	9	56	11	0	0	76	23	37	2	0	0	62	286
Hourly Total	10	111	110	0	0	231	22	90	107	0	0	219	30	143	22	0	0	195	67	143	9	2	0	221	866
8:00 AM	4	41	26	2	0	73	2	19	25	0	0	46	7	55	12	0	0	74	15	44	2	0	0	61	254
8:15 AM	10	46	26	0	0	82	3	20	19	0	0	42	3	52	15	0	0	70	20	23	5	0	0	48	242
8:30 AM	6	22	10	0	0	38	2	25	34	0	0	61	7	39	14	0	0	60	12	21	9	0	0	42	201
8:45 AM	6	28	13	1	0	48	1	10	21	0	0	32	2	37	5	0	0	44	14	22	3	0	0	39	163
Hourly Total	26	137	75	3	0	241	8	74	99	0	0	181	19	183	46	0	0	248	61	110	19	0	0	190	860
9:00 AM	6	14	6	0	0	26	6	10	18	0	0	34	1	38	3	0	0	42	34	22	4	0	0	60	162
9:15 AM	3	9	7	1	0	20	2	11	19	0	0	32	4	18	7	0	0	29	19	27	5	0	0	51	132
9:30 AM	2	12	3	0	0	17	3	10	17	0	0	30	5	18	6	0	0	29	22	18	2	0	0	42	118
9:45 AM	4	16	14	0	0	34	1	12	20	0	0	33	5	18	1	0	0	24	24	21	4	0	0	49	140
Hourly Total	15	51	30	1	0	97	12	43	74	0	0	129	15	92	17	0	0	124	99	88	15	0	0	202	552
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	4	13	7	0	0	24	4	15	9	1	0	29	4	9	2	0	0	15	16	22	0	0	0	38	106
11:45 AM	3	12	7	0	0	22	4	7	6	0	0	17	5	12	3	0	0	20	18	20	2	0	0	40	99
Hourly Total	7	25	14	0	0	46	8	22	15	1	0	46	9	21	5	0	0	35	34	42	2	0	0	78	205
12:00 PM	6	7	9	0	0	22	4	12	12	0	0	28	2	23	3	0	0	28	9	14	1	0	0	24	102
12:15 PM	3	6	2	0	0	11	5	11	16	0	0	32	3	24	11	0	0	38	12	15	6	0	0	33	114
12:30 PM	5	10	8	0	0	23	5	12	10	0	0	27	6	25	4	1	0	36	18	26	4	0	0	48	134
12:45 PM	4	11	5	0	0	20	2	8	12	0	0	22	4	26	3	0	0	33	27	20	1	0	0	48	123
Hourly Total	18	34	24	0	0	76	16	43	50	0	0	109	15	98	21	1	0	135	66	75	12	0	0	153	473
1:00 PM	1	7	4	0	0	12	6	18	13	0	0	37	8	18	4	0	0	30	16	18	5	1	0	40	119
1:15 PM	2	8	5	0	0	15	5	14	5	0	0	24	7	20	5	0	0	32	20	15	7	0	0	42	113
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	3	15	9	0	0	27	11	32	18	0	0	61	15	38	9	0	0	62	36	33	12	1	0	82	232
3:00 PM	3	14	5	0	0	22	4	27	19	0	0	50	13	48	5	0	0	66	28	40	10	0	0	78	216
3:15 PM	8	18	4	1	0	31	3	29	18	0	0	50	11	25	7	0	0	43	26	29	1	0	0	56	180
3:30 PM	2	12	6	0	0	20	2	21	36	0	0	59	11	52	5	0	0	68	29	40	9	0	0	78	225
3:45 PM	9	24	2	0	0	35	10	34	28	0	0	72	10	40	6	0	0	56	26	42	4	0	0	72	235
Hourly Total	22	68	17	1	0	108	19	111	101	0	0	231	45	165	23	0	0	233	109	151	24	0	0	284	856
4:00 PM	7	14	7	0	0	28	9	25	39	0	0	73	13	50	9	0	0	72	29	37	5	0	0	71	244
4:15 PM	6	28	12	0	0	46	7	41	26	0	0	74	15	50	8	0	0	73	32	44	7	0	0	83	276

4:30 PM	4	22	13	1	0	40	7	39	39	0	0	85	19	47	5	0	0	71	29	40	7	1	0	77	273
4:45 PM	9	32	6	0	0	47	8	46	46	0	0	100	20	36	11	0	0	67	36	44	15	0	0	95	309
Hourly Total	26	96	38	1	0	161	31	151	150	0	0	332	67	183	33	0	0	283	126	165	34	1	0	326	1102
5:00 PM	1	35	4	0	0	40	2	58	44	0	0	104	27	45	3	0	0	75	43	37	4	0	0	84	303
5:15 PM	5	39	7	0	0	51	1	76	42	0	0	119	27	57	8	0	0	92	36	33	9	0	0	78	340
5:30 PM	6	39	8	0	0	53	2	68	52	0	0	122	18	59	10	0	0	87	30	43	11	0	0	84	346
5:45 PM	4	37	8	0	0	49	4	61	56	0	0	121	15	28	10	0	0	53	38	25	3	0	0	66	289
Hourly Total	16	150	27	0	0	193	9	263	194	0	0	466	87	189	31	0	0	307	147	138	27	0	0	312	1278
Grand Total	143	687	344	6	0	1180	136	829	808	1	0	1774	302	1112	207	1	0	1622	745	945	154	4	0	1848	6424
Approach %	12.1	58.2	29.2	0.5	-	-	7.7	46.7	45.5	0.1	-	-	18.6	68.6	12.8	0.1	-	-	40.3	51.1	8.3	0.2	-	-	-
Total %	2.2	10.7	5.4	0.1	-	18.4	2.1	12.9	12.6	0.0	-	27.6	4.7	17.3	3.2	0.0	-	25.2	11.6	14.7	2.4	0.1	-	28.8	-
Motorcycles	0	3	2	0	-	5	0	4	0	0	-	4	0	2	1	0	-	3	1	3	0	0	-	4	16
% Motorcycles	0.0	0.4	0.6	0.0	-	0.4	0.0	0.5	0.0	0.0	-	0.2	0.0	0.2	0.5	0.0	-	0.2	0.1	0.3	0.0	0.0	-	0.2	0.2
Cars & Light Goods	133	663	298	0	-	1094	121	805	767	1	-	1694	273	961	188	0	-	1422	699	780	143	3	-	1625	5835
% Cars & Light Goods	93.0	96.5	86.6	0.0	-	92.7	89.0	97.1	94.9	100.0	-	95.5	90.4	86.4	90.8	0.0	-	87.7	93.8	82.5	92.9	75.0	-	87.9	90.8
Buses	2	6	5	3	-	16	5	4	2	0	-	11	1	11	4	0	-	16	4	13	0	0	-	17	60
% Buses	1.4	0.9	1.5	50.0	-	1.4	3.7	0.5	0.2	0.0	-	0.6	0.3	1.0	1.9	0.0	-	1.0	0.5	1.4	0.0	0.0	-	0.9	0.9
Single-Unit Trucks	8	8	17	2	-	35	7	9	21	0	-	37	11	73	12	1	-	97	30	75	9	1	-	115	284
% Single-Unit Trucks	5.6	1.2	4.9	33.3	-	3.0	5.1	1.1	2.6	0.0	-	2.1	3.6	6.6	5.8	100.0	-	6.0	4.0	7.9	5.8	25.0	-	6.2	4.4
Articulated Trucks	0	7	22	1	-	30	3	7	18	0	-	28	16	64	2	0	-	82	11	74	2	0	-	87	227
% Articulated Trucks	0.0	1.0	6.4	16.7	-	2.5	2.2	0.8	2.2	0.0	-	1.6	5.3	5.8	1.0	0.0	-	5.1	1.5	7.8	1.3	0.0	-	4.7	3.5
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	1	1	0	0	-	2	0	0	0	0	-	0	2
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.3	0.1	0.0	0.0	-	0.1	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	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: Wellington Road 34 & Concession Road 7
Site Code: 240623
Start Date: 09/23/2025



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: Wellington Road 34 & Concession Road 7
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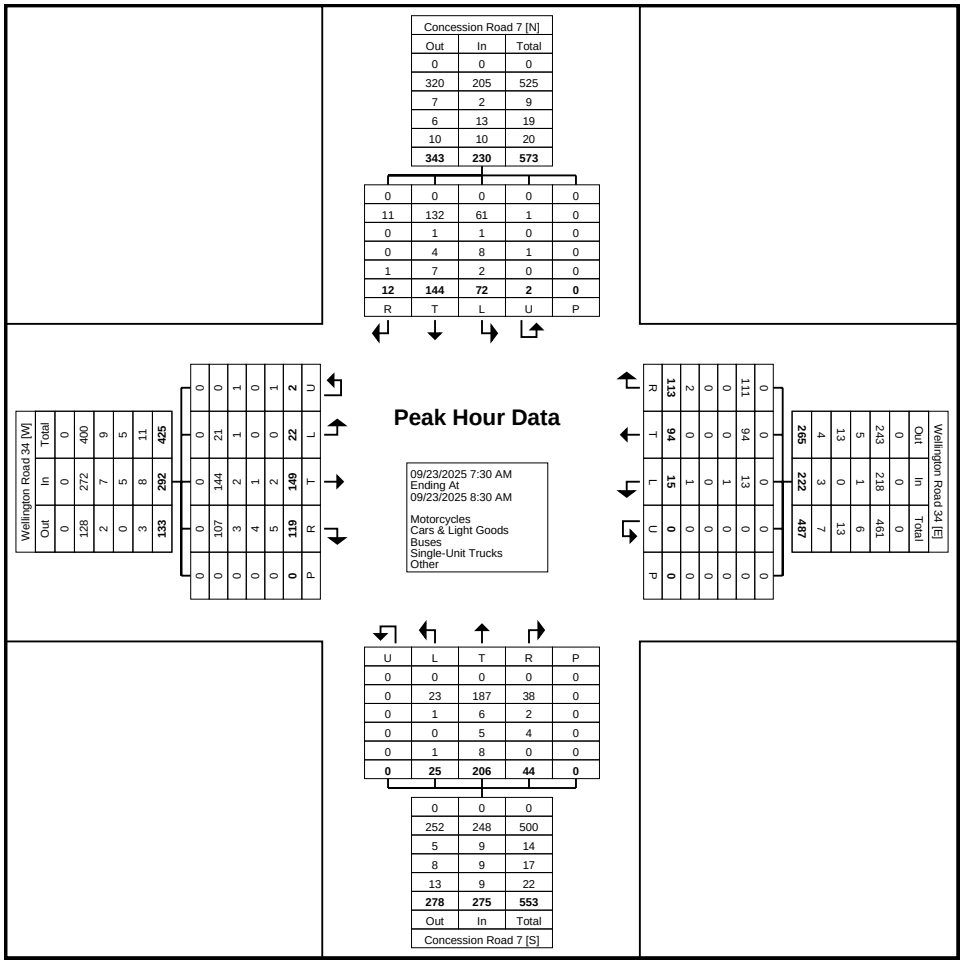
Turning Movement Peak Hour Data (7:30 AM)

Start Time	Wellington Road 34 Eastbound						Wellington Road 34 Westbound						Concession Road 7 Northbound						Concession Road 7 Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:30 AM	3	29	30	0	0	62	5	23	33	0	0	61	6	43	6	0	0	55	14	40	3	2	0	59	237
7:45 AM	5	33	37	0	0	75	5	32	36	0	0	73	9	56	11	0	0	76	23	37	2	0	0	62	286
8:00 AM	4	41	26	2	0	73	2	19	25	0	0	46	7	55	12	0	0	74	15	44	2	0	0	61	254
8:15 AM	10	46	26	0	0	82	3	20	19	0	0	42	3	52	15	0	0	70	20	23	5	0	0	48	242
Total	22	149	119	2	0	292	15	94	113	0	0	222	25	206	44	0	0	275	72	144	12	2	0	230	1019
Approach %	7.5	51.0	40.8	0.7	-	-	6.8	42.3	50.9	0.0	-	-	9.1	74.9	16.0	0.0	-	-	31.3	62.6	5.2	0.9	-	-	-
Total %	2.2	14.6	11.7	0.2	-	28.7	1.5	9.2	11.1	0.0	-	21.8	2.5	20.2	4.3	0.0	-	27.0	7.1	14.1	1.2	0.2	-	22.6	-
PHF	0.550	0.810	0.804	0.250	-	0.890	0.750	0.734	0.785	0.000	-	0.760	0.694	0.920	0.733	0.000	-	0.905	0.783	0.818	0.600	0.250	-	0.927	0.891
Motorcycles	0	0	0	0	-	0	0	0	0	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	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Cars & Light Goods	21	144	107	0	-	272	13	94	111	0	-	218	23	187	38	0	-	248	61	132	11	1	-	205	943
% Cars & Light Goods	95.5	96.6	89.9	0.0	-	93.2	86.7	100.0	98.2	-	-	98.2	92.0	90.8	86.4	-	-	90.2	84.7	91.7	91.7	50.0	-	89.1	92.5
Buses	1	2	3	1	-	7	1	0	0	0	-	1	1	6	2	0	-	9	1	1	0	0	-	2	19
% Buses	4.5	1.3	2.5	50.0	-	2.4	6.7	0.0	0.0	-	-	0.5	4.0	2.9	4.5	-	-	3.3	1.4	0.7	0.0	0.0	-	0.9	1.9
Single-Unit Trucks	0	1	4	0	-	5	0	0	0	0	-	0	0	5	4	0	-	9	8	4	0	1	-	13	27
% Single-Unit Trucks	0.0	0.7	3.4	0.0	-	1.7	0.0	0.0	0.0	-	-	0.0	0.0	2.4	9.1	-	-	3.3	11.1	2.8	0.0	50.0	-	5.7	2.6
Articulated Trucks	0	2	5	1	-	8	1	0	2	0	-	3	1	8	0	0	-	9	2	7	1	0	-	10	30
% Articulated Trucks	0.0	1.3	4.2	50.0	-	2.7	6.7	0.0	1.8	-	-	1.4	4.0	3.9	0.0	-	-	3.3	2.8	4.9	8.3	0.0	-	4.3	2.9
Bicycles on Road	0	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	0.0	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	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
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519-896-3163 cbowness@ptsl.com

Count Name: Wellington Road 34 & Concession Road 7
Site Code: 240623
Start Date: 09/23/2025



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

Paradigm Transportation Solutions Limited
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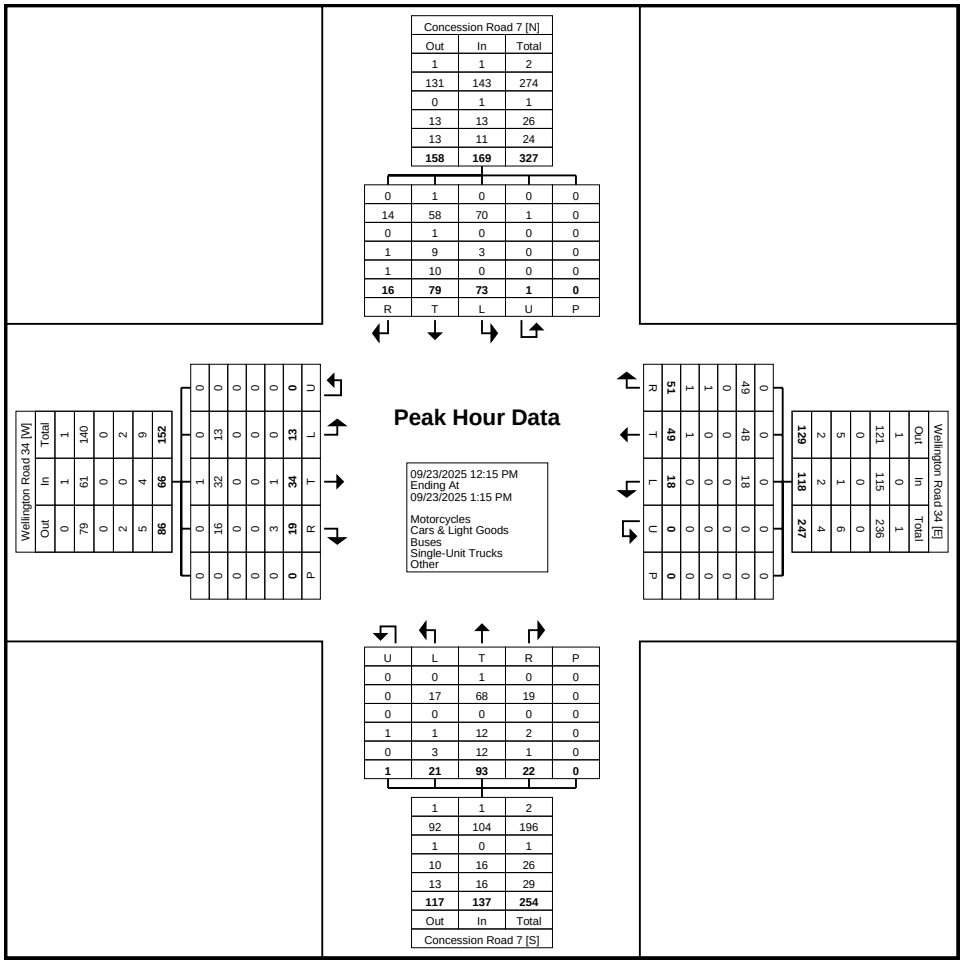
Turning Movement Peak Hour Data (12:15 PM)

Start Time	Wellington Road 34 Eastbound						Wellington Road 34 Westbound						Concession Road 7 Northbound						Concession Road 7 Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:15 PM	3	6	2	0	0	11	5	11	16	0	0	32	3	24	11	0	0	38	12	15	6	0	0	33	114
12:30 PM	5	10	8	0	0	23	5	12	10	0	0	27	6	25	4	1	0	36	18	26	4	0	0	48	134
12:45 PM	4	11	5	0	0	20	2	8	12	0	0	22	4	26	3	0	0	33	27	20	1	0	0	48	123
1:00 PM	1	7	4	0	0	12	6	18	13	0	0	37	8	18	4	0	0	30	16	18	5	1	0	40	119
Total	13	34	19	0	0	66	18	49	51	0	0	118	21	93	22	1	0	137	73	79	16	1	0	169	490
Approach %	19.7	51.5	28.8	0.0	-	-	15.3	41.5	43.2	0.0	-	-	15.3	67.9	16.1	0.7	-	-	43.2	46.7	9.5	0.6	-	-	-
Total %	2.7	6.9	3.9	0.0	-	13.5	3.7	10.0	10.4	0.0	-	24.1	4.3	19.0	4.5	0.2	-	28.0	14.9	16.1	3.3	0.2	-	34.5	-
PHF	0.650	0.773	0.594	0.000	-	0.717	0.750	0.681	0.797	0.000	-	0.797	0.656	0.894	0.500	0.250	-	0.901	0.676	0.760	0.667	0.250	-	0.880	0.914
Motorcycles	0	1	0	0	-	1	0	0	0	0	-	0	0	1	0	0	-	1	0	1	0	0	-	1	3
% Motorcycles	0.0	2.9	0.0	-	-	1.5	0.0	0.0	0.0	-	-	0.0	0.0	1.1	0.0	0.0	-	0.7	0.0	1.3	0.0	0.0	-	0.6	0.6
Cars & Light Goods	13	32	16	0	-	61	18	48	49	0	-	115	17	68	19	0	-	104	70	58	14	1	-	143	423
% Cars & Light Goods	100.0	94.1	84.2	-	-	92.4	100.0	98.0	96.1	-	-	97.5	81.0	73.1	86.4	0.0	-	75.9	95.9	73.4	87.5	100.0	-	84.6	86.3
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	1
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	1.3	0.0	0.0	-	0.6	0.2
Single-Unit Trucks	0	0	0	0	-	0	0	0	1	0	-	1	1	12	2	1	-	16	3	9	1	0	-	13	30
% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	2.0	-	-	0.8	4.8	12.9	9.1	100.0	-	11.7	4.1	11.4	6.3	0.0	-	7.7	6.1
Articulated Trucks	0	1	3	0	-	4	0	1	1	0	-	2	3	11	1	0	-	15	0	10	1	0	-	11	32
% Articulated Trucks	0.0	2.9	15.8	-	-	6.1	0.0	2.0	2.0	-	-	1.7	14.3	11.8	4.5	0.0	-	10.9	0.0	12.7	6.3	0.0	-	6.5	6.5
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	1.1	0.0	0.0	-	0.7	0.0	0.0	0.0	0.0	-	0.0	0.2
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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519-896-3163 cbowness@ptsl.com

Count Name: Wellington Road 34 & Concession Road 7
Site Code: 240623
Start Date: 09/23/2025



Turning Movement Peak Hour Data Plot (12:15 PM)

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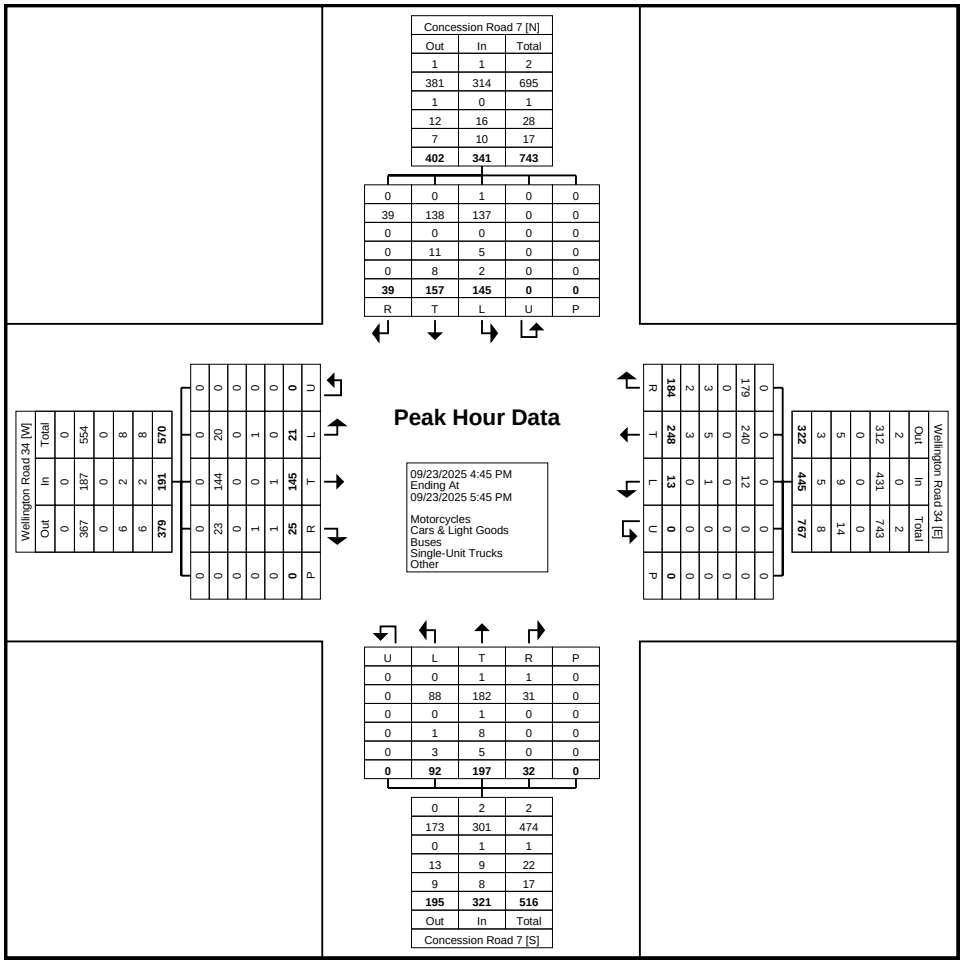
Turning Movement Peak Hour Data (4:45 PM)

Start Time	Wellington Road 34 Eastbound						Wellington Road 34 Westbound						Concession Road 7 Northbound						Concession Road 7 Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:45 PM	9	32	6	0	0	47	8	46	46	0	0	100	20	36	11	0	0	67	36	44	15	0	0	95	309
5:00 PM	1	35	4	0	0	40	2	58	44	0	0	104	27	45	3	0	0	75	43	37	4	0	0	84	303
5:15 PM	5	39	7	0	0	51	1	76	42	0	0	119	27	57	8	0	0	92	36	33	9	0	0	78	340
5:30 PM	6	39	8	0	0	53	2	68	52	0	0	122	18	59	10	0	0	87	30	43	11	0	0	84	346
Total	21	145	25	0	0	191	13	248	184	0	0	445	92	197	32	0	0	321	145	157	39	0	0	341	1298
Approach %	11.0	75.9	13.1	0.0	-	-	2.9	55.7	41.3	0.0	-	-	28.7	61.4	10.0	0.0	-	-	42.5	46.0	11.4	0.0	-	-	-
Total %	1.6	11.2	1.9	0.0	-	14.7	1.0	19.1	14.2	0.0	-	34.3	7.1	15.2	2.5	0.0	-	24.7	11.2	12.1	3.0	0.0	-	26.3	-
PHF	0.583	0.929	0.781	0.000	-	0.901	0.406	0.816	0.885	0.000	-	0.912	0.852	0.835	0.727	0.000	-	0.872	0.843	0.892	0.650	0.000	-	0.897	0.938
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	1	1	0	-	2	1	0	0	0	-	1	3
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.5	3.1	-	-	0.6	0.7	0.0	0.0	-	-	0.3	0.2
Cars & Light Goods	20	144	23	0	-	187	12	240	179	0	-	431	88	182	31	0	-	301	137	138	39	0	-	314	1233
% Cars & Light Goods	95.2	99.3	92.0	-	-	97.9	92.3	96.8	97.3	-	-	96.9	95.7	92.4	96.9	-	-	93.8	94.5	87.9	100.0	-	-	92.1	95.0
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	1
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.5	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.1
Single-Unit Trucks	1	0	1	0	-	2	1	5	3	0	-	9	1	8	0	0	-	9	5	11	0	0	-	16	36
% Single-Unit Trucks	4.8	0.0	4.0	-	-	1.0	7.7	2.0	1.6	-	-	2.0	1.1	4.1	0.0	-	-	2.8	3.4	7.0	0.0	-	-	4.7	2.8
Articulated Trucks	0	1	1	0	-	2	0	3	2	0	-	5	3	5	0	0	-	8	2	8	0	0	-	10	25
% Articulated Trucks	0.0	0.7	4.0	-	-	1.0	0.0	1.2	1.1	-	-	1.1	3.3	2.5	0.0	-	-	2.5	1.4	5.1	0.0	-	-	2.9	1.9
Bicycles on Road	0	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	0.0	-	-	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	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Count Name: Wellington Road 34 & Concession Road 7
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Start Date: 09/23/2025



Turning Movement Peak Hour Data Plot (4:45 PM)

Appendix C

Base Year Operations

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]
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The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution

Filename: CR 7 & WR 34.arc8
Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Project Files\2024\240623-Arcady\2025-12
Report generation date: 2025-12-09 1:42:45 PM

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	0.28	~1	3.93	0.20	A	4.18	A
Leg West	0.40	~1	4.36	0.27	A		
Leg South	0.38	~1	4.44	0.26	A		
Leg East	0.27	~1	3.89	0.21	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 2032, AM" model duration: 8:00 AM - 9:00 AM
"D4 - Background 2032, PM" model duration: 4:30 PM - 5:30 PM
"D5 - Total 2032, AM" model duration: 8:00 AM - 9:00 AM
"D6 - Total 2032, PM" model duration: 4:30 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2025-12-09 1:42:45 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2025-12-09
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,West,South,East				4.18	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Wellington Road 54	
West	West	Wellington Road 34	
South	South	Concession Road 7	
East	East	Wellington Road 34	

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
West	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	
West	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
West		(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	✓	230.00	100.000
West	PHF	✓	292.00	100.000
South	PHF	✓	275.00	100.000
East	PHF	✓	222.00	100.000

Peak Hour Factor Data

Leg	Hourly Volume (PCE/hr)	Peak Hour Factor	Peak Time Segment
North	230.00	0.89	SecondQuarter
West	292.00	0.89	SecondQuarter
South	275.00	0.89	SecondQuarter
East	222.00	0.89	SecondQuarter

Turning Proportions

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

		To			
		North	**West**	**South**	**East**
From	**North**	0.000	12.000	144.000	74.000
	West	24.000	0.000	119.000	149.000
	South	206.000	25.000	0.000	44.000
	East	113.000	94.000	15.000	0.000

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

		To			
		North	**West**	**South**	**East**
From	**North**	0.00	0.05	0.63	0.32
	West	0.08	0.00	0.41	0.51
	South	0.75	0.09	0.00	0.16

	East	0.51	0.42	0.07	0.00

Vehicle Mix

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

		To			
		North	West	South	East
From	North	1.000	1.080	1.080	1.160
	West	1.130	1.000	1.100	1.030
	South	1.090	1.080	1.000	1.140
	East	1.020	1.000	1.130	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.0	8.0	8.0	16.0
	West	13.0	0.0	10.0	3.0
	South	9.0	8.0	0.0	14.0
	East	2.0	0.0	13.0	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	0.20	3.93	0.28	~1	A	230.00	230.00	14.51	3.78	0.24	14.51	3.78
West	0.27	4.36	0.40	~1	A	292.00	292.00	20.07	4.12	0.33	20.08	4.13
South	0.26	4.44	0.38	~1	A	275.00	275.00	19.27	4.21	0.32	19.28	4.21
East	0.21	3.89	0.27	~1	A	222.00	222.00	13.73	3.71	0.23	13.73	3.71

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	211.05	52.76	210.19	313.38	122.46	0.00	1286.57	1059.21	0.164	0.00	0.22	3.690	A
West	267.94	66.99	266.76	119.72	212.93	0.00	1234.21	741.92	0.217	0.00	0.29	3.959	A
South	252.34	63.09	251.21	254.02	225.67	0.00	1226.83	905.81	0.206	0.00	0.28	4.043	A
East	203.71	50.93	202.90	243.94	232.94	0.00	1222.63	881.79	0.167	0.00	0.20	3.589	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	258.43	64.61	258.17	384.94	150.40	0.00	1270.40	1059.21	0.203	0.22	0.28	3.927	A
West	328.09	82.02	327.68	147.03	261.53	0.00	1206.08	741.92	0.272	0.29	0.40	4.364	A
South	308.99	77.25	308.60	312.01	277.20	0.00	1197.01	905.81	0.258	0.28	0.38	4.442	A
East	249.44	62.36	249.18	299.65	286.16	0.00	1191.83	881.79	0.209	0.20	0.27	3.887	A

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

	Total	Intersection	Entry	Exit Flow	Circulating	Pedestrian	Capacity	Saturation	V/C	Start	End	Delay	

Leg	Demand (PCE/hr)	Arrivals (PCE)	Flow (PCE/hr)	(PCE/hr)	Flow (PCE/hr)	Demand (Ped/hr)	(PCE/hr)	Capacity (PCE/hr)	Ratio	Queue (PCE)	Queue (PCE)	(s)	LOS
North	239.48	59.87	239.57	357.30	139.58	0.00	1276.66	1059.21	0.188	0.28	0.26	3.833	A
West	304.03	76.01	304.18	136.46	242.70	0.00	1216.98	741.92	0.250	0.40	0.36	4.202	A
South	286.33	71.58	286.48	289.58	257.30	0.00	1208.53	905.81	0.237	0.38	0.34	4.284	A
East	231.15	57.79	231.25	278.13	265.64	0.00	1203.70	881.79	0.192	0.27	0.24	3.768	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	211.05	52.76	211.20	315.01	123.06	0.00	1286.23	1059.21	0.164	0.26	0.22	3.698	A
West	267.94	66.99	268.18	120.30	213.96	0.00	1233.62	741.92	0.217	0.36	0.30	3.974	A
South	252.34	63.09	252.57	255.30	226.84	0.00	1226.16	905.81	0.206	0.34	0.29	4.056	A
East	203.71	50.93	203.86	245.21	234.20	0.00	1221.90	881.79	0.167	0.24	0.20	3.602	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	3.17	0.21	3.690	A	A
West	4.30	0.29	3.959	A	A
South	4.14	0.28	4.043	A	A
East	2.98	0.20	3.589	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	4.14	0.28	3.927	A	A
West	5.82	0.39	4.364	A	A
South	5.58	0.37	4.442	A	A
East	3.96	0.26	3.887	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	3.89	0.26	3.833	A	A
West	5.42	0.36	4.202	A	A
South	5.20	0.35	4.284	A	A
East	3.69	0.25	3.768	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	3.31	0.22	3.698	A	A
West	4.52	0.30	3.974	A	A
South	4.35	0.29	4.056	A	A
East	3.11	0.21	3.602	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	0.22	~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
West	0.29	~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	0.28	~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: (08:15-08:30)

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	0.28	~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
West	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	0.38	~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
East	0.27	~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	0.26	~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
West	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
South	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
East	0.24	~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	0.22	~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
West	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
South	0.29	~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

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]
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Filename: CR 7 & WR 34.arc8
Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Project Files\2024\240623-Arcady\2025-12
Report generation date: 2026-01-19 7:24:13 PM

Summary of intersection performance

	PM							
	Queue (PCE)	**95% Queue (PCE)**	**Delay (s)**	**V/C Ratio**	**LOS**	**Intersection Delay (s)**	**Intersection LOS**	**Network Residual Capacity**
	A1 - Base Year							
Leg North	0.50	1.07	4.97	0.32	A	4.84	A	94 % [Leg East]
Leg West	0.22	~1	3.83	0.17	A			
Leg South	0.43	~1	4.60	0.29	A			
Leg East	0.70	~1	5.35	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. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

"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 2032, AM" model duration: 8:00 AM - 9:00 AM
"D4 - Background 2032, PM" model duration: 4:30 PM - 5:30 PM
"D5 - Total 2032, AM" model duration: 8:00 AM - 9:00 AM
"D6 - Total 2032, PM" model duration: 4:30 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2026-01-19 7:24:11 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2025-12-09
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	✓	✓	Delay	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,West,South,East				4.84	A

Intersection Network Options

Driving Side	Lighting	Network Residual Capacity (%)	First Leg Reaching Threshold
Right	Normal/unknown	94	Leg East

Legs

Legs

Leg	Leg	Name	Description
North	North	Wellington Road 54	
West	West	Wellington Road 34	
South	South	Concession Road 7	
East	East	Wellington Road 34	

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
West	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	
West	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
West		(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	✓	341.00	100.000
West	PHF	✓	191.00	100.000
South	PHF	✓	321.00	100.000
East	PHF	✓	445.00	100.000

Peak Hour Factor Data

Leg	Hourly Volume (PCE/hr)	Peak Hour Factor	Peak Time Segment
North	341.00	0.94	SecondQuarter
West	191.00	0.94	SecondQuarter
South	321.00	0.94	SecondQuarter
East	445.00	0.94	SecondQuarter

Turning Proportions

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

		To			
		North	**West**	**South**	**East**
From	**North**	0.000	39.000	157.000	145.000
	West	21.000	0.000	25.000	145.000
	South	197.000	92.000	0.000	32.000
	East	184.000	248.000	13.000	0.000

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

		To			
		North	**West**	**South**	**East**
From	**North**	0.00	0.11	0.46	0.43
	West	0.11	0.00	0.13	0.76
	South	0.61	0.29	0.00	0.10

	East	0.41	0.56	0.03	0.00

Vehicle Mix

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

		To			
		North	West	South	East
From	North	1.000	1.000	1.120	1.050
	West	1.050	1.000	1.080	1.010
	South	1.070	1.040	1.000	1.000
	East	1.030	1.030	1.080	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.0	0.0	12.0	5.0
	West	5.0	0.0	8.0	1.0
	South	7.0	4.0	0.0	0.0
	East	3.0	3.0	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	0.32	4.97	0.50	1.07	A	341.00	341.00	26.98	4.75	0.45	26.98	4.75
West	0.17	3.83	0.22	~1	A	191.00	191.00	11.87	3.73	0.20	11.88	3.73
South	0.29	4.60	0.43	~1	A	321.00	321.00	23.62	4.41	0.39	23.62	4.42
East	0.41	5.35	0.70	~1	A	445.00	445.00	37.43	5.05	0.62	37.44	5.05

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	326.49	81.62	324.82	382.96	336.21	0.00	1162.86	923.04	0.281	0.00	0.42	4.607	A
West	182.87	45.72	182.13	360.98	300.05	0.00	1183.79	868.42	0.154	0.00	0.19	3.675	A
South	307.34	76.84	305.88	185.77	296.41	0.00	1185.89	693.47	0.259	0.00	0.37	4.304	A
East	426.06	106.52	423.77	306.88	295.41	0.00	1186.48	940.85	0.359	0.00	0.57	4.853	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	362.77	90.69	362.44	427.28	375.16	0.00	1140.32	923.04	0.318	0.42	0.50	4.971	A
West	203.19	50.80	203.07	402.80	334.80	0.00	1163.67	868.42	0.175	0.19	0.22	3.833	A
South	341.49	85.37	341.22	207.27	330.61	0.00	1166.10	693.47	0.293	0.37	0.43	4.598	A
East	473.40	118.35	472.91	342.30	329.53	0.00	1166.72	940.85	0.406	0.57	0.70	5.348	A

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

	Total	Intersection	Entry	Exit Flow	Circulating	Pedestrian	Capacity	Saturation	V/C	Start	End	Delay	

Leg	Demand (PCE/hr)	Arrivals (PCE)	Flow (PCE/hr)	(PCE/hr)	Flow (PCE/hr)	Demand (Ped/hr)	(PCE/hr)	Capacity (PCE/hr)	Ratio	Queue (PCE)	Queue (PCE)	(s)	LOS
North	348.26	87.06	348.36	410.68	360.63	0.00	1148.73	923.04	0.303	0.50	0.47	4.834	A
West	195.06	48.77	195.10	387.19	321.80	0.00	1171.20	868.42	0.167	0.22	0.21	3.775	A
South	327.83	81.96	327.92	199.21	317.70	0.00	1173.57	693.47	0.279	0.43	0.41	4.486	A
East	454.47	113.62	454.63	328.94	316.68	0.00	1174.16	940.85	0.387	0.70	0.66	5.161	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	326.49	81.62	326.68	385.12	338.20	0.00	1161.71	923.04	0.281	0.47	0.42	4.634	A
West	182.87	45.72	182.94	363.10	301.77	0.00	1182.79	868.42	0.155	0.21	0.19	3.682	A
South	307.34	76.84	307.50	186.81	297.91	0.00	1185.03	693.47	0.259	0.41	0.37	4.325	A
East	426.06	106.52	426.36	308.45	296.96	0.00	1185.58	940.85	0.359	0.66	0.58	4.892	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	6.08	0.41	4.607	A	A
West	2.73	0.18	3.675	A	A
South	5.35	0.36	4.304	A	A
East	8.33	0.56	4.853	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	7.33	0.49	4.971	A	A
West	3.19	0.21	3.833	A	A
South	6.40	0.43	4.598	A	A
East	10.25	0.68	5.348	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	7.13	0.48	4.834	A	A
West	3.10	0.21	3.775	A	A
South	6.22	0.41	4.486	A	A
East	9.97	0.66	5.161	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	6.43	0.43	4.634	A	A
West	2.85	0.19	3.682	A	A
South	5.64	0.38	4.325	A	A
East	8.89	0.59	4.892	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	0.42	~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
West	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
South	0.37	~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

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	0.50	~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
West	0.22	~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	0.70	~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

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

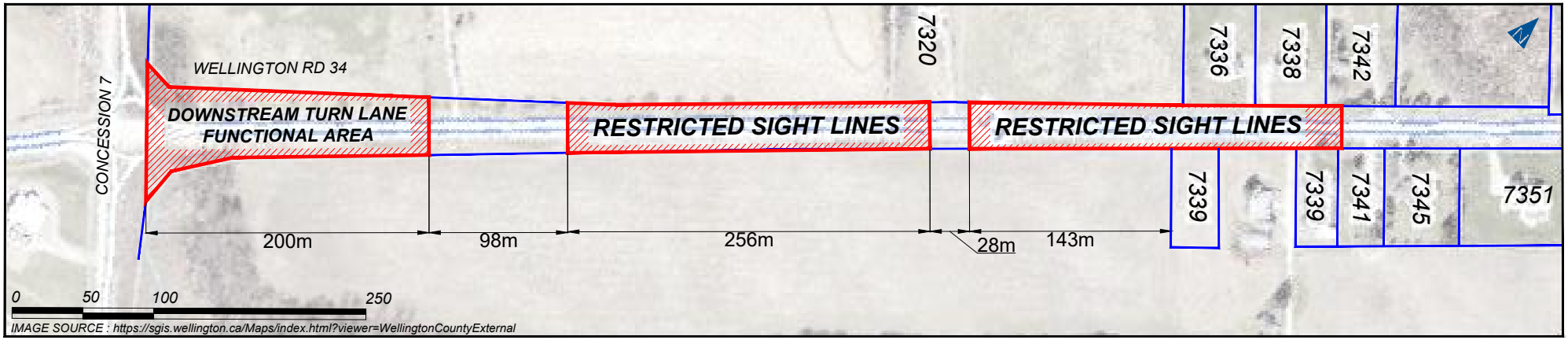
Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.47	0.00	0.00	0.00	1.07			N/A	N/A
West	0.21	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	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
East	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

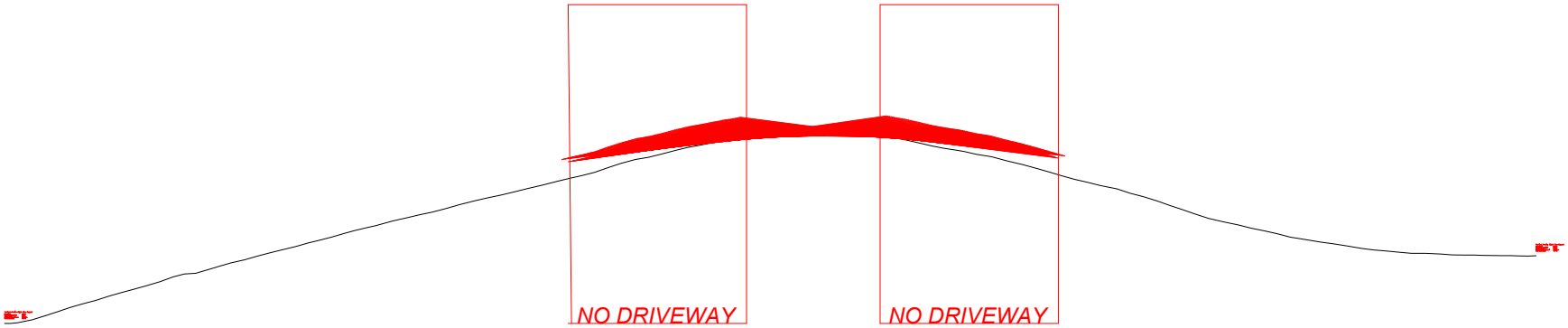
Queue Variation results: (17:15-17:30)

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	0.42	~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
West	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
South	0.37	~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	0.58	~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

Appendix D

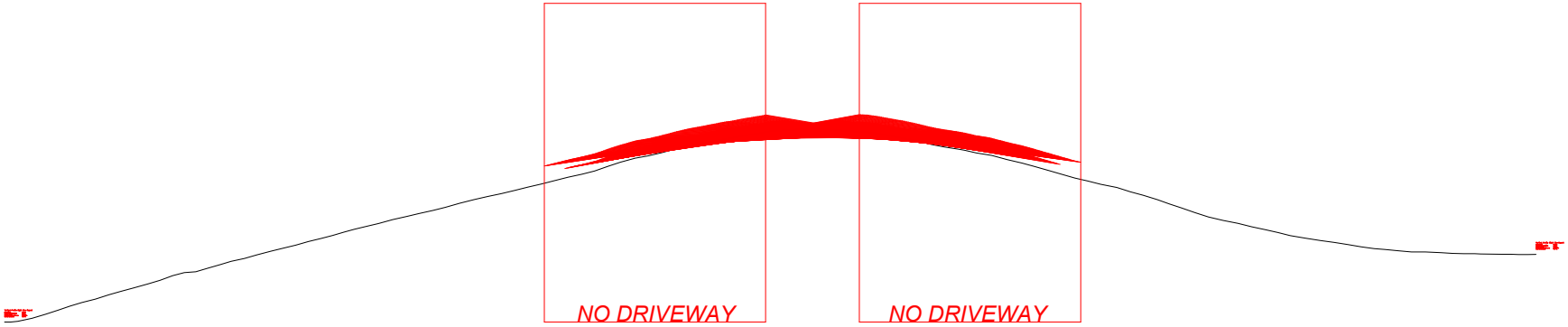
Sight Distance Restrictions


WELLINGTON RD 34
CONCESSION 7
DOWNSTREAM TURN LANE FUNCTIONAL AREA
RESTRICTED SIGHT LINES
RESTRICTED SIGHT LINES
7320
7336
7338
7342
7339
7339
7341
7345
7351
200m
98m
256m
28m
143m
0
50
100
250
IMAGE SOURCE : https://sgis.wellington.ca/Maps/index.html?viewer=WellingtonCountyExternal



Wellington County SD = 200 m(80 km/h Posted Speed)

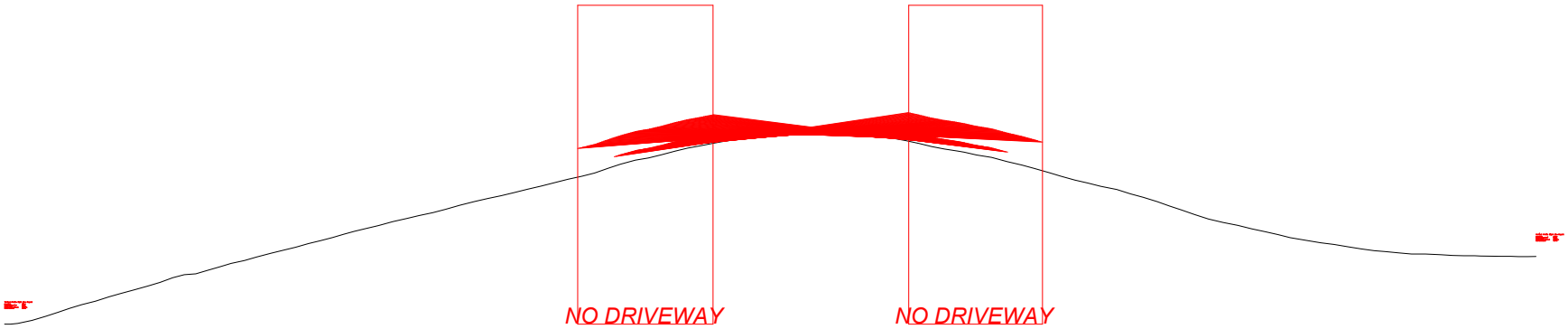
- Drive Eye to Object = 1.05 m to 1.30 m



TAC (100 km/h Design Speed)

Minimum Stopping Sight Distance = 185 m

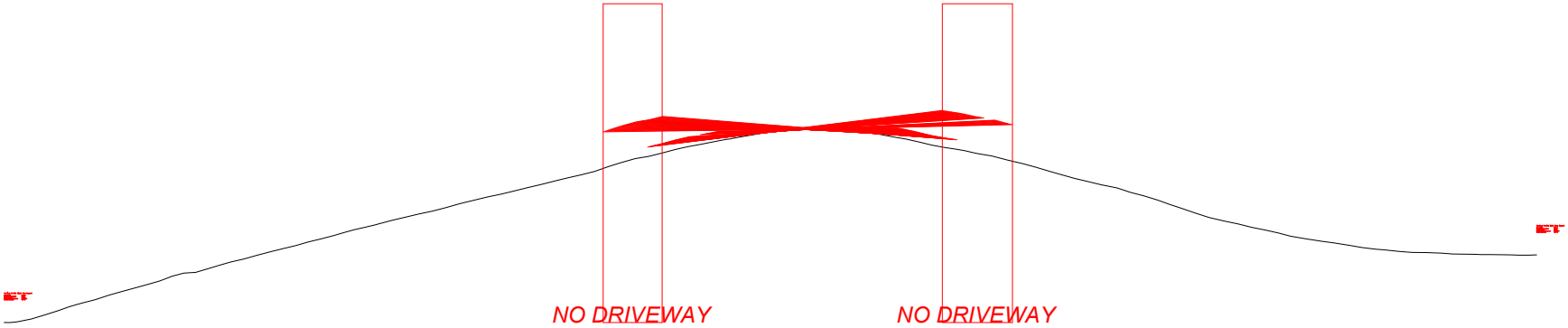
- Car Eye to Object = 1.08 m to 0.60 m



TAC (100 km/h Design Speed)

Minimum Stopping Sight Distance = 185 m

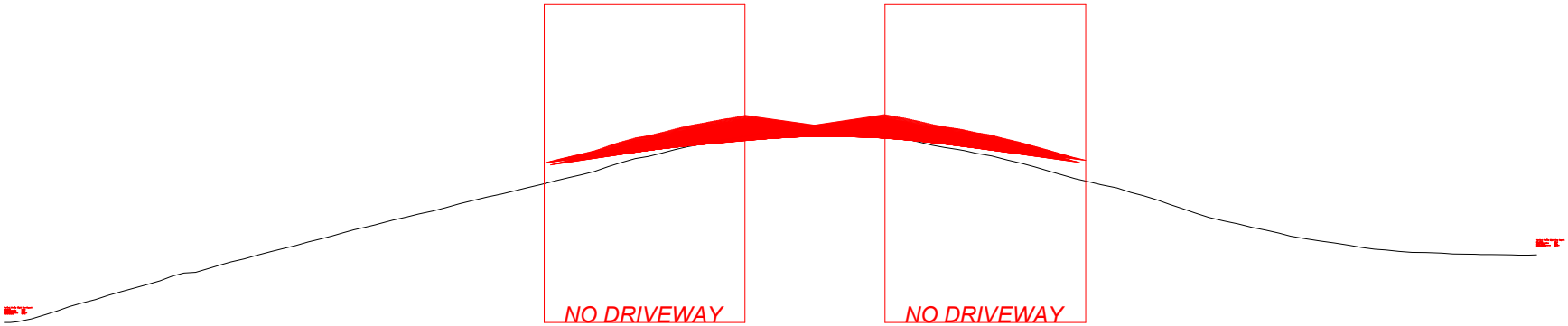
- Truck Eye (single) to Object = 1.80 m to 0.60 m



TAC (100 km/h Design Speed)

Minimum Stopping Sight Distance = 185 m

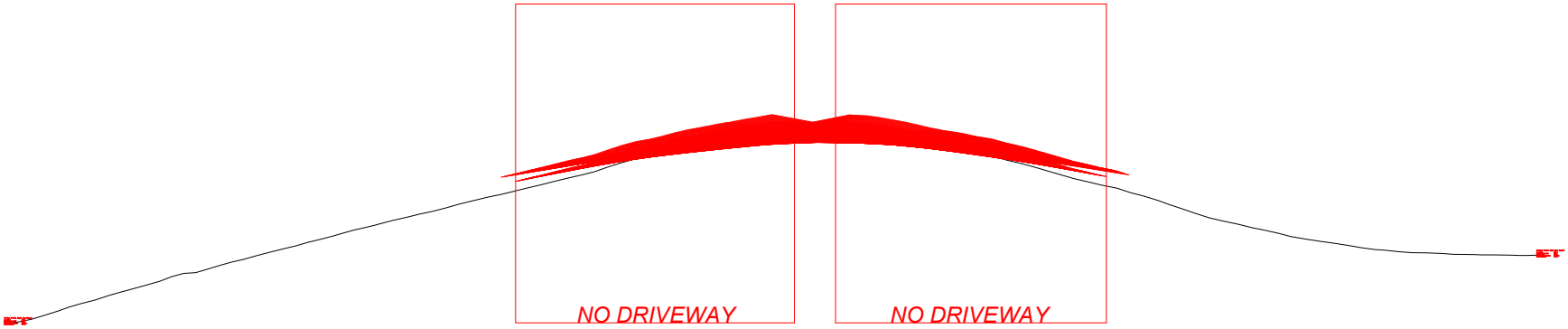
- Truck Eye (Combo) to Object = 2.30 m to 0.60 m



TAC 100 km/h design speed

Intersection Sight Distance **Left-turn**

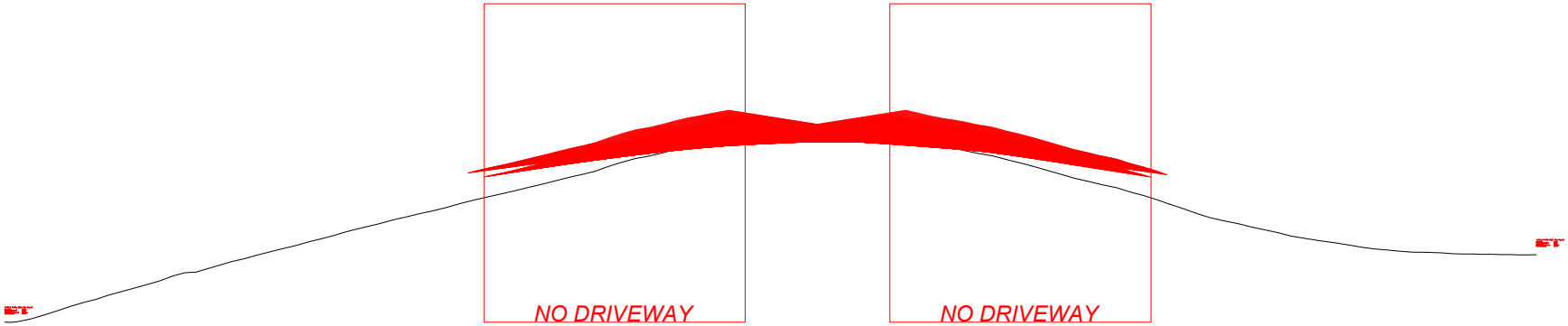
- Car Eye to Top of Car = 1.08 m to 1.30 m **= 210 m**



TAC 100 km/h design speed

Intersection Sight Distance **Left-turn**

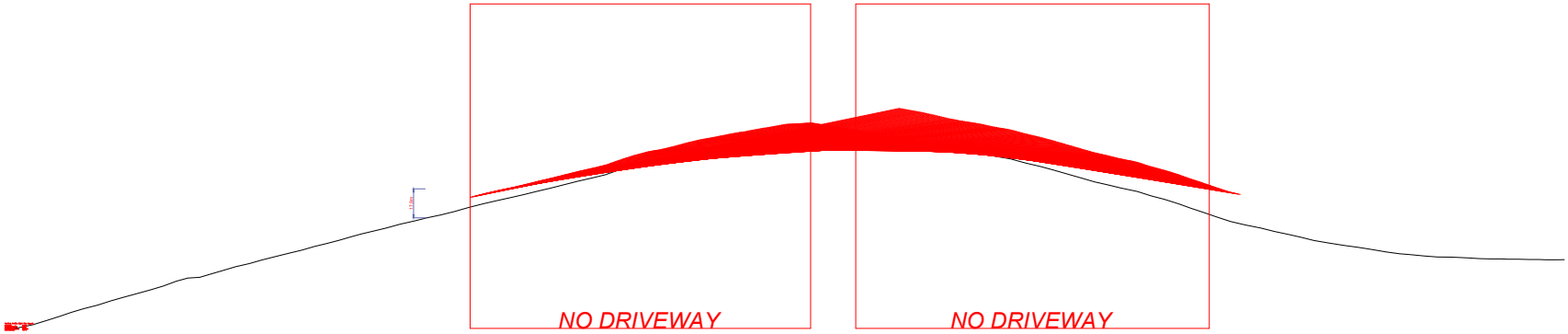
- Car Eye to Headlights = 1.08 m to 0.60 m **= 210 m**



TAC 100 km/h design speed

Intersection Sight Distance **Left-turn**

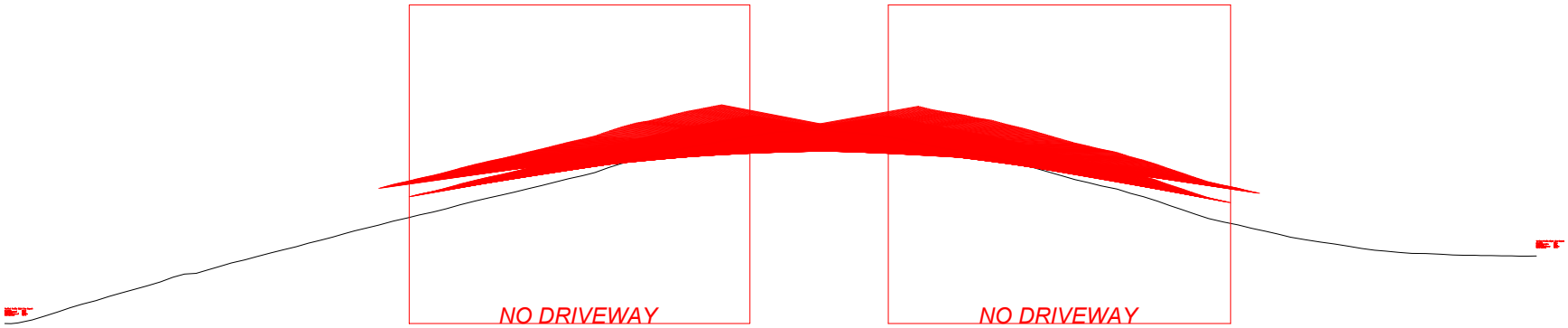
- Truck Eye (Single) to Top of Car = 1.80 m to 1.30 m **= 265 m**



TAC 100 km/h design speed

Intersection Sight Distance **Left-turn**

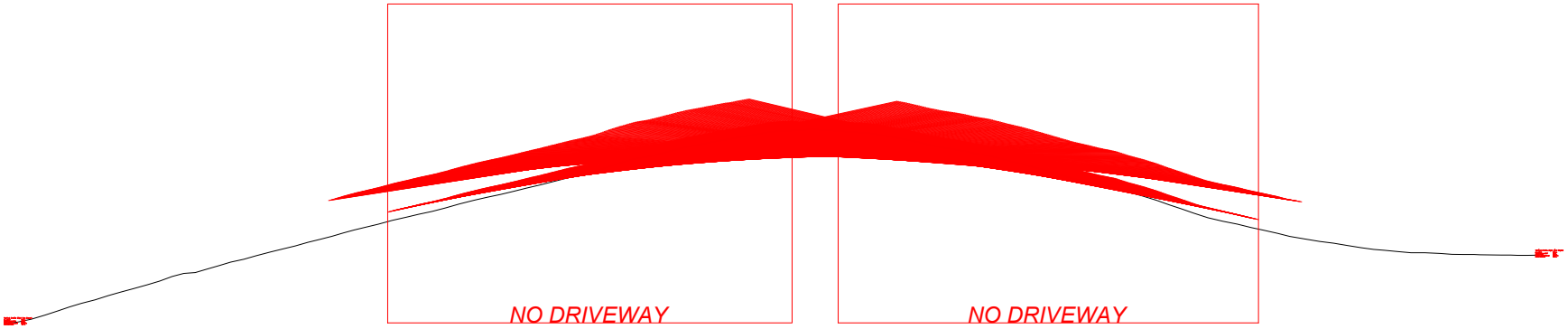
- Truck Eye (Single) to Headlights = 1.80 m to 0.60 m **= 265 m**



TAC 100 km/h design speed

Intersection Sight Distance **Left-turn**

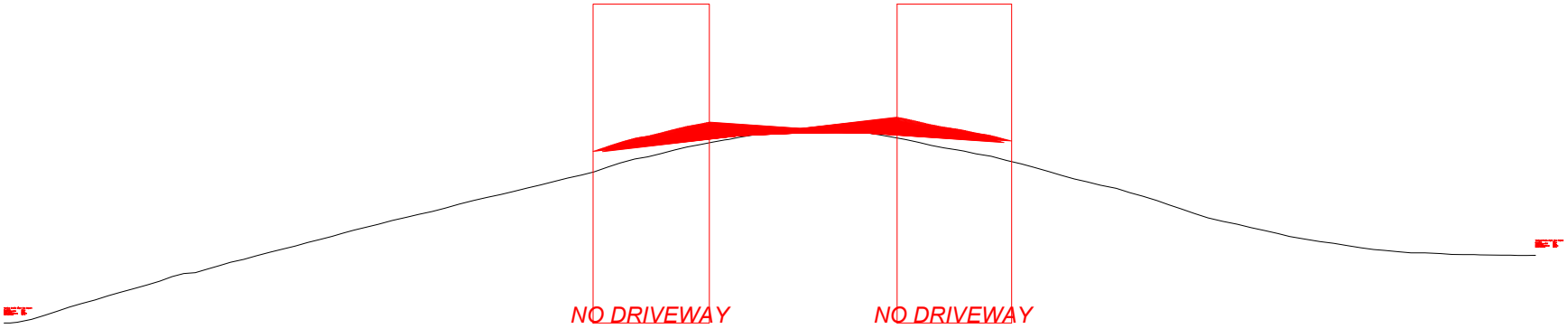
- Truck Eye (Combo) to Top of Car = 2.30 m to 1.30 m **= 320 m**



TAC 100 km/h design speed

Intersection Sight Distance **Left-turn**

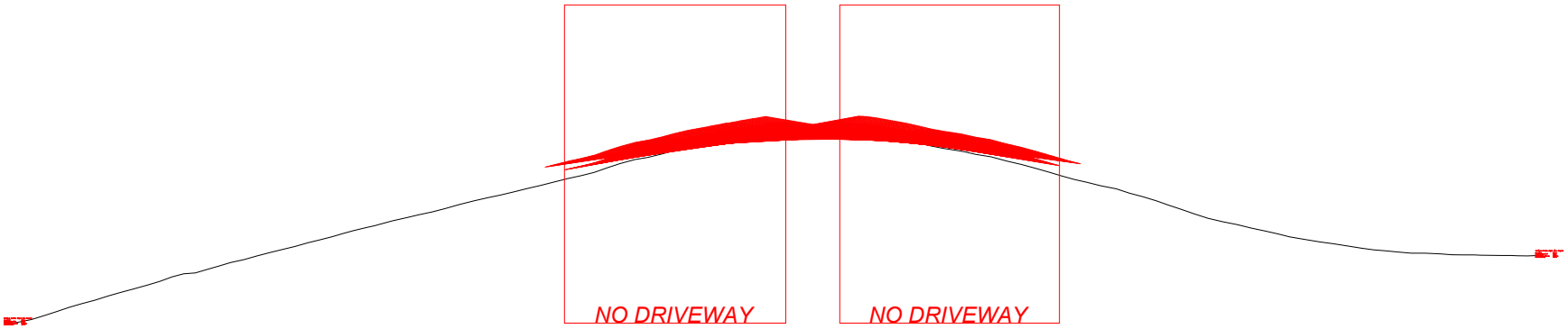
- Truck Eye (Combo) to Headlights = 2.30 m to 0.60 m **= 320 m**



TAC 100 km/h design speed

Intersection Sight Distance **Right-turn**

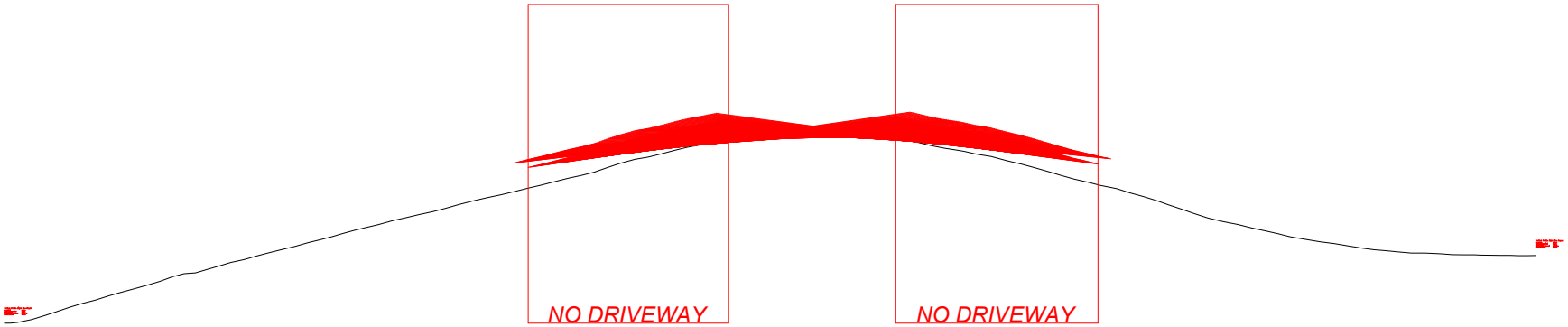
- Car Eye to Top of Car = 1.08 m to 1.30 m **= 185 m**



TAC 100 km/h design speed

Intersection Sight Distance **Right-turn**

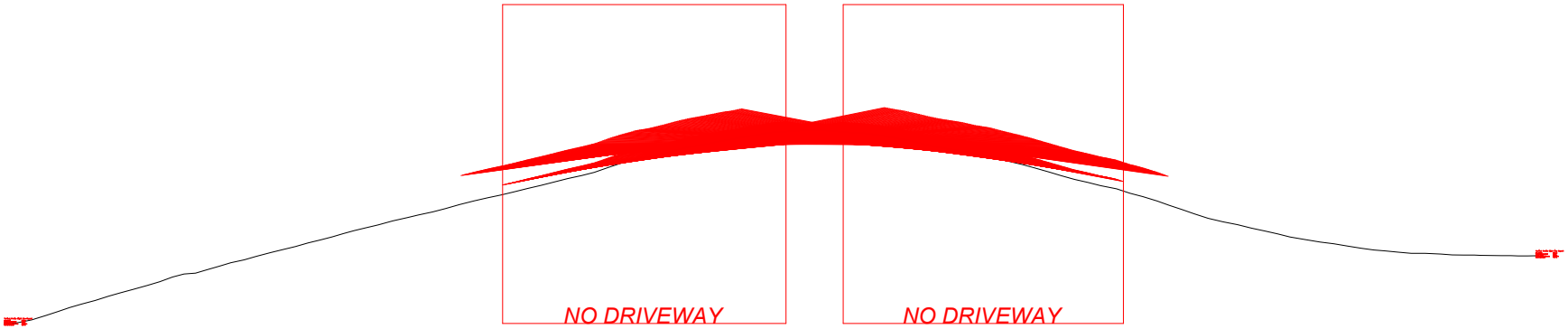
- Car Eye to Headlights = 1.08 m to 0.60 m **= 185 m**



TAC 100 km/h design speed

Intersection Sight Distance **Right-turn**

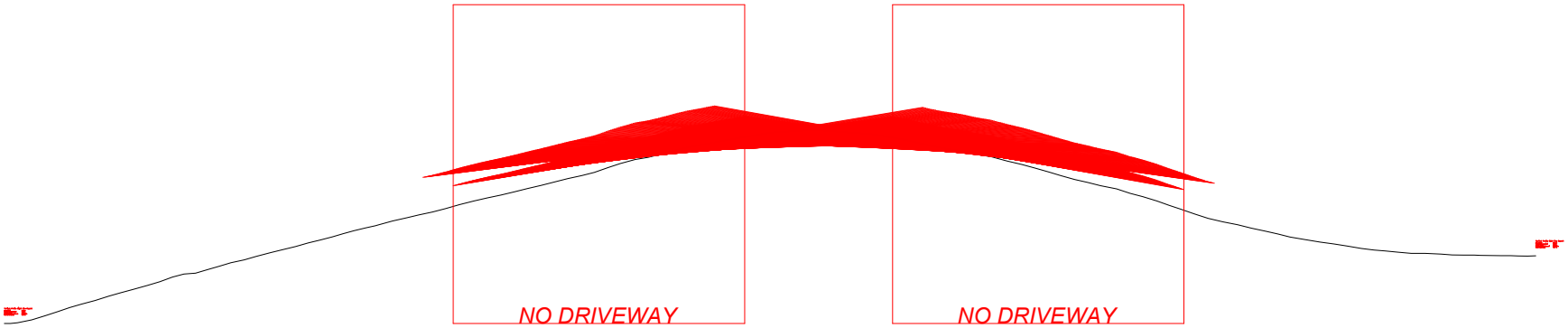
- Truck Eye (Single) to Top of Car = 1.80 m to 1.30 m **= 240 m**



TAC 100 km/h design speed

Intersection Sight Distance **Right-turn**

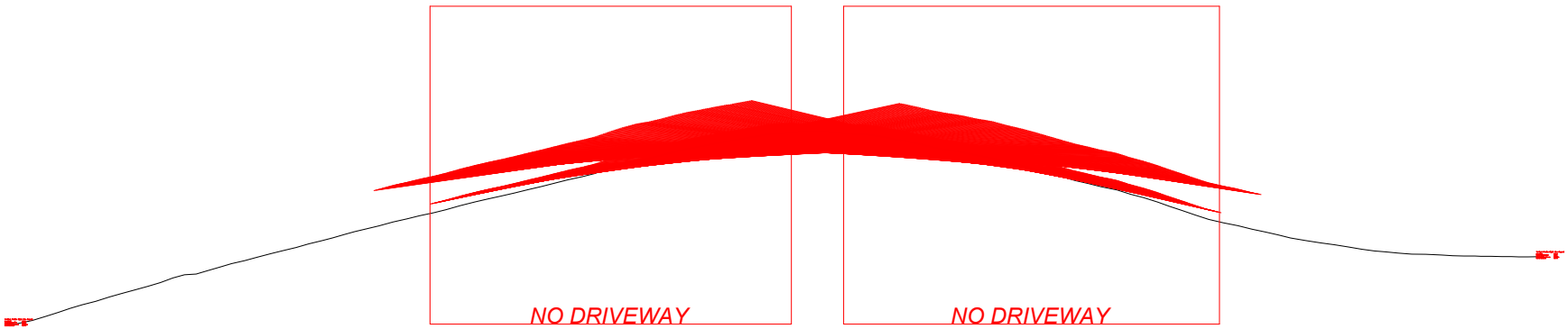
- Truck Eye (Single) to Headlights = 1.80 m to 0.60 m **= 240 m**



TAC 100 km/h design speed

Intersection Sight Distance **Right-turn**

- Truck Eye (Combo) to Top of Car = 2.30 m to 1.30 m **= 295 m**



TAC 100 km/h design speed

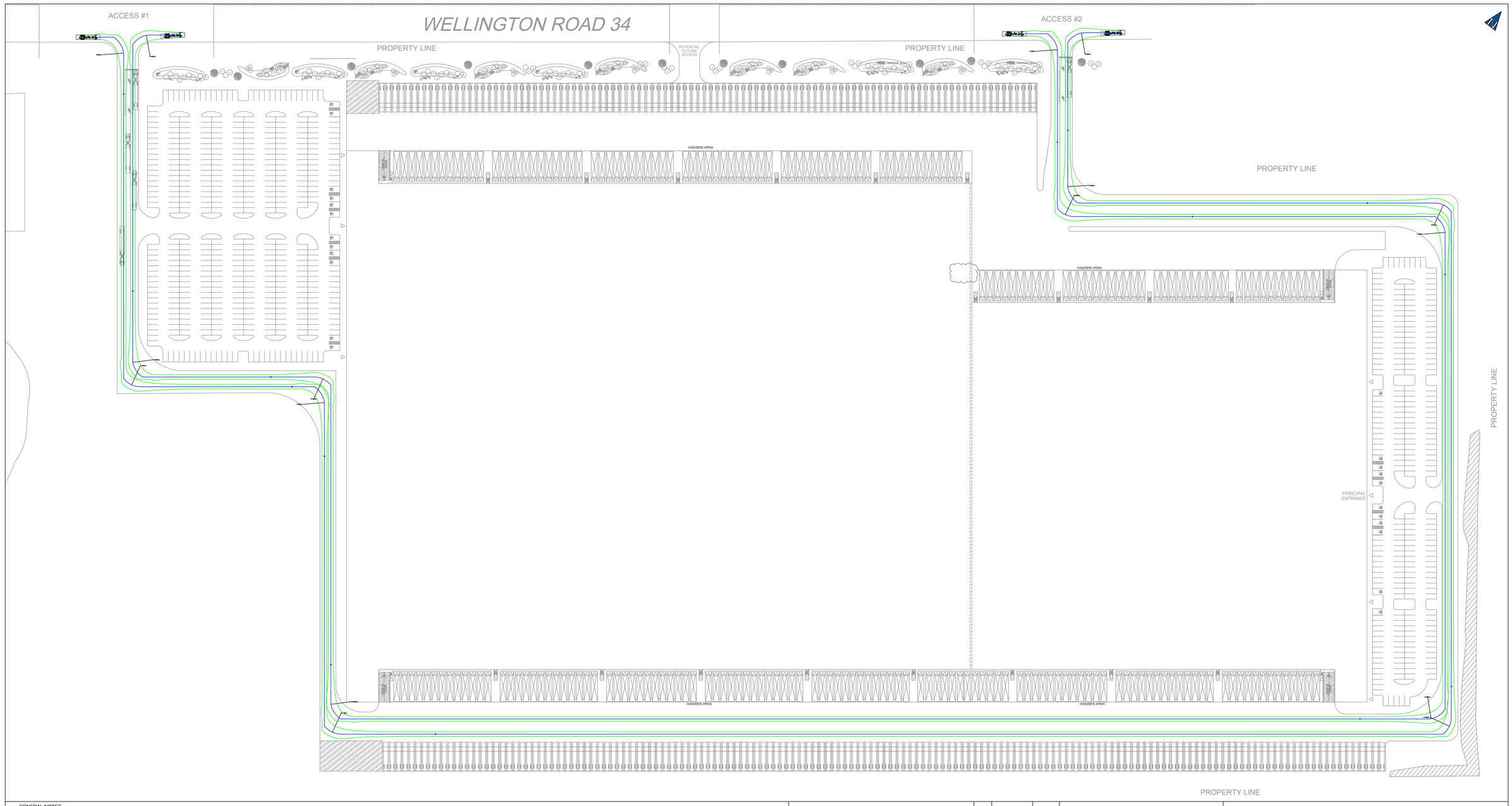
Driver Eye and Object in AutoTURN are flipped so it's driver eye at

Intersection Sight Distance **Right-turn**

- Truck Eye (Combo) to Headlights = 2.30 m to 0.60 m **= 295 m**

Appendix E

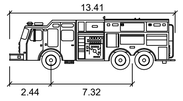
AutoTURN Analysis



GENERAL NOTES

1. THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

DESIGN VEHICLE:



Pumper Fire Truck

	meters
Width	: 2.59
Track	: 2.59
Lock to Lock Time	: 6.0
Steering Angle	: 37.8

NO.	DATE	INITIAL	REVISION DETAIL

DRAWING STATUS

ISSUED FOR REVIEW

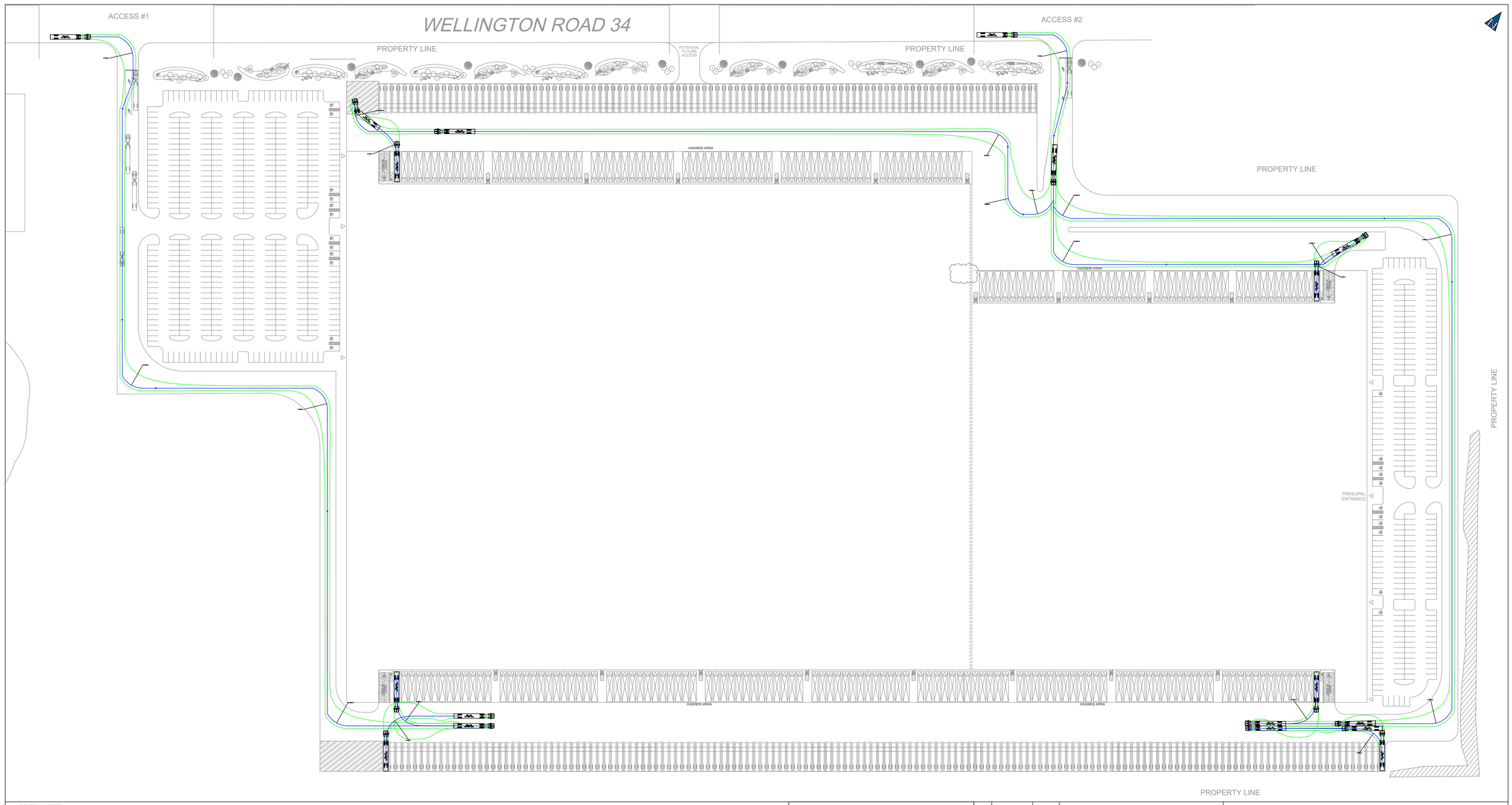
APPROVED DATE:_____

SIGNATURE

paradigm TRANSPORTATION SOLUTIONS LIMITED

AUTOTURN ASSESSMENT
7335 WELLINGTON ROAD 34
TOWNSHIP OF PUSLINCH

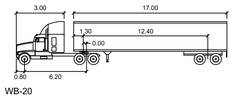
PROJECT NO.: 240623	DATE: JAN 2026	SCALE: 1:1000	DRAWING NO.:
DESIGN: DC	DRAWN: DC	CHECK: EB	01



GENERAL NOTES

1. THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

DESIGN VEHICLE:



WB-20

meters

Tractor Width	: 2.60	Lock to Lock Time	: 6.0
Trailer Width	: 2.60	Steering Angle	: 28.2
Tractor Track	: 2.60	Articulating Angle	: 70.0
Trailer Track	: 2.60		

NO.	DATE	INITIAL	REVISION DETAIL

DRAWING STATUS

ISSUED FOR REVIEW

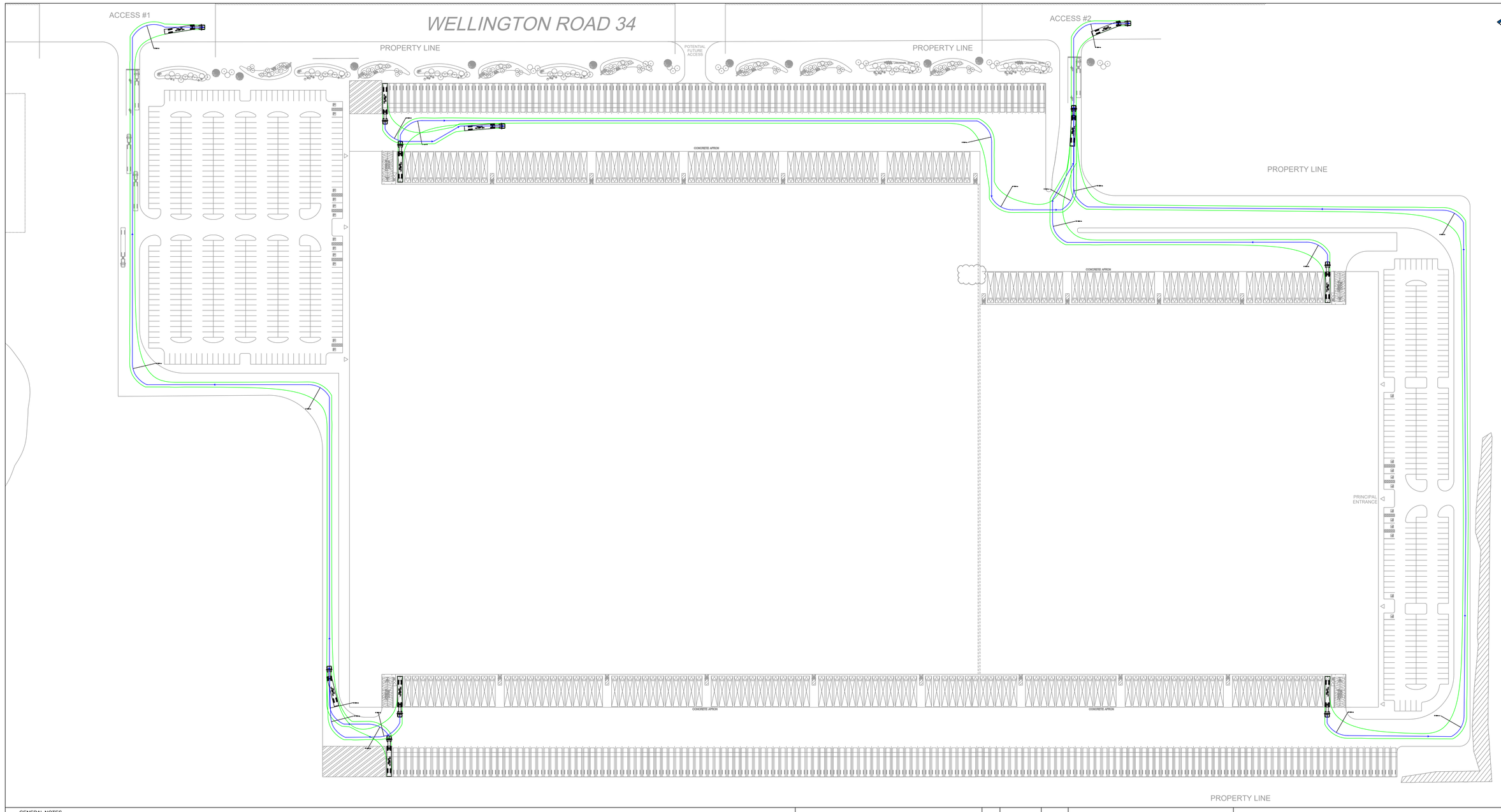
APPROVED DATE:_____

SIGNATURE

paradigm TRANSPORTATION SOLUTIONS LIMITED

AUTOTURN ASSESSMENT
7335 WELLINGTON ROAD 34
TOWNSHIP OF PUSLINCH

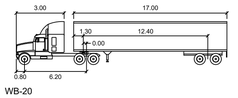
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DESIGN: DC	DRAWN: DC	CHECK: EB	02



GENERAL NOTES

1. THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

DESIGN VEHICLE:



WB-20

meters

Tractor Width	: 2.60	Lock to Lock Time	: 6.0
Trailer Width	: 2.60	Steering Angle	: 28.2
Tractor Track	: 2.60	Articulating Angle	: 70.0
Trailer Track	: 2.60		

NO.	DATE	INITIAL	REVISION DETAIL

DRAWING STATUS

ISSUED FOR REVIEW

APPROVED DATE:_____

SIGNATURE

paradigm TRANSPORTATION SOLUTIONS LIMITED

AUTOTURN ASSESSMENT
7335 WELLINGTON ROAD 34
TOWNSHIP OF PUSLINCH

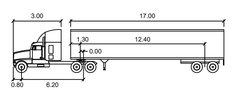
PROJECT NO.: 240623	DATE: JAN 2026	SCALE: 1:1000	DRAWING NO.:
DESIGN: DC	DRAWN: DC	CHECK: EB	03



GENERAL NOTES

1. THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

DESIGN VEHICLE:



WB-20

meters

Tractor Width	: 2.60	Lock to Lock Time	: 6.0
Trailer Width	: 2.60	Steering Angle	: 28.2
Tractor Track	: 2.60	Articulating Angle	: 70.0
Trailer Track	: 2.60		

NO.	DATE	INITIAL	REVISION DETAIL

DRAWING STATUS

ISSUED FOR REVIEW

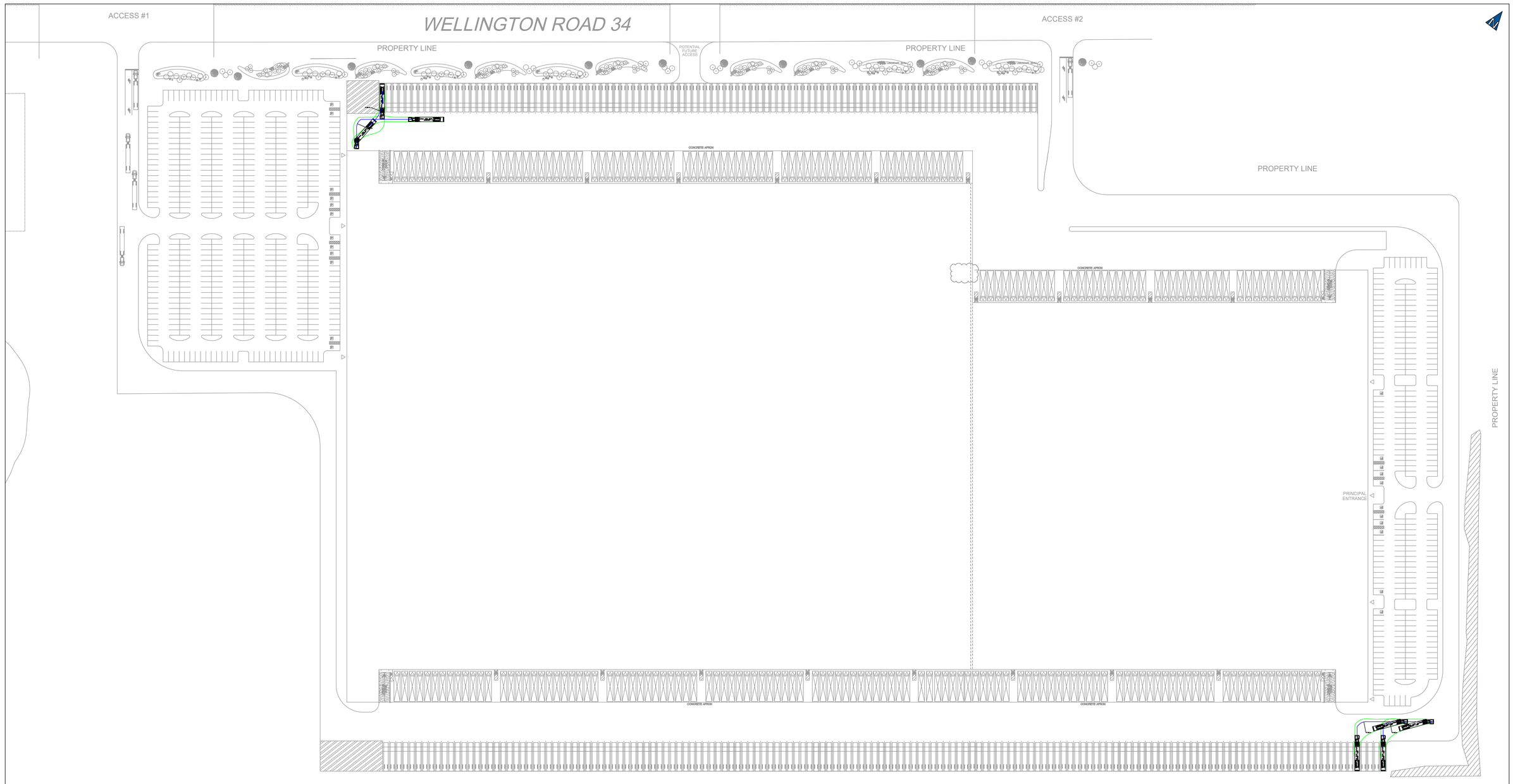
APPROVED DATE:_____

SIGNATURE

paradigm TRANSPORTATION SOLUTIONS LIMITED

AUTOTURN ASSESSMENT
7335 WELLINGTON ROAD 34
TOWNSHIP OF PUSLINCH

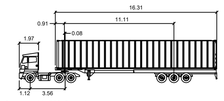
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DESIGN: DC	DRAWN: DC	CHECK: EB	



GENERAL NOTES

1. THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

DESIGN VEHICLE:



Spotter with 53ft Container

meters

Tractor Width	: 2.51	Lock to Lock Time	: 6.0
Trailer Width	: 2.59	Steering Angle	: 36.5
Tractor Track	: 2.43	Articulating Angle	: 70.0
Trailer Track	: 2.44		

NO.	DATE	INITIAL	REVISION DETAIL

DRAWING STATUS

ISSUED FOR REVIEW

APPROVED DATE:_____

SIGNATURE

paradigm TRANSPORTATION SOLUTIONS LIMITED

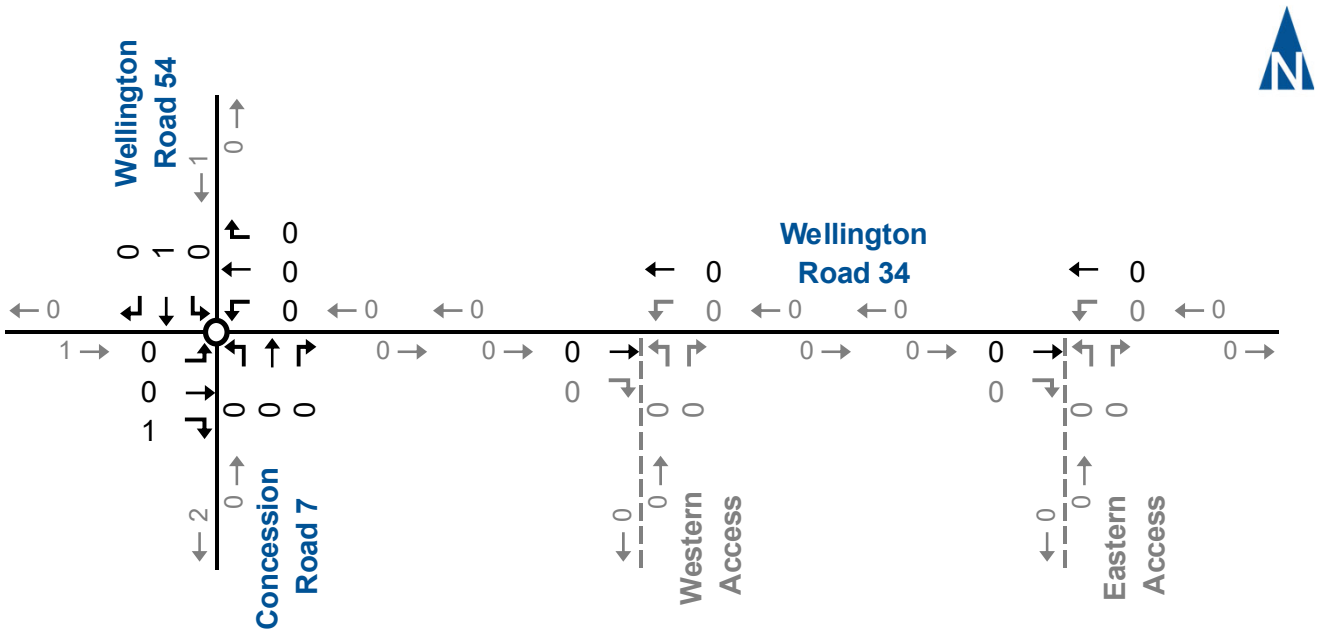
AUTOTURN ASSESSMENT
7335 WELLINGTON ROAD 34
TOWNSHIP OF PUSLINCH

PROJECT NO.: 240623	DATE: JAN 2026	SCALE: 1:1000	DRAWING NO.:
DESIGN: DC	DRAWN: DC	CHECK: EB	05

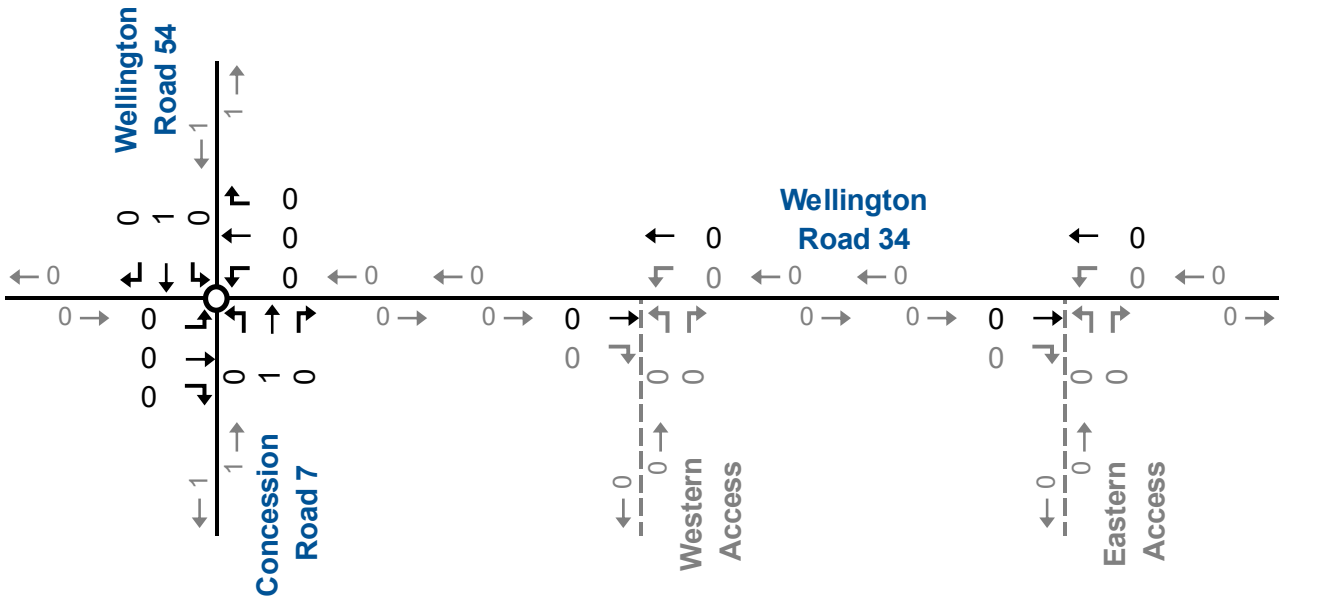
Appendix F

Background Development Traffic Volumes

AM Peak Hour

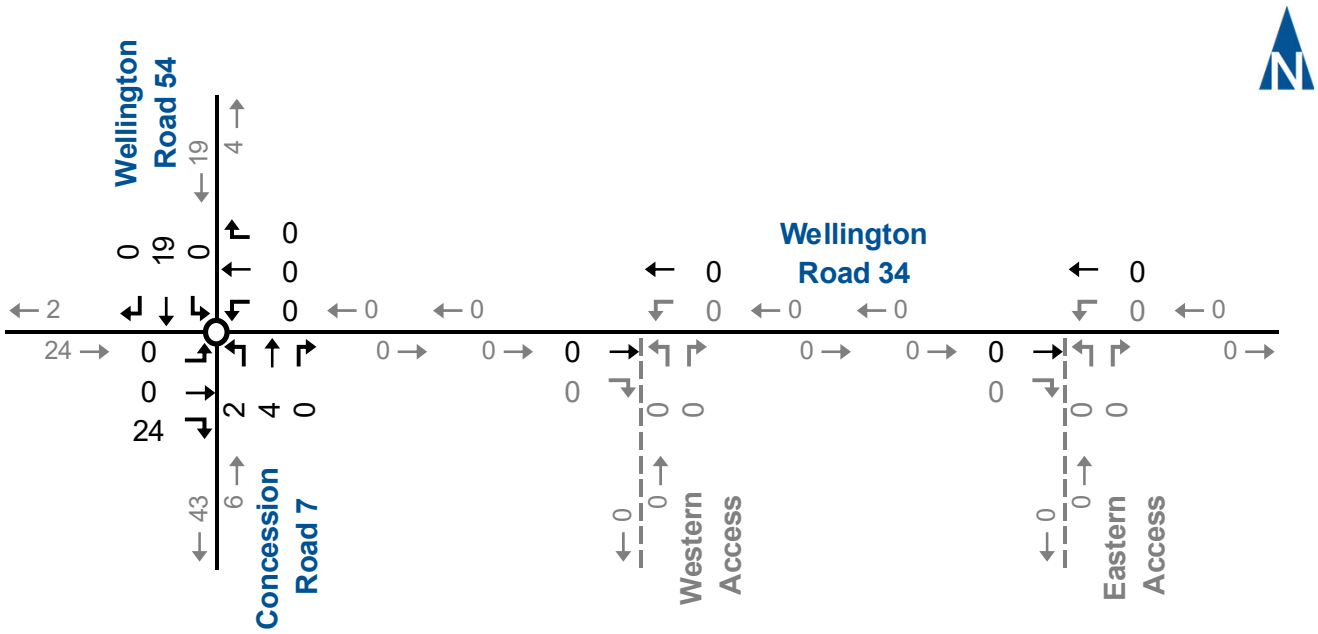


PM Peak Hour

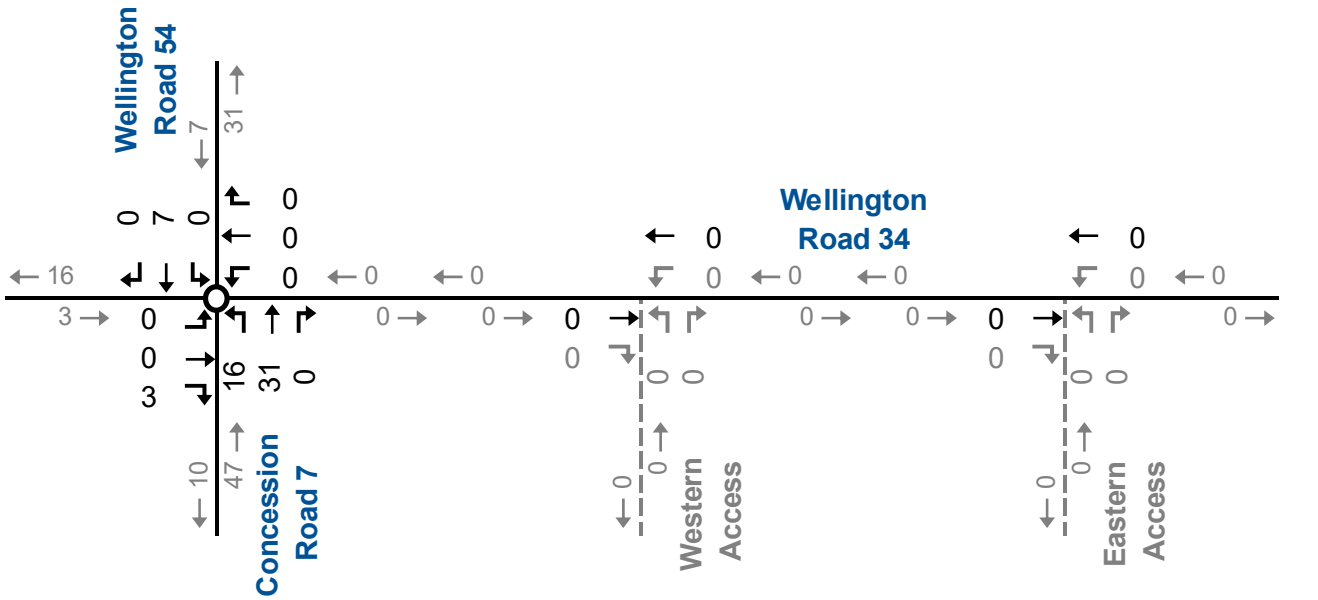


Background Development Traffic Volumes

AM Peak Hour



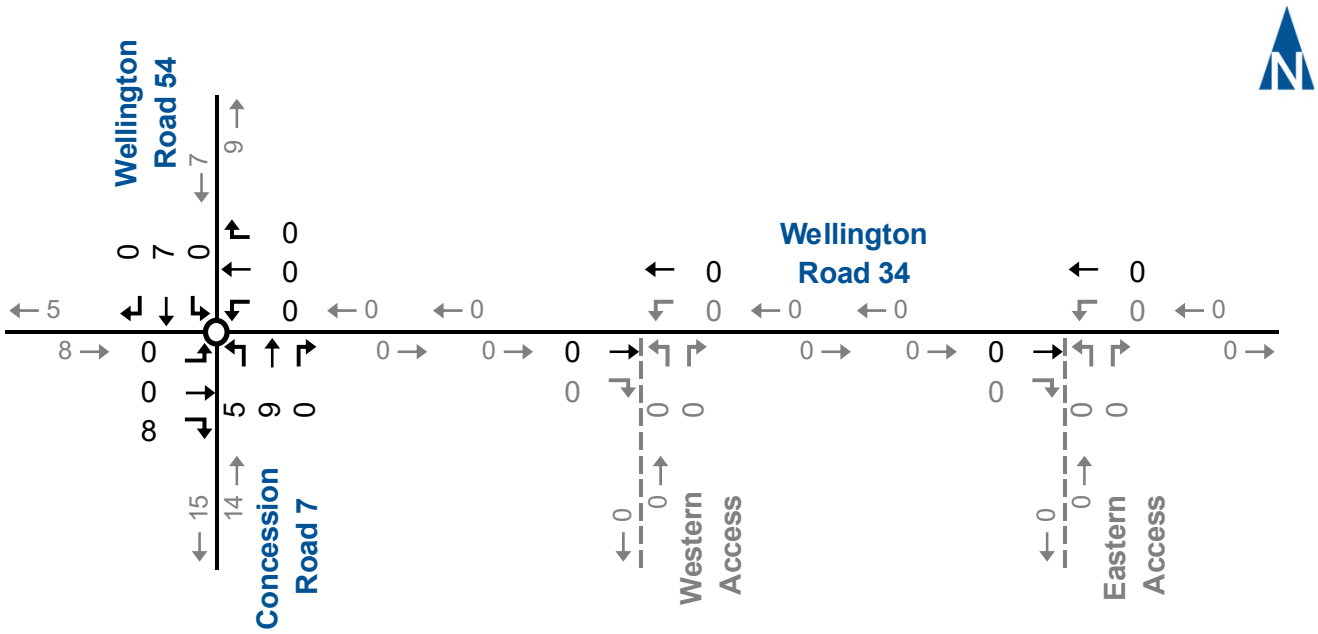
PM Peak Hour



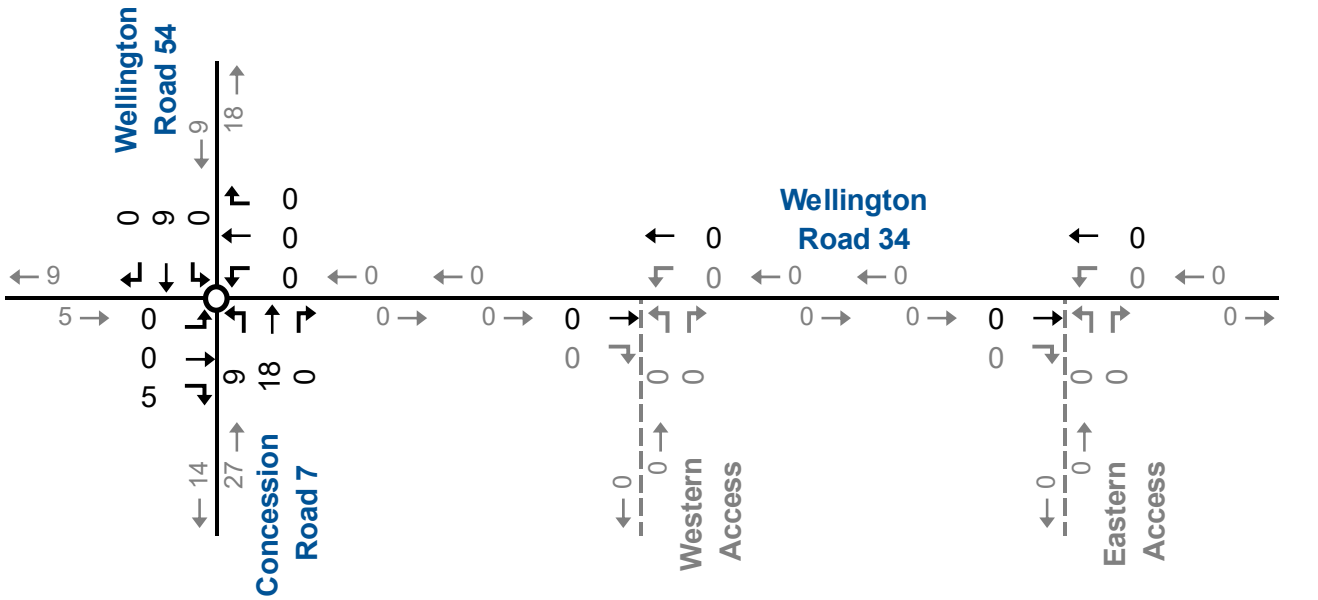
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Background Development Traffic Volumes

AM Peak Hour

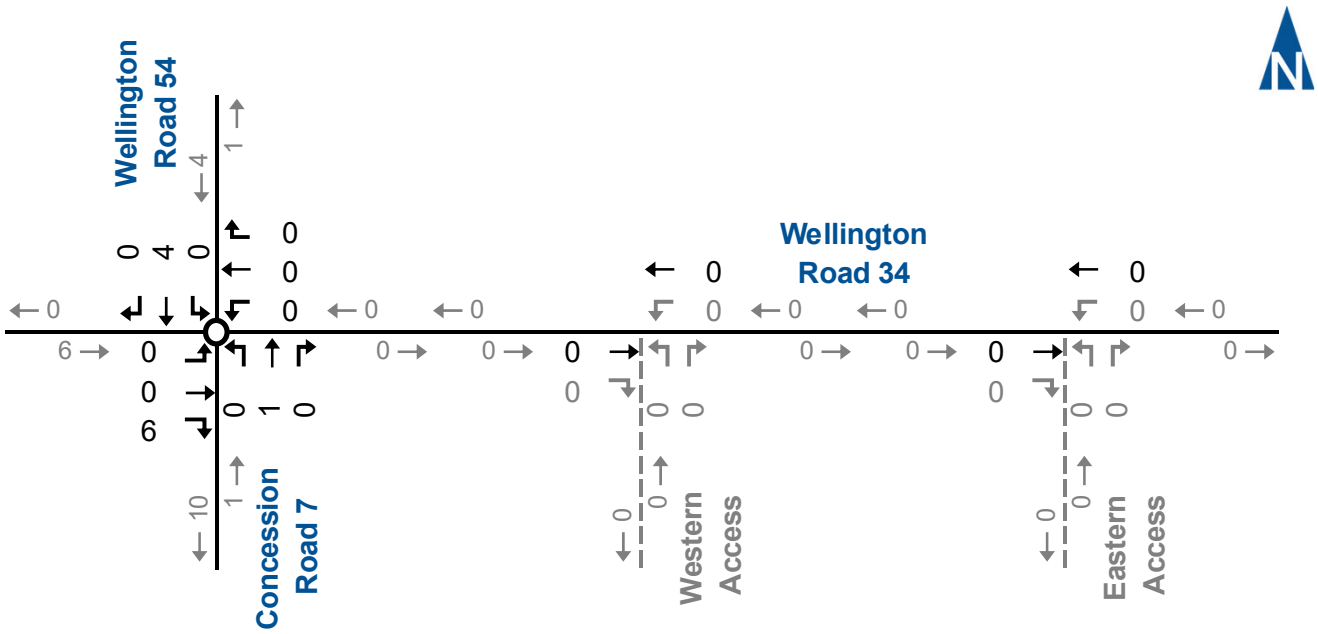


PM Peak Hour

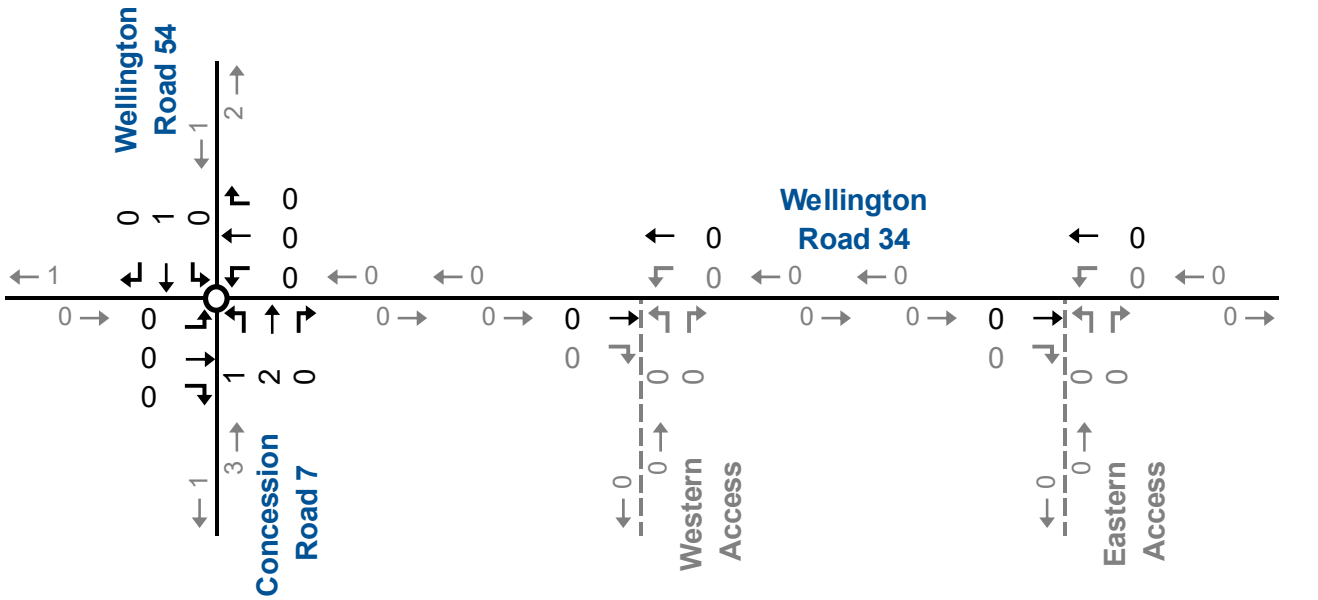


Background Development Traffic Volumes

AM Peak Hour



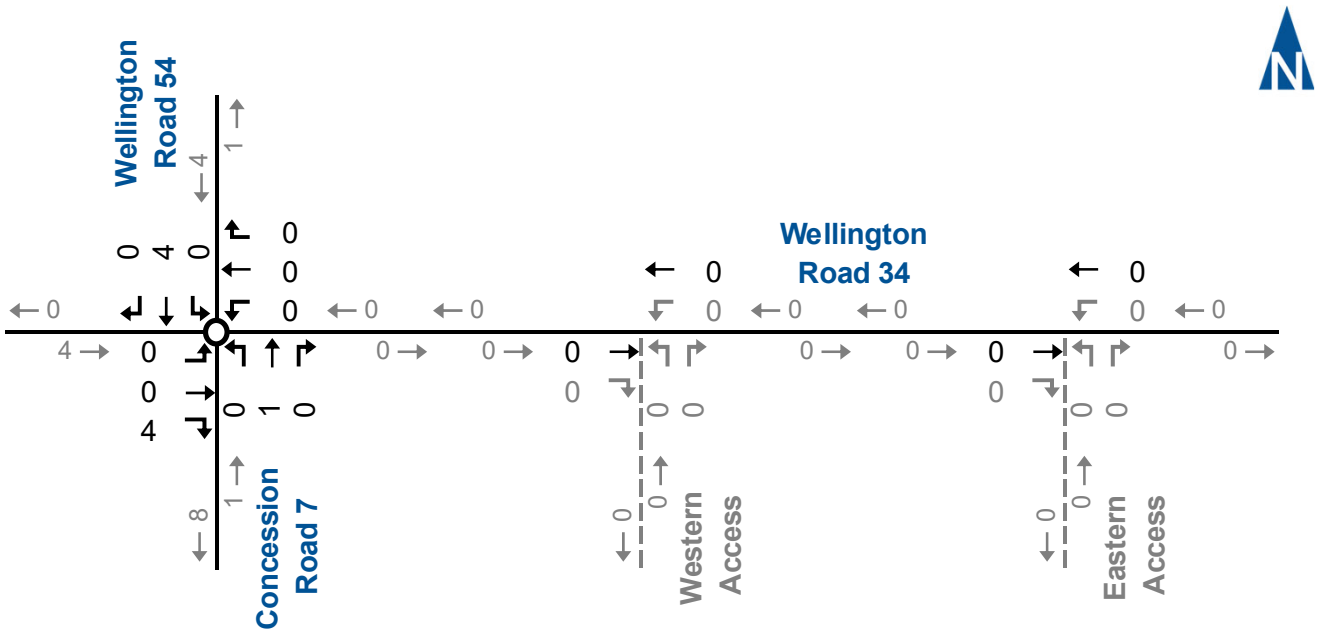
PM Peak Hour



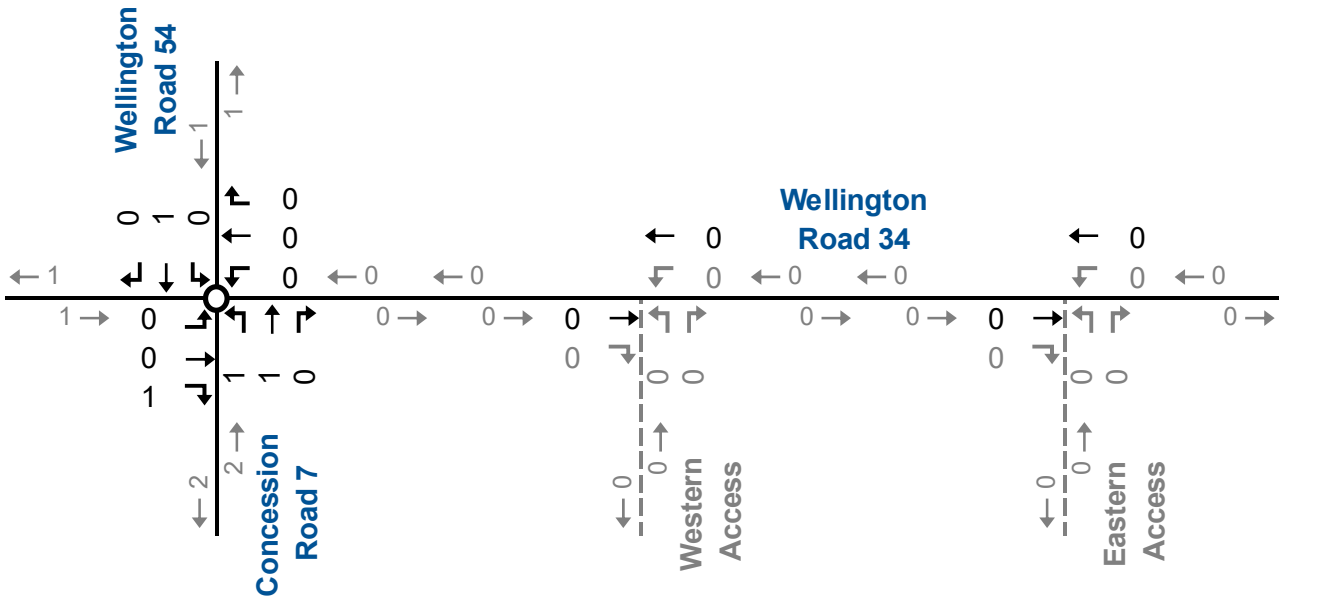
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Background Development Traffic Volumes

AM Peak Hour

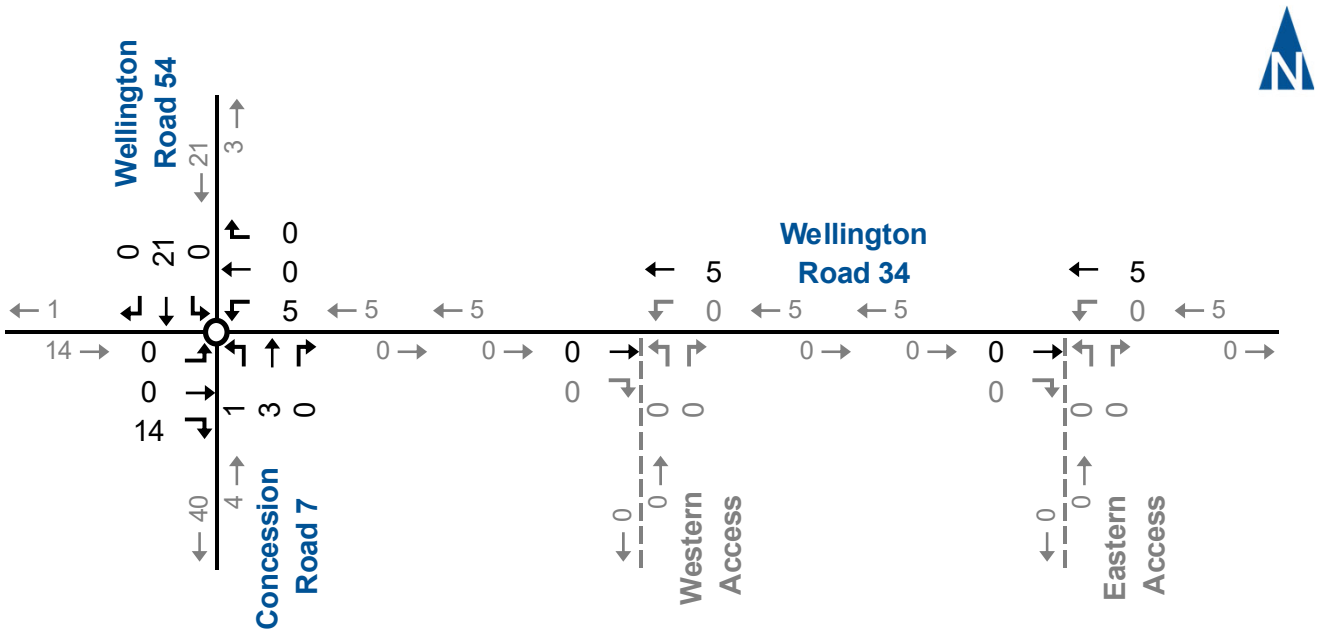


PM Peak Hour

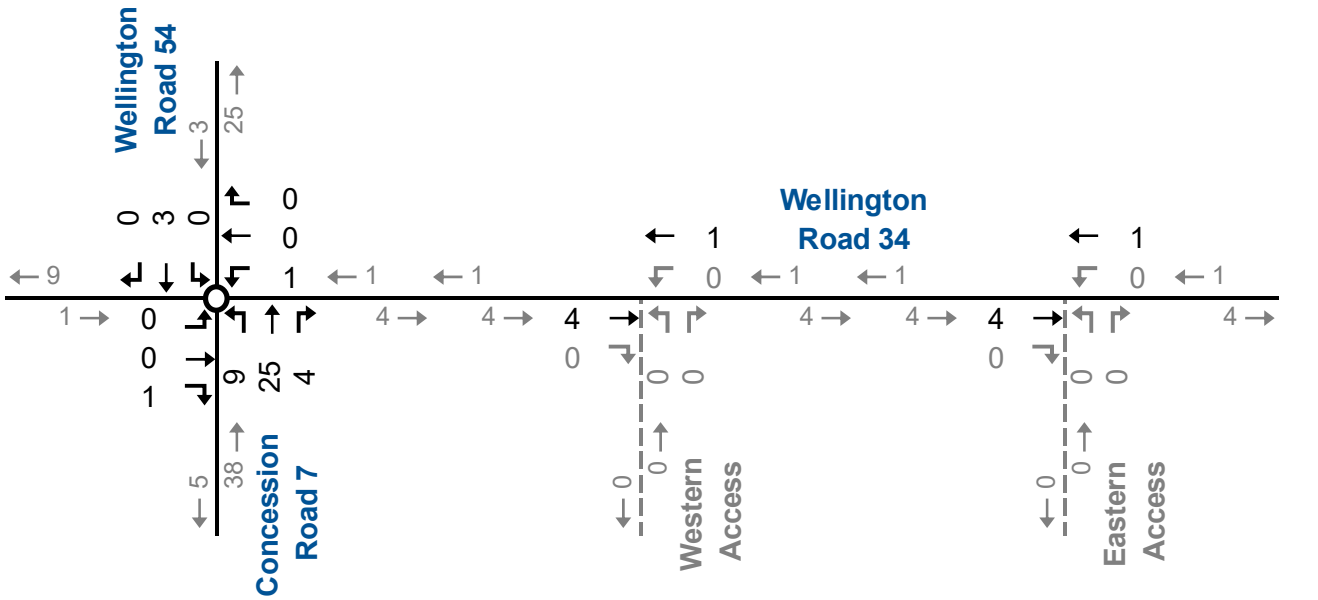


Background Development Traffic Volumes

AM Peak Hour



PM Peak Hour



Background Development Traffic Volumes

Appendix G

Background Operations

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]
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Filename: CR 7 & WR 34.arc8
Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Project Files\2024\240623-Arcady\2025-12
Report generation date: 2025-12-09 1:47:04 PM

Summary of intersection performance

	AM						
	Queue (PCE)	**95% Queue (PCE)**	**Delay (s)**	**V/C Ratio**	**LOS**	**Intersection Delay (s)**	**Intersection LOS**
	A1 - Background 2032						
Leg North	0.44	~1	4.45	0.29	A	4.87	A
Leg West	0.67	1.08	5.49	0.39	A		
Leg South	0.53	1.10	5.01	0.33	A		
Leg East	0.35	~1	4.29	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 2032, AM " model duration: 8:00 AM - 9:00 AM
"D4 - Background 2032, PM" model duration: 4:30 PM - 5:30 PM
"D5 - Total 2032, AM" model duration: 8:00 AM - 9:00 AM
"D6 - Total 2032, PM" model duration: 4:30 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2025-12-09 1:47:04 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2025-12-09
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 2032, 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
Background 2032, AM	Background 2032	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,West,South,East				4.87	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Wellington Road 54	
West	West	Wellington Road 34	
South	South	Concession Road 7	
East	East	Wellington Road 34	

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
West	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	
West	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
West		(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	✓	320.00	100.000
West	PHF	✓	393.00	100.000
South	PHF	✓	343.00	100.000
East	PHF	✓	260.00	100.000

Peak Hour Factor Data

Leg	Hourly Volume (PCE/hr)	Peak Hour Factor	Peak Time Segment
North	320.00	0.89	SecondQuarter
West	393.00	0.89	SecondQuarter
South	343.00	0.89	SecondQuarter
East	260.00	0.89	SecondQuarter

Turning Proportions

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

		To			
		North	**West**	**South**	**East**
From	**North**	0.000	14.000	221.000	85.000
	West	28.000	0.000	194.000	171.000
	South	255.000	37.000	0.000	51.000
	East	130.000	108.000	22.000	0.000

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

		To			
		North	**West**	**South**	**East**
From	**North**	0.00	0.04	0.69	0.27
	West	0.07	0.00	0.49	0.44
	South	0.74	0.11	0.00	0.15
	East	0.50	0.42	0.08	0.00

Vehicle Mix

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

		To			
		North	**West**	**South**	**East**
From	**North**	1.000	1.080	1.080	1.160
	West	1.130	1.000	1.100	1.040
	South	1.090	1.090	1.000	1.140
	East	1.020	1.000	1.160	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.0	8.0	8.0	16.0
	West	13.0	0.0	10.0	4.0
	South	9.0	9.0	0.0	14.0
	East	2.0	0.0	16.0	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	0.29	4.45	0.44	~1	A	320.00	320.00	22.46	4.21	0.37	22.47	4.21
West	0.39	5.49	0.67	1.08	A	393.00	393.00	32.86	5.02	0.55	32.87	5.02
South	0.33	5.01	0.53	1.10	A	343.00	343.00	26.62	4.66	0.44	26.62	4.66
East	0.25	4.29	0.35	~1	A	260.00	260.00	17.50	4.04	0.29	17.50	4.04

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	293.63	73.41	292.32	377.18	152.56	0.00	1269.15	1051.96	0.231	0.00	0.33	4.050	A
West	360.62	90.15	358.75	145.25	299.63	0.00	1184.03	733.91	0.305	0.00	0.47	4.679	A
South	314.74	78.68	313.20	399.07	259.30	0.00	1207.37	980.64	0.261	0.00	0.38	4.410	A
East	238.58	59.64	237.56	280.31	292.19	0.00	1188.34	844.02	0.201	0.00	0.26	3.865	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	359.55	89.89	359.10	463.37	187.40	0.00	1248.99	1051.96	0.288	0.33	0.44	4.449	A
West	441.57	110.39	440.77	178.42	368.08	0.00	1144.42	733.91	0.386	0.47	0.67	5.495	A
South	385.39	96.35	384.80	490.27	318.57	0.00	1173.07	980.64	0.329	0.38	0.53	5.008	A
East	292.13	73.03	291.77	344.39	358.99	0.00	1149.68	844.02	0.254	0.26	0.35	4.286	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	333.18	83.30	333.35	430.27	173.97	0.00	1256.76	1051.96	0.265	0.44	0.40	4.291	A
West	409.19	102.30	409.50	165.64	341.69	0.00	1159.69	733.91	0.353	0.67	0.59	5.162	A
South	357.13	89.28	357.36	455.29	295.90	0.00	1186.19	980.64	0.301	0.53	0.48	4.768	A
East	270.71	67.68	270.85	319.86	333.40	0.00	1164.49	844.02	0.232	0.35	0.31	4.118	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	293.63	73.41	293.90	379.37	153.38	0.00	1268.67	1051.96	0.231	0.40	0.33	4.063	A
West	360.62	90.15	361.08	146.04	301.24	0.00	1183.10	733.91	0.305	0.59	0.47	4.712	A
South	314.74	78.68	315.08	401.42	260.90	0.00	1206.44	980.64	0.261	0.48	0.39	4.432	A
East	238.58	59.64	238.79	282.03	293.96	0.00	1187.31	844.02	0.201	0.31	0.26	3.879	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	4.82	0.32	4.050	A	A
West	6.81	0.45	4.679	A	A
South	5.61	0.37	4.410	A	A
East	3.74	0.25	3.865	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	6.50	0.43	4.449	A	A
West	9.78	0.65	5.495	A	A
South	7.82	0.52	5.008	A	A
East	5.10	0.34	4.286	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	6.07	0.40	4.291	A	A
West	9.01	0.60	5.162	A	A
South	7.24	0.48	4.768	A	A
East	4.73	0.32	4.118	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	5.07	0.34	4.063	A	A
West	7.26	0.48	4.712	A	A
South	5.95	0.40	4.432	A	A
East	3.93	0.26	3.879	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	0.33	~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
West	0.47	~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	0.38	~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
East	0.26	~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	0.44	~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
West	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	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	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

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	0.40	~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
West	0.59	0.00	0.00	0.00	1.08			N/A	N/A
South	0.48	0.00	0.00	0.00	1.10			N/A	N/A
East	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

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	0.33	~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
West	0.47	~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	0.39	~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
East	0.26	~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

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]
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Filename: CR 7 & WR 34.arc8
Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Project Files\2024\240623-Arcady\2025-12
Report generation date: 2026-01-19 7:26:17 PM

Summary of intersection performance

	PM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity
	A1 - Background 2032							
Leg North	0.73	~1	6.00	0.41	A	6.12	A	55 % [Leg East]
Leg West	0.29	~1	4.22	0.22	A			
Leg South	0.87	~1	6.14	0.46	A			
Leg East	1.06	?	7.06	0.51	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. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

"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 2032, AM" model duration: 8:00 AM - 9:00 AM
"D4 - Background 2032, PM " model duration: 4:30 PM - 5:30 PM
"D5 - Total 2032, AM" model duration: 8:00 AM - 9:00 AM
"D6 - Total 2032, PM" model duration: 4:30 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2026-01-19 7:26:15 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2025-12-09
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	✓	✓	Delay	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 2032, 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
Background 2032, PM	Background 2032	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,West,South,East				6.12	A

Intersection Network Options

Driving Side	Lighting	Network Residual Capacity (%)	First Leg Reaching Threshold
Right	Normal/unknown	55	Leg East

Legs

Legs

Leg	Leg	Name	Description
North	North	Wellington Road 54	
West	West	Wellington Road 34	
South	South	Concession Road 7	
East	East	Wellington Road 34	

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
West	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	
West	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
West		(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	✓	414.00	100.000
West	PHF	✓	230.00	100.000
South	PHF	✓	487.00	100.000
East	PHF	✓	512.00	100.000

Peak Hour Factor Data

Leg	Hourly Volume (PCE/hr)	Peak Hour Factor	Peak Time Segment
North	414.00	0.94	SecondQuarter
West	230.00	0.94	SecondQuarter
South	487.00	0.94	SecondQuarter
East	512.00	0.94	SecondQuarter

Turning Proportions

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

		To			
		North	**West**	**South**	**East**
From	**North**	0.000	45.000	202.000	167.000
	West	24.000	0.000	39.000	167.000
	South	304.000	142.000	0.000	41.000
	East	211.000	285.000	16.000	0.000

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

		To			
		North	**West**	**South**	**East**
From	**North**	0.00	0.11	0.49	0.40
	West	0.10	0.00	0.17	0.73
	South	0.62	0.29	0.00	0.08
	East	0.41	0.56	0.03	0.00

Vehicle Mix

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

		To			
		North	**West**	**South**	**East**
From	**North**	1.000	1.000	1.120	1.050
	West	1.050	1.000	1.090	1.010
	South	1.070	1.050	1.000	1.000
	East	1.030	1.030	1.080	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.0	0.0	12.0	5.0
	West	5.0	0.0	9.0	1.0
	South	7.0	5.0	0.0	0.0
	East	3.0	3.0	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	0.41	6.00	0.73	~1	A	414.00	414.00	38.79	5.62	0.65	38.80	5.62
West	0.22	4.22	0.29	~1	A	230.00	230.00	15.61	4.07	0.26	15.61	4.07
South	0.46	6.14	0.87	~1	A	487.00	487.00	46.43	5.72	0.77	46.45	5.72
East	0.51	7.06	1.06	?	A	512.00	512.00	55.08	6.46	0.92	55.10	6.46

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	396.38	99.10	394.02	512.85	421.40	0.00	1113.56	921.77	0.356	0.00	0.59	5.371	A
West	220.21	55.05	219.24	449.01	366.41	0.00	1145.38	865.30	0.192	0.00	0.24	3.987	A
South	466.28	116.57	463.46	244.65	341.01	0.00	1160.08	726.36	0.402	0.00	0.70	5.445	A
East	490.21	122.55	486.93	357.15	447.32	0.00	1098.55	920.19	0.446	0.00	0.82	6.039	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	440.43	110.11	439.87	572.57	470.52	0.00	1085.12	921.77	0.406	0.59	0.73	6.003	A
West	244.68	61.17	244.51	501.34	409.05	0.00	1120.70	865.30	0.218	0.24	0.29	4.217	A
South	518.09	129.52	517.40	273.08	380.49	0.00	1137.23	726.36	0.456	0.70	0.87	6.138	A
East	544.68	136.17	543.74	398.53	499.36	0.00	1068.44	920.19	0.510	0.82	1.06	7.064	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	422.81	105.70	422.99	550.74	452.67	0.00	1095.46	921.77	0.386	0.73	0.68	5.769	A
West	234.89	58.72	234.95	482.29	393.36	0.00	1129.78	865.30	0.208	0.29	0.27	4.131	A
South	497.36	124.34	497.58	262.57	365.74	0.00	1145.77	726.36	0.434	0.87	0.82	5.877	A
East	522.89	130.72	523.20	383.11	480.21	0.00	1079.52	920.19	0.484	1.06	0.98	6.678	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	396.38	99.10	396.71	516.55	424.59	0.00	1111.71	921.77	0.357	0.68	0.60	5.426	A
West	220.21	55.05	220.31	452.37	368.92	0.00	1143.93	865.30	0.193	0.27	0.25	4.004	A
South	466.28	116.57	466.68	246.26	342.98	0.00	1158.94	726.36	0.402	0.82	0.72	5.504	A
East	490.21	122.55	490.76	359.28	450.38	0.00	1096.78	920.19	0.447	0.98	0.84	6.132	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	8.55	0.57	5.371	A	A
West	3.56	0.24	3.987	A	A
South	10.19	0.68	5.445	A	A
East	11.83	0.79	6.039	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	10.67	0.71	6.003	A	A
West	4.22	0.28	4.217	A	A
South	12.80	0.85	6.138	A	A
East	15.38	1.03	7.064	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	10.38	0.69	5.769	A	A
West	4.10	0.27	4.131	A	A
South	12.46	0.83	5.877	A	A
East	14.95	1.00	6.678	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	9.19	0.61	5.426	A	A
West	3.73	0.25	4.004	A	A
South	10.98	0.73	5.504	A	A
East	12.92	0.86	6.132	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	0.59	~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
West	0.24	~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	0.70	~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
East	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

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	0.73	~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
West	0.29	~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	0.87	~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	1.06	?	?	?	?	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	0.68	~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
West	0.27	~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	0.82	~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
East	0.98	~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	0.60	~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
West	0.25	~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	0.72	~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
East	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

Appendix H

Total Operations

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]
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Filename: CR 7 & WR 34.arc8
Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Project Files\2024\240623-Arcady\2026-07
Report generation date: 2026-07-21 1:10:30 PM

« (Default Analysis Set) - Total 2032, 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	Network Residual Capacity
	A1 - Total 2032							
Leg North	0.54	1.11	4.78	0.33	A	5.39	A	74 % [Leg West]
Leg West	0.86	~1	6.27	0.45	A			
Leg South	0.61	1.10	5.55	0.36	A			
Leg East	0.42	~1	4.63	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. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

"D5 - Total 2032, AM " model duration: 8:00 AM - 9:00 AM
"D6 - Total 2032, PM" model duration: 4:30 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2026-07-21 1:10:29 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2025-12-09
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	✓	✓	Delay	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 2032, 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 2032, AM	Total 2032	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,West,South,East				5.39	A

Intersection Network Options

Driving Side	Lighting	Network Residual Capacity (%)	First Leg Reaching Threshold
Right	Normal/unknown	74	Leg West

Legs

Legs

Leg	Leg	Name	Description
North	North	Wellington Road 54	
West	West	Wellington Road 34	
South	South	Concession Road 7	
East	East	Wellington Road 34	

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
West	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	
West	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
West		(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	✓	363.00	100.000
West	PHF	✓	443.00	100.000
South	PHF	✓	357.00	100.000
East	PHF	✓	291.00	100.000

Peak Hour Factor Data

Leg	Hourly Volume (PCE/hr)	Peak Hour Factor	Peak Time Segment
North	363.00	0.89	SecondQuarter
West	443.00	0.89	SecondQuarter
South	357.00	0.89	SecondQuarter
East	291.00	0.89	SecondQuarter

Turning Proportions

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

		To			
		North	West	South	East
From	North	0.000	14.000	221.000	128.000
	West	28.000	0.000	194.000	221.000
	South	255.000	37.000	0.000	65.000
	East	147.000	117.000	27.000	0.000

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

		To			
		North	West	South	East
From	North	0.00	0.04	0.61	0.35
	West	0.06	0.00	0.44	0.50
	South	0.71	0.10	0.00	0.18
	East	0.51	0.40	0.09	0.00

Vehicle Mix

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

		To			
		North	West	South	East
From	North	1.000	1.080	1.080	1.160
	West	1.130	1.000	1.100	1.050
	South	1.090	1.090	1.000	1.140
	East	1.060	1.030	1.190	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.0	8.0	8.0	16.0
	West	13.0	0.0	10.0	5.0
	South	9.0	9.0	0.0	14.0
	East	6.0	3.0	19.0	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	0.33	4.78	0.54	1.11	A	363.00	363.00	27.13	4.48	0.45	27.14	4.49
West	0.45	6.27	0.86	~1	A	443.00	443.00	41.34	5.60	0.69	41.35	5.60
South	0.36	5.55	0.61	1.10	A	357.00	357.00	30.21	5.08	0.50	30.21	5.08
East	0.28	4.63	0.42	~1	A	291.00	291.00	21.01	4.33	0.35	21.01	4.33

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	333.09	83.27	331.51	392.58	165.30	0.00	1261.77	1044.90	0.264	0.00	0.39	4.277	A
West	406.50	101.62	404.19	153.43	343.39	0.00	1158.71	727.63	0.351	0.00	0.58	5.120	A
South	327.58	81.90	325.86	403.50	344.08	0.00	1158.30	907.50	0.283	0.00	0.43	4.742	A
East	267.02	66.76	265.80	377.87	292.08	0.00	1188.40	901.23	0.225	0.00	0.30	4.125	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	407.87	101.97	407.29	482.32	203.07	0.00	1239.92	1044.90	0.329	0.39	0.54	4.783	A
West	497.75	124.44	496.62	188.48	421.88	0.00	1113.28	727.63	0.447	0.58	0.86	6.271	A
South	401.12	100.28	400.39	495.74	422.76	0.00	1112.77	907.50	0.360	0.43	0.61	5.546	A
East	326.97	81.74	326.52	464.27	358.88	0.00	1149.74	901.23	0.284	0.30	0.42	4.626	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	377.96	94.49	378.17	448.03	188.57	0.00	1248.31	1044.90	0.303	0.54	0.48	4.580	A
West	461.25	115.31	461.69	175.03	391.72	0.00	1130.74	727.63	0.408	0.86	0.75	5.796	A
South	371.71	92.93	371.99	460.55	392.86	0.00	1130.08	907.50	0.329	0.61	0.54	5.219	A
East	302.99	75.75	303.16	431.41	333.44	0.00	1164.46	901.23	0.260	0.42	0.37	4.424	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	333.09	83.27	333.43	395.05	166.26	0.00	1261.22	1044.90	0.264	0.48	0.40	4.296	A
West	406.50	101.62	407.14	154.32	345.37	0.00	1157.56	727.63	0.351	0.75	0.59	5.167	A
South	327.58	81.90	328.01	406.09	346.42	0.00	1156.95	907.50	0.283	0.54	0.44	4.775	A
East	267.02	66.76	267.29	380.41	294.02	0.00	1187.28	901.23	0.225	0.37	0.31	4.142	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	5.77	0.38	4.277	A	A
West	8.37	0.56	5.120	A	A
South	6.27	0.42	4.742	A	A
East	4.46	0.30	4.125	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	7.91	0.53	4.783	A	A
West	12.51	0.83	6.271	A	A
South	8.98	0.60	5.546	A	A
East	6.14	0.41	4.626	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	7.36	0.49	4.580	A	A
West	11.45	0.76	5.796	A	A
South	8.28	0.55	5.219	A	A
East	5.69	0.38	4.424	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	6.10	0.41	4.296	A	A
West	9.01	0.60	5.167	A	A
South	6.68	0.45	4.775	A	A
East	4.71	0.31	4.142	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	0.39	~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
West	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
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	0.30	~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

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	0.54	~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
West	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	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	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

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	0.48	0.00	0.00	0.00	1.11			N/A	N/A
West	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
South	0.54	0.00	0.00	0.00	1.10			N/A	N/A
East	0.37	~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	0.40	~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
West	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
South	0.44	~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	0.31	~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

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	349	65	21	275	16	6
Future Volume (vph)	349	65	21	275	16	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	0.979				0.961	
Flt Protected				0.996	0.966	
Satd. Flow (prot)	1701	0	0	1802	1490	0
Flt Permitted				0.996	0.966	
Satd. Flow (perm)	1701	0	0	1802	1490	0
Link Speed (k/h)	80			80	50	
Link Distance (m)	286.9			519.3	86.0	
Travel Time (s)	12.9			23.4	6.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	10%	6%	5%	5%	19%	17%
Adj. Flow (vph)	379	71	23	299	17	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	450	0	0	322	24	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 41.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	349	65	21	275	16	6
Future Vol, veh/h	349	65	21	275	16	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	6	5	5	19	17
Mvmt Flow	379	71	23	299	17	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	450	0	759	415
Stage 1	-	-	-	-	415	-
Stage 2	-	-	-	-	345	-
Critical Hdwy	-	-	4.15	-	6.59	6.37
Critical Hdwy Stg 1	-	-	-	-	5.59	-
Critical Hdwy Stg 2	-	-	-	-	5.59	-
Follow-up Hdwy	-	-	2.245	-	3.671	3.453
Pot Cap-1 Maneuver	-	-	1095	-	351	607
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	681	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1095	-	342	607
Mov Cap-2 Maneuver	-	-	-	-	342	-
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	681	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.59	14.88
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	388	-	-	128	-
HCM Lane V/C Ratio	0.062	-	-	0.021	-
HCM Ctrl Dly (s/v)	14.9	-	-	8.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	313	42	14	281	15	6
Future Volume (vph)	313	42	14	281	15	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	0.984				0.959	
Flt Protected				0.998	0.966	
Satd. Flow (prot)	1697	0	0	1843	1157	0
Flt Permitted				0.998	0.966	
Satd. Flow (perm)	1697	0	0	1843	1157	0
Link Speed (k/h)	80			80	50	
Link Distance (m)	519.3			237.0	83.3	
Travel Time (s)	23.4			10.7	6.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	9%	19%	21%	2%	53%	50%
Adj. Flow (vph)	340	46	15	305	16	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	386	0	0	320	23	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 36.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	313	42	14	281	15	6
Future Vol, veh/h	313	42	14	281	15	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	9	19	21	2	53	50
Mvmt Flow	340	46	15	305	16	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	386	0	699	363
Stage 1	-	-	-	-	363	-
Stage 2	-	-	-	-	336	-
Critical Hdwy	-	-	4.31	-	6.93	6.7
Critical Hdwy Stg 1	-	-	-	-	5.93	-
Critical Hdwy Stg 2	-	-	-	-	5.93	-
Follow-up Hdwy	-	-	2.389	-	3.977	3.75
Pot Cap-1 Maneuver	-	-	1076	-	338	587
Stage 1	-	-	-	-	604	-
Stage 2	-	-	-	-	623	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1076	-	333	587
Mov Cap-2 Maneuver	-	-	-	-	333	-
Stage 1	-	-	-	-	594	-
Stage 2	-	-	-	-	623	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.4	15.09
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	380	-	-	85	-
HCM Lane V/C Ratio	0.06	-	-	0.014	-
HCM Ctrl Dly (s/v)	15.1	-	-	8.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]
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Filename: CR 7 & WR 34.arc8
Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Project Files\2024\240623-Arcady\2026-07
Report generation date: 2026-07-21 1:02:08 PM

« (Default Analysis Set) - Total 2032, 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	Network Residual Capacity
	A1 - Total 2032							
Leg North	0.86	~1	6.71	0.44	A	7.24	A	34 % [Leg East]
Leg West	0.32	~1	4.44	0.24	A			
Leg South	0.93	~1	6.45	0.47	A			
Leg East	1.70	2.08	9.31	0.63	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. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

"D5 - Total 2032, AM" model duration: 8:00 AM - 9:00 AM
"D6 - Total 2032, PM " model duration: 4:30 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2026-07-21 1:02:08 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2025-12-09
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	✓	✓	Delay	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 2032, 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 2032, PM	Total 2032	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,West,South,East				7.24	A

Intersection Network Options

Driving Side	Lighting	Network Residual Capacity (%)	First Leg Reaching Threshold
Right	Normal/unknown	34	Leg East

Legs

Legs

Leg	Leg	Name	Description
North	North	Wellington Road 54	
West	West	Wellington Road 34	
South	South	Concession Road 7	
East	East	Wellington Road 34	

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
West	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	
West	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
West		(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	✓	436.00	100.000
West	PHF	✓	243.00	100.000
South	PHF	✓	494.00	100.000
East	PHF	✓	629.00	100.000

Peak Hour Factor Data

Leg	Hourly Volume (PCE/hr)	Peak Hour Factor	Peak Time Segment
North	436.00	0.94	SecondQuarter
West	243.00	0.94	SecondQuarter
South	494.00	0.94	SecondQuarter
East	629.00	0.94	SecondQuarter

Turning Proportions

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

		To			
		North	West	South	East
From	North	0.000	45.000	204.000	187.000
	West	24.000	0.000	39.000	180.000
	South	304.000	142.000	0.000	48.000
	East	261.000	335.000	33.000	0.000

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

		To			
		North	West	South	East
From	North	0.00	0.10	0.47	0.43
	West	0.10	0.00	0.16	0.74
	South	0.62	0.29	0.00	0.10
	East	0.41	0.53	0.05	0.00

Vehicle Mix

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

		To			
		North	West	South	East
From	North	1.000	1.000	1.120	1.070
	West	1.050	1.000	1.090	1.020
	South	1.070	1.050	1.000	1.050
	East	1.040	1.040	1.080	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.0	0.0	12.0	7.0
	West	5.0	0.0	9.0	2.0
	South	7.0	5.0	0.0	5.0
	East	4.0	4.0	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	0.44	6.71	0.86	~1	A	436.00	436.00	45.14	6.21	0.75	45.15	6.21
West	0.24	4.44	0.32	~1	A	243.00	243.00	17.28	4.27	0.29	17.28	4.27
South	0.47	6.45	0.93	~1	A	494.00	494.00	49.23	5.98	0.82	49.25	5.98
East	0.63	9.31	1.70	2.08	A	629.00	629.00	85.94	8.20	1.43	85.99	8.20

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	417.45	104.36	414.73	559.94	484.54	0.00	1077.01	921.84	0.388	0.00	0.68	5.874	A
West	232.66	58.16	231.59	496.01	403.26	0.00	1124.05	850.60	0.207	0.00	0.27	4.164	A
South	472.98	118.24	470.01	262.55	372.30	0.00	1141.98	715.34	0.414	0.00	0.74	5.666	A
East	602.23	150.56	597.27	395.09	447.21	0.00	1098.62	935.04	0.548	0.00	1.24	7.411	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	463.83	115.96	463.12	625.35	541.26	0.00	1044.19	921.85	0.444	0.68	0.86	6.712	A
West	258.51	64.63	258.32	554.05	450.33	0.00	1096.81	850.59	0.236	0.27	0.32	4.436	A
South	525.53	131.38	524.78	293.16	415.49	0.00	1116.98	715.34	0.471	0.74	0.93	6.449	A
East	669.15	167.29	667.31	440.97	499.30	0.00	1068.47	935.04	0.626	1.24	1.70	9.305	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	445.28	111.32	445.50	601.92	521.25	0.00	1055.77	921.84	0.422	0.86	0.80	6.404	A
West	248.17	62.04	248.24	533.50	433.25	0.00	1106.70	850.60	0.224	0.32	0.30	4.334	A
South	504.51	126.13	504.75	282.02	399.47	0.00	1126.25	715.34	0.448	0.93	0.87	6.157	A
East	642.38	160.60	642.95	424.00	480.23	0.00	1079.51	935.04	0.595	1.70	1.56	8.607	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	417.45	104.36	417.86	564.67	489.06	0.00	1074.40	921.84	0.389	0.80	0.70	5.954	A
West	232.66	58.16	232.77	500.53	406.39	0.00	1122.25	850.60	0.207	0.30	0.27	4.185	A
South	472.98	118.24	473.42	264.52	374.64	0.00	1140.62	715.34	0.415	0.87	0.76	5.737	A
East	602.23	150.56	603.31	397.65	450.41	0.00	1096.76	935.04	0.549	1.56	1.29	7.619	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	9.82	0.65	5.874	A	A
West	3.93	0.26	4.164	A	A
South	10.74	0.72	5.666	A	A
East	17.65	1.18	7.411	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	12.51	0.83	6.712	A	A
West	4.68	0.31	4.436	A	A
South	13.62	0.91	6.449	A	A
East	24.43	1.63	9.305	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	12.17	0.81	6.404	A	A
West	4.55	0.30	4.334	A	A
South	13.25	0.88	6.157	A	A
East	23.91	1.59	8.607	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	10.65	0.71	5.954	A	A
West	4.13	0.28	4.185	A	A
South	11.62	0.77	5.737	A	A
East	19.95	1.33	7.619	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	0.68	~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
West	0.27	~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	0.74	~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
East	1.24	0.00	0.00	1.04	2.08			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
West	0.32	~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	0.93	~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	1.70	?	?	?	?	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	0.80	~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
West	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
South	0.87	~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	1.56	?	?	?	?	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	0.70	~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
West	0.27	~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	0.76	~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
East	1.29	0.00	0.00	2.08	2.08			N/A	N/A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	392	22	14	558	71	30
Future Volume (vph)	392	22	14	558	71	30
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	0.993				0.959	
Flt Protected				0.999	0.966	
Satd. Flow (prot)	1805	0	0	1804	1697	0
Flt Permitted				0.999	0.966	
Satd. Flow (perm)	1805	0	0	1804	1697	0
Link Speed (k/h)	80			80	50	
Link Distance (m)	286.9			519.3	86.0	
Travel Time (s)	12.9			23.4	6.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	14%	14%	5%	4%	3%
Adj. Flow (vph)	426	24	15	607	77	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	450	0	0	622	110	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	392	22	14	558	71	30
Future Vol, veh/h	392	22	14	558	71	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	14	14	5	4	3
Mvmt Flow	426	24	15	607	77	33

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	450	0	1075	438
Stage 1	-	-	-	-	438	-
Stage 2	-	-	-	-	637	-
Critical Hdwy	-	-	4.24	-	6.44	6.23
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.326	-	3.536	3.327
Pot Cap-1 Maneuver	-	-	1050	-	241	617
Stage 1	-	-	-	-	646	-
Stage 2	-	-	-	-	523	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1050	-	236	617
Mov Cap-2 Maneuver	-	-	-	-	236	-
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	523	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.21	24.93
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	289	-	-	44	-
HCM Lane V/C Ratio	0.38	-	-	0.014	-
HCM Ctrl Dly (s/v)	24.9	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.7	-	-	0	-



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	404	18	11	526	46	19
Future Volume (vph)	404	18	11	526	46	19
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	0.994				0.960	
Flt Protected				0.999	0.966	
Satd. Flow (prot)	1806	0	0	1814	1510	0
Flt Permitted				0.999	0.966	
Satd. Flow (perm)	1806	0	0	1814	1510	0
Link Speed (k/h)	80			80	50	
Link Distance (m)	519.3			237.0	83.3	
Travel Time (s)	23.4			10.7	6.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	39%	36%	4%	17%	16%
Adj. Flow (vph)	439	20	12	572	50	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	459	0	0	584	71	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.9%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	404	18	11	526	46	19
Future Vol, veh/h	404	18	11	526	46	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	39	36	4	17	16
Mvmt Flow	439	20	12	572	50	21

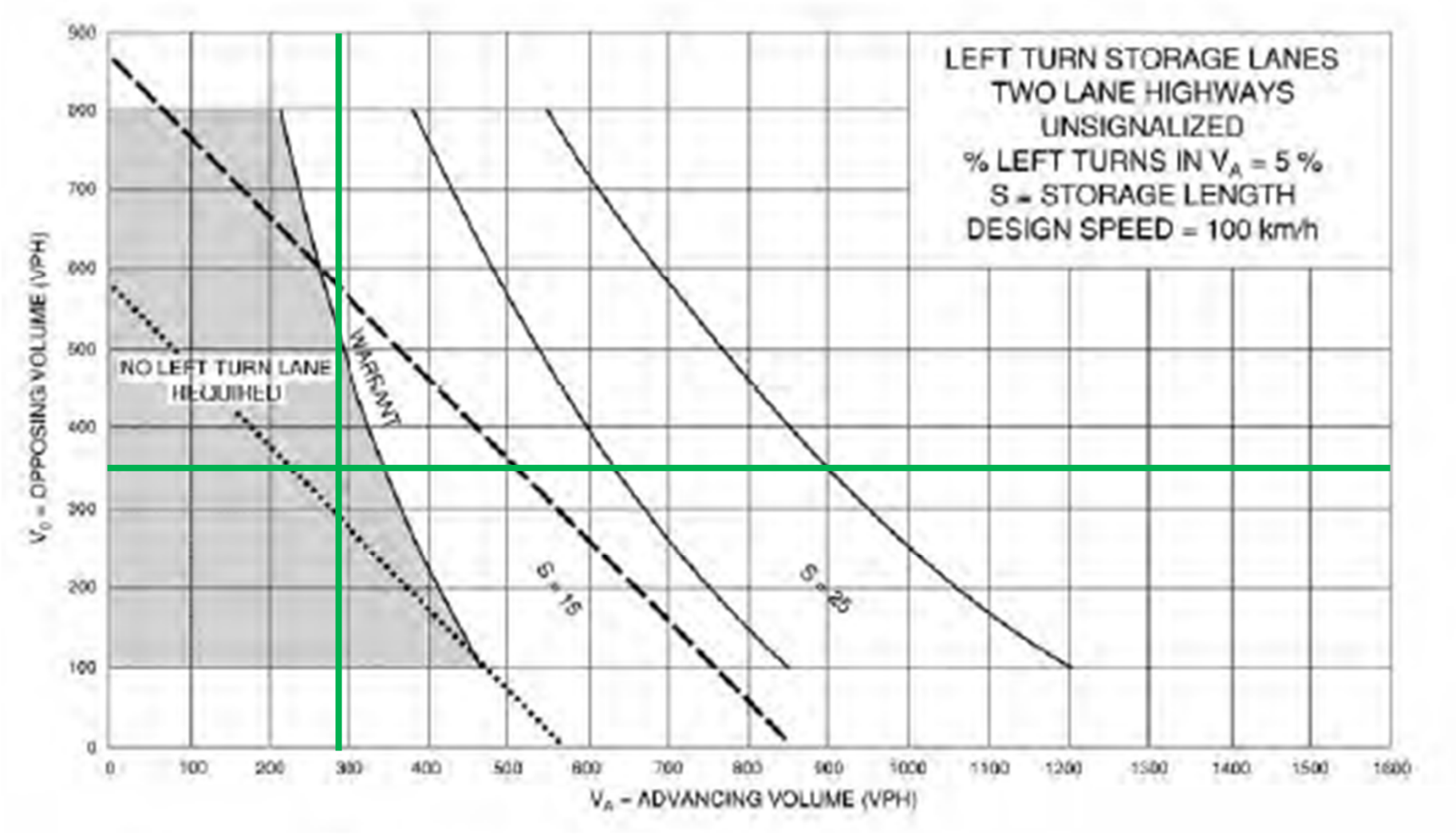
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	459	0	1045	449
Stage 1	-	-	-	-	449	-
Stage 2	-	-	-	-	596	-
Critical Hdwy	-	-	4.46	-	6.57	6.36
Critical Hdwy Stg 1	-	-	-	-	5.57	-
Critical Hdwy Stg 2	-	-	-	-	5.57	-
Follow-up Hdwy	-	-	2.524	-	3.653	3.444
Pot Cap-1 Maneuver	-	-	945	-	238	582
Stage 1	-	-	-	-	613	-
Stage 2	-	-	-	-	522	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	945	-	233	582
Mov Cap-2 Maneuver	-	-	-	-	233	-
Stage 1	-	-	-	-	601	-
Stage 2	-	-	-	-	522	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.18	21.93
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	283	-	-	37	-
HCM Lane V/C Ratio	0.25	-	-	0.013	-
HCM Ctrl Dly (s/v)	21.9	-	-	8.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1	-	-	0	-

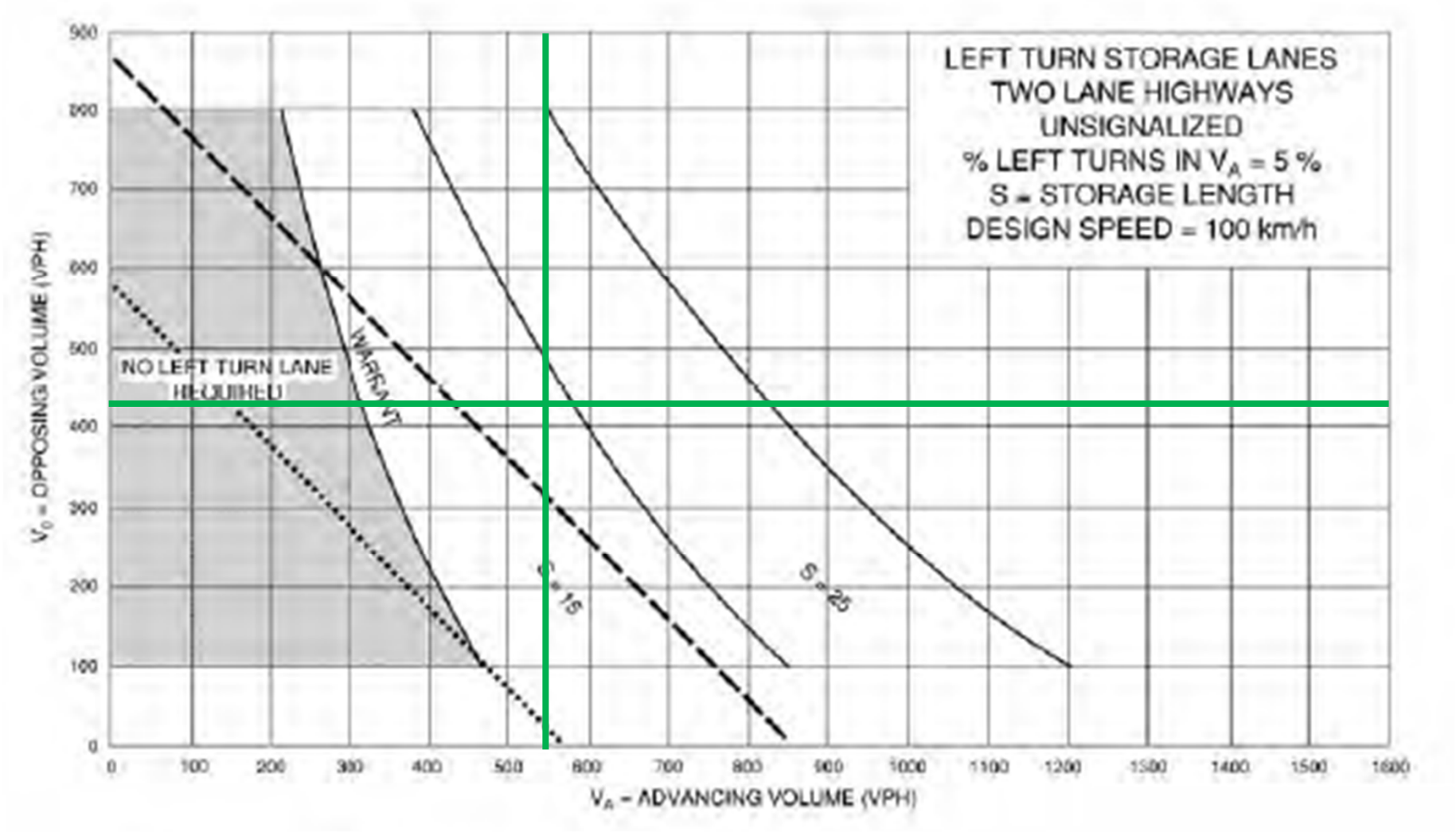
Appendix I

Left Turn Lane Warrant



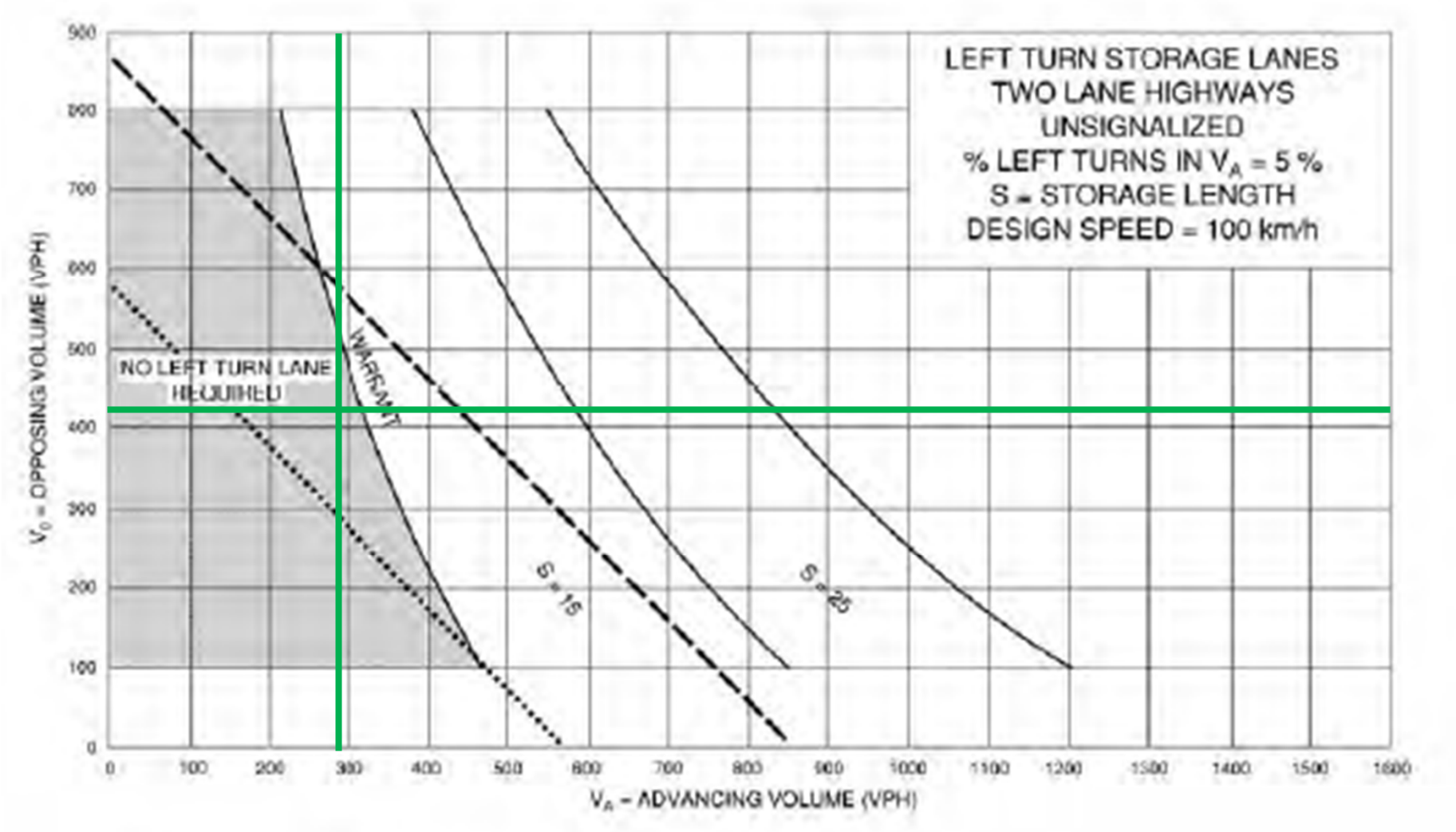
Wellington Road 34 and Eastern Access
Left-Turn Lane Warrant

Total 2032 (AM Peak Hour)



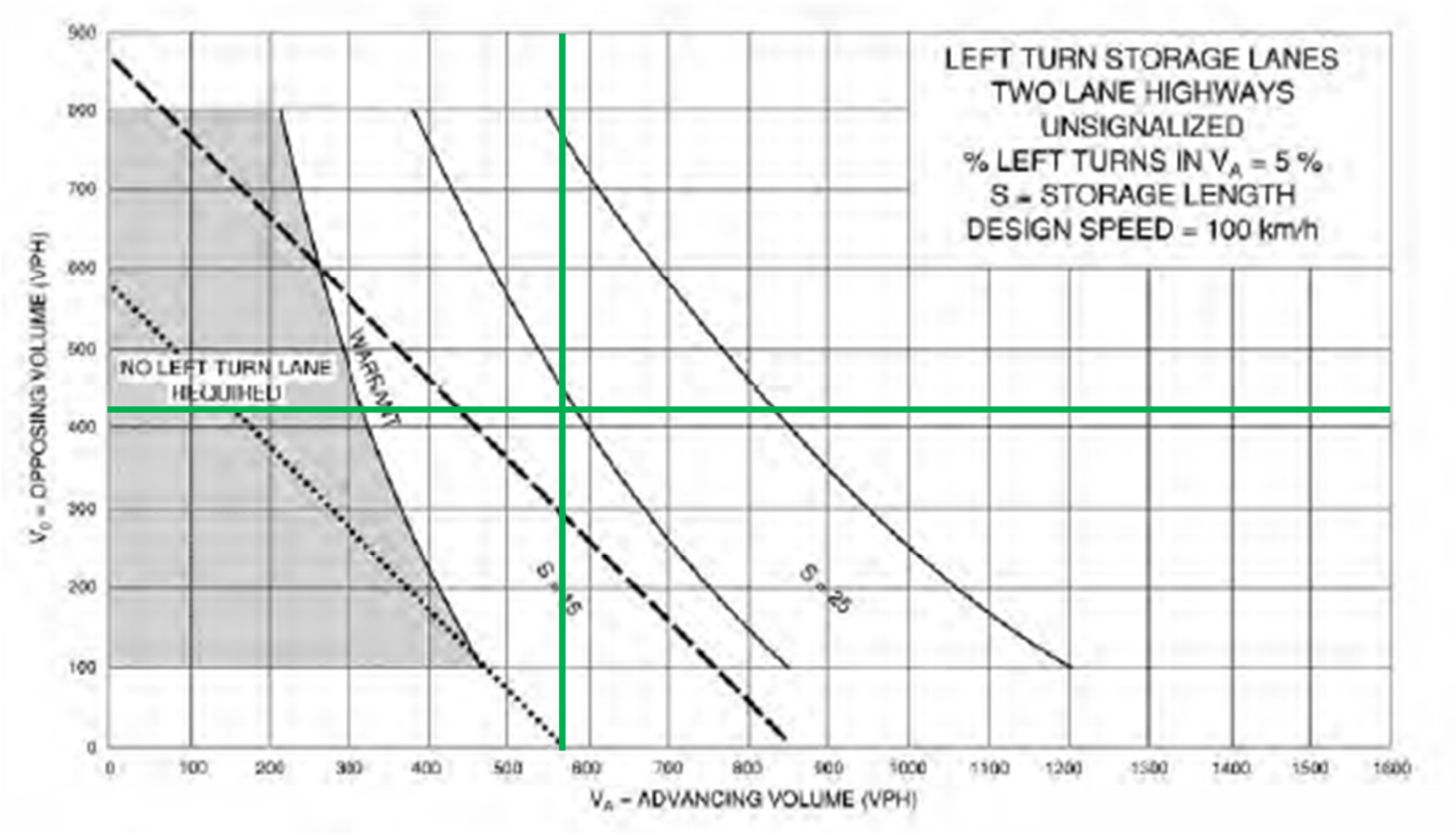
Wellington Road 34 and Eastern Access
Left-Turn Lane Warrant

Total 2032 (PM Peak Hour)



Wellington Road 34 and Western Access
Left-Turn Lane Warrant

Total 2032 (AM Peak Hour)



Wellington Road 34 and Western Access
Left-Turn Lane Warrant

Total 2032 (PM Peak Hour)