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TRANSPORTATION SOLUTIONS LIMITED

Loyalist Heights (Picton) Transportation Impact Study

Paradigm Transportation Solutions Limited

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Executive Summary

Content

This report is an update to the August 2020 and July 2022 study iterations previously prepared. This update reflects changes to the site plan and proposed development statistics.

Paradigm Transportation Solutions Limited (Paradigm) was retained to conduct a Transportation Impact Study in support of a development application for a proposed residential subdivision in the Town of Picton, County of Prince Edward.

The proposed residential subdivision would comprise a mix of housing types with an anticipated maximum build-out of 495 residential units. The dwelling types proposed align with the land uses identified within the Picton Urban Centre Secondary Plan and responds to commentary received from planning staff.

This Transportation Impact Study (TIS) has been conducted in general accordance with the Ministry of Transportation Ontario (MTO) Traffic Impact Study Guideline document. The technical content of the study includes an analysis of existing traffic conditions, a description of the proposed development, traffic forecasts for the anticipated 2027 (opening year), 2032, and 2037 horizon years, and recommendations required to improve future traffic conditions, if any.

Conclusions

Based on the analysis contained in this report, it is concluded that:

- ▶ Under existing base year conditions, the Study Area intersections currently operate at good levels of service with all movements well within capacity during the AM and PM peak hours;
- ▶ For the 2027 (opening year), 2032, and 2037 horizon years, the analysis of background traffic conditions (without the proposed development) determined the Study Area intersections are forecast to operate at good levels of service with all movements well within capacity during the AM and PM peak hours.

The exception would be the intersection of Sandy Hook Road/County Road 10 under the 2032 and 2037 horizon years, where the eastbound shared left/right movement is forecast to be approaching capacity;



- ▶ For the 2027 (opening year), 2032, and 2037 horizon years, the analysis of total traffic conditions (with the proposed development) determined the Study Area intersections are forecast to operate at good levels of service with all movements well within capacity during the AM and PM peak hours.

Similar to background traffic conditions, the exception would be the intersection of Sandy Hook Road/County Road 10 under the 2032 and 2037 horizon years, where the eastbound shared left/right movement is forecast to operate over-capacity;

- ▶ The proposed residential subdivision is estimated to generate 226 vehicle trips during the AM peak hour, and 249 vehicle trips during the PM peak hour;
- ▶ The site access driveway connections with Sandy Hook Road (County Road 1) are both forecast to operate at good levels of service and with all movements within capacity.

The proposed west site access driveway intersection with Sandy Hook Road is determined to warrant the provision of an eastbound auxiliary left turn lane.

- ▶ To mitigate the approaching/over-capacity condition forecast at the intersection of Sandy Hook Road/County Road 10 it is recommended that dedicated eastbound left and right turn lanes be provided by the 2032 horizon regardless of if the subject Loyalist Heights development proceeds or not; and
- ▶ The difference in operating conditions between future background and future total traffic conditions concludes the proposed residential subdivision would have a small impact on traffic operations at the Study Area intersections.

Recommendations

Based on the findings of this study, it is recommended that:

- ▶ From a traffic operations perspective, the proposed residential subdivision development should be approved.



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1 Introduction

1.1 Overview

This report is an update to the August 2020 and July 2022 study iterations previously prepared. This update reflects changes to the site plan and proposed development statistics.

Paradigm Transportation Solutions Limited (Paradigm) was retained by 1983358 Ontario Inc. to conduct this Transportation Impact Study for a proposed residential subdivision development in the Town of Picton. The lands are generally located southeast of Highway 33 and Sandy Hook Road (County Road 1). Error! Reference source not found. illustrates the location of the subject site and the Study Area.

Based on pre-study consultation with the Ministry of Transportation of Ontario (MTO) and Prince Edward County via e-mail in April/May 2020, the following intersections form the Study Area:

- ▶ Loyalist Parkway (Highway 33) and Sandy Hook Road (County Road 1);
- ▶ Sandy Hook Road (County Road 1) and Lake Street (County Road 10); and
- ▶ The proposed site access connections with Sandy Hook Road (County Road 1).

Appendix A contains the pre-study correspondence for reference.

1.2 Purpose and Scope

The purpose of this report is to determine the net impact of the proposed development on the surrounding transportation network and provide recommendations on any measures necessary to support the development from a transportation planning perspective.

More specifically, the scope of this study is as follows:

- ▶ Document and estimate existing traffic volumes and operations at the Study Area intersections under the weekday AM and PM peak hours;
- ▶ Estimate future background traffic volumes, including traffic generated by other area development (approved and/or in-stream) near the site, under the following horizon years:
 - Opening-Year Horizon (build-out);
 - Five-Year Horizon (five years following build-out); and



- Ten-Year Horizon (ten years following build-out).
 - ▶ Estimate the new site generated traffic and assign this traffic to the Study Area road network;
 - ▶ Estimate future total traffic volumes through the summation of the forecast background traffic and site generated traffic;
 - ▶ Estimate future traffic operations under each horizon year, for both future background and future total traffic conditions; and
 - ▶ Identify any remedial measures, if necessary.





2 Proposed Development

The residential subdivision proposes a total of 495 residential units. **Table 2.1** summarizes the proposed dwelling types and the number of units.

TABLE 2.1: PROPOSED DEVELOPMENT STATISTICS

Dwelling Type	# of Units
Detached Single-Family House	73
Semi-Detached House	27
Apartment and Townhouse	350
Senior's Village	45
Total	495

The subdivision would be served by an internal roadway network, accessed by Sandy Hook Road (County Road 1). Pedestrian connections to the adjacent trail network are proposed. The adjacent Millennium Trail is an active transportation route.

The proposed residential subdivision **will not be accessed via Highway 33**. Vehicular access to the subdivision is proposed via two full-movement driveway connections with Sandy Hook Road (County Road 1), herein referred to as the West Access and East Access.

The West Access is located on Sandy Hook Road and is located approximately 470.0 metres east of the splitter island of the Loyalist Parkway (Highway 33)/Sandy Hook Road (County Road 1) roundabout intersection. This would exceed the minimum separation identified by the MTO during pre-study consultation.

The spacing between the proposed West Access driveway and East Access driveway is approximately 350.0 metres.

The Land Owner, will be retaining Lot 1 for themselves. It is understood, a curb cut currently exists for an existing access connection with Highway 33.

The Land Owner has proposed the construction of a single-detached residential dwelling on this parcel of land. That is, access to this single-family home will be provided via Highway 33, consistent with the corridor. No access or connections will be made with the adjacent proposed residential subdivision, nor is any public/private roadway proposed with Highway 33.



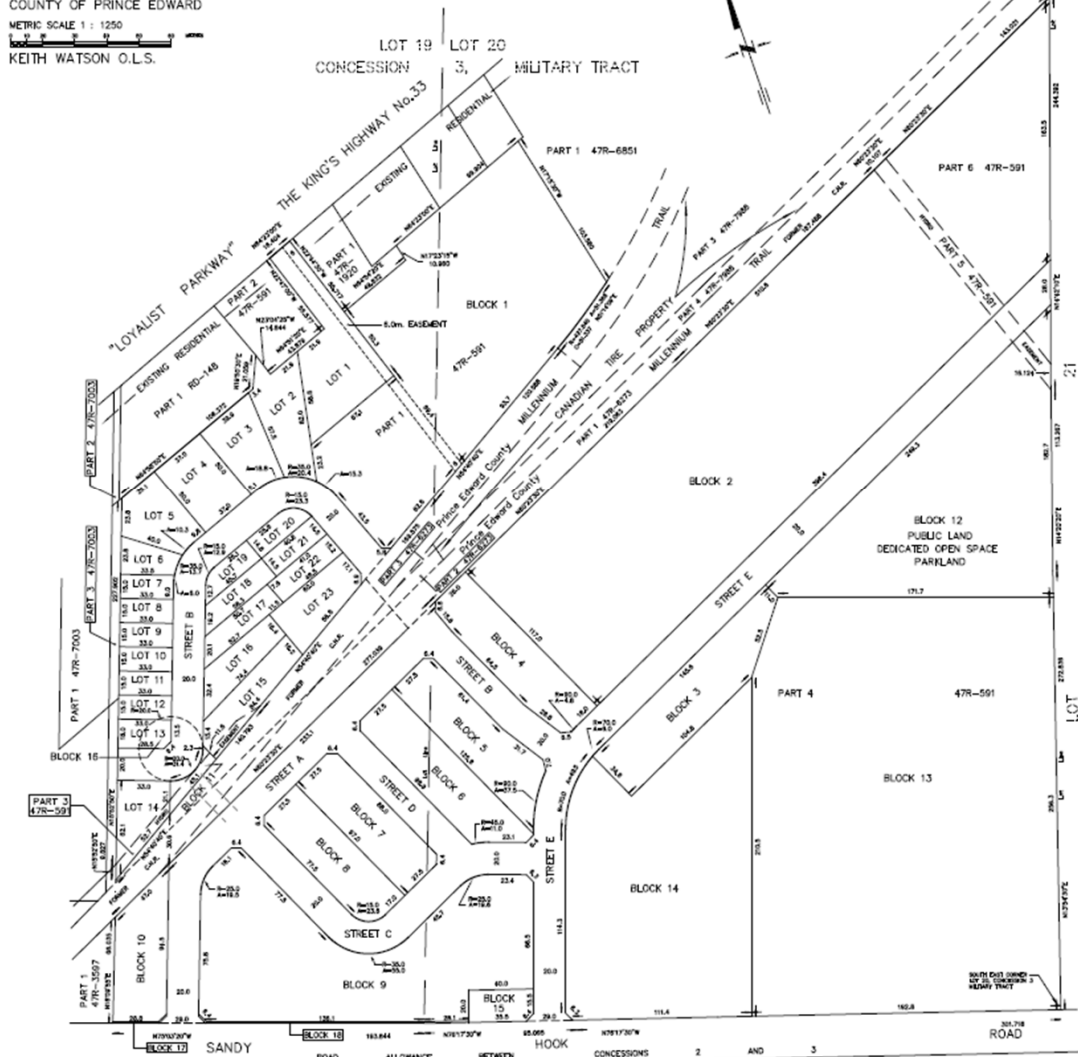
For the purposes of assessment, it is assumed that the subdivision would be constructed in a single phase with build-out occurring by 2027.

Figure 2.1 illustrates the draft plan of subdivision.



DRAFT PLAN OF SUBDIVISION

PARTS OF LOTS 19 AND 20
 CONCESSION 3, MILITARY TRACT
 TOWNSHIP OF HALLOWELL
 NOW IN THE MUNICIPALITY OF
 COUNTY OF PRINCE EDWARD
 METRIC SCALE 1 : 1250
 KEITH WATSON O.L.S.



LAND USE SCHEDULE		
PROPERTY LAND ALLOCATION	PART	AREA
RESIDENTIAL DEVELOPMENT	BLOCKS 3-10	3.94 Ha.
RESIDENTIAL LOTS	LOTS 1-23	2.47 Ha.
STREETS	A,B,C,D,E	3.30 Ha.
SENIORS VILLAGE	BLOCK 1	2.20 Ha.
APARTMENTS & TOWNHOMES	BLOCK 2	5.31 Ha.
TRANSFERRED TO MUNICIPALITY	BLOCK 11	335 m. ²
OPEN SPACE – PARKLAND	BLOCK 12	1.70 Ha.
WOODLOT & EP	BLOCK 13	4.88 Ha.
STORM POND	BLOCK 14	1.92 Ha.
PUMP STATION	BLOCK 15	790 m. ²
TEMPORARY TURNAROUND	BLOCK 16	304 m. ²
0.3m. RESERVES	BLOCKS 17 & 18	6.3 m. ²
TOTAL AREA OF PROPERTY		25.86 Ha.



Draft Plan of Subdivision

3 Existing Conditions

3.1 Road Network

The characteristics of the roads and intersections near the subject site are described below. Reference was made to Schedule B: Secondary Plan Transportation Map, Picton Urban Centre Secondary Plan (June 2014).

- ▶ **Loyalist Parkway (Ontario Highway 33)** is an east-west roadway that operates under the jurisdiction of MTO. The roadway has a two-lane cross section within the study area, transitioning to an urban four-lane cross section, east of County Road 1. The roadway has a posted speed limit of 60 kilometres per hour. The Picton Urban Centre Secondary Plan classifies Loyalist Parkway as an Arterial Road.
- ▶ **Sandy Hook Road (County Road 1)** is a southeast-northwest, two-lane roadway that operates under the jurisdiction of the County. Within the study area, the roadway has a posted speed limit of 60 kilometres per hour south of Highway 33, transitioning to 50 kilometres per hour approaching County Road 10. The roadway has a rural cross-section, with no provision of dedicated pedestrian or cycling facilities. The Picton Urban Centre Secondary Plan classifies Sandy Hook Road as a Collector Road.
 - An unsignalized roundabout intersection is formed with Loyalist Parkway (Highway 33). All intersection legs are single lane approaches, with no pedestrian crossings provided. This roundabout has an outside diameter of approximately 45.0 metres.
- ▶ **Lake Street (County Road 10)** is a southwest-northeast two-lane roadway that operates under the jurisdiction of the County of Prince Edward. Within the study area, the road has a posted speed limit of 60 kilometres per hour. The Picton Urban Centre Secondary Plan classifies Lake Street as a Collector Road.
 - An unsignalized “T” intersection is formed with Sandy Hook Road (County Road 10). Stop control is provided on the Sandy Hook Road approach. An auxiliary eastbound left turn lane is provided on Lake Street (County Road 10). It was observed in the field that a short 15.0 m westbound right turn taper is provided on Lake Street (County Road 10).



For the purpose of the report, as Loyalist Parkway (Highway 33) is generally orientated northeast/southwest and will herein be referenced as orientated northeast-southwest.

Sandy Hook Road (County Road 1) is generally orientated northwest/southeast, it will herein be referenced as east-west.

Lake Street (County Road 10) is generally oriented northeast/southwest, it will herein be referenced as north-south.

Figure 3.1 illustrates the existing lane configurations and traffic control.





Existing Lane Configurations and Traffic Control

3.2 Transit

While the subject site is not immediately serviced by the available fixed-route transit service, it is noted that this service which runs along Loyalist Parkway provides a connection between Picton, Bloomfield, and Belleville.

It is further noted that Prince Edward County introduced a ride-sharing program to offer an alternative public transit option. Uride came to Prince Edward County in 2022, with patrons to book rides via the Uride application available on smartphone devices.

3.3 Active Transportation

No sidewalks facilities are provided on either side of Loyalist Parkway or Sandy Hook Road.

No designated cycling facilities are provided within the Study Area; however, the exception being within vicinity there is the Millennium Trail which functions as a multi-use pathway running south of and parallel to Loyalist Parkway. The trail will also bisect through the subject development site lands.

Per the Picton Urban Centre Secondary Plan, both Sandy Hook Road (County Road 1) and Lake Street (County Road 10) are identified as “Activity Routes”. An “Activity Route” is described as a road designed to accommodate non-vehicular modes of transportation (walking, cycling, wheelchair, etc.) on facilities that include sidewalks, paths, and trails. These routes may use a road right-of-way or a dedicated right-of-way.

Loyalist Parkway has been identified as a bicycle route as per the MTO Bicycle Policy. The MTO Draft Cycling Infrastructure Analysis indicates the route should be implemented as a signed bike route with buffered paved shoulders.

3.4 Traffic Volumes

Existing traffic volumes are usually obtained through turning movement counts which capture the various vehicles completing each maneuver at an intersection. The counts typically include a minimum of eight-hours of data, usually collected during morning rush hour and afternoon rush hour time periods (i.e., commuter periods).

The initial iteration of this study commenced in 2020 during the COVID-19 pandemic. Due to the ongoing COVID-19 pandemic, provincial and federal measures were and are currently imposed to reduce the spread. Traffic volumes and patterns at the time of writing



in 2020 were not representative of typical conditions. Since the future end date of these measures was unknown, the collection of up-to-date turning movement counts was not feasible.

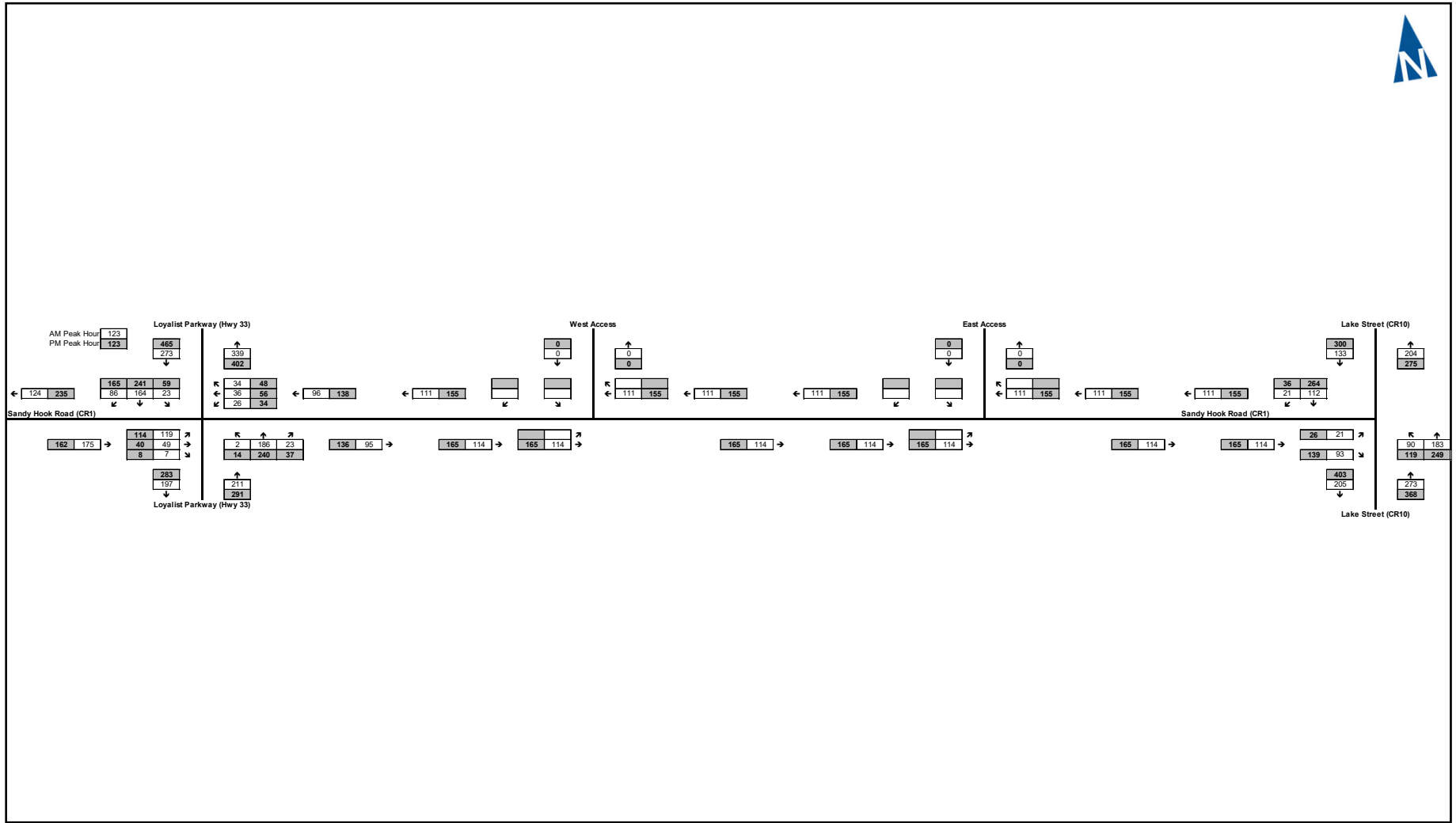
At that time, per consultation with MTO and County staff, traffic volumes and patterns were estimated through available historical turning movement count (TMC) and automatic traffic recorder (ATR) link volume data.

Given we are now out of the pandemic and traffic conditions have since normalized, updated base year traffic data has been obtained for analysis. 2024 winter traffic counts which were adjusted to summer conditions for the intersections of Sandy Hook Road with Loyalist Parkway and Lake Street were obtained and extracted from the Cold Creed Residential Subdivision Traffic Impact Study report and are used in this study.

Appendix B contains the traffic data for reference.

Figure 3.2 illustrates the forecast base year 2024 summer traffic volumes.





Base Year Traffic Volumes AM and PM Peak Hours

Figure 3.2

3.5 Traffic Operations

3.5.1 Intersection Operations

This section documents current traffic conditions, operational deficiencies, and/or constraints experienced by the public travelling at the intersections within the study area, if any.

The quality of intersection operations at signalized and unsignalized intersections is evaluated in terms of level of service (LOS) and volume to capacity (v/c) as defined by the Highway Capacity Manual (HCM). LOS is evaluated based on average control delay per vehicle and includes deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections LOS ranges from LOS A for 10 seconds or less average delay to LOS F for average delay greater than 80 seconds. For unsignalized intersections, the LOS ranges from LOS A for 10 seconds or less average delay to LOS F for average delay greater than 50 seconds. Capacity is evaluated in terms of the ratio of demand flow to capacity with an at capacity condition represented by a v/c ratio of 1.00 (i.e., volume demand equals capacity).

The determination of the potential need for capacity improvements was based on MTO criteria for critical movements (i.e. volume to capacity ratios of 0.85 or higher).

To assess the base year peak hour conditions, an operational analysis was conducted using Synchro 11 software, which implements the methodologies of the Highway Capacity Manual (HCM). Arcady 8 software has been utilized to analyze the roundabout intersection.

Table 3.1 presents the operational analysis results including level of service (LOS), average vehicle delay in seconds, volume to capacity ratio, and 95th percentile queues. **Appendix C** contains the analysis outputs for reference.

The analysis of summer base year conditions indicates that all traffic movements are currently operating at acceptable levels of service and well within capacity.



TABLE 3.1: EXISTING TRAFFIC OPERATIONS

Intersection	Approach/ Movement		AM Peak Hour				PM Peak Hour			
			LOS ₁	Delay ₂	V/C ³	Q ⁴	LOS ₁	Delay ₂	V/C ³	Q ⁴
Highway 33/ CR 1-Sandy Hook Road <i>Roundabout</i>	EB	Left/Thru/Right	A	4	0.16	< 1	A	3	0.14	< 1
	WB	Left/Thru/Right	A	4	0.09	< 1	A	4	0.14	< 1
	NB	Left/Thru/Right	A	4	0.19	< 1	A	4	0.26	< 1
	SB	Left/Thru/Right	A	4	0.23	< 1	A	4	0.23	< 1
CR 10/ CR 1-Sandy Hook Road <i>Unsignalized</i>	NB	Left	A	8	0.07	2	A	8	0.10	3
		Thru	Unopposed Movement				Unopposed Movement			
	SB	Thru/Right	Unopposed Movement				Unopposed Movement			
	EB	Left/Right	B	11	0.17	5	B	13	0.29	10

¹ Level of Service; ² Average vehicle delay, seconds; ³ Volume to capacity ratio; ⁴ 95th percentile queues, metres;



3.5.2 Roadway Capacity

The Transportation Association of Canada (TAC) provides characteristics of roadways in their Geometric Design Guide for Canadian Roads. TAC specifies rural collector roadways typically experience daily volumes up to 5,000 vehicles per day.

The historical available data provided by PEC staff indicates Sandy Hook Road experiences daily summer volumes of 2,130 vehicles.

Under present conditions the currently daily volumes are well within the rural collector roadway classification.

Furthermore, assuming a typical rural collector roadway capacity of 500 vehicles per hour per lane (vphpl), the existing volume to capacity ratio for Sandy Hook Road in vicinity to the subject site is calculated. The use of the rural collector roadway capacity of 500 vphpl was extracted from the coding standards utilized for the GTHA 2016 EMME Network.

Table 3.3 summarizes the roadway mid-block operations along Sandy Hook Road between Highway 33 and County Road 10.

TABLE 3.3: BASE YEAR MID-BLOCK TRAFFIC OPERATIONS

AM Peak Hour				PM Peak Hour			
EB		WB		EB		WB	
Vol ¹	V/C ²	Vol ¹	V/C ²	Vol ¹	V/C ²	Vol ¹	V/C ²
114	0.23	111	0.22	165	0.33	155	0.31

¹ Vol = Peak Hour Volumes; ² V/C = Volume to Capacity Ratio

Sandy Hook Road, a two-lane rural collector roadway is currently operating well within capacity during both peak hours.



4 Future Traffic Conditions

4.1 Horizon Years

Consistent with the terms of reference established, traffic forecasts have been developed for the opening year, five-years beyond opening year, and ten-years beyond opening year horizons. For assessment purposes it is anticipated the residential subdivision development will be built-out by 2027 in a single phase.

4.2 Forecast Background Traffic

4.2.1 General Background Growth

The future background traffic volumes in the Study Area are expected to comprise general background growth and site traffic generated by approved or in-stream adjacent developments. For the purposes of this report, general background traffic has been estimated through the application of a 1.0% per annum compounded growth rate to the base year traffic volumes only (i.e., independent of the other area background developments).

This growth rate is based upon a review of the census population data, the growth rate within Picton and Prince Edward County is growing at a rate of approximately 1.0% per annum. This growth rate is consistent with that used in the 13300 Loyalist Parkway TIS, and Base 31 TIS reports.

4.2.2 Other Area Background Developments

In addition to general background traffic growth, several other are background developments are accounted for in the traffic forecasts. For consistency, the same other area back developments considered within the Cold Creek Residential Subdivision TIS were accounted for.

Table 4.1 summarizes the background developments accounted for.

TABLE 4.1: OTHER AREA BACKGROUN DEVELOPMENTS

#	Development	Location	Proposed Land Uses	Completion Year
1	Cold Creek	North-west quadrant of Sandy Hook Road and Lake Street	902 residential units	2027 – Phase 1 2035 – Ultimate

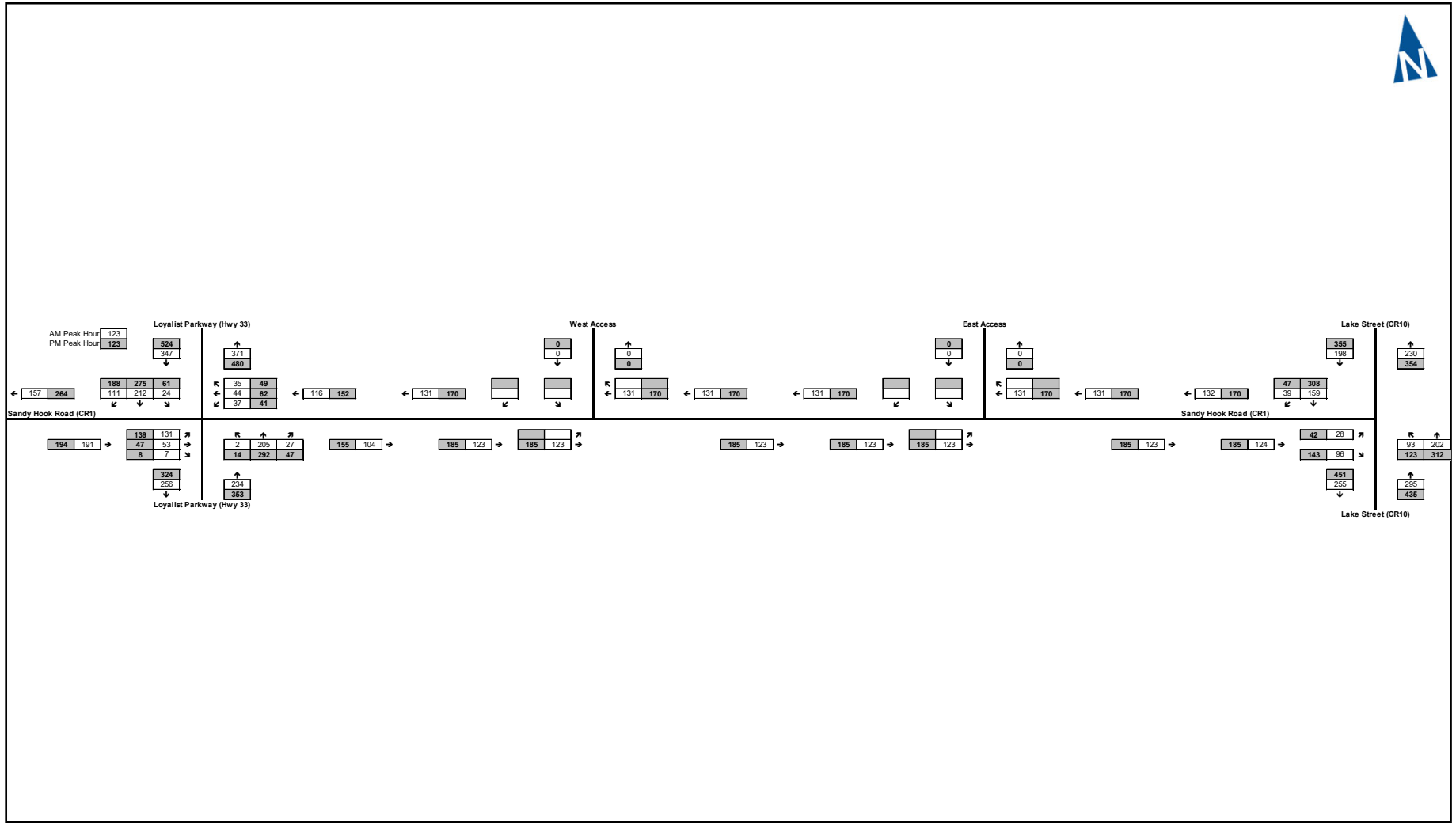


2	Base 31	343 County Road 22 & 204 Kingsley Road	7,500 residential units and a hotel	2032 – Interim 2041 – Ultimate
3	West Meadow Picton	North of Loyalist Parkway, west of Talbot Street	645 residential units	2027
4	Canadian Tire	South of Loyalist Parkway, approximately 1.0 km west of Talbot Street	One-store building contained 153 SM GFA quick-service restaurant	2023
5	13 Lake Street	East of Lake Street, south of Loyalist Parkway	12 residential units	2028
6	The Heights	East of County Road 22, south of County Road 8	600 residential units	2032
7	Affordable Housing Project	South-east quadrant of Sandy Hook Road/County Road 10	130 residential units	2029

Appendix B also contains the components of the background traffic forecasts (growth and other area development traffic) for reference.

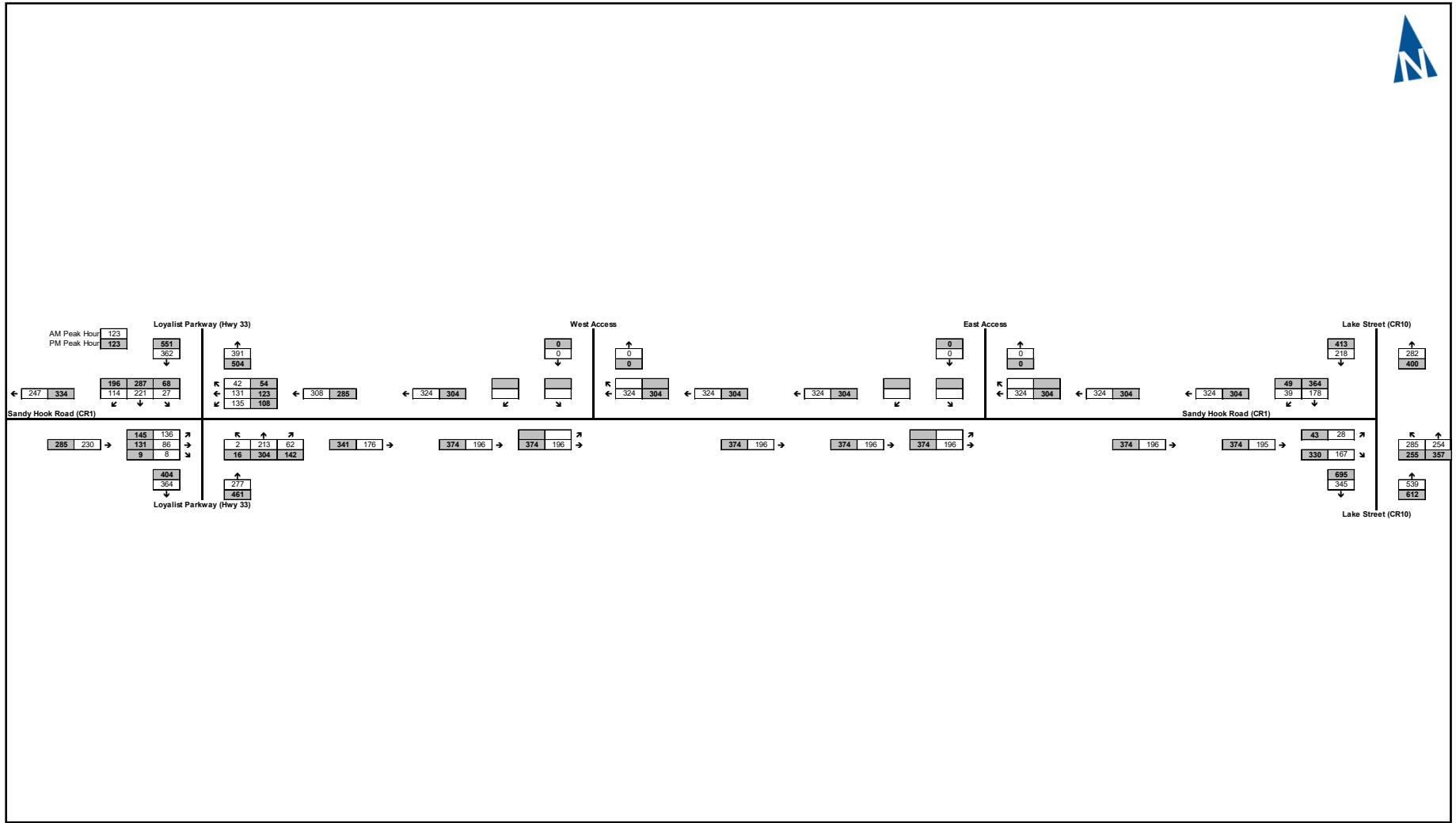
Figure 4.1, **Figure 4.2**, and **Figure 4.3** illustrate the background traffic forecasts for the 2027, 2032, and 2037 horizon years, respectively.





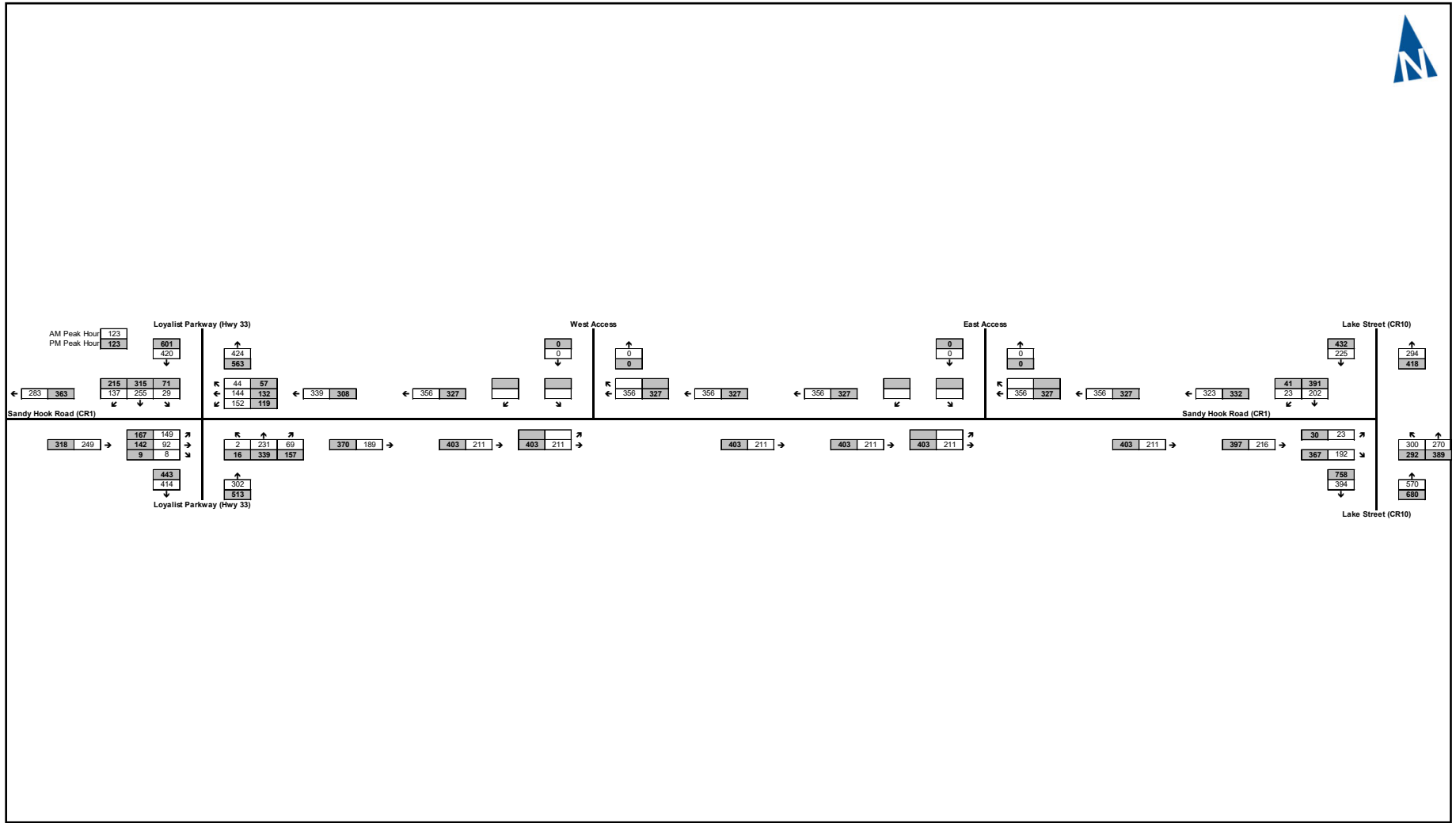
2027 Background Traffic Volumes AM and PM Peak Hours

Figure 4.1



2032 Background Traffic Volumes AM and PM Peak Hours

Figure 4.2



2037 Background Traffic Volumes AM and PM Peak Hours

Figure 4.3

4.3 Site Generated Traffic

4.3.1 Trip Generation

The weekday AM and PM peak hour trip estimates for the residential subdivision is based on data from the Institute of Transportation Engineers (ITE) publication, *Trip Generation Manual*.¹

Land Use Codes 210 (Single Family Detached Housing), 221 (Multifamily Housing (Mid-Rise)) and 252 (Senior Adult Housing (Attached)) were utilized to estimate the vehicle trip generation. For LUC 210 and LUC 221, the trip equations were utilized to estimate the vehicular trips. For 252 the average trip rates were utilized to estimate the vehicular trips.

Table 4.1 provides a summary of the site trip generation. No adjustments have been made to account for trips made by transit or alternate modes. It is acknowledged the site would have connections to adjacent active transportation infrastructure; however, these modes were not considered representing a conservative approach (i.e., errs on the high side).

TABLE 4.1: ESTIMATED VEHICULAR TRIP GENERATION

Land Use	Units	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Detached Single-Family House <i>LUC 210</i>	73	19	56	75	63	37	100
Semi-Detached House <i>LUC 210</i>	27						
Apartment/Townhouse <i>LUC 221</i>	350	33	109	142	84	53	137
Seniors Village <i>LUC 252</i>	45	3	6	9	7	8	12
Total		55	171	226	154	98	249

The proposed residential subdivision is estimated to generate 226 vehicle trips during the AM peak hour, and 249 vehicle trips during the PM peak hour.

¹ Institute of Transportation Engineers. *Trip Generation Manual (11th Edition)*. Washington, D.C. September 2021.



4.3.2 Trip Distribution and Assignment

The trip distribution for the site generated traffic has been derived through a review of existing travel patterns and contextual location of the site in relation to likely origins and destinations. The distributions were also cross referenced with the distribution percentages utilized in the traffic study for the other area background development immediately adjacent to the site.

Table 4.2 presents the estimated trip distribution.

TABLE 4.2: TRIP DISTRIBUTION

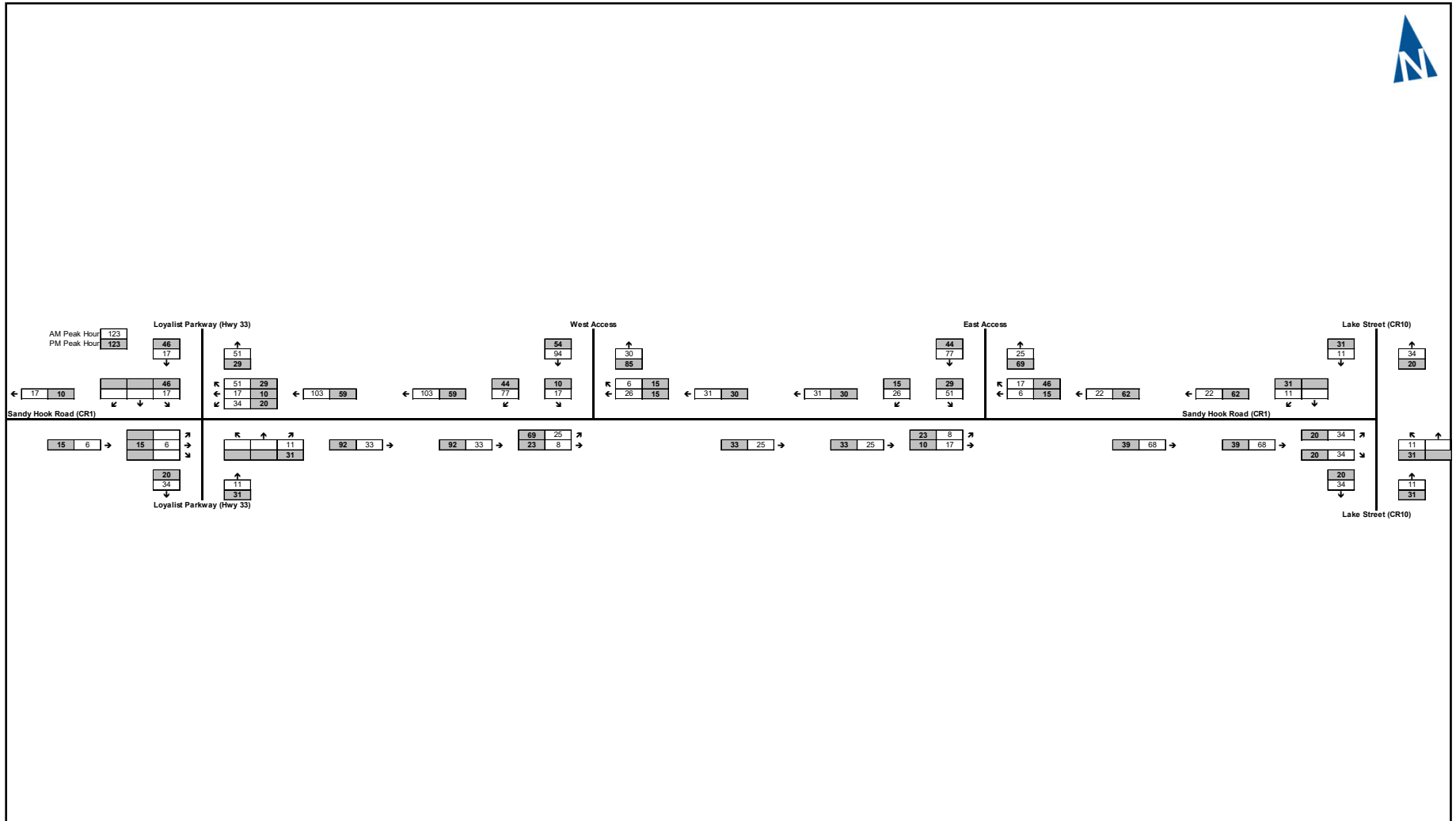
To/From	Via	% of Site Trips
West	Sandy Hook Road/ Country Road 1	10%
North-East	Highway 33 via County Road 10	20%
	Highway 33 via Sandy Hook Road	30%
South-West	Highway 33	20%
South	County Road 10	20%
Total		100%

The site trips were assigned to the subject site in accordance with the trip distribution and proportioned to the two site accesses as noted below:

- ▶ To/from the west via Sandy Hook Road (CR1) and Highway 33 – 75% use the West Access and 25% East Access;
- ▶ To/from the south via County Road 10 – 25% use the West Access and 75% use the East Access;
- ▶ To/from the north-east via County Road 10 and Highway 33 – 25% use the West Access and 75% use the East Access; and
- ▶ To/from the north-east via Sandy Hook Road and Highway 33 – 75% use the West Access and 25% use the East Access; and
- ▶ To/from the south-west via Highway 33 – 75% use the West Access and 25% use the East Access.

Figure 4.4 Error! Reference source not found. illustrates the site traffic assignments. Slight discrepancies between the trip generation in Table 4.1 and the traffic assignments are due to rounding.





Site Traffic Volumes AM and PM Peak Hours

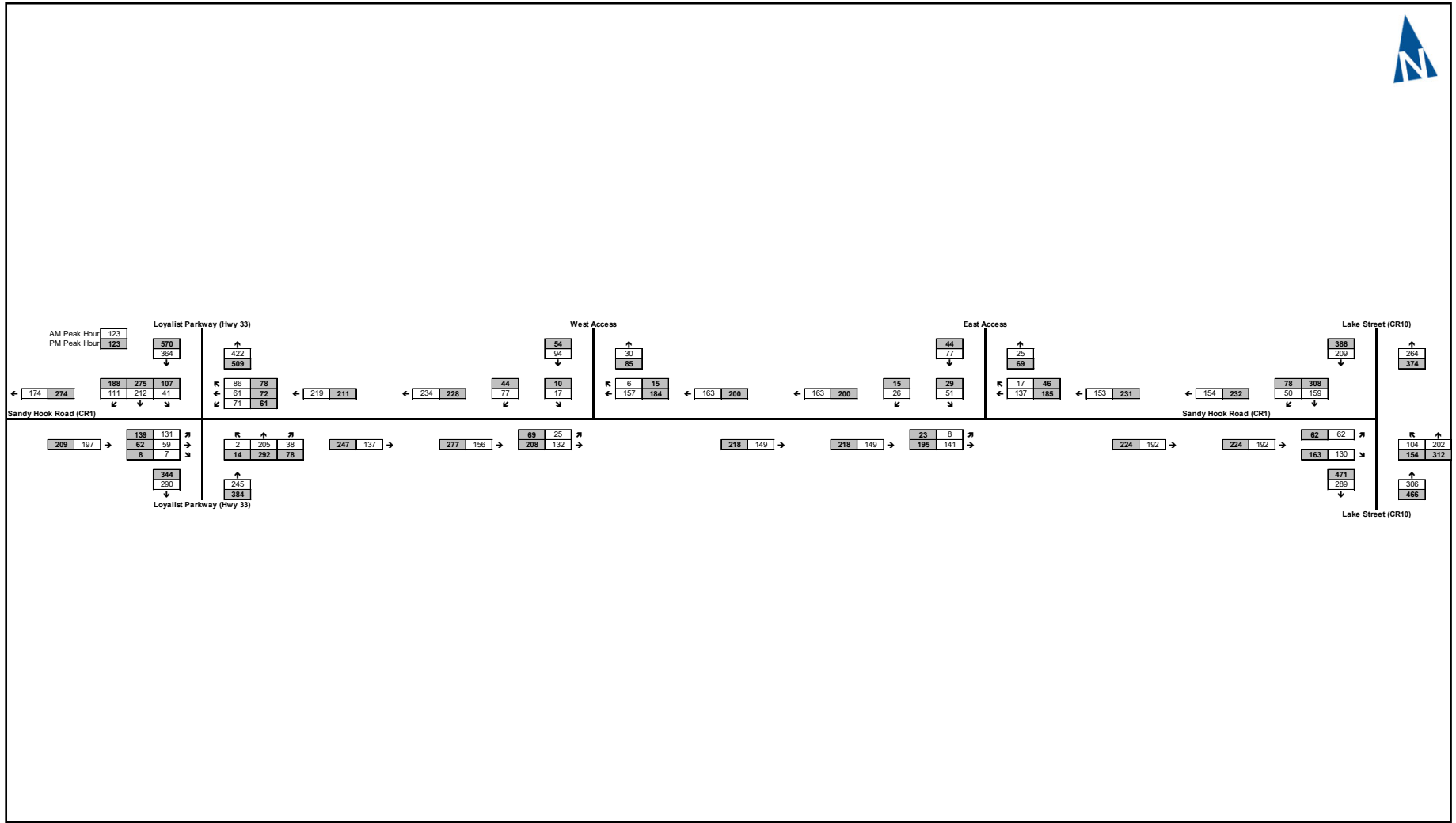
Figure 4.4

4.4 Forecast Total Traffic

The AM and PM peak hour background traffic forecasts were combined with the site traffic assignments to determine the total traffic volumes for the 2027, 2032, and 2037 horizon years.

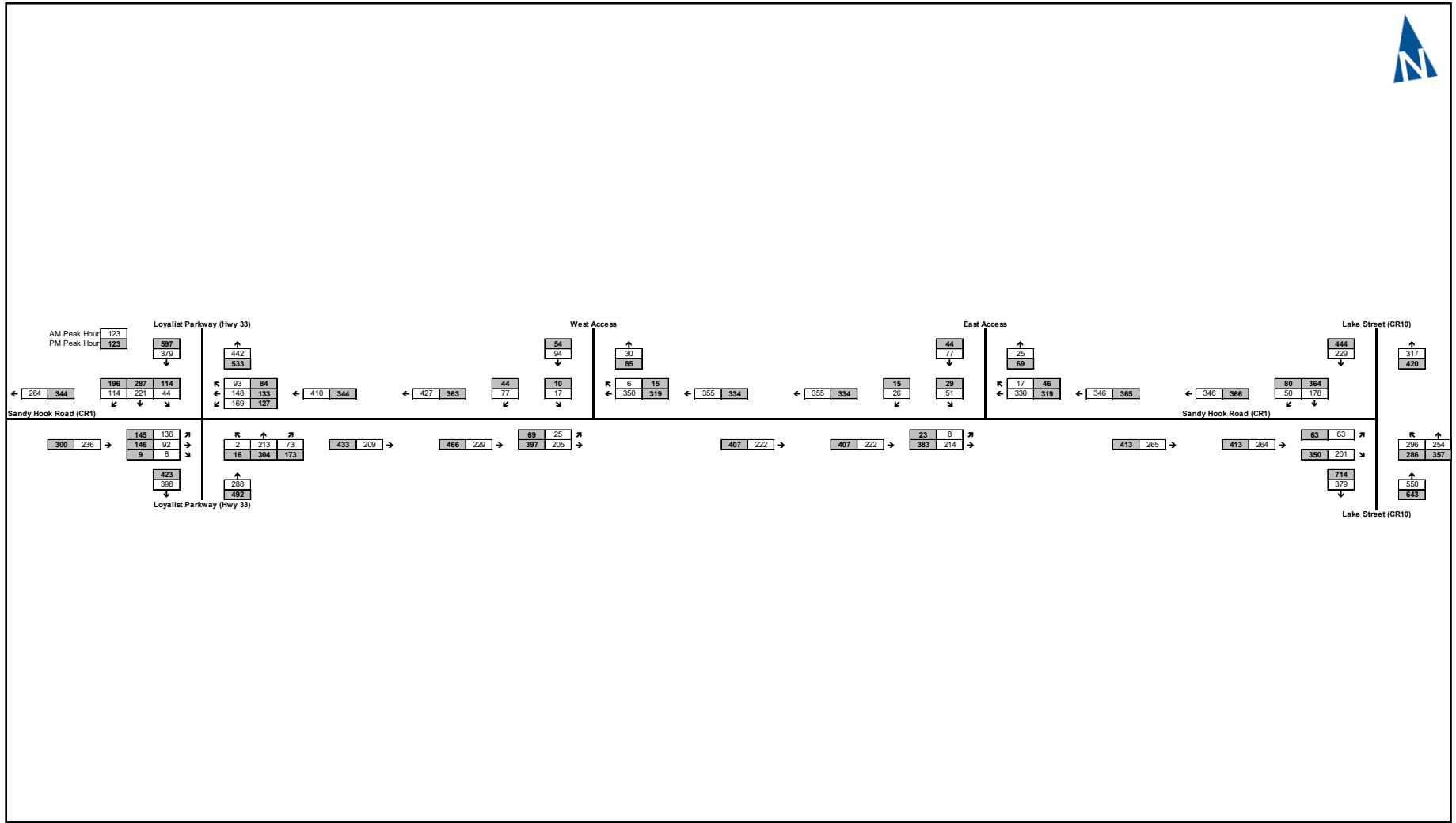
Figure 4.5, Figure 4.6, and Figure 4.7 illustrate the 2027, 2032 and 2037 total traffic forecasts, respectively.





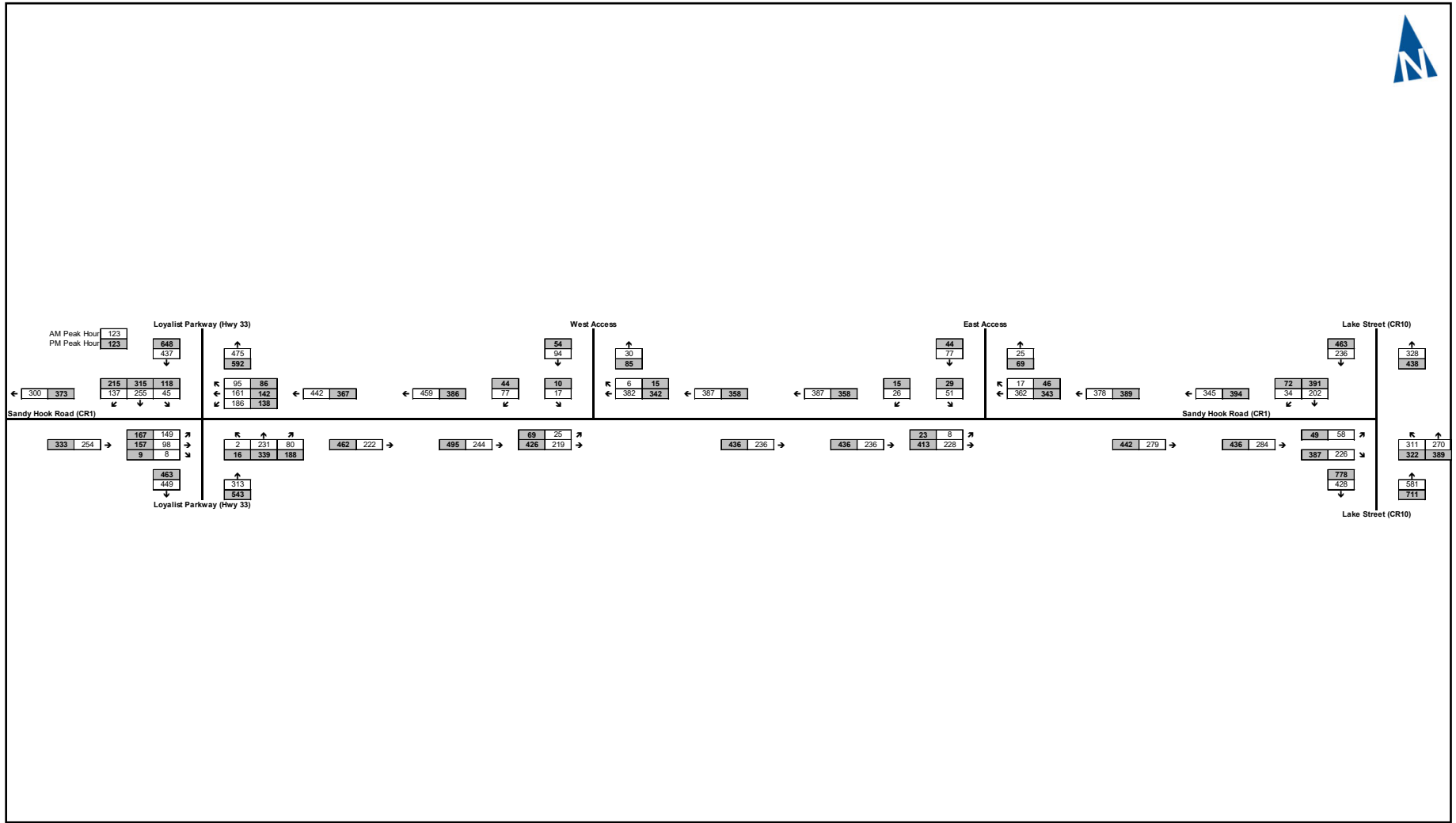
2027 Total Traffic Volumes AM and PM Peak Hours

Figure 4.5



2032 Total Traffic Volumes AM and PM Peak Hours

Figure 4.6



2037 Total Traffic Volumes AM and PM Peak Hours

Figure 4.7

5 Transportation Impact Assessment

5.1 2027 Traffic Conditions

5.1.1 Intersection Operations

To assess the operating conditions for the 2027 future peak hour background and total traffic forecasts, operational analyses were undertaken using the same methodology, parameters, lane arrangements, and traffic control devices as in the analysis of base year traffic conditions.

Table 5.1 and **Table 5.2** present the analysis results for background and total traffic conditions, respectively. **Appendix D** contains the Synchro and ARCADY analysis outputs for reference.

The key findings of the analysis of 2027 background and total traffic conditions are summarized as follows:

- ▶ All Study Area intersections and movements operate at good levels of service (C or better) and well within capacity under background and total traffic conditions; and
- ▶ The addition of the site traffic has minor impact on the Study Area intersections operations and no road or traffic control improvements would be required.

5.1.2 Roadway Capacity

Table 5.3 and **Table 5.4** summarize the roadway mid-block operations along Sandy Hook Road between Highway 33 and County Road 10 under background and total traffic conditions, respectively. A conservative approach is taken where the largest link volume was examined.

Under both background (without development) and total (with development) conditions the two-lane rural collector roadway is forecast to continue to operate well within capacity during both peak hours.



TABLE 5.1: 2027 BACKGROUND TRAFFIC OPERATIONS

Intersection	Approach/ Movement		AM Peak Hour				PM Peak Hour			
			LOS ₁	Delay ₂	V/C ³	Q ⁴	LOS ₁	Delay ₂	V/C ³	Q ⁴
Highway 33/ CR 1-Sandy Hook Road <i>Roundabout</i>	EB	Left/Thru/Right	A	4	0.18	< 1	A	4	0.19	< 1
	WB	Left/Thru/Right	A	4	0.11	< 1	A	4	0.16	< 1
	NB	Left/Thru/Right	A	4	0.21	< 1	A	5	0.32	1
	SB	Left/Thru/Right	A	4	0.29	< 1	A	5	0.45	1
CR 10/ CR 1-Sandy Hook Road <i>Unsignalized</i>	NB	Left	A	8	0.01	< 1	A	8	0.11	3
		Thru	Unopposed Movement				Unopposed Movement			
	SB	Thru/Right	Unopposed Movement				Unopposed Movement			
	EB	Left/Right	B	11	0.19	6	C	17	0.40	15

¹ Level of Service; ² Average vehicle delay, seconds; ³ Volume to capacity ratio; ⁴ 95th percentile queues, metres;

TABLE 5.2: 2027 TOTAL TRAFFIC OPERATIONS

Intersection	Approach/ Movement		AM Peak Hour				PM Peak Hour			
			LOS ₁	Delay ₂	V/C ³	Q ⁴	LOS ₁	Delay ₂	V/C ³	Q ⁴
Highway 33/ CR 1-Sandy Hook Road <i>Roundabout</i>	EB	Left/Thru/Right	A	4	0.18	< 1	A	4	0.19	1
	WB	Left/Thru/Right	A	4	0.11	< 1	A	4	0.16	< 1
	NB	Left/Thru/Right	A	4	0.21	< 1	A	5	0.32	1
	SB	Left/Thru/Right	A	4	0.29	< 1	A	5	0.45	1
Sandy Hook Road/West Access <i>Unsignalized</i>	SB	Left/Right	A	10	0.12	3	B	11	0.08	2
	WB	Thru/Right	Unopposed Movement				Unopposed Movement			
	EB	Left/Thru	A	1	0.02	1	A	2	0.06	1
Sandy Hook Road/East Access <i>Unsignalized</i>	SB	Left/Right	B	11	0.11	3	B	12	0.08	2
	WB	Thru/Right	Unopposed Movement				Unopposed Movement			
	EB	Left/Thru	A	1	0.01	< 1	A	1	0.02	1
CR 10/ CR 1-Sandy Hook Road <i>Unsignalized</i>	NB	Left	A	8	0.09	2	A	9	0.14	4
		Thru	Unopposed Movement				Unopposed Movement			
	SB	Thru/Right	Unopposed Movement				Unopposed Movement			
	EB	Left/Right	B	15	0.37	14	C	24	0.56	27

¹ Level of Service; ² Average vehicle delay, seconds; ³ Volume to capacity ratio; ⁴ 95th percentile queues, metres;



TABLE 5.3: 2027 BACKGROUND MID-BLOCK TRAFFIC OPERATIONS

AM Peak Hour				PM Peak Hour			
EB		WB		EB		WB	
Vol ¹	V/C ²	Vol ¹	V/C ²	Vol ¹	V/C ²	Vol ¹	V/C ²
123	0.25	131	0.26	185	0.37	170	0.34

¹ Vol = Peak Hour Volumes; ² V/C = Volume to Capacity Ratio

TABLE 5.4: 2027 TOTAL MID-BLOCK TRAFFIC OPERATIONS

AM Peak Hour				PM Peak Hour			
EB		WB		EB		WB	
Vol ¹	V/C ²	Vol ¹	V/C ²	Vol ¹	V/C ²	Vol ¹	V/C ²
195	0.38	234	0.47	277	0.55	232	0.53

¹ Vol = Peak Hour Volumes; ² V/C = Volume to Capacity Ratio



5.2 2032 Traffic Conditions

5.2.1 Intersection Operations

To assess the operating conditions for the 2032 future peak hour background and total traffic forecasts, operational analyses were undertaken using the same methodology, parameters, lane arrangements, and traffic control devices as in the analysis of base year traffic conditions.

Table 5.5 and **Table 5.6** present the analysis results for background and total traffic conditions, respectively. **Appendix E** contains the Synchro and ARCADY analysis outputs for reference.

The key findings of the analysis of 2032 background and total traffic conditions are summarized as follows:

- ▶ All Study Area intersections and movements operate at good levels of service (C or better) and well within capacity for background and total traffic conditions.
- ▶ The exception is at the intersection of Sandy Hook Road/County Road 10. Under background traffic conditions, the eastbound Sandy Hook Road approach is forecast to operate at a LOS F with the movement approaching capacity ($v/c = 0.92$) under the PM peak hour.

With the addition of site traffic, the movement is reported to operate at a LOS F and the movement would be over-capacity ($v/c = 1.23$).

Mitigation measures will need to be investigated at this intersection.

5.2.2 Roadway Capacity

Table 5.7 and **Table 5.8** summarize the roadway mid-block operations along Sandy Hook Road between Highway 33 and County Road 10 under background and total traffic conditions, respectively. A conservative approach is taken where the largest link volume was examined.

Under both background (without development) and total (with development) conditions the two-lane rural collector roadway is forecast to continue to operate well within capacity during both peak hours.



TABLE 5.5: 2032 BACKGROUND TRAFFIC OPERATIONS

Intersection	Approach/ Movement		AM Peak Hour				PM Peak Hour			
			LOS ₁	Delay ₂	V/C ³	Q ⁴	LOS ₁	Delay ₂	V/C ³	Q ⁴
Highway 33/ CR 1-Sandy Hook Road <i>Roundabout</i>	EB	Left/Thru/Right	A	4	0.23	< 1	A	5	0.30	< 1
	WB	Left/Thru/Right	A	5	0.30	< 1	A	5	0.30	< 1
	NB	Left/Thru/Right	A	4	0.25	< 1	A	6	0.45	1
	SB	Left/Thru/Right	A	5	0.34	1	A	6	0.51	1
CR 10/ CR 1-Sandy Hook Road <i>Unsignalized</i>	NB	Left	A	9	0.24	8	A	9	0.24	8
		Thru	Unopposed Movement			Unopposed Movement				
	SB	Thru/Right	Unopposed Movement			Unopposed Movement				
	EB	Left/Right	C	18	0.44	18	F	56	0.92	81

¹ Level of Service; ² Average vehicle delay, seconds; ³ Volume to capacity ratio; ⁴ 95th percentile queues, metres;

TABLE 5.6: 2032 TOTAL TRAFFIC OPERATIONS

Intersection	Approach/ Movement		AM Peak Hour				PM Peak Hour			
			LOS ₁	Delay ₂	V/C ³	Q ⁴	LOS ₁	Delay ₂	V/C ³	Q ⁴
Highway 33/ CR 1-Sandy Hook Road <i>Roundabout</i>	EB	Left/Thru/Right	A	4	0.23	< 1	A	5	0.30	< 1
	WB	Left/Thru/Right	A	5	0.30	< 1	A	5	0.30	< 1
	NB	Left/Thru/Right	A	4	0.25	< 1	A	6	0.45	1
	SB	Left/Thru/Right	A	5	0.34	1	A	6	0.51	1
Sandy Hook Road/West Access <i>Unsignalized</i>	SB	Left/Right	B	12	0.17	5	B	13	0.11	3
	WB	Thru/Right	Unopposed Movement			Unopposed Movement				
	EB	Left/Thru	A	1	0.02	1	A	2	0.06	2
Sandy Hook Road/East Access <i>Unsignalized</i>	SB	Left/Right	B	14	0.16	5	C	15	0.12	3
	WB	Thru/Right	Unopposed Movement			Unopposed Movement				
	EB	Left/Thru	A	< 1	0.01	< 1	A	1	0.02	1
CR 10/ CR 1-Sandy Hook Road <i>Unsignalized</i>	NB	Left	A	9	0.26	8	A	10	0.28	9
		Thru	Unopposed Movement			Unopposed Movement				
	SB	Thru/Right	Unopposed Movement			Unopposed Movement				
	EB	Left/Right	E	40	0.77	51	F	157	1.23	151

¹ Level of Service; ² Average vehicle delay, seconds; ³ Volume to capacity ratio; ⁴ 95th percentile queues, metres;



TABLE 5.7: 2032 BACKGROUND MID-BLOCK TRAFFIC OPERATIONS

AM Peak Hour				PM Peak Hour			
EB		WB		EB		WB	
Vol ¹	V/C ²	Vol ¹	V/C ²	Vol ¹	V/C ²	Vol ¹	V/C ²
196	0.39	324	0.65	374	0.75	304	0.61

¹ Vol = Peak Hour Volumes; ² V/C = Volume to Capacity Ratio

TABLE 5.8: 2032 TOTAL MID-BLOCK TRAFFIC OPERATIONS

AM Peak Hour				PM Peak Hour			
EB		WB		EB		WB	
Vol ¹	V/C ²	Vol ¹	V/C ²	Vol ¹	V/C ²	Vol ¹	V/C ²
265	0.53	427	0.85	433	0.87	366	0.73

¹ Vol = Peak Hour Volumes; ² V/C = Volume to Capacity Ratio



5.3 2037 Traffic Conditions

5.3.1 Intersection Operations

To assess the operating conditions for the 2037 future peak hour background and total traffic forecasts, operational analyses were undertaken using the same methodology, parameters, lane arrangements, and traffic control devices as in the analysis of base year traffic conditions.

Table 5.9 and **Table 5.10** present the analysis results for background and total traffic conditions, respectively. **Appendix F** contains the Synchro and ARCADY analysis outputs for reference.

The key findings of the analysis of 2037 background and total traffic conditions are summarized as follows:

- ▶ All Study Area intersections and movements operate at good levels of service (D or better) and well within capacity for background and total traffic conditions.
- ▶ The exception is at the intersection of Sandy Hook Road/County Road 10. Under background traffic conditions, the eastbound Sandy Hook Road approach is forecast to operate at a LOS F with the movement approaching capacity ($v/c = 0.96$) under the PM peak hour.

With the addition of site traffic, the movement is reported to operate at a LOS F and the movement would be over-capacity ($v/c = 1.31$).

Mitigation measures will need to be investigated at this intersection.

5.3.2 Roadway Capacity

Table 5.11 and **Table 5.12** summarize the roadway mid-block operations along Sandy Hook Road between Highway 33 and County Road 10 under background and total traffic conditions, respectively. A conservative approach is taken where the largest link volume was examined.

Under both background (without development) and total (with development) conditions the two-lane rural collector roadway is forecast to continue to operate well within capacity during both peak hours.



TABLE 5.9: 2037 BACKGROUND TRAFFIC OPERATIONS

Intersection	Approach/ Movement		AM Peak Hour				PM Peak Hour			
			LOS ₁	Delay ₂	V/C ³	Q ⁴	LOS ₁	Delay ₂	V/C ³	Q ⁴
Highway 33/ CR 1-Sandy Hook Road <i>Roundabout</i>	EB	Left/Thru/Right	A	5	0.25	< 1	A	5	0.34	1
	WB	Left/Thru/Right	A	5	0.34	1	A	5	0.33	1
	NB	Left/Thru/Right	A	4	0.28	< 1	A	7	0.51	1
	SB	Left/Thru/Right	A	5	0.40	1	A	7	0.56	1
CR 10/ CR 1-Sandy Hook Road <i>Unsignalized</i>	NB	Left	A	9	0.26	8	A	10	0.28	9
		Thru	Unopposed Movement			Unopposed Movement				
	SB	Thru/Right	Unopposed Movement			Unopposed Movement				
	EB	Left/Right	C	18	0.47	20	F	64	0.96	92

¹ Level of Service; ² Average vehicle delay, seconds; ³ Volume to capacity ratio; ⁴ 95th percentile queues, metres;

TABLE 5.10: 2037 TOTAL TRAFFIC OPERATIONS

Intersection	Approach/ Movement		AM Peak Hour				PM Peak Hour			
			LOS ₁	Delay ₂	V/C ³	Q ⁴	LOS ₁	Delay ₂	V/C ³	Q ⁴
Highway 33/ CR 1-Sandy Hook Road <i>Roundabout</i>	EB	Left/Thru/Right	A	5	0.25	< 1	A	5	0.34	1
	WB	Left/Thru/Right	A	5	0.34	1	A	5	0.33	1
	NB	Left/Thru/Right	A	4	0.28	< 1	A	7	0.51	1
	SB	Left/Thru/Right	A	5	0.40	1	A	7	0.56	1
Sandy Hook Road/West Access <i>Unsignalized</i>	SB	Left/Right	B	13	0.18	5	B	13	0.12	3
	WB	Thru/Right	Unopposed Movement			Unopposed Movement				
	EB	Left/Thru	A	2	0.02	1	A	2	0.06	2
Sandy Hook Road/East Access <i>Unsignalized</i>	SB	Left/Right	B	12	0.14	4	D	32	0.26	8
	WB	Thru/Right	Unopposed Movement			Unopposed Movement				
	EB	Left/Thru	A	2	0.01	< 1	A	5	0.21	6
CR 10/ CR 1-Sandy Hook Road <i>Unsignalized</i>	NB	Left	A	9	0.27	9	A	10	0.32	11
		Thru	Unopposed Movement			Unopposed Movement				
	SB	Thru/Right	Unopposed Movement			Unopposed Movement				
	EB	Left/Right	E	47	0.83	61	F	190	1.31	175

¹ Level of Service; ² Average vehicle delay, seconds; ³ Volume to capacity ratio; ⁴ 95th percentile queues, metres;



TABLE 5.11: 2037 BACKGROUND MID-BLOCK TRAFFIC OPERATIONS

AM Peak Hour				PM Peak Hour			
EB		WB		EB		WB	
Vol ¹	V/C ²	Vol ¹	V/C ²	Vol ¹	V/C ²	Vol ¹	V/C ²
216	0.43	356	0.71	403	0.81	332	0.66

¹ Vol = Peak Hour Volumes; ² V/C = Volume to Capacity Ratio

TABLE 5.12: 2037 TOTAL MID-BLOCK TRAFFIC OPERATIONS

AM Peak Hour				PM Peak Hour			
EB		WB		EB		WB	
Vol ¹	V/C ²	Vol ¹	V/C ²	Vol ¹	V/C ²	Vol ¹	V/C ²
284	0.57	442	0.88	462	0.92	394	0.79

¹ Vol = Peak Hour Volumes; ² V/C = Volume to Capacity Ratio



5.4 Remedial Measures

5.4.1 Sandy Hook Road and County Road 10

Under future 2032 background traffic conditions, the eastbound approach is forecast to operate at a LOS F and with the movement approaching capacity. The poor operations are directly attributed to the other area development traffic contributions.

With the addition of site traffic to this intersection, the movement is forecast to operate over-capacity.

To mitigate the poor operations, the eastbound approach was investigated providing a two lane approach, that is, separate eastbound left and right turn lanes, while maintaining the existing traffic control of stop control on the eastbound Sandy Hook Road approach.

Table 5.13 and **Table 5.14** summarize the operational results for the furthest 2037 horizon, background and total traffic conditions, respectively.

With the provision of separate eastbound left and right turn lanes on the Sandy Hook Road approach with County Road 10, all movements are now forecast to operate within capacity under both background and total traffic conditions for the projected 2037 horizon.

It is acknowledged the eastbound left turn movement would be characterized by LOS E and F. It is reiterated that the left turn movement would operate well within capacity and that this is not an unusual condition where a minor road operating under stop control intersects with a major road.

From our review of the traffic study conducted for the adjacent Cold Creek Residential Subdivision, that study recommended upgrading the traffic control from unsignalized to traffic signal control. This was necessary to accommodate the other area site traffic contributions from the ultimate build-out of the adjacent “Base 31” development site.

It is recommended that a dedicated eastbound left turn lane be implemented by the 2032 horizon regardless of if the subject Loyalist Heights development proceeds or not.



TABLE 5.13: 2037 BACKGROUND TRAFFIC OPERATIONS – MITIGATION

Intersection	Approach/ Movement		AM Peak Hour				PM Peak Hour			
			LOS ₁	Delay ₂	V/C ³	Q ⁴	LOS ₁	Delay ₂	V/C ³	Q ⁴
CR 10/ CR 1-Sandy Hook Road <i>Unsignalized</i>	NB	Left	A	9	0.26	8	A	10	0.28	9
		Thru	Unopposed Movement				Unopposed Movement			
	EB	Thru/Right	Unopposed Movement				Unopposed Movement			
		Left	E	38	0.19	6	F	59	0.33	10
		Right	B	11	0.27	9	C	20	0.63	35

¹ Level of Service; ² Average vehicle delay, seconds; ³ Volume to capacity ratio; ⁴ 95th percentile queues, metres;

TABLE 5.14: 2037 TOTAL TRAFFIC OPERATIONS – MITIGATION

Intersection	Approach/ Movement		AM Peak Hour				PM Peak Hour			
			LOS ₁	Delay ₂	V/C ³	Q ⁴	LOS ₁	Delay ₂	V/C ³	Q ⁴
CR 10/ CR 1-Sandy Hook Road <i>Unsignalized</i>	NB	Left	A	9	0.27	9	A	10	0.32	11
		Thru	Unopposed Movement				Unopposed Movement			
	EB	Thru/Right	Unopposed Movement				Unopposed Movement			
		Left	F	60	0.51	19	F	106	0.64	23
		Right	B	12	0.33	11	C	23	0.68	42

¹ Level of Service; ² Average vehicle delay, seconds; ³ Volume to capacity ratio; ⁴ 95th percentile queues, metres;



5.4.2 Left-Turn Lane

The left turn lane warrants set out in the Ministry of Transportation Geometric Design Standards for Ontario Highways for two-lane undivided roads were also reviewed at the Study Area intersections.

Based on the MTO warrants, an eastbound auxiliary left turn lane would be warranted for installation on Sandy Hook Road at the Western site access driveway (i.e., driveway closest to Highway 33) under 2037 total traffic conditions. **Appendix G** contains the left-turn lane warrant nomographs.

From the preceding operational analyses conducted, all movements at the site access driveways are reported to operate at LOS A and well within capacity. While the West site access driveway has not been explicitly analyzed with an eastbound left turn lane, it is anticipated that the operational results will be similar (i.e., LOS A and movements well within capacity).

5.5 Impact Assessment Summary

5.5.1 Study Area Intersections

The proposed residential subdivision development is forecast to generate 226 and 249 vehicle trips during the AM and PM peak hours.

The roundabout intersection of Highway 33/Sandy Hook Road is forecast to operate well within capacity under horizon year 2037 (10 years post full build-out of the subdivision).

The unsignalized “T” intersection of County Road 10/Sandy Hook Road is forecast to operate with the eastbound shared left/right movement approaching capacity under the horizon year 2032 onwards. (5 years post full build-out of the subdivision). The poor operation is due to other area site traffic contributions. With the addition of site generated traffic, the eastbound shared left/right movement would operate over-capacity.

Based upon the analyses conducted, the implementation of separate eastbound left and right turn lanes on Sandy Hook Road approaching County Road 10 would mitigate the forecast capacity issues up to the 2037 horizon.

5.5.2 Active Transportation

Active transportation modes (i.e., walking trips and cycling trips) were not assessed explicitly as the intent of this study was to assess and determine vehicular impacts to the transportation network.



No significant commuter trips are anticipated to be generated by walking and cycling trips. However, given the adjacent connections to existing and future active transportation infrastructure, it can be expected that local walking and cycling trips would be generated.

5.5.3 Roadway Capacity

From a road capacity perspective, the impact to Sandy Hook Road due to the site generated traffic is also noted to be minor. During the AM and PM adjacent street peak hours, the additional traffic would be accommodated and the roadway forecast to continue operating well within capacity under its current rural collector classification.

Based upon the site trip assignment, the largest mid-block links are discussed for each peak hour:

AM Peak Hour

- ▶ EB = 68 vehicles added; and
- ▶ WB = 103 vehicles added.

PM Peak Hour

- ▶ EB = 92 vehicles added; and
- ▶ WB = 62 vehicles added.

The additional traffic would represent an additional two vehicles every minute along Sandy Hook Road during the peak hours.

5.5.3 Site Access Driveway Intersections

It is anticipated Sandy Hook Road will continue to operate and function as a rural collector roadway. No future plans have been identified to upgrade or improve Sandy Hook Road. Subject to confirmation following the completion of the updated Transportation Master Plan.

Access to the residential subdivision is proposed via two unsignalized driveway access connections with Sandy Hook Road. Each driveway access will form a “T-intersection” connection, the Sandy Hook Road approaches will operate as free-flow, whereas, the driveway approaches will operate under stop control.

Based upon the preceding analyses, it is determined an eastbound auxiliary left turn lane would be warranted at the west site access connection to accommodate the forecast site generated traffic.

Figure 5.1 illustrates the lane configuration and traffic control at the site access intersections.





Future Lane Configurations and Traffic Control

6 Access Review

The proposed residential subdivision **will not be accessed via Highway 33**. Vehicular access to the subdivision is proposed via two full-movement driveway connections with Sandy Hook Road (County Road 1), herein referred to as the West Access and East Access.

The proposed accesses would both form “T” intersections where the access connections with Sandy Hook Road (County Road 1) would operate under stop control.

The West Access is located on Sandy Hook Road and is located approximately 470.0 metres east of the splitter island of the Loyalist Parkway (Highway 33)/Sandy Hook Road (County Road 1) roundabout intersection. This would exceed the minimum separation identified by the MTO during pre-study consultation.

The spacing between the proposed West Access driveway and East Access driveway is approximately 350.0 metres.

It is noted the Land Owner, will be retaining Lot 1 for themselves. It is understood, a curb cut currently exists for an existing access connection with Highway 33.

The Land Owner has proposed the construction of a single-detached residential dwelling on this parcel of land. That is, access to this single-family home will be provided via Highway 33, consistent with the corridor. No access or connections will be made with the adjacent proposed residential subdivision, nor is any public/private roadway proposed with Highway 33.

6.1 Auxiliary Turn Lanes

As previously investigated under Section 5.4.2, it was determined that an eastbound auxiliary left turn lane would be warranted at the west site access connection with Sandy Hook Road (County Road 1).

6.2 Access Spacing

During pre-study consultation with MTO it was indicated they would support access to the residential subdivision via Sandy Hook Road (County Road 1) where a minimum separation of 400.0 metres from the splitter island of the Loyalist Parkway (Highway 33)/Sandy Hook Road (County Road 1) roundabout intersection is provided. The proposed West Access serving the subdivision is located approximately 470.0 metres from the splitter island.



The two proposed site access driveways are spaced approximately 350.00 metres apart. This would exceed suggested minimum driveway spacing requirements outlined in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads. TAC guidelines were utilized in lieu of the MTO Access Management Guidelines as Sandy Hook Road operates under the jurisdiction of the County.

It is acknowledged there are private driveways to single-detached residential dwellings on the opposite side of Sandy Hook Road. As related to spacing considerations for driveways on opposite sides of the road, the TAC manual notes in Section 8.9.9, *“For low volume roadways, such as locals and most collectors, the spatial relationship between driveways on opposite sides of the road is not a necessary design consideration. Similarly, if one or both of the driveways are low volume, this relationship does not impact traffic operations”*.

6.3 Site Distance Assessment

The proposed driveway connections with Sandy Hook Road (County Road 1) have been reviewed to determine sight distance availability. The assessment has been carried out using the methodology outlined in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads. TAC guidelines were utilized in lieu of the MTO Access Management Guidelines as Sandy Hook Road operates under the jurisdiction of the County. The following object heights were utilized in the field measurements:

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

The main measurements for departing traffic were taken approximately 3.0 – 5.0 metres back from the existing edge of pavement for vehicles exiting the subject site at the proposed site driveway access locations, representing the position of a driver performing a turning movement. The main measurements for approaching traffic were taken from within the centre of either travel lane on Sandy Hook Road (County Road 1), assuming a vehicle position perpendicular to the proposed site access locations.

The sight distance requirements for the site access locations on Sandy Hook Road (County Road 1) based on a design speed of 80 km/h (20 km/h above the posted 60 km/h limit) are as follows:



- ▶ Minimum stopping sight distance: 130 metres²
- ▶ Decision/departure sight distance (Left Turn from Stop): 170 metres³
- ▶ Decision/departure sight distance (Right Turn from Stop): 145 metres⁴

Paradigm staff completed a site visit in June 2020 to determine the available sight distance at each of the proposed site access driveway locations. Measurements were collected using visual targets and measuring wheels.

From the site visit, it was noted that visibility to the west and east along Sandy Hook Road (County Road 1) are unobstructed. To and from the west, a distance in excess of 200.0 metres was measured. To and from the east, a distance in excess of 200.0 metres was measured. Sandy Hook Road (County Road 1) is noted to be relatively flat and straight along the site frontage.

The collected field measurements indicate that both proposed site access driveway connections have more than adequate site distance in both directions meeting approach and departure sight distance requirements.

² TAC Geometric Design Guide for Canadian Roads. June 2017. Table 2.5.2: Stopping Sight Distance on Level Roadways for Automobiles

³ TAC Geometric Design Guide for Canadian Roads. June 2017. Table 9.9.4: Design Intersection Sight Distance – Case B1, Left Turn from Stop

⁴ TAC Geometric Design Guide for Canadian Roads. June 2017. Table 9.9.6: Design Intersection Sight Distance – Case B2, Right Turn from Stop



7 Conclusions and Recommendations

7.1 Conclusions

Based on the analysis contained in this report, it is concluded that:

- ▶ Under existing base year conditions, the Study Area intersections currently operate at good levels of service with all movements well within capacity during the AM and PM peak hours;
- ▶ For the 2027 (opening year), 2032, and 2037 horizon years, the analysis of background traffic conditions (without the proposed development) determined the Study Area intersections are forecast to operate at good levels of service with all movements well within capacity during the AM and PM peak hours.

The exception would be the intersection of Sandy Hook Road/County Road 10 under the 2032 and 2037 horizon years, where the eastbound shared left/right movement is forecast to be approaching capacity;

- ▶ For the 2027 (opening year), 2032, and 2037 horizon years, the analysis of total traffic conditions (with the proposed development) determined the Study Area intersections are forecast to operate at good levels of service with all movements well within capacity during the AM and PM peak hours.

Similar to background traffic conditions, the exception would be the intersection of Sandy Hook Road/County Road 10 under the 2032 and 2037 horizon years, where the eastbound shared left/right movement is forecast to operate over-capacity;

- ▶ The proposed residential subdivision is estimated to generate 226 vehicle trips during the AM peak hour, and 249 vehicle trips during the PM peak hour;
- ▶ The site access driveway connections with Sandy Hook Road (County Road 1) are both forecast to operate at good levels of service and with all movements within capacity.

The proposed west site access driveway intersection with Sandy Hook Road is determined to warrant the provision of an eastbound auxiliary left turn lane.

- ▶ To mitigate the approaching/over-capacity condition forecast at the intersection of Sandy Hook Road/County Road 10 it is recommended that dedicated eastbound left and right turn lanes be provided by the 2032 horizon regardless of if the subject Loyalist Heights development proceeds or not; and



- ▶ The difference in operating conditions between future background and future total traffic conditions concludes the proposed residential subdivision would have a small impact on traffic operations at the Study Area intersections.

7.2 Recommendations

Based on the findings of this study, it is recommended that:

- ▶ From a traffic operations perspective, the proposed residential subdivision development should be approved.



Appendix A

Pre-Study Consultation Correspondence



Adrian Soo

From: Matthew Coffey <mcoffey@pecounty.on.ca>
Sent: May 7, 2020 4:35 PM
To: Andrew Steinsky
Cc: Steve G. Harvey; Aynsley Osborne; Adrian Soo
Subject: RE: TIS Pre-Study Consultation: 13437 Loyalist Parkway, Picton

Hi Andrew,

Further to this, we have reviewed internally and approve your COVID-19 Traffic Study Terms of Reference.

Please let us know if you have any questions,

Mr. Matt Coffey, MCIP, RPP
Planning Coordinator, Approvals
The Corporation of the County of Prince Edward
T: 613.476.2148 ext. 2032 | F: 613.471.2050
mcoffey@pecounty.on.ca

From: Andrew Steinsky [mailto:asteinsky@ptsl.com]
Sent: May 7, 2020 10:20 AM
To: Matthew Coffey
Cc: Steve G. Harvey; Aynsley Osborne; Adrian Soo
Subject: RE: TIS Pre-Study Consultation: 13437 Loyalist Parkway, Picton

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Hi Matt,

Thank you very much for letting us know. We look forward to hearing back from the County when comments are ready.

Andrew Steinsky, EIT
Transportation Consultant



Paradigm Transportation Solutions Limited

5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 416.479.9684 x507

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As social distancing is imperative to stop the spread of the COVID-19 virus, we will not be conducting in-person meetings until we are advised by the proper authorities that it is safe to do so. In the meantime, we have the technology to host on-line meetings in various forms and will be using it to communicate with you.

Let's stay safe and look out for each other. We will get through this together.

From: Matthew Coffey <mcoffey@pecounty.on.ca>
Sent: May 6, 2020 3:40 PM
To: Andrew Steinsky <asteinsky@ptsl.com>
Cc: Steve G. Harvey <sgharvey@pecounty.on.ca>; Aynsley Osborne <aosborne@pecounty.on.ca>
Subject: FW: TIS Pre-Study Consultation: 13437 Loyalist Parkway, Picton

Hi Andrew, thank you for the opportunity to provide comments on your proposed work plan. We are reviewing your request and require an additional week to review the proposed TIS method. We can provide the requested material by May 14, 2020.

Mr. Matt Coffey, MCIP, RPP
Planning Coordinator, Approvals
The Corporation of the County of Prince Edward
T: 613.476.2148 ext. 2032 | F: 613.471.2050
mcoffey@pecounty.on.ca



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From: Andrew Steinsky [<mailto:asteinsky@ptsl.com>]
Sent: April 29, 2020 2:03 PM
To: Matthew Coffey
Cc: Adrian Soo; Aynsley Osborne
Subject: TIS Pre-Study Consultation: 13437 Loyalist Parkway, Picton

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Hi Matthew,

Paradigm Transportation Solutions Limited has been retained to complete a Transportation Impact Study for a proposed residential development in the community of Picton, Prince Edward County. The subject site is generally situated southeast of the Highway 33 and Sandy Hook Road (Prince Edward County Road 1) roundabout intersection. Preliminary plans indicate the potential for a total of approximately 393 residential units: 101 single-family detached homes, 56 semi-detached homes, 45 townhouse units, 156 apartment/condominium units, and a 35 unit senior's village. I note these numbers are preliminary in nature and may change. Access is proposed via one all-moves connection to Highway 33 and one all-moves connection to Sandy Hook Road. The preliminary concept site plan is attached for your information.

Based on the level of development, we have prepared the following work plan for the Transportation Impact Study. The study will be conducted in general accordance with the MTO TIS Guidelines (September 2014). We kindly ask County staff to review the work plan and provide any comments by **Wednesday May 6, 2020**.

- We will analyze the weekday AM and PM peak hours (typical commuter traffic peak periods), and three horizon years: opening-year, five-years beyond opening, and ten-years beyond opening;
- We will review and forecast traffic volumes and conduct operational analyses at the following intersections:
 - Highway 33 & Sandy Hook Road (County Road 1)
 - Sandy Hook Road (County Road 1) & County Road 10; and
 - The proposed connections to Sandy Hook Road and Highway 33.
- Due to the ongoing COVID-19 pandemic, and provincial and federal measures imposed to reduce the spread, traffic volumes and patterns are not representative of typical conditions. Since the future end date of these measures remains unknown, as well as when traffic volumes and patterns will return to pre-pandemic levels, we are limited in our ability to conduct up-to-date turning movement counts, since these volumes would be unrepresentative.

Available turning movement count data obtained for the intersection of Highway 33/County Road 1 is greater than three years old. Whereas, no recent turning movement count data is available at County Road 1/County Road 10. In addition, historical (2013) and recent (2018) ATR volume information for Highway 33 at two locations (east and west of the roundabout) was obtained from MTO. We have also obtained historical and recent 24-hour summer counts on Sandy Hook Road (County Road 1) and County Road 10 from County staff. Historical and recent AADT volume information for the applicable section of Highway 33 has also been extracted from the Ministry's website.

We propose to estimate and develop base year (2020) intersection turning movement volumes using the available data as a starting point. This will include deriving an applicable growth rate to factor the data to 2020 conditions.

Specifically, for the intersection of Highway 33/County Road 1, using the known 2018 ATR data, peak hour volumes for the Highway 33 east and west intersection legs will be extracted and grown to 2020 conditions. The turning movements for all intersection approaches will be based off the 2010 turning movement count patterns and adjusted accordingly. The peak hour volumes for the north and south legs will be populated and based upon the volumes to/from Highway 33.

For the intersection of County Road 1/County Road 10, peak hour link volumes can be derived; however, turning movements will be estimated based upon the location of existing development. There are only a handful of residential homes and other land uses in the vicinity of the intersection. Trip generation and anticipated origins/destinations for will be utilized in combination with the link volumes to develop the turning movement count.

We will include a recommendation within the study that post-pandemic traffic counts be undertaken to validate the developed traffic counts and assumptions used. Operational analyses to be updated, if necessary.

- We will estimate future background traffic volumes through the application of a growth rate to the developed base year traffic volumes and the addition of traffic from any approved or in-stream developments expected to increase traffic volumes at the study area intersections.
- We will estimate the trip generation for the proposed development using information contained in the *ITE Trip Generation Manual (10th Edition)*. The forecast vehicle trips will be assigned to study road network based on existing travel patterns as derived from the turning movement count data.
- We will estimate future total traffic volumes through the addition of the site-generated traffic and future background traffic forecasts.
- We will analyze traffic operations using Synchro, including the use of any model parameters outlined in the Ministry's *TIS Guidelines (September 2014)*. This analysis will be carried out for existing conditions, future background and future total conditions under each horizon year. We will identify unacceptable traffic operations based the requirements in the *TIS Guidelines*, and provide recommendations on remedial measures, as necessary.
- We will review the proposed access locations to confirm whether their location provides sufficient sight distance in accordance with requirements in the Ministry's *Access Management Guidelines*.

If you have any questions related to the above, please do not hesitate to contact myself or Adrian Soo (cc'd on this e-mail).

Thanks,

Andrew Steinsky, EIT
Transportation Consultant



Paradigm Transportation Solutions Limited

5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 416.479.9684 x507

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Let's stay safe and look out for each other. We will get through this together.

From: Aynsley Osborne <aosborne@pecounty.on.ca>

Sent: April 27, 2020 1:06 PM

To: Andrew Steinsky <asteinsky@ptsl.com>
Cc: Adrian Soo <asoo@ptsl.com>; Matthew Coffey <mcoffey@pecounty.on.ca>; Garrett Osborne <gosborne@pecounty.on.ca>; Steve G. Harvey <sgharvey@pecounty.on.ca>
Subject: RE: 200188 Town of Picton Historical Traffic Volumes

Hi Andrew,

Here are the counts we have for near the requested intersections. All counts are only 24-hour summer counts. We had counts for County Road 11 however no counts for County Road 10 near County Road 11.

PRIMARY COUNTS SITE NUMBER	COUNTY ROADS	DESCRIPTION
TC04	COUNTY ROAD 1	500 metres West of County Rd 10
TC35	COUNTY ROAD 10	200 metres South of County Rd 22
TC358		
TC36	COUNTY ROAD 11	200 metres West of County Rd 10
TC230		

Additionally, I haven't been able to find the traffic studies for Home Hardware or the LCBO yet. If I do I will let you know. The section of Highway 33 between Picton and Bloomfield is owned by the MTO however, so they may have a copy for the Home Hardware/round-a-bout traffic study.

Regards,

Aynsley Osborne, E.I.T.
Civil Engineering Technologist
Engineering Division
Department of Development Services
The Corporation of the County of Prince Edward
T: 613.476.2148 ext. 2005 | F: 613.471.2050
aosborne@pecounty.on.ca



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From: Andrew Steinsky <asteinsky@ptsl.com>
Sent: April 27, 2020 12:44 PM
To: Aynsley Osborne <aosborne@pecounty.on.ca>
Cc: Adrian Soo <asoo@ptsl.com>; Matthew Coffey <mcoffey@pecounty.on.ca>; Garrett Osborne <gosborne@pecounty.on.ca>; Steve G. Harvey <sgharvey@pecounty.on.ca>
Subject: RE: 200188 Town of Picton Historical Traffic Volumes

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Hi Aynsley,

My apologies on the back to back e-mails. Since my e-mail on Friday, I've also noticed the Home Hardware on Highway 33 was constructed between 2009 and 2011. Given it's proximity to our study intersections, the scale of the development, and it's direct access onto Highway 33, our experience would suggest a traffic impact study was completed for the site. This study might offer some insight on traffic volumes at the roundabout, and therefore County Road 1.

Would you be able to provide us with a copy of the traffic study, if it exists, or point us in the direction of someone in Planning and Development who may be familiar with the site?

Thanks,

Andrew Steinsky, EIT
Transportation Consultant



Paradigm Transportation Solutions Limited

5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 416.479.9684 x507

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As social distancing is imperative to stop the spread of the COVID-19 virus, we will not be conducting in-person meetings until we are advised by the proper authorities that it is safe to do so. In the meantime, we have the technology to host on-line meetings in various forms and will be using it to communicate with you.

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From: Andrew Steinsky
Sent: April 24, 2020 11:13 AM
To: aosborne@pecounty.on.ca
Cc: Adrian Soo <asoo@ptsl.com>; mcoffey@pecounty.on.ca
Subject: RE: 200188 Town of Picton Historical Traffic Volumes

Hi Aynsley,

I'm just following up on my e-mail from last week. Could you kindly let us know if the County has any additional traffic data which could assist us with our work.

Thanks,

Andrew Steinsky, EIT
Transportation Consultant



Paradigm Transportation Solutions Limited

5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 416.479.9684 x507

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Let's stay safe and look out for each other. We will get through this together.

From: Andrew Steinsky
Sent: April 15, 2020 10:39 AM
To: aosborne@pecounty.on.ca
Cc: Adrian Soo <asoo@ptsl.com>; mcoffey@pecounty.on.ca
Subject: RE: 200188 Town of Picton Historical Traffic Volumes

Hi Aynsley,

I'm following up on Patrick's e-mail from earlier this week. Thank you for getting back to us so quickly.

With the ongoing impacts of COVID-19, we're limited in our ability to count the intersection right now, since traffic volumes and patterns are being affected by federal and provincial efforts to stop the spread (social distancing, closure of non-essential businesses, etc.).

In lieu of there not being a TMC at County Road 1/County Road 10, does the County have any ATR, AADT or other traffic related data for segments of County Road 10 and County Road 1, near the vicinity of each other or any TMC data at intersections between Highway 33/County Road 10 (Picton) and County Road 10/County Road 11 (Woodrour)? I notice from aerial imagery that an LCBO was recently constructed at the intersection of Highway 33/County Road 10/County Road 4. Was there a transportation study conducted for that site, that might offer some information?

Anything you might be able to provide would be greatly appreciated.

Thanks,

Andrew Steinsky, EIT
Transportation Consultant



Paradigm Transportation Solutions Limited

5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 416.479.9684 x507

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As social distancing is imperative to stop the spread of the COVID-19 virus, we will not be conducting in-person meetings until we are advised by the proper authorities that it is safe to do so. In the meantime, we have the technology to host on-line meetings in various forms and will be using it to communicate with you.

Let’s stay safe and look out for each other. We will get through this together.

From: Patrick Neal <pneal@ptsl.com>
Sent: April 14, 2020 11:34 AM
To: Adrian Soo <asoo@ptsl.com>; Andrew Steinsky <asteinsky@ptsl.com>
Subject: FW: 200188 Town of Picton Historical Traffic Volumes

See below for Picton responses. They don't have any data we're looking for.

Patrick Neal, BCE
Transportation Consultant



Paradigm Transportation Solutions Limited

p: 416.479.9684 x510
m: 416.688.7338

From: Aynsley Osborne <aosborne@pecounty.on.ca>
Sent: April 14, 2020 11:29 AM
To: Patrick Neal <pneal@ptsl.com>
Cc: Matthew Coffey <>
Subject: RE: 200188 Town of Picton Historical Traffic Volumes

Good Morning Patrick,

Unfortunately, we do not have any historical turning movement count data for the intersections at County Road 33 and County Road 1 or at County Road 1 and County Road 10.

If you any other questions or requests regarding traffic counts please don't hesitate to contact me.

Regards,

Aynsley Osborne, E.I.T.
Civil Engineering Technologist
Engineering Division
Department of Development Services
The Corporation of the County of Prince Edward
T: 613.476.2148 ext. 2005 | F: 613.471.2050
aosborne@pecounty.on.ca



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From: Matthew Coffey
Sent: April 14, 2020 11:14 AM
To: Aynsley Osborne <aosborne@pecounty.on.ca>
Subject: FW: 200188 Town of Picton Historical Traffic Volumes

Good morning, I was wondering if you can assist Patrick? See below, thanks!

From: Patrick Neal [<mailto:pneal@ptsl.com>]
Sent: April 14, 2020 11:06 AM
To: Matthew Coffey
Subject: RE: 200188 Town of Picton Historical Traffic Volumes

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Hi Matt,

I attempted to reach out to Steve Harvey, who Garrett referred me to, but he is out of the office for the week and his out-of-office reply referred me to you.

Would you be able to provide any information regarding the historical turning movement counts for the below intersections? MTO has been able to provide us with a few other nearby turning movement counts but does not have any data related to the below intersections.

Please let me know if you have any questions or concerns.

Patrick Neal, BCE
Transportation Consultant



Paradigm Transportation Solutions Limited

p: 416.479.9684 x510
m: 416.688.7338

From: Garrett Osborne <gosborne@pecounty.on.ca>
Sent: April 14, 2020 10:35 AM
To: Patrick Neal <pneal@ptsl.com>; christina.klein@ontario.ca
Subject: RE: 200188 Town of Picton Historical Traffic Volumes

Hi Patrick,

Not sure which development this may be related to but please contact our Development Engineer, Steve Harvey, at sgharvey@pecounty.on.ca.

Regards,

Garrett Osborne, C.E.T.
Project Manager
Engineering Division
Department of Development Services
The Corporation of the County of Prince Edward
T: 613.476.2148 ext. 2002 | F: 613.471.2050
gosborne@pecounty.on.ca



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From: Patrick Neal <pneal@ptsl.com>
Sent: April 13, 2020 12:14 PM
To: christina.klein@ontario.ca; Garrett Osborne <gosborne@pecounty.on.ca>
Subject: 200188 Town of Picton Historical Traffic Volumes

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Hi Christina and Garrett,

I hope you are both staying safe and healthy.

Paradigm has been undertaken to conduct a traffic impact study for a development located in the Town of Picton. Due to COVID-19, we are unable to collect existing traffic volumes that represent typical (unaffected by COVID-19) traffic volumes. As such, I'm curious if either of you might be able to provide us with historical turning movement count data for the following two intersections:

- Highway 33 and County Road 1 (Sandy Hook Road); and
- County Road 1 (Sandy Hook Road) and County Road 10.

Please let me know if you have any questions or concerns.

Regards,

Patrick Neal, BCE
Transportation Consultant



Paradigm Transportation Solutions Limited

5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 416.479.9684 x510
m: 416.688.7338
e: pneal@ptsl.com
w: www.ptsl.com

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Adrian Soo

From: Pacheco, Lloyd (MTO) <Lloyd.Pacheco@ontario.ca>
Sent: May 8, 2020 4:14 PM
To: Andrew Steinsky
Cc: Adrian Soo; Klein, Christina (MTO); Brake, Lori (MTO); Paul Walsh
Subject: RE: TIS Pre-Study Consultation: 13437 Loyalist Parkway, Picton

Good Afternoon Andrew,

Thank you for the email. The ministry notes that the preliminary plans for the residential development will have approximately 393 residential units, 101 single family detached residences, 56 semi-detached residences, 45 townhouse units, 156 apartment units and a 35 unit senior's village. We also note that the proposed subdivision is proposing to have access on Highway 33 and on Co. Rd. 1 (Sandy Hook Road) in the vicinity of the Highway 33/ Co. Rd. 1 roundabout. The ministry has reviewed the proposal for a residential subdivision development located in the south east quadrant of the intersection Highway 33/Co. Rd. 1 (Sandy Hook Road) and provides the following comments:

The subject lands are within the Ministry of Transportation's (MTO) jurisdiction as under the Public Transportation and Highway Improvement Act, RSO 1990, (P.T.H.I.A.) the Ministry of Transportation through the issuance of permits controls all land use within specified limits of the Highway 33/Co Rd 1 intersection and along Highway 33. Any development within 45 metres (150ft) of the Highway 33 MTO right of way or within 180 metres (1300ft) of the centre point of any intersection along a provincial highway, requires permits from the Ministry of Transportation. Ministry approvals and permits are required prior to the construction and/or demolition of any building and/or structures and prior to the issuance of any municipal building permits or approvals as per section 8. (2) (a) of the Building Code Act.

Highway 33 is classified as a provincial Class 3 – Collector. The access spacing separation needed for a new municipal road connection along a the municipal road (Co Rd. 1) from an intersection on Highway 33 is 400 metres. We note that the proposed access on Co. Rd 1 (Sandy Hook Road) is approximately 450 metres from the Highway 33/Co Rd 1 splitter island of the roundabout.

The access spacing separation needed for a new municipal road on Highway 33 is a minimum of 800 metres between intersections. The proposed new intersection location for the proposed subdivision is approximately 675 metres from the splitter island of the Highway 33/Co. Rd 1 roundabout intersection. The proponent should be aware that PEC is nearing completion of a new signaled municipal road intersection design, located approximately 730 metres east from the proposed subdivision access on Highway 33. (Please see snip-it below)

I regret to let you know that there is insufficient spacing between intersections for a proposed new municipal road intersection onto Highway 33 to facilitate this subdivision proposal. The ministry is unable to support a proposed subdivision development with access onto Highway 33, as this will impact the safety operations of the Highway 33/Co Rd 1 roundabout and the new PEC signaled intersection "Street A" on Highway 33. The ministry is also unable to endorse an application of this property for municipal zoning amendment(s) nor issue permits under the PTHIA with access onto Hwy 33 for the proposed subdivision.

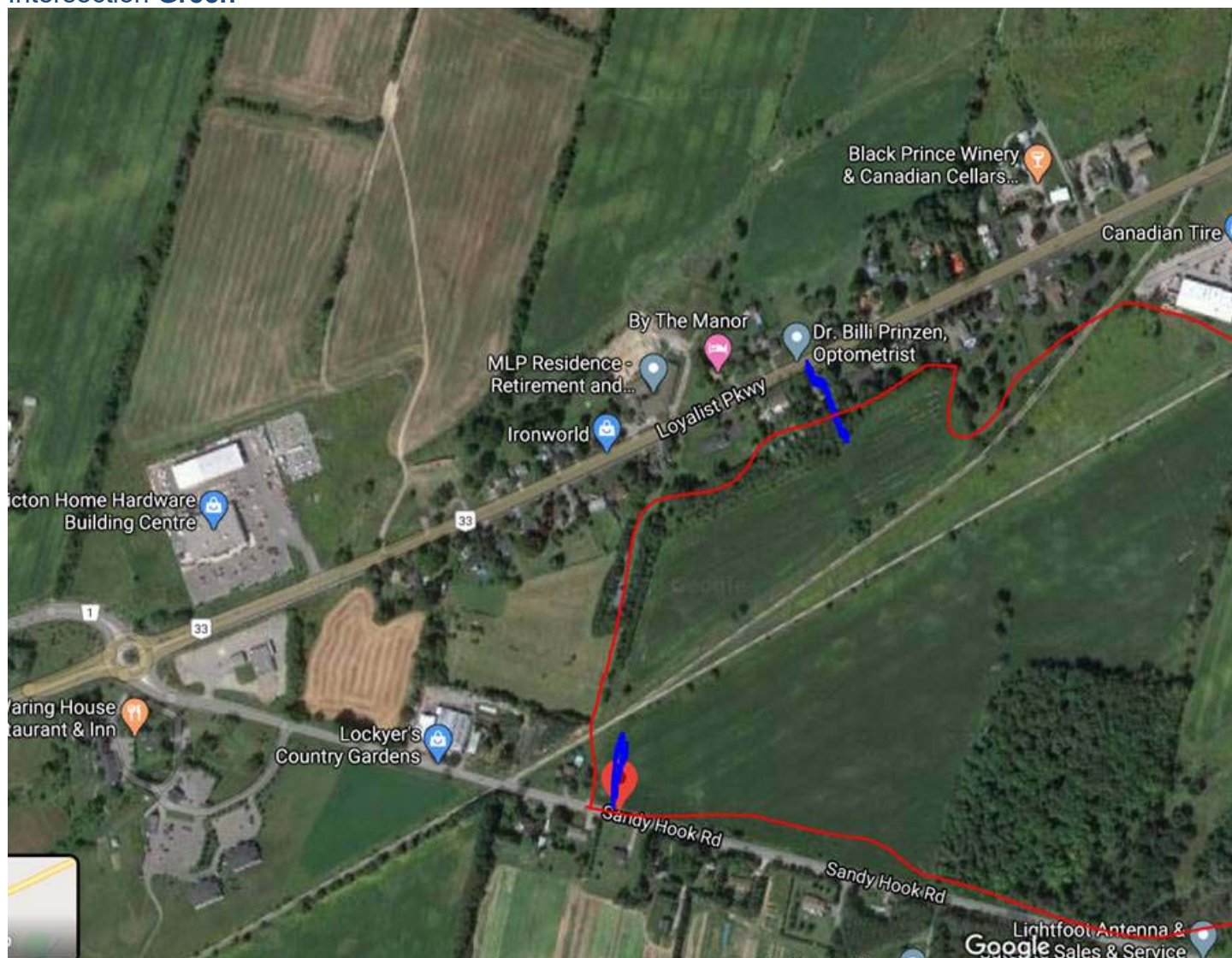
The proponent should note, as the subject property(s) having road frontage on Sandy Hook Road, the ministry would support access via Sandy Hook Road with a minimum separation of 400 metres from the splitter island of the Highway 33 roundabout intersection for a proposed subdivision. In such a case, MTO will be one of many authorities circulated as part of the subdivision process. The ministry's main concerns would be around the master stormwater management plan and the master transportation management plan for the subdivision.

Should you have any further questions please do not hesitate to contact myself.

Regards,

Lloyd Pacheco | Corridor Management Planner
Ministry of Transportation | Highway Corridor Management Section
1355 John Counter Blvd., Postal Bag 4000
Kingston, ON K7L 5A3
Tel: 613 545-4865 | Toll Free: 1 800 267-0295

Proposed Subdivision **Red**, Proposed New Municipal Rd Locations **Blue** and New PEC Signalized Intersection **Green**



From: Andrew Steinsky <asteinsky@ptsl.com>
Sent: April 29, 2020 1:22 PM
To: Pacheco, LLOYD (MTO) <LLoyd.Pacheco@ontario.ca>
Cc: Adrian Soo <asoo@ptsl.com>; Klein, Christina (MTO) <Christina.Klein@ontario.ca>; Brake, Lori (MTO) <Lori.Brake@ontario.ca>
Subject: TIS Pre-Study Consultation: 13437 Loyalist Parkway, Picton

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Hi Lloyd,

Paradigm Transportation Solutions Limited has been retained to complete a Transportation Impact Study for a proposed residential development in the community of Picton, Prince Edward County. The subject site is generally situated southeast of the Highway 33 and Sandy Hook Road (Prince Edward County Road 1) roundabout intersection. Preliminary plans indicate the potential for a total of approximately 393 residential units: 101 single-family detached homes, 56 semi-detached homes, 45 townhouse units, 156 apartment/condominium units, and a 35 unit senior's village. I note these numbers are preliminary in nature and may change. Access is proposed via one all-moves connection to Highway 33 and one all-moves connection to Sandy Hook Road. The preliminary concept site plan is attached for your information.

Based on the level of development, we have prepared the following work plan for the Transportation Impact Study. The study will be conducted in general accordance with the MTO TIS Guidelines (September 2014). We kindly ask MTO staff to review the work plan and provide any comments by **Wednesday May 6, 2020**.

- We will analyze the weekday AM and PM peak hours (typical commuter traffic peak periods), and three horizon years: opening-year, five-years beyond opening, and ten-years beyond opening;
- We will review and forecast traffic volumes and conduct operational analyses at the following intersections:
 - o Highway 33 & Sandy Hook Road (County Road 1)
 - o Sandy Hook Road (County Road 1) & County Road 10; and
 - o The proposed connections to Sandy Hook Road and Highway 33.
- Due to the ongoing COVID-19 pandemic, and provincial and federal measures imposed to reduce the spread, traffic volumes and patterns are not representative of typical conditions. Since the future end date of these measures remains unknown, as well as when traffic volumes and patterns will return to pre-pandemic levels, we are limited in our ability to conduct up-to-date turning movement counts, since these volumes would be unrepresentative.

Available turning movement count data obtained for the intersection of Highway 33/County Road 1 is greater than three years old. Whereas, no recent turning movement count data is available at County Road 1/County Road 10. In addition, historical (2013) and recent (2018) ATR volume information for Highway 33 at two locations (east and west of the roundabout) was obtained from MTO. We have also obtained historical and recent 24-hour summer counts on Sandy Hook Road (County Road 1) and County Road 10 from County staff. Historical and recent AADT volume information for the applicable section of Highway 33 has also been extracted from the Ministry's website.

We propose to estimate and develop base year (2020) intersection turning movement volumes using the available data as a starting point. This will include deriving an applicable growth rate to factor the data to 2020 conditions.

Specifically, for the intersection of Highway 33/County Road 1, using the known 2018 ATR data, peak hour volumes for the Highway 33 east and west intersection legs will be extracted and grown to 2020 conditions. The turning movements for all intersection approaches will be based off the 2010 turning movement count patterns and adjusted accordingly. The peak hour volumes for the north and south legs will be populated and based upon the volumes to/from Highway 33.

For the intersection of County Road 1/County Road 10, peak hour link volumes can be derived; however, turning movements will be estimated based upon the location of existing development. There are only a handful of residential homes and other land uses in the vicinity of the intersection. Trip generation and anticipated origins/destinations for will be utilized in combination with the link volumes to develop the turning movement count.

We will include a recommendation within the study that post-pandemic traffic counts be undertaken to validate the developed traffic counts and assumptions used. Operational analyses to be updated, if necessary.

- We will estimate future background traffic volumes through the application of a growth rate to the developed base year traffic volumes and the addition of traffic from any approved or in-stream developments expected to increase traffic volumes at the study area intersections.
- We will estimate the trip generation for the proposed development using information contained in the *ITE Trip Generation Manual (10th Edition)*. The forecast vehicle trips will be assigned to study road network based on existing travel patterns as derived from the turning movement count data.
- We will estimate future total traffic volumes through the addition of the site-generated traffic and future background traffic forecasts.
- We will analyze traffic operations using Synchro, including the use of any model parameters outlined in the Ministry's *TIS Guidelines (September 2014)*. This analysis will be carried out for existing conditions, future background and future total conditions under each horizon year. We will identify unacceptable traffic operations based the requirements in the *TIS Guidelines*, and provide recommendations on remedial measures, as necessary.
- We will review the proposed access locations to confirm whether their location provides sufficient sight distance in accordance with requirements in the Ministry's *Access Management Guidelines*.

If you have any questions related to the above, please do not hesitate to contact myself or Adrian Soo (cc'd on this e-mail).

Thanks,

Andrew Steinsky, EIT
Transportation Consultant



Paradigm Transportation Solutions Limited

5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 416.479.9684 x507

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As social distancing is imperative to stop the spread of the COVID-19 virus, we will not be conducting in-person meetings until we are advised by the proper authorities that it is safe to do so. In the meantime, we have the technology to host on-line meetings in various forms and will be using it to communicate with you.

Let's stay safe and look out for each other. We will get through this together.

From: Brake, Lori (MTO) <Lori.Brake@ontario.ca>
Sent: April 27, 2020 3:10 PM
To: Andrew Steinsky <asteinsky@ptsl.com>; Pacheco, LLOYD (MTO) <LLOYD.Pacheco@ontario.ca>
Cc: Adrian Soo <asoo@ptsl.com>; Klein, Christina (MTO) <Christina.Klein@ontario.ca>
Subject: Re: 200188 Town of Picton Historical Traffic Volumes

Andrew,

Your client could start their study using the information that was previously provided by our office and use a reasonable growth rate for this area to project volumes to a current year. These volumes would have to be verified by new counts once traffic operations return to normal.

MTO cannot provide you with another developer's traffic impact study. You would have to obtain this from them directly. However having said that as construction was fairly close to the roundabout project they would have used similar numbers to the roundabout design.

As this is a corridor issue you should be dealing with Lloyd Pacheco from our corridor management office.

Thanks,
Lori

From: Andrew Steinsky <asteinsky@ptsl.com>
Sent: Monday, April 27, 2020 12:44 PM
To: Brake, Lori (MTO) <Lori.Brake@ontario.ca>
Cc: Adrian Soo <asoo@ptsl.com>; Klein, Christina (MTO) <Christina.Klein@ontario.ca>
Subject: RE: 200188 Town of Picton Historical Traffic Volumes

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Hi Lori,

Thank you very much for providing that historical count data. We recognize that up to date intersection counts would be ideal; however, we are limited in our ability to collect new traffic data due to the ongoing COVID-19 pandemic, and its impact on traffic patterns and volumes. We also do not know when traffic volumes and patterns will return to "normal" conditions, therefore, we are hoping to formulate best-guess estimates based on the variety of historical data you have provided. Given the uncertainty of how long this pandemic will last and post-pandemic traffic conditions, at the urging of our client they would like to continue moving forward with their development application.

Since my last e-mail, I have also noticed that the Home Hardware immediately east of the roundabout appears to have been constructed between 2009 and 2011. Given its scale and sole access onto Highway 33, which includes an eastbound left-turn lane, and a westbound right-turn lane, our experience would suggest a traffic study was completed for the site. Would we be able to obtain a copy of this study to cross reference volumes from the 2010 TMC you've provided for the roundabout?

We will also be issuing a proposed Terms of Reference for the traffic study in support of a residential subdivision located south-east of the roundabout. The ToR will include details and the proposed methodology for developing base year traffic volumes for our study. As you also noted in your message, we will likely

include provisions to collect new data once restrictions are lifted to confirm/validate the accuracy of our assumptions.

Can you please confirm that Christina and yourself are the appropriate contacts to engage with regarding pre-study consultation for the traffic study.

Thanks,

Andrew Steinsky, EIT
Transportation Consultant



Paradigm Transportation Solutions Limited

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From: Brake, Lori (MTO) <Lori.Brake@ontario.ca>
Sent: April 27, 2020 7:48 AM
To: Andrew Steinsky <asteinsky@ptsl.com>
Cc: Adrian Soo <asoo@ptsl.com>; Klein, Christina (MTO) <Christina.Klein@ontario.ca>
Subject: Re: 200188 Town of Picton Historical Traffic Volumes

Andrew,

I went through our historical records for this area and have attached a turning movement from 2010 and volume information from 2013. Ideally new data should be captured once restrictions are lifted and people are travelling around again to make sure any assumptions are accurate.

Lori Brake

From: Brake, Lori (MTO) <Lori.Brake@ontario.ca>
Sent: Friday, April 24, 2020 11:23 AM
To: Andrew Steinsky <asteinsky@ptsl.com>
Cc: Adrian Soo <asoo@ptsl.com>; Klein, Christina (MTO) <Christina.Klein@ontario.ca>
Subject: Re: 200188 Town of Picton Historical Traffic Volumes

Andrew,

I apologize I have not been able to check the system. I will do my best to dig up any information for you next week.

As the data used in the design of the roundabout is quite old now, (most likely before 2008) I would suggest it may not be representative of traffic operations and volumes today. I will look to see what else we may have.

Lori

From: Andrew Steinsky <asteinsky@ptsl.com>
Sent: Friday, April 24, 2020 11:12 AM
To: Brake, Lori (MTO) <Lori.Brake@ontario.ca>
Cc: Adrian Soo <asoo@ptsl.com>; Klein, Christina (MTO) <Christina.Klein@ontario.ca>
Subject: RE: 200188 Town of Picton Historical Traffic Volumes

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Hi Lori,

I'm just following up on my e-mail from last week. Could you kindly let us know if MTO has any additional traffic data which could assist us with our work.

Thanks,

Andrew Steinsky, EIT
Transportation Consultant



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From: Andrew Steinsky
Sent: April 15, 2020 10:25 AM
To: Lori.Brake@ontario.ca
Cc: Adrian Soo <asoo@ptsl.com>; Christina.Klein@ontario.ca
Subject: FW: 200188 Town of Picton Historical Traffic Volumes

Hi Lori,

Thank you for providing that volume information.

Unfortunately, we are trying our best to estimate individual movement volumes at the intersection, in lieu of collecting current traffic volumes, which would not reflect typical conditions due to COVID-19. While we would not typically rely on volume data greater than two or three years old, the impacts of COVID-19 on traffic volumes prevents us from collecting up to date information at the intersection directly. Therefore, we would be grateful if there might be older turning movement counts (greater than two years old) at Highway 33/Sandy Hook Road.

I am was able to track down a press release from 2009 signifying the opening of the roundabout as the first one in Ontario. Would you happen to have a copy of the design study that was undertaken for the roundabout, or perhaps be able to locate a TMC from 2008 or 2009 that would have fed into the study? It sounds as though collision history drove the need for intersection improvements, but that a traffic signal warrant may have also been conducted as part of the design process/review of potential intersection improvements. In addition, has there been any traffic volume or collision monitoring undertaken at the location since it was opened, that might yield some data?

It also appears that the Waring House Restaurant & Inn expanded sometime between 2005 and 2011 based on Google Earth imagery. Is there a transportation study on file for this expansion, that might yield some information of historical volumes at the roundabout?

I'm just hoping to exhaust potential avenues for a TMC that might be buried somewhere, which would really help us out. Any info you might be able to find would be greatly appreciated.

Please let us know.

Thanks,

Andrew Steinsky, EIT
Transportation Consultant



Paradigm Transportation Solutions Limited

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From: Brake, Lori (MTO) <Lori.Brake@ontario.ca>

Sent: April 14, 2020 7:49 AM

To: Patrick Neal <pneal@ptsl.com>

Cc: Klein, Christina (MTO) <Christina.Klein@ontario.ca>
Subject: Fw: 200188 Town of Picton Historical Traffic Volumes

Patrick,

I've attached the most recent volume information that we have on file however it is not at the intersection.

We have volume information on Hwy 33 at the location of the Millenium Trail for 3 seasons and for the east limit of Bloomfield connecting link for 3 seasons.

Please let me know if you have any questions,

Lori Brake
Traffic Supervisor
613-483-6863

From: Patrick Neal <pneal@ptsI.com>
Sent: April 13, 2020 12:14 PM
To: Klein, Christina (MTO) <Christina.Klein@ontario.ca>; gosborne@pecounty.on.ca
Subject: 200188 Town of Picton Historical Traffic Volumes

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Hi Christina and Garrett,

I hope you are both staying safe and healthy.

Paradigm has been undertaken to conduct a traffic impact study for a development located in the Town of Picton. Due to COVID-19, we are unable to collect existing traffic volumes that represent typical (unaffected by COVID-19) traffic volumes. As such, I'm curious if either of you might be able to provide us with historical turning movement count data for the following two intersections:

- Highway 33 and County Road 1 (Sandy Hook Road); and
- County Road 1 (Sandy Hook Road) and County Road 10.

Please let me know if you have any questions or concerns.

Regards,

Patrick Neal, BCE
Transportation Consultant



Paradigm Transportation Solutions Limited
5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 416.479.9684 x510
m: 416.688.7338

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Appendix B

Traffic Data



Cold Creek Residential Subdivision, Picton Traffic Impact Study

CCO-24-1706

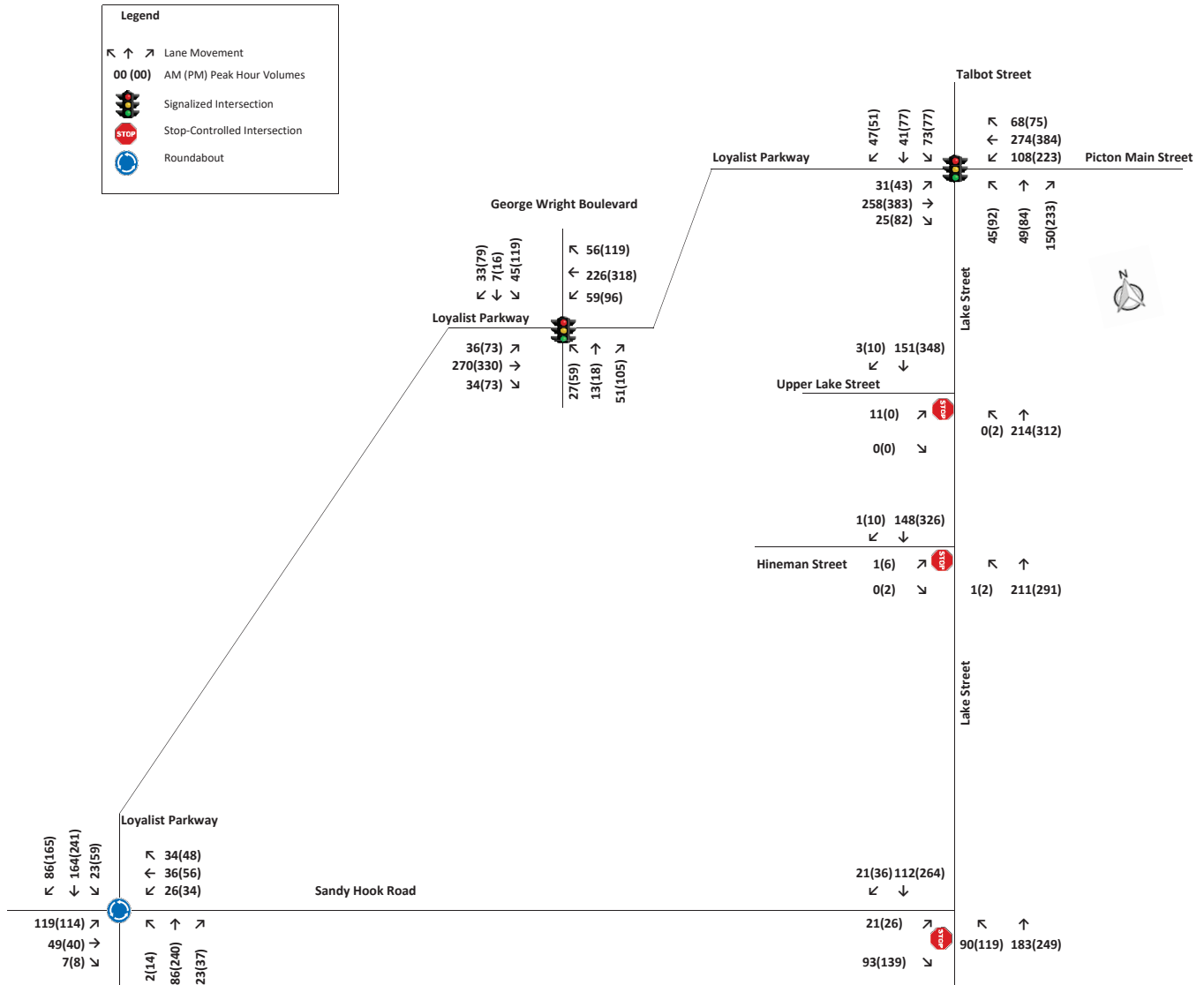
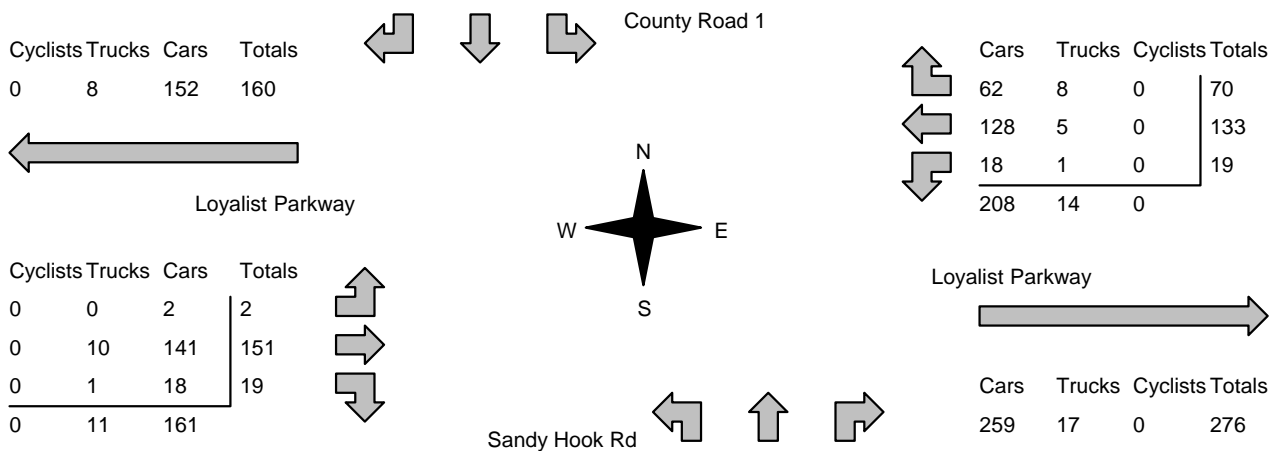




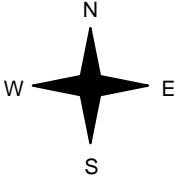






Figure 3-4 2024 Existing Traffic Volumes

Morning Peak Diagram		Specified Period From: 6:00:00 To: 10:00:00	One Hour Peak From: 8:00:00 To: 9:00:00																																								
Municipality: Prince Edward Site #: 2401400001 Intersection: Loyalist Parkway & Sandy Hook Rd TFR File #: 1 Count date: 23-Jan-24		Weather conditions: Person counted: Person prepared: Person checked:																																									
** Non-Signalized Intersection **		Major Road: Loyalist Parkway runs W/E																																									
North Leg Total: 244 North Entering: 143 North Peds: 0 Peds Cross: ☒	<table style="width:100%; border-collapse: collapse;"> <tr><td>Cyclists</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Trucks</td><td>2</td><td>4</td><td>6</td><td>12</td></tr> <tr><td>Cars</td><td>4</td><td>36</td><td>91</td><td>131</td></tr> <tr><td>Totals</td><td>6</td><td>40</td><td>97</td><td></td></tr> </table>	Cyclists	0	0	0	0	Trucks	2	4	6	12	Cars	4	36	91	131	Totals	6	40	97		<table style="width:100%; border-collapse: collapse;"> <tr><td>Cyclists</td><td>0</td></tr> <tr><td>Trucks</td><td>9</td></tr> <tr><td>Cars</td><td>92</td></tr> <tr><td>Totals</td><td>101</td></tr> </table>	Cyclists	0	Trucks	9	Cars	92	Totals	101	East Leg Total: 498 East Entering: 222 East Peds: 0 Peds Cross: ☒												
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Totals	208	14	0																																								
Peds Cross: ☒ West Peds: 0 West Entering: 172 West Leg Total: 332	<table style="width:100%; border-collapse: collapse;"> <tr><td>Cars</td><td>72</td></tr> <tr><td>Trucks</td><td>6</td></tr> <tr><td>Cyclists</td><td>0</td></tr> <tr><td>Totals</td><td>78</td></tr> </table>	Cars	72	Trucks	6	Cyclists	0	Totals	78	<table style="width:100%; border-collapse: collapse;"> <tr><td>Cars</td><td>20</td><td>28</td><td>27</td><td>75</td></tr> <tr><td>Trucks</td><td>1</td><td>1</td><td>1</td><td>3</td></tr> <tr><td>Cyclists</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Totals</td><td>21</td><td>29</td><td>28</td><td></td></tr> </table>	Cars	20	28	27	75	Trucks	1	1	1	3	Cyclists	0	0	0	0	Totals	21	29	28		Peds Cross: ☒ South Peds: 0 South Entering: 78 South Leg Total: 156												
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Totals	21	29	28																																								
Comments																																											

Afternoon Peak Diagram		Specified Period From: 15:00:00 To: 19:00:00	One Hour Peak From: 15:45:00 To: 16:45:00																													
Municipality: Prince Edward Site #: 2401400001 Intersection: Loyalist Parkway & Sandy Hook Rd TFR File #: 1 Count date: 23-Jan-24		Weather conditions: Person counted: Person prepared: Person checked:																														
** Non-Signalized Intersection **		Major Road: Loyalist Parkway runs W/E																														
North Leg Total: 248 North Entering: 101 North Peds: 0 Peds Cross: ☒	<table style="width:100%; border-collapse: collapse;"> <tr><td>Cyclists</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Trucks</td><td>1</td><td>0</td><td>3</td><td>4</td></tr> <tr><td>Cars</td><td>4</td><td>25</td><td>68</td><td>97</td></tr> <tr><td>Totals</td><td>5</td><td>25</td><td>71</td><td></td></tr> </table>	Cyclists	0	0	0	0	Trucks	1	0	3	4	Cars	4	25	68	97	Totals	5	25	71			<table style="width:100%; border-collapse: collapse;"> <tr><td>Cyclists</td><td>0</td></tr> <tr><td>Trucks</td><td>8</td></tr> <tr><td>Cars</td><td>139</td></tr> <tr><td>Totals</td><td>147</td></tr> </table>	Cyclists	0	Trucks	8	Cars	139	Totals	147	East Leg Total: 542 East Entering: 291 East Peds: 0 Peds Cross: ☒
Cyclists	0	0	0	0																												
Trucks	1	0	3	4																												
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<table style="width:100%; border-collapse: collapse;"> <tr><td>Cyclists</td><td>Trucks</td><td>Cars</td><td>Totals</td></tr> <tr><td>0</td><td>2</td><td>175</td><td>177</td></tr> </table>	Cyclists	Trucks	Cars	Totals	0	2	175	177		County Road 1		<table style="width:100%; border-collapse: collapse;"> <tr><td>Cars</td><td>Trucks</td><td>Cyclists</td><td>Totals</td></tr> <tr><td>97</td><td>6</td><td>0</td><td>103</td></tr> <tr><td>150</td><td>1</td><td>0</td><td>151</td></tr> <tr><td>36</td><td>1</td><td>0</td><td>37</td></tr> <tr><td>283</td><td>8</td><td>0</td><td></td></tr> </table>	Cars	Trucks	Cyclists	Totals	97	6	0	103	150	1	0	151	36	1	0	37	283	8	0	
Cyclists	Trucks	Cars	Totals																													
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Cars	Trucks	Cyclists	Totals																													
97	6	0	103																													
150	1	0	151																													
36	1	0	37																													
283	8	0																														
	Loyalist Parkway		Loyalist Parkway																													
<table style="width:100%; border-collapse: collapse;"> <tr><td>Cyclists</td><td>Trucks</td><td>Cars</td><td>Totals</td></tr> <tr><td>0</td><td>0</td><td>9</td><td>9</td></tr> <tr><td>0</td><td>2</td><td>148</td><td>150</td></tr> <tr><td>0</td><td>0</td><td>23</td><td>23</td></tr> <tr><td>0</td><td>2</td><td>180</td><td></td></tr> </table>	Cyclists	Trucks	Cars	Totals	0	0	9	9	0	2	148	150	0	0	23	23	0	2	180			Sandy Hook Rd		<table style="width:100%; border-collapse: collapse;"> <tr><td>Cars</td><td>Trucks</td><td>Cyclists</td><td>Totals</td></tr> <tr><td>245</td><td>6</td><td>0</td><td>251</td></tr> </table>	Cars	Trucks	Cyclists	Totals	245	6	0	251
Cyclists	Trucks	Cars	Totals																													
0	0	9	9																													
0	2	148	150																													
0	0	23	23																													
0	2	180																														
Cars	Trucks	Cyclists	Totals																													
245	6	0	251																													
Peds Cross: ☒ West Peds: 0 West Entering: 182 West Leg Total: 359	<table style="width:100%; border-collapse: collapse;"> <tr><td>Cars</td><td>84</td></tr> <tr><td>Trucks</td><td>1</td></tr> <tr><td>Cyclists</td><td>0</td></tr> <tr><td>Totals</td><td>85</td></tr> </table>	Cars	84	Trucks	1	Cyclists	0	Totals	85		<table style="width:100%; border-collapse: collapse;"> <tr><td>Cars</td><td>21</td><td>33</td><td>29</td><td>83</td></tr> <tr><td>Trucks</td><td>0</td><td>2</td><td>1</td><td>3</td></tr> <tr><td>Cyclists</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Totals</td><td>21</td><td>35</td><td>30</td><td></td></tr> </table>	Cars	21	33	29	83	Trucks	0	2	1	3	Cyclists	0	0	0	0	Totals	21	35	30		Peds Cross: ☒ South Peds: 0 South Entering: 86 South Leg Total: 171
Cars	84																															
Trucks	1																															
Cyclists	0																															
Totals	85																															
Cars	21	33	29	83																												
Trucks	0	2	1	3																												
Cyclists	0	0	0	0																												
Totals	21	35	30																													
Comments																																

Total Count Diagram

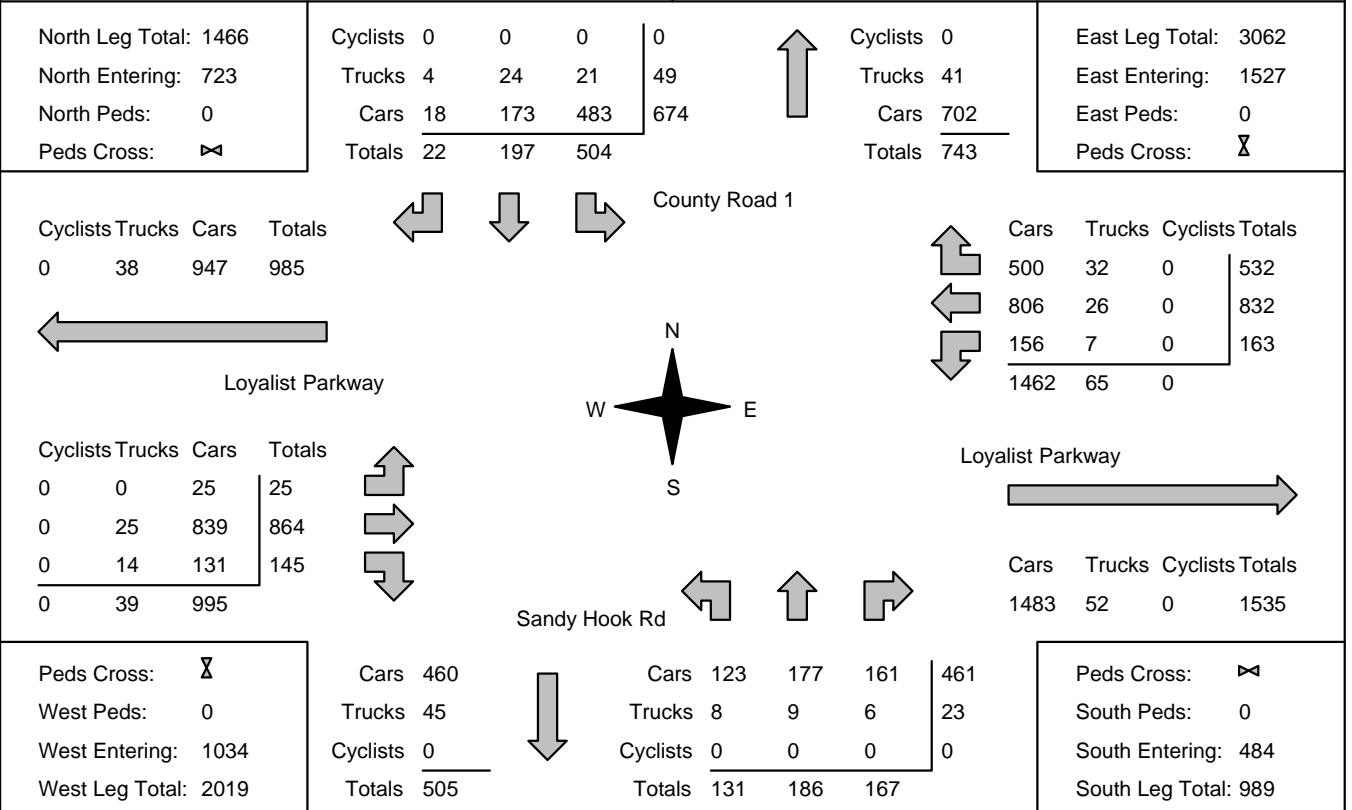
Municipality: Prince Edward
Site #: 2401400001
Intersection: Loyalist Parkway & Sandy Hook Rd
TFR File #: 1
Count date: 23-Jan-24

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: Loyalist Parkway runs W/E



Peds Cross: \times
 West Peds: 0
 West Entering: 1034
 West Leg Total: 2019

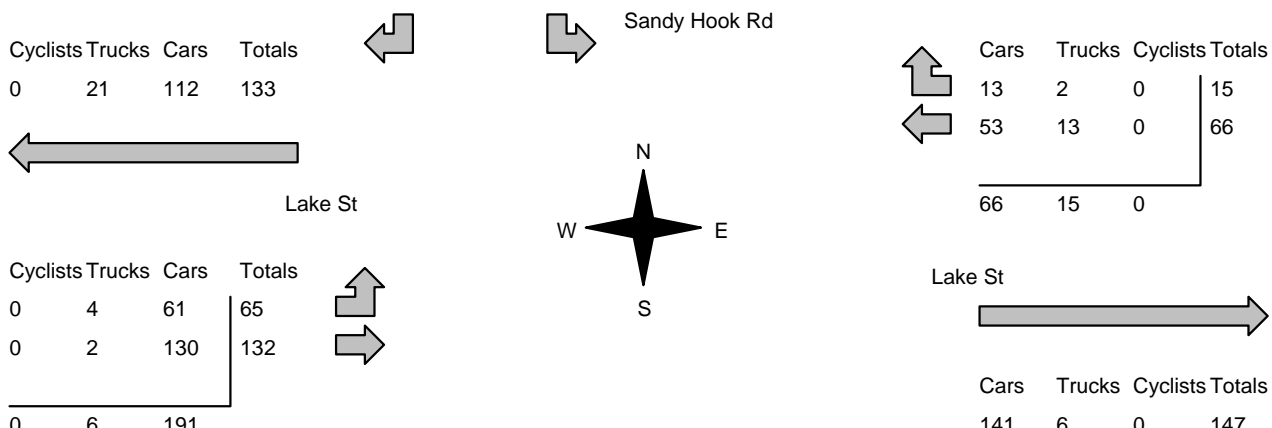
Peds Cross: \times
 South Peds: 0
 South Entering: 484
 South Leg Total: 989


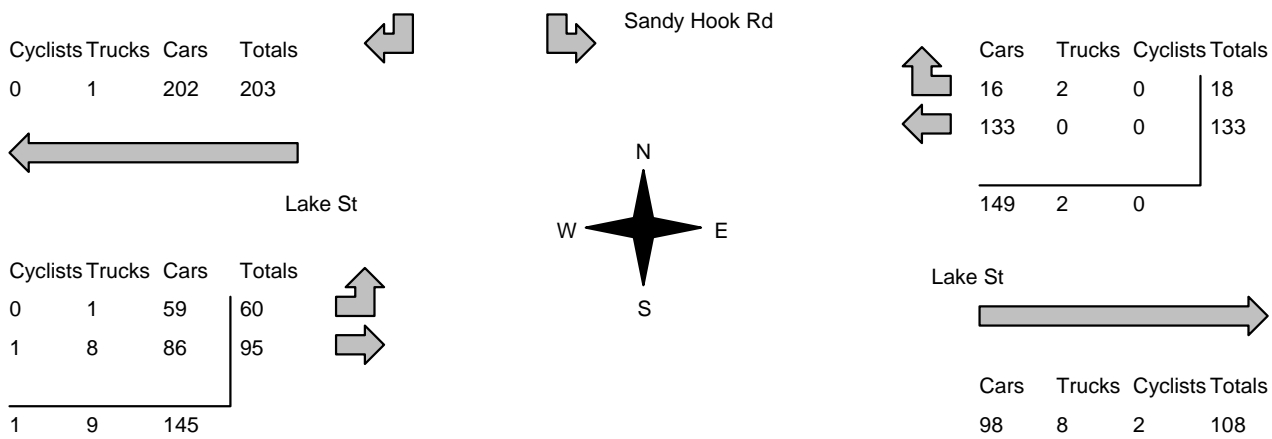
Comments

Traffic Count Summary

Intersection: Loyalist Parkway & Sandy Hook R Count Date: 23-Jan-24 Municipality: Prince Edward

North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds		Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
6:00:00	0	0	0	0	0	0	6:00:00	0	0	0	0	0
7:00:00	26	18	1	45	0	75	7:00:00	6	17	7	30	0
8:00:00	72	33	4	109	0	171	8:00:00	18	28	16	62	0
9:00:00	97	40	6	143	0	221	9:00:00	21	29	28	78	0
10:00:00	78	26	1	105	0	192	10:00:00	26	29	32	87	0
15:00:00	0	0	0	0	0	0	15:00:00	0	0	0	0	0
16:00:00	65	27	2	94	0	168	16:00:00	18	33	23	74	0
17:00:00	71	24	5	100	0	183	17:00:00	27	27	29	83	0
18:00:00	58	16	3	77	0	123	18:00:00	11	15	20	46	0
19:00:00	37	13	0	50	0	74	19:00:00	4	8	12	24	0
Totals:	504	197	22	723	0	1207	S Totals:	131	186	167	484	0
East Approach Totals						East/West Total Approaches	West Approach Totals					
Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds		Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
6:00:00	0	0	0	0	0	0	6:00:00	0	0	0	0	0
7:00:00	2	45	19	66	0	123	7:00:00	2	46	9	57	0
8:00:00	13	53	51	117	0	208	8:00:00	2	73	16	91	0
9:00:00	19	133	70	222	0	394	9:00:00	2	151	19	172	0
10:00:00	25	118	73	216	0	376	10:00:00	1	139	20	160	0
15:00:00	0	0	0	0	0	0	15:00:00	0	0	0	0	0
16:00:00	42	152	79	273	0	468	16:00:00	6	157	32	195	0
17:00:00	35	147	110	292	0	465	17:00:00	8	142	23	173	0
18:00:00	20	124	93	237	0	346	18:00:00	2	90	17	109	0
19:00:00	7	60	37	104	0	181	19:00:00	2	66	9	77	0
Totals:	163	832	532	1527	0	2561	W Totals:	25	864	145	1034	0
Calculated Values for Traffic Crossing Major Street												
Hours Ending:	7:00	8:00	9:00	10:00			16:00	17:00	18:00	19:00		
Crossing Values:	50	123	158	133			116	125	85	54		

<h1>Morning Peak Diagram</h1>	Specified Period From: 6:00:00 To: 10:00:00	One Hour Peak From: 7:45:00 To: 8:45:00																																																	
Municipality: Prince Edward Site #: 2401400002 Intersection: Lake St & Sandy Hook Rd TFR File #: 1 Count date: 23-Jan-24	Weather conditions: Person counted: Person prepared: Person checked:																																																		
** Non-Signalized Intersection **	Major Road: Lake St runs W/E																																																		
<table style="width: 100%; border-collapse: collapse;"> <tr><td>North Leg Total: 162</td></tr> <tr><td>North Entering: 82</td></tr> <tr><td>North Peds: 0</td></tr> <tr><td>Peds Cross: ∇</td></tr> </table>	North Leg Total: 162	North Entering: 82	North Peds: 0	Peds Cross: ∇	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cyclists 0</td><td>0</td><td>0</td></tr> <tr><td>Trucks 8</td><td>4</td><td>12</td></tr> <tr><td>Cars 59</td><td>11</td><td>70</td></tr> <tr><td>Totals 67</td><td>15</td><td></td></tr> </table>	Cyclists 0	0	0	Trucks 8	4	12	Cars 59	11	70	Totals 67	15		<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cyclists 0</td></tr> <tr><td>Trucks 6</td></tr> <tr><td>Cars 74</td></tr> <tr><td>Totals 80</td></tr> </table>	Cyclists 0	Trucks 6	Cars 74	Totals 80	<table style="width: 100%; border-collapse: collapse;"> <tr><td>East Leg Total: 228</td></tr> <tr><td>East Entering: 81</td></tr> <tr><td>East Peds: 0</td></tr> <tr><td>Peds Cross: ∇</td></tr> </table>	East Leg Total: 228	East Entering: 81	East Peds: 0	Peds Cross: ∇																								
North Leg Total: 162																																																			
North Entering: 82																																																			
North Peds: 0																																																			
Peds Cross: ∇																																																			
Cyclists 0	0	0																																																	
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Peds Cross: ∇																																																			
																																																			
<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cyclists</td><td>Trucks</td><td>Cars</td><td>Totals</td></tr> <tr><td>0</td><td>21</td><td>112</td><td>133</td></tr> </table>	Cyclists	Trucks	Cars	Totals	0	21	112	133	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cyclists</td><td>Trucks</td><td>Cars</td><td>Totals</td></tr> <tr><td>0</td><td>4</td><td>61</td><td>65</td></tr> <tr><td>0</td><td>2</td><td>130</td><td>132</td></tr> <tr><td>0</td><td>6</td><td>191</td><td></td></tr> </table>	Cyclists	Trucks	Cars	Totals	0	4	61	65	0	2	130	132	0	6	191		<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cars</td><td>Trucks</td><td>Cyclists</td><td>Totals</td></tr> <tr><td>13</td><td>2</td><td>0</td><td>15</td></tr> <tr><td>53</td><td>13</td><td>0</td><td>66</td></tr> <tr><td>66</td><td>15</td><td>0</td><td></td></tr> </table>	Cars	Trucks	Cyclists	Totals	13	2	0	15	53	13	0	66	66	15	0		<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cars</td><td>Trucks</td><td>Cyclists</td><td>Totals</td></tr> <tr><td>141</td><td>6</td><td>0</td><td>147</td></tr> </table>	Cars	Trucks	Cyclists	Totals	141	6	0	147
Cyclists	Trucks	Cars	Totals																																																
0	21	112	133																																																
Cyclists	Trucks	Cars	Totals																																																
0	4	61	65																																																
0	2	130	132																																																
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13	2	0	15																																																
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Cars	Trucks	Cyclists	Totals																																																
141	6	0	147																																																
<table style="width: 100%; border-collapse: collapse;"> <tr><td>Peds Cross: ∇</td></tr> <tr><td>West Peds: 0</td></tr> <tr><td>West Entering: 197</td></tr> <tr><td>West Leg Total: 330</td></tr> </table>				Peds Cross: ∇	West Peds: 0	West Entering: 197	West Leg Total: 330																																												
Peds Cross: ∇																																																			
West Peds: 0																																																			
West Entering: 197																																																			
West Leg Total: 330																																																			
<h2>Comments</h2>																																																			

<h2>Afternoon Peak Diagram</h2>	Specified Period From: 15:00:00 To: 19:00:00	One Hour Peak From: 16:00:00 To: 17:00:00																																				
Municipality: Prince Edward Site #: 2401400002 Intersection: Lake St & Sandy Hook Rd TFR File #: 1 Count date: 23-Jan-24	Weather conditions: Person counted: Person prepared: Person checked:																																					
** Non-Signalized Intersection **	Major Road: Lake St runs W/E																																					
<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">North Leg Total: 161</td> <td style="width:33%;">Cyclists 0</td> <td style="width:33%;">1</td> <td style="width:33%;">1</td> </tr> <tr> <td>North Entering: 83</td> <td>Trucks 1</td> <td>0</td> <td>1</td> </tr> <tr> <td>North Peds: 0</td> <td>Cars 69</td> <td>12</td> <td>81</td> </tr> <tr> <td>Peds Cross: ☒</td> <td>Totals 70</td> <td>13</td> <td></td> </tr> </table>	North Leg Total: 161	Cyclists 0	1	1	North Entering: 83	Trucks 1	0	1	North Peds: 0	Cars 69	12	81	Peds Cross: ☒	Totals 70	13			<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Cyclists 0</td> <td style="width:33%;">East Leg Total: 259</td> </tr> <tr> <td>Trucks 3</td> <td>East Entering: 151</td> </tr> <tr> <td>Cars 75</td> <td>East Peds: 0</td> </tr> <tr> <td>Totals 78</td> <td>Peds Cross: ☒</td> </tr> </table>	Cyclists 0	East Leg Total: 259	Trucks 3	East Entering: 151	Cars 75	East Peds: 0	Totals 78	Peds Cross: ☒												
North Leg Total: 161	Cyclists 0	1	1																																			
North Entering: 83	Trucks 1	0	1																																			
North Peds: 0	Cars 69	12	81																																			
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<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Cyclists 0</td> <td style="width:33%;">Trucks 1</td> <td style="width:33%;">Cars 202</td> <td style="width:33%;">Totals 203</td> </tr> <tr> <td>0</td> <td>1</td> <td>202</td> <td>203</td> </tr> </table>	Cyclists 0	Trucks 1	Cars 202	Totals 203	0	1	202	203	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Cyclists 0</td> <td style="width:33%;">Trucks 2</td> <td style="width:33%;">Cars 16</td> <td style="width:33%;">Totals 18</td> </tr> <tr> <td>0</td> <td>2</td> <td>16</td> <td>18</td> </tr> <tr> <td>1</td> <td>8</td> <td>86</td> <td>95</td> </tr> <tr> <td>1</td> <td>9</td> <td>145</td> <td></td> </tr> </table>	Cyclists 0	Trucks 2	Cars 16	Totals 18	0	2	16	18	1	8	86	95	1	9	145		<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Cars 133</td> <td style="width:33%;">Trucks 0</td> <td style="width:33%;">Cyclists 0</td> <td style="width:33%;">Totals 133</td> </tr> <tr> <td>133</td> <td>0</td> <td>0</td> <td>133</td> </tr> <tr> <td>149</td> <td>2</td> <td>0</td> <td></td> </tr> </table>	Cars 133	Trucks 0	Cyclists 0	Totals 133	133	0	0	133	149	2	0	
Cyclists 0	Trucks 1	Cars 202	Totals 203																																			
0	1	202	203																																			
Cyclists 0	Trucks 2	Cars 16	Totals 18																																			
0	2	16	18																																			
1	8	86	95																																			
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Cars 133	Trucks 0	Cyclists 0	Totals 133																																			
133	0	0	133																																			
149	2	0																																				
<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Cyclists 0</td> <td style="width:33%;">Trucks 1</td> <td style="width:33%;">Cars 59</td> <td style="width:33%;">Totals 60</td> </tr> <tr> <td>0</td> <td>1</td> <td>59</td> <td>60</td> </tr> <tr> <td>1</td> <td>8</td> <td>86</td> <td>95</td> </tr> <tr> <td>1</td> <td>9</td> <td>145</td> <td></td> </tr> </table>	Cyclists 0	Trucks 1	Cars 59	Totals 60	0	1	59	60	1	8	86	95	1	9	145		<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Cars 98</td> <td style="width:33%;">Trucks 8</td> <td style="width:33%;">Cyclists 2</td> <td style="width:33%;">Totals 108</td> </tr> <tr> <td>98</td> <td>8</td> <td>2</td> <td>108</td> </tr> </table>	Cars 98	Trucks 8	Cyclists 2	Totals 108	98	8	2	108													
Cyclists 0	Trucks 1	Cars 59	Totals 60																																			
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98	8	2	108																																			
<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Peds Cross: ☒</td> <td style="width:33%;">West Peds: 0</td> <td style="width:33%;">West Entering: 155</td> <td style="width:33%;">West Leg Total: 358</td> </tr> <tr> <td>☒</td> <td>0</td> <td>155</td> <td>358</td> </tr> </table>	Peds Cross: ☒	West Peds: 0	West Entering: 155	West Leg Total: 358	☒	0	155	358																														
Peds Cross: ☒	West Peds: 0	West Entering: 155	West Leg Total: 358																																			
☒	0	155	358																																			
<h2>Comments</h2>																																						

Total Count Diagram

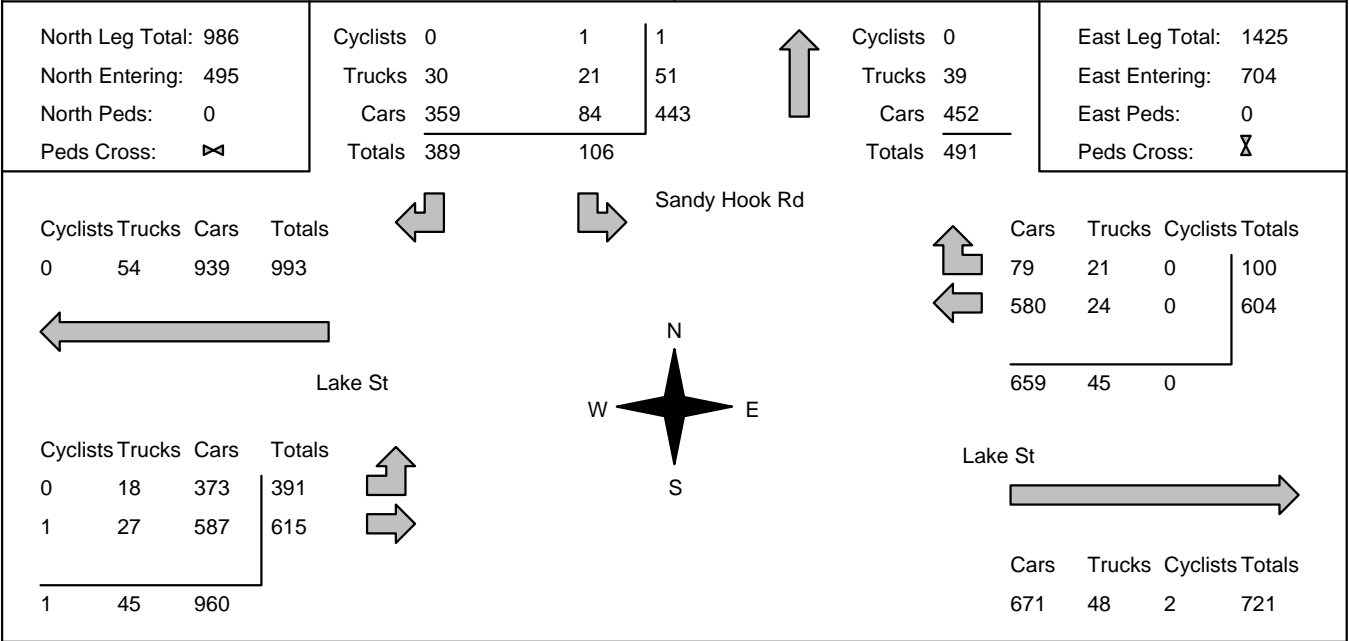
Municipality: Prince Edward
Site #: 2401400002
Intersection: Lake St & Sandy Hook Rd
TFR File #: 1
Count date: 23-Jan-24

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: Lake St runs W/E



Peds Cross: ☒
 West Peds: 0
 West Entering: 1006
 West Leg Total: 1999

Comments

Traffic Count Summary

Intersection: Lake St & Sandy Hook Rd					Count Date: 23-Jan-24		Municipality: Prince Edward					
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds		Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
6:00:00	0	0	0	0	0	0	6:00:00	0	0	0	0	0
7:00:00	14	0	11	25	0	25	7:00:00	0	0	0	0	0
8:00:00	15	0	44	59	0	59	8:00:00	0	0	0	0	0
9:00:00	12	0	62	74	0	74	9:00:00	0	0	0	0	0
10:00:00	16	0	54	70	0	70	10:00:00	0	0	0	0	0
15:00:00	0	0	0	0	0	0	15:00:00	0	0	0	0	0
16:00:00	20	0	81	101	0	101	16:00:00	0	0	0	0	0
17:00:00	13	0	70	83	0	83	17:00:00	0	0	0	0	0
18:00:00	6	0	45	51	0	51	18:00:00	0	0	0	0	0
19:00:00	10	0	22	32	0	32	19:00:00	0	0	0	0	0
Totals:	106	0	389	495	0	495	S Totals:	0	0	0	0	0
East Approach Totals						East/West Total Approaches	West Approach Totals					
Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds		Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
6:00:00	0	0	0	0	0	0	6:00:00	0	0	0	0	0
7:00:00	0	13	1	14	0	85	7:00:00	30	41	0	71	0
8:00:00	0	37	15	52	0	210	8:00:00	54	104	0	158	0
9:00:00	0	78	15	93	0	274	9:00:00	68	113	0	181	0
10:00:00	0	60	16	76	0	246	10:00:00	69	101	0	170	0
15:00:00	0	0	0	0	0	0	15:00:00	0	0	0	0	0
16:00:00	0	112	17	129	0	252	16:00:00	59	64	0	123	0
17:00:00	0	133	18	151	0	306	17:00:00	60	95	0	155	0
18:00:00	0	114	7	121	0	212	18:00:00	35	56	0	91	0
19:00:00	0	57	11	68	0	125	19:00:00	16	41	0	57	0
Totals:	0	604	100	704	0	1710	W Totals:	391	615	0	1006	0
Calculated Values for Traffic Crossing Major Street												
Hours Ending:	7:00	8:00	9:00	10:00			16:00	17:00	18:00	19:00		
Crossing Values:	14	15	12	16			20	13	6	10		

Count Date: 23-Jan-24 Site #: 2401400002

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Cyclists - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	2	2	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30:00	9	7	16	10	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
6:45:00	20	11	24	8	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
7:00:00	30	10	40	16	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
7:15:00	40	10	52	12	0	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0
7:30:00	56	16	66	14	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0
7:45:00	67	11	90	24	0	0	1	1	7	3	0	0	0	0	0	0	0	0	0	0
8:00:00	82	15	137	47	0	0	2	1	8	1	0	0	0	0	0	0	0	0	0	0
8:15:00	99	17	163	26	0	0	2	0	9	1	0	0	0	0	0	0	0	0	0	0
8:30:00	116	17	195	32	0	0	3	1	9	0	0	0	0	0	0	0	0	0	0	0
8:45:00	128	12	220	25	0	0	5	2	9	0	0	0	0	0	0	0	0	0	0	0
9:00:00	147	19	248	28	0	0	5	0	10	1	0	0	0	0	0	0	0	0	0	0
9:15:00	158	11	268	20	0	0	6	1	11	1	0	0	0	0	0	0	0	0	0	0
9:30:00	171	13	297	29	0	0	9	3	13	2	0	0	0	0	0	0	0	0	0	0
9:45:00	187	16	325	28	0	0	12	3	15	2	0	0	0	0	0	0	0	0	0	0
10:00:00	207	20	344	19	0	0	14	2	15	0	0	0	0	0	0	0	0	0	0	0
10:15:00	207	0	344	0	0	0	14	0	15	0	0	0	0	0	0	0	0	0	0	0
15:00:00	207	0	344	0	0	0	14	0	15	0	0	0	0	0	0	0	0	0	0	0
15:15:00	222	15	359	15	0	0	14	0	15	0	0	0	0	0	0	0	0	0	0	0
15:30:00	238	16	375	16	0	0	14	0	16	1	0	0	0	0	0	0	0	0	0	0
15:45:00	249	11	389	14	0	0	14	0	17	1	0	0	0	0	0	0	0	0	0	0
16:00:00	265	16	406	17	0	0	15	1	17	0	0	0	0	0	0	0	0	0	0	0
16:15:00	282	17	423	17	0	0	15	0	18	1	0	0	0	0	0	0	0	0	0	0
16:30:00	297	15	450	27	0	0	15	0	21	3	0	0	0	0	0	0	0	0	0	0
16:45:00	314	17	473	23	0	0	16	1	23	2	0	0	0	0	1	1	0	0	0	0
17:00:00	324	10	492	19	0	0	16	0	25	2	0	0	0	0	1	0	0	0	0	0
17:15:00	335	11	507	15	0	0	17	1	26	1	0	0	0	0	1	0	0	0	0	0
17:30:00	344	9	516	9	0	0	18	1	26	0	0	0	0	0	1	0	0	0	0	0
17:45:00	351	7	529	13	0	0	18	0	27	1	0	0	0	0	1	0	0	0	0	0
18:00:00	357	6	546	17	0	0	18	0	27	0	0	0	0	0	1	0	0	0	0	0
18:15:00	364	7	558	12	0	0	18	0	27	0	0	0	0	0	1	0	0	0	0	0
18:30:00	368	4	571	13	0	0	18	0	27	0	0	0	0	0	1	0	0	0	0	0
18:45:00	372	4	579	8	0	0	18	0	27	0	0	0	0	0	1	0	0	0	0	0
19:00:00	373	1	587	8	0	0	18	0	27	0	0	0	0	0	1	0	0	0	0	0
19:15:00	373	0	587	0	0	0	18	0	27	0	0	0	0	0	1	0	0	0	0	0
19:15:15	373	0	587	0	0	0	18	0	27	0	0	0	0	0	1	0	0	0	0	0

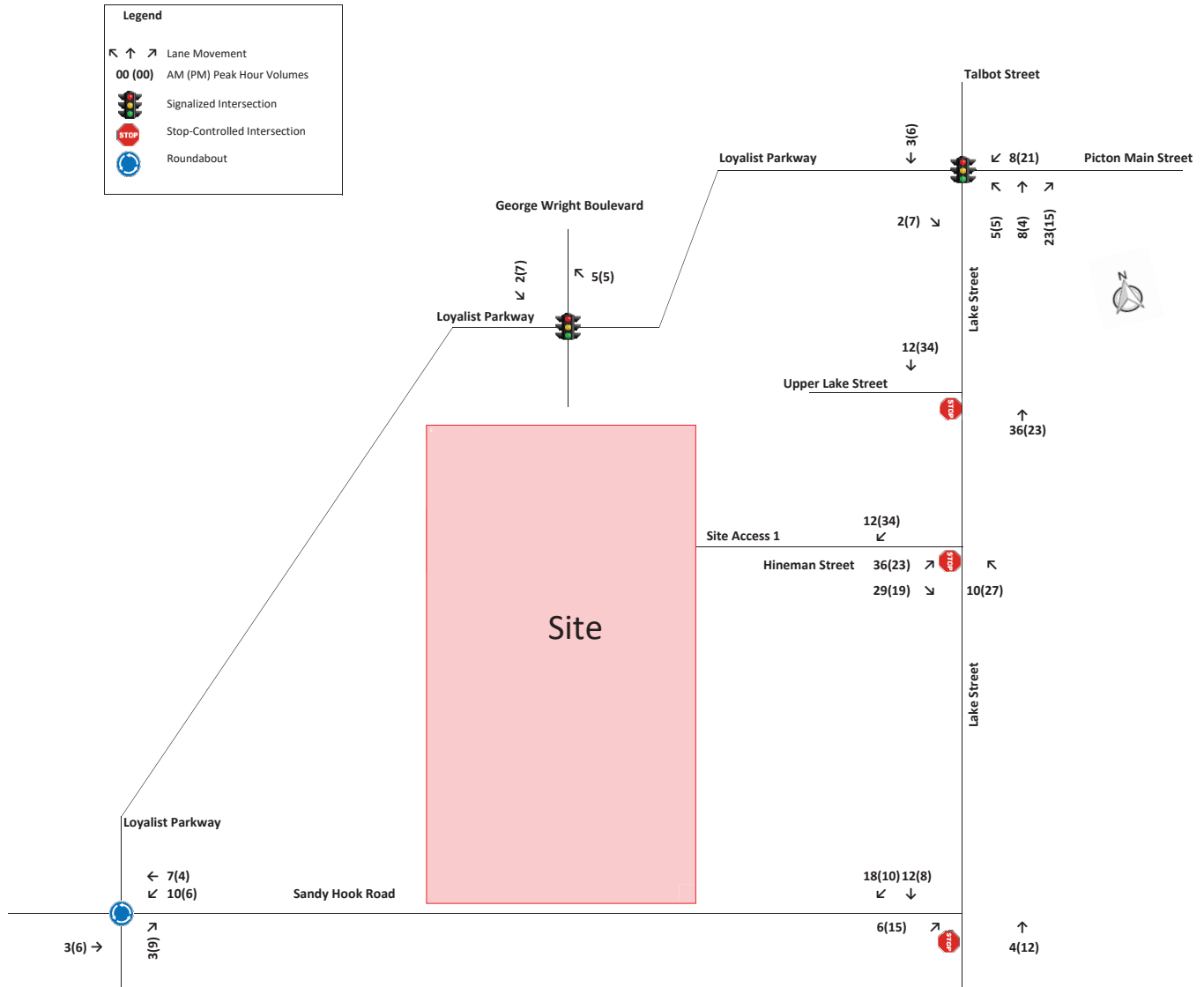


Figure 5-1 2027 Site Generated Traffic Volumes

Cold Creek Residential Subdivision, Picton Traffic Impact Study

CCO-24-1706

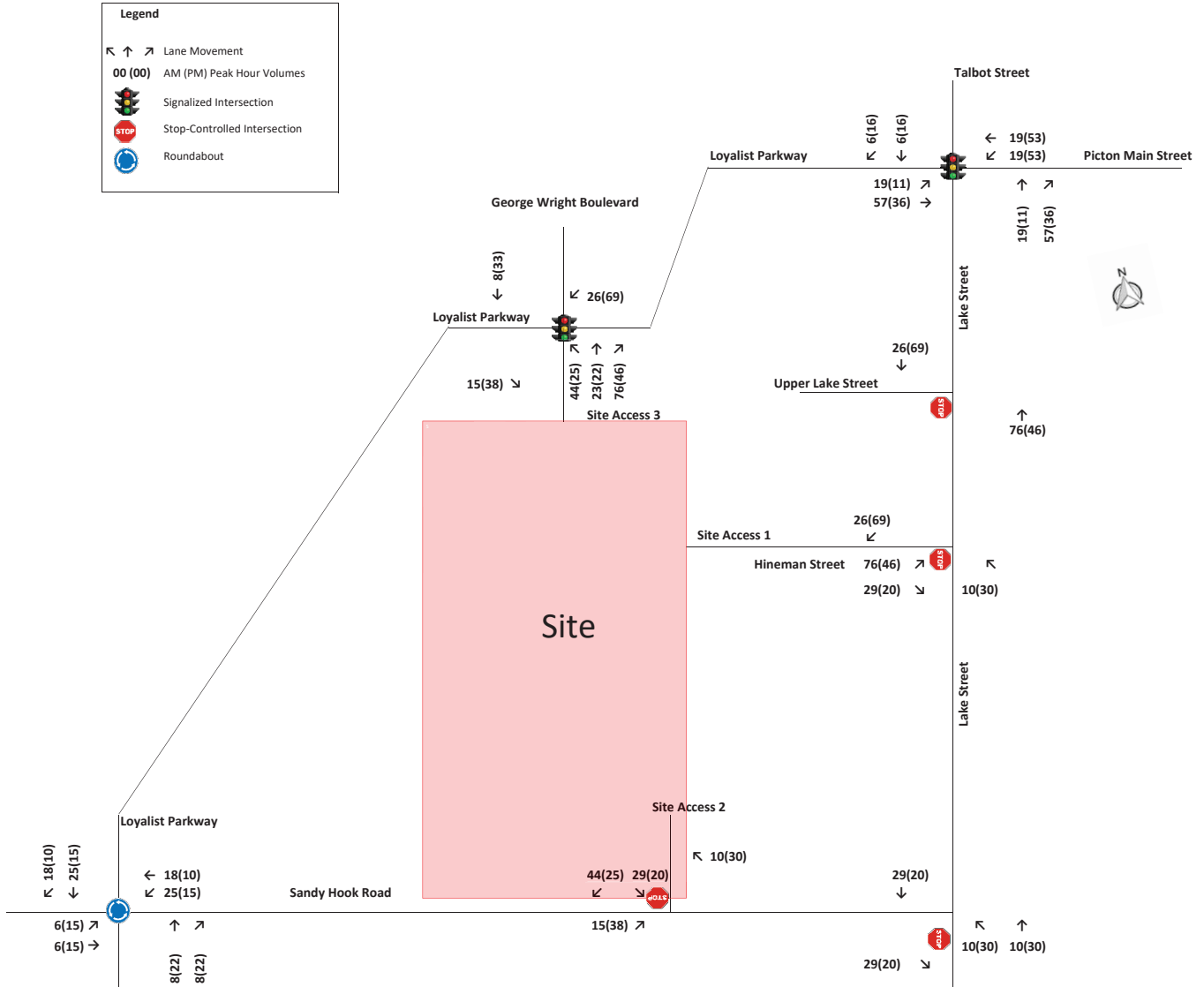
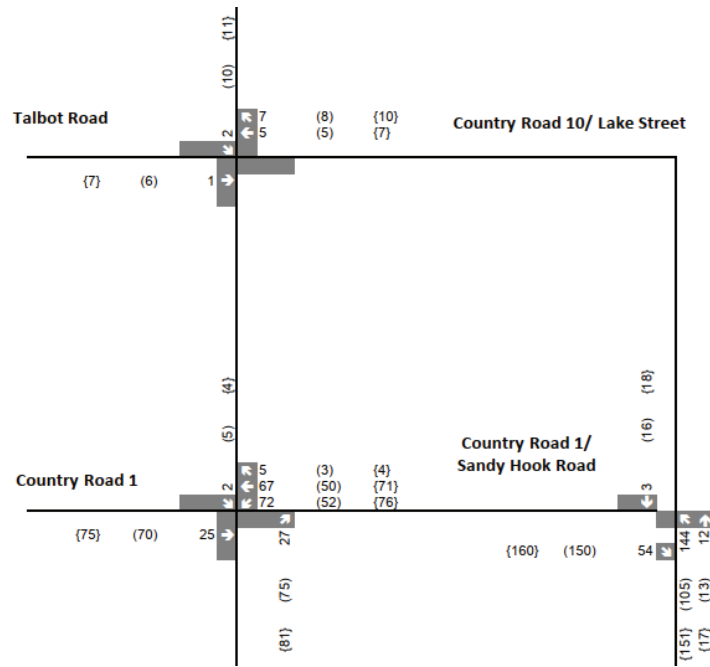
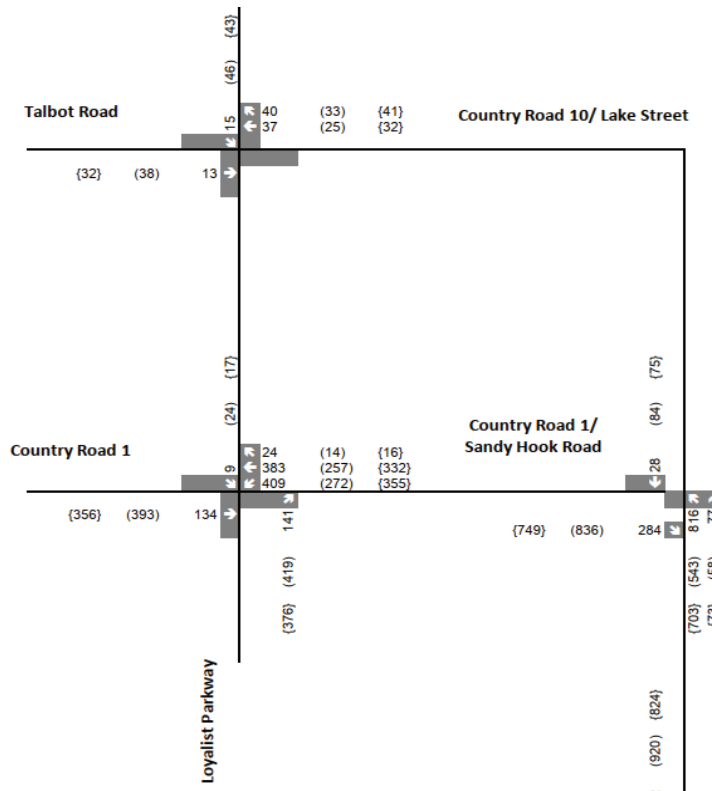


Figure 5-2 2035 Site Generated Traffic Volumes

- **Base 31:** Phase 1 - 2031, Phase 2 - 2041

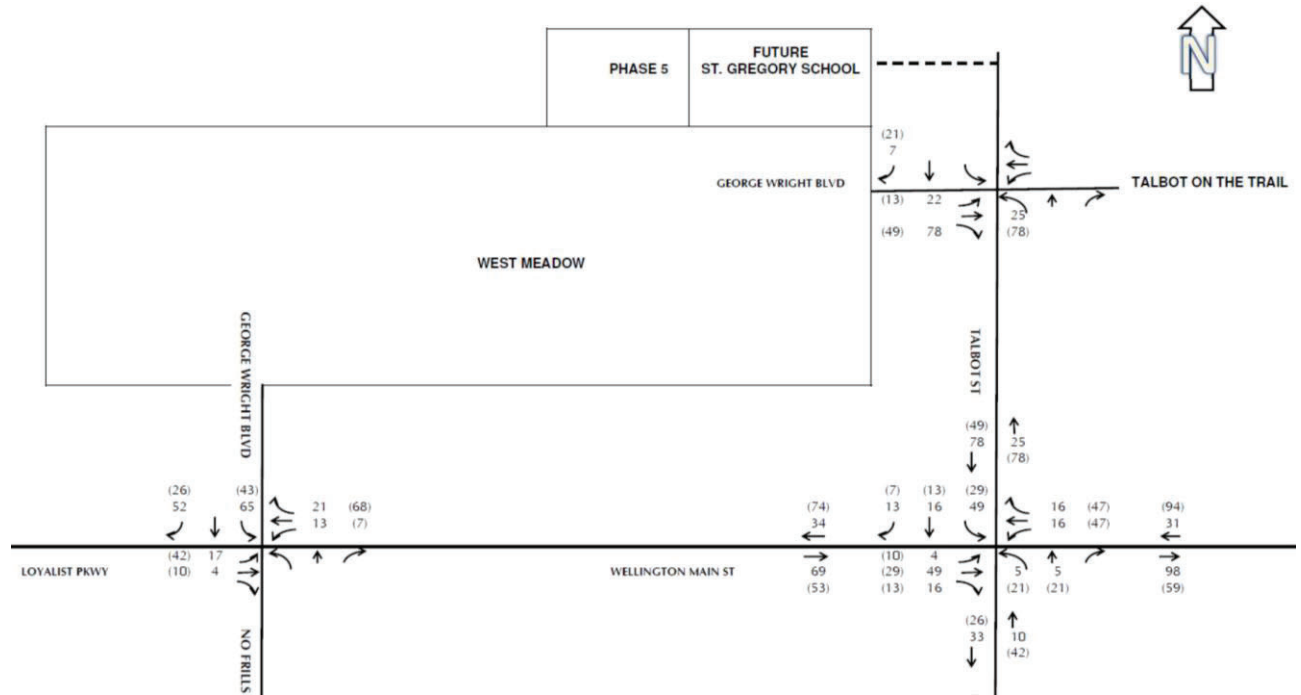


2031

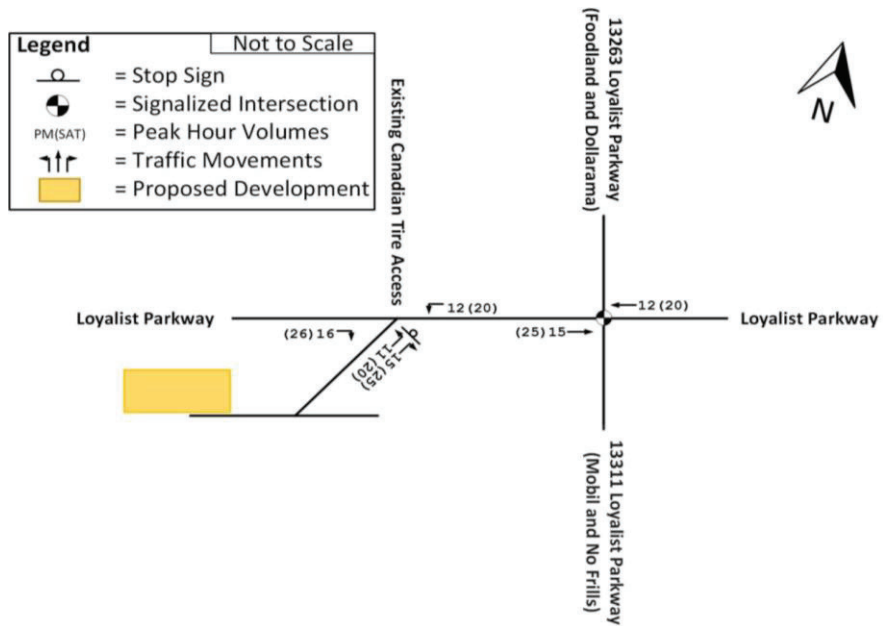


2041

- West Meadow Picton, 2027



- Canadian Tire, 2023



- **13 Lake Street, 2028**

Site Component	Density (Units)	ITE Code	Item	M Peak Hour		PM Peak Hour			Total
				In	Out	Total	In	Out	
Rental Apartment	12	Multifamily Housing (Low-Rise) (220)	Directional Distribution	24%	76%	100%	63%	37%	100%
			Average Rate / Fitted Curve	0.10	0.30	0.40	0.32	0.19	0.51
			Generated Trips	1	4	5	4	2	6

- **The Heights, 2035**

Site Component	Density (Units)	ITE Code	Item	M Peak Hour		PM Peak Hour			Total
				In	Out	Total	In	Out	
Single Units	100	Single Family Detached Housing (210)	Directional Distribution	25%	75%	100%	63%	37%	100%
			Average Rate / Fitted Curve	$\text{Ln}(T) = 0.91 \text{Ln}(X) + 0.12$			$\text{Ln}(T) = 0.94 \text{Ln}(X) + 0.27$		
			Generated Trips	19	55	74	63	36	99
Stacked Units	250	Single Family Attached Housing (215)	Directional Distribution	25%	75%	100%	59%	41%	100%
			Average Rate / Fitted Curve	$T = 0.52(X) - 5.70$			$T = 0.60(X) - 3.93$		
			Generated Trips	31	93	124	86	60	146
Apartment Units	250	Multifamily Housing (Mid-Rise) (221)	Directional Distribution	23%	77%	100%	61%	39%	100%
			Average Rate / Fitted Curve	$T = 0.44(X) - 11.61$			$T = 0.39(X) + 0.34$		
			Generated Trips	23	75	98	60	38	98
Total	600		Generated Trips	35	113	148	83	62	145

- **Affordable Housing Project, 2029**

Site Component	Density (Units)	ITE Code	Item	M Peak Hour		PM Peak Hour			Total
				In	Out	Total	In	Out	
Townhouse Units	130	Single Family Attached Housing (215)	Directional Distribution	25%	75%	100%	59%	41%	100%
			Average Rate / Fitted Curve	$T = 0.52(X) - 5.70$			$T = 0.60(X) - 3.93$		
			Generated Trips	15	47	62	44	30	74

Appendix C

Existing Operational Analysis Outputs



HCM Unsignalized Intersection Capacity Analysis
 2: Lake Street (CR10) & Sandy Hook Road (CR1)

Base Year - AM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	93	90	183	112	21
Future Volume (Veh/h)	21	93	90	183	112	21
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	23	103	100	203	124	23
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	538	136	147			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	538	136	147			
tC, single (s)	6.7	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.7	3.4	2.3			
p0 queue free %	95	88	93			
cM capacity (veh/h)	430	887	1411			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	126	100	203	147		
Volume Left	23	100	0	0		
Volume Right	103	0	0	23		
cSH	743	1411	1700	1700		
Volume to Capacity	0.17	0.07	0.12	0.09		
Queue Length 95th (m)	4.9	1.8	0.0	0.0		
Control Delay (s)	10.8	7.7	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	10.8	2.6				
Approach LOS	B					
Intersection Summary						
Average Delay	3.7					
Intersection Capacity Utilization	29.1%		ICU Level of Service	A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

2: Lake Street (CR10) & Sandy Hook Road (CR1)

Base Year - PM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	139	119	249	264	36
Future Volume (Veh/h)	26	139	119	249	264	36
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	28	148	127	265	281	38
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	819	300	319			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	819	300	319			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	91	80	90			
cM capacity (veh/h)	303	742	1241			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	176	127	265	319		
Volume Left	28	127	0	0		
Volume Right	148	0	0	38		
cSH	603	1241	1700	1700		
Volume to Capacity	0.29	0.10	0.16	0.19		
Queue Length 95th (m)	9.7	2.7	0.0	0.0		
Control Delay (s)	13.4	8.2	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	13.4	2.7	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay	3.8					
Intersection Capacity Utilization	42.7%			ICU Level of Service	A	
Analysis Period (min)	15					

<h1>Junctions 8</h1>
<h2>ARCADY 8 - Roundabout Module</h2>
Version: 8.0.6.541 [19821,26/11/2015] © Copyright TRL Limited, 2024
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Filename: Loyalist and Sandy Hook.arc8

Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Personal Project Files\240418-Arcady

Report generation date: 2024-10-15 11:17:05 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	0.30	~1	3.61	0.23	A	3.60	A
Leg West	0.19	~1	3.57	0.16	A		
Leg South	0.24	~1	3.66	0.19	A		
Leg East	0.10	~1	3.48	0.09	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 - 9:30 AM
 "D2 - Base Year, PM" model duration: 4:00 PM - 5:30 PM
 "D3 - 2027 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D4 - 2027 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D5 - 2032 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D6 - 2032 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D7 - 2037 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D8 - 2037 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D9 - 2027 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D10 - 2027 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D11 - 2032 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D12 - 2032 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D13 - 2037 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D14 - 2037 Total, PM" model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2024-10-15 11:17:04 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2024-10-15
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		ONE HOUR	08:00	09:30	90	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				3.60	A

Intersection Set Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Loyalist Parkway (Hwy 33)	
West	West	Sandy Hook Road (CR1)	
South	South	Loyalist Parkway (Hwy 33)	
East	East	Sandy Hook Road (CR1)	

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)	I' - 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	ONE HOUR	✓	273.00	100.000
West	ONE HOUR	✓	175.00	100.000
South	ONE HOUR	✓	211.00	100.000
East	ONE HOUR	✓	96.00	100.000

Turning Proportions

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

		To			
		North	West	South	East
From	North	0.000	86.000	164.000	23.000
	West	119.000	0.000	7.000	49.000
	South	186.000	2.000	0.000	23.000
	East	34.000	36.000	26.000	0.000

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

		To			
		North	West	South	East
From	North	0.00	0.32	0.60	0.08
	West	0.68	0.00	0.04	0.28
	South	0.88	0.01	0.00	0.11
	East	0.35	0.38	0.27	0.00

Vehicle Mix

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

		To			
		North	West	South	East
From	North	1.000	1.020	1.020	1.020
	West	1.020	1.000	1.020	1.020
	South	1.020	1.020	1.000	1.020
	East	1.020	1.020	1.020	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.0	2.0	2.0	2.0
	West	2.0	0.0	2.0	2.0
	South	2.0	2.0	0.0	2.0
	East	2.0	2.0	2.0	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	0.23	3.61	0.30	~1	A	250.51	375.76	21.49	3.43	0.24	21.49	3.43
West	0.16	3.57	0.19	~1	A	160.58	240.87	13.64	3.40	0.15	13.64	3.40
South	0.19	3.66	0.24	~1	A	193.62	290.43	16.79	3.47	0.19	16.79	3.47
East	0.09	3.48	0.10	~1	A	88.09	132.14	7.33	3.33	0.08	7.33	3.33

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	205.53	51.38	204.79	254.30	48.01	0.00	1329.66	1129.08	0.155	0.00	0.19	3.263	A
West	131.75	32.94	131.28	93.02	159.78	0.00	1264.97	816.02	0.104	0.00	0.12	3.237	A
South	158.85	39.71	158.27	147.78	143.28	0.00	1274.52	849.00	0.125	0.00	0.14	3.287	A
East	72.27	18.07	72.02	71.26	230.29	0.00	1224.16	598.49	0.059	0.00	0.06	3.187	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	245.42	61.36	245.24	304.53	57.49	0.00	1324.17	1129.08	0.185	0.19	0.23	3.403	A
West	157.32	39.33	157.21	111.39	191.34	0.00	1246.70	816.02	0.126	0.12	0.15	3.369	A
South	189.68	47.42	189.54	176.97	171.58	0.00	1258.14	849.00	0.151	0.14	0.18	3.435	A
East	86.30	21.58	86.24	85.34	275.78	0.00	1197.83	598.49	0.072	0.06	0.08	3.302	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	300.58	75.14	300.30	372.90	70.40	0.00	1316.70	1129.07	0.228	0.23	0.30	3.612	A
West	192.68	48.17	192.50	136.40	234.30	0.00	1221.84	816.02	0.158	0.15	0.19	3.567	A
South	232.32	58.08	232.10	216.70	210.10	0.00	1235.84	849.00	0.188	0.18	0.23	3.658	A
East	105.70	26.42	105.61	104.50	337.70	0.00	1162.00	598.49	0.091	0.08	0.10	3.475	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	300.58	75.14	300.58	373.24	70.46	0.00	1316.66	1129.07	0.228	0.30	0.30	3.612	A
West	192.68	48.17	192.68	136.53	234.52	0.00	1221.72	816.02	0.158	0.19	0.19	3.567	A
South	232.32	58.08	232.31	216.90	210.29	0.00	1235.74	849.00	0.188	0.23	0.24	3.658	A
East	105.70	26.42	105.70	104.60	338.01	0.00	1161.82	598.49	0.091	0.10	0.10	3.476	A

Main results: (09:00-09:15)

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	245.42	61.36	245.69	305.09	57.59	0.00	1324.11	1129.08	0.185	0.30	0.23	3.407	A
West	157.32	39.33	157.49	111.59	191.69	0.00	1246.50	816.02	0.126	0.19	0.15	3.371	A
South	189.68	47.42	189.90	177.29	171.89	0.00	1257.96	849.00	0.151	0.24	0.18	3.437	A
East	86.30	21.58	86.39	85.50	276.29	0.00	1197.54	598.49	0.072	0.10	0.08	3.306	A

Main results: (09:15-09:30)

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	205.53	51.38	205.71	255.44	48.22	0.00	1329.54	1129.08	0.155	0.23	0.19	3.269	A
West	131.75	32.94	131.86	93.44	160.50	0.00	1264.55	816.02	0.104	0.15	0.12	3.243	A
South	158.85	39.71	159.00	148.44	143.92	0.00	1274.15	849.00	0.125	0.18	0.15	3.295	A
East	72.27	18.07	72.33	71.58	231.33	0.00	1223.56	598.49	0.059	0.08	0.06	3.191	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	2.73	0.18	3.263	A	A
West	1.74	0.12	3.237	A	A
South	2.13	0.14	3.287	A	A
East	0.94	0.06	3.187	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	3.42	0.23	3.403	A	A
West	2.17	0.14	3.369	A	A
South	2.67	0.18	3.435	A	A
East	1.17	0.08	3.302	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	4.44	0.30	3.612	A	A
West	2.81	0.19	3.567	A	A
South	3.47	0.23	3.658	A	A
East	1.51	0.10	3.475	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	4.51	0.30	3.612	A	A
West	2.86	0.19	3.567	A	A

South	3.53	0.24	3.658	A	A
East	1.53	0.10	3.476	A	A

Queueing Delay results: (09:00-09:15)

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	3.55	0.24	3.407	A	A
West	2.25	0.15	3.371	A	A
South	2.77	0.18	3.437	A	A
East	1.21	0.08	3.306	A	A

Queueing Delay results: (09:15-09:30)

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	2.85	0.19	3.269	A	A
West	1.81	0.12	3.243	A	A
South	2.22	0.15	3.295	A	A
East	0.98	0.07	3.191	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	0.19	~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
West	0.12	~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	0.14	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.06	~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	0.23	~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	0.15	~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	0.18	~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	0.08	~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	0.30	~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
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	0.23	~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	0.10	~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)

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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	0.30	~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
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	0.24	~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
East	0.10	~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: (09:00-09:15)

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	0.23	~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	0.15	~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	0.18	~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	0.08	~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: (09:15-09:30)

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	0.19	~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
West	0.12	~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	0.15	~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	0.06	~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

<h1>Junctions 8</h1>
<h2>ARCADY 8 - Roundabout Module</h2>
Version: 8.0.6.541 [19821,26/11/2015] © Copyright TRL Limited, 2024
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Filename: Loyalist and Sandy Hook.arc8

Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Personal Project Files\240418-Arcady

Report generation date: 2024-10-15 11:16:33 PM

Summary of intersection performance

	PM						
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
	A1 - Base Year						
Leg North	0.30	~1	3.67	0.23	A	3.77	A
Leg West	0.17	~1	3.36	0.14	A		
Leg South	0.36	~1	4.07	0.26	A		
Leg East	0.16	~1	3.78	0.14	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 - 9:30 AM
 "D2 - Base Year, PM" model duration: 4:00 PM - 5:30 PM
 "D3 - 2027 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D4 - 2027 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D5 - 2032 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D6 - 2032 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D7 - 2037 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D8 - 2037 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D9 - 2027 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D10 - 2027 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D11 - 2032 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D12 - 2032 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D13 - 2037 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D14 - 2037 Total, PM" model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2024-10-15 11:16:33 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2024-10-15
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	AdamMorrison
Description	

Analysis Options

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

Units

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

(Default Analysis Set) - Base Year, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

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

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
Base Year, PM	Base Year	PM		ONE HOUR	16:00	17:30	90	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				3.77	A

Intersection Set Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Loyalist Parkway (Hwy 33)	
West	West	Sandy Hook Road (CR1)	
South	South	Loyalist Parkway (Hwy 33)	
East	East	Sandy Hook Road (CR1)	

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)	I' - 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	ONE HOUR	✓	265.00	100.000
West	ONE HOUR	✓	162.00	100.000
South	ONE HOUR	✓	291.00	100.000
East	ONE HOUR	✓	138.00	100.000

Turning Proportions

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

		To			
		North	West	South	East
From	North	0.000	165.000	41.000	59.000
	West	114.000	0.000	8.000	40.000
	South	240.000	14.000	0.000	37.000
	East	48.000	56.000	34.000	0.000

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

		To			
		North	West	South	East
From	North	0.00	0.62	0.15	0.22
	West	0.70	0.00	0.05	0.25
	South	0.82	0.05	0.00	0.13
	East	0.35	0.41	0.25	0.00

Vehicle Mix

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

		To			
		North	West	South	East
From	North	1.000	1.020	1.020	1.020
	West	1.020	1.000	1.020	1.020
	South	1.020	1.020	1.000	1.020
	East	1.020	1.020	1.020	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.0	2.0	2.0	2.0
	West	2.0	0.0	2.0	2.0
	South	2.0	2.0	0.0	2.0
	East	2.0	2.0	2.0	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	0.23	3.67	0.30	~1	A	243.17	364.75	21.15	3.48	0.23	21.15	3.48
West	0.14	3.36	0.17	~1	A	148.65	222.98	12.01	3.23	0.13	12.01	3.23
South	0.26	4.07	0.36	~1	A	267.03	400.54	25.26	3.78	0.28	25.26	3.78
East	0.14	3.78	0.16	~1	A	126.63	189.95	11.28	3.56	0.13	11.28	3.56

Main Results for each time segment

Main results: (16:00-16:15)

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	199.51	49.88	198.78	301.51	78.00	0.00	1312.30	1108.81	0.152	0.00	0.18	3.296	A
West	121.96	30.49	121.54	176.27	100.51	0.00	1299.27	1028.18	0.094	0.00	0.11	3.118	A
South	219.08	54.77	218.23	62.26	159.80	0.00	1264.96	648.89	0.173	0.00	0.21	3.504	A
East	103.89	25.97	103.51	102.01	276.01	0.00	1197.70	610.89	0.087	0.00	0.10	3.356	A

Main results: (16:15-16:30)

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	238.23	59.56	238.05	361.10	93.42	0.00	1303.38	1108.81	0.183	0.18	0.23	3.446	A
West	145.63	36.41	145.54	211.10	120.37	0.00	1287.78	1028.18	0.113	0.11	0.13	3.214	A
South	261.60	65.40	261.38	74.56	191.35	0.00	1246.70	648.89	0.210	0.21	0.27	3.726	A
East	124.06	31.01	123.96	122.17	330.56	0.00	1166.13	610.89	0.106	0.10	0.12	3.522	A

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	291.77	72.94	291.49	442.16	114.39	0.00	1291.24	1108.81	0.226	0.23	0.30	3.673	A
West	178.37	44.59	178.22	258.49	147.40	0.00	1272.14	1028.18	0.140	0.13	0.17	3.356	A
South	320.40	80.10	320.03	91.30	234.32	0.00	1221.83	648.89	0.262	0.27	0.36	4.070	A
East	151.94	37.99	151.79	149.60	404.76	0.00	1123.19	610.89	0.135	0.12	0.16	3.779	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	291.77	72.94	291.77	442.61	114.50	0.00	1291.17	1108.81	0.226	0.30	0.30	3.673	A
West	178.37	44.59	178.36	258.74	147.54	0.00	1272.06	1028.18	0.140	0.17	0.17	3.356	A
South	320.40	80.10	320.39	91.38	234.52	0.00	1221.72	648.89	0.262	0.36	0.36	4.073	A
East	151.94	37.99	151.94	149.74	405.17	0.00	1122.95	610.89	0.135	0.16	0.16	3.780	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	238.23	59.56	238.50	361.84	93.61	0.00	1303.27	1108.81	0.183	0.30	0.23	3.451	A
West	145.63	36.41	145.78	211.51	120.60	0.00	1287.65	1028.18	0.113	0.17	0.13	3.215	A
South	261.60	65.40	261.96	74.70	191.68	0.00	1246.51	648.89	0.210	0.36	0.27	3.730	A
East	124.06	31.01	124.21	122.40	331.24	0.00	1165.74	610.89	0.106	0.16	0.12	3.525	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	199.51	49.88	199.69	302.94	78.37	0.00	1312.09	1108.81	0.152	0.23	0.18	3.300	A
West	121.96	30.49	122.06	177.08	100.98	0.00	1299.00	1028.18	0.094	0.13	0.11	3.121	A
South	219.08	54.77	219.31	62.54	160.49	0.00	1264.56	648.89	0.173	0.27	0.21	3.512	A
East	103.89	25.97	103.99	102.48	277.32	0.00	1196.94	610.89	0.087	0.12	0.10	3.359	A

Queueing Delay Results for each time segment

Queueing Delay results: (16:00-16:15)

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	2.68	0.18	3.296	A	A
West	1.55	0.10	3.118	A	A
South	3.13	0.21	3.504	A	A
East	1.42	0.09	3.356	A	A

Queueing Delay results: (16:15-16:30)

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	3.36	0.22	3.446	A	A
West	1.92	0.13	3.214	A	A
South	3.98	0.27	3.726	A	A
East	1.79	0.12	3.522	A	A

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	4.38	0.29	3.673	A	A
West	2.45	0.16	3.356	A	A
South	5.31	0.35	4.070	A	A
East	2.35	0.16	3.779	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	4.45	0.30	3.673	A	A
West	2.49	0.17	3.356	A	A

South	5.42	0.36	4.073	A	A
East	2.39	0.16	3.780	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	3.49	0.23	3.451	A	A
West	1.98	0.13	3.215	A	A
South	4.15	0.28	3.730	A	A
East	1.86	0.12	3.525	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	2.79	0.19	3.300	A	A
West	1.61	0.11	3.121	A	A
South	3.27	0.22	3.512	A	A
East	1.48	0.10	3.359	A	A

Queue Variation Results for each time segment

Queue Variation results: (16:00-16:15)

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	0.18	~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	0.11	~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	0.21	~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
East	0.10	~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: (16:15-16:30)

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	0.23	~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	0.13	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	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
East	0.12	~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: (16:30-16:45)

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	0.30	~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
West	0.17	~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	0.36	~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
East	0.16	~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)

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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	0.30	~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
West	0.17	~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	0.36	~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
East	0.16	~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	0.23	~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	0.13	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	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
East	0.12	~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	0.18	~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	0.11	~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	0.21	~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
East	0.10	~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

2027 Operational Analysis Outputs



HCM Unsignalized Intersection Capacity Analysis
2: Lake Street (CR10) & Sandy Hook Road (CR1)

2027 Background - AM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	28	96	9	202	159	39
Future Volume (Veh/h)	28	96	9	202	159	39
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	31	107	10	224	177	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	442	198	220			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	442	198	220			
tC, single (s)	6.7	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.7	3.4	2.3			
p0 queue free %	94	87	99			
cM capacity (veh/h)	525	818	1326			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	138	10	224	220		
Volume Left	31	10	0	0		
Volume Right	107	0	0	43		
cSH	727	1326	1700	1700		
Volume to Capacity	0.19	0.01	0.13	0.13		
Queue Length 95th (m)	5.6	0.2	0.0	0.0		
Control Delay (s)	11.1	7.7	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	11.1	0.3		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay			2.7			
Intersection Capacity Utilization			24.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: Lake Street (CR10) & Sandy Hook Road (CR1)

2027 Background - PM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	143	123	312	308	47
Future Volume (Veh/h)	42	143	123	312	308	47
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	45	152	131	332	328	50
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	947	353	378			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	947	353	378			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	82	78	89			
cM capacity (veh/h)	251	693	1180			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	197	131	332	378		
Volume Left	45	131	0	0		
Volume Right	152	0	0	50		
cSH	494	1180	1700	1700		
Volume to Capacity	0.40	0.11	0.20	0.22		
Queue Length 95th (m)	15.1	3.0	0.0	0.0		
Control Delay (s)	17.0	8.4	0.0	0.0		
Lane LOS	C	A				
Approach Delay (s)	17.0	2.4		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			47.0%	ICU Level of Service	A	
Analysis Period (min)			15			

<h1>Junctions 8</h1>
<h2>ARCADY 8 - Roundabout Module</h2>
Version: 8.0.6.541 [19821,26/11/2015] © Copyright TRL Limited, 2024
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Filename: Loyalist and Sandy Hook.arc8

Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Personal Project Files\240418-Arcady

Report generation date: 2024-10-15 11:16:11 PM

Summary of intersection performance

AM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
A1 - 2027 Background							
Leg North	0.42	~1	3.98	0.29	A	3.84	A
Leg West	0.22	~1	3.77	0.18	A		
Leg South	0.27	~1	3.79	0.21	A		
Leg East	0.13	~1	3.62	0.11	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 - 9:30 AM
 "D2 - Base Year, PM" model duration: 4:00 PM - 5:30 PM
 "D3 - 2027 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D4 - 2027 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D5 - 2032 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D6 - 2032 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D7 - 2037 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D8 - 2037 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D9 - 2027 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D10 - 2027 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D11 - 2032 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D12 - 2032 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D13 - 2037 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D14 - 2037 Total, PM" model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2024-10-15 11:16:11 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2024-10-15
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) - 2027 Background, 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
2027 Background, AM	2027 Background	AM		ONE HOUR	08:00	09:30	90	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				3.84	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Loyalist Parkway (Hwy 33)	
West	West	Sandy Hook Road (CR1)	
South	South	Loyalist Parkway (Hwy 33)	
East	East	Sandy Hook Road (CR1)	

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)	I' - 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	ONE HOUR	✓	347.00	100.000
West	ONE HOUR	✓	191.00	100.000
South	ONE HOUR	✓	234.00	100.000
East	ONE HOUR	✓	116.00	100.000

Turning Proportions

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

		To			
		North	West	South	East
From	North	0.000	111.000	212.000	24.000
	West	131.000	0.000	7.000	53.000
	South	205.000	2.000	0.000	27.000
	East	35.000	44.000	37.000	0.000

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

		To			
		North	West	South	East
From	North	0.00	0.32	0.61	0.07
	West	0.69	0.00	0.04	0.28
	South	0.88	0.01	0.00	0.12
	East	0.30	0.38	0.32	0.00

Vehicle Mix

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

		To			
		North	West	South	East
From	North	1.000	1.020	1.020	1.020
	West	1.020	1.000	1.020	1.020
	South	1.020	1.020	1.000	1.020
	East	1.020	1.020	1.020	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North				
	West				
	South				
	East				

		To			
		North	West	South	East
From	North	0.0	2.0	2.0	2.0
	West	2.0	0.0	2.0	2.0
	South	2.0	2.0	0.0	2.0
	East	2.0	2.0	2.0	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	3.98	0.42	~1	A	318.41	477.62	29.55	3.71	0.33	29.55	3.71
West	0.18	3.77	0.22	~1	A	175.26	262.90	15.58	3.56	0.17	15.58	3.56
South	0.21	3.79	0.27	~1	A	214.72	322.08	19.18	3.57	0.21	19.18	3.57
East	0.11	3.62	0.13	~1	A	106.44	159.67	9.15	3.44	0.10	9.15	3.44

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	261.24	65.31	260.24	278.27	62.26	0.00	1321.41	1112.72	0.198	0.00	0.25	3.457	A
West	143.79	35.95	143.26	117.75	204.75	0.00	1238.95	809.61	0.116	0.00	0.13	3.349	A
South	176.17	44.04	175.51	192.00	156.01	0.00	1267.15	861.51	0.139	0.00	0.16	3.362	A
East	87.33	21.83	87.01	78.00	253.52	0.00	1210.72	595.00	0.072	0.00	0.08	3.267	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	311.95	77.99	311.68	333.26	74.56	0.00	1314.29	1112.73	0.237	0.25	0.32	3.662	A
West	171.71	42.93	171.57	141.03	245.22	0.00	1215.52	809.61	0.141	0.13	0.17	3.516	A
South	210.36	52.59	210.19	229.95	186.84	0.00	1249.31	861.51	0.168	0.16	0.21	3.533	A
East	104.28	26.07	104.20	93.42	303.62	0.00	1181.72	595.00	0.088	0.08	0.10	3.407	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	382.05	95.51	381.64	408.07	91.30	0.00	1304.60	1112.72	0.293	0.32	0.42	3.976	A
West	210.29	52.57	210.09	172.68	300.26	0.00	1183.67	809.61	0.178	0.17	0.22	3.771	A
South	257.64	64.41	257.38	281.56	228.78	0.00	1225.04	861.51	0.210	0.21	0.27	3.794	A
East	127.72	31.93	127.60	114.39	371.77	0.00	1142.28	595.00	0.112	0.10	0.13	3.618	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	382.05	95.51	382.05	408.47	91.38	0.00	1304.56	1112.72	0.293	0.42	0.42	3.980	A
West	210.29	52.57	210.29	172.86	300.57	0.00	1183.48	809.61	0.178	0.22	0.22	3.772	A
South	257.64	64.41	257.64	281.86	229.01	0.00	1224.90	861.51	0.210	0.27	0.27	3.795	A
East	127.72	31.93	127.72	114.50	372.14	0.00	1142.07	595.00	0.112	0.13	0.13	3.619	A

Main results: (09:00-09:15)

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	311.95	77.99	312.35	333.92	74.70	0.00	1314.21	1112.73	0.237	0.42	0.32	3.668	A
West	171.71	42.93	171.91	141.32	245.74	0.00	1215.22	809.61	0.141	0.22	0.17	3.519	A
South	210.36	52.59	210.61	230.43	187.21	0.00	1249.09	861.51	0.168	0.27	0.21	3.535	A
East	104.28	26.07	104.40	93.61	304.22	0.00	1181.37	595.00	0.088	0.13	0.10	3.411	A

Main results: (09:15-09:30)

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	261.24	65.31	261.51	279.57	62.54	0.00	1321.25	1112.72	0.198	0.32	0.25	3.467	A
West	143.79	35.95	143.93	118.31	205.73	0.00	1238.37	809.61	0.116	0.17	0.13	3.357	A
South	176.17	44.04	176.34	192.92	156.74	0.00	1266.73	861.51	0.139	0.21	0.17	3.367	A
East	87.33	21.83	87.41	78.37	254.71	0.00	1210.03	595.00	0.072	0.10	0.08	3.272	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	3.68	0.25	3.457	A	A
West	1.96	0.13	3.349	A	A
South	2.41	0.16	3.362	A	A
East	1.16	0.08	3.267	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	4.67	0.31	3.662	A	A
West	2.47	0.16	3.516	A	A
South	3.04	0.20	3.533	A	A
East	1.46	0.10	3.407	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	6.19	0.41	3.976	A	A
West	3.24	0.22	3.771	A	A
South	3.99	0.27	3.794	A	A
East	1.89	0.13	3.618	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	6.31	0.42	3.980	A	A
West	3.29	0.22	3.772	A	A
South	4.06	0.27	3.795	A	A
East	1.92	0.13	3.619	A	A

Queueing Delay results: (09:00-09:15)

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	4.87	0.32	3.668	A	A
West	2.57	0.17	3.519	A	A
South	3.16	0.21	3.535	A	A
East	1.51	0.10	3.411	A	A

Queueing Delay results: (09:15-09:30)

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	3.84	0.26	3.467	A	A
West	2.04	0.14	3.357	A	A
South	2.52	0.17	3.367	A	A
East	1.21	0.08	3.272	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	0.25	~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
West	0.13	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.16	~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	0.08	~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	0.32	~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
West	0.17	~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	0.21	~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
East	0.10	~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	0.42	~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	0.22	~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	0.27	~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
East	0.13	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (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	0.42	~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	0.22	~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	0.27	~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
East	0.13	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (09:00-09:15)

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	0.32	~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
West	0.17	~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	0.21	~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
East	0.10	~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: (09:15-09:30)

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	0.25	~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
West	0.13	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.17	~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	0.08	~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

<h1>Junctions 8</h1>
<h2>ARCADY 8 - Roundabout Module</h2>
Version: 8.0.6.541 [19821,26/11/2015] © Copyright TRL Limited, 2024
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Filename: Loyalist and Sandy Hook.arc8

Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Personal Project Files\240418-Arcady

Report generation date: 2024-10-15 11:15:42 PM

Summary of intersection performance

PM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
A1 - 2027 Background							
Leg North	0.84	1.02	5.22	0.45	A	4.69	A
Leg West	0.24	~1	4.07	0.19	A		
Leg South	0.49	1.02	4.52	0.32	A		
Leg East	0.19	~1	4.05	0.16	A		

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

"D1 - Base Year, AM" model duration: 8:00 AM - 9:30 AM
 "D2 - Base Year, PM" model duration: 4:00 PM - 5:30 PM
 "D3 - 2027 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D4 - 2027 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D5 - 2032 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D6 - 2032 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D7 - 2037 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D8 - 2037 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D9 - 2027 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D10 - 2027 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D11 - 2032 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D12 - 2032 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D13 - 2037 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D14 - 2037 Total, PM" model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2024-10-15 11:15:42 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2024-10-15
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) - 2027 Background, 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
2027 Background, PM	2027 Background	PM		ONE HOUR	16:00	17:30	90	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				4.69	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Loyalist Parkway (Hwy 33)	
West	West	Sandy Hook Road (CR1)	
South	South	Loyalist Parkway (Hwy 33)	
East	East	Sandy Hook Road (CR1)	

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)	I' - 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	ONE HOUR	✓	526.00	100.000
West	ONE HOUR	✓	194.00	100.000
South	ONE HOUR	✓	353.00	100.000
East	ONE HOUR	✓	152.00	100.000

Turning Proportions

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

		To			
		North	West	South	East
From	North	0.000	188.000	277.000	61.000
	West	139.000	0.000	8.000	47.000
	South	292.000	14.000	0.000	47.000
	East	49.000	62.000	41.000	0.000

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

		To			
		North	West	South	East
From	North	0.00	0.36	0.53	0.12
	West	0.72	0.00	0.04	0.24
	South	0.83	0.04	0.00	0.13
	East	0.32	0.41	0.27	0.00

Vehicle Mix

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

		To			
		North	West	South	East
From	North	1.000	1.020	1.020	1.020
	West	1.020	1.000	1.020	1.020
	South	1.020	1.020	1.000	1.020
	East	1.020	1.020	1.020	1.000

Truck Percentages - Intersection 1 (for whole period)

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		To			
		North	West	South	East
From	North	0.0	2.0	2.0	2.0
	West	2.0	0.0	2.0	2.0
	South	2.0	2.0	0.0	2.0
	East	2.0	2.0	2.0	0.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Total Queueing Delay (PCE-min)	Inclusive Average Queueing Delay (s)
North	0.45	5.22	0.84	1.02	A	482.67	724.00	55.51	4.60	0.62	55.51	4.60
West	0.19	4.07	0.24	~1	A	178.02	267.03	16.83	3.78	0.19	16.83	3.78
South	0.32	4.52	0.49	1.02	A	323.92	485.88	33.33	4.12	0.37	33.33	4.12
East	0.16	4.05	0.19	~1	A	139.48	209.22	13.14	3.77	0.15	13.14	3.77

Main Results for each time segment

Main results: (16:00-16:15)

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	396.00	99.00	394.24	359.91	87.74	0.00	1306.66	1104.60	0.303	0.00	0.44	4.017	A
West	146.05	36.51	145.49	197.90	284.08	0.00	1193.03	853.39	0.122	0.00	0.14	3.503	A
South	265.76	66.44	264.66	244.36	185.21	0.00	1250.25	809.76	0.213	0.00	0.27	3.723	A
East	114.43	28.61	113.99	116.20	333.66	0.00	1164.33	597.30	0.098	0.00	0.11	3.493	A

Main results: (16:15-16:30)

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	472.86	118.22	472.30	431.10	105.09	0.00	1296.62	1104.60	0.365	0.44	0.58	4.452	A
West	174.40	43.60	174.25	237.07	340.32	0.00	1160.48	853.39	0.150	0.14	0.18	3.722	A
South	317.34	79.33	317.02	292.73	221.84	0.00	1229.05	809.76	0.258	0.27	0.35	4.025	A
East	136.64	34.16	136.53	139.20	399.66	0.00	1126.14	597.30	0.121	0.11	0.14	3.710	A

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	579.14	144.78	578.14	527.82	128.67	0.00	1282.98	1104.62	0.451	0.58	0.83	5.202	A
West	213.60	53.40	213.36	290.21	416.59	0.00	1116.34	853.39	0.191	0.18	0.24	4.065	A
South	388.66	97.17	388.13	358.35	271.60	0.00	1200.25	809.76	0.324	0.35	0.48	4.518	A
East	167.36	41.84	167.17	170.41	489.32	0.00	1074.24	597.30	0.156	0.14	0.19	4.047	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	579.14	144.78	579.12	528.48	128.82	0.00	1282.89	1104.62	0.451	0.83	0.84	5.217	A
West	213.60	53.40	213.60	290.66	417.28	0.00	1115.94	853.39	0.191	0.24	0.24	4.069	A
South	388.66	97.17	388.65	358.92	271.95	0.00	1200.05	809.76	0.324	0.48	0.49	4.525	A
East	167.36	41.84	167.35	170.65	489.95	0.00	1073.88	597.30	0.156	0.19	0.19	4.050	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	472.86	118.22	473.84	432.17	105.33	0.00	1296.49	1104.60	0.365	0.84	0.59	4.470	A
West	174.40	43.60	174.64	237.78	341.39	0.00	1159.86	853.39	0.150	0.24	0.18	3.727	A
South	317.34	79.33	317.86	293.64	222.39	0.00	1228.74	809.76	0.258	0.49	0.36	4.034	A
East	136.64	34.16	136.83	139.58	400.67	0.00	1125.56	597.30	0.121	0.19	0.14	3.716	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	396.00	99.00	396.57	361.78	88.18	0.00	1306.41	1104.60	0.303	0.59	0.45	4.039	A
West	146.05	36.51	146.21	199.02	285.73	0.00	1192.07	853.39	0.123	0.18	0.14	3.513	A
South	265.76	66.44	266.08	245.77	186.17	0.00	1249.70	809.76	0.213	0.36	0.28	3.733	A
East	114.43	28.61	114.55	116.84	335.41	0.00	1163.32	597.30	0.098	0.14	0.11	3.500	A

Queueing Delay Results for each time segment

Queueing Delay results: (16:00-16:15)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	6.44	0.43	4.017	A	A
West	2.08	0.14	3.503	A	A
South	4.02	0.27	3.723	A	A
East	1.63	0.11	3.493	A	A

Queueing Delay results: (16:15-16:30)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	8.54	0.57	4.452	A	A
West	2.66	0.18	3.722	A	A
South	5.21	0.35	4.025	A	A
East	2.07	0.14	3.710	A	A

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	12.14	0.81	5.202	A	A
West	3.54	0.24	4.065	A	A
South	7.13	0.48	4.518	A	A
East	2.76	0.18	4.047	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	12.50	0.83	5.217	A	A
West	3.61	0.24	4.069	A	A
South	7.29	0.49	4.525	A	A
East	2.81	0.19	4.050	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	9.06	0.60	4.470	A	A
West	2.76	0.18	3.727	A	A
South	5.46	0.36	4.034	A	A
East	2.16	0.14	3.716	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	6.82	0.45	4.039	A	A
West	2.18	0.15	3.513	A	A
South	4.22	0.28	3.733	A	A
East	1.70	0.11	3.500	A	A

Queue Variation Results for each time segment

Queue Variation results: (16:00-16:15)

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	0.44	~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	0.14	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	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
East	0.11	~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: (16:15-16:30)

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	0.58	~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
West	0.18	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.35	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.14	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (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	0.83	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
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	0.48	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.19	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (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	0.84	0.00	0.00	0.00	1.02			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	0.49	0.00	0.00	0.00	1.02			N/A	N/A
East	0.19	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (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	0.59	~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	0.18	~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	0.36	~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
East	0.14	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

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

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.45	~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	0.14	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
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	0.11	~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

HCM Unsignalized Intersection Capacity Analysis
 2: Lake Street (CR10) & Sandy Hook Road

2027 Total - AM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	62	130	104	202	159	50
Future Volume (Veh/h)	62	130	104	202	159	50
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	69	144	116	224	177	56
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	661	205	233			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	661	205	233			
tC, single (s)	6.7	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.7	3.4	2.3			
p0 queue free %	81	82	91			
cM capacity (veh/h)	356	811	1311			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	213	116	224	233		
Volume Left	69	116	0	0		
Volume Right	144	0	0	56		
cSH	574	1311	1700	1700		
Volume to Capacity	0.37	0.09	0.13	0.14		
Queue Length 95th (m)	13.7	2.3	0.0	0.0		
Control Delay (s)	14.9	8.0	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	14.9	2.7		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay	5.2					
Intersection Capacity Utilization	38.6%			ICU Level of Service	A	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
 6: Sandy Hook Road & West Access

2027 Total - AM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	132	125	6	17	77
Future Volume (Veh/h)	25	132	125	6	17	77
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	143	136	7	18	84
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)	249					
pX, platoon unblocked						
vC, conflicting volume	143			336	140	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	143			336	140	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	98			97	91	
cM capacity (veh/h)	1440			647	909	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	170	143	102			
Volume Left	27	0	18			
Volume Right	0	7	84			
cSH	1440	1700	848			
Volume to Capacity	0.02	0.08	0.12			
Queue Length 95th (m)	0.5	0.0	3.3			
Control Delay (s)	1.3	0.0	9.8			
Lane LOS	A		A			
Approach Delay (s)	1.3	0.0	9.8			
Approach LOS			A			
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization			31.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8: Sandy Hook Road & East Access

2027 Total - AM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Traffic Volume (veh/h)	8	141	137	17	51	26
Future Volume (Veh/h)	8	141	137	17	51	26
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	153	149	18	55	28
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	167				329	158
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	167				329	158
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				92	97
cM capacity (veh/h)	1411				661	887
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	162	167	83			
Volume Left	9	0	55			
Volume Right	0	18	28			
cSH	1411	1700	723			
Volume to Capacity	0.01	0.10	0.11			
Queue Length 95th (m)	0.2	0.0	3.1			
Control Delay (s)	0.5	0.0	10.6			
Lane LOS	A		B			
Approach Delay (s)	0.5	0.0	10.6			
Approach LOS			B			
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization			25.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 2: Lake Street (CR10) & Sandy Hook Road

2027 Total - PM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	62	163	154	312	308	78
Future Volume (Veh/h)	62	163	154	312	308	78
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	66	173	164	332	328	83
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1030	370	411			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1030	370	411			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	69	74	86			
cM capacity (veh/h)	216	678	1148			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	239	164	332	411		
Volume Left	66	164	0	0		
Volume Right	173	0	0	83		
cSH	426	1148	1700	1700		
Volume to Capacity	0.56	0.14	0.20	0.24		
Queue Length 95th (m)	26.8	4.0	0.0	0.0		
Control Delay (s)	23.7	8.7	0.0	0.0		
Lane LOS	C	A				
Approach Delay (s)	23.7	2.9		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay	6.2					
Intersection Capacity Utilization	53.0%			ICU Level of Service	A	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
 7: Sandy Hook Road & West Access

2027 Total - PM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Traffic Volume (veh/h)	69	208	184	15	10	44
Future Volume (Veh/h)	69	208	184	15	10	44
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	75	226	200	16	11	48
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)	293					
pX, platoon unblocked						
vC, conflicting volume	216			584	208	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	216			584	208	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	94			98	94	
cM capacity (veh/h)	1354			448	832	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	301	216	59			
Volume Left	75	0	11			
Volume Right	0	16	48			
cSH	1354	1700	717			
Volume to Capacity	0.06	0.13	0.08			
Queue Length 95th (m)	1.4	0.0	2.1			
Control Delay (s)	2.3	0.0	10.5			
Lane LOS	A		B			
Approach Delay (s)	2.3	0.0	10.5			
Approach LOS			B			
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization			38.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8: Sandy Hook Road & East Access

2027 Total - PM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Traffic Volume (veh/h)	23	195	185	46	29	15
Future Volume (Veh/h)	23	195	185	46	29	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	212	201	50	32	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	251			488	226	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	251			488	226	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	98			94	98	
cM capacity (veh/h)	1314			529	813	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	237	251	48			
Volume Left	25	0	32			
Volume Right	0	50	16			
cSH	1314	1700	598			
Volume to Capacity	0.02	0.15	0.08			
Queue Length 95th (m)	0.5	0.0	2.1			
Control Delay (s)	1.0	0.0	11.5			
Lane LOS	A		B			
Approach Delay (s)	1.0	0.0	11.5			
Approach LOS			B			
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			37.4%	ICU Level of Service	A	
Analysis Period (min)			15			

<h1>Junctions 8</h1>
<h2>ARCADY 8 - Roundabout Module</h2>
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Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Personal Project Files\240418-Arcady

Report generation date: 2024-10-15 11:13:18 PM

Summary of intersection performance

AM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
A1 - 2027 Total							
Leg North	0.42	~1	3.98	0.29	A	3.84	A
Leg West	0.22	~1	3.77	0.18	A		
Leg South	0.27	~1	3.79	0.21	A		
Leg East	0.13	~1	3.62	0.11	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 - 9:30 AM
 "D2 - Base Year, PM" model duration: 4:00 PM - 5:30 PM
 "D3 - 2027 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D4 - 2027 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D5 - 2032 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D6 - 2032 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D7 - 2037 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D8 - 2037 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D9 - 2027 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D10 - 2027 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D11 - 2032 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D12 - 2032 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D13 - 2037 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D14 - 2037 Total, PM" model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2024-10-15 11:13:17 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2024-10-15
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) - 2027 Total, 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
2027 Total, AM	2027 Total	AM		ONE HOUR	08:00	09:30	90	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				3.84	A

Intersection Set Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Loyalist Parkway (Hwy 33)	
West	West	Sandy Hook Road (CR1)	
South	South	Loyalist Parkway (Hwy 33)	
East	East	Sandy Hook Road (CR1)	

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)	I' - 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	ONE HOUR	✓	347.00	100.000
West	ONE HOUR	✓	191.00	100.000
South	ONE HOUR	✓	234.00	100.000
East	ONE HOUR	✓	116.00	100.000

Turning Proportions

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

		To			
		North	West	South	East
From	North	0.000	111.000	212.000	24.000
	West	131.000	0.000	7.000	53.000
	South	205.000	2.000	0.000	27.000
	East	35.000	44.000	37.000	0.000

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

		To			
		North	West	South	East
From	North	0.00	0.32	0.61	0.07
	West	0.69	0.00	0.04	0.28
	South	0.88	0.01	0.00	0.12
	East	0.30	0.38	0.32	0.00

Vehicle Mix

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

		To			
		North	West	South	East
From	North	1.000	1.020	1.020	1.020
	West	1.020	1.000	1.020	1.020
	South	1.020	1.020	1.000	1.020
	East	1.020	1.020	1.020	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.0	2.0	2.0	2.0
	West	2.0	0.0	2.0	2.0
	South	2.0	2.0	0.0	2.0
	East	2.0	2.0	2.0	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	3.98	0.42	~1	A	318.41	477.62	29.55	3.71	0.33	29.55	3.71
West	0.18	3.77	0.22	~1	A	175.26	262.90	15.58	3.56	0.17	15.58	3.56
South	0.21	3.79	0.27	~1	A	214.72	322.08	19.18	3.57	0.21	19.18	3.57
East	0.11	3.62	0.13	~1	A	106.44	159.67	9.15	3.44	0.10	9.15	3.44

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	261.24	65.31	260.24	278.27	62.26	0.00	1321.41	1112.72	0.198	0.00	0.25	3.457	A
West	143.79	35.95	143.26	117.75	204.75	0.00	1238.95	809.61	0.116	0.00	0.13	3.349	A
South	176.17	44.04	175.51	192.00	156.01	0.00	1267.15	861.51	0.139	0.00	0.16	3.362	A
East	87.33	21.83	87.01	78.00	253.52	0.00	1210.72	595.00	0.072	0.00	0.08	3.267	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	311.95	77.99	311.68	333.26	74.56	0.00	1314.29	1112.73	0.237	0.25	0.32	3.662	A
West	171.71	42.93	171.57	141.03	245.22	0.00	1215.52	809.61	0.141	0.13	0.17	3.516	A
South	210.36	52.59	210.19	229.95	186.84	0.00	1249.31	861.51	0.168	0.16	0.21	3.533	A
East	104.28	26.07	104.20	93.42	303.62	0.00	1181.72	595.00	0.088	0.08	0.10	3.407	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	382.05	95.51	381.64	408.07	91.30	0.00	1304.60	1112.72	0.293	0.32	0.42	3.976	A
West	210.29	52.57	210.09	172.68	300.26	0.00	1183.67	809.61	0.178	0.17	0.22	3.771	A
South	257.64	64.41	257.38	281.56	228.78	0.00	1225.04	861.51	0.210	0.21	0.27	3.794	A
East	127.72	31.93	127.60	114.39	371.77	0.00	1142.28	595.00	0.112	0.10	0.13	3.618	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	382.05	95.51	382.05	408.47	91.38	0.00	1304.56	1112.72	0.293	0.42	0.42	3.980	A
West	210.29	52.57	210.29	172.86	300.57	0.00	1183.48	809.61	0.178	0.22	0.22	3.772	A
South	257.64	64.41	257.64	281.86	229.01	0.00	1224.90	861.51	0.210	0.27	0.27	3.795	A
East	127.72	31.93	127.72	114.50	372.14	0.00	1142.07	595.00	0.112	0.13	0.13	3.619	A

Main results: (09:00-09:15)

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	311.95	77.99	312.35	333.92	74.70	0.00	1314.21	1112.73	0.237	0.42	0.32	3.668	A
West	171.71	42.93	171.91	141.32	245.74	0.00	1215.22	809.61	0.141	0.22	0.17	3.519	A
South	210.36	52.59	210.61	230.43	187.21	0.00	1249.09	861.51	0.168	0.27	0.21	3.535	A
East	104.28	26.07	104.40	93.61	304.22	0.00	1181.37	595.00	0.088	0.13	0.10	3.411	A

Main results: (09:15-09:30)

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	261.24	65.31	261.51	279.57	62.54	0.00	1321.25	1112.72	0.198	0.32	0.25	3.467	A
West	143.79	35.95	143.93	118.31	205.73	0.00	1238.37	809.61	0.116	0.17	0.13	3.357	A
South	176.17	44.04	176.34	192.92	156.74	0.00	1266.73	861.51	0.139	0.21	0.17	3.367	A
East	87.33	21.83	87.41	78.37	254.71	0.00	1210.03	595.00	0.072	0.10	0.08	3.272	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	3.68	0.25	3.457	A	A
West	1.96	0.13	3.349	A	A
South	2.41	0.16	3.362	A	A
East	1.16	0.08	3.267	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	4.67	0.31	3.662	A	A
West	2.47	0.16	3.516	A	A
South	3.04	0.20	3.533	A	A
East	1.46	0.10	3.407	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	6.19	0.41	3.976	A	A
West	3.24	0.22	3.771	A	A
South	3.99	0.27	3.794	A	A
East	1.89	0.13	3.618	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	6.31	0.42	3.980	A	A
West	3.29	0.22	3.772	A	A

South	4.06	0.27	3.795	A	A
East	1.92	0.13	3.619	A	A

Queueing Delay results: (09:00-09:15)

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	4.87	0.32	3.668	A	A
West	2.57	0.17	3.519	A	A
South	3.16	0.21	3.535	A	A
East	1.51	0.10	3.411	A	A

Queueing Delay results: (09:15-09:30)

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	3.84	0.26	3.467	A	A
West	2.04	0.14	3.357	A	A
South	2.52	0.17	3.367	A	A
East	1.21	0.08	3.272	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	0.25	~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
West	0.13	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.16	~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	0.08	~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	0.32	~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
West	0.17	~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	0.21	~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
East	0.10	~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	0.42	~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	0.22	~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	0.27	~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
East	0.13	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

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

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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	0.22	~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	0.27	~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
East	0.13	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (09:00-09:15)

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	0.32	~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
West	0.17	~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	0.21	~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
East	0.10	~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: (09:15-09:30)

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	0.25	~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
West	0.13	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.17	~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	0.08	~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

<h1>Junctions 8</h1>
<h2>ARCADY 8 - Roundabout Module</h2>
Version: 8.0.6.541 [19821,26/11/2015] © Copyright TRL Limited, 2024
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Filename: Loyalist and Sandy Hook.arc8

Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Personal Project Files\240418-Arcady

Report generation date: 2024-10-15 11:12:35 PM

Summary of intersection performance

PM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
A1 - 2027 Total							
Leg North	0.84	1.02	5.22	0.45	A	4.69	A
Leg West	0.24	~1	4.07	0.19	A		
Leg South	0.49	1.02	4.52	0.32	A		
Leg East	0.19	~1	4.05	0.16	A		

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

"D1 - Base Year, AM" model duration: 8:00 AM - 9:30 AM
 "D2 - Base Year, PM" model duration: 4:00 PM - 5:30 PM
 "D3 - 2027 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D4 - 2027 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D5 - 2032 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D6 - 2032 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D7 - 2037 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D8 - 2037 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D9 - 2027 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D10 - 2027 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D11 - 2032 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D12 - 2032 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D13 - 2037 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D14 - 2037 Total, PM" model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2024-10-15 11:12:34 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2024-10-15
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) - 2027 Total, 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
2027 Total, PM	2027 Total	PM		ONE HOUR	16:00	17:30	90	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				4.69	A

Intersection Set Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Loyalist Parkway (Hwy 33)	
West	West	Sandy Hook Road (CR1)	
South	South	Loyalist Parkway (Hwy 33)	
East	East	Sandy Hook Road (CR1)	

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)	I' - 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	ONE HOUR	✓	526.00	100.000
West	ONE HOUR	✓	194.00	100.000
South	ONE HOUR	✓	353.00	100.000
East	ONE HOUR	✓	152.00	100.000

Turning Proportions

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

		To			
		North	West	South	East
From	North	0.000	188.000	277.000	61.000
	West	139.000	0.000	8.000	47.000
	South	292.000	14.000	0.000	47.000
	East	49.000	62.000	41.000	0.000

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

		To			
		North	West	South	East
From	North	0.00	0.36	0.53	0.12
	West	0.72	0.00	0.04	0.24
	South	0.83	0.04	0.00	0.13
	East	0.32	0.41	0.27	0.00

Vehicle Mix

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

		To			
		North	West	South	East
From	North	1.000	1.020	1.020	1.020
	West	1.020	1.000	1.020	1.020
	South	1.020	1.020	1.000	1.020
	East	1.020	1.020	1.020	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.0	2.0	2.0	2.0
	West	2.0	0.0	2.0	2.0
	South	2.0	2.0	0.0	2.0
	East	2.0	2.0	2.0	0.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Total Queueing Delay (PCE-min)	Inclusive Average Queueing Delay (s)
North	0.45	5.22	0.84	1.02	A	482.67	724.00	55.51	4.60	0.62	55.51	4.60
West	0.19	4.07	0.24	~1	A	178.02	267.03	16.83	3.78	0.19	16.83	3.78
South	0.32	4.52	0.49	1.02	A	323.92	485.88	33.33	4.12	0.37	33.33	4.12
East	0.16	4.05	0.19	~1	A	139.48	209.22	13.14	3.77	0.15	13.14	3.77

Main Results for each time segment

Main results: (16:00-16:15)

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	396.00	99.00	394.24	359.91	87.74	0.00	1306.66	1104.60	0.303	0.00	0.44	4.017	A
West	146.05	36.51	145.49	197.90	284.08	0.00	1193.03	853.39	0.122	0.00	0.14	3.503	A
South	265.76	66.44	264.66	244.36	185.21	0.00	1250.25	809.76	0.213	0.00	0.27	3.723	A
East	114.43	28.61	113.99	116.20	333.66	0.00	1164.33	597.30	0.098	0.00	0.11	3.493	A

Main results: (16:15-16:30)

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	472.86	118.22	472.30	431.10	105.09	0.00	1296.62	1104.60	0.365	0.44	0.58	4.452	A
West	174.40	43.60	174.25	237.07	340.32	0.00	1160.48	853.39	0.150	0.14	0.18	3.722	A
South	317.34	79.33	317.02	292.73	221.84	0.00	1229.05	809.76	0.258	0.27	0.35	4.025	A
East	136.64	34.16	136.53	139.20	399.66	0.00	1126.14	597.30	0.121	0.11	0.14	3.710	A

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	579.14	144.78	578.14	527.82	128.67	0.00	1282.98	1104.62	0.451	0.58	0.83	5.202	A
West	213.60	53.40	213.36	290.21	416.59	0.00	1116.34	853.39	0.191	0.18	0.24	4.065	A
South	388.66	97.17	388.13	358.35	271.60	0.00	1200.25	809.76	0.324	0.35	0.48	4.518	A
East	167.36	41.84	167.17	170.41	489.32	0.00	1074.24	597.30	0.156	0.14	0.19	4.047	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	579.14	144.78	579.12	528.48	128.82	0.00	1282.89	1104.62	0.451	0.83	0.84	5.217	A
West	213.60	53.40	213.60	290.66	417.28	0.00	1115.94	853.39	0.191	0.24	0.24	4.069	A
South	388.66	97.17	388.65	358.92	271.95	0.00	1200.05	809.76	0.324	0.48	0.49	4.525	A
East	167.36	41.84	167.35	170.65	489.95	0.00	1073.88	597.30	0.156	0.19	0.19	4.050	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	472.86	118.22	473.84	432.17	105.33	0.00	1296.49	1104.60	0.365	0.84	0.59	4.470	A
West	174.40	43.60	174.64	237.78	341.39	0.00	1159.86	853.39	0.150	0.24	0.18	3.727	A
South	317.34	79.33	317.86	293.64	222.39	0.00	1228.74	809.76	0.258	0.49	0.36	4.034	A
East	136.64	34.16	136.83	139.58	400.67	0.00	1125.56	597.30	0.121	0.19	0.14	3.716	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	396.00	99.00	396.57	361.78	88.18	0.00	1306.41	1104.60	0.303	0.59	0.45	4.039	A
West	146.05	36.51	146.21	199.02	285.73	0.00	1192.07	853.39	0.123	0.18	0.14	3.513	A
South	265.76	66.44	266.08	245.77	186.17	0.00	1249.70	809.76	0.213	0.36	0.28	3.733	A
East	114.43	28.61	114.55	116.84	335.41	0.00	1163.32	597.30	0.098	0.14	0.11	3.500	A

Queueing Delay Results for each time segment

Queueing Delay results: (16:00-16:15)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	6.44	0.43	4.017	A	A
West	2.08	0.14	3.503	A	A
South	4.02	0.27	3.723	A	A
East	1.63	0.11	3.493	A	A

Queueing Delay results: (16:15-16:30)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	8.54	0.57	4.452	A	A
West	2.66	0.18	3.722	A	A
South	5.21	0.35	4.025	A	A
East	2.07	0.14	3.710	A	A

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	12.14	0.81	5.202	A	A
West	3.54	0.24	4.065	A	A
South	7.13	0.48	4.518	A	A
East	2.76	0.18	4.047	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	12.50	0.83	5.217	A	A
West	3.61	0.24	4.069	A	A

South	7.29	0.49	4.525	A	A
East	2.81	0.19	4.050	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	9.06	0.60	4.470	A	A
West	2.76	0.18	3.727	A	A
South	5.46	0.36	4.034	A	A
East	2.16	0.14	3.716	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	6.82	0.45	4.039	A	A
West	2.18	0.15	3.513	A	A
South	4.22	0.28	3.733	A	A
East	1.70	0.11	3.500	A	A

Queue Variation Results for each time segment

Queue Variation results: (16:00-16:15)

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	0.44	~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	0.14	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	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
East	0.11	~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: (16:15-16:30)

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	0.58	~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
West	0.18	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.35	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.14	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (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	0.83	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
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	0.48	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.19	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

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

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Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.84	0.00	0.00	0.00	1.02			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	0.49	0.00	0.00	0.00	1.02			N/A	N/A
East	0.19	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (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	0.59	~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	0.18	~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	0.36	~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
East	0.14	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

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

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.45	~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	0.14	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
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	0.11	~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 E

2032 Operational Analysis Outputs



HCM Unsignalized Intersection Capacity Analysis
 2: Lake Street (CR10) & Sandy Hook Road (CR1)

2032 Background - AM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	28	167	285	254	178	39
Future Volume (Veh/h)	28	167	285	254	178	39
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	31	186	317	282	198	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1136	220	241			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1136	220	241			
tC, single (s)	6.7	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.7	3.4	2.3			
p0 queue free %	80	77	76			
cM capacity (veh/h)	151	796	1302			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	217	317	282	241		
Volume Left	31	317	0	0		
Volume Right	186	0	0	43		
cSH	495	1302	1700	1700		
Volume to Capacity	0.44	0.24	0.17	0.14		
Queue Length 95th (m)	17.6	7.7	0.0	0.0		
Control Delay (s)	17.8	8.7	0.0	0.0		
Lane LOS	C	A				
Approach Delay (s)	17.8	4.6		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			6.3			
Intersection Capacity Utilization			49.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: Lake Street (CR10) & Sandy Hook Road (CR1)

2032 Background - PM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	43	330	255	357	364	49
Future Volume (Veh/h)	43	330	255	357	364	49
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	46	351	271	380	387	52
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1335	413	439			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1335	413	439			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	63	45	76			
cM capacity (veh/h)	125	641	1121			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	397	271	380	439		
Volume Left	46	271	0	0		
Volume Right	351	0	0	52		
cSH	433	1121	1700	1700		
Volume to Capacity	0.92	0.24	0.22	0.26		
Queue Length 95th (m)	81.1	7.6	0.0	0.0		
Control Delay (s)	55.9	9.2	0.0	0.0		
Lane LOS	F	A				
Approach Delay (s)	55.9	3.8		0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			16.6			
Intersection Capacity Utilization			69.0%	ICU Level of Service	C	
Analysis Period (min)			15			

<h1>Junctions 8</h1>
<h2>ARCADY 8 - Roundabout Module</h2>
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Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Personal Project Files\240418-Arcady

Report generation date: 2024-10-15 11:15:14 PM

Summary of intersection performance

AM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
A1 - 2032 Background							
Leg North	0.51	1.02	4.66	0.34	A	4.44	A
Leg West	0.30	~1	4.27	0.23	A		
Leg South	0.35	~1	4.11	0.25	A		
Leg East	0.43	~1	4.62	0.30	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 - 9:30 AM
 "D2 - Base Year, PM" model duration: 4:00 PM - 5:30 PM
 "D3 - 2027 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D4 - 2027 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D5 - 2032 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D6 - 2032 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D7 - 2037 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D8 - 2037 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D9 - 2027 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D10 - 2027 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D11 - 2032 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D12 - 2032 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D13 - 2037 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D14 - 2037 Total, PM" model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2024-10-15 11:15:13 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2024-10-15
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) - 2032 Background, 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
2032 Background, AM	2032 Background	AM		ONE HOUR	08:00	09:30	90	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				4.44	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Loyalist Parkway (Hwy 33)	
West	West	Sandy Hook Road (CR1)	
South	South	Loyalist Parkway (Hwy 33)	
East	East	Sandy Hook Road (CR1)	

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)	I' - 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	ONE HOUR	✓	362.00	100.000
West	ONE HOUR	✓	230.00	100.000
South	ONE HOUR	✓	277.00	100.000
East	ONE HOUR	✓	308.00	100.000

Turning Proportions

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

		To			
		North	West	South	East
From	North	0.000	114.000	221.000	27.000
	West	136.000	0.000	8.000	86.000
	South	213.000	2.000	0.000	62.000
	East	42.000	131.000	135.000	0.000

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

		To			
		North	West	South	East
From	North	0.00	0.31	0.61	0.07
	West	0.59	0.00	0.03	0.37
	South	0.77	0.01	0.00	0.22
	East	0.14	0.43	0.44	0.00

Vehicle Mix

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

		To			
		North	West	South	East
From	North	1.000	1.020	1.020	1.020
	West	1.020	1.000	1.020	1.020
	South	1.020	1.020	1.000	1.020
	East	1.020	1.020	1.020	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North				
	West				
	South				
	East				

		To			
		North	West	South	East
From	North	0.0	2.0	2.0	2.0
	West	2.0	0.0	2.0	2.0
	South	2.0	2.0	0.0	2.0
	East	2.0	2.0	2.0	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	0.34	4.66	0.51	1.02	A	332.18	498.27	34.97	4.21	0.39	34.98	4.21
West	0.23	4.27	0.30	~1	A	211.05	316.58	20.73	3.93	0.23	20.73	3.93
South	0.25	4.11	0.35	~1	A	254.18	381.27	24.21	~3.81	0.27	24.21	3.81
East	0.30	4.62	0.43	~1	A	282.63	423.94	29.57	4.19	0.33	29.57	4.19

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	272.53	68.13	271.39	293.20	200.92	0.00	1241.16	1006.00	0.220	0.00	0.29	3.784	A
West	173.16	43.29	172.47	185.18	287.14	0.00	1191.26	782.06	0.145	0.00	0.17	3.602	A
South	208.54	52.14	207.73	272.89	186.71	0.00	1249.39	877.14	0.167	0.00	0.20	3.525	A
East	231.88	57.97	230.91	131.22	263.21	0.00	1205.11	695.78	0.192	0.00	0.24	3.766	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	325.43	81.36	325.09	351.18	240.68	0.00	1218.15	1006.00	0.267	0.29	0.37	4.111	A
West	206.77	51.69	206.57	221.82	343.95	0.00	1158.38	782.06	0.179	0.17	0.22	3.856	A
South	249.02	62.25	248.80	326.89	223.64	0.00	1228.01	877.14	0.203	0.20	0.26	3.749	A
East	276.89	69.22	276.60	157.18	315.26	0.00	1174.99	695.78	0.236	0.24	0.31	4.086	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	398.57	99.64	398.00	429.98	294.66	0.00	1186.91	1006.00	0.336	0.37	0.51	4.652	A
West	253.23	63.31	252.92	271.57	421.09	0.00	1113.73	782.06	0.227	0.22	0.30	4.265	A
South	304.98	76.25	304.63	400.20	273.81	0.00	1198.97	877.14	0.254	0.26	0.35	4.103	A
East	339.11	84.78	338.64	192.44	386.00	0.00	1134.04	695.78	0.299	0.31	0.43	4.613	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	398.57	99.64	398.56	430.49	295.07	0.00	1186.67	1006.00	0.336	0.51	0.51	4.658	A
West	253.23	63.31	253.23	271.95	421.68	0.00	1113.39	782.06	0.227	0.30	0.30	4.268	A
South	304.98	76.25	304.98	400.76	274.15	0.00	1198.78	877.14	0.254	0.35	0.35	4.108	A
East	339.11	84.78	339.11	192.68	386.45	0.00	1133.78	695.78	0.299	0.43	0.43	4.620	A

Main results: (09:00-09:15)

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	325.43	81.36	325.99	352.01	241.33	0.00	1217.77	1006.00	0.267	0.51	0.37	4.121	A
West	206.77	51.69	207.07	222.43	344.90	0.00	1157.83	782.06	0.179	0.30	0.22	3.864	A
South	249.02	62.25	249.36	327.79	224.18	0.00	1227.70	877.14	0.203	0.35	0.26	3.756	A
East	276.89	69.22	277.35	157.55	315.99	0.00	1174.56	695.78	0.236	0.43	0.32	4.094	A

Main results: (09:15-09:30)

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	272.53	68.13	272.87	294.69	202.01	0.00	1240.53	1006.00	0.220	0.37	0.29	3.795	A
West	173.16	43.29	173.35	186.19	288.70	0.00	1190.36	782.06	0.145	0.22	0.17	3.613	A
South	208.54	52.14	208.76	274.38	187.67	0.00	1248.83	877.14	0.167	0.26	0.21	3.533	A
East	231.88	57.97	232.17	131.90	264.54	0.00	1204.34	695.78	0.193	0.32	0.24	3.777	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	4.19	0.28	3.784	A	A
West	2.54	0.17	3.602	A	A
South	2.99	0.20	3.525	A	A
East	3.55	0.24	3.766	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	5.45	0.36	4.111	A	A
West	3.26	0.22	3.856	A	A
South	3.82	0.25	3.749	A	A
East	4.61	0.31	4.086	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	7.52	0.50	4.652	A	A
West	4.40	0.29	4.265	A	A
South	5.10	0.34	4.103	A	A
East	6.35	0.42	4.613	A	A

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

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	7.70	0.51	4.658	A	A
West	4.48	0.30	4.268	A	A
South	5.20	0.35	4.108	A	A
East	6.50	0.43	4.620	A	A

Queueing Delay results: (09:00-09:15)

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	5.72	0.38	4.121	A	A
West	3.40	0.23	3.864	A	A
South	3.98	0.27	3.756	A	A
East	4.84	0.32	4.094	A	A

Queueing Delay results: (09:15-09:30)

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	4.40	0.29	3.795	A	A
West	2.65	0.18	3.613	A	A
South	3.13	0.21	3.533	A	A
East	3.73	0.25	3.777	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	0.29	~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
West	0.17	~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	0.20	~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
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: (08:15-08:30)

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	0.37	~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
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	0.26	~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
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: (08:30-08:45)

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	0.51	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
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	0.35	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.43	~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

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

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.51	0.00	0.00	0.00	1.02			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	0.35	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.43	~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

Queue Variation results: (09:00-09:15)

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	0.37	~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
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	0.26	~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
East	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

Queue Variation results: (09:15-09:30)

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	0.29	~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
West	0.17	~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	0.21	~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
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

<h1>Junctions 8</h1>
<h2>ARCADY 8 - Roundabout Module</h2>
Version: 8.0.6.541 [19821,26/11/2015] © Copyright TRL Limited, 2024
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Filename: Loyalist and Sandy Hook.arc8

Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Personal Project Files\240418-Arcady

Report generation date: 2024-10-15 11:14:55 PM

Summary of intersection performance

PM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
A1 - 2032 Background							
Leg North	1.04	?	6.19	0.51	A	5.62	A
Leg West	0.43	~1	4.90	0.30	A		
Leg South	0.82	1.02	5.83	0.45	A		
Leg East	0.43	~1	4.91	0.30	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 - 9:30 AM
 "D2 - Base Year, PM" model duration: 4:00 PM - 5:30 PM
 "D3 - 2027 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D4 - 2027 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D5 - 2032 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D6 - 2032 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D7 - 2037 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D8 - 2037 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D9 - 2027 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D10 - 2027 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D11 - 2032 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D12 - 2032 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D13 - 2037 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D14 - 2037 Total, PM" model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2024-10-15 11:14:55 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2024-10-15
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) - 2032 Background, 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
2032 Background, PM	2032 Background	PM		ONE HOUR	16:00	17:30	90	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				5.62	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Loyalist Parkway (Hwy 33)	
West	West	Sandy Hook Road (CR1)	
South	South	Loyalist Parkway (Hwy 33)	
East	East	Sandy Hook Road (CR1)	

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)	I' - 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	ONE HOUR	✓	551.00	100.000
West	ONE HOUR	✓	285.00	100.000
South	ONE HOUR	✓	462.00	100.000
East	ONE HOUR	✓	285.00	100.000

Turning Proportions

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

		To			
		North	West	South	East
From	North	0.000	196.000	287.000	68.000
	West	145.000	0.000	9.000	131.000
	South	304.000	16.000	0.000	142.000
	East	54.000	123.000	108.000	0.000

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

		To			
		North	West	South	East
From	North	0.00	0.36	0.52	0.12
	West	0.51	0.00	0.03	0.46
	South	0.66	0.03	0.00	0.31
	East	0.19	0.43	0.38	0.00

Vehicle Mix

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

		To			
		North	West	South	East
From	North	1.000	1.020	1.020	1.020
	West	1.020	1.000	1.020	1.020
	South	1.020	1.020	1.000	1.020
	East	1.020	1.020	1.020	1.000

Truck Percentages - Intersection 1 (for whole period)

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		To			
		North	West	South	East
From	North	0.0	2.0	2.0	2.0
	West	2.0	0.0	2.0	2.0
	South	2.0	2.0	0.0	2.0
	East	2.0	2.0	2.0	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	0.51	6.19	1.04	?	A	505.61	758.41	66.30	5.25	0.74	66.31	5.25
West	0.30	4.90	0.43	~1	A	261.52	392.28	28.69	4.39	0.32	28.69	4.39
South	0.45	5.83	0.82	1.02	A	423.94	635.91	53.16	5.02	0.59	53.17	5.02
East	0.30	4.91	0.43	~1	A	261.52	392.28	28.73	4.39	0.32	28.73	4.39

Main Results for each time segment

Main results: (16:00-16:15)

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	414.82	103.71	412.81	376.96	185.15	0.00	1250.29	973.22	0.332	0.00	0.50	4.374	A
West	214.56	53.64	213.64	251.03	346.92	0.00	1156.66	822.66	0.186	0.00	0.23	3.891	A
South	347.82	86.95	346.18	302.73	257.84	0.00	1208.22	826.85	0.288	0.00	0.41	4.252	A
East	214.56	53.64	213.64	255.55	348.47	0.00	1155.76	783.75	0.186	0.00	0.23	3.895	A

Main results: (16:15-16:30)

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	495.34	123.83	494.62	451.62	221.80	0.00	1229.08	973.23	0.403	0.50	0.68	4.994	A
West	256.21	64.05	255.93	300.76	415.66	0.00	1116.88	822.66	0.229	0.23	0.30	4.264	A
South	415.33	103.83	414.76	362.70	308.89	0.00	1178.67	826.85	0.352	0.41	0.55	4.804	A
East	256.21	64.05	255.93	306.16	417.49	0.00	1115.82	783.75	0.230	0.23	0.30	4.269	A

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	606.66	151.67	605.28	552.78	271.52	0.00	1200.30	973.22	0.505	0.68	1.03	6.155	A
West	313.79	78.45	313.30	368.10	508.69	0.00	1063.03	822.66	0.295	0.30	0.42	4.894	A
South	508.67	127.17	507.62	443.89	378.11	0.00	1138.61	826.85	0.447	0.55	0.81	5.810	A
East	313.79	78.45	313.30	374.73	511.00	0.00	1061.70	783.75	0.296	0.30	0.42	4.903	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	606.66	151.67	606.63	553.80	271.95	0.00	1200.05	973.22	0.506	1.03	1.04	6.187	A
West	313.79	78.45	313.78	368.83	509.75	0.00	1062.42	822.66	0.295	0.42	0.43	4.904	A
South	508.67	127.17	508.65	444.79	378.74	0.00	1138.25	826.85	0.447	0.81	0.82	5.831	A
East	313.79	78.45	313.78	375.44	511.96	0.00	1061.14	783.75	0.296	0.42	0.43	4.912	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	495.34	123.83	496.70	453.20	222.47	0.00	1228.69	973.23	0.403	1.04	0.70	5.025	A
West	256.21	64.05	256.69	301.89	417.29	0.00	1115.94	822.66	0.230	0.43	0.31	4.275	A
South	415.33	103.83	416.37	364.09	309.88	0.00	1178.10	826.85	0.353	0.82	0.56	4.828	A
East	256.21	64.05	256.69	307.26	418.99	0.00	1114.95	783.75	0.230	0.43	0.31	4.280	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	414.82	103.71	415.56	379.27	186.21	0.00	1249.68	973.22	0.332	0.70	0.51	4.405	A
West	214.56	53.64	214.85	252.61	349.16	0.00	1155.37	822.66	0.186	0.31	0.23	3.905	A
South	347.82	86.95	348.40	304.66	259.35	0.00	1207.34	826.85	0.288	0.56	0.42	4.279	A
East	214.56	53.64	214.85	257.12	350.62	0.00	1154.52	783.75	0.186	0.31	0.23	3.908	A

Queueing Delay Results for each time segment

Queueing Delay results: (16:00-16:15)

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	7.33	0.49	4.374	A	A
West	3.39	0.23	3.891	A	A
South	5.98	0.40	4.252	A	A
East	3.39	0.23	3.895	A	A

Queueing Delay results: (16:15-16:30)

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	10.00	0.67	4.994	A	A
West	4.45	0.30	4.264	A	A
South	8.09	0.54	4.804	A	A
East	4.46	0.30	4.269	A	A

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

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	14.94	1.00	6.155	A	A
West	6.23	0.42	4.894	A	A
South	11.87	0.79	5.810	A	A
East	6.24	0.42	4.903	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	15.49	1.03	6.187	A	A
West	6.38	0.43	4.904	A	A
South	12.26	0.82	5.831	A	A
East	6.39	0.43	4.912	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	10.72	0.71	5.025	A	A
West	4.68	0.31	4.275	A	A
South	8.61	0.57	4.828	A	A
East	4.68	0.31	4.280	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	7.82	0.52	4.405	A	A
West	3.57	0.24	3.905	A	A
South	6.36	0.42	4.279	A	A
East	3.57	0.24	3.908	A	A

Queue Variation Results for each time segment

Queue Variation results: (16:00-16:15)

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	0.50	~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	0.23	~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	0.23	~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: (16:15-16:30)

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	0.68	~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	0.30	~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	0.55	~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: (16:30-16:45)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.03	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.42	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.81	~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: (16:45-17:00)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.04	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	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
South	0.82	0.00	0.00	0.00	1.02			N/A	N/A
East	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

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

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.70	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	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
South	0.56	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
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: (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	0.51	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.23	~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	0.42	~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
East	0.23	~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

HCM Unsignalized Intersection Capacity Analysis
 2: Lake Street (CR10) & Sandy Hook Road

2032 Total - AM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	63	201	296	254	178	50
Future Volume (Veh/h)	63	201	296	254	178	50
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	70	223	329	282	198	56
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1166	226	254			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1166	226	254			
tC, single (s)	6.7	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.7	3.4	2.3			
p0 queue free %	51	72	74			
cM capacity (veh/h)	142	789	1288			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	293	329	282	254		
Volume Left	70	329	0	0		
Volume Right	223	0	0	56		
cSH	379	1288	1700	1700		
Volume to Capacity	0.77	0.26	0.17	0.15		
Queue Length 95th (m)	51.3	8.2	0.0	0.0		
Control Delay (s)	40.4	8.8	0.0	0.0		
Lane LOS	E	A				
Approach Delay (s)	40.4	4.7		0.0		
Approach LOS	E					
Intersection Summary						
Average Delay			12.7			
Intersection Capacity Utilization			54.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
7: Sandy Hook Road & West Access

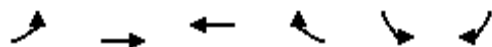
2032 Total - AM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↶		↶	
Traffic Volume (veh/h)	25	205	350	6	17	77
Future Volume (Veh/h)	25	205	350	6	17	77
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	223	380	7	18	84
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)	294					
pX, platoon unblocked						
vC, conflicting volume	387			660	384	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	387			660	384	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	98			96	87	
cM capacity (veh/h)	1171			418	664	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	250	387	102			
Volume Left	27	0	18			
Volume Right	0	7	84			
cSH	1171	1700	601			
Volume to Capacity	0.02	0.23	0.17			
Queue Length 95th (m)	0.6	0.0	4.9			
Control Delay (s)	1.1	0.0	12.2			
Lane LOS	A		B			
Approach Delay (s)	1.1	0.0	12.2			
Approach LOS			B			
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			44.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8: Sandy Hook Road & East Access

2032 Total - AM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	214	330	17	51	26
Future Volume (Veh/h)	8	214	330	17	51	26
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	233	359	18	55	28
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	377			619	368	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	377			619	368	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	99			88	96	
cM capacity (veh/h)	1181			449	677	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	242	377	83			
Volume Left	9	0	55			
Volume Right	0	18	28			
cSH	1181	1700	506			
Volume to Capacity	0.01	0.22	0.16			
Queue Length 95th (m)	0.2	0.0	4.7			
Control Delay (s)	0.4	0.0	13.5			
Lane LOS	A		B			
Approach Delay (s)	0.4	0.0	13.5			
Approach LOS			B			
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			29.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: Lake Street (CR10) & Sandy Hook Road

2032 Background - PM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	63	350	286	357	364	80
Future Volume (Veh/h)	63	350	286	357	364	80
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	67	372	304	380	387	85
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1418	430	472			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1418	430	472			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	37	41	72			
cM capacity (veh/h)	106	628	1090			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	439	304	380	472		
Volume Left	67	304	0	0		
Volume Right	372	0	0	85		
cSH	358	1090	1700	1700		
Volume to Capacity	1.23	0.28	0.22	0.28		
Queue Length 95th (m)	151.1	9.2	0.0	0.0		
Control Delay (s)	156.7	9.6	0.0	0.0		
Lane LOS	F	A				
Approach Delay (s)	156.7	4.3		0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			44.9			
Intersection Capacity Utilization			75.0%	ICU Level of Service	D	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

6: Sandy Hook Road & West Access

2032 Background - PM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Traffic Volume (veh/h)	69	397	319	15	10	44
Future Volume (Veh/h)	69	397	319	15	10	44
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	75	432	347	16	11	48
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)			303			
pX, platoon unblocked						
vC, conflicting volume	363				937	355
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	363				937	355
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				96	93
cM capacity (veh/h)	1196				275	689
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	507	363	59			
Volume Left	75	0	11			
Volume Right	0	16	48			
cSH	1196	1700	538			
Volume to Capacity	0.06	0.21	0.11			
Queue Length 95th (m)	1.6	0.0	2.9			
Control Delay (s)	1.8	0.0	12.5			
Lane LOS	A		B			
Approach Delay (s)	1.8	0.0	12.5			
Approach LOS			B			
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			55.7%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 9: Sandy Hook Road & East Access

2032 Background - PM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	23	383	319	46	29	15
Future Volume (Veh/h)	23	383	319	46	29	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	416	347	50	32	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	397				838	372
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	397				838	372
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				90	98
cM capacity (veh/h)	1162				329	674
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	441	397	48			
Volume Left	25	0	32			
Volume Right	0	50	16			
cSH	1162	1700	397			
Volume to Capacity	0.02	0.23	0.12			
Queue Length 95th (m)	0.5	0.0	3.3			
Control Delay (s)	0.7	0.0	15.3			
Lane LOS	A		C			
Approach Delay (s)	0.7	0.0	15.3			
Approach LOS			C			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			49.0%	ICU Level of Service		A
Analysis Period (min)			15			

<h1>Junctions 8</h1>
<h2>ARCADY 8 - Roundabout Module</h2>
Version: 8.0.6.541 [19821,26/11/2015] © Copyright TRL Limited, 2024
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Filename: Loyalist and Sandy Hook.arc8

Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Personal Project Files\240418-Arcady

Report generation date: 2024-10-15 11:11:50 PM

Summary of intersection performance

AM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
A1 - 2032 Total							
Leg North	0.51	1.02	4.66	0.34	A	4.44	A
Leg West	0.30	~1	4.27	0.23	A		
Leg South	0.35	~1	4.11	0.25	A		
Leg East	0.43	~1	4.62	0.30	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 - 9:30 AM
 "D2 - Base Year, PM" model duration: 4:00 PM - 5:30 PM
 "D3 - 2027 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D4 - 2027 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D5 - 2032 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D6 - 2032 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D7 - 2037 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D8 - 2037 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D9 - 2027 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D10 - 2027 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D11 - 2032 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D12 - 2032 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D13 - 2037 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D14 - 2037 Total, PM" model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2024-10-15 11:11:49 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2024-10-15
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) - 2032 Total, 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
2032 Total, AM	2032 Total	AM		ONE HOUR	08:00	09:30	90	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				4.44	A

Intersection Set Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Loyalist Parkway (Hwy 33)	
West	West	Sandy Hook Road (CR1)	
South	South	Loyalist Parkway (Hwy 33)	
East	East	Sandy Hook Road (CR1)	

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)	I' - 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	ONE HOUR	✓	362.00	100.000
West	ONE HOUR	✓	230.00	100.000
South	ONE HOUR	✓	277.00	100.000
East	ONE HOUR	✓	308.00	100.000

Turning Proportions

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

		To			
		North	West	South	East
From	North	0.000	114.000	221.000	27.000
	West	136.000	0.000	8.000	86.000
	South	213.000	2.000	0.000	62.000
	East	42.000	131.000	135.000	0.000

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

		To			
		North	West	South	East
From	North	0.00	0.31	0.61	0.07
	West	0.59	0.00	0.03	0.37
	South	0.77	0.01	0.00	0.22
	East	0.14	0.43	0.44	0.00

Vehicle Mix

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

		To			
		North	West	South	East
From	North	1.000	1.020	1.020	1.020
	West	1.020	1.000	1.020	1.020
	South	1.020	1.020	1.000	1.020
	East	1.020	1.020	1.020	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.0	2.0	2.0	2.0
	West	2.0	0.0	2.0	2.0
	South	2.0	2.0	0.0	2.0
	East	2.0	2.0	2.0	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	0.34	4.66	0.51	1.02	A	332.18	498.27	34.97	4.21	0.39	34.98	4.21
West	0.23	4.27	0.30	~1	A	211.05	316.58	20.73	3.93	0.23	20.73	3.93
South	0.25	4.11	0.35	~1	A	254.18	381.27	24.21	3.81	0.27	24.21	3.81
East	0.30	4.62	0.43	~1	A	282.63	423.94	29.57	4.19	0.33	29.57	4.19

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	272.53	68.13	271.39	293.20	200.92	0.00	1241.16	1006.00	0.220	0.00	0.29	3.784	A
West	173.16	43.29	172.47	185.18	287.14	0.00	1191.26	782.06	0.145	0.00	0.17	3.602	A
South	208.54	52.14	207.73	272.89	186.71	0.00	1249.39	877.14	0.167	0.00	0.20	3.525	A
East	231.88	57.97	230.91	131.22	263.21	0.00	1205.11	695.78	0.192	0.00	0.24	3.766	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	325.43	81.36	325.09	351.18	240.68	0.00	1218.15	1006.00	0.267	0.29	0.37	4.111	A
West	206.77	51.69	206.57	221.82	343.95	0.00	1158.38	782.06	0.179	0.17	0.22	3.856	A
South	249.02	62.25	248.80	326.89	223.64	0.00	1228.01	877.14	0.203	0.20	0.26	3.749	A
East	276.89	69.22	276.60	157.18	315.26	0.00	1174.99	695.78	0.236	0.24	0.31	4.086	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	398.57	99.64	398.00	429.98	294.66	0.00	1186.91	1006.00	0.336	0.37	0.51	4.652	A
West	253.23	63.31	252.92	271.57	421.09	0.00	1113.73	782.06	0.227	0.22	0.30	4.265	A
South	304.98	76.25	304.63	400.20	273.81	0.00	1198.97	877.14	0.254	0.26	0.35	4.103	A
East	339.11	84.78	338.64	192.44	386.00	0.00	1134.04	695.78	0.299	0.31	0.43	4.613	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	398.57	99.64	398.56	430.49	295.07	0.00	1186.67	1006.00	0.336	0.51	0.51	4.658	A
West	253.23	63.31	253.23	271.95	421.68	0.00	1113.39	782.06	0.227	0.30	0.30	4.268	A
South	304.98	76.25	304.98	400.76	274.15	0.00	1198.78	877.14	0.254	0.35	0.35	4.108	A
East	339.11	84.78	339.11	192.68	386.45	0.00	1133.78	695.78	0.299	0.43	0.43	4.620	A

Main results: (09:00-09:15)

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	325.43	81.36	325.99	352.01	241.33	0.00	1217.77	1006.00	0.267	0.51	0.37	4.121	A
West	206.77	51.69	207.07	222.43	344.90	0.00	1157.83	782.06	0.179	0.30	0.22	3.864	A
South	249.02	62.25	249.36	327.79	224.18	0.00	1227.70	877.14	0.203	0.35	0.26	3.756	A
East	276.89	69.22	277.35	157.55	315.99	0.00	1174.56	695.78	0.236	0.43	0.32	4.094	A

Main results: (09:15-09:30)

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	272.53	68.13	272.87	294.69	202.01	0.00	1240.53	1006.00	0.220	0.37	0.29	3.795	A
West	173.16	43.29	173.35	186.19	288.70	0.00	1190.36	782.06	0.145	0.22	0.17	3.613	A
South	208.54	52.14	208.76	274.38	187.67	0.00	1248.83	877.14	0.167	0.26	0.21	3.533	A
East	231.88	57.97	232.17	131.90	264.54	0.00	1204.34	695.78	0.193	0.32	0.24	3.777	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	4.19	0.28	3.784	A	A
West	2.54	0.17	3.602	A	A
South	2.99	0.20	3.525	A	A
East	3.55	0.24	3.766	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	5.45	0.36	4.111	A	A
West	3.26	0.22	3.856	A	A
South	3.82	0.25	3.749	A	A
East	4.61	0.31	4.086	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	7.52	0.50	4.652	A	A
West	4.40	0.29	4.265	A	A
South	5.10	0.34	4.103	A	A
East	6.35	0.42	4.613	A	A

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

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	7.70	0.51	4.658	A	A
West	4.48	0.30	4.268	A	A

South	5.20	0.35	4.108	A	A
East	6.50	0.43	4.620	A	A

Queueing Delay results: (09:00-09:15)

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	5.72	0.38	4.121	A	A
West	3.40	0.23	3.864	A	A
South	3.98	0.27	3.756	A	A
East	4.84	0.32	4.094	A	A

Queueing Delay results: (09:15-09:30)

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	4.40	0.29	3.795	A	A
West	2.65	0.18	3.613	A	A
South	3.13	0.21	3.533	A	A
East	3.73	0.25	3.777	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	0.29	~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
West	0.17	~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	0.20	~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
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: (08:15-08:30)

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	0.37	~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
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	0.26	~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
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: (08:30-08:45)

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	0.51	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
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	0.35	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.43	~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

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

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Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.51	0.00	0.00	0.00	1.02			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	0.35	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.43	~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

Queue Variation results: (09:00-09:15)

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	0.37	~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
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	0.26	~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
East	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

Queue Variation results: (09:15-09:30)

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	0.29	~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
West	0.17	~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	0.21	~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
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

<h1>Junctions 8</h1>
<h2>ARCADY 8 - Roundabout Module</h2>
Version: 8.0.6.541 [19821,26/11/2015] © Copyright TRL Limited, 2024
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Filename: Loyalist and Sandy Hook.arc8

Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Personal Project Files\240418-Arcady

Report generation date: 2024-10-15 11:11:27 PM

Summary of intersection performance

PM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
A1 - 2032 Total							
Leg North	1.04	?	6.19	0.51	A	5.62	A
Leg West	0.43	~1	4.90	0.30	A		
Leg South	0.82	1.02	5.83	0.45	A		
Leg East	0.43	~1	4.91	0.30	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 - 9:30 AM
 "D2 - Base Year, PM" model duration: 4:00 PM - 5:30 PM
 "D3 - 2027 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D4 - 2027 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D5 - 2032 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D6 - 2032 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D7 - 2037 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D8 - 2037 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D9 - 2027 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D10 - 2027 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D11 - 2032 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D12 - 2032 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D13 - 2037 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D14 - 2037 Total, PM" model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2024-10-15 11:11:26 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2024-10-15
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) - 2032 Total, 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
2032 Total, PM	2032 Total	PM		ONE HOUR	16:00	17:30	90	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				5.62	A

Intersection Set Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Loyalist Parkway (Hwy 33)	
West	West	Sandy Hook Road (CR1)	
South	South	Loyalist Parkway (Hwy 33)	
East	East	Sandy Hook Road (CR1)	

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)	I' - 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	ONE HOUR	✓	551.00	100.000
West	ONE HOUR	✓	285.00	100.000
South	ONE HOUR	✓	462.00	100.000
East	ONE HOUR	✓	285.00	100.000

Turning Proportions

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

		To			
		North	West	South	East
From	North	0.000	196.000	287.000	68.000
	West	145.000	0.000	9.000	131.000
	South	304.000	16.000	0.000	142.000
	East	54.000	123.000	108.000	0.000

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

		To			
		North	West	South	East
From	North	0.00	0.36	0.52	0.12
	West	0.51	0.00	0.03	0.46
	South	0.66	0.03	0.00	0.31
	East	0.19	0.43	0.38	0.00

Vehicle Mix

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

		To			
		North	West	South	East
From	North	1.000	1.020	1.020	1.020
	West	1.020	1.000	1.020	1.020
	South	1.020	1.020	1.000	1.020
	East	1.020	1.020	1.020	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.0	2.0	2.0	2.0
	West	2.0	0.0	2.0	2.0
	South	2.0	2.0	0.0	2.0
	East	2.0	2.0	2.0	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	0.51	6.19	1.04	?	A	505.61	758.41	66.30	5.25	0.74	66.31	5.25
West	0.30	4.90	0.43	~1	A	261.52	392.28	28.69	4.39	0.32	28.69	4.39
South	0.45	5.83	0.82	1.02	A	423.94	635.91	53.16	5.02	0.59	53.17	5.02
East	0.30	4.91	0.43	~1	A	261.52	392.28	28.73	4.39	0.32	28.73	4.39

Main Results for each time segment

Main results: (16:00-16:15)

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	414.82	103.71	412.81	376.96	185.15	0.00	1250.29	973.22	0.332	0.00	0.50	4.374	A
West	214.56	53.64	213.64	251.03	346.92	0.00	1156.66	822.66	0.186	0.00	0.23	3.891	A
South	347.82	86.95	346.18	302.73	257.84	0.00	1208.22	826.85	0.288	0.00	0.41	4.252	A
East	214.56	53.64	213.64	255.55	348.47	0.00	1155.76	783.75	0.186	0.00	0.23	3.895	A

Main results: (16:15-16:30)

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	495.34	123.83	494.62	451.62	221.80	0.00	1229.08	973.23	0.403	0.50	0.68	4.994	A
West	256.21	64.05	255.93	300.76	415.66	0.00	1116.88	822.66	0.229	0.23	0.30	4.264	A
South	415.33	103.83	414.76	362.70	308.89	0.00	1178.67	826.85	0.352	0.41	0.55	4.804	A
East	256.21	64.05	255.93	306.16	417.49	0.00	1115.82	783.75	0.230	0.23	0.30	4.269	A

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	606.66	151.67	605.28	552.78	271.52	0.00	1200.30	973.22	0.505	0.68	1.03	6.155	A
West	313.79	78.45	313.30	368.10	508.69	0.00	1063.03	822.66	0.295	0.30	0.42	4.894	A
South	508.67	127.17	507.62	443.89	378.11	0.00	1138.61	826.85	0.447	0.55	0.81	5.810	A
East	313.79	78.45	313.30	374.73	511.00	0.00	1061.70	783.75	0.296	0.30	0.42	4.903	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	606.66	151.67	606.63	553.80	271.95	0.00	1200.05	973.22	0.506	1.03	1.04	6.187	A
West	313.79	78.45	313.78	368.83	509.75	0.00	1062.42	822.66	0.295	0.42	0.43	4.904	A
South	508.67	127.17	508.65	444.79	378.74	0.00	1138.25	826.85	0.447	0.81	0.82	5.831	A
East	313.79	78.45	313.78	375.44	511.96	0.00	1061.14	783.75	0.296	0.42	0.43	4.912	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	495.34	123.83	496.70	453.20	222.47	0.00	1228.69	973.23	0.403	1.04	0.70	5.025	A
West	256.21	64.05	256.69	301.89	417.29	0.00	1115.94	822.66	0.230	0.43	0.31	4.275	A
South	415.33	103.83	416.37	364.09	309.88	0.00	1178.10	826.85	0.353	0.82	0.56	4.828	A
East	256.21	64.05	256.69	307.26	418.99	0.00	1114.95	783.75	0.230	0.43	0.31	4.280	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	414.82	103.71	415.56	379.27	186.21	0.00	1249.68	973.22	0.332	0.70	0.51	4.405	A
West	214.56	53.64	214.85	252.61	349.16	0.00	1155.37	822.66	0.186	0.31	0.23	3.905	A
South	347.82	86.95	348.40	304.66	259.35	0.00	1207.34	826.85	0.288	0.56	0.42	4.279	A
East	214.56	53.64	214.85	257.12	350.62	0.00	1154.52	783.75	0.186	0.31	0.23	3.908	A

Queueing Delay Results for each time segment

Queueing Delay results: (16:00-16:15)

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	7.33	0.49	4.374	A	A
West	3.39	0.23	3.891	A	A
South	5.98	0.40	4.252	A	A
East	3.39	0.23	3.895	A	A

Queueing Delay results: (16:15-16:30)

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	10.00	0.67	4.994	A	A
West	4.45	0.30	4.264	A	A
South	8.09	0.54	4.804	A	A
East	4.46	0.30	4.269	A	A

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

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	14.94	1.00	6.155	A	A
West	6.23	0.42	4.894	A	A
South	11.87	0.79	5.810	A	A
East	6.24	0.42	4.903	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	15.49	1.03	6.187	A	A
West	6.38	0.43	4.904	A	A

South	12.26	0.82	5.831	A	A
East	6.39	0.43	4.912	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	10.72	0.71	5.025	A	A
West	4.68	0.31	4.275	A	A
South	8.61	0.57	4.828	A	A
East	4.68	0.31	4.280	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	7.82	0.52	4.405	A	A
West	3.57	0.24	3.905	A	A
South	6.36	0.42	4.279	A	A
East	3.57	0.24	3.908	A	A

Queue Variation Results for each time segment

Queue Variation results: (16:00-16:15)

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	0.50	~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	0.23	~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	0.23	~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: (16:15-16:30)

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	0.68	~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	0.30	~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	0.55	~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: (16:30-16:45)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.03	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.42	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.81	~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: (16:45-17:00)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.04	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	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
South	0.82	0.00	0.00	0.00	1.02			N/A	N/A
East	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

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

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.70	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	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
South	0.56	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
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: (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	0.51	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.23	~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	0.42	~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
East	0.23	~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 F

2037 Operational Analysis Outputs



HCM Unsignalized Intersection Capacity Analysis

2: Lake Street (CR10) & Sandy Hook Road (CR1)

10-16-2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	23	192	300	270	202	23
Future Volume (Veh/h)	23	192	300	270	202	23
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	26	213	333	300	224	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1203	237	250			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1203	237	250			
tC, single (s)	6.7	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.7	3.4	2.3			
p0 queue free %	81	73	74			
cM capacity (veh/h)	135	778	1293			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	239	333	300	250		
Volume Left	26	333	0	0		
Volume Right	213	0	0	26		
cSH	512	1293	1700	1700		
Volume to Capacity	0.47	0.26	0.18	0.15		
Queue Length 95th (m)	19.6	8.3	0.0	0.0		
Control Delay (s)	18.0	8.7	0.0	0.0		
Lane LOS	C	A				
Approach Delay (s)	18.0	4.6		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			6.4			
Intersection Capacity Utilization			51.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 2: Lake Street (CR10) & Sandy Hook Road (CR1)

2037 Background - PM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	30	367	292	389	391	41
Future Volume (Veh/h)	30	367	292	389	391	41
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	32	390	311	414	416	44
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1474	438	460			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1474	438	460			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	67	37	72			
cM capacity (veh/h)	97	621	1101			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	422	311	414	460		
Volume Left	32	311	0	0		
Volume Right	390	0	0	44		
cSH	440	1101	1700	1700		
Volume to Capacity	0.96	0.28	0.24	0.27		
Queue Length 95th (m)	91.9	9.3	0.0	0.0		
Control Delay (s)	63.9	9.6	0.0	0.0		
Lane LOS	F	A				
Approach Delay (s)	63.9	4.1		0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			18.6			
Intersection Capacity Utilization			73.6%	ICU Level of Service	D	
Analysis Period (min)			15			

<h1>Junctions 8</h1>
<h2>ARCADY 8 - Roundabout Module</h2>
Version: 8.0.6.541 [19821,26/11/2015] © Copyright TRL Limited, 2024
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Filename: Loyalist and Sandy Hook.arc8

Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Personal Project Files\240418-Arcady

Report generation date: 2024-10-15 11:14:28 PM

Summary of intersection performance

AM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
A1 - 2037 Background							
Leg North	0.67	1.02	5.21	0.40	A	4.82	A
Leg West	0.35	~1	4.56	0.25	A		
Leg South	0.40	~1	4.30	0.28	A		
Leg East	0.51	1.02	4.96	0.34	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 - 9:30 AM
 "D2 - Base Year, PM" model duration: 4:00 PM - 5:30 PM
 "D3 - 2027 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D4 - 2027 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D5 - 2032 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D6 - 2032 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D7 - 2037 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D8 - 2037 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D9 - 2027 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D10 - 2027 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D11 - 2032 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D12 - 2032 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D13 - 2037 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D14 - 2037 Total, PM" model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2024-10-15 11:14:27 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2024-10-15
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) - 2037 Background, 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
2037 Background, AM	2037 Background	AM		ONE HOUR	08:00	09:30	90	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				4.82	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Loyalist Parkway (Hwy 33)	
West	West	Sandy Hook Road (CR1)	
South	South	Loyalist Parkway (Hwy 33)	
East	East	Sandy Hook Road (CR1)	

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)	I' - 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	ONE HOUR	✓	421.00	100.000
West	ONE HOUR	✓	249.00	100.000
South	ONE HOUR	✓	302.00	100.000
East	ONE HOUR	✓	340.00	100.000

Turning Proportions

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

		To			
		North	West	South	East
From	North	0.000	137.000	255.000	29.000
	West	149.000	0.000	8.000	92.000
	South	231.000	2.000	0.000	69.000
	East	44.000	144.000	152.000	0.000

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

		To			
		North	West	South	East
From	North	0.00	0.33	0.61	0.07
	West	0.60	0.00	0.03	0.37
	South	0.76	0.01	0.00	0.23
	East	0.13	0.42	0.45	0.00

Vehicle Mix

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

		To			
		North	West	South	East
From	North	1.000	1.020	1.020	1.020
	West	1.020	1.000	1.020	1.020
	South	1.020	1.020	1.000	1.020
	East	1.020	1.020	1.020	1.000

Truck Percentages - Intersection 1 (for whole period)

--	--	--	--	--	--

From	To			
	North	West	South	East
North	0.0	2.0	2.0	2.0
West	2.0	0.0	2.0	2.0
South	2.0	2.0	0.0	2.0
East	2.0	2.0	2.0	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	0.40	5.21	0.67	1.02	A	386.32	579.48	44.44	4.60	0.49	44.44	4.60
West	0.25	4.56	0.35	~1	A	228.49	342.73	23.66	4.14	0.26	23.66	4.14
South	0.28	4.30	0.40	~1	A	277.12	415.68	27.40	3.96	0.30	27.40	3.96
East	0.34	4.96	0.51	1.02	A	311.99	467.98	34.54	4.43	0.38	34.54	4.43

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	316.95	79.24	315.54	317.90	223.38	0.00	1228.16	1004.60	0.258	0.00	0.35	4.018	A
West	187.46	46.87	186.68	212.12	326.80	0.00	1168.31	785.76	0.160	0.00	0.19	3.735	A
South	227.36	56.84	226.45	311.06	202.42	0.00	1240.29	877.24	0.183	0.00	0.23	3.618	A
East	255.97	63.99	254.86	142.45	286.42	0.00	1191.68	693.61	0.215	0.00	0.28	3.914	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	378.47	94.62	378.02	380.79	267.60	0.00	1202.57	1004.60	0.315	0.35	0.47	4.451	A
West	223.85	55.96	223.62	254.12	391.50	0.00	1130.86	785.76	0.198	0.19	0.25	4.046	A
South	271.49	67.87	271.24	372.64	242.48	0.00	1217.11	877.24	0.223	0.23	0.29	3.881	A
East	305.65	76.41	305.31	170.63	343.08	0.00	1158.88	693.61	0.264	0.28	0.36	4.299	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	463.53	115.88	462.73	466.21	327.58	0.00	1167.85	1004.60	0.397	0.47	0.67	5.202	A
West	274.15	68.54	273.78	311.07	479.24	0.00	1080.08	785.76	0.254	0.25	0.34	4.552	A
South	332.51	83.13	332.09	456.16	296.86	0.00	1185.64	877.24	0.280	0.29	0.39	4.300	A
East	374.35	93.59	373.75	208.90	420.04	0.00	1114.34	693.61	0.336	0.36	0.51	4.953	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	463.53	115.88	463.52	466.82	328.10	0.00	1167.56	1004.60	0.397	0.67	0.67	5.215	A
West	274.15	68.54	274.15	311.58	480.03	0.00	1079.62	785.76	0.254	0.34	0.35	4.558	A
South	332.51	83.13	332.50	456.91	297.27	0.00	1185.40	877.24	0.281	0.39	0.40	4.305	A
East	374.35	93.59	374.34	209.19	420.58	0.00	1114.03	693.61	0.336	0.51	0.51	4.963	A

Main results: (09:00-09:15)

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	378.47	94.62	379.26	381.78	268.41	0.00	1202.10	1004.60	0.315	0.67	0.47	4.468	A
West	223.85	55.96	224.22	254.92	392.75	0.00	1130.14	785.76	0.198	0.35	0.25	4.054	A
South	271.49	67.87	271.90	373.83	243.14	0.00	1216.73	877.24	0.223	0.40	0.29	3.887	A
East	305.65	76.41	306.24	171.09	343.95	0.00	1158.38	693.61	0.264	0.51	0.37	4.313	A

Main results: (09:15-09:30)

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	316.95	79.24	317.41	319.59	224.66	0.00	1227.42	1004.60	0.258	0.47	0.36	4.036	A
West	187.46	46.87	187.69	213.36	328.71	0.00	1167.20	785.76	0.161	0.25	0.20	3.748	A
South	227.36	56.84	227.62	312.88	203.52	0.00	1239.65	877.24	0.183	0.29	0.23	3.631	A
East	255.97	63.99	256.32	143.22	287.93	0.00	1190.81	693.61	0.215	0.37	0.28	3.932	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	5.16	0.34	4.018	A	A
West	2.85	0.19	3.735	A	A
South	3.35	0.22	3.618	A	A
East	4.07	0.27	3.914	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	6.85	0.46	4.451	A	A
West	3.70	0.25	4.046	A	A
South	4.30	0.29	3.881	A	A
East	5.35	0.36	4.299	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	9.73	0.65	5.202	A	A
West	5.07	0.34	4.552	A	A
South	5.82	0.39	4.300	A	A
East	7.51	0.50	4.953	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	10.01	0.67	5.215	A	A
West	5.18	0.35	4.558	A	A
South	5.94	0.40	4.305	A	A
East	7.70	0.51	4.963	A	A

Queueing Delay results: (09:00-09:15)

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	7.24	0.48	4.468	A	A
West	3.87	0.26	4.054	A	A
South	4.50	0.30	3.887	A	A
East	5.63	0.38	4.313	A	A

Queueing Delay results: (09:15-09:30)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	5.46	0.36	4.036	A	A
West	2.99	0.20	3.748	A	A
South	3.51	0.23	3.631	A	A
East	4.28	0.29	3.932	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	0.35	~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
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	0.23	~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	0.28	~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

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	0.47	~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
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	0.29	~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	0.36	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (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	0.67	~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
West	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
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	0.51	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

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	0.67	0.00	0.00	0.00	1.02			N/A	N/A
West	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
South	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
East	0.51	0.00	0.00	0.00	1.02			N/A	N/A

Queue Variation results: (09:00-09:15)

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	~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	0.29	~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	0.37	~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: (09:15-09:30)

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	0.36	~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
West	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
South	0.23	~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	0.28	~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

<h1>Junctions 8</h1>
<h2>ARCADY 8 - Roundabout Module</h2>
Version: 8.0.6.541 [19821,26/11/2015] © Copyright TRL Limited, 2024
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Filename: Loyalist and Sandy Hook.arc8

Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Personal Project Files\240418-Arcady

Report generation date: 2024-10-15 11:14:05 PM

Summary of intersection performance

PM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
A1 - 2037 Background							
Leg North	1.27	1.02	6.98	0.56	A	6.30	A
Leg West	0.52	1.02	5.36	0.34	A		
Leg South	1.03	?	6.66	0.51	A		
Leg East	0.50	1.02	5.35	0.33	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 - 9:30 AM
 "D2 - Base Year, PM" model duration: 4:00 PM - 5:30 PM
 "D3 - 2027 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D4 - 2027 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D5 - 2032 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D6 - 2032 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D7 - 2037 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D8 - 2037 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D9 - 2027 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D10 - 2027 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D11 - 2032 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D12 - 2032 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D13 - 2037 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D14 - 2037 Total, PM" model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2024-10-15 11:14:04 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2024-10-15
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) - 2037 Background, 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
2037 Background, PM	2037 Background	PM		ONE HOUR	16:00	17:30	90	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				6.30	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Loyalist Parkway (Hwy 33)	
West	West	Sandy Hook Road (CR1)	
South	South	Loyalist Parkway (Hwy 33)	
East	East	Sandy Hook Road (CR1)	

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)	I' - 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	ONE HOUR	✓	601.00	100.000
West	ONE HOUR	✓	318.00	100.000
South	ONE HOUR	✓	512.00	100.000
East	ONE HOUR	✓	308.00	100.000

Turning Proportions

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

		To			
		North	West	South	East
From	North	0.000	215.000	315.000	71.000
	West	167.000	0.000	9.000	142.000
	South	339.000	16.000	0.000	157.000
	East	57.000	132.000	119.000	0.000

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

		To			
		North	West	South	East
From	North	0.00	0.36	0.52	0.12
	West	0.53	0.00	0.03	0.45
	South	0.66	0.03	0.00	0.31
	East	0.19	0.43	0.39	0.00

Vehicle Mix

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

		To			
		North	West	South	East
From	North	1.000	1.020	1.020	1.020
	West	1.020	1.000	1.020	1.020
	South	1.020	1.020	1.000	1.020
	East	1.020	1.020	1.020	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North				
	West				
	South				
	East				

		To			
		North	West	South	East
From	North	0.0	2.0	2.0	2.0
	West	2.0	0.0	2.0	2.0
	South	2.0	2.0	0.0	2.0
	East	2.0	2.0	2.0	0.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Total Queueing Delay (PCE-min)	Inclusive Average Queueing Delay (s)
North	0.56	6.98	1.27	1.02	A	551.49	827.23	79.21	5.74	0.88	79.21	5.75
West	0.34	5.36	0.52	1.02	A	291.80	437.70	34.29	4.70	0.38	34.29	4.70
South	0.51	6.66	1.03	?	A	469.82	704.73	65.13	5.54	0.72	65.13	5.55
East	0.33	5.35	0.50	1.02	A	282.63	423.94	33.21	4.70	0.37	33.21	4.70

Main Results for each time segment

Main results: (16:00-16:15)

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	452.46	113.12	450.14	421.81	200.10	0.00	1241.64	976.81	0.364	0.00	0.58	4.627	A
West	239.41	59.85	238.33	271.95	378.30	0.00	1138.50	821.00	0.210	0.00	0.27	4.074	A
South	385.46	96.37	383.53	331.86	284.76	0.00	1192.64	828.95	0.323	0.00	0.48	4.527	A
East	231.88	57.97	230.83	277.21	391.08	0.00	1131.10	775.26	0.205	0.00	0.26	4.075	A

Main results: (16:15-16:30)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	540.29	135.07	539.39	505.40	239.73	0.00	1218.70	976.81	0.443	0.58	0.80	5.399	A
West	285.88	71.47	285.52	325.84	453.28	0.00	1095.11	821.00	0.261	0.27	0.36	4.533	A
South	460.28	115.07	459.55	397.64	341.16	0.00	1159.99	828.95	0.397	0.48	0.66	5.237	A
East	276.89	69.22	276.55	332.14	468.58	0.00	1086.25	775.26	0.255	0.26	0.35	4.532	A

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	661.71	165.43	659.88	618.47	293.43	0.00	1187.62	976.81	0.557	0.80	1.26	6.934	A
West	350.12	87.53	349.49	398.71	554.60	0.00	1036.46	821.00	0.338	0.36	0.52	5.341	A
South	563.72	140.93	562.27	486.54	417.56	0.00	1115.78	828.95	0.505	0.66	1.03	6.616	A
East	339.11	84.78	338.50	406.44	573.40	0.00	1025.59	775.26	0.331	0.35	0.50	5.340	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	661.71	165.43	661.67	619.85	293.96	0.00	1187.31	976.81	0.557	1.26	1.27	6.985	A
West	350.12	87.53	350.11	399.65	555.98	0.00	1035.66	821.00	0.338	0.52	0.52	5.355	A
South	563.72	140.93	563.69	487.72	418.37	0.00	1115.31	828.95	0.505	1.03	1.03	6.656	A
East	339.11	84.78	339.10	407.36	574.71	0.00	1024.83	775.26	0.331	0.50	0.50	5.354	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	540.29	135.07	542.09	507.51	240.56	0.00	1218.22	976.81	0.444	1.27	0.82	5.444	A
West	285.88	71.47	286.50	327.28	455.38	0.00	1093.89	821.00	0.261	0.52	0.36	4.551	A
South	460.28	115.07	461.70	399.44	342.43	0.00	1159.26	828.95	0.397	1.03	0.68	5.276	A
East	276.89	69.22	277.49	333.55	470.58	0.00	1085.09	775.26	0.255	0.50	0.35	4.549	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	452.46	113.12	453.39	424.60	201.32	0.00	1240.93	976.81	0.365	0.82	0.59	4.667	A
West	239.41	59.85	239.77	273.79	380.92	0.00	1136.98	821.00	0.211	0.36	0.27	4.095	A
South	385.46	96.37	386.21	334.14	286.54	0.00	1191.61	828.95	0.323	0.68	0.49	4.564	A
East	231.88	57.97	232.23	279.05	393.70	0.00	1129.59	775.26	0.205	0.35	0.26	4.094	A

Queueing Delay Results for each time segment

Queueing Delay results: (16:00-16:15)

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	8.44	0.56	4.627	A	A
West	3.96	0.26	4.074	A	A
South	7.05	0.47	4.527	A	A
East	3.83	0.26	4.075	A	A

Queueing Delay results: (16:15-16:30)

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	11.75	0.78	5.399	A	A
West	5.27	0.35	4.533	A	A
South	9.74	0.65	5.237	A	A
East	5.11	0.34	4.532	A	A

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	18.22	1.21	6.934	A	A
West	7.56	0.50	5.341	A	A
South	14.88	0.99	6.616	A	A
East	7.32	0.49	5.340	A	A

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

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	19.03	1.27	6.985	A	A
West	7.76	0.52	5.355	A	A
South	15.47	1.03	6.656	A	A
East	7.52	0.50	5.354	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	12.71	0.85	5.444	A	A
West	5.57	0.37	4.551	A	A
South	10.46	0.70	5.276	A	A
East	5.39	0.36	4.549	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	9.06	0.60	4.667	A	A
West	4.18	0.28	4.095	A	A
South	7.53	0.50	4.564	A	A
East	4.04	0.27	4.094	A	A

Queue Variation Results for each time segment

Queue Variation results: (16:00-16:15)

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	0.58	~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
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	0.48	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.26	~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: (16:15-16:30)

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	0.80	0.00	0.00	0.00	1.02			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	0.66	~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
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: (16:30-16:45)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.26	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.52	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	1.03	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	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

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

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.27	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.52	0.00	0.00	0.00	1.02			N/A	N/A
South	1.03	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.50	0.00	0.00	0.00	1.02			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	0.82	~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
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	0.68	~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
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: (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	0.59	~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	0.27	~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	0.49	~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

HCM Unsignalized Intersection Capacity Analysis
 2: Lake Street (CR10) & Sandy Hook Road

2037 Background - AM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	58	226	311	270	202	34
Future Volume (Veh/h)	58	226	311	270	202	34
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	64	251	346	300	224	38
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1235	243	262			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1235	243	262			
tC, single (s)	6.7	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.7	3.4	2.3			
p0 queue free %	49	67	73			
cM capacity (veh/h)	126	772	1279			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	315	346	300	262		
Volume Left	64	346	0	0		
Volume Right	251	0	0	38		
cSH	379	1279	1700	1700		
Volume to Capacity	0.83	0.27	0.18	0.15		
Queue Length 95th (m)	60.7	8.8	0.0	0.0		
Control Delay (s)	47.2	8.9	0.0	0.0		
Lane LOS	E	A				
Approach Delay (s)	47.2	4.7		0.0		
Approach LOS	E					
Intersection Summary						
Average Delay			14.7			
Intersection Capacity Utilization			57.1%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: Sandy Hook Road & West Access

2037 Background - AM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	219	382	6	17	77
Future Volume (Veh/h)	25	219	382	6	17	77
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	238	415	7	18	84
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)	299					
pX, platoon unblocked						
vC, conflicting volume	422			710	418	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	422			710	418	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	98			95	87	
cM capacity (veh/h)	1137			390	635	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	265	422	102			
Volume Left	27	0	18			
Volume Right	0	7	84			
cSH	1137	1700	571			
Volume to Capacity	0.02	0.25	0.18			
Queue Length 95th (m)	0.6	0.0	5.2			
Control Delay (s)	1.0	0.0	12.7			
Lane LOS	A		B			
Approach Delay (s)	1.0	0.0	12.7			
Approach LOS			B			
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			44.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8: Sandy Hook Road & East Access

2037 Background - AM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	28	362	17	51	26
Future Volume (Veh/h)	8	28	362	17	51	26
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	30	393	18	55	28
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	411				450	402
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	411				450	402
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				90	96
cM capacity (veh/h)	1148				562	648
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	39	411	83			
Volume Left	9	0	55			
Volume Right	0	18	28			
cSH	1148	1700	589			
Volume to Capacity	0.01	0.24	0.14			
Queue Length 95th (m)	0.2	0.0	3.9			
Control Delay (s)	1.9	0.0	12.1			
Lane LOS	A		B			
Approach Delay (s)	1.9	0.0	12.1			
Approach LOS			B			
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			31.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 2: Lake Street (CR10) & Sandy Hook Road

2037 Total - PM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	49	387	322	389	391	72
Future Volume (Veh/h)	49	387	322	389	391	72
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	52	412	343	414	416	77
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1554	454	493			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1554	454	493			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	36	32	68			
cM capacity (veh/h)	82	608	1071			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	464	343	414	493		
Volume Left	52	343	0	0		
Volume Right	412	0	0	77		
cSH	353	1071	1700	1700		
Volume to Capacity	1.31	0.32	0.24	0.29		
Queue Length 95th (m)	174.5	11.1	0.0	0.0		
Control Delay (s)	190.4	9.9	0.0	0.0		
Lane LOS	F	A				
Approach Delay (s)	190.4	4.5		0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			53.5			
Intersection Capacity Utilization			79.4%	ICU Level of Service	D	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 7: Sandy Hook Road & West Access

2037 Total - PM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	69	426	342	15	10	44
Future Volume (Veh/h)	69	426	342	15	10	44
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	75	463	372	16	11	48
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)			297			
pX, platoon unblocked						
vC, conflicting volume	388				993	380
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	388				993	380
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				96	93
cM capacity (veh/h)	1170				255	667
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	538	388	59			
Volume Left	75	0	11			
Volume Right	0	16	48			
cSH	1170	1700	512			
Volume to Capacity	0.06	0.23	0.12			
Queue Length 95th (m)	1.6	0.0	3.1			
Control Delay (s)	1.8	0.0	12.9			
Lane LOS	A		B			
Approach Delay (s)	1.8	0.0	12.9			
Approach LOS			B			
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			58.5%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8: Sandy Hook Road & East Access

2037 Total - PM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	223	413	343	46	29	15
Future Volume (Veh/h)	223	413	343	46	29	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	242	449	373	50	32	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	423				1331	398
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	423				1331	398
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	79				76	98
cM capacity (veh/h)	1136				134	652
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	691	423	48			
Volume Left	242	0	32			
Volume Right	0	50	16			
cSH	1136	1700	182			
Volume to Capacity	0.21	0.25	0.26			
Queue Length 95th (m)	6.4	0.0	8.1			
Control Delay (s)	4.9	0.0	31.6			
Lane LOS	A		D			
Approach Delay (s)	4.9	0.0	31.6			
Approach LOS			D			
Intersection Summary						
Average Delay			4.2			
Intersection Capacity Utilization			68.2%	ICU Level of Service	C	
Analysis Period (min)			15			

<h1>Junctions 8</h1>
<h2>ARCADY 8 - Roundabout Module</h2>
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Filename: Loyalist and Sandy Hook.arc8

Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Personal Project Files\240418-Arcady

Report generation date: 2024-10-15 11:11:04 PM

Summary of intersection performance

AM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
A1 - 2037 Total							
Leg North	0.67	1.02	5.21	0.40	A	4.82	A
Leg West	0.35	~1	4.56	0.25	A		
Leg South	0.40	~1	4.30	0.28	A		
Leg East	0.51	1.02	4.96	0.34	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 - 9:30 AM
 "D2 - Base Year, PM" model duration: 4:00 PM - 5:30 PM
 "D3 - 2027 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D4 - 2027 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D5 - 2032 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D6 - 2032 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D7 - 2037 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D8 - 2037 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D9 - 2027 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D10 - 2027 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D11 - 2032 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D12 - 2032 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D13 - 2037 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D14 - 2037 Total, PM" model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2024-10-15 11:11:04 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2024-10-15
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) - 2037 Total, 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
2037 Total, AM	2037 Total	AM		ONE HOUR	08:00	09:30	90	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				4.82	A

Intersection Set Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Loyalist Parkway (Hwy 33)	
West	West	Sandy Hook Road (CR1)	
South	South	Loyalist Parkway (Hwy 33)	
East	East	Sandy Hook Road (CR1)	

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)	I' - 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	ONE HOUR	✓	421.00	100.000
West	ONE HOUR	✓	249.00	100.000
South	ONE HOUR	✓	302.00	100.000
East	ONE HOUR	✓	340.00	100.000

Turning Proportions

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

		To			
		North	West	South	East
From	North	0.000	137.000	255.000	29.000
	West	149.000	0.000	8.000	92.000
	South	231.000	2.000	0.000	69.000
	East	44.000	144.000	152.000	0.000

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

		To			
		North	West	South	East
From	North	0.00	0.33	0.61	0.07
	West	0.60	0.00	0.03	0.37
	South	0.76	0.01	0.00	0.23
	East	0.13	0.42	0.45	0.00

Vehicle Mix

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

		To			
		North	West	South	East
From	North	1.000	1.020	1.020	1.020
	West	1.020	1.000	1.020	1.020
	South	1.020	1.020	1.000	1.020
	East	1.020	1.020	1.020	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.0	2.0	2.0	2.0
	West	2.0	0.0	2.0	2.0
	South	2.0	2.0	0.0	2.0
	East	2.0	2.0	2.0	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	0.40	5.21	0.67	1.02	A	386.32	579.48	44.44	4.60	0.49	44.44	4.60
West	0.25	4.56	0.35	~1	A	228.49	342.73	23.66	4.14	0.26	23.66	4.14
South	0.28	4.30	0.40	~1	A	277.12	415.68	27.40	3.96	0.30	27.40	3.96
East	0.34	4.96	0.51	1.02	A	311.99	467.98	34.54	4.43	0.38	34.54	4.43

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	316.95	79.24	315.54	317.90	223.38	0.00	1228.16	1004.60	0.258	0.00	0.35	4.018	A
West	187.46	46.87	186.68	212.12	326.80	0.00	1168.31	785.76	0.160	0.00	0.19	3.735	A
South	227.36	56.84	226.45	311.06	202.42	0.00	1240.29	877.24	0.183	0.00	0.23	3.618	A
East	255.97	63.99	254.86	142.45	286.42	0.00	1191.68	693.61	0.215	0.00	0.28	3.914	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	378.47	94.62	378.02	380.79	267.60	0.00	1202.57	1004.60	0.315	0.35	0.47	4.451	A
West	223.85	55.96	223.62	254.12	391.50	0.00	1130.86	785.76	0.198	0.19	0.25	4.046	A
South	271.49	67.87	271.24	372.64	242.48	0.00	1217.11	877.24	0.223	0.23	0.29	3.881	A
East	305.65	76.41	305.31	170.63	343.08	0.00	1158.88	693.61	0.264	0.28	0.36	4.299	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	463.53	115.88	462.73	466.21	327.58	0.00	1167.85	1004.60	0.397	0.47	0.67	5.202	A
West	274.15	68.54	273.78	311.07	479.24	0.00	1080.08	785.76	0.254	0.25	0.34	4.552	A
South	332.51	83.13	332.09	456.16	296.86	0.00	1185.64	877.24	0.280	0.29	0.39	4.300	A
East	374.35	93.59	373.75	208.90	420.04	0.00	1114.34	693.61	0.336	0.36	0.51	4.953	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	463.53	115.88	463.52	466.82	328.10	0.00	1167.56	1004.60	0.397	0.67	0.67	5.215	A
West	274.15	68.54	274.15	311.58	480.03	0.00	1079.62	785.76	0.254	0.34	0.35	4.558	A
South	332.51	83.13	332.50	456.91	297.27	0.00	1185.40	877.24	0.281	0.39	0.40	4.305	A
East	374.35	93.59	374.34	209.19	420.58	0.00	1114.03	693.61	0.336	0.51	0.51	4.963	A

Main results: (09:00-09:15)

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	378.47	94.62	379.26	381.78	268.41	0.00	1202.10	1004.60	0.315	0.67	0.47	4.468	A
West	223.85	55.96	224.22	254.92	392.75	0.00	1130.14	785.76	0.198	0.35	0.25	4.054	A
South	271.49	67.87	271.90	373.83	243.14	0.00	1216.73	877.24	0.223	0.40	0.29	3.887	A
East	305.65	76.41	306.24	171.09	343.95	0.00	1158.38	693.61	0.264	0.51	0.37	4.313	A

Main results: (09:15-09:30)

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	316.95	79.24	317.41	319.59	224.66	0.00	1227.42	1004.60	0.258	0.47	0.36	4.036	A
West	187.46	46.87	187.69	213.36	328.71	0.00	1167.20	785.76	0.161	0.25	0.20	3.748	A
South	227.36	56.84	227.62	312.88	203.52	0.00	1239.65	877.24	0.183	0.29	0.23	3.631	A
East	255.97	63.99	256.32	143.22	287.93	0.00	1190.81	693.61	0.215	0.37	0.28	3.932	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	5.16	0.34	4.018	A	A
West	2.85	0.19	3.735	A	A
South	3.35	0.22	3.618	A	A
East	4.07	0.27	3.914	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	6.85	0.46	4.451	A	A
West	3.70	0.25	4.046	A	A
South	4.30	0.29	3.881	A	A
East	5.35	0.36	4.299	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	9.73	0.65	5.202	A	A
West	5.07	0.34	4.552	A	A
South	5.82	0.39	4.300	A	A
East	7.51	0.50	4.953	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	10.01	0.67	5.215	A	A
West	5.18	0.35	4.558	A	A

South	5.94	0.40	4.305	A	A
East	7.70	0.51	4.963	A	A

Queueing Delay results: (09:00-09:15)

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	7.24	0.48	4.468	A	A
West	3.87	0.26	4.054	A	A
South	4.50	0.30	3.887	A	A
East	5.63	0.38	4.313	A	A

Queueing Delay results: (09:15-09:30)

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	5.46	0.36	4.036	A	A
West	2.99	0.20	3.748	A	A
South	3.51	0.23	3.631	A	A
East	4.28	0.29	3.932	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	0.35	~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
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	0.23	~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	0.28	~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

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	0.47	~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
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	0.29	~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	0.36	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (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	0.67	~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
West	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
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	0.51	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

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

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Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.67	0.00	0.00	0.00	1.02			N/A	N/A
West	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
South	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
East	0.51	0.00	0.00	0.00	1.02			N/A	N/A

Queue Variation results: (09:00-09:15)

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	~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	0.29	~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	0.37	~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: (09:15-09:30)

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	0.36	~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
West	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
South	0.23	~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	0.28	~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

<h1>Junctions 8</h1>
<h2>ARCADY 8 - Roundabout Module</h2>
Version: 8.0.6.541 [19821,26/11/2015] © Copyright TRL Limited, 2024
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Filename: Loyalist and Sandy Hook.arc8

Path: C:\Users\AdamMorrison\OneDrive - Paradigm\Desktop\Project\Personal Project Files\240418-Arcady

Report generation date: 2024-10-15 11:10:09 PM

Summary of intersection performance

PM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
A1 - 2037 Total							
Leg North	1.27	1.02	6.98	0.56	A	6.30	A
Leg West	0.52	1.02	5.36	0.34	A		
Leg South	1.03	?	6.66	0.51	A		
Leg East	0.50	1.02	5.35	0.33	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 - 9:30 AM
 "D2 - Base Year, PM" model duration: 4:00 PM - 5:30 PM
 "D3 - 2027 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D4 - 2027 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D5 - 2032 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D6 - 2032 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D7 - 2037 Background, AM" model duration: 8:00 AM - 9:30 AM
 "D8 - 2037 Background, PM" model duration: 4:00 PM - 5:30 PM
 "D9 - 2027 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D10 - 2027 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D11 - 2032 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D12 - 2032 Total, PM" model duration: 4:00 PM - 5:30 PM
 "D13 - 2037 Total, AM" model duration: 8:00 AM - 9:30 AM
 "D14 - 2037 Total, PM" model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2024-10-15 11:10:09 PM

File summary

Title	(untitled)
Location	
Site Number	
Date	2024-10-15
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) - 2037 Total, 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
2037 Total, PM	2037 Total	PM		ONE HOUR	16:00	17:30	90	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				6.30	A

Intersection Set Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Loyalist Parkway (Hwy 33)	
West	West	Sandy Hook Road (CR1)	
South	South	Loyalist Parkway (Hwy 33)	
East	East	Sandy Hook Road (CR1)	

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)	I' - 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	ONE HOUR	✓	601.00	100.000
West	ONE HOUR	✓	318.00	100.000
South	ONE HOUR	✓	512.00	100.000
East	ONE HOUR	✓	308.00	100.000

Turning Proportions

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

		To			
		North	West	South	East
From	North	0.000	215.000	315.000	71.000
	West	167.000	0.000	9.000	142.000
	South	339.000	16.000	0.000	157.000
	East	57.000	132.000	119.000	0.000

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

		To			
		North	West	South	East
From	North	0.00	0.36	0.52	0.12
	West	0.53	0.00	0.03	0.45
	South	0.66	0.03	0.00	0.31
	East	0.19	0.43	0.39	0.00

Vehicle Mix

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

		To			
		North	West	South	East
From	North	1.000	1.020	1.020	1.020
	West	1.020	1.000	1.020	1.020
	South	1.020	1.020	1.000	1.020
	East	1.020	1.020	1.020	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.0	2.0	2.0	2.0
	West	2.0	0.0	2.0	2.0
	South	2.0	2.0	0.0	2.0
	East	2.0	2.0	2.0	0.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Total Queueing Delay (PCE-min)	Inclusive Average Queueing Delay (s)
North	0.56	6.98	1.27	1.02	A	551.49	827.23	79.21	5.74	0.88	79.21	5.75
West	0.34	5.36	0.52	1.02	A	291.80	437.70	34.29	4.70	0.38	34.29	4.70
South	0.51	6.66	1.03	?	A	469.82	704.73	65.13	5.54	0.72	65.13	5.55
East	0.33	5.35	0.50	1.02	A	282.63	423.94	33.21	4.70	0.37	33.21	4.70

Main Results for each time segment

Main results: (16:00-16:15)

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	452.46	113.12	450.14	421.81	200.10	0.00	1241.64	976.81	0.364	0.00	0.58	4.627	A
West	239.41	59.85	238.33	271.95	378.30	0.00	1138.50	821.00	0.210	0.00	0.27	4.074	A
South	385.46	96.37	383.53	331.86	284.76	0.00	1192.64	828.95	0.323	0.00	0.48	4.527	A
East	231.88	57.97	230.83	277.21	391.08	0.00	1131.10	775.26	0.205	0.00	0.26	4.075	A

Main results: (16:15-16:30)

Leg	Total Demand (PCE/hr)	Intersection Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	V/C Ratio	Start Queue (PCE)	End Queue (PCE)	Delay (s)	LOS
North	540.29	135.07	539.39	505.40	239.73	0.00	1218.70	976.81	0.443	0.58	0.80	5.399	A
West	285.88	71.47	285.52	325.84	453.28	0.00	1095.11	821.00	0.261	0.27	0.36	4.533	A
South	460.28	115.07	459.55	397.64	341.16	0.00	1159.99	828.95	0.397	0.48	0.66	5.237	A
East	276.89	69.22	276.55	332.14	468.58	0.00	1086.25	775.26	0.255	0.26	0.35	4.532	A

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	661.71	165.43	659.88	618.47	293.43	0.00	1187.62	976.81	0.557	0.80	1.26	6.934	A
West	350.12	87.53	349.49	398.71	554.60	0.00	1036.46	821.00	0.338	0.36	0.52	5.341	A
South	563.72	140.93	562.27	486.54	417.56	0.00	1115.78	828.95	0.505	0.66	1.03	6.616	A
East	339.11	84.78	338.50	406.44	573.40	0.00	1025.59	775.26	0.331	0.35	0.50	5.340	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	661.71	165.43	661.67	619.85	293.96	0.00	1187.31	976.81	0.557	1.26	1.27	6.985	A
West	350.12	87.53	350.11	399.65	555.98	0.00	1035.66	821.00	0.338	0.52	0.52	5.355	A
South	563.72	140.93	563.69	487.72	418.37	0.00	1115.31	828.95	0.505	1.03	1.03	6.656	A
East	339.11	84.78	339.10	407.36	574.71	0.00	1024.83	775.26	0.331	0.50	0.50	5.354	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	540.29	135.07	542.09	507.51	240.56	0.00	1218.22	976.81	0.444	1.27	0.82	5.444	A
West	285.88	71.47	286.50	327.28	455.38	0.00	1093.89	821.00	0.261	0.52	0.36	4.551	A
South	460.28	115.07	461.70	399.44	342.43	0.00	1159.26	828.95	0.397	1.03	0.68	5.276	A
East	276.89	69.22	277.49	333.55	470.58	0.00	1085.09	775.26	0.255	0.50	0.35	4.549	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	452.46	113.12	453.39	424.60	201.32	0.00	1240.93	976.81	0.365	0.82	0.59	4.667	A
West	239.41	59.85	239.77	273.79	380.92	0.00	1136.98	821.00	0.211	0.36	0.27	4.095	A
South	385.46	96.37	386.21	334.14	286.54	0.00	1191.61	828.95	0.323	0.68	0.49	4.564	A
East	231.88	57.97	232.23	279.05	393.70	0.00	1129.59	775.26	0.205	0.35	0.26	4.094	A

Queueing Delay Results for each time segment

Queueing Delay results: (16:00-16:15)

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	8.44	0.56	4.627	A	A
West	3.96	0.26	4.074	A	A
South	7.05	0.47	4.527	A	A
East	3.83	0.26	4.075	A	A

Queueing Delay results: (16:15-16:30)

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	11.75	0.78	5.399	A	A
West	5.27	0.35	4.533	A	A
South	9.74	0.65	5.237	A	A
East	5.11	0.34	4.532	A	A

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	18.22	1.21	6.934	A	A
West	7.56	0.50	5.341	A	A
South	14.88	0.99	6.616	A	A
East	7.32	0.49	5.340	A	A

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

Leg	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	19.03	1.27	6.985	A	A
West	7.76	0.52	5.355	A	A

South	15.47	1.03	6.656	A	A
East	7.52	0.50	5.354	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	12.71	0.85	5.444	A	A
West	5.57	0.37	4.551	A	A
South	10.46	0.70	5.276	A	A
East	5.39	0.36	4.549	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	9.06	0.60	4.667	A	A
West	4.18	0.28	4.095	A	A
South	7.53	0.50	4.564	A	A
East	4.04	0.27	4.094	A	A

Queue Variation Results for each time segment

Queue Variation results: (16:00-16:15)

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	0.58	~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
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	0.48	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.26	~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: (16:15-16:30)

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	0.80	0.00	0.00	0.00	1.02			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	0.66	~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
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: (16:30-16:45)

Leg	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	1.26	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.52	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	1.03	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	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

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

Leg	Mean	Q05	Q50	Q90	Q95	Percentile Message	Marker	Probability Of Reaching	Probability Of Exactly
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	(PCE)	(PCE)	(PCE)	(PCE)	(PCE)		Message	Or Exceeding Marker	Reaching Marker
North	1.27	?	?	?	?		Percentiles could not be calculated. This may be because the mean queue is very small or very big.	N/A	N/A
West	0.52	0.00	0.00	0.00	1.02			N/A	N/A
South	1.03	?	?	?	?		Percentiles could not be calculated. This may be because the mean queue is very small or very big.	N/A	N/A
East	0.50	0.00	0.00	0.00	1.02			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	0.82	~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
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	0.68	~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
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: (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	0.59	~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	0.27	~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	0.49	~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

HCM Unsignalized Intersection Capacity Analysis

2: Lake Street (CR10) & Sandy Hook Road (CR1)

10-16-2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	23	192	300	270	202	23
Future Volume (Veh/h)	23	192	300	270	202	23
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	26	213	333	300	224	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1203	237	250			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1203	237	250			
tC, single (s)	6.7	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.7	3.4	2.3			
p0 queue free %	81	73	74			
cM capacity (veh/h)	135	778	1293			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	
Volume Total	26	213	333	300	250	
Volume Left	26	0	333	0	0	
Volume Right	0	213	0	0	26	
cSH	135	778	1293	1700	1700	
Volume to Capacity	0.19	0.27	0.26	0.18	0.15	
Queue Length 95th (m)	5.5	8.9	8.3	0.0	0.0	
Control Delay (s)	38.0	11.4	8.7	0.0	0.0	
Lane LOS	E	B	A			
Approach Delay (s)	14.3		4.6		0.0	
Approach LOS	B					
Intersection Summary						
Average Delay	5.6					
Intersection Capacity Utilization	42.0%			ICU Level of Service	A	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
 2: Lake Street (CR10) & Sandy Hook Road (CR1)

2037 Background - PM - Mitigation



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	30	367	292	389	391	41
Future Volume (Veh/h)	30	367	292	389	391	41
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	32	390	311	414	416	44
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1474	438	460			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1474	438	460			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	67	37	72			
cM capacity (veh/h)	97	621	1101			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	
Volume Total	32	390	311	414	460	
Volume Left	32	0	311	0	0	
Volume Right	0	390	0	0	44	
cSH	97	621	1101	1700	1700	
Volume to Capacity	0.33	0.63	0.28	0.24	0.27	
Queue Length 95th (m)	10.2	35.2	9.3	0.0	0.0	
Control Delay (s)	59.4	20.1	9.6	0.0	0.0	
Lane LOS	F	C	A			
Approach Delay (s)	23.1		4.1		0.0	
Approach LOS	C					
Intersection Summary						
Average Delay			7.9			
Intersection Capacity Utilization			52.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 2: Lake Street (CR10) & Sandy Hook Road












2037 Background - AM - Mitigation



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	58	226	311	270	202	34
Future Volume (Veh/h)	58	226	311	270	202	34
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	64	251	346	300	224	38
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1235	243	262			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1235	243	262			
tC, single (s)	6.7	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.7	3.4	2.3			
p0 queue free %	49	67	73			
cM capacity (veh/h)	126	772	1279			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	
Volume Total	64	251	346	300	262	
Volume Left	64	0	346	0	0	
Volume Right	0	251	0	0	38	
cSH	126	772	1279	1700	1700	
Volume to Capacity	0.51	0.33	0.27	0.18	0.15	
Queue Length 95th (m)	18.9	11.3	8.8	0.0	0.0	
Control Delay (s)	59.6	11.9	8.9	0.0	0.0	
Lane LOS	F	B	A			
Approach Delay (s)	21.6		4.7		0.0	
Approach LOS	C					
Intersection Summary						
Average Delay			8.1			
Intersection Capacity Utilization			43.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 2: Lake Street (CR10) & Sandy Hook Road

2037 Total - PM - Mitigation

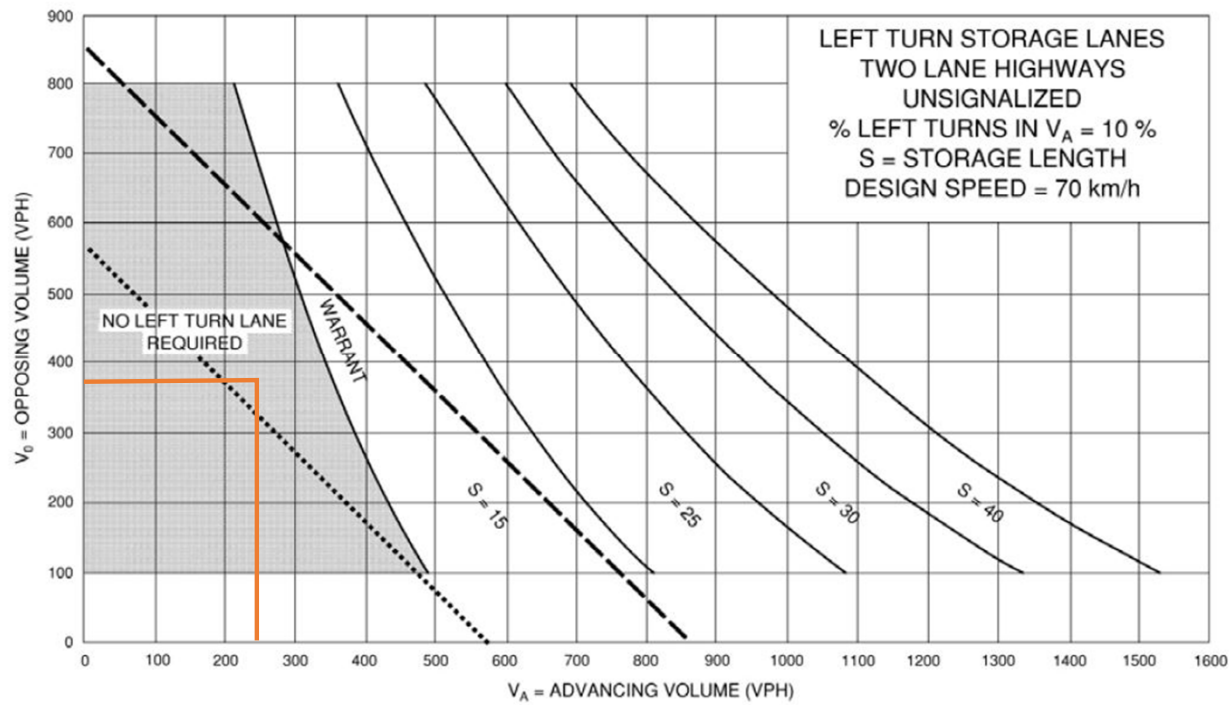
						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	49	387	322	389	391	72
Future Volume (Veh/h)	49	387	322	389	391	72
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	52	412	343	414	416	77
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1554	454	493			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1554	454	493			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	36	32	68			
cM capacity (veh/h)	82	608	1071			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	
Volume Total	52	412	343	414	493	
Volume Left	52	0	343	0	0	
Volume Right	0	412	0	0	77	
cSH	82	608	1071	1700	1700	
Volume to Capacity	0.64	0.68	0.32	0.24	0.29	
Queue Length 95th (m)	23.4	41.7	11.1	0.0	0.0	
Control Delay (s)	105.8	22.5	9.9	0.0	0.0	
Lane LOS	F	C	A			
Approach Delay (s)	31.8		4.5		0.0	
Approach LOS	D					
Intersection Summary						
Average Delay			10.6			
Intersection Capacity Utilization			56.1%	ICU Level of Service	B	
Analysis Period (min)			15			

Appendix G

Left Turn Lane Warrants

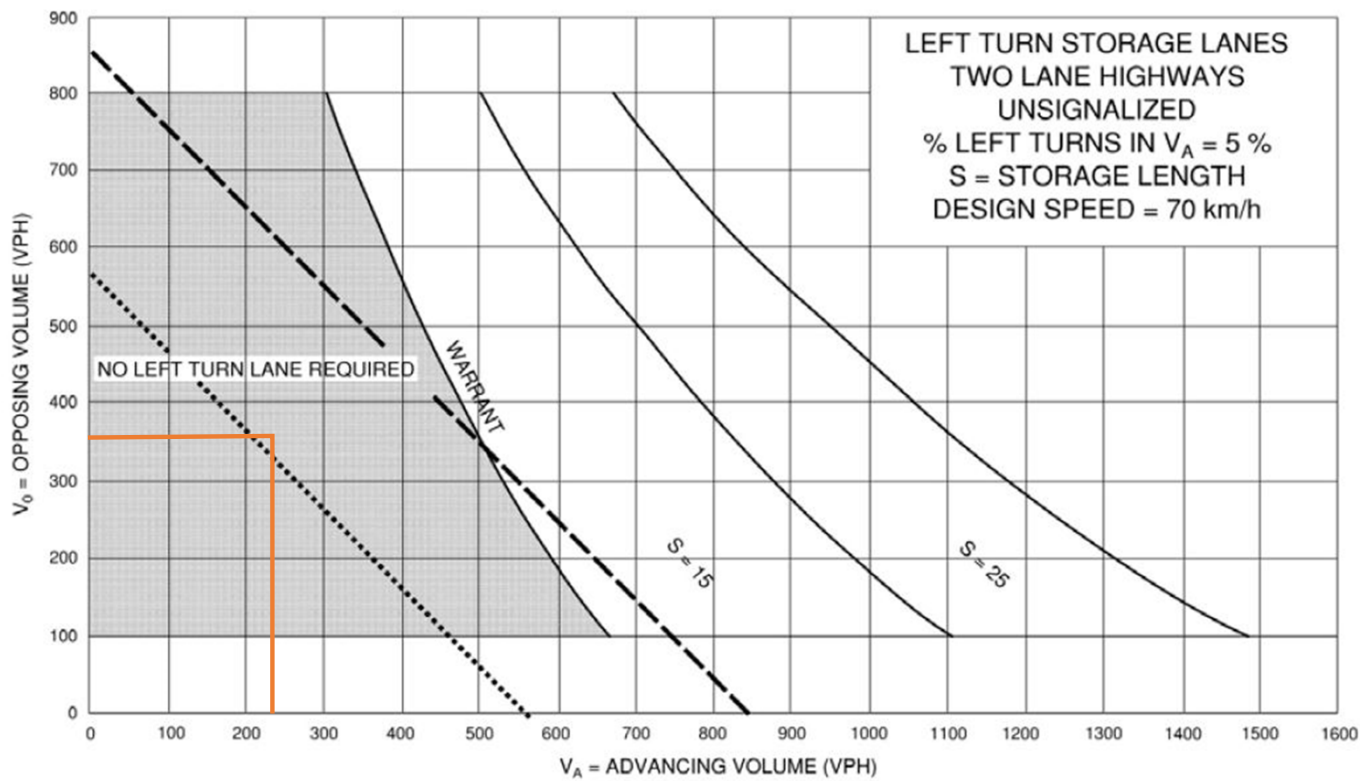


2037 Total Traffic Forecasts
AM Peak Hour
WEST ACCESS



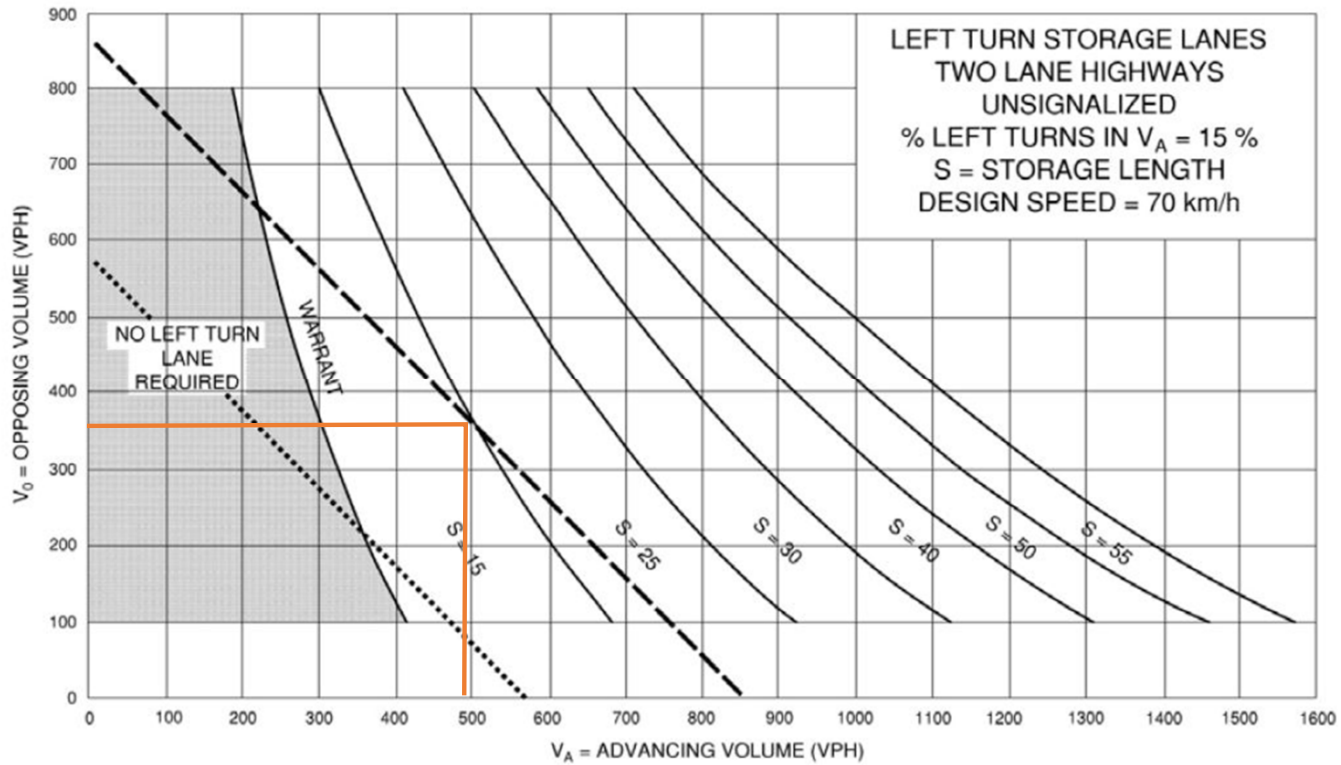
$V_A = 244$
 $V_L = 25$
%LT = 10%
 $V_O = 387$

2037 Total Traffic Forecasts
 AM Peak Hour
 EAST ACCESS



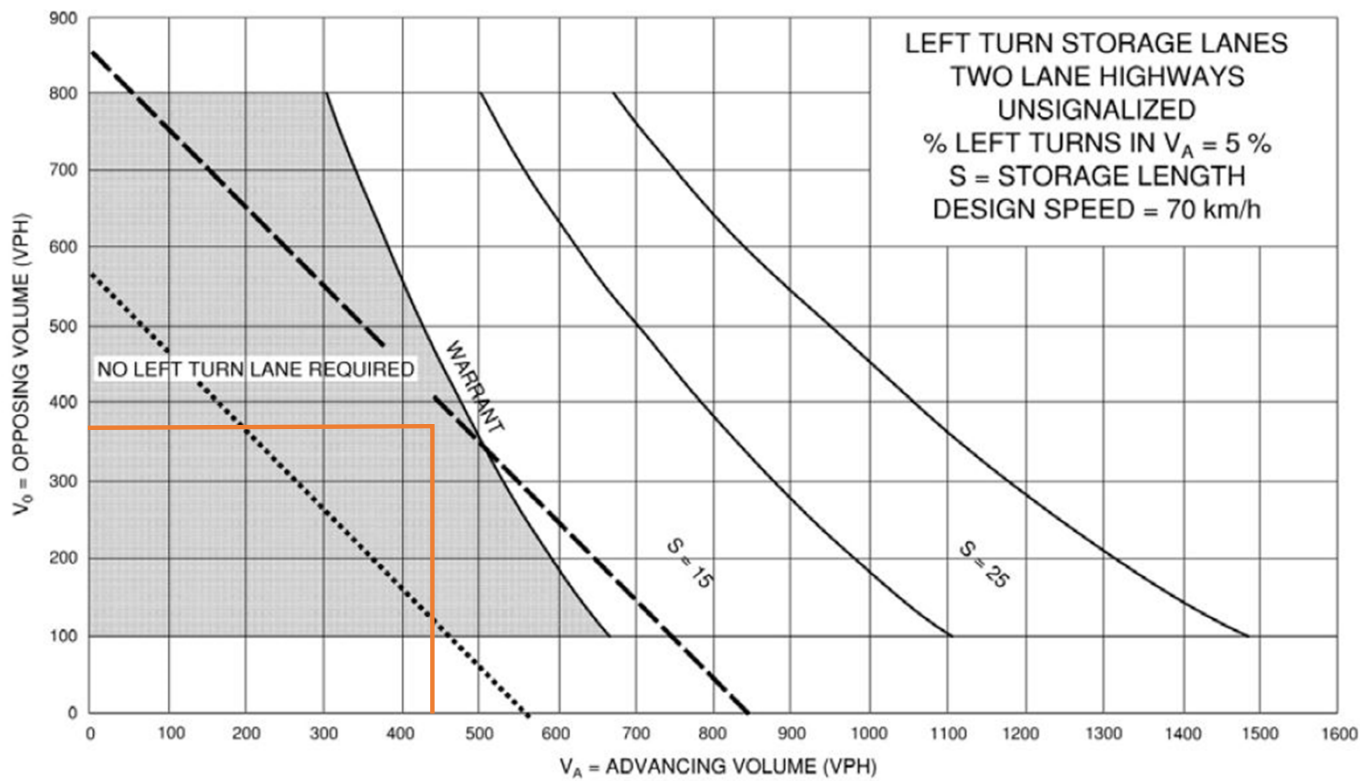
$V_A = 236$
 $V_L = 8$
 $\%LT = 3\%$
 $V_O = 378$

2037 Total Traffic Forecasts
 PM Peak Hour
 WEST ACCESS



VA = 495
 VL = 69
 %LT = 14%
 VO = 358

2037 Total Traffic Forecasts
PM Peak Hour
EAST ACCESS



$V_A = 436$
 $V_L = 23$
%LT = 5%
 $V_O = 389$