Waldemar Residential Development

Sarah Properties Ltd.

January 28, 2015

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Executive Summary

HDR was retained to undertake a traffic impact study for a residential development proposed by Sarah Properties Limited. The site is located northwest of 10th Line and County Road 109, in the community of Waldemar, within the Township of Amaranth. The site is planned to be connected to Mill Street (10th Line) via Evans Avenue, Main Street, and an additional connection (Street 1) south of David Street.

The existing road network in the vicinity of the proposed development consists of county and local roads with two-lane cross sections (one lane per direction) and intersections, which are all controlled by stop signs on the minor street. Turning lanes or storage lanes are currently not provided on any of the intersection approaches.

The proposed site will accommodate 336 detached single family homes within a lot area of approximately 35 hectares. Trip generation analysis conducted for the development estimated that during peak commuting times, 63 inbound and 189 outbound site trips would be introduced onto the existing road network during the AM peak hour. The PM peak hour is estimated to have 212 inbound and 124 outbound site related trips.

An analysis of existing, 2019 future background, and 2019 future total traffic conditions (background plus proposed development) shows that all studied intersections will continue to operate at level of service (LOS) 'A' which indicates no capacity deficiencies or congestion. The proposed site is expected to generate the most new vehicles at the 10th Line / County Road 109 intersection compared to the other intersections in the area, decreasing SB left turn and right turn (SBL/R) movement related LOS from 'B' to 'C'. At LOS 'C', delays and queues for the SBL/R movement are expected to remain at acceptable levels.

Overall, the proposed residential development is not expected to adversely impact existing and future traffic operations in the area, as the existing road network (roads and intersections) is capable of accommodating site generated traffic volumes as well future background growth in the area. No external road improvements will be required other than tying in the proposed development roads with the existing road network.

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- B. 2019 Background Traffic Intersection Operations Calculations
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1. Introduction

HDR was retained by Sarah Properties Limited to undertake a traffic study to support the development of 336 single-family detached homes in the community of Waldemar, within the Township of Amaranth. The subject site is located northwest of County Road 109 and 10th Line, with planned site connections to Mill Street (10th Line) via Evans Avenue, Main Street, and an additional connection (Street 1) south of David Street. The site location is shown in Exhibit 1.



Department of Natural Resources Canada), and StatCan (Geography Division, Statistics Canada).

Exhibit 1: Site Location

These units are contained within a 35.021 hectare lot area and construction is expected to take approximately five years before full build out.

Scope of Work 1.1

The proposed scope of work for the traffic study is summarized below and was discussed and

agreed to by RJ Burnside & Associates Limited, who were representing the Township of Amaranth:

Scenarios Scenarios to be analyzed:

- Existing 2014 traffic conditions
- 2019 Background traffic conditions (includes road growth and traffic from approved or under construction background developments in the immediate area)
- 2019 Total traffic conditions (2019 background plus the proposed development)

Time Periods Time periods that were analyzed are the development peak hours, which include:

- Weekday AM Peak Hour (between 7:00 9:00 AM)
- Weekday PM Peak Hour (between 4:00 6:00 PM)

Intersections Intersections analyzed for capacity purposes include:

- 10th Line / County Road 109
- John Street (10th Line) / Street 1
- Mill Street (10th Line) / David Street
- Mill Street (10th Line) / Station Street
- Mill Street (10th Line) / Henry Street
- 9th Line / Station Street
- 9th Line / County Road 109

1.2 Intersection Operations Analysis Methodology

Intersection operations were assessed for intersections in the study area using the software program Synchro 8, Traffic Signal Coordination Software Version 8 Build 801, which employs methodology from the *Highway Capacity Manual (HCM2000)* published by the Transportation Research Board National Research Council. Synchro 8 can analyze both signalized and unsignalized intersections in a road corridor or network taking into account the spacing, interaction, queues and operations between intersections.

The two-way unsignalized intersection analysis considers two separate measures of performance:

- The capacity of the critical intersection movements, which is based on a volume to capacity ratio.
- The level of service for the critical movements, which is based on the average control delay per vehicle for the various critical movements within the intersection.

Level of service is based on the average control delay per vehicle for a given movement. Delay is an indicator of how long a vehicle must wait to complete a movement and is represented by a letter between 'A' and 'F', with 'F' being the longest delay. The volume to capacity (v/c) ratio is a measure of the degree of capacity utilized at an intersection.

2. Existing Conditions

2.1 Site Area Description

The subject site is located northwest of County Road 109 and 10th Line in the community of Waldemar within the Township of Amaranth. In the immediate area, the site is currently surrounded by undeveloped land to the north, west, and south, and existing detached homes to the east. All intersections in the study area are unsignalized and stop sign controlled. Truck restriction signage is placed on 10th Line and 9th Line in the vicinity of Waldemar. It is also noted that the land use is primarily residential.

2.2 Road Network

The existing road network configurations are illustrated in **Exhibit 2** and described below.

County Road 109	An east-west undivided rural highway under the jurisdiction of the County of Dufferin with a two-lane cross section within the study area. The posted speed limit is 80 km/hr.
10 th Line	A north-south rural concession road with a two-lane cross section. The street name changes to John Street and Mill Street when passing though the Waldemar area. There is truck restriction signage placed approaching Waldemar. The posted speed limit is 50 km/hr.
9 th Line	A north-south rural road with a two-lane cross section, with residential driveway connections on east and west sides. There is truck restriction signage placed approaching Waldemar. The posted speed limit is 50 km/hr.
David Street	An east-west local residential road with a two lane cross section. The posted speed limit is 40 km/hr.
Station Street	An east-west local residential road with a two lane cross section. The posted speed limit is 50 km/hr.
Henry Street	An east-west local residential road with a two lane cross section. The posted speed limit is 40 km/hr.

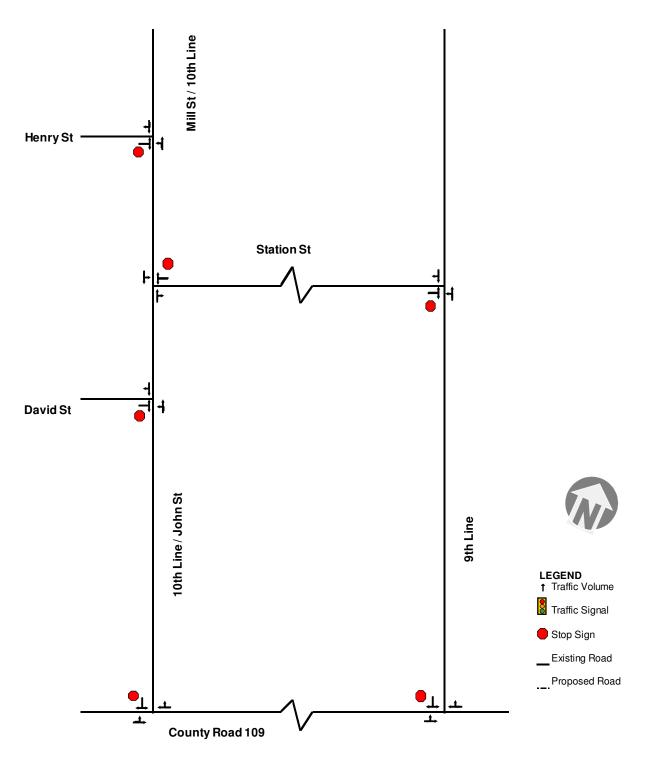


Exhibit 2: Site Lane Configuration

2.3 Traffic Data Collection

Existing weekday AM and PM peak hour turning movement counts for this study were obtained from traffic surveys commissioned by HDR. The dates of the traffic counts are summarized in **Table 3**.

Location	Date	Source
County Road 109/10 th Line	Weekday AM: June 18, 2014	Commissioned by HDR
	Weekday PM: June 18, 2014	
County Road 109/9 th Line	Weekday AM: June 18, 2014	Commissioned by HDR
	Weekday PM: June 18, 2014	
10 th Line/David Street	Weekday AM: June 18, 2014	Commissioned by HDR
	Weekday PM: June 18, 2014	
10 th Line/Station Street	Weekday AM: June 18, 2014	Commissioned by HDR
	Weekday PM: June 18, 2014	
10 th Line/Henry Street	Weekday AM: June 18, 2014	Commissioned by HDR
	Weekday PM: June 18, 2014	
9 th Line/Station Street	Weekday AM: July 8, 2014	Commissioned by HDR
	Weekday PM: July 8, 2014	

Table 3: Summary of Traffic Counts

The existing weekday AM and PM peak hour turning movement counts at the study intersections are illustrated in **Exhibit 3** and **Exhibit 4**, respectively.

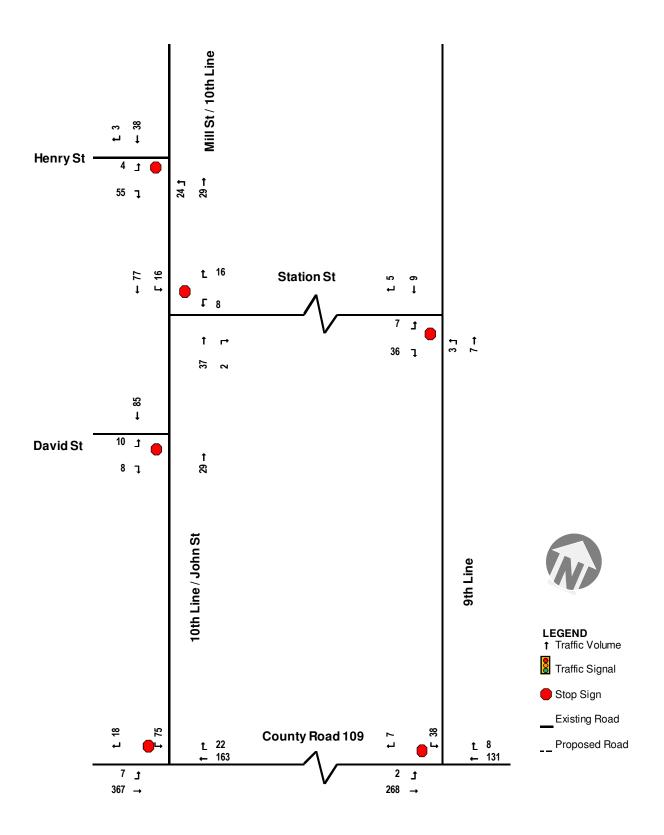


Exhibit 3: Existing AM Traffic Volumes

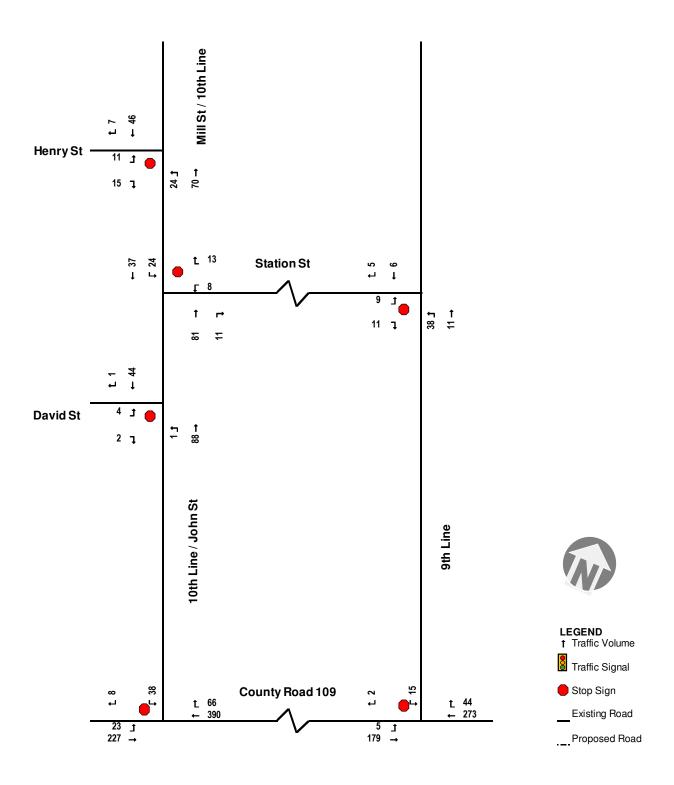


Exhibit 4: Existing PM Traffic Volumes

2.4 Existing Traffic Intersection Operations

Based on existing road configurations illustrated in **Exhibit 2** and existing traffic volumes shown in **Exhibit 3** and **4**, the existing unsignalized intersection operations are summarized in **Table 4**. Detailed HCM output sheets are provided in **Appendix A**. It was noted that truck restriction signage is in place along 10th Line and 9th in the vicinity of Waldemar, however trucks were observed in the conducted traffic count surveys and subsequently included in the Synchro analysis.

Intersection & Movement	Weekday AM Peak Hour				Weekday PM Peak Hour			
	LOS	(delays) (s)	v/c	95th Percentile Queue (m)	LOS	(delays) (s)	v/c	95th Percentile Queue (m)
10th Line / County Road 109		(0.4)	0.00			(4.0)	0.00	
Overall		(2.1)	0.20	0.1	A	(1.3)	0.29	0.0
EBL/T	A	(0.2)	0.01	0.1	A	(1.0)	0.02	0.6 0
WBT/R SBL/R		(0.0)	0.12	0	AB	(0.0)	0.29	3.3
	В	(13.8)	0.20	5.5	В	(15.4)	0.13	3.3
10th Line / Henry Street Overall								
EBL/R		(4.7)	0.10 0.10	2.6	A	(2.5)	0.04	0.9
EBL/R NBL/T	A	(9.1) (3.6)	0.10	2.6	A	(9.3) (2.0)	0.04	0.9
SBT/R		(0.0)	0.03	0.7	A	(2.0)	0.02	0.5
9th Line / County Road 109	A	(0.0)	0.04	0.0	A	(0.0)	0.04	0
Overall	Α	(1.2)	0.10		Α	(0 E)	0.19	
EBL/T	A	. ,	0.00	0.0		(0.5)	0.19	0.1
WBT/R		(0.1) (0.0)	0.00	0.0	A A	(0.3) (0.0)	0.19	0.1
SBL/R	B	(12.2)	0.10	2.5	B	(11.8)	0.13	0.7
10th Line (Mill St) / Station S	_	(12.2)	0.10	2.5	D	(11.0)	0.00	0.7
Overall	Α	(2.2)	0.03		Α	(2.2)	0.08	
WBL/R		(9.2)	0.03	0.8	Â	(9.5)	0.00	0.9
NBT/R		(0.0)	0.03	0.0	A	(0.0)	0.04	0.9
SBL/T	A	(1.3)	0.03	0.3	A	(0.0)	0.00	0.6
10th Line (Mill St) / David St		(1.0)	0.01	0.0		(0.1)	0.02	0.0
Overall		(1.3)	0.07		Α	(0.4)	0.03	
EBL/R		(9.4)	0.03	0.7	Â	(9.0)	0.01	0.2
NBL/T		(0.0)	0.00	0.0	A	(0.1)	0.01	0.2
SBT/R	A	(0.0)	0.00	0.0	A	(0.0)	0.03	0
9th Line / Station St		(0.0)	0.0.	0.0		(0.0)	0.00	-
Overall	Α	(5.9)	0.06		Α	(5.7)	0.03	
EBL/R	А	(8.6)	0.06	1.5	А	(8.8)	0.02	0.6
NBL/T	А	(2.3)	0.00	0.1	А	(5.7)	0.03	0.6
SBT/R	А	(0.0)	0.01	0.0	А	(0.0)	0.01	0

Table 4: Existing Traffic Unsignalized Intersection Operations

v/c - volume to capacity ratio, LOS - Level of Service

Under existing traffic conditions, overall Level of Service 'A' was observed for all intersections during both peak hours. For individual movements, the southbound left/right movement at 9th and 10th Line at County Road 109 exhibited LOS 'B', due to higher opposing traffic volumes. Queues and v/c ratios were low throughout the study area.

3. 2019 Background Traffic Conditions

Forecasts of future background traffic consist of background traffic growth to the year 2019 and the background development. The horizon year of 2019 was selected for the analysis period, as this represents an appropriate time frame within which the proposed development is expected to be fully developed.

3.1 Planned Road Network Improvements

There are no major planned road improvements by 2019 in the study area.

3.2 Background Traffic Growth

An annual growth rate of 2% per annum was applied to all observed movements in the study area. As historical intersection traffic counts were unavailable, a conservative approach was taken when assuming growth in the area. Furthermore, future traffic patterns were assumed to remain identical to existing observed patterns, as there are no additional developments planned for the region. These assumptions was proposed to RJ Burnside and accepted.

3.3 Background Development Traffic

No background developments planned for construction were determined to occur within the next five years in the vicinity of the study area.

3.4 Background Trip Distribution

The trip distribution for future background traffic volumes was based on the 2014 turning movement counts, as there were no additional developments planned in the vicinity of the study area. This distribution approach was approved by RJ Burnside. The trip distribution for assigning new traffic related to background growth is summarized in **Table 8**.

Table 8: Trip Distribution for Background Traffic Gro	owth
Table 6. The Distribution for Background Traine are	J W U

Direction:	Via		2014 TMC							
To/From			kday Peak	Weekday PM Peak						
		In	Out	In	Out					
North	10 th Line	53%	20%	28%	56%					
	9 th Line	6%	4%	3%	7%					
South	10 th Line	37%	63%	48%	31%					
	 Then West via County Road 109 Then East via County Road 109 	9% 28%	10% 53%	12% 36%	26% 5%					
	9 th Line									
	- Then East via County Road 109	4%	13%	21%	6%					
Total		100%	100%	100%	100%					

The assignment of background traffic growth for the study area in 2019 is shown in **Exhibit 4** and **Exhibit 5** for the AM and PM peak hours, respectively.

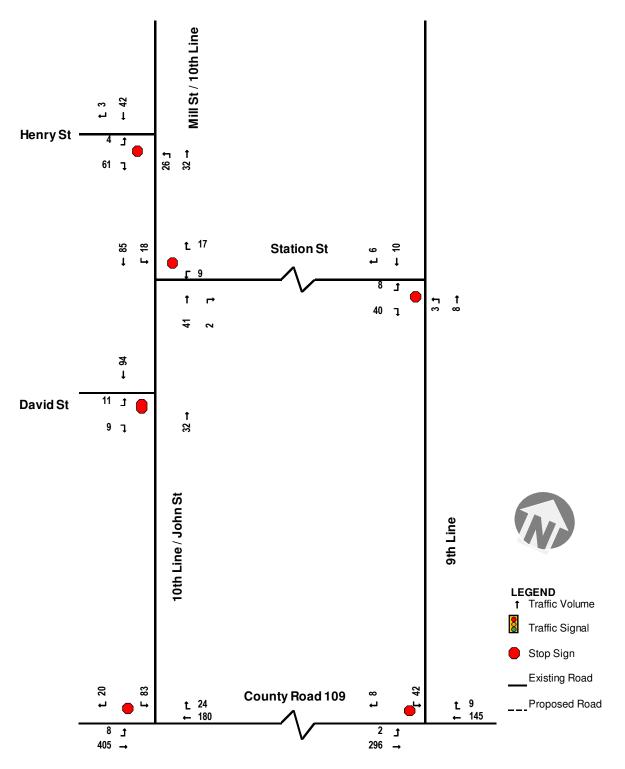


Exhibit 4: 2019 AM Background Traffic Volumes

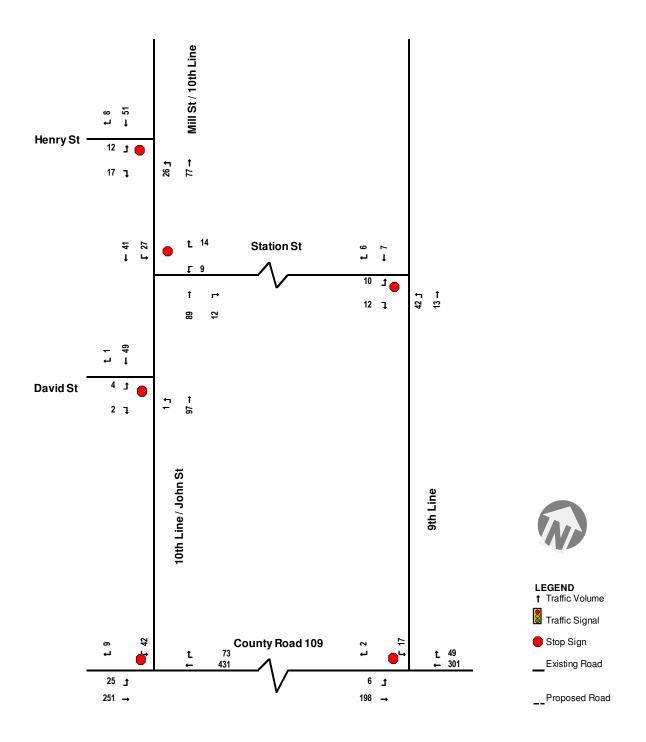


Exhibit 5: 2019 PM Background Traffic Volumes

3.5 Background Traffic Intersection Operations

Based on the road network illustrated in **Exhibit 2** and 2019 background traffic shown in **Exhibits 4** and **5**, the background unsignalized intersection operations are summarized in **Table 9**. Detailed HCM output sheets are provided in **Appendix B**.

Intersection & Movement			Weekday AM Peak Hour				/eekday Peak Ho	
	LOS	(delays) (s)	v/c	95th Percentile Queue (m)	LOS	(delays) (s)	v/c	95th Percentile Queue (m)
10th Line / County Road 109								
Overall	Α	(2.3)	0.24		Α	(1.4)	0.32	
EBL/T	А	(0.2)	0.01	0.1	А	(1.1)	0.03	0.6
WBT/R	A	(0.0)	0.13	0	A	(0.0)	0.32	0
SBL/R	В	(15.0)	0.24	6.9	В	(16.9)	0.16	4.1
10th Line / Henry Street								
Overall		(4.8)	0.12		Α	(2.5)	0.04	
EBL/R	Α	(9.2)	0.12	3	А	(9.4)	0.04	1
NBL/T	A	(3.5)	0.03	0.7	A	(2.0)	0.02	0.5
SBT/R	A	(0.0)	0.05	0.0	Α	(0.0)	0.04	0
9th Line / County Road 109								
Overall		(1.3)	0.12		Α	(0.5)	0.21	
EBL/T	А	(0.1)	0.00	0.0	А	(0.3)	0.01	0.1
WBT/R	A	(0.0)	0.11	0.0	A	(0.0)	0.21	0
SBL/R		(12.8)	0.12	3	В	(12.4)	0.04	0.9
10th Line (Mill St) / Station S	St							
Overall	Α	(2.2)	0.04		Α	(2.2)	0.09	
WBL/R	А	(9.3)	0.04	0.8	А	(9.6)	0.04	1
NBT/R	A	(0.0)	0.03	0.0	A	(0.0)	0.09	0
SBL/T	A	(1.4)	0.01	0.3	Α	(3.1)	0.03	0.6
10th Line (Mill St) / David St								
Overall		(1.3)	0.07		Α	(0.4)	0.03	
EBL/R	А	(9.5)	0.03	0.7	А	(9.1)	0.01	0.2
NBL/T	А	(0.0)	0.00	0.0	А	(0.1)	0	0
SBT/R	Α	(0.0)	0.07	0.0	А	(0.0)	0.03	0
9th Line / Station St								
Overall		(5.9)	0.07		Α	(5.7)	0.03	
EBL/R	А	(8.8)	0.07	1.7	А	(8.9)	0.03	0.6
NBL/T	Α	(2.1)	0.00	0.1	А	(5.7)	0.03	0.7
SBT/R	A	(0.0)	0.01	0.0	Α	(0.0)	0.01	0

Table 9: 2019 Background Traffic Unsignalized Intersection Operations

v/c – volume to capacity ratio, LOS – Level of Service

For 2019 future background traffic conditions, all studied intersections will continue to operate at overall Level of Service 'A' for both peak hours. For individual movements, the southbound left/right movement at both 9th and 10th Line at County Road 109 will continue to operate at LOS 'B' with marginal increases to delays and queues. Delays, queues and v/c ratios are expected to remain low (relative to existing conditions) throughout the study area.

4. Site Details

4.1 Site Concept Plan

Sarah Properties Ltd. is proposing to construct 336 detached homes within a 35.021 hectare lot, located northwest of County Road 109. The proposed site concept plan is shown in **Exhibit 6**.



Exhibit 6: Site Concept Plan

4.2 Site Access

As shown in **Exhibit 6**, the accesses for the proposed development will consist of connections to 10th Line (Mill Street / John Street) via Evans Avenue (connected to Henry Street), Main Street (interpreted as a connection to David Street), and Street 1. The minor approach (i.e. east-

west roads) at these connection points are assumed to be stop-controlled while 10th Line will remain as the main street with free flow movement.

4.3 Site Trip Generation

The trip generation for the residential development was based upon information in the publication *Trip Generation Manual, 9th Edition* by the Institute of Transportation Engineers ("ITE"). The "Single Family Home" land use code 210 was used to generate trips for the proposed detached houses.

10th Line and 9th Line are considered to be the predominant access/egress routes to the proposed residential development to/from County Road 109. Furthermore, a lack of transit service and the rural nature of the surrounding area led to the assumption that the modal split for future site related trips will consist of 100% auto trips.

The trip generation in/out percentage splits for the residential development for the AM and PM peak hour is summarized in **Table 6**.

Table 6: Proposed Residential Development Trip Rates	

Intersection		AM Peak Hour (trips/hour)	PM Peak Hour (trips/hour)			
	In	Out	Total	In	Out	Total
ITE	0.19	0.56	0.75	0.63	0.37	1.00

The resulting vehicular traffic generation for the proposed residential units is summarized in **Table 7**.

Table 7: Vehicular Site Traffic Generation

Residential Units (3	<u>36 Units)</u>	Weekday AM Peak Hour	Weekday PM Peak Hour
Trip Rate	veh/unit	0.75	1.00
Net Trip	veh/h	252	336
Inbound Trips	veh/h	63	212
Outbound Trips	veh/h	189	124

4.4 **Trip Distribution**

As mentioned in **Section 3.4**, the trip distribution is based on existing traffic distribution observed from the 2014 turning movement counts. The assignment of the resulting site traffic is shown in **Exhibit 7** and **8** for the AM and PM peak hours, respectively.

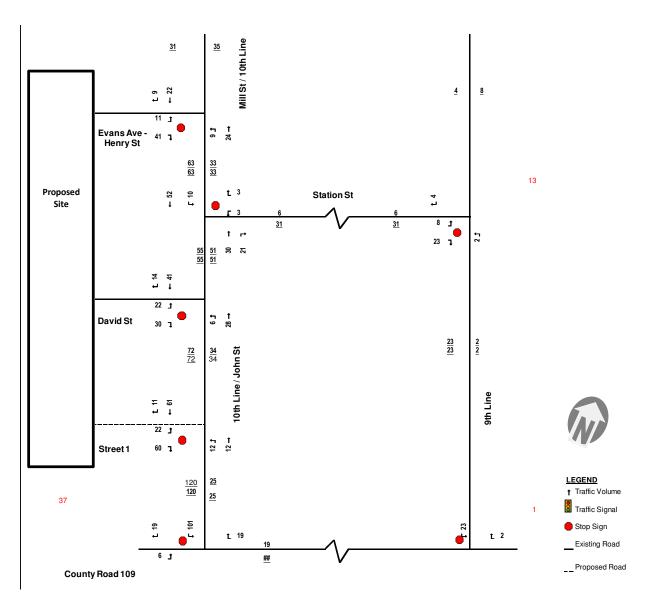


Exhibit 7: Waldemar Residential Development Trips – AM Peak Hour

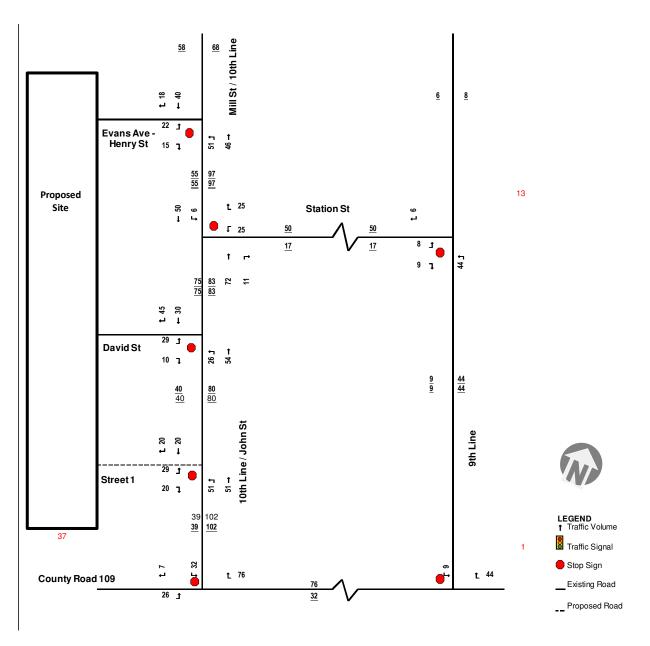


Exhibit 8: Waldemar Residential Development Trips – PM Peak Hour

5. 2019 Total Traffic Conditions

5.1 Total Traffic Intersection Operations

The 2019 total traffic volumes include 2019 background traffic plus the resulting site traffic created by the proposed development. The resulting future total traffic volumes are shown in **Exhibit 8** and **Exhibit 9** for the AM and PM peak hours, respectively.

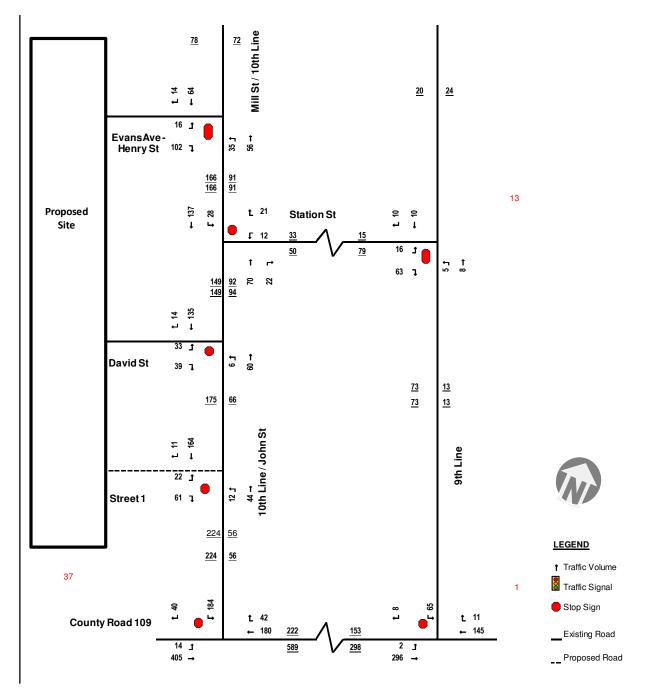


Exhibit 8: 2019 Future Total Volumes – AM Peak Hour

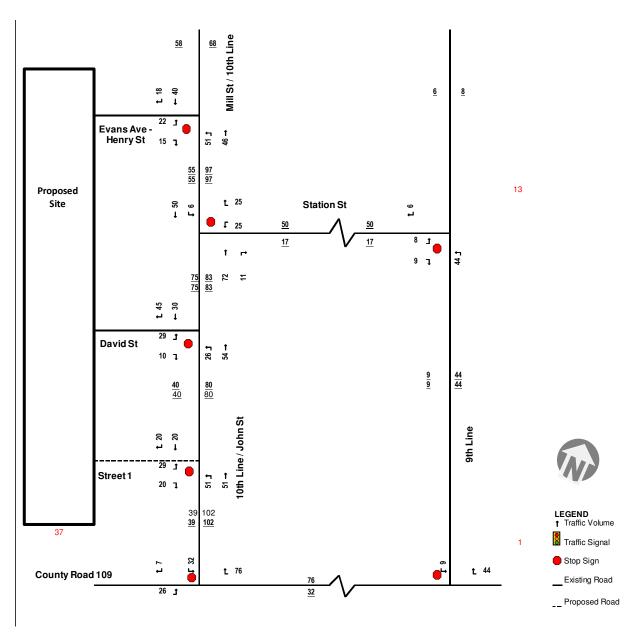


Exhibit 9: 2019 Future Total Volumes – PM Peak Hour

The analysis of the unsignalized intersections based on future total traffic is summarized in **Table 13**. Detailed HCM output sheets are provided in **Appendix C**.

		v	Veekday			w	eekday	
			Peak Ho				Peak Ho	
	LOS	(delays) (s)	v/c	95th Percentile Queue (m)	LOS	(delays) (s)	v/c	95th Percentile Queue (m)
10th Line / County Road 109								
Overall	Α	(5.8)	0.54		Α	(2.7)	0.37	
EBL/T	Α	(0.4)	0.01	0.3	А	(2.1)	0.06	1.5
WBT/R		(0.0)	0.14	0	А	(0.0)	0.37	0
SBL/R	С	(21.8)	0.54	23.5	С	(22.2)	0.32	10.2
10th Line / Henry Street								
Overall		(5.3)	0.23		Α	(3.7)	0.13	
EBL/R		(10.3)	0.23	6.8	В	(11.4)	0.13	3.4
NBL/T	Α	(3.2)	0.04	1.1	А	(3.3)	0.07	1.6
SBT/R	A	(0.0)	0.08	0.0	Α	(0.0)	0.09	0
9th Line / County Road 109								
Overall	Α	(1.9)	0.17		Α	(0.7)	0.24	
EBL/T	Α	(0.1)	0.00	0.0	А	(0.3)	0.01	0.1
WBT/R	Α	(0.0)	0.11	0.0	А	(0.0)	0.24	0
SBL/R	В	(13.5)	0.17	4.7	В	(12.8)	0.06	1.4
10th Line (Mill St) / Station S	St							
Overall	Α	(1.9)	0.07		Α	(3.0)	0.17	
WBL/R	Α	(9.9)	0.05	1.2	В	(11.8)	0.17	4.7
NBT/R	Α	(0.0)	0.07	0.0	А	(0.0)	0.16	0
SBL/T	Α	(1.4)	0.02	0.5	Α	(2.3)	0.04	0.9
10th Line (Mill St) / David St	reet							
Overall	Α	(2.8)	0.13		Α	(2.0)	0.08	
EBL/R	В	(10.5)	0.13	3.3	В	(10.5)	0.07	1.7
NBL/T	А	(0.7)	0.01	0.1	А	(1.3)	0.02	0.5
SBT/R	Α	(0.0)	0.12	0.0	А	(0.0)	0.08	0
9th Line / Station St								
Overall	Α	(6.7)	0.12		Α	(6.4)	0.06	
EBL/R	А	(9.0)	0.12	3	А	(9.4)	0.05	1.3
NBL/T	А	(2.9)	0.01	0.1	А	(6.5)	0.06	1.5
SBT/R		(0.0)	0.02	0.0	А	(0.0)	0.01	0
10th Line (Mill St) / Street 1								
Overall	Α	(3.1)	0.14		Α	(2.8)	0.08	
EBL/R		(10.4)	0.14	3.7	В	(10.4)	0.08	1.9
NBL/T	А	(0.0)	0.14	0.0	А	(2.1)	0.04	0.9
SBT/R		(1.7)	0.01	0.3	А	(0.0)	0.06	0

Table 13: 2019 Future Total Traffic Unsignalized Intersection Operations

 $\ensuremath{\text{v/c}}\xspace - \ensuremath{\text{volume}}\xspace$ to capacity ratio, LOS – Level of Service

Under 2019 future total traffic conditions, overall Level of Service 'A' is predicted for all intersections during both peak hours. For individual movements, when compared against the 2019 future background scenario, the proposed site will introduce marginal increases to delays (less than seven seconds) on the roads relating to the development's access/egress points.

The largest increase in delay is predicted at the southbound left/right movement at the 10th Line / County Road 109 intersection, where an additional delay of up to seven seconds during both peak hours is expected when compared against future background conditions.

Overall, the proposed residential development is not expected to adversely impact existing traffic conditions in the study area. Existing road capacity will be sufficient to accommodate forecasted traffic volumes, based on the resulting delays, queues, and v/c ratios.

5.2 Queuing Summary

A comparison of queues for all scenarios for key movements within the study area outlined in **Exhibit 2** was conducted. The queuing results for existing, 2019 background, and 2019 total traffic conditions are based on the Synchro 95th percentile queues, and are provided in **Table 15**.

			95th Percer	ntile Queue	(m)	
Intersection & Movement	We	ekday AM Peak	Hour	We	eekday PM Peak	Hour
Intersection & Movement	Existing	2019 Background	2019 Total	Existing	2019 Background	2019 Total
10th Line / County Road 10	9					
EBL/T	0.1	0.1	0.3	0.6	0.6	1.5
WBT/R	0	0.0	0	0	0.0	0
SBL/R	5.5	6.9	23.5	3.3	4.1	10.2
10th Line / Henry Street						
EBL/R	2.6	3.0	6.8	0.9	1.0	3.4
NBL/T	0.7	0.7	1.1	0.5	0.5	1.6
SBT/R	0	0.0	0.0	0	0.0	0
9th Line / County Road 109						
EBL/T	0.0	0.0	0.0	0.1	0.1	0.1
WBT/R	0.0	0.0	0.0	0	0.0	0
SBL/R	2.5	3.0	4.7	0.7	0.9	1.4
10th Line (Mill St) / Station	St					
WBL/R	0.8	0.8	1.2	0.9	1.0	4.7
NBT/R	0	0.0	0.0	0	0.0	0
SBL/T	0.3	0.3	0.5	0.6	0.6	0.9
10th Line (Mill St) / David S	street					
EBL/R	0.7	0.7	3.3	0.2	0.2	1.7
NBL/T	0.0	0.0	0.1	0	0.0	0.5
SBT/R	0.0	0.0	0.0	0	0.0	0
9th Line / Station St						-
EBL/R	1.5	1.7	3.0	0.6	0.6	1.3
NBL/T	0.1	0.1	0.1	0.6	0.7	1.5
SBT/R	0	0.0	0.0	0	0.0	0
10th Line (Mill St) / Street 1						
EBL/R			3.1			1.5
NBL/T			0.0			0.8
SBT/R			0.2			0

Table 15: 95th Percentile Queue Summary

95th percentile Queue

Note: No storage lanes are provided in the study area

Under total traffic conditions, 95th percentile queues will be accommodated for all turning movements, as site related traffic volumes are expected to be low when compared to intersection capacity. The largest increase in queuing (from 7 to 23.5m) is expected to occur for the southbound left/right movement at the 10th Line/ County Road 109 intersection, which is the equivalent of about 4 cars waiting 7 more seconds on average to turn. There will be no issues with this queue length as there are no adjacent driveways or intersections affected by the queue.

6. Conclusions and Recommendations

All existing roads in Waldemar and leading to/from Waldemar can accommodate the proposed addition of 336 homes. An analysis of existing, 2019 future background, and 2019 future total traffic conditions demonstrated that all studied intersections will operate at LOS 'A'. The proposed site is expected to generate the most vehicles at the 10th Line / County Road 109 intersection compared to the other intersections in the area, however, delays and queues for the SBL/R movement are expected to remain at acceptable levels.

Overall, the proposed residential development is not expected to adversely impact existing and future traffic operations in the area, as the existing road network is capable of accommodating site generated traffic volumes as well long term future background growth.

Appendix A

Existing Traffic Intersection Operations Calculations

ane Configurations Image: Configrations Image: Configuration <thi< th=""><th></th><th>٦</th><th>+</th><th>t</th><th>×</th><th>*</th><th>~</th><th></th></thi<>		٦	+	t	×	*	~	
ane Configurations Image: Configuration of the second	Movement	EBL	EBT	WBT	WBR	SBL	SBR	
folume (veh/h) 7 367 163 22 75 18 ign Control Free Free Stop							-	
Free Free Stop arade 0% 0% 0% lourly flow rate (vph) 8 395 175 24 81 19 redestrians ane Width (m) 8 395 175 24 81 19 redestrians ane Width (m) Valking Speed (m/s) Free See		7			22		18	
Arrade 0% 0% 0% teak Hour Factor 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
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Iourly flow rate (vph) 8 395 175 24 81 19 Vedestrians ane Width (m) Valking Speed (m/s) Valking		0.93			0.93		0.93	
are Width (m) Valking Speed (m/s) lercent Blockage tight turn flare (veh) fedian type None Median type None fedian type None fedian type None fedian storage veh) Ipstream signal (m) X, platoon unblocked C, conflicting volume 199 20, stage 1 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C3, single (s) 4.2 C, conflicting volume 199 Segs 2 6.4 6(a) 6.2 C, stage (s)								
ane Width (m) Valking Speed (m/s) Vercent Blockage tight turn flare (veh) ledian storage veh) Ipstream signal (m) X, platoon unblocked C, conflicting volume 199 Soft af X C, songlie (s) C, stage 2 conf vol CL, stage 1 conf vol CL, stage 2 conf vol CL, unblocked vol Spr 187 C, single (s) 4.2 597 187 C, single (s) 4.2 597 187 C, stage 2 conf vol CL, stage 2 conf vol CL, unblocked vol Spr 187 C, stage 2 conf vol CL, unblocked vol Spr 187 C, stage 2 conf vol CL, stage 2 conf vol CL, stage 2 conf vol CL, unblocked vol Spr 187 C, stage 2 conf vol CL, stage 2 conf vol Sh 1350 Troo 507 Volume to Capacity 0.01 0.12 0.2 0.0 13.8 ane LOS A B tersection Summary verage Delay Verage Delay CL Verage Delay Verage Delay		v	000	110	21	01	10	
Valking Speed (m/s) vercent Blockage tight turn flare (veh) ledian type None Mone None Mone None Valking Speed (m/s) ledian type None Valking Speed (m/s) ledian storage veh) lpstream signal (m) X, platoon unblocked C, conflicting volume 199 C2, stage 1 conf vol C2, stage 2 conf vol Cu, unblocked vol 199 C, single (s) 4.2 C, single (s) 2.3 Sige (s) 2.3 (s) 2.3 Oqueue free % 99 Basa 98 M capacity (veh/h) 1350 Vincetion, Lane # EB 1 WB 1 Veretion Lane # EB 1 WB 1 Volume Total 402 199 Volume Right 0 24 Volume Right 0.12 0.20 Vueue Length 95th (m) 0.1 0.0 SH 1350 1700 507 V								
tercent Blockage None None None Itight turn flare (veh) Mone None None Median storage veh) Ipstream signal (m) X, platoon unblocked S97 187 C, conflicting volume 199 597 187 S97 187 C1, stage 1 conf vol C2, stage 2 conf vol Cu, unblocked vol 199 597 187 C2, stage 2 conf vol Cu, unblocked vol 199 597 187 C, single (s) 4.2 6.4 6.2 2, 2 stage (s) S1	()							
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Itedian type None None Median storage veh) Ipstream signal (m) X, platoon unblocked C, conflicting volume 199 597 187 C1, stage 1 conf vol C2, stage 2 conf vol C Cu, unblocked vol 199 597 187 C2, stage 2 conf vol Cu, unblocked vol 199 597 187 C2, stage 2 conf vol Cu, unblocked vol 199 597 187 C2, stage 2 conf vol Cu, unblocked vol 199 597 187 C2, stage 2 conf vol Cu, unblocked vol 199 597 187 C2, stage (s) E 597 187 53 3.3 O queue free % 99 83 98 98 462 860 Virection, Lane # EB 1 WB 1 SB 1 50 50 50 folume Total 402 199 100 507 507 507 folume Right 0 24 19 507 507 50 507								
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M capacity (veh/h) 1350 462 860 Direction, Lane # EB 1 WB 1 SB 1 Yolume Total 402 199 100 Yolume Total 402 199 100 Yolume Left 8 0 81 Yolume Right 0 24 19 SH 1350 1700 507 Yolume to Capacity 0.01 0.12 0.20 Queue Length 95th (m) 0.1 0.0 5.5 Control Delay (s) 0.2 0.0 13.8 ane LOS A B Approach Delay (s) 0.2 0.0 13.8 approach LOS B B Mersection Summary 2.1 werage Delay 2.1 ntersection Capacity Utilization 36.8% ICU Level of Service								
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pproach Delay (s) 0.2 0.0 13.8 pproach LOS B Intersection Summary 2.1 Intersection Capacity Utilization 36.8% ICU Level of Service	Control Delay (s)	0.2	0.0					
pproach LOS B htersection Summary verage Delay 2.1 htersection Capacity Utilization 36.8% ICU Level of Service	Lane LOS							
ntersection Summary Nerage Delay 2.1 Intersection Capacity Utilization 36.8% ICU Level of Service	Approach Delay (s)	0.2	0.0	13.8				
verage Delay 2.1 htersection Capacity Utilization 36.8% ICU Level of Service	Approach LOS			В				
ntersection Capacity Utilization 36.8% ICU Level of Service	Intersection Summary							
	Average Delay			2.1				
	Intersection Capacity Utiliza	ition		36.8%	IC	U Level c	of Service	
	Analysis Period (min)			15				

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			र्स	4	
Volume (veh/h)	4	55	24	29	38	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.58	0.58	0.58	0.58	0.58	0.58
Hourly flow rate (vph)	7	95	41	50	66	5
Pedestrians	•		••	00		Ū
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)				NULLE	NULLE	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	201	68	71			
	201	00	/ 1			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol	004	60	74			
vCu, unblocked vol	201	68	71			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)	0 -		0 4			
tF (s)	3.5	3.3	2.4			
p0 queue free %	99	91	97			
cM capacity (veh/h)	769	1001	1440			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	102	91	71			
Volume Left	7	41	0			
Volume Right	95	0	5			
cSH	981	1440	1700			
Volume to Capacity	0.10	0.03	0.04			
Queue Length 95th (m)	2.6	0.7	0.0			
Control Delay (s)	9.1	3.6	0.0			
Lane LOS	А	А				
Approach Delay (s)	9.1	3.6	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			4.7			
Intersection Capacity Utilization	ation		19.8%	IC	CU Level of	Service
Analysis Period (min)			15.070			0011100
			15			

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		स्	4		Y	
Volume (veh/h)	2	268	131	8	38	7
Sign Control		Free	Free	-	Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	2	327	160	10	46	9
Pedestrians	_	•=-				•
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)		None	None			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	170				496	165
vC1, stage 1 conf vol	170				-30	105
vC2, stage 2 conf vol						
vCu, unblocked vol	170				496	165
tC, single (s)	4.1				6.4	6.5
	4.1				0.4	0.5
tC, 2 stage (s)	2.2				3.5	3.6
tF (s)	100				91	3.0 99
p0 queue free %					527	
cM capacity (veh/h)	1420				527	814
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	329	170	55			
Volume Left	2	0	46			
Volume Right	0	10	9			
cSH	1420	1700	557			
Volume to Capacity	0.00	0.10	0.10			
Queue Length 95th (m)	0.0	0.0	2.5			
Control Delay (s)	0.1	0.0	12.2			
Lane LOS	Α		В			
Approach Delay (s)	0.1	0.0	12.2			
Approach LOS			В			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization	ation		25.7%	IC	U Level o	f Service
Analysis Period (min)			15			

	4	*	Ť	1	1	ţ		
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations	Υ		eî 🗧			र्भ		
Volume (veh/h)	8	16	37	2	16	77		
Sign Control	Stop		Free			Free		
Grade	0%		0%			0%		
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83		
Hourly flow rate (vph)	10	19	45	2	19	93		
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	177	46			47			
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	177	46			47			
tC, single (s)	6.4	6.5			4.1			
tC, 2 stage (s)								
tF (s)	3.5	3.6			2.2			
p0 queue free %	99	98			99			
cM capacity (veh/h)	807	942			1573			
Direction, Lane #	WB 1	NB 1	SB 1					
Volume Total	29	47	112					
Volume Left	10	0	19					
Volume Right	10	2	0					
cSH	893	1700	1573					
Volume to Capacity	0.03	0.03	0.01					
Queue Length 95th (m)	0.00	0.0	0.3					
Control Delay (s)	9.2	0.0	1.3					
Lane LOS	A	0.0	A					
Approach Delay (s)	9.2	0.0	1.3					
Approach LOS	A	0.0						
Intersection Summary								
Average Delay			2.2					
Intersection Capacity Utiliza	ation		21.6%	IC	U Level o	of Service		
Analysis Period (min)			15		2 201010			
			.0					

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			स्	eî.	
Volume (veh/h)	10	8	0	29	85	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	13	11	0	38	112	0
Pedestrians			•			· ·
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)				10110	Rono	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	150	112	112			
vC1, stage 1 conf vol	150	112	112			
vC2, stage 2 conf vol						
vCu, unblocked vol	150	112	112			
tC, single (s)	6.7	6.2	4.1			
• • • •	0.7	0.2	4.1			
tC, 2 stage (s) tF (s)	3.8	3.3	2.2			
	98	3.3 99	100			
p0 queue free %						
cM capacity (veh/h)	774	947	1490			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	24	38	112			
Volume Left	13	0	0			
Volume Right	11	0	0			
cSH	843	1490	1700			
Volume to Capacity	0.03	0.00	0.07			
Queue Length 95th (m)	0.7	0.0	0.0			
Control Delay (s)	9.4	0.0	0.0			
Lane LOS	А					
Approach Delay (s)	9.4	0.0	0.0			
Approach LOS	А					
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utiliza	tion		14.5%	10	CU Level o	f Service
Analysis Period (min)			15			
			10			

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		र्भ	4		Y	
Volume (veh/h)	0	0	0	0	0	0
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)	0	0	0	0	0	0
Pedestrians	•			Ū	· ·	•
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)		None	None			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol	0				0	U
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
	4.1				0.4	0.2
tC, 2 stage (s)	2.2				3.5	3.3
tF (s)	100				3.5 100	3.3 100
p0 queue free %						
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			А			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			А			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utiliza	tion		0.0%	IC	U Level o	of Service
Analysis Period (min)			15		,	

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Movement	WBL	WBR	NBT	NBR	SBL	SBT	j	
Lane Configurations	Y		4Î			र्स		
Volume (veh/h)	0	0	0	0	0	0		
Sign Control	Stop		Free			Free		
Grade	0%		0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	0	0	0	0	0	0		
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	0	0			0			
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	0	0			0			
tC, single (s)	6.4	6.2			4.1			
tC, 2 stage (s)								
tF (s)	3.5	3.3			2.2			
p0 queue free %	100	100			100			
cM capacity (veh/h)	1023	1085			1623			
Direction, Lane #	WB 1	NB 1	SB 1					
Volume Total	0	0	0					
Volume Left	0	0	0					
Volume Right	0	0	0					
cSH	1700	1700	1700					
Volume to Capacity	0.00	0.00	0.00					
Queue Length 95th (m)	0.0	0.0	0.0					
Control Delay (s)	0.0	0.0	0.0					
Lane LOS	A	0.0						
Approach Delay (s)	0.0	0.0	0.0					
Approach LOS	A		0.0					
Intersection Summary								
Average Delay			0.0					
Intersection Capacity Utiliza	ation		0.0%	IC	U Level o	f Service		
Analysis Period (min)			15	.0				
			10					

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			र्स	4Î	
Volume (veh/h)	7	36	3	7	9	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Hourly flow rate (vph)	10	53	4	10	13	7
Pedestrians	10	00	т	10	10	,
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
				NONE	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked	20	17	21			
vC, conflicting volume	36	17	21			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol	00	47	04			
vCu, unblocked vol	36	17	21			
tC, single (s)	6.4	6.2	4.4			
tC, 2 stage (s)	<u> </u>		0.5			
tF (s)	3.5	3.3	2.5			
p0 queue free %	99	95	100			
cM capacity (veh/h)	974	1068	1416			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	63	15	21			
Volume Left	10	4	0			
Volume Right	53	0	7			
cSH	1051	1416	1700			
Volume to Capacity	0.06	0.00	0.01			
Queue Length 95th (m)	1.5	0.1	0.0			
Control Delay (s)	8.6	2.3	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.6	2.3	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			5.9			
Intersection Capacity Utiliza	ation		13.3%	10	CU Level o	f Service
Analysis Period (min)			15			
			10			

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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	f,			स	Y	
Volume (veh/h)	0	0	0	0	0	0
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)	0.02	0.02	0.02	0.02	0	0.02
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			0		0	0
vC1, stage 1 conf vol			v		v	Ū
vC2, stage 2 conf vol						
vCu, unblocked vol			0		0	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					0.1	J.L
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1623		1023	1085
					1020	1000
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			А			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			А			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilizat	tion		0.0%	IC	U Level o	of Service
Analysis Period (min)			15			
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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		र्भ	4Î		¥	
Volume (veh/h)	23	227	390	66	38	8
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	247	424	72	41	9
Pedestrians	20				••	•
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)		None	None			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	496				757	460
vC1, stage 1 conf vol	+30				151	400
vC2, stage 2 conf vol						
vCu, unblocked vol	496				757	460
tC, single (s)	4.2				6.4	6.2
	4.2				0.4	0.2
tC, 2 stage (s)	2.3				3.5	3.3
tF (s)	2.3 98				3.5 89	3.3 99
p0 queue free %						
cM capacity (veh/h)	1028				369	606
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	272	496	50			
Volume Left	25	0	41			
Volume Right	0	72	9			
cSH	1028	1700	396			
Volume to Capacity	0.02	0.29	0.13			
Queue Length 95th (m)	0.6	0.0	3.3			
Control Delay (s)	1.0	0.0	15.4			
Lane LOS	А		С			
Approach Delay (s)	1.0	0.0	15.4			
Approach LOS			С			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization	ation		41.1%	IC	U Level c	of Service
Analysis Period (min)			15			
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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			र्स	4Î	
Volume (veh/h)	11	15	24	70	46	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	14	19	30	88	58	9
Pedestrians		10		00	00	Ū
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)				None	None	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	209	62	66			
vC1, stage 1 conf vol	209	02	00			
vC2, stage 2 conf vol						
vC2, stage 2 com vor vCu, unblocked vol	209	62	66			
	209 6.4	6.3	4.1			
tC, single (s)	0.4	0.5	4.1			
tC, 2 stage (s)	25	2.4	2.2			
tF (s)	3.5	3.4				
p0 queue free %	98	98	98			
cM capacity (veh/h)	768	973	1548			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	32	118	66			
Volume Left	14	30	0			
Volume Right	19	0	9			
cSH	874	1548	1700			
Volume to Capacity	0.04	0.02	0.04			
Queue Length 95th (m)	0.9	0.5	0.0			
Control Delay (s)	9.3	2.0	0.0			
Lane LOS	А	А				
Approach Delay (s)	9.3	2.0	0.0			
Approach LOS	А					
Intersection Summary						
Average Delay			2.5			
Intersection Capacity Utiliza	ation		21.7%	IC	CU Level of	Service
Analysis Period (min)			15			20.1100
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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		र्स	¢,		¥	
Volume (veh/h)	5	179	273	44	15	2
Sign Control	-	Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	5	183	279	45	15	2
Pedestrians	•					_
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)		None	None			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	323				494	301
vC1, stage 1 conf vol	020				777	001
vC2, stage 2 conf vol						
vCu, unblocked vol	323				494	301
tC, single (s)	4.3				6.4	6.7
tC, 2 stage (s)	т.5				0.4	0.7
tF (s)	2.4				3.5	3.8
p0 queue free %	100				97	100
cM capacity (veh/h)	1142				536	639
,					550	009
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	188	323	17			
Volume Left	5	0	15			
Volume Right	0	45	2			
cSH	1142	1700	546			
Volume to Capacity	0.00	0.19	0.03			
Queue Length 95th (m)	0.1	0.0	0.7			
Control Delay (s)	0.3	0.0	11.8			
Lane LOS	А		В			
Approach Delay (s)	0.3	0.0	11.8			
Approach LOS			В			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization	ation		27.0%	IC	U Level o	of Service
Analysis Period (min)			15			
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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		4Î			र्भ
Volume (veh/h)	8	13	81	11	24	37
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67
Hourly flow rate (vph)	12	19	121	16	36	55
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	256	129			137	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	256	129			137	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	98			98	
cM capacity (veh/h)	719	926			1459	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	31	137	91			
Volume Left	12	0	36			
Volume Right	12	16	0			
cSH	835	1700	1459			
Volume to Capacity	0.04	0.08	0.02			
Queue Length 95th (m)	0.9	0.0	0.6			
Control Delay (s)	9.5	0.0	3.1			
Lane LOS	A	0.0	A			
Approach Delay (s)	9.5	0.0	3.1			
Approach LOS	A	0.0	0.1			
Intersection Summary						
Average Delay			2.2			
Intersection Capacity Utiliza	ation		19.9%	IC	Ulevelo	of Service
Analysis Period (min)			15.576			
			15			

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			स्	4Î	
Volume (veh/h)	4	2	1	88	44	1
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)	4	2	1	98	49	1
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	149	49	50			
vC1, stage 1 conf vol	110					
vC2, stage 2 conf vol						
vCu, unblocked vol	149	49	50			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	••••	•				
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	847	1025	1570			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	7	99	50			
Volume Left	4	1	0			
Volume Right	2	0	1			
cSH	899	1570	1700			
Volume to Capacity	0.01	0.00	0.03			
Queue Length 95th (m)	0.2	0.0	0.0			
Control Delay (s)	9.0	0.1	0.0			
Lane LOS	А	А				
Approach Delay (s)	9.0	0.1	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utiliza	ation		15.4%	IC	CU Level c	f Service
Analysis Period (min)			15			

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		र्भ	4		Y	
Volume (veh/h)	0	0	0	0	0	0
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)	0	0	0	0	0	0
Pedestrians	•	•		•	, , , , , , , , , , , , , , , , , , ,	•
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)		None	None			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol	0				U	U
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
	4.1				0.4	0.2
tC, 2 stage (s)	2.2				3.5	3.3
tF (s)	100				3.5 100	3.3 100
p0 queue free %						
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			А			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			А			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utiliza	ation		0.0%	IC	U Level o	of Service
Analysis Period (min)			15			

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Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	Υ		eî 🗧			र्स	
Volume (veh/h)	0	0	0	0	0	Ö	
Sign Control	Stop		Free			Free	
Grade	0%		0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	0	0	0	0	0	
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	0	0			0		
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	0	0			0		
tC, single (s)	6.4	6.2			4.1		
tC, 2 stage (s)							
tF (s)	3.5	3.3			2.2		
p0 queue free %	100	100			100		
cM capacity (veh/h)	1023	1085			1623		
Direction, Lane #	WB 1	NB 1	SB 1				
Volume Total	0	0	0				
Volume Left	0	0	0				
Volume Right	Ũ	0	Ũ				
cSH	1700	1700	1700				
Volume to Capacity	0.00	0.00	0.00				
Queue Length 95th (m)	0.0	0.0	0.0				
Control Delay (s)	0.0	0.0	0.0				
Lane LOS	A	0.0	0.0				
Approach Delay (s)	0.0	0.0	0.0				
Approach LOS	A	0.0	0.0				
Intersection Summary							
Average Delay			0.0				
Intersection Capacity Utiliza	ation		0.0%	IC	CU Level c	f Service	
Analysis Period (min)			15				
			15				

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			र्स	ef.	
Volume (veh/h)	9	11	38	11	6	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	11	13	45	13	7	6
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	112	10	13			
vC1, stage 1 conf vol	112	10	10			
vC2, stage 2 conf vol						
vCu, unblocked vol	112	10	13			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	0.1	0.2				
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	97			
cM capacity (veh/h)	865	1077	1619			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	24	58	13			
Volume Left	11	45	0			
Volume Right	13	0	6			
cSH	970	1619	1700			
Volume to Capacity	0.02	0.03	0.01			
Queue Length 95th (m)	0.6	0.6	0.0			
Control Delay (s)	8.8	5.7	0.0			
Lane LOS	А	Α				
Approach Delay (s)	8.8	5.7	0.0			
Approach LOS	А					
Intersection Summary						
Average Delay			5.7			
Intersection Capacity Utiliza	ation		19.3%	IC	CU Level o	f Service
Analysis Period (min)			15			

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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	f,			स	Y	
Volume (veh/h)	0	0	0	0	0	0
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)	0.02	0.02	0.02	0.02	0	0.02
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			0		0	0
vC1, stage 1 conf vol			v		v	v
vC2, stage 2 conf vol						
vCu, unblocked vol			0		0	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					0.1	0.2
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1623		1023	1085
					1020	1000
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			А			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			А			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilizat	tion		0.0%	IC	U Level o	of Service
Analysis Period (min)			15			
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Appendix **B**

2019 Background Traffic Intersection Operations Calculations

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Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations		र्स	eî.		Y		
Volume (veh/h)	8	405	180	24	83	20	
Sign Control		Free	Free		Stop		
Grade		0%	0%		0%		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	
Hourly flow rate (vph)	9	435	194	26	89	22	
Pedestrians	Ū	100	101	20	00		
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type		None	None				
Median storage veh)		NONE	NONE				
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	219				659	206	
vC1, stage 1 conf vol	219				009	200	
vC2, stage 2 conf vol vCu, unblocked vol	219				659	206	
,	4.2				6.4		
tC, single (s)	4.Z				0.4	6.2	
tC, 2 stage (s)	0.0				0.5	0.0	
tF (s)	2.3				3.5	3.3	
p0 queue free %	99				79	97	
cM capacity (veh/h)	1327				424	839	
Direction, Lane #	EB 1	WB 1	SB 1				
Volume Total	444	219	111				
Volume Left	9	0	89				
Volume Right	0	26	22				
cSH	1327	1700	469				
Volume to Capacity	0.01	0.13	0.24				
Queue Length 95th (m)	0.1	0.0	6.9				
Control Delay (s)	0.2	0.0	15.0				
Lane LOS	А		С				
Approach Delay (s)	0.2	0.0	15.0				
Approach LOS			С				
Intersection Summary							
Average Delay			2.3				
Intersection Capacity Utiliza	ition		40.2%	IC	U Level c	of Service	
Analysis Period (min)			15	10			
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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			ર્શ	4	
Volume (veh/h)	4	61	26	32	42	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.58	0.58	0.58	0.58	0.58	0.58
Hourly flow rate (vph)	7	105	45	55	72	5
Pedestrians	•					•
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)				10110	110110	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	220	75	78			
vC1, stage 1 conf vol	220	15	10			
vC2, stage 2 conf vol						
vCu, unblocked vol	220	75	78			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)	0.4	0.2	4.5			
tF (s)	3.5	3.3	2.4			
p0 queue free %	99	3.3 89	2.4 97			
	749	992	1431			
cM capacity (veh/h)	749	992	1431			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	112	100	78			
Volume Left	7	45	0			
Volume Right	105	0	5			
cSH	973	1431	1700			
Volume to Capacity	0.12	0.03	0.05			
Queue Length 95th (m)	3.0	0.7	0.0			
Control Delay (s)	9.2	3.5	0.0			
Lane LOS	А	А				
Approach Delay (s)	9.2	3.5	0.0			
Approach LOS	А					
Intersection Summary						
Average Delay			4.8			
Intersection Capacity Utilizat	tion		20.4%	IC	CU Level of	Service
Analysis Period (min)			15			

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Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations		र्स	4Î		Y		
Volume (veh/h)	2	296	145	9	42	8	
Sign Control	_	Free	Free	-	Stop	-	
Grade		0%	0%		0%		
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	
Hourly flow rate (vph)	2	361	177	11	51	10	
Pedestrians	_	•••			•		
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type		None	None				
Median storage veh)		. tonio	1 tonio				
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	188				548	182	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	188				548	182	
tC, single (s)	4.1				6.4	6.5	
tC, 2 stage (s)					-		
tF (s)	2.2				3.5	3.6	
p0 queue free %	100				90	99	
cM capacity (veh/h)	1399				491	795	
Direction, Lane #	EB 1	WB 1	SB 1				
Volume Total	363	188	61				
Volume Left	2	0	51				
Volume Right	0	11	10				
cSH	1399	1700	523				
Volume to Capacity	0.00	0.11	0.12				
Queue Length 95th (m)	0.0	0.0	3.0				
Control Delay (s)	0.1	0.0	12.8				
Lane LOS	A	0.0	B				
Approach Delay (s)	0.1	0.0	12.8				
Approach LOS			В				
Intersection Summary							
Average Delay			1.3				
Intersection Capacity Utilizat	tion		27.2%	IC	U Level o	of Service	
Analysis Period (min)			15				

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Movement	WBL	WBR	NBT	NBR	SBL	SBT				
Lane Configurations	Y		4			र्स				
Volume (veh/h)	9	17	41	2	18	85				
Sign Control	Stop		Free			Free				
Grade	0%		0%			0%				
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83				
Hourly flow rate (vph)	11	20	49	2	22	102				
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	196	51			52					
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	196	51			52					
tC, single (s)	6.4	6.5			4.1					
tC, 2 stage (s)										
tF (s)	3.5	3.6			2.2					
p0 queue free %	99	98			99					
cM capacity (veh/h)	786	936			1567					
Direction, Lane #	WB 1	NB 1	SB 1							
Volume Total	31	52	124							
Volume Left	11	0	22							
Volume Right	20	2	0							
cSH	878	1700	1567							
Volume to Capacity	0.04	0.03	0.01							
Queue Length 95th (m)	0.8	0.0	0.3							
Control Delay (s)	9.3	0.0	1.4							
Lane LOS	А		А							
Approach Delay (s)	9.3	0.0	1.4							
Approach LOS	А									
Intersection Summary										
Average Delay			2.2					 		
Intersection Capacity Utiliza	ation		22.1%	IC	U Level of	Service	,		А	A
Analysis Period (min)			15							

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			र्भ	f,	
Volume (veh/h)	11	9	0	32	94	0
Sign Control	Stop	· ·	· ·	Free	Free	•
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	14	12	0	42	124	0
Pedestrians			Ū			Ŭ
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	166	124	124			
vC1, stage 1 conf vol	100	121	121			
vC2, stage 2 conf vol						
vCu, unblocked vol	166	124	124			
tC, single (s)	6.7	6.2	4.1			
tC, 2 stage (s)	0.1	0.2				
tF (s)	3.8	3.3	2.2			
p0 queue free %	98	99	100			
cM capacity (veh/h)	758	933	1476			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	26	42	124			
Volume Left	14	0	0			
Volume Right	12	0	0			
cSH	828	1476	1700			
Volume to Capacity	0.03	0.00	0.07			
Queue Length 95th (m)	0.7	0.0	0.0			
Control Delay (s)	9.5	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.5	0.0	0.0			
Approach LOS	А					
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization	ation		14.9%	IC	CU Level o	f Service
Analysis Period (min)			15			

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		र्भ	4		Y	
Volume (veh/h)	0	0	0	0	0	0
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)	0	0	0	0	0	0
Pedestrians	•	•		•	, , , , , , , , , , , , , , , , , , ,	•
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)		None	None			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol	0				U	U
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
	4.1				0.4	0.2
tC, 2 stage (s)	2.2				3.5	3.3
tF (s)	100				3.5 100	3.3 100
p0 queue free %						
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			А			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			А			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utiliza	ation		0.0%	IC	U Level o	of Service
Analysis Period (min)			15			

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Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	Υ		eî 🗧			र्स	
Volume (veh/h)	0	0	0	0	0	Ö	
Sign Control	Stop		Free			Free	
Grade	0%		0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	0	0	0	0	0	
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	0	0			0		
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	0	0			0		
tC, single (s)	6.4	6.2			4.1		
tC, 2 stage (s)							
tF (s)	3.5	3.3			2.2		
p0 queue free %	100	100			100		
cM capacity (veh/h)	1023	1085			1623		
Direction, Lane #	WB 1	NB 1	SB 1				
Volume Total	0	0	0				
Volume Left	0	0	0				
Volume Right	Ũ	0	Ũ				
cSH	1700	1700	1700				
Volume to Capacity	0.00	0.00	0.00				
Queue Length 95th (m)	0.0	0.0	0.0				
Control Delay (s)	0.0	0.0	0.0				
Lane LOS	A O.O	0.0	0.0				
Approach Delay (s)	0.0	0.0	0.0				
Approach LOS	A	0.0	0.0				
Intersection Summary							
Average Delay			0.0				
Intersection Capacity Utiliza	ation		0.0%	IC	CU Level c	f Service	
Analysis Period (min)			15				
			15				

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			र्भ	¢Î,	
Volume (veh/h)	8	40	3	8	10	6
Sign Control	Stop		-	Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Hourly flow rate (vph)	12	59	4	12	15	9
Pedestrians			·			Ū
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)				Tiono	Nono	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	40	19	24			
vC1, stage 1 conf vol	Ĩ	10	21			
vC2, stage 2 conf vol						
vCu, unblocked vol	40	19	24			
tC, single (s)	6.7	6.3	4.4			
tC, 2 stage (s)	0.1	0.0	•••			
tF (s)	3.8	3.4	2.5			
p0 queue free %	99	94	100			
cM capacity (veh/h)	905	1048	1412			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	71	16	24			
Volume Left	12	4	0			
Volume Right	59	0	9			
cSH	1021	1412	1700			
Volume to Capacity	0.07	0.00	0.01			
Queue Length 95th (m)	1.7	0.1	0.0			
Control Delay (s)	8.8	2.1	0.0			
Lane LOS	А	A				
Approach Delay (s)	8.8	2.1	0.0			
Approach LOS	А					
Intersection Summary						
Average Delay			5.9			
Intersection Capacity Utilization	ation		13.3%	IC	CU Level o	f Service
Analysis Period (min)			15			
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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	f,			स	Y	
Volume (veh/h)	0	0	0	0	0	0
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)	0.02	0.02	0.02	0.02	0	0.02
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			0		0	0
vC1, stage 1 conf vol			v		v	v
vC2, stage 2 conf vol						
vCu, unblocked vol			0		0	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					0.1	0.2
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1623		1023	1085
					1020	1000
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			А			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			А			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilizat	tion		0.0%	IC	U Level o	of Service
Analysis Period (min)			15			
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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		با	¢Î		Y	•=••
Volume (veh/h)	25	251	431	73	42	9
Sign Control	20	Free	Free	15	Stop	5
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	273	468	79	46	10
Pedestrians	21	215	400	19	40	10
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	548				835	508
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	548				835	508
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	97				86	98
cM capacity (veh/h)	983				331	569
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	300	548	55			
Volume Left	27	040	46			
	0	79	40			
Volume Right						
cSH	983	1700	357			
Volume to Capacity	0.03	0.32	0.16			
Queue Length 95th (m)	0.6	0.0	4.1			
Control Delay (s)	1.1	0.0	16.9			
Lane LOS	Α		С			
Approach Delay (s)	1.1	0.0	16.9			
Approach LOS			С			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utiliza	ation		44.0%	IC	U Level o	of Service
Analysis Period (min)			15			
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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Υ			ર્સ	¢Î,	
Volume (veh/h)	12	17	26	77	51	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	15	21	32	96	64	10
Pedestrians	10	21	02	50	U-T	10
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
				None	None	
Median type				NONE	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked	000	00	74			
vC, conflicting volume	230	69	74			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	230	69	74			
tC, single (s)	6.4	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.2			
p0 queue free %	98	98	98			
cM capacity (veh/h)	747	964	1539			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	36	129	74			
Volume Left	15	32	0			
Volume Right	21	0	10			
cSH	860	1539	1700			
Volume to Capacity	0.04	0.02	0.04			
Queue Length 95th (m)	1.0	0.5	0.0			
Control Delay (s)	9.4	2.0	0.0			
Lane LOS	A	A	0.0			
Approach Delay (s)	9.4	2.0	0.0			
Approach LOS	A	2.0	0.0			
Intersection Summary						
Average Delay			2.5			
Intersection Capacity Utiliza	ation		22.2%	IC	CU Level o	f Service
Analysis Period (min)			15	I.		
			10			

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		र्स	4		Y	
Volume (veh/h)	6	198	301	49	17	2
Sign Control	J	Free	Free		Stop	-
Grade		0%	0%		0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	6	202	307	50	17	2
Pedestrians	0	202	507	00	17	L
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		None	None			
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked	^_ _				E 10	000
vC, conflicting volume	357				546	332
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	357				546	332
tC, single (s)	4.3				6.4	6.7
tC, 2 stage (s)						
tF (s)	2.4				3.5	3.8
p0 queue free %	99				97	100
cM capacity (veh/h)	1108				499	612
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	208	357	19			
Volume Left	6	0	17			
Volume Right	0	50	2			
cSH	1108	1700	509			
Volume to Capacity	0.01	0.21	0.04			
Queue Length 95th (m)	0.1	0.0	0.9			
Control Delay (s)	0.3	0.0	12.4			
Lane LOS	A	0.0	B			
Approach Delay (s)	0.3	0.0	12.4			
Approach LOS	0.0	0.0	12.4 B			
Intersection Summary						
			0.5			
Average Delay	ation				المربعا	of Service
Intersection Capacity Utiliza	auon		28.8%	IC IC		I Service
Analysis Period (min)			15			

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		4			र्स
Volume (veh/h)	9	14	89	12	26	41
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67
Hourly flow rate (vph)	13	21	133	18	39	61
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	281	142			151	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	281	142			151	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	98			97	
cM capacity (veh/h)	694	911			1443	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	34	151	100			
Volume Left	13	0	39			
Volume Right	21	18	0			
cSH	812	1700	1443			
Volume to Capacity	0.04	0.09	0.03			
Queue Length 95th (m)	1.0	0.0	0.6			
Control Delay (s)	9.6	0.0	3.1			
Lane LOS	А		А			
Approach Delay (s)	9.6	0.0	3.1			
Approach LOS	А					
Intersection Summary						
Average Delay			2.2			
Intersection Capacity Utilization	ation		20.3%	IC	U Level o	of Service
Analysis Period (min)			15			

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	¥			र्स	4Î	
Volume (veh/h)	4	2	1	97	49	1
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)	4	2	1	108	54	1
Pedestrians					-	
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)				Tiono	Nono	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	165	55	56			
vC1, stage 1 conf vol	100	00	50			
vC2, stage 2 conf vol						
vCu, unblocked vol	165	55	56			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	0.4	0.2	4.1			
tF (s)	3.5	3.3	2.2			
	99	100	100			
p0 queue free %	830		1562			
cM capacity (veh/h)		1018				
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	7	109	56			
Volume Left	4	1	0			
Volume Right	2	0	1			
cSH	884	1562	1700			
Volume to Capacity	0.01	0.00	0.03			
Queue Length 95th (m)	0.2	0.0	0.0			
Control Delay (s)	9.1	0.1	0.0			
Lane LOS	А	А				
Approach Delay (s)	9.1	0.1	0.0			
Approach LOS	А					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization	tion		15.9%	IC	CU Level c	f Service
Analysis Period (min)			15			
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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		र्भ	4		Y	
Volume (veh/h)	0	0	0	0	0	0
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)	0	0	0	0	0	0
Pedestrians	•	•		•	, , , , , , , , , , , , , , , , , , ,	•
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)		None	None			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol	0				U	U
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
	4.1				0.4	0.2
tC, 2 stage (s)	2.2				3.5	3.3
tF (s)	100				3.5 100	3.3 100
p0 queue free %						
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			А			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			А			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utiliza	ation		0.0%	IC	U Level o	of Service
Analysis Period (min)			15			

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Movement	WBL	WBR	NBT	NBR	SBL	SBT	j	
Lane Configurations	Y		4Î			र्स		
Volume (veh/h)	0	0	0	0	0	0		
Sign Control	Stop		Free			Free		
Grade	0%		0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	0	0	0	0	0	0		
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	0	0			0			
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	0	0			0			
tC, single (s)	6.4	6.2			4.1			
tC, 2 stage (s)								
tF (s)	3.5	3.3			2.2			
p0 queue free %	100	100			100			
cM capacity (veh/h)	1023	1085			1623			
Direction, Lane #	WB 1	NB 1	SB 1					
Volume Total	0	0	0					
Volume Left	0	0	0					
Volume Right	0	0	0					
cSH	1700	1700	1700					
Volume to Capacity	0.00	0.00	0.00					
Queue Length 95th (m)	0.0	0.0	0.0					
Control Delay (s)	0.0	0.0	0.0					
Lane LOS	A	0.0						
Approach Delay (s)	0.0	0.0	0.0					
Approach LOS	A		0.0					
Intersection Summary								
Average Delay			0.0					
Intersection Capacity Utiliza	ation		0.0%	IC	U Level o	f Service		
Analysis Period (min)			15	.0				
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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Υ			र्स	¢Î,	
Volume (veh/h)	10	12	42	12	7	6
Sign Control	Stop			Free	Free	-
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	12	14	49	14	8	7
Pedestrians	12		10		v	•
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)				NULLE	NONE	
Upstream signal (m)						
pX, platoon unblocked	125	12	15			
vC, conflicting volume	120	IZ	IJ			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol	405	40	45			
vCu, unblocked vol	125	12	15			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	0.5					
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	97			
cM capacity (veh/h)	848	1075	1616			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	26	64	15			
Volume Left	12	49	0			
Volume Right	14	0	7			
cSH	958	1616	1700			
Volume to Capacity	0.03	0.03	0.01			
Queue Length 95th (m)	0.6	0.7	0.0			
Control Delay (s)	8.9	5.7	0.0			
Lane LOS	А	А				
Approach Delay (s)	8.9	5.7	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			5.7			
Intersection Capacity Utiliza	tion		19.6%	IC	CU Level o	Service
Analysis Period (min)			15.070			0011100
			15			

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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	f,			स	Y	
Volume (veh/h)	0	0	0	0	0	0
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)	0.02	0.02	0.02	0.02	0	0.02
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			0		0	0
vC1, stage 1 conf vol			v		v	Ū
vC2, stage 2 conf vol						
vCu, unblocked vol			0		0	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					0.1	J.L
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1623		1023	1085
					1020	1000
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			А			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			А			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilizat	tion		0.0%	IC	U Level o	of Service
Analysis Period (min)			15			
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Appendix C

2019 Total Traffic Intersection Operations Calculations

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		ર્સ	ef 👘		¥	
Volume (veh/h)	14	405	180	42	184	40
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	15	435	194	45	198	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)		NULLE	NULLE			
Upstream signal (m)						
pX, platoon unblocked	000				COO	040
vC, conflicting volume	239				682	216
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						040
vCu, unblocked vol	239				682	216
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	99				52	95
cM capacity (veh/h)	1305				409	829
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	451	239	241			
Volume Left	15	0	198			
Volume Right	0	45	43			
cSH	1305	1700	450			
Volume to Capacity	0.01	0.14	0.54			
Queue Length 95th (m)	0.3	0.0	23.5			
Control Delay (s)	0.4	0.0	21.8			
Lane LOS	A		C			
Approach Delay (s)	0.4	0.0	21.8			
Approach LOS			С			
Intersection Summary						
Average Delay			5.8			
Intersection Capacity Utiliza	ation		51.9%	IC	U Level o	of Service
Analysis Period (min)			15			
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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			ર્શ	4Î	
Volume (veh/h)	16	102	35	56	64	14
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.58	0.58	0.58	0.58	0.58	0.58
Hourly flow rate (vph)	28	176	60	97	110	24
Pedestrians				•••		- ·
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)				NULLE	NONE	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	340	122	134			
vC1, stage 1 conf vol	340	122	134			
vC1, stage 2 conf vol						
vCu, unblocked vol	340	122	134			
tC, single (s)	6.4	6.2	4.3			
• • • •	0.4	0.2	4.3			
tC, 2 stage (s)	25	2.2	0.4			
tF (s)	3.5	3.3	2.4			
p0 queue free %	96	81	96			
cM capacity (veh/h)	631	934	1363			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	203	157	134			
Volume Left	28	60	0			
Volume Right	176	0	24			
cSH	877	1363	1700			
Volume to Capacity	0.23	0.04	0.08			
Queue Length 95th (m)	6.8	1.1	0.0			
Control Delay (s)	10.3	3.2	0.0			
Lane LOS	В	А				
Approach Delay (s)	10.3	3.2	0.0			
Approach LOS	В					
Intersection Summary						
Average Delay			5.3			
Intersection Capacity Utilizati	ion		25.4%	IC	CU Level of	Service
Analysis Period (min)			15			

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		र्स	4Î		M	
Volume (veh/h)	2	296	145	11	65	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	2	361	177	13	79	10
Pedestrians	_					
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)		10110	110110			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	190				549	184
vC1, stage 1 conf vol	100				040	107
vC2, stage 2 conf vol						
vCu, unblocked vol	190				549	184
tC, single (s)	4.1				6.4	6.5
tC, 2 stage (s)	7.1				0.7	0.0
tF (s)	2.2				3.5	3.6
p0 queue free %	100				3.3 84	99
cM capacity (veh/h)	1396				490	794
					430	1 34
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	363	190	89			
Volume Left	2	0	79			
Volume Right	0	13	10			
cSH	1396	1700	512			
Volume to Capacity	0.00	0.11	0.17			
Queue Length 95th (m)	0.0	0.0	4.7			
Control Delay (s)	0.1	0.0	13.5			
Lane LOS	А		В			
Approach Delay (s)	0.1	0.0	13.5			
Approach LOS			В			
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utiliza	ation		27.9%	IC	U Level o	of Service
Analysis Period (min)			15			
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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		4			र्स
Volume (veh/h)	12	21	70	22	28	137
Sign Control	Stop	21	Free		20	Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	14	25	84	27	34	165
Pedestrians	14	20	04	21	54	105
Lane Width (m)						
()						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)			NI-			Man
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	330	98			111	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	330	98			111	
tC, single (s)	6.4	6.5			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.6			2.2	
p0 queue free %	98	97			98	
cM capacity (veh/h)	654	880			1492	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	40	111	199			
Volume Left	40	0	34			
Volume Right	25	27	0			
cSH	782	1700	1492			
	0.05	0.07	0.02			
Volume to Capacity						
Queue Length 95th (m)	1.2	0.0	0.5			
Control Delay (s)	9.9	0.0	1.4			
Lane LOS	A	0.0	A			
Approach Delay (s)	9.9	0.0	1.4			
Approach LOS	A					
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization	ation		25.4%	IC	U Level of	Service
Analysis Period (min)			15			

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	¥			र्स	4	
Volume (veh/h)	33	39	6	60	135	14
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	43	51	8	79	178	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)				110110	110110	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	282	187	196			
vC1, stage 1 conf vol	202	107	150			
vC2, stage 2 conf vol						
vCu, unblocked vol	282	187	196			
tC, single (s)	6.7	6.2	4.1			
tC, 2 stage (s)	0.7	0.2	7.1			
tF (s)	3.8	3.3	2.2			
p0 queue free %	93	94	2.2 99			
cM capacity (veh/h)	644	860	1389			
	044	000				
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	95	87	196			
Volume Left	43	8	0			
Volume Right	51	0	18			
cSH	745	1389	1700			
Volume to Capacity	0.13	0.01	0.12			
Queue Length 95th (m)	3.3	0.1	0.0			
Control Delay (s)	10.5	0.7	0.0			
Lane LOS	В	А				
Approach Delay (s)	10.5	0.7	0.0			
Approach LOS	В					
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization	on		19.0%	IC	CU Level o	Service
Analysis Period (min)			15			
			10			

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		र्स	4		¥	
Volume (veh/h)	0	0	0	0	0	0
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)	0	0	0	0	0	0
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	0				0	0
vC1, stage 1 conf vol	Ū					v
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					••••	·
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085
					1020	1000
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utiliza	ation		0.0%	IC	U Level o	of Service
Analysis Period (min)			15			
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Movement	EBL	EBR	SET	SER	NWL	NWT
Lane Configurations	Y		4Î			र्स
Volume (veh/h)	22	61	164	11	12	44
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	29	80	216	14	16	58
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)			None			None
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	312	223			230	
vC1, stage 1 conf vol	JIZ	225			200	
vC2, stage 2 conf vol						
vCu, unblocked vol	312	223			230	
tC, single (s)	6.4	6.2			4.1	
	0.4	0.2			4.1	
tC, 2 stage (s)	3.5	3.3			2.2	
tF (s)	3.5 96	3.3 90			2.2 99	
p0 queue free %						
cM capacity (veh/h)	676	822			1350	
Direction, Lane #	EB 1	SE 1	NW 1			
Volume Total	109	230	74			
Volume Left	29	0	16			
Volume Right	80	14	0			
cSH	777	1700	1350			
Volume to Capacity	0.14	0.14	0.01			
Queue Length 95th (m)	3.7	0.0	0.3			
Control Delay (s)	10.4	0.0	1.7			
Lane LOS	В		А			
Approach Delay (s)	10.4	0.0	1.7			
Approach LOS	В					
Intersection Summary						
Average Delay			3.1			
Intersection Capacity Utilizat	tion		24.4%	IC	Ulevelo	of Service
Analysis Period (min)			15	10	5 201010	
			10			

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		¢Î			र्स
Volume (veh/h)	0	0	0	0	0	1
Sign Control	Stop	5	Free	0	v	Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0.92	0.92	0.92	0.92	0.92	0.92
Pedestrians	0	U	U	U	U	U
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)			NI-			Max
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked					-	
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.00	0.00			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS		0.0	0.0			
	A	0.0	0.0			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	А					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization	tion		0.0%	IC	CU Level of	Service
Analysis Period (min)			15			

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			र्भ	4Î	
Volume (veh/h)	16	63	5	8	10	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Hourly flow rate (vph)	24	93	7	12	15	15
Pedestrians	21	00		12	10	10
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
				None	NONE	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked	40	00	00			
vC, conflicting volume	49	22	29			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	49	22	29			
tC, single (s)	6.7	6.3	4.4			
tC, 2 stage (s)						
tF (s)	3.8	3.4	2.5			
p0 queue free %	97	91	99			
cM capacity (veh/h)	892	1044	1405			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	116	19	29			
Volume Left	24	7	0			
Volume Right	93	0	15			
cSH	1009	1405	1700			
Volume to Capacity	0.12	0.01	0.02			
Queue Length 95th (m)	3.0	0.1	0.0			
Control Delay (s)	9.0	2.9	0.0			
Lane LOS	A	A	0.0			
Approach Delay (s)	9.0	2.9	0.0			
Approach LOS	A	2.0	0.0			
Intersection Summary						
Average Delay			6.7			
Intersection Capacity Utilization	ation		16.3%	IC	CU Level of	F Sonvico
	allUll			IC		Service
Analysis Period (min)			15			

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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	4Î			र्स	Y	
Volume (veh/h)	0	0	0	0	0	0
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)	0	0	0	0	0	0
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			0		0	0
vC1, stage 1 conf vol			-			
vC2, stage 2 conf vol						
vCu, unblocked vol			0		0	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1623		1023	1085
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	0.0	0.0	A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utiliza	ation		0.0%	IC	U Level o	of Service
Analysis Period (min)			15			

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Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations		र्स	¢Î		Y		
Volume (veh/h)	51	251	431	149	74	16	
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)	55	273	468	162	80	17	
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	630				933	549	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	630				933	549	
tC, single (s)	4.2				6.4	6.2	
tC, 2 stage (s)							
tF (s)	2.3				3.5	3.3	
p0 queue free %	94				71	97	
cM capacity (veh/h)	915				280	539	
Direction, Lane #	EB 1	WB 1	SB 1				
Volume Total	328	630	98				
Volume Left	55	0	80				
Volume Right	0	162	17				
cSH	915	1700	306				
Volume to Capacity	0.06	0.37	0.32				
Queue Length 95th (m)	1.5	0.0	10.2				
Control Delay (s)	2.1	0.0	22.2				
Lane LOS	А		С				
Approach Delay (s)	2.1	0.0	22.2				
Approach LOS			С				
Intersection Summary							
Average Delay			2.7				
Intersection Capacity Utilizatio	n		62.9%	IC	CU Level c	f Service	
Analysis Period (min)			15				

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			र्स	4	
Volume (veh/h)	35	32	77	123	91	28
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	44	40	96	154	114	35
Pedestrians		10	00	101		00
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)				NULLE	NUILE	
Upstream signal (m) pX, platoon unblocked						
	170	101	149			
vC, conflicting volume vC1, stage 1 conf vol	478	131	149			
vC2, stage 2 conf vol	470	101	149			
vCu, unblocked vol	478	131				
tC, single (s)	6.4	6.3	4.1			
tC, 2 stage (s)	0.5	0.4	0.0			
tF (s)	3.5	3.4	2.2			
p0 queue free %	91	96	93			
cM capacity (veh/h)	514	890	1445			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	84	250	149			
Volume Left	44	96	0			
Volume Right	40	0	35			
cSH	643	1445	1700			
Volume to Capacity	0.13	0.07	0.09			
Queue Length 95th (m)	3.4	1.6	0.0			
Control Delay (s)	11.4	3.3	0.0			
Lane LOS	В	A				
Approach Delay (s)	11.4	3.3	0.0			
Approach LOS	В					
Intersection Summary						
Average Delay			3.7			
Intersection Capacity Utiliz	ation		28.0%	IC	CU Level of	Service
Analysis Period (min)			15			20.1100
			10			

MovementEBLEBTWBTWBRSBLSBRLane ConfigurationsImage: stress of the stress
Lane ConfigurationsImage: Configuration for the systemVolume (veh/h)619830193262Sign ControlFreeFreeStopGrade0%0%0%Peak Hour Factor0.980.980.980.980.98Hourly flow rate (vph)620230795272PedestriansImage: Configuration for the systemImage: Configuration for the systemImage: Configuration for the systemImage: Configuration for the systemWalking Speed (m/s)Image: Configuration for the systemImage: Configuration for the systemImage: Configuration for the system
Volume (veh/h) 6 198 301 93 26 2 Sign Control Free Free Stop Grade 0% 0% 0% 0% 0% Peak Hour Factor 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98
Sign Control Free Free Stop Grade 0% 0% 0% Peak Hour Factor 0.98 0.98 0.98 0.98 0.98 Hourly flow rate (vph) 6 202 307 95 27 2 Pedestrians
Grade 0% 0% Peak Hour Factor 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98
Peak Hour Factor 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98
Hourly flow rate (vph) 6 202 307 95 27 2 Pedestrians Lane Width (m) Walking Speed (m/s)
Pedestrians Lane Width (m) Walking Speed (m/s)
Walking Speed (m/s)
Walking Speed (m/s)
Right turn flare (veh)
Median type None None
Median storage veh)
Upstream signal (m)
pX, platoon unblocked
vC, conflicting volume 402 569 355
vC1, stage 1 conf vol
vC2, stage 2 conf vol
vCu, unblocked vol 402 569 355
tC, single (s) 4.3 6.4 6.7
tC, 2 stage (s)
tF (s) 2.4 3.5 3.8
p0 queue free % 99 95 100
cM capacity (veh/h) 1066 484 593
Direction, Lane # EB 1 WB 1 SB 1
· · · · · · · · · · · · · · · · · · ·
Volume Left 6 0 27
Volume Right 0 95 2
cSH 1066 1700 491
Volume to Capacity 0.01 0.24 0.06
Queue Length 95th (m) 0.1 0.0 1.4
Control Delay (s) 0.3 0.0 12.8
Lane LOS A B
Approach Delay (s) 0.3 0.0 12.8
Approach LOS B
Intersection Summary
Average Delay 0.7
Intersection Capacity Utilization 31.5% ICU Level of Service
Analysis Period (min) 15

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	¥		4Î			स
Volume (veh/h)	34	39	161	23	33	91
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67
Hourly flow rate (vph)	51	58	240	34	49	136
Pedestrians	01	00	210	01	10	100
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)			NOTIE			NOTE
č ,						
Upstream signal (m)						
pX, platoon unblocked	400	057			075	
vC, conflicting volume	492	257			275	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol	400	057			075	
vCu, unblocked vol	492	257			275	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	<u> </u>					
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	93			96	
cM capacity (veh/h)	519	786			1300	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	109	275	185			
Volume Left	51	0	49			
Volume Right	58	34	0			
cSH	634	1700	1300			
Volume to Capacity	0.17	0.16	0.04			
Queue Length 95th (m)	4.7	0.0	0.9			
Control Delay (s)	11.8	0.0	2.3			
Lane LOS	В		A			
Approach Delay (s)	11.8	0.0	2.3			
Approach LOS	В					
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utiliza	ation		30.8%	IC	U Level of	Service
Analysis Period (min)			15			0011100
			10			

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	¥			र्स	4	
Volume (veh/h)	33	12	27	151	79	46
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)	37	13	30	168	88	51
Pedestrians	•••					
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)					10110	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	341	113	139			
vC1, stage 1 conf vol	170	115	100			
vC2, stage 2 conf vol						
vCu, unblocked vol	341	113	139			
tC, single (s)	6.4	6.2	4.1			
	0.4	0.2	4.1			
tC, 2 stage (s) tF (s)	3.5	3.3	2.2			
	3.5 94	3.3 99	2.2 98			
p0 queue free %						
cM capacity (veh/h)	645	945	1457			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	50	198	139			
Volume Left	37	30	0			
Volume Right	13	0	51			
cSH	705	1457	1700			
Volume to Capacity	0.07	0.02	0.08			
Queue Length 95th (m)	1.7	0.5	0.0			
Control Delay (s)	10.5	1.3	0.0			
Lane LOS	В	А				
Approach Delay (s)	10.5	1.3	0.0			
Approach LOS	В					
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilizat	tion		29.7%	IC	CU Level of	Service
Analysis Period (min)			15			

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		र्भ	4		Y	
Volume (veh/h)	0	0	0	0	0	0
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)	0	0	0	0	0	0
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	0				0	0
vC1, stage 1 conf vol	Ŭ				v	·
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					•••	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.00	0.00	0.00			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	0.0	0.0	0.0 A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	0.0	0.0	0.0 A			
			Л			
Intersection Summary			0.0			
Average Delay			0.0			(0 ·
Intersection Capacity Utilizat	tion		0.0%	IC	CU Level o	of Service
Analysis Period (min)			15			

MovementEBLEBRNBLNBTSBTSBRLane ConfigurationsY41Volume (veh/h)2920511497120Sign ControlStopFreeFreeGrade0%0%0%0%Peak Hour Factor0.900.900.900.900.90Hourly flow rate (vph)3222571667922PedestriansLane Width (m)Valking Speed (m/s)Percent BlockageRight turn flare (veh)
Lane Configurations Y Image: Configuration in the image:
Volume (veh/h) 29 20 51 149 71 20 Sign Control Stop Free Free Grade 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%
Sign Control Stop Free Free Grade 0% 0% 0% Peak Hour Factor 0.90 0.90 0.90 0.90 Hourly flow rate (vph) 32 22 57 166 79 22 Pedestrians Image: Control of the second
Grade 0% 0% 0% Peak Hour Factor 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90
Peak Hour Factor 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90
Hourly flow rate (vph) 32 22 57 166 79 22 Pedestrians Lane Width (m) Walking Speed (m/s) Percent Blockage
Pedestrians Lane Width (m) Walking Speed (m/s) Percent Blockage
Walking Speed (m/s) Percent Blockage
Walking Speed (m/s) Percent Blockage
Percent Blockage
Median type None None
Median storage veh)
Upstream signal (m)
pX, platoon unblocked
vC, conflicting volume 369 90 101
vC1, stage 1 conf vol
vC2, stage 2 conf vol
vCu, unblocked vol 369 90 101
tC, single (s) 6.4 6.2 4.1
tC, 2 stage (s)
tF (s) 3.5 3.3 2.2
p0 queue free % 95 98 96
cM capacity (veh/h) 611 973 1504
Direction, Lane # EB 1 NB 1 SB 1
· · · · · · · · · · · · · · · · · · ·
Volume Total 54 222 101
Volume Left 32 57 0
Volume Right 22 0 22
cSH 721 1504 1700
Volume to Capacity 0.08 0.04 0.06
Queue Length 95th (m) 1.9 0.9 0.0
Control Delay (s) 10.4 2.1 0.0
Lane LOS B A
Approach Delay (s) 10.4 2.1 0.0
Approach LOS B
Intersection Summary
Average Delay 2.8
Intersection Capacity Utilization 27.3% ICU Level of Service
Analysis Period (min) 15

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		4Î			ų
Volume (veh/h)	0	0	0	0	0	0
Sign Control	Stop	v	Free	Ū		Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0.52	0.52	0.02	0.52	0.32	0.52
Pedestrians	U	U	U	U	U	U
Lane Width (m)						
· · · ·						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)			Marra			1
Median type			None		ſ	lone
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked					•	
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A	0.0	0.0			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A	0.0	0.0			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utiliza	ation		0.0%	IC	U Level of S	Service
Analysis Period (min)			15	10		
			10			

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			र्स	¢Î	
Volume (veh/h)	18	21	86	13	7	12
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	21	25	101	15	8	14
Pedestrians	2 1	20	101	10	U	
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
				None	NONE	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked	000	45	00			
vC, conflicting volume	233	15	22			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol			~~~			
vCu, unblocked vol	233	15	22			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	98	94			
cM capacity (veh/h)	712	1070	1606			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	46	116	22			
Volume Left	21	101	0			
Volume Right	25	0	14			
cSH	868	1606	1700			
Volume to Capacity	0.05	0.06	0.01			
Queue Length 95th (m)	1.3	1.5	0.0			
Control Delay (s)	9.4	6.5	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.4	6.5	0.0			
Approach LOS	A	0.0	0.0			
Intersection Summary						
Average Delay			6.4			
Intersection Capacity Utiliza	ation		22.1%	IC	CU Level o	f Service
Analysis Period (min)			15			
			15			

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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	¢Î,			र्भ	Y	
Volume (veh/h)	0	0	0	0	0	0
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)	0	0	0	0	0	0
Pedestrians	•	· ·	•	, , , , , , , , , , , , , , , , , , ,	•	•
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)	NONE			NULLE		
Upstream signal (m)						
pX, platoon unblocked						
			0		0	0
vC, conflicting volume			U		U	U
vC1, stage 1 conf vol						
vC2, stage 2 conf vol			0		0	0
vCu, unblocked vol			0		0	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1623		1023	1085
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization	tion		0.0%	IC	Ulevelo	of Service
Analysis Period (min)			15			
			15			