SM ROCHA, LLC
Comment Response

TRAFFIC IMPACT STUDY

Comments 12.19.19:
1) Include CDOT SHAC aux lane discussion.
2) See comments below.

1. Auxiliary lane discussion added.
2. See responses throughout.

For

Meadows at Highline
Aurora, Colorado

October 2019

Prepared for:

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19-101071

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Appendices

I. Introduction

Project Overview

This traffic impact study addresses the capacity, geometric, and control requirements associated with the development entitled Meadows at Highline.

This proposed residential development consists of an apartment/condominium complex. The development is located at on the south side of Colfax Avenue (US Highway 40) between Laredo Street and Norfolk Street in Aurora, Colorado.

Study Area Boundaries

The study area to be examined in this analysis encompasses the intersections of Colfax Avenue with existing site accesses.

Figure 1 illustrates location of the site and study intersections.

Site Description

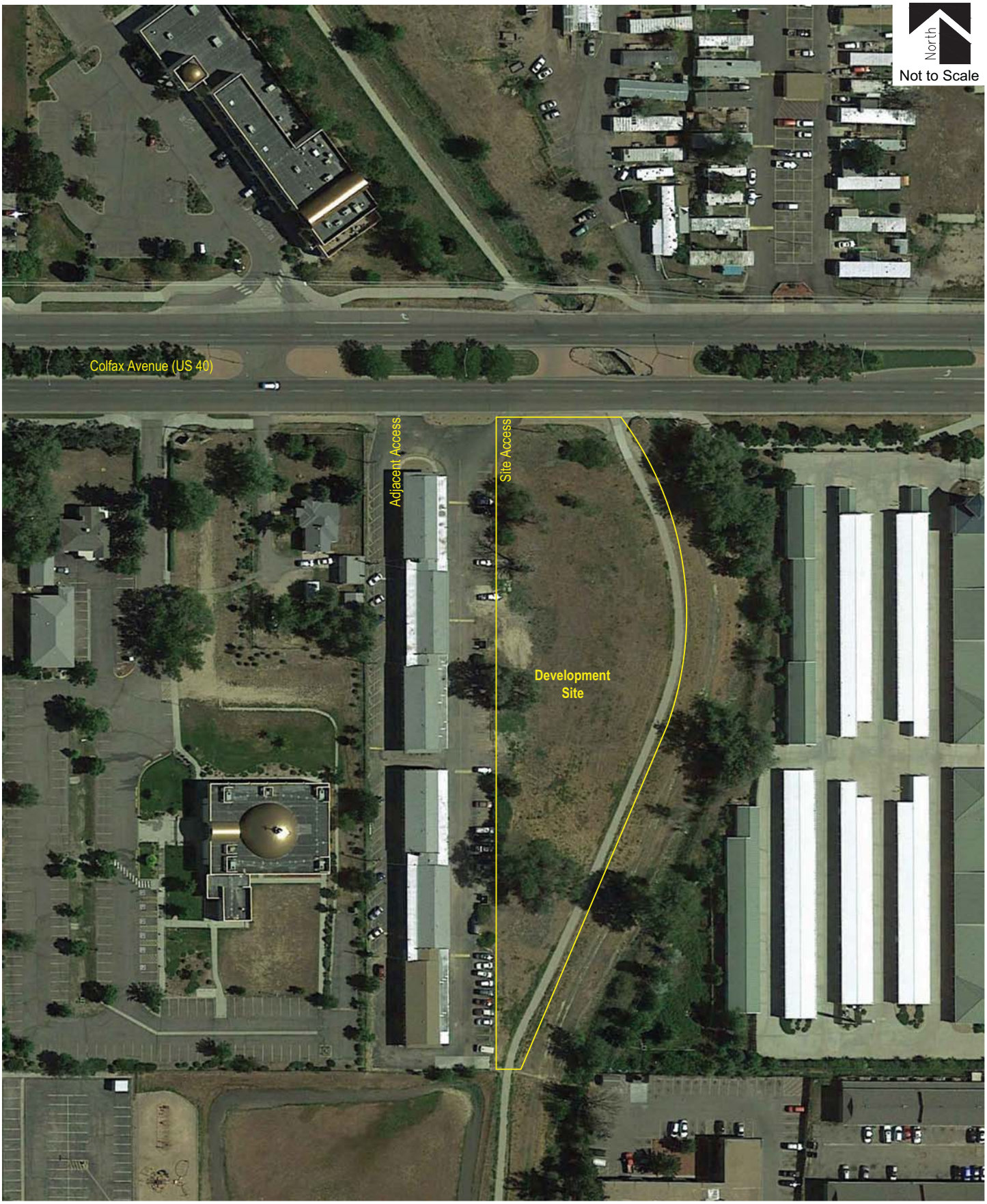
The proposed development is understood to entail the new construction of an apartment/condominium complex consisting of 25 dwelling units.

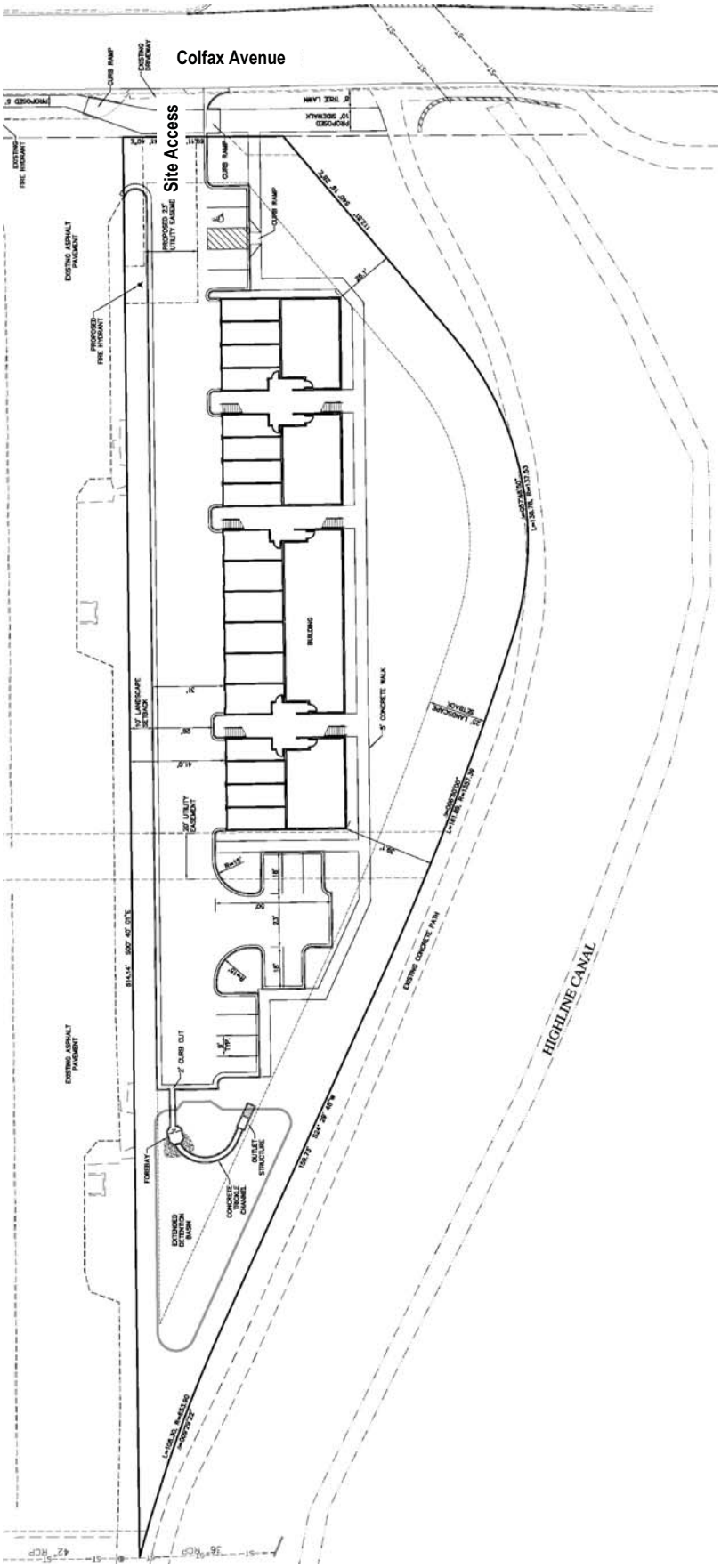
Land for the development is currently vacant and surrounded by a mix of residential, commercial, institutional, and open space land uses.

Existing access to the development is provided at the following locations: one right-in / right-out access (referred to as Site Access) located on Colfax Avenue approximately 525 feet west of Norfolk Street and shared with an existing adjacent residential development. Additional access may be provided via a second right-in/right-out access onto Colfax Avenue serving the adjacent residential property. This access (referred to as Adjacent Access) is located approximately 110 feet west of Site Access.

For purposes of this study, it is anticipated that development construction would be completed by end of Year 2021.

A conceptual site plan, as prepared by Vermilion Peak Engineering, is shown on Figure 2. This plan is provided for illustrative purposes.


North
Not to Scale
Colfax Avenue (US 40)
Adjacent Access
Site Access
Development Site



North
Not to Scale

Existing and Committed Surface Transportation Network

Within the study area, Colfax Avenue is the primary roadway that will accommodate traffic to and from the proposed development. A brief description of the study roadway is provided below:

> Colfax Avenue is an east-west state roadway having four through lanes (one lane in each direction) with exclusive turn lanes at the intersection within the study area. The Colorado Department of Transportation (CDOT) categorizes the adjacent segment of Colfax Avenue (US Highway 40) as a Regional Highway (R-A) and provides a posted speed limit of 40 MPH.

The study intersections operate under a stop-controlled condition. A stop-controlled intersection is defined as a roadway intersection where vehicle rights-of-way are controlled by one or more "STOP" signs.

No regional or specific improvements for the above described roadway are known to be planned or committed at this time. The study area roadways appear to be built to their ultimate cross-sections.

II. Existing Traffic Conditions

Morning (AM) and afternoon (PM) peak hour traffic counts were collected at the intersections of Colfax Avenue with Site Access and Adjacent Access. Average daily (24-hour) traffic volumes were collected on Colfax Avenue. Counts were collected on October 22nd, 2019, with AM peak hour counts being collected during the period of 7:00 AM to 9:00 AM, and PM peak hour counts being collected during the period of 4:00 PM to 6:00 PM. These counts are shown on Figure 3.

Traffic count data is included for reference in Appendix A.

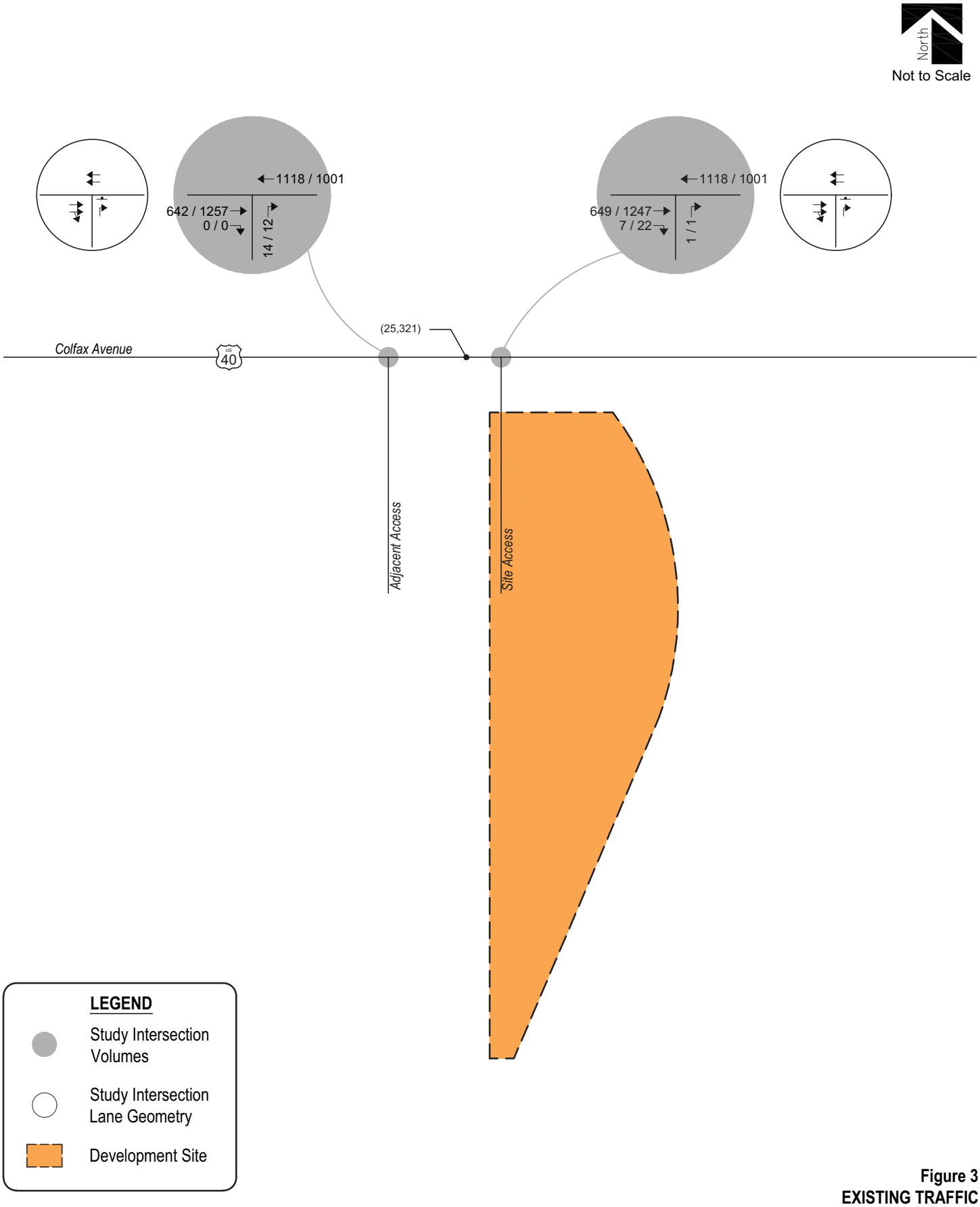


Figure 3
EXISTING TRAFFIC
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic

The Unsignalized Intersection Analysis technique, as published in the Highway Capacity Manual (HCM) by the Transportation Research Board and as incorporated into the SYNCHRO computer program, was used to analyze the study intersections for existing traffic conditions. This nationally accepted technique allows for the determination of intersection level of service (LOS) based on the congestion and delay of each traffic movement.

Level of service is a method of measurement used by transportation professionals to quantify a driver's perception of travel conditions that include travel time, number of stops, and total amount of stopped delay experienced on a roadway network. The HCM categorizes level of service into a range from "A" which indicates little, if any, vehicle delay, to "F" which indicates a level of operation considered unacceptable to most drivers. These levels of service grades with brief descriptions of the operating condition, for unsignalized and signalized intersections, are included for reference in Appendix B and have been used throughout this study.

The level of service analyses results for existing conditions are summarized in Table 1.

Intersection capacity worksheets developed for this study are provided in Appendix C.

Table 1 – Intersection Capacity Analysis Summary – Existing Traffic

INTERSECTION LANE GROUPS	LEVEL OF SERVICE AM PEAK HOUR	 PM PEAK HOUR
Colfax Avenue / Site Access (Stop-Controlled) Northbound Right	B	B
Colfax Avenue / Adjacent Access (Stop-Controlled) Northbound Right	B	B

Key: Stop-Controlled Intersection: Level of Service

Existing Traffic Analysis Results

Under existing conditions, operational analysis shows that the unsignalized intersection of Colfax Avenue with Site Access has turning movement operations at LOS B during both the morning and afternoon peak traffic hours.

The unsignalized intersection of Colfax Avenue with Adjacent Access has turning movement operations at LOS B during both the morning and afternoon peak traffic hours.

III. Future Traffic Conditions Without Proposed Development

Background traffic is the traffic projected to be on area roadways without consideration of the proposed development. Background traffic includes traffic generated by development of vacant parcels in the area.

To account for projected increases in background traffic for Years 2021 and 2040, a compounded annual growth rate was determined using traffic data provided by CDOT's Online Transportation Information System (OTIS), which anticipates a 20-year growth rate less than one percent. Therefore, in order to provide for a conservative analysis, a growth rate of approximately two percent was applied to existing traffic volumes. This annual growth rate is also consistent with regional growth projections and the level of in-fill development expected within the area.

Pursuant to the non-committed area roadway improvements discussed in Section I, Year 2021 and Year 2040 background traffic conditions assume no roadway improvements to accommodate regional transportation demands. This assumption provides for a conservative analysis.

Projected background traffic volumes and intersection geometry for Years 2021 and 2040 are shown on Figure 4 and Figure 5, respectively.

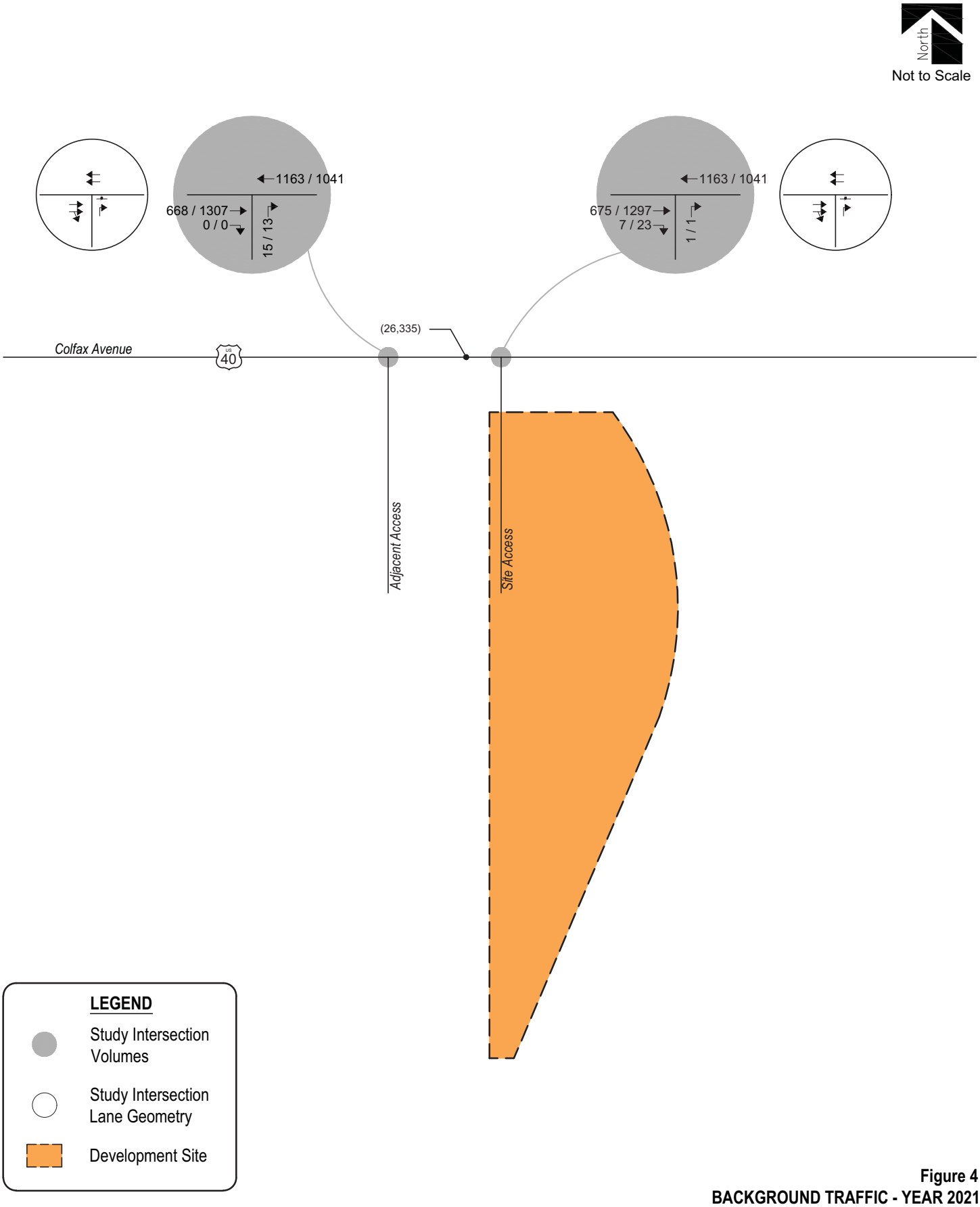


Figure 4
BACKGROUND TRAFFIC - YEAR 2021
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic

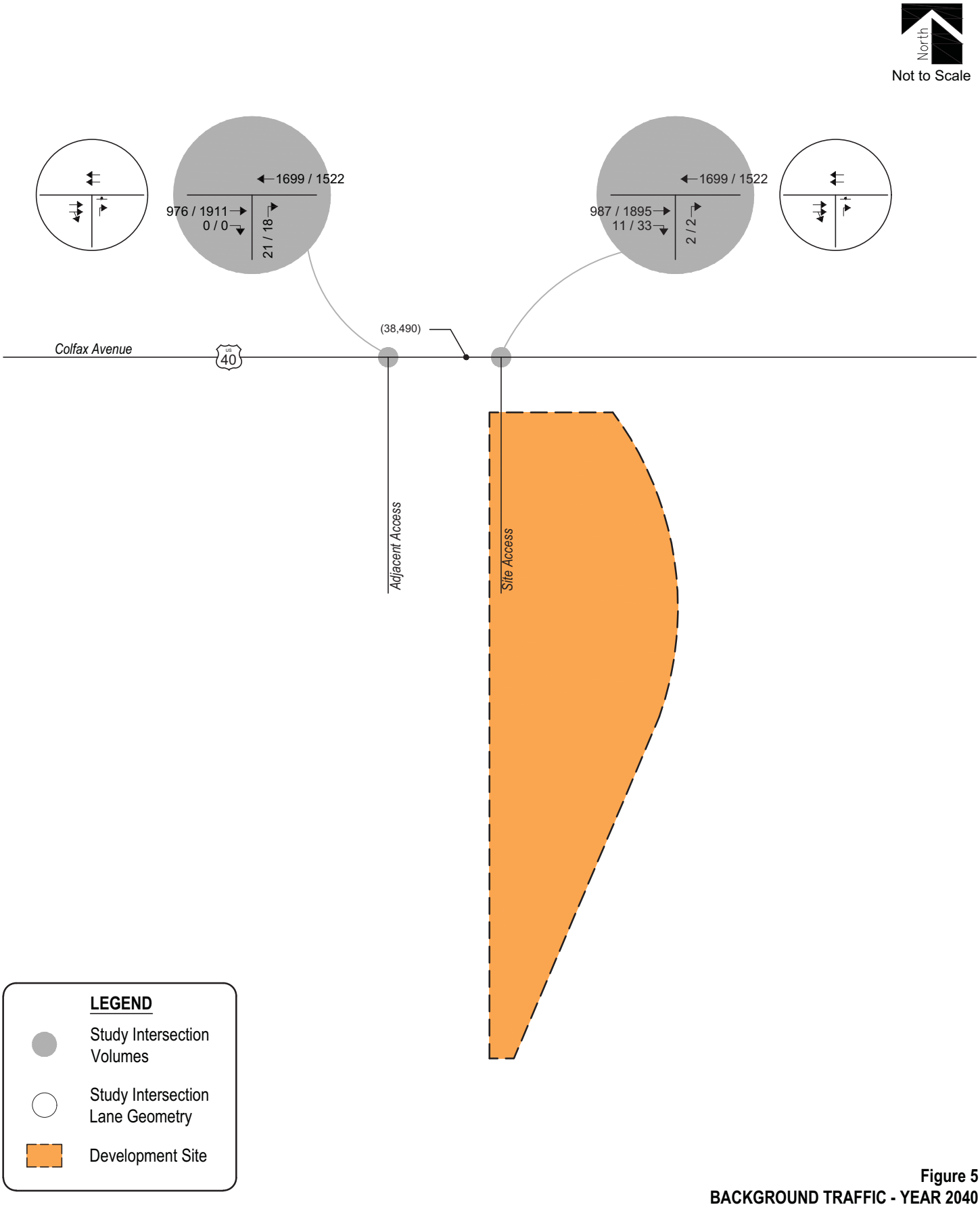


Figure 5
BACKGROUND TRAFFIC - YEAR 2040
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic

As with existing traffic conditions, the operations of study intersections were analyzed under background conditions, without the proposed development, using the SYNCHRO computer program.

Background traffic level of service analysis results for Year 2021 are listed in Table 2. Year 2040 operational results are summarized in Table 3.

Definitions of levels of service are given in Appendix B. Intersection capacity worksheets are provided in Appendix C.

Table 2 – Intersection Capacity Analysis Summary – Background Traffic – Year 2021

INTERSECTION LANE GROUPS	LEVEL OF SERVICE AM PEAK HOUR	 PM PEAK HOUR
Colfax Avenue / Site Access (Stop-Controlled) Northbound Right	B	B
Colfax Avenue / Adjacent Access (Stop-Controlled) Northbound Right	B	C

Key: Stop-Controlled Intersection: Level of Service

Background Traffic Analysis Results – Year 2021

Year 2021 background traffic analysis indicates that the unsignalized intersection of Colfax Avenue with Site Access has turning movement operations at LOS B during both the AM and PM peak traffic hours.

The unsignalized intersection of Colfax Avenue with Adjacent Access has turning movement operations at LOS B during the AM peak traffic hour and LOS C during the PM peak traffic hour.

Table 3 – Intersection Capacity Analysis Summary – Background Traffic – Year 2040

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
Colfax Avenue / Site Access (Stop-Controlled) Northbound Right	B	C
Colfax Avenue / Adjacent Access (Stop-Controlled) Northbound Right	B	C

Key: Stop-Controlled Intersection: Level of Service

Background Traffic Analysis Results – Year 2040

By Year 2040 and without the proposed development, the study intersection of Colfax Avenue with Site Access experiences LOS B operations during the AM peak traffic hour and LOS C operations during the PM peak traffic hour.

The study intersection of Colfax Avenue with Adjacent Access experiences LOS B operations during the AM peak traffic hour and LOS C operations during the PM peak traffic hour.

IV. Proposed Project Traffic

Trip Generation

Standard traffic generation characteristics compiled by the Institute of Transportation Engineers (ITE) in their report entitled Trip Generation, 10th Edition, were applied to the proposed land use in order to estimate average daily traffic (ADT), AM Peak Hour, and PM Peak Hour vehicle trips. A vehicle trip is defined as a one-way vehicle movement from a point of origin to a point of destination.

The ITE land use code 220 (Multi-Family Housing (Low-Rise)) was used for estimating trip generation because of its best fit to the proposed land use description.

Trip generation rates used in this study are presented in Table 4.

Table 4 – Trip Generation Rates

			TRIP GENERATION RATES						
ITE			24	AM PEAK HOUR			PM PEAK HOUR		
CODE	LAND USE	UNIT	HOUR	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
220	Multi-Family Housing (Low-Rise)	DU	7.32	0.11	0.35	0.46	0.35	0.21	0.56

Key: DU = Dwelling Units.
Note: All data and calculations above are subject to being rounded to nearest value.

Table 5 illustrates projected average daily traffic (ADT), AM Peak Hour, and PM Peak Hour traffic volumes likely generated by the proposed development upon build-out.

Table 5 – Trip Generation Summary

			TOTAL TRIPS GENERATED						
ITE			24	AM PEAK HOUR			PM PEAK HOUR		
CODE	LAND USE	SIZE	HOUR	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
220	Multi-Family Housing (Low-Rise)	25 DU	183	3	9	12	9	5	14
		Total:	*183*	*3*	*9*	*12*	*9*	*5*	*14*

Note: All data and calculations above are subject to being rounded to nearest value.

Upon build-out, Table 5 illustrates that the proposed development has the potential to generate approximately 183 daily trips with 12 of those occurring during the morning peak hour and 14 during the afternoon peak hour.

Adjustments to Trip Generation Rates

A development of this type is not likely to attract trips from within area land uses nor pass-by or diverted link trips from the adjacent roadway system, therefore no trip reduction was taken in this analysis.

Trip Distribution

The overall directional distribution of site-generated traffic was determined based on the location of development site within the City, proposed and existing area land uses, allowed turning movements, and available roadway network.

Overall trip distribution patterns for the development are shown on Figure 6.

Trip Assignment

Traffic assignment is how generated and distributed vehicle trips are expected to be loaded onto the available roadway network.

It is to be noted that given the right-in/right-out nature of the site access vehicle trips originating from the east and trips returning to the west are likely to perform a U-turn movement at the first available intersection or median break. Therefore, trip assignment assumes various U-turn trips and adds them eastbound and westbound movements as necessary.

Applying trip distribution patterns to site-generated traffic provides the overall site-generated trip assignments shown on Figure 6.

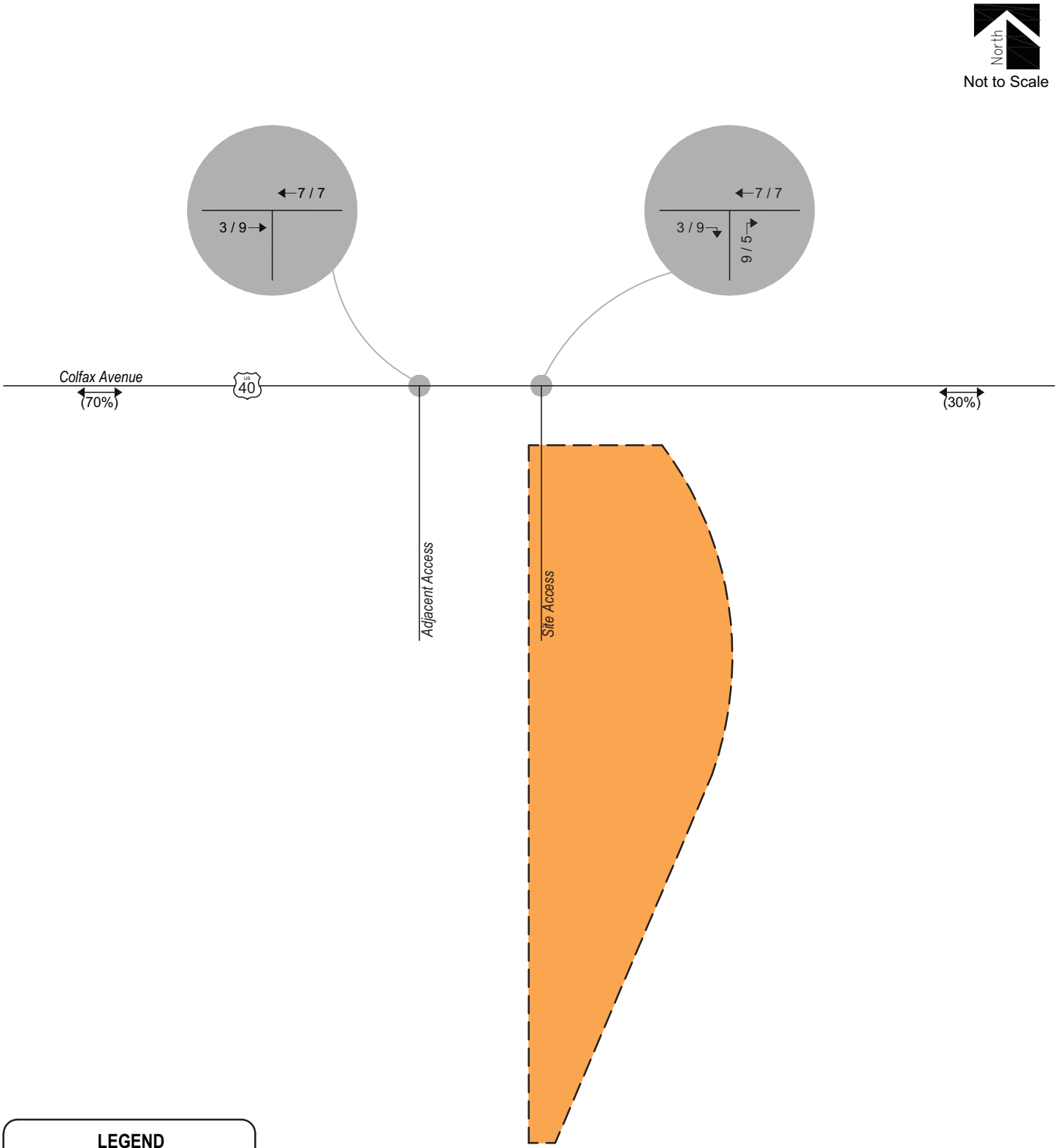


Figure 6
SITE DEVELOPMENT DISTRIBUTION
(%) : Overall
SITE-GENERATED
AM / PM Peak Hour

V. Future Traffic Conditions With Proposed Developments

Site-generated traffic was added to background traffic projections for Years 2021 and 2040 to develop total traffic projections. For analysis purposes, it was assumed that development construction would be completed by end of Year 2021.

Pursuant to area roadway improvement discussions provided in Section III, Year 2021 and Year 2040 total traffic conditions assume no roadway improvements to accommodate regional transportation demands. Roadway improvements associated with site development are expected to be limited to site access and frontage as required by the governing agency.

Projected Year 2021 total traffic volumes and intersection geometry are shown in Figure 7.

Figure 8 shows projected total traffic volumes and intersection geometry for Year 2040.

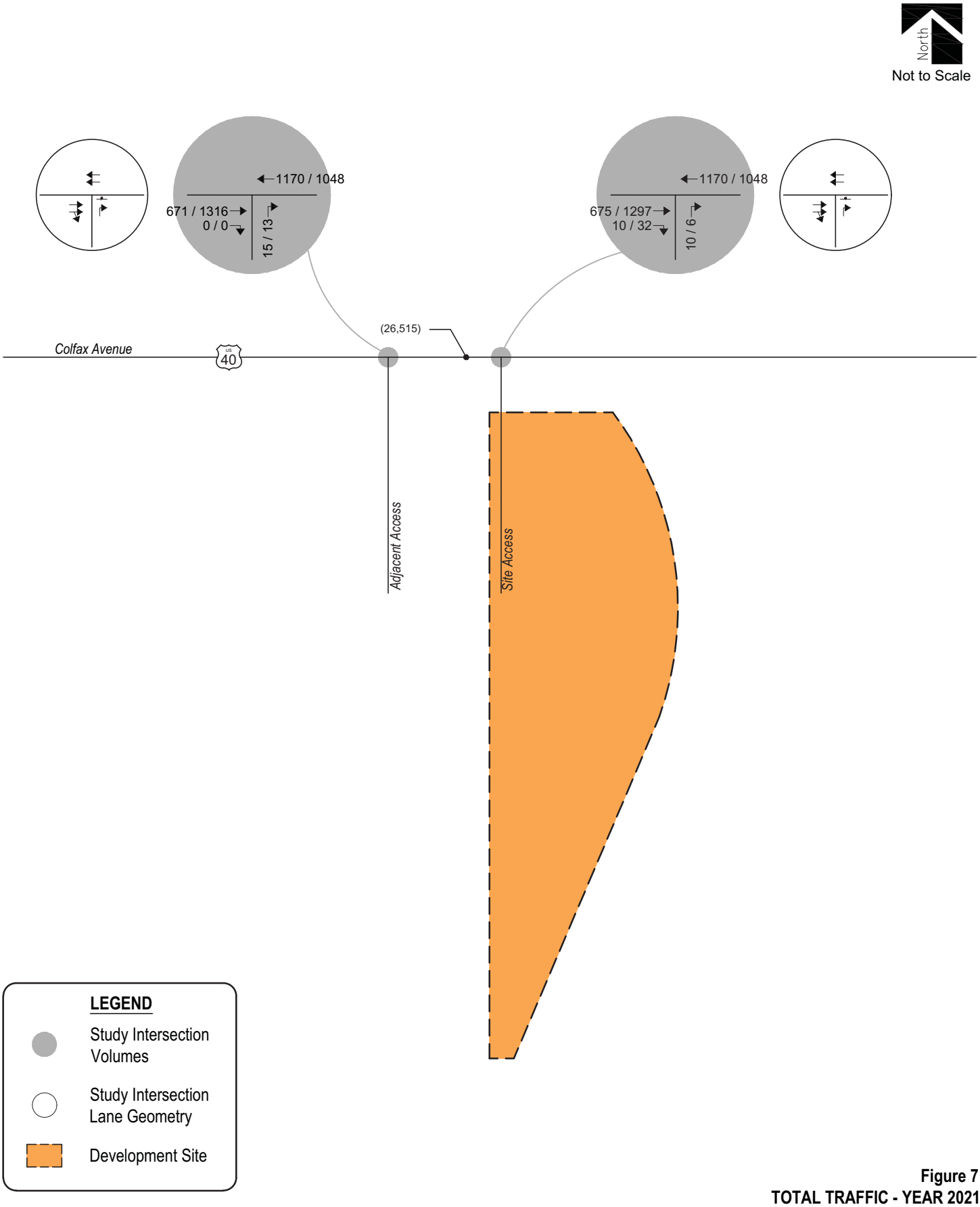


Figure 7
TOTAL TRAFFIC - YEAR 2021
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic

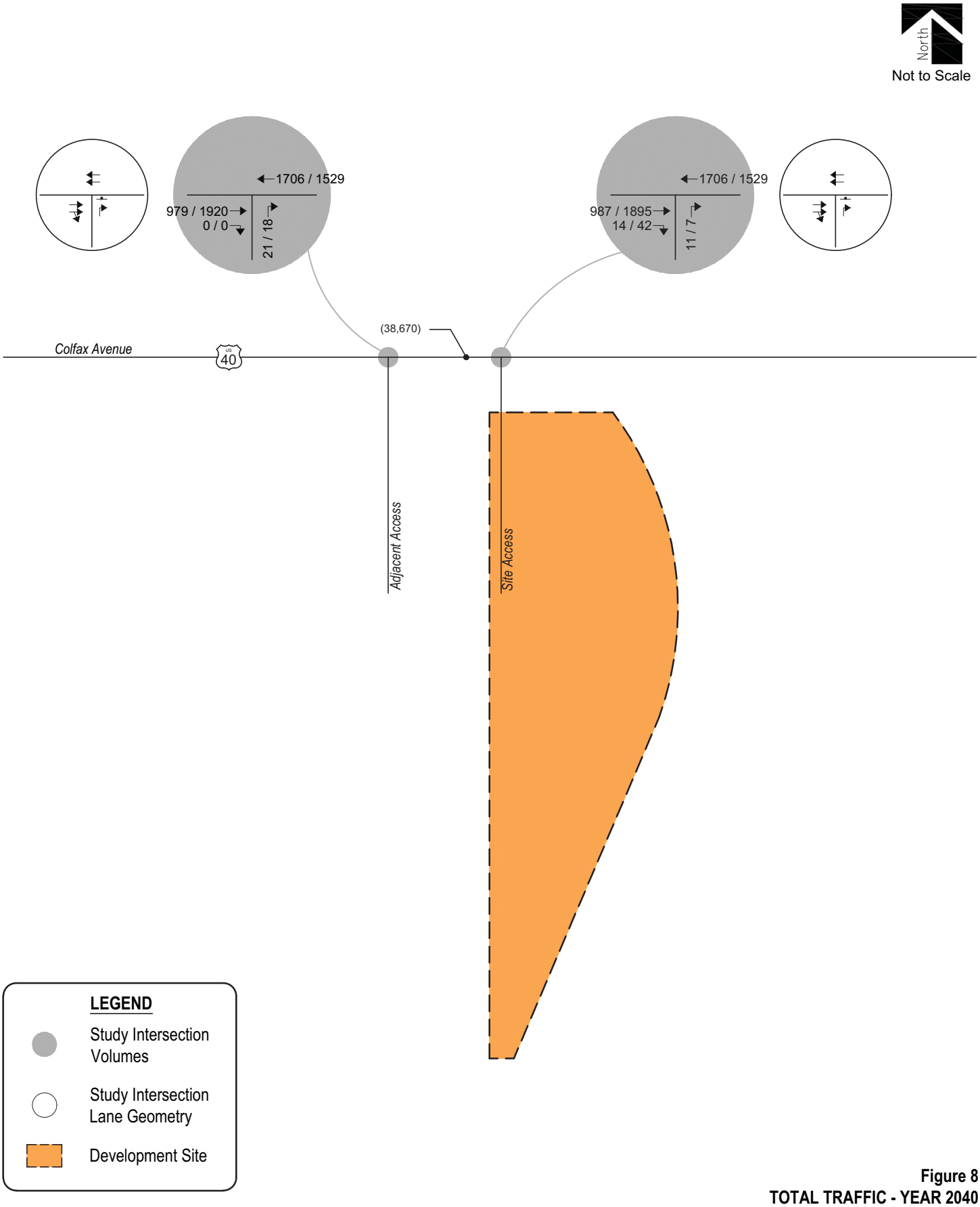


Figure 8
TOTAL TRAFFIC - YEAR 2040
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic

VI. Project Impacts

The analyses and procedures described in this study were performed in accordance with the Highway Capacity Manual (HCM) and are based upon the worst-case conditions that occur during a typical weekday upon build-out of site development and analyzed land uses. Therefore, study intersections are likely to operate with traffic conditions better than those described within this study, which represent the peak hours of weekday operations only.

Peak Hour Intersection Levels of Service

As with background traffic, the operations of the study intersections were analyzed under projected total traffic conditions using the SYNCHRO computer program. Total traffic level of service analysis results for Years 2021 and 2040 are summarized in Table 6 and Table 7, respectively.

Definitions of levels of service are given in Appendix B. Intersection capacity worksheets are provided in Appendix C.

Table 6 – Intersection Capacity Analysis Summary – Total Traffic – Year 2021

INTERSECTION	LEVEL OF SERVICE	
LANE GROUPS	AM PEAK HOUR	PM PEAK HOUR
Colfax Avenue / Site Access (Stop-Controlled)		
Northbound Right	B	B
Colfax Avenue / Adjacent Access (Stop-Controlled)		
Northbound Right	B	C

Key: Stop-Controlled Intersection: Level of Service

Table 7 – Intersection Capacity Analysis Summary – Total Traffic – Year 2040

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
Colfax Avenue / Site Access (Stop-Controlled) Northbound Right	B	C
Colfax Avenue / Adjacent Access (Stop-Controlled) Northbound Right	B	C

Key: Stop-Controlled Intersection: Level of Service

Total Traffic Analysis Results Upon Development Build-Out

Table 7 illustrates how, by Year 2040 and upon development build-out, the stop-controlled intersection of Colfax Avenue with Site Access shows turning movement operations of LOS B during the morning peak traffic hour and LOS C during the afternoon peak traffic hour. Compared to the background traffic analysis, the traffic generated by the proposed development is not expected to significantly change the operations of the study intersection.

The stop-controlled intersection of Colfax Avenue with Adjacent Access is projected to have turning movement operations at LOS B for the morning peak traffic hour and LOS C for the afternoon peak traffic hour.

These intersection operations are similar to background conditions.

Include discussion of CDOT SHAC. Based on proposed trips/ volumes, it appears no additional laneage is required, but indicate CDOT SHAC classification, thresholds for auxiliary lane and comparison of anticipated trips to thesholds.

Comment acknowledged. Auxiliary lane additional analysis section added to revised study.

VII. Conclusion

This traffic impact study addressed the capacity, geometric, and control requirements associated with the development entitled Meadows at Highline. This proposed residential development consists of an apartment/condominium complex. The development is located at on the south side of Colfax Avenue between Laredo Street and Norfolk Street in Aurora, Colorado.

The study area examined in this analysis encompassed the intersections of Colfax Avenue with existing site accesses.

Analysis was conducted for critical AM Peak Hour and PM Peak Hour traffic operations for existing traffic conditions, Year 2021 and Year 2040 background traffic conditions, and Year 2021 and Year 2040 total traffic conditions.

Under existing conditions, operational analysis shows that the unsignalized intersection of Colfax Avenue with Site Access has turning movement operations at LOS B during both the morning and afternoon peak traffic hours. The unsignalized intersection of Colfax Avenue with Adjacent Access has turning movement operations at LOS B during both the morning and afternoon peak traffic hours.

Year 2021 background traffic analysis indicates that the unsignalized intersection of Colfax Avenue with Site Access has turning movement operations at LOS B during both the AM and PM peak traffic hours. The unsignalized intersection of Colfax Avenue with Adjacent Access has turning movement operations at LOS B during the AM peak traffic hour and LOS C during the PM peak traffic hour.

By Year 2040 and without the proposed development, the study intersection of Colfax Avenue with Site Access experiences LOS B operations during the AM peak traffic hour and LOS C operations during the PM peak traffic hour. The study intersection of Colfax Avenue with Adjacent Access experiences LOS B operations during the AM peak traffic hour and LOS C operations during the PM peak traffic hour.

Analysis of future traffic conditions indicates that the addition of site-generated traffic is expected to create no negative impact to traffic operations for the existing and surrounding roadway system upon implementation of the roadway and intersection control improvements assumed within this analysis. With all conservative assumptions defined in this analysis, the study intersections are projected to operate at future levels of service comparable to Year 2040 background traffic conditions. The proposed site access has long-term operations at LOS C or better during peak traffic periods and upon build-out.

The submittal of a new CDOT access permit is anticipated with the development of this site and will be coordinated through CDOT staff.

APPENDIX A

Traffic Count Data

	A	B	C	D	E
1					
2	Start Date: 10/22/2019				
3	Start Time: 12:00:00 AM				
4	Site Code: 1				
5	Station ID: 1				
6	Location 1: COLFAX AVE & EAST SITE ACCESS				
7					
8	Date	Time	IN	OUT	
9	10/22/2019	12:00 AM	0	0	
10	10/22/2019	12:15 AM	0	0	
11	10/22/2019	12:30 AM	0	0	
12	10/22/2019	12:45 AM	0	0	
13	10/22/2019	01:00 AM	0	0	
14	10/22/2019	01:15 AM	0	0	
15	10/22/2019	01:30 AM	0	0	
16	10/22/2019	01:45 AM	0	0	
17	10/22/2019	02:00 AM	0	0	
18	10/22/2019	02:15 AM	0	0	
19	10/22/2019	02:30 AM	0	0	
20	10/22/2019	02:45 AM	0	0	
21	10/22/2019	03:00 AM	0	0	
22	10/22/2019	03:15 AM	0	0	
23	10/22/2019	03:30 AM	0	0	
24	10/22/2019	03:45 AM	0	0	
25	10/22/2019	04:00 AM	0	0	
26	10/22/2019	04:15 AM	0	0	
27	10/22/2019	04:30 AM	0	0	
28	10/22/2019	04:45 AM	0	0	
29	10/22/2019	05:00 AM	0	0	
30	10/22/2019	05:15 AM	0	0	
31	10/22/2019	05:30 AM	0	0	
32	10/22/2019	05:45 AM	0	0	
33	10/22/2019	06:00 AM	0	0	
34	10/22/2019	06:15 AM	0	0	
35	10/22/2019	06:30 AM	0	0	
36	10/22/2019	06:45 AM	0	0	
37	10/22/2019	07:00 AM	2	1	
38	10/22/2019	07:15 AM	2	0	
39	10/22/2019	07:30 AM	2	0	
40	10/22/2019	07:45 AM	1	0	
41	10/22/2019	08:00 AM	2	1	
42	10/22/2019	08:15 AM	0	0	
43	10/22/2019	08:30 AM	2	1	
44	10/22/2019	08:45 AM	2	0	
45	10/22/2019	09:00 AM	0	0	
46	10/22/2019	09:15 AM	0	0	
47	10/22/2019	09:30 AM	0	0	
48	10/22/2019	09:45 AM	0	0	
49	10/22/2019	10:00 AM	0	0	
50	10/22/2019	10:15 AM	0	0	
51	10/22/2019	10:30 AM	0	0	

	A	B	C	D	E
52	10/22/2019	10:45 AM	0	0	
53	10/22/2019	11:00 AM	0	0	
54	10/22/2019	11:15 AM	0	0	
55	10/22/2019	11:30 AM	0	0	
56	10/22/2019	11:45 AM	0	0	
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61	10/22/2019	01:00 PM	0	0	
62	10/22/2019	01:15 PM	0	0	
63	10/22/2019	01:30 PM	0	0	
64	10/22/2019	01:45 PM	0	0	
65	10/22/2019	02:00 PM	0	0	
66	10/22/2019	02:15 PM	0	0	
67	10/22/2019	02:30 PM	0	0	
68	10/22/2019	02:45 PM	0	0	
69	10/22/2019	03:00 PM	0	0	
70	10/22/2019	03:15 PM	0	0	
71	10/22/2019	03:30 PM	0	0	
72	10/22/2019	03:45 PM	0	0	
73	10/22/2019	04:00 PM	6	0	
74	10/22/2019	04:15 PM	5	1	
75	10/22/2019	04:30 PM	9	0	
76	10/22/2019	04:45 PM	2	0	
77	10/22/2019	05:00 PM	3	0	
78	10/22/2019	05:15 PM	2	0	
79	10/22/2019	05:30 PM	2	0	
80	10/22/2019	05:45 PM	5	0	
81	10/22/2019	06:00 PM	0	0	
82	10/22/2019	06:15 PM	0	0	
83	10/22/2019	06:30 PM	0	0	
84	10/22/2019	06:45 PM	0	0	
85	10/22/2019	07:00 PM	0	0	
86	10/22/2019	07:15 PM	0	0	
87	10/22/2019	07:30 PM	0	0	
88	10/22/2019	07:45 PM	0	0	
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98	10/22/2019	10:15 PM	0	0	
99	10/22/2019	10:30 PM	0	0	
100	10/22/2019	10:45 PM	0	0	
101	10/22/2019	11:00 PM	0	0	
102	10/22/2019	11:15 PM	0	0	

	A	B	C	D	E
103	10/22/2019	11:30 PM	0	0	
104	10/22/2019	11:45 PM	0	0	

	A	B	C	D	E
1					
2	Start Date: 10/22/2019				
3	Start Time: 12:00:00 AM				
4	Site Code: 2				
5	Station ID: 2				
6	Location 1: COLFAX AVE & WEST SITE ACCESS				
7					
8	Date	Time	IN	OUT	
9	10/22/2019	12:00 AM	0	0	
10	10/22/2019	12:15 AM	0	0	
11	10/22/2019	12:30 AM	0	0	
12	10/22/2019	12:45 AM	0	0	
13	10/22/2019	01:00 AM	0	0	
14	10/22/2019	01:15 AM	0	0	
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27	10/22/2019	04:30 AM	0	0	
28	10/22/2019	04:45 AM	0	0	
29	10/22/2019	05:00 AM	0	0	
30	10/22/2019	05:15 AM	0	0	
31	10/22/2019	05:30 AM	0	0	
32	10/22/2019	05:45 AM	0	0	
33	10/22/2019	06:00 AM	0	0	
34	10/22/2019	06:15 AM	0	0	
35	10/22/2019	06:30 AM	0	0	
36	10/22/2019	06:45 AM	0	0	
37	10/22/2019	07:00 AM	0	7	
38	10/22/2019	07:15 AM	0	2	
39	10/22/2019	07:30 AM	0	3	
40	10/22/2019	07:45 AM	0	2	
41	10/22/2019	08:00 AM	0	4	
42	10/22/2019	08:15 AM	0	1	
43	10/22/2019	08:30 AM	0	3	
44	10/22/2019	08:45 AM	0	3	
45	10/22/2019	09:00 AM	0	0	
46	10/22/2019	09:15 AM	0	0	
47	10/22/2019	09:30 AM	0	0	
48	10/22/2019	09:45 AM	0	0	
49	10/22/2019	10:00 AM	0	0	
50	10/22/2019	10:15 AM	0	0	

	A	B	C	D	E
51	10/22/2019	10:30 AM	0	0	
52	10/22/2019	10:45 AM	0	0	
53	10/22/2019	11:00 AM	0	0	
54	10/22/2019	11:15 AM	0	0	
55	10/22/2019	11:30 AM	0	0	
56	10/22/2019	11:45 AM	0	0	
57	10/22/2019	12:00 PM	0	0	
58	10/22/2019	12:15 PM	0	0	
59	10/22/2019	12:30 PM	0	0	
60	10/22/2019	12:45 PM	0	0	
61	10/22/2019	01:00 PM	0	0	
62	10/22/2019	01:15 PM	0	0	
63	10/22/2019	01:30 PM	0	0	
64	10/22/2019	01:45 PM	0	0	
65	10/22/2019	02:00 PM	0	0	
66	10/22/2019	02:15 PM	0	0	
67	10/22/2019	02:30 PM	0	0	
68	10/22/2019	02:45 PM	0	0	
69	10/22/2019	03:00 PM	0	0	
70	10/22/2019	03:15 PM	0	0	
71	10/22/2019	03:30 PM	0	0	
72	10/22/2019	03:45 PM	0	0	
73	10/22/2019	04:00 PM	0	2	
74	10/22/2019	04:15 PM	0	4	
75	10/22/2019	04:30 PM	0	2	
76	10/22/2019	04:45 PM	0	4	
77	10/22/2019	05:00 PM	0	1	
78	10/22/2019	05:15 PM	0	3	
79	10/22/2019	05:30 PM	0	4	
80	10/22/2019	05:45 PM	0	5	
81	10/22/2019	06:00 PM	0	0	
82	10/22/2019	06:15 PM	0	0	
83	10/22/2019	06:30 PM	0	0	
84	10/22/2019	06:45 PM	0	0	
85	10/22/2019	07:00 PM	0	0	
86	10/22/2019	07:15 PM	0	0	
87	10/22/2019	07:30 PM	0	0	
88	10/22/2019	07:45 PM	0	0	
89	10/22/2019	08:00 PM	0	0	
90	10/22/2019	08:15 PM	0	0	
91	10/22/2019	08:30 PM	0	0	
92	10/22/2019	08:45 PM	0	0	
93	10/22/2019	09:00 PM	0	0	
94	10/22/2019	09:15 PM	0	0	
95	10/22/2019	09:30 PM	0	0	
96	10/22/2019	09:45 PM	0	0	
97	10/22/2019	10:00 PM	0	0	
98	10/22/2019	10:15 PM	0	0	
99	10/22/2019	10:30 PM	0	0	
100	10/22/2019	10:45 PM	0	0	

	A	B	C	D	E
101	10/22/2019	11:00 PM	0	0	
102	10/22/2019	11:15 PM	0	0	
103	10/22/2019	11:30 PM	0	0	
104	10/22/2019	11:45 PM	0	0	

All Traffic Data Services

Wheat Ridge, CO 80033

Date Start: 22-Oct-19
Date End: 22-Oct-19
Site Code: 3
COLFAX AVE W.O. SITE ACCESS

Start Time	22-Oct-19 Tue	EB	WB							Total
12:00 AM		81	93							174
01:00		56	90							146
02:00		63	75							138
03:00		78	56							134
04:00		169	151							320
05:00		335	424							759
06:00		610	784							1394
07:00		**642**	**1118**							**1760**
08:00		534	853							1387
09:00		473	614							1087
10:00		516	606							1122
11:00		606	705							1311
12:00 PM		692	708							1400
01:00		700	680							1380
02:00		875	807							1682
03:00		998	**1005**							2003
04:00		**1257**	1001							**2258**
05:00		1171	986							2157
06:00		870	752							1622
07:00		625	524							1149
08:00		405	378							783
09:00		281	231							512
10:00		179	180							359
11:00		143	141							284
Total		12359	12962							25321
Percent		48.8%	51.2%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	642	1118	-	-	-	-	-	-	1760
PM Peak	-	16:00	15:00	-	-	-	-	-	-	16:00
Vol.	-	1257	1005	-	-	-	-	-	-	2258
Grand Total		12359	12962							25321
Percent		48.8%	51.2%							

ADT ADT 25,321 AADT 25,321

APPENDIX B

Level of Service Definitions

The following information can be found in the Highway Capacity Manual, Transportation Research Board, 2010: Chapter 18 – Signalized Intersections and Chapter 19 – Two-Way Stop Controlled Intersections.

Automobile Level of Service (LOS) for Signalized Intersections

Levels of service are defined to represent reasonable ranges in control delay.

LOS A

Describes operations with a control delay of 10s/veh or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.

LOS B

Describes operations with control delay between 10 and 20 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.

LOS C

Describes operations with control delay between 20 and 35 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual *cycle failures* (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.

LOS D

Describes operations with control delay between 35 and 55 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.

LOS E

Describes operations with control delay between 55 and 80 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.

LOS F

Describes operations with control delay exceeding 80 s/veh or a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

Level of Service (LOS) for Unsignalized TWSC Intersections

Level of Service	Average Control Delay (s/veh)
A	0 - 10
B	> 10 - 15
C	> 15 - 25
D	> 25 - 35
E	> 35 - 50
F	> 50

APPENDIX C

Capacity Worksheets

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	642	0	0	1118	0	14
Future Vol, veh/h	642	0	0	1118	0	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	698	0	0	1215	0	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	349
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	647
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	647
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	647	-	-	-
HCM Lane V/C Ratio	0.024	-	-	-
HCM Control Delay (s)	10.7	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	649	7	0	1118	0	1
Future Vol, veh/h	649	7	0	1118	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	705	8	0	1215	0	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	357
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	639
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	639
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	639	-	-	-
HCM Lane V/C Ratio	0.002	-	-	-
HCM Control Delay (s)	10.6	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1257	0	0	1001	0	12
Future Vol, veh/h	1257	0	0	1001	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1366	0	0	1088	0	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	683
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	392
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	392
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	392	-	-	-
HCM Lane V/C Ratio	0.033	-	-	-
HCM Control Delay (s)	14.5	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1247	22	0	1001	0	1
Future Vol, veh/h	1247	22	0	1001	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1355	24	0	1088	0	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	690
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	388
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	388
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	388	-	-	-
HCM Lane V/C Ratio	0.003	-	-	-
HCM Control Delay (s)	14.3	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	668	0	0	1163	0	15
Future Vol, veh/h	668	0	0	1163	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	726	0	0	1264	0	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	363
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	634
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	634
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	634	-	-	-
HCM Lane V/C Ratio	0.026	-	-	-
HCM Control Delay (s)	10.8	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	675	7	0	1163	0	1
Future Vol, veh/h	675	7	0	1163	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	734	8	0	1264	0	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	371
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	626
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	626
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	626	-	-	-
HCM Lane V/C Ratio	0.002	-	-	-
HCM Control Delay (s)	10.8	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1307	0	0	1041	0	13
Future Vol, veh/h	1307	0	0	1041	0	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1421	0	0	1132	0	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	711
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	375
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	375
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	375	-	-	-
HCM Lane V/C Ratio	0.038	-	-	-
HCM Control Delay (s)	15	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1297	23	0	1041	0	1
Future Vol, veh/h	1297	23	0	1041	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1410	25	0	1132	0	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	718
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	371
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	371
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	371	-	-	-
HCM Lane V/C Ratio	0.003	-	-	-
HCM Control Delay (s)	14.7	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	976	0	0	1699	0	21
Future Vol, veh/h	976	0	0	1699	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1061	0	0	1847	0	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	531
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	493
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	493
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	493	-	-	-
HCM Lane V/C Ratio	0.046	-	-	-
HCM Control Delay (s)	12.7	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	987	11	0	1699	0	2
Future Vol, veh/h	987	11	0	1699	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1073	12	0	1847	0	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	543
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	484
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	484
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	484	-	-	-
HCM Lane V/C Ratio	0.004	-	-	-
HCM Control Delay (s)	12.5	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1911	0	0	1522	0	18
Future Vol, veh/h	1911	0	0	1522	0	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2077	0	0	1654	0	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1039
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	227
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	227
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	22.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	227	-	-	-
HCM Lane V/C Ratio	0.086	-	-	-
HCM Control Delay (s)	22.3	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1895	33	0	1522	0	2
Future Vol, veh/h	1895	33	0	1522	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2060	36	0	1654	0	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1048
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	224
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	224
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	21.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	224	-	-	-
HCM Lane V/C Ratio	0.01	-	-	-
HCM Control Delay (s)	21.2	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	671	0	0	1170	0	15
Future Vol, veh/h	671	0	0	1170	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	729	0	0	1272	0	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	365
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	632
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	632
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	632	-	-	-
HCM Lane V/C Ratio	0.026	-	-	-
HCM Control Delay (s)	10.8	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	675	10	0	1170	0	10
Future Vol, veh/h	675	10	0	1170	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	734	11	0	1272	0	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	373
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	624
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	624
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	624	-	-	-
HCM Lane V/C Ratio	0.017	-	-	-
HCM Control Delay (s)	10.9	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1316	0	0	1048	0	13
Future Vol, veh/h	1316	0	0	1048	0	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1430	0	0	1139	0	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	715
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	373
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	373
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	373	-	-	-
HCM Lane V/C Ratio	0.038	-	-	-
HCM Control Delay (s)	15	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↳			↑↑		↱
Traffic Vol, veh/h	1297	32	0	1048	0	6
Future Vol, veh/h	1297	32	0	1048	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1410	35	0	1139	0	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	723
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	369
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	369
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	369	-	-	-
HCM Lane V/C Ratio	0.018	-	-	-
HCM Control Delay (s)	14.9	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	979	0	0	1706	0	21
Future Vol, veh/h	979	0	0	1706	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1064	0	0	1854	0	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	532
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	492
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	492
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	492	-	-	-
HCM Lane V/C Ratio	0.046	-	-	-
HCM Control Delay (s)	12.7	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	987	14	0	1706	0	11
Future Vol, veh/h	987	14	0	1706	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1073	15	0	1854	0	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	544
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	483
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	483
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	483	-	-	-
HCM Lane V/C Ratio	0.025	-	-	-
HCM Control Delay (s)	12.6	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1920	0	0	1529	0	18
Future Vol, veh/h	1920	0	0	1529	0	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2087	0	0	1662	0	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1044
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	226
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	226
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	22.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	226	-	-	-
HCM Lane V/C Ratio	0.087	-	-	-
HCM Control Delay (s)	22.4	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1895	42	0	1529	0	7
Future Vol, veh/h	1895	42	0	1529	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2060	46	0	1662	0	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1053
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	223
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	223
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	21.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	223	-	-	-
HCM Lane V/C Ratio	0.034	-	-	-
HCM Control Delay (s)	21.7	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-