

MEMORANDUM

To: Manny Nuno, PE, CFM, LEED AP, CPESC, Ware Malcomb

From: Cassie Slade, PE, PTOE

Date: August 1, 2024

Project: Aurora One Planning Area 4 in Aurora, Colorado

Subject: Traffic Conformance Memo – Updated

The Fox Tuttle Transportation Group has completed a traffic analysis for the proposed development of Planning Area 4 within the Aurora One project in Aurora, Colorado. The 150-acre property is located on both sides of Stephen D. Hogan Parkway between Picadilly Road and E-470. It is understood that the entire project will have a mix of land uses including commercial retail/service, medical office, single-family attached residential, and multi-family residential. The project area is bounded by Picadilly Road to the west, 6th Avenue to the north, Valdai Street to the east, and the Coal Creek to the south. Planning Area 4 is located in the southwest corner of 6th Avenue and the new alignment of Valdai Street, as shown in **Figure 1**.

Planning Area 4 proposes constructing 204 townhomes and 76 duplexes. The existing and future roadways and intersections have been planned or built to support Aurora One



Figure 1. Vicinity Map

traffic including Planning Area 4. The master development includes realigning Valdai Street to connect to 6th Avenue approximately 670 feet west of the current intersection and constructing new internal roadways to provide connectivity for vehicular and multi-modal travel through Aurora One.

The purpose of this “traffic conformance memo” is to determine if the proposed Aurora One Planning Area 4 project compares to the trip generation assumptions as analyzed in the master traffic study and to determine if additional traffic analyses are necessary.

Comparison to the Master Traffic Study

A “Master” traffic impact study¹ (TIS) was previously prepared for the entire Aurora One development including Planning Area 4, as shown in **Figure 2**. The proposed roadways and intersections have been planned and will be built to support this full buildout traffic of Aurora One and other projects within the area. A review of the Aurora One TIS shows that Planning Area 4 included 272 townhomes. The current site plan includes 280 townhomes/duplexes, which is an increase of eight (8) dwelling units (3% increase). Proposed access will remain the same along 6th Avenue and Valdai Street (new alignment) and as previously evaluated. One (1) additional access is proposed on 6th Avenue to serve the homes on the west end of Planning Area 4. It is not anticipated that this new access will

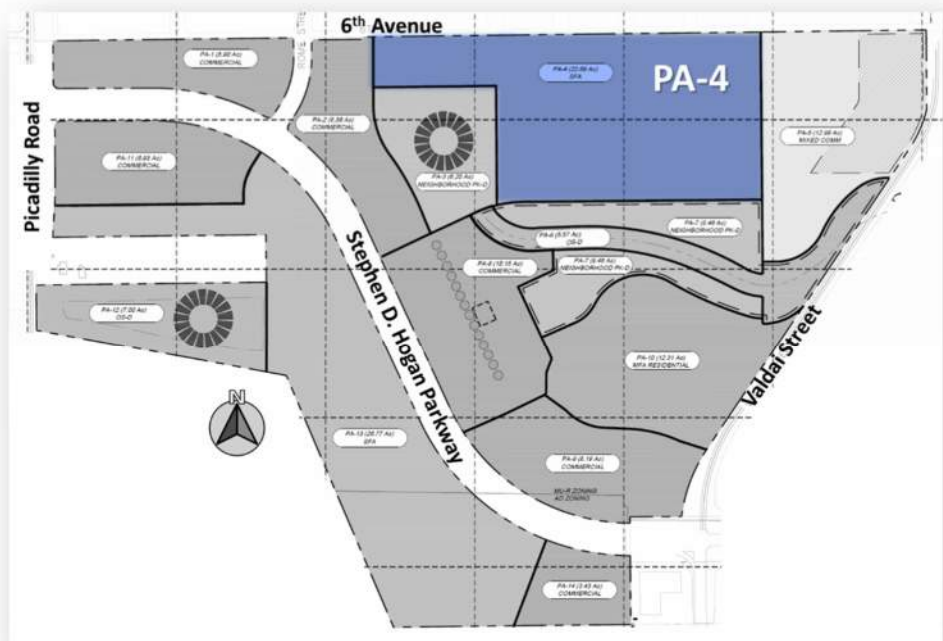


Figure 2. Proposed Planning Area 4 of Aurora One Map

¹ Aurora One Traffic Impact Study. Fox Tuttle Transportation Group, LLC. January 2021.

create any issues with adjacent accesses and intersections.

Trip Generation

To establish the volume of trips associated with the proposed Aurora One Planning Area 4 project, the data contained in the Institute of Transportation Engineers' (ITE) *Trip Generation Handbook and Manual* (10th Edition, Year 2017) was utilized in the Master Traffic Study and a newer version of the *Trip Generation Manual*, has since been released in Year 2021 (11th Edition). The new version was applied to the current site plan for Planning Area 4. The proposed land use is estimated to mostly be new trips, known as 'primary trips', and non-auto trips which are discussed below:

Primary Trips. These trips are made specifically to visit the site and are considered "new" trips. Primary trips would not have been made if the proposed project did not exist. Therefore, this is the only trip type that increases the number of trips made on a regional basis.

Non-Auto Trips. These trips are those that are completed by walking, biking, or transit. The future pedestrian and bicycle amenities will encourage residents, employees, customers, and visitors to make non-auto trips to/from the Aurora One community.

In the Aurora One TIS, it was assumed that there will 10% internal capture and 5% non-auto reduction with the mix of land uses and connectivity to multi-modal facilities. For comparison purposes, the same percentage was applied to Planning Area 4. The estimated trip generation is summarized in **Table 1** for weekday daily, weekday AM, and weekday PM periods. The site generated trips and distribution from the Aurora One TIS are attached to this letter.

Aurora One Planning Area 4

Traffic Conformance Memo

Updated October 7, 2024

Table 1. Trip Generation Estimate and Comparison

Land Use	Size	Unit	Internal Capture	Non-Auto	Average Daily New Trips				AM Peak Hour New Trips				PM Peak Hour New Trips			
					Rate	Total	In	Out	Rate	Total	In	Out	Rate	Total	In	Out
Master Traffic Study ¹																
ITE 220: Multi-Family Housing (Low-Rise)	272	DU	0.90	0.95	7.32	1,702	851	851	0.46	107	28	79	0.56	130	79	51
Planning Area 4 ²																
ITE 220: Multi-Family Housing (Low-Rise)	204	DU	0.90	0.95	6.74	1,176	588	588	0.40	70	17	53	0.51	89	56	33
ITE 215: Single-Family Attached Housing	76	DU	0.90	0.95	7.20	468	234	234	0.48	31	8	23	0.57	37	22	15
Subtotal						1,644	822	822		101	25	76		126	78	48
Change from Previous Land Use Assumptions						-58	-29	-29	AM >	-6	-3	-3	PM >	-4	-1	-3
Percent Difference						-3%			-6%				-3%			

Source: ¹ ITE Trip Generation 10th Edition, 2017. This is the version that was used in the Master Traffic Study.

² ITE Trip Generation 11th Edition, 2021. Most current version of ITE data.

Based on the comparison to the Aurora One TIS, **it was estimated that the latest site plan for Planning Area 4 will have a 3% decrease in daily and 3-6% decrease in peak hour traffic.** The daily traffic volume was estimated to be reduced by 58 vehicles per day (vpd). The AM and PM peak hours were estimated to be reduced by six (6) trips and four (4) trips, respectively. The slight increase does not impact the recommendations or require additional improvements. The distribution applied to the updated Planning Area 4 trips is the same as the Aurora One TIS (attached to this letter).

Traffic Operations

The proposed intersections on Valdai Street adjacent to Planning Area 4 were evaluated for delay and queuing at the anticipated buildout year of the project and full buildout of Aurora One. The following intersections were included, and the numbering is consistent with the MTIS:

#112. Valdai Street and Access 12 (PA-4 & 5)

#113. Valdai Street and Access 13 (PA-4 & 5)

#114. Valdai Street and 6th Avenue

#213. Valdai Street and Access 13.5 (New PA-4 Access)

Planning Area 4 trip volumes for Year 2025 are shown on **Figure 3**.

Site-generated trips were added to the background Year 2025 volumes and are illustrated on **Figure 4**. The Year 2040 full buildout traffic volumes are shown on **Figure 5**. The necessary traffic control and lane configurations for the near-term and long-term scenarios are shown on the appropriate figures.

Evaluation Methodology

The traffic operations analysis addressed the signalized and unsignalized intersection operations using the procedures and methodologies set forth by the Highway Capacity Manual (HCM)². Study intersections were evaluated using Synchro software.

Level of Service Capacity Analysis

A Level of Service analysis was conducted to determine the existing and future performance of the study area intersections and accesses to determine the most appropriate intersection traffic controls and auxiliary lanes for future conditions.

To measure and describe the operational status of the study intersections, transportation engineers and planners commonly use a grading system referred to as “Level of Service” (LOS) that is defined by the HCM. LOS characterizes the operational conditions of an intersections traffic flow, ranging from LOS A (indicating very good, free flow operations) and LOS F (indicating congested and sometimes oversaturated conditions). These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with traveling through the intersections. The intersection LOS is represented as a delay in seconds per vehicle for the intersection as a whole and for each turning movement.

Typically, LOS A through C is considered to be acceptable for the overall intersection operations and LOS D overall during peak hours is acceptable. Individual movements may be allowed to fall to LOS E at signalized intersections. Minor movements at unsignalized intersections, such as left turns onto a major arterial, may be allowed to fall below LOS D. Individual movements are allowed to fall to LOS E if traffic volume is low, or there is not a viable alternative. Criteria contained in the HCM was applied for these analyses in order to determine peak hour LOS for each scenario. A more detailed discussion of LOS methodology is contained in the Appendix for reference.

² Highway Capacity Manual, Highway Research Board Special Report 209, Transportation Research Board, National Research Council, 7th Edition (2022).

Planning Area 4 Buildout Year

It was assumed that Planning Area 4 will be completed and generating traffic by Year 2025. To estimate the background growth associated with Horizon (development project to the north) and other Aurora One planning areas, it was assumed that 50% of Horizon was completed and 25% of Aurora One Planning Areas 5 and 10 was completed. These are the projects that were anticipated to utilize Valdai Street or 6th Avenue within the study area for Planning Area 4 in the MTIS.

Trips for Planning Area 4 were slightly decreased as discussed in the **Trip Generation Section** and the volumes were redistributed to include the one (1) additional access proposed on Valdai Street, just south of 6th Avenue. The Year 2025 traffic volumes are shown on **Figure 4**.

The results of the LOS calculations for the intersections are summarized in **Table 2** (attached to this letter). The details of queuing for each movement are provided in **Table 3** (attached to this letter). The intersection Level of Service worksheets are included in the attachments.

All of the side-street stop-controlled intersections operate overall at LOS A in both peak hours with all movements operating at LOS A or B. The 95th percentile queues were calculated to be one (1) vehicle or less.

Year 2040 Full Buildout of Aurora One

The MTIS volumes for Aurora One were adjusted to account for the increase in dwelling units in Planning Area 4. These new trip volumes were redistributed to account for the proposed additional access on Valdai Street, just south of 6th Avenue. The background forecasts and other Aurora One Planning Areas remained the same as estimated in the MTIS for this focused analysis.

The results of the LOS calculations for the intersections are summarized in **Table 2** (attached to this letter). The details of queuing for each movement are provided in **Table 3** (attached to this letter). The intersection Level of Service worksheets are included in the attachments. The long-term full buildout traffic volumes are shown on **Figure 6**.

All of the side-street stop-controlled intersections operate overall at LOS A in both peak hours with majority of the movements operating at LOS C or better. The eastbound approach at the intersection of **Valdai Street at 6th Avenue** was estimated to operate at LOS E in the PM peak hour, consistent with the MTIS findings. The 95th percentile queue for this movement was calculated to be up to 83 feet (about three vehicles). The westbound approach at the intersection of **Valdai Street at Access 13** was estimated to operate at LOS E in the PM peak hour with a 95th percentile queue of 80 feet (about three vehicles).

No mitigation measures are recommended at either intersection since the delay is reasonable for a side-street approach, the queue is minimal, and volumes do not warrant a change in traffic control. The 95th percentile queues for the other study intersections and movements were calculated to be one (1) vehicle or less.

Auxiliary Lanes

The recommended auxiliary lanes and minimum storage lengths are presented in **Table 3**. It is understood that Valdai Street will include a center left-turn lane, therefore, each access for Planning Area 4 is recommended to include a minimum of 50 feet of storage. The northbound left-turn at 6th Avenue (#14) is recommended to be a minimum of 90 feet to accommodate the estimated 95th percentile queue at full buildout of Aurora One. It should be noted that the new proposed access on Valdai Street (#213) is approximately 115 feet (flowline to flowline) south of 6th Avenue. The recommended northbound left-turn storage can be accommodated in the center left-turn lane since there will not be a back-to-back left-turn into Planning Area 5. The intersection at Valdai Street and Access 13 has a northbound right-turn volume that places a consideration for needing a separate turn lane. Based on operations and minor through volume, it is recommended that this northbound right-turn remain shared with the through.

Conclusions

It is anticipated that the existing and proposed roadway network, intersections, and accesses can accommodate the Aurora One Planning Area 4 project since the associated trips were estimated to be slightly more than the Master TIS trip forecasts. Planning Area 4 increased the number of townhomes from 272 units to 280 units (3% increase). As noted, the **proposed land use is consistent with the trip generation assumptions, lane configurations, and access needs as presented in the Aurora One MTIS, and thus the findings and recommendations of that study are still valid.** No additional traffic analysis is necessary to support this project.

Aurora One Planning Area 4

Traffic Conformance Memo

Updated October 7, 2024

I hope that the contents of this memorandum are helpful to you. If you have any questions, please feel free to give me a call.

Sincerely,

FOX TUTTLE TRANSPORTATION GROUP, LLC



Cassie Slade, P.E., PTOE
Principal



Attachments:

Table 2 – Peak Hour Intersection Level of Service Summary

Table 3 – Peak Hour Estimated 95th Percentile Queue Lengths

Figure 3 – New Site-Generated Traffic Volumes

Figure 4 – Year 2025 Background + Project Traffic Volumes

Figure 5 – Year 2040 Background + Project Traffic Volumes

Intersection Capacity Analysis Worksheets

Volume Figures from Aurora One TIS (background volumes, site generated traffic, and distribution)

Tables and Figures



Table 2 - Peak Hour Intersection Level of Service Summary

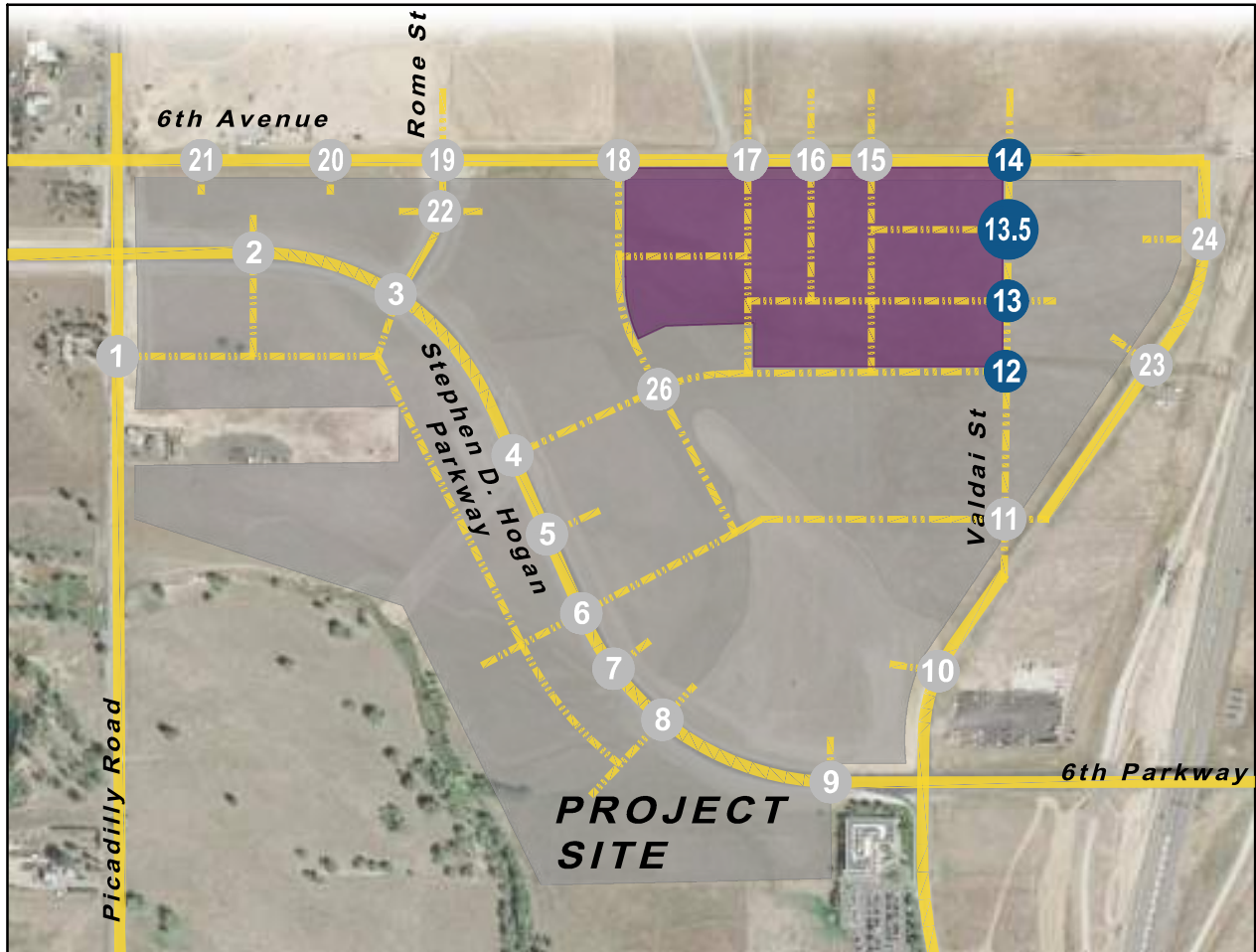
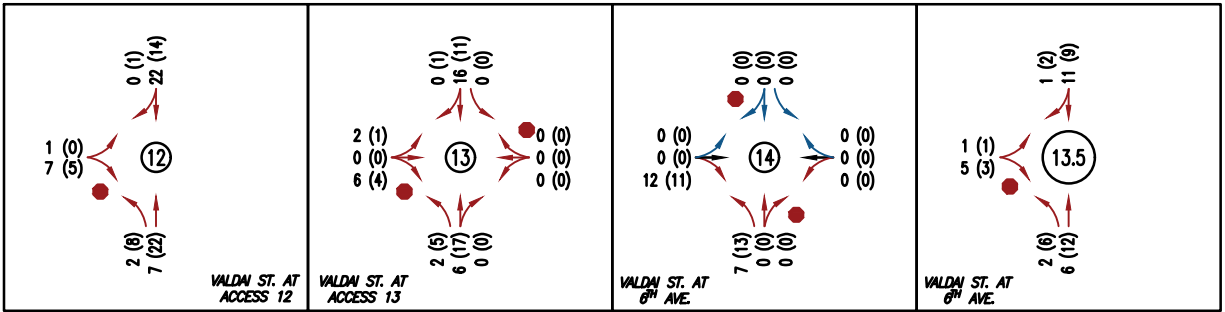
Intersection and Critical Lane Groups	2025 Bkgrd + Project				2040 Bkgrd + Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
STOP SIGN CONTROL								
#112. Valdai Street at Access 12 (PA 4 & 5)	1	A	1	A	1	A	0	A
Eastbound Left+Right	10	A	10	A	16	C	17	C
Northbound Left	8	A	8	A	8	A	9	A
#113. Valdai Street at Access 13 (PA 4 & 5)	1	A	3	A	1	A	5	A
Eastbound Left+Through+Right	9	A	9	A	13	B	14	B
Westbound Left+Through+Right	10	A	11	B	17	C	36	E
Northbound Left	8	A	7	A	8	A	8	A
Southbound Left	8	A	8	A	8	A	9	A
#114. Valdai Street at 6th Avenue	4	A	3	A	6	A	8	A
Eastbound Left+Through+Right	10	A	11	B	23	C	43	E
Westbound Left+Through+Right	9	A	11	B	13	B	27	D
Northbound Left	7	A	8	A	9	A	8	A
Southbound Left	7	A	8	A	8	A	8	A
#213. Valdai Street at Access 13.5 (PA 4 NEW)	0	A	0	A	0	A	0	A
Eastbound Left+Right	9	A	9	A	11	B	12	B
Northbound Left	8	A	7	A	8	A	8	A
Southbound Through+Right	0	A	0	A	0	A	0	A

Note: Delay represented in average seconds per vehicle.



Table 3 - Peak Hour Estimated 95th Percentile Queue Lengths

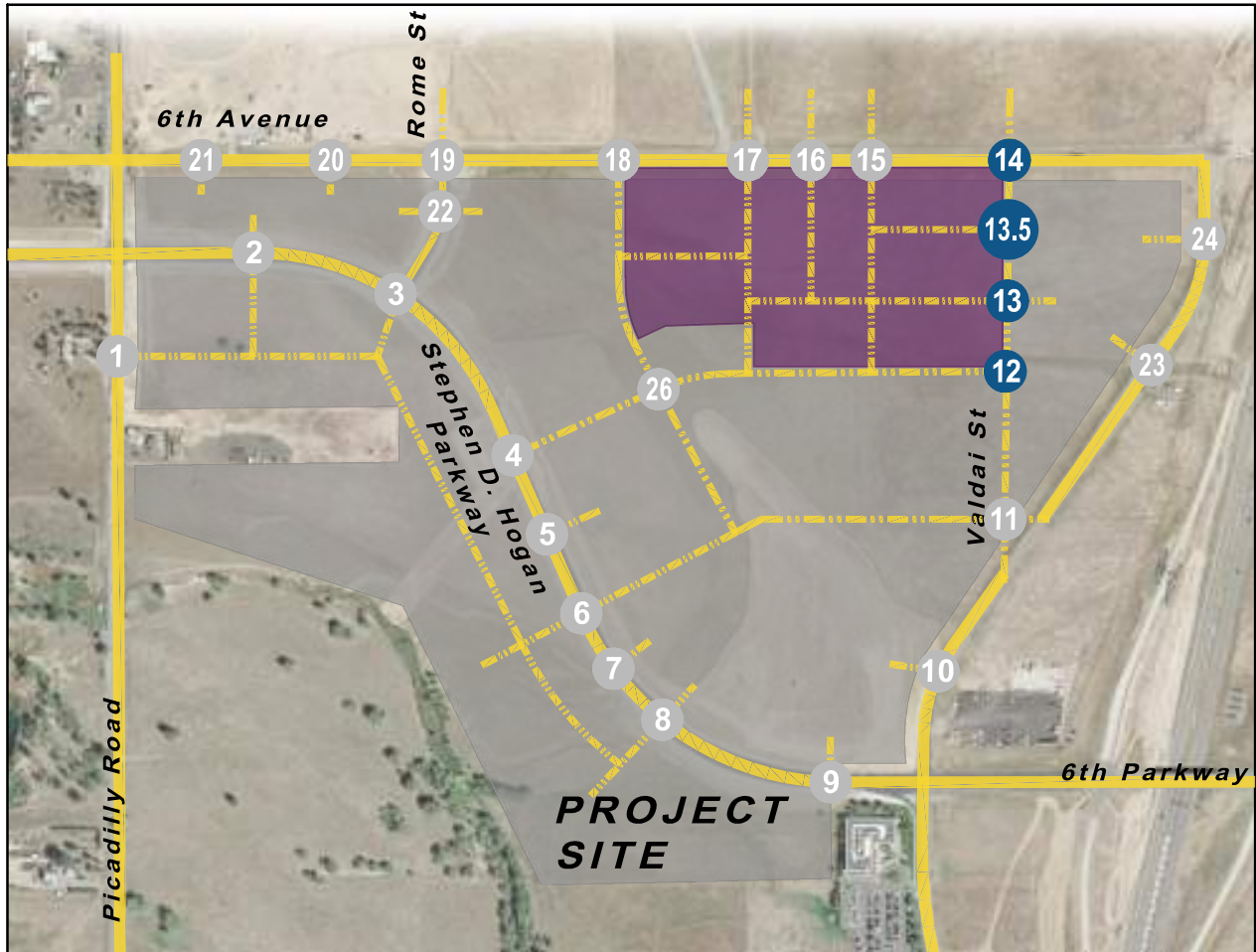
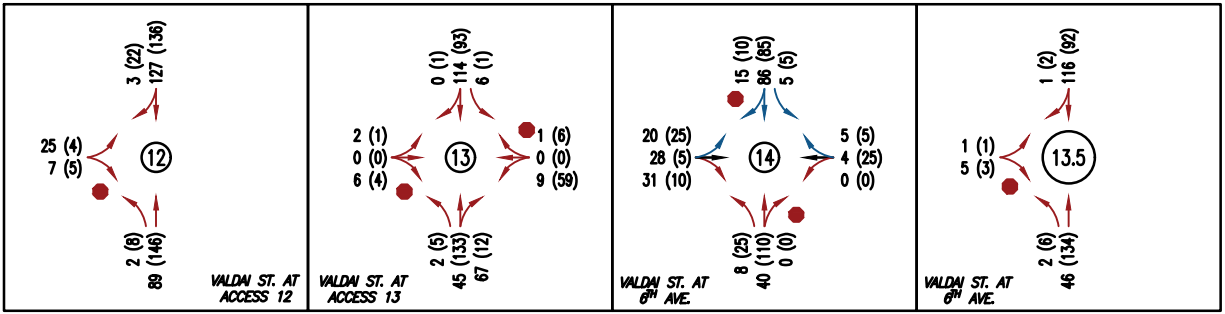
Intersection and Critical Lane Groups	Ex. Storage Length	Prop. Storage Length	2025 Bkgrd + Project		2040 Bkgrd + Project		Max. Queue	Max Vol. (vph)	City Requirement (NR-C) Storage + Taper				Proposed Minimum Future Storage
			AM Peak	PM Peak	AM Peak	PM Peak			Speed (mph)	Storage (feet)	Taper (feet)	Total (feet)	
#112. Valdai Street at Access 12 (PA 4 & 5)			Stop-Control		Stop-Control								
Eastbound Left+Right	-	-	3'	0'	15'	5'	-	-	-	-	-	-	-
Northbound Left	-	50'	0'	0'	0'	0'	0'	11'	30	25	96	121'	50'
#113. Valdai Street at Access 13 (PA 4 & 5)			Stop-Control		Stop-Control								
Eastbound Left+Through+Right	-	-	0'	0'	3'	0'	-	-	-	-	-	-	-
Westbound Left+Through+Right	-	-	0'	8'	5'	80'	-	-	-	-	-	-	-
Northbound Left	-	50'	0'	0'	0'	0'	0'	2'	30	25	96	121'	50'
Southbound Left	-	50'	0'	0'	0'	0'	0'	3'	30	25	96	121'	50'
#114. Valdai Street at 6th Avenue			Stop-Control		Stop-Control								
Eastbound Left+Through+Right	-	-	10'	5'	63'	90'	-	-	-	-	-	-	-
Westbound Left+Through+Right	-	-	0'	5'	3'	30'	-	-	-	-	-	-	-
Northbound Left	-	50'	0'	3'	8'	10'	10'	91'	30	90'	96	186'	90'
Southbound Left	-	50'	0'	0'	0'	0'	0'	10'	30	25	96	121'	50'
#213. Valdai Street at Access 13.5 (PA 4 NEW)			Stop-Control		Stop-Control								
Eastbound Left+Right	-	-	0'	0'	0'	0'	-	-	-	-	-	-	-
Northbound Left	-	50'	0'	0'	0'	0'	0'	5'	30	25	96	121'	50'
Southbound Through+Right	-	-	0'	0'	0'	0'	0'	1'	30	25	96	121'	50'



KEY

- XX (XX) AM (PM) PEAK HOUR TRIPS
- EXISTING LANE CONFIGURATION
- NEW BACKGROUND LANE CONFIGURATION
- NEW PROJECT LANE CONFIGURATION
- EXISTING / BKGRD TRAFFIC CONTROL
- NEW PROJECT TRAFFIC CONTROL
- PROPOSED PROJECT ROADWAY NETWORK
- # ACCESS INTERSECTION ID NUMBER

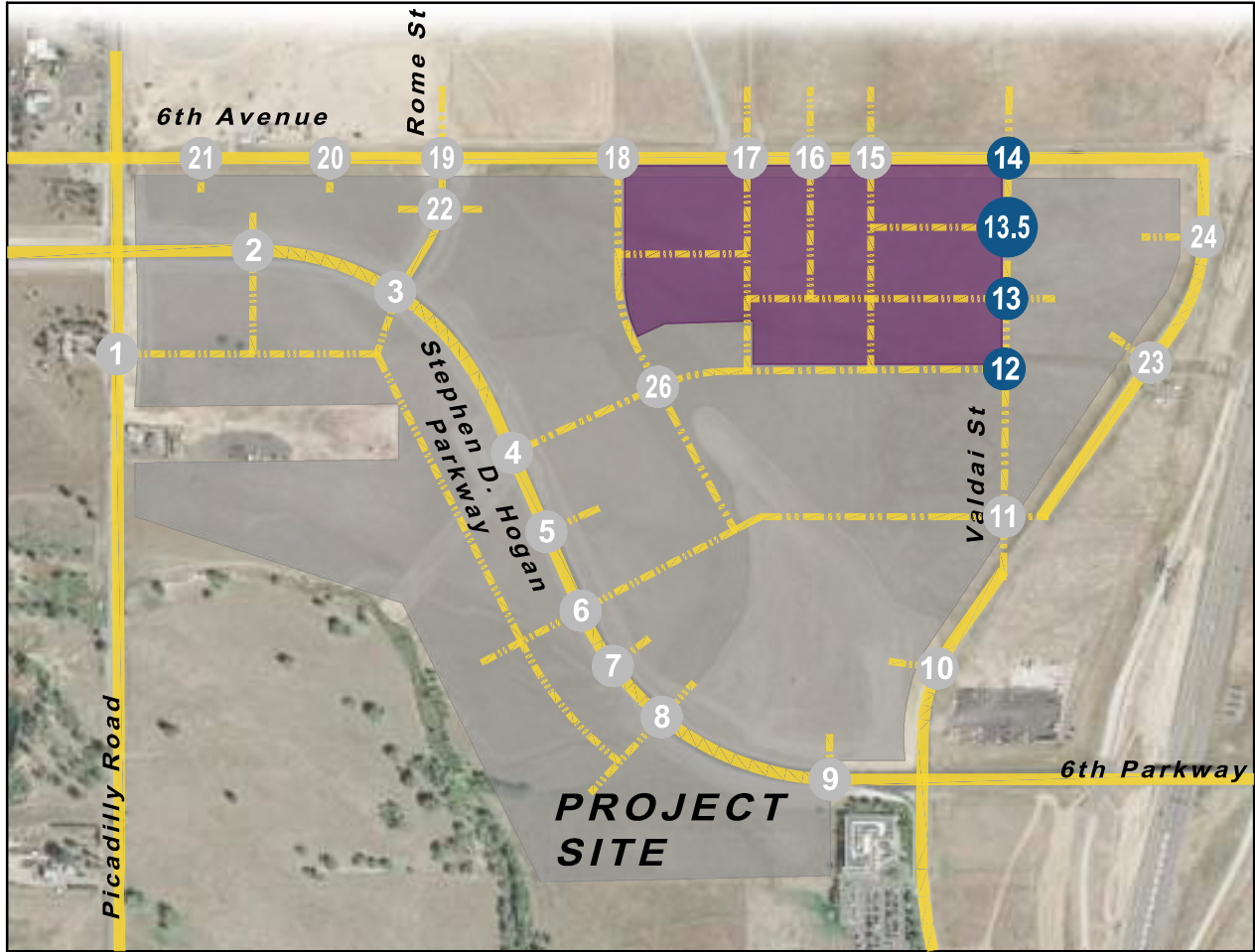
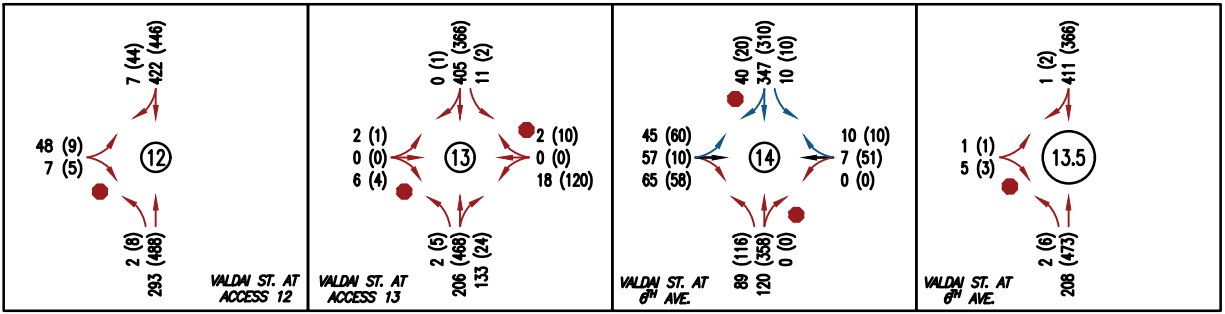




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


KEY

- XX (XX) AM (PM) PEAK HOUR TRIPS
- EXISTING LANE CONFIGURATION
- NEW BACKGROUND LANE CONFIGURATION
- NEW PROJECT LANE CONFIGURATION
- EXISTING / BKGRD TRAFFIC CONTROL
- NEW PROJECT TRAFFIC CONTROL
- PROPOSED PROJECT ROADWAY NETWORK
- # ACCESS INTERSECTION ID NUMBER



Intersection Capacity Analysis Worksheets: 2025 Bkgrd + Project

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	7	3	89	127	3
Future Vol, veh/h	25	7	3	89	127	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
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	27	8	3	97	138	3

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	243	140	141	0	-	0
Stage 1	140	-	-	-	-	-
Stage 2	103	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	745	908	1442	-	-	-
Stage 1	887	-	-	-	-	-
Stage 2	921	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	744	908	1442	-	-	-
Mov Cap-2 Maneuver	744	-	-	-	-	-
Stage 1	885	-	-	-	-	-
Stage 2	921	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.87	0.24	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1442	-	774	-	-
HCM Lane V/C Ratio	0.002	-	0.045	-	-
HCM Control Delay (s/veh)	7.5	-	9.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	2	1	6	9	1	1	2	45	67	6	114	0
Future Vol, veh/h	2	1	6	9	1	1	2	45	67	6	114	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	1	7	10	1	1	2	49	73	7	124	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	191	263	124	227	227	85	124	0	0	122	0	0
Stage 1	137	137	-	90	90	-	-	-	-	-	-	-
Stage 2	54	126	-	138	137	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	769	642	927	728	673	974	1463	-	-	1466	-	-
Stage 1	866	783	-	918	821	-	-	-	-	-	-	-
Stage 2	959	792	-	866	783	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	762	638	927	717	669	974	1463	-	-	1466	-	-
Mov Cap-2 Maneuver	762	638	-	717	669	-	-	-	-	-	-	-
Stage 1	862	780	-	916	819	-	-	-	-	-	-	-
Stage 2	955	790	-	855	780	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s/v	9.32		10.01		0.13		0.37	
HCM LOS	A		B					






Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1463	-	-	844	730	1466	-	-
HCM Lane V/C Ratio	0.001	-	-	0.012	0.016	0.004	-	-
HCM Control Delay (s/veh)	7.5	-	-	9.3	10	7.5	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	20	28	31	1	4	5	8	40	1	5	86	15
Future Vol, veh/h	20	28	31	1	4	5	8	40	1	5	86	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	30	34	1	4	5	9	43	1	5	93	16

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	176	174	102	181	182	44	110	0	0	45	0	0
Stage 1	113	113	-	61	61	-	-	-	-	-	-	-
Stage 2	63	62	-	120	121	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	787	719	954	781	712	1026	1480	-	-	1564	-	-
Stage 1	892	802	-	950	844	-	-	-	-	-	-	-
Stage 2	948	843	-	885	796	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	771	712	954	714	705	1026	1480	-	-	1564	-	-
Mov Cap-2 Maneuver	771	712	-	714	705	-	-	-	-	-	-	-
Stage 1	889	800	-	944	839	-	-	-	-	-	-	-
Stage 2	932	838	-	818	793	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s/v	9.98		9.36		1.22		0.34	
HCM LOS	A		A					






Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1480	-	-	808	837	1564	-	-
HCM Lane V/C Ratio	0.006	-	-	0.106	0.013	0.003	-	-
HCM Control Delay (s/veh)	7.4	-	-	10	9.4	7.3	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0	0	-	-

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	5	2	46	116	1
Future Vol, veh/h	1	5	2	46	116	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
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	1	5	2	50	126	1

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	181	127	127
Stage 1	127	-	-
Stage 2	54	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	808	924	1459
Stage 1	899	-	-
Stage 2	968	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	807	924	1459
Mov Cap-2 Maneuver	807	-	-
Stage 1	898	-	-
Stage 2	968	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.02	0.31	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1459	-	902	-	-
HCM Lane V/C Ratio	0.001	-	0.007	-	-
HCM Control Delay (s/veh)	7.5	-	9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	5	8	146	136	22
Future Vol, veh/h	4	5	8	146	136	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
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	4	5	9	159	148	24

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	336	160	172
Stage 1	160	-	-
Stage 2	176	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	659	885	1405
Stage 1	869	-	-
Stage 2	854	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	655	885	1405
Mov Cap-2 Maneuver	655	-	-
Stage 1	864	-	-
Stage 2	854	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.76	0.39	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1405	-	766	-	-
HCM Lane V/C Ratio	0.006	-	0.013	-	-
HCM Control Delay (s/veh)	7.6	-	9.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	1	4	59	1	6	5	133	12	1	93	1
Future Vol, veh/h	1	1	4	59	1	6	5	133	12	1	93	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	4	64	1	7	5	145	13	1	101	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	260	272	102	266	266	151	102	0	0	158	0	0
Stage 1	104	104	-	162	162	-	-	-	-	-	-	-
Stage 2	156	168	-	104	104	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	693	635	954	687	639	895	1490	-	-	1422	-	-
Stage 1	902	809	-	840	764	-	-	-	-	-	-	-
Stage 2	846	759	-	902	809	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	684	632	954	680	637	895	1490	-	-	1422	-	-
Mov Cap-2 Maneuver	684	632	-	680	637	-	-	-	-	-	-	-
Stage 1	901	809	-	837	761	-	-	-	-	-	-	-
Stage 2	836	756	-	896	808	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s/v	9.38		10.78		0.25		0.08	
HCM LOS	A		B					





Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1490	-	-	829	694	1422	-	-
HCM Lane V/C Ratio	0.004	-	-	0.008	0.103	0.001	-	-
HCM Control Delay (s/veh)	7.4	-	-	9.4	10.8	7.5	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0	-	-

Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	25	5	10	1	25	5	25	110	1	5	85	10
Future Vol, veh/h	25	5	10	1	25	5	25	110	1	5	85	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	5	11	1	27	5	27	120	1	5	92	11

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	296	284	98	280	289	120	103	0	0	121	0	0
Stage 1	109	109	-	174	174	-	-	-	-	-	-	-
Stage 2	188	175	-	106	114	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	656	625	958	672	621	931	1489	-	-	1467	-	-
Stage 1	897	805	-	827	755	-	-	-	-	-	-	-
Stage 2	814	754	-	900	801	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	610	612	958	644	608	931	1489	-	-	1467	-	-
Mov Cap-2 Maneuver	610	612	-	644	608	-	-	-	-	-	-	-
Stage 1	893	802	-	812	741	-	-	-	-	-	-	-
Stage 2	766	740	-	880	798	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v10.73		10.89	1.37	0.37
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1489	-	-	671 645	1467	-	-
HCM Lane V/C Ratio	0.018	-	-	0.065 0.052	0.004	-	-
HCM Control Delay (s/veh)	7.5	-	-	10.7 10.9	7.5	-	-
HCM Lane LOS	A	-	-	B B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2 0.2	0	-	-






Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	3	6	134	92	2
Future Vol, veh/h	1	3	6	134	92	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
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	1	3	7	146	100	2

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	260	101	102
Stage 1	101	-	-
Stage 2	159	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	729	954	1490
Stage 1	923	-	-
Stage 2	870	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	726	954	1490
Mov Cap-2 Maneuver	726	-	-
Stage 1	919	-	-
Stage 2	870	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.09	0.32	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1490	-	885	-	-
HCM Lane V/C Ratio	0.004	-	0.005	-	-
HCM Control Delay (s/veh)	7.4	-	9.1	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection Capacity Analysis Worksheets: 2040 Bkgrd + Project

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	48	7	3	293	422	7
Future Vol, veh/h	48	7	3	293	422	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
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	52	8	3	318	459	8

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	788	462	466
Stage 1	462	-	-
Stage 2	325	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	360	599	1095
Stage 1	634	-	-
Stage 2	732	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	359	599	1095
Mov Cap-2 Maneuver	359	-	-
Stage 1	632	-	-
Stage 2	732	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v16.29		0.08	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1095	-	378	-	-
HCM Lane V/C Ratio	0.003	-	0.158	-	-
HCM Control Delay (s/veh)	8.3	-	16.3	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	2	1	6	18	1	2	2	206	133	11	405	0
Future Vol, veh/h	2	1	6	18	1	2	2	206	133	11	405	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	1	7	20	1	2	2	224	145	12	440	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	693	837	440	765	765	296	440	0	0	368	0	0
Stage 1	464	464	-	301	301	-	-	-	-	-	-	-
Stage 2	229	373	-	465	464	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	358	303	617	320	333	743	1120	-	-	1190	-	-
Stage 1	578	563	-	708	665	-	-	-	-	-	-	-
Stage 2	774	618	-	578	563	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	351	299	617	312	329	743	1120	-	-	1190	-	-
Mov Cap-2 Maneuver	351	299	-	312	329	-	-	-	-	-	-	-
Stage 1	572	558	-	707	664	-	-	-	-	-	-	-
Stage 2	769	617	-	565	558	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v12.66		16.69	0.05	0.21
HCM LOS	B	C		






Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1120	-	-	480	331	1190	-	-
HCM Lane V/C Ratio	0.002	-	-	0.02	0.069	0.01	-	-
HCM Control Delay (s/veh)	8.2	-	-	12.7	16.7	8.1	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-

Intersection												
Int Delay, s/veh	6.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	45	57	65	1	7	10	89	120	1	10	347	40
Future Vol, veh/h	45	57	65	1	7	10	89	120	1	10	347	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	62	71	1	8	11	97	130	1	11	377	43

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	748	746	399	754	767	131	421	0	0	132	0	0
Stage 1	421	421	-	324	324	-	-	-	-	-	-	-
Stage 2	328	325	-	430	442	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	328	342	651	325	333	919	1138	-	-	1454	-	-
Stage 1	610	589	-	688	649	-	-	-	-	-	-	-
Stage 2	685	649	-	603	576	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	288	311	651	215	302	919	1138	-	-	1454	-	-
Mov Cap-2 Maneuver	288	311	-	215	302	-	-	-	-	-	-	-
Stage 1	606	585	-	629	594	-	-	-	-	-	-	-
Stage 2	612	594	-	477	572	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v22.85		13.08	3.58	0.19
HCM LOS	C	B		






Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1138	-	-	380	465	1454	-	-
HCM Lane V/C Ratio	0.085	-	-	0.478	0.042	0.007	-	-
HCM Control Delay (s/veh)	8.5	-	-	22.9	13.1	7.5	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	2.5	0.1	0	-	-

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	5	2	208	411	1
Future Vol, veh/h	1	5	2	208	411	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
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	1	5	2	226	447	1

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	678	447	448
Stage 1	447	-	-
Stage 2	230	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	418	611	1112
Stage 1	644	-	-
Stage 2	808	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	417	611	1112
Mov Cap-2 Maneuver	417	-	-
Stage 1	643	-	-
Stage 2	808	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	11.42	0.08	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1112	-	567	-	-
HCM Lane V/C Ratio	0.002	-	0.011	-	-
HCM Control Delay (s/veh)	8.2	-	11.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	5	8	488	446	44
Future Vol, veh/h	9	5	8	488	446	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
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	10	5	9	530	485	48

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1057	509	533	0	-	0
Stage 1	509	-	-	-	-	-
Stage 2	548	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	249	564	1035	-	-	-
Stage 1	604	-	-	-	-	-
Stage 2	579	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	247	564	1035	-	-	-
Mov Cap-2 Maneuver	247	-	-	-	-	-
Stage 1	599	-	-	-	-	-
Stage 2	579	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v17.24		0.14	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1035	-	309	-	-
HCM Lane V/C Ratio	0.008	-	0.049	-	-
HCM Control Delay (s/veh)	8.5	-	17.2	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	1	4	120	1	10	5	468	24	2	366	1
Future Vol, veh/h	1	1	4	120	1	10	5	468	24	2	366	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	4	130	1	11	5	509	26	2	398	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	923	948	398	935	936	522	399	0	0	535	0	0
Stage 1	403	403	-	533	533	-	-	-	-	-	-	-
Stage 2	520	546	-	403	403	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	250	261	651	246	265	555	1160	-	-	1033	-	-
Stage 1	624	600	-	531	525	-	-	-	-	-	-	-
Stage 2	539	518	-	624	600	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	243	259	651	241	263	555	1160	-	-	1033	-	-
Mov Cap-2 Maneuver	243	259	-	241	263	-	-	-	-	-	-	-
Stage 1	623	599	-	528	523	-	-	-	-	-	-	-
Stage 2	525	516	-	618	598	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v13.61		36.29	0.08	0.05
HCM LOS	B	E		






Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1160	-	-	425 252	1033	-	-
HCM Lane V/C Ratio	0.005	-	-	0.015 0.564	0.002	-	-
HCM Control Delay (s/veh)	8.1	-	-	13.6 36.3	8.5	-	-
HCM Lane LOS	A	-	-	B E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0 3.2	0	-	-

Intersection												
Int Delay, s/veh	8.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	60	10	58	1	51	10	116	358	1	10	310	20
Future Vol, veh/h	60	10	58	1	51	10	116	358	1	10	310	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	65	11	63	1	55	11	126	389	1	11	337	22

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1039	1012	348	1006	1022	390	359	0	0	390	0	0
Stage 1	370	370	-	642	642	-	-	-	-	-	-	-
Stage 2	669	642	-	364	380	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	209	239	695	220	236	659	1200	-	-	1168	-	-
Stage 1	650	620	-	463	469	-	-	-	-	-	-	-
Stage 2	447	469	-	655	614	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	138	212	695	169	209	659	1200	-	-	1168	-	-
Mov Cap-2 Maneuver	138	212	-	169	209	-	-	-	-	-	-	-
Stage 1	644	615	-	414	420	-	-	-	-	-	-	-
Stage 2	341	419	-	580	608	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v43.35		26.49	2.04	0.24
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1200	-	-	226 234	1168	-	-
HCM Lane V/C Ratio	0.105	-	-	0.615 0.288	0.009	-	-
HCM Control Delay (s/veh)	8.4	-	-	43.4 26.5	8.1	-	-
HCM Lane LOS	A	-	-	E D	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	3.6 1.2	0	-	-

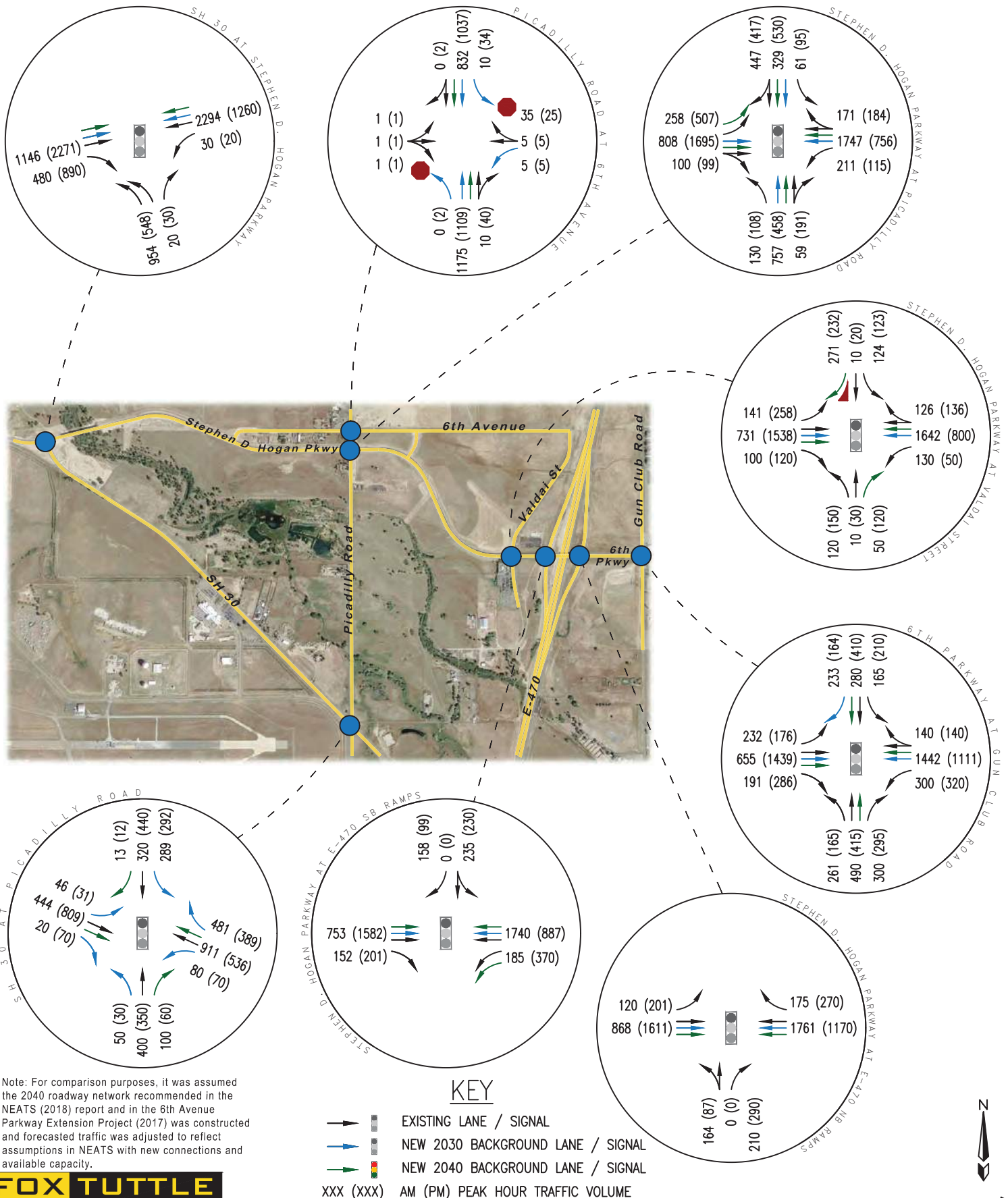
Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	3	6	473	366	2
Future Vol, veh/h	1	3	6	473	366	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
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	1	3	7	514	398	2

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	926	399	400
Stage 1	399	-	-
Stage 2	527	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	298	651	1159
Stage 1	678	-	-
Stage 2	592	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	297	651	1159
Mov Cap-2 Maneuver	297	-	-
Stage 1	674	-	-
Stage 2	592	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v12.25		0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1159	-	501	-	-
HCM Lane V/C Ratio	0.006	-	0.009	-	-
HCM Control Delay (s/veh)	8.1	-	12.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Volume Figures from Aurora One TIS



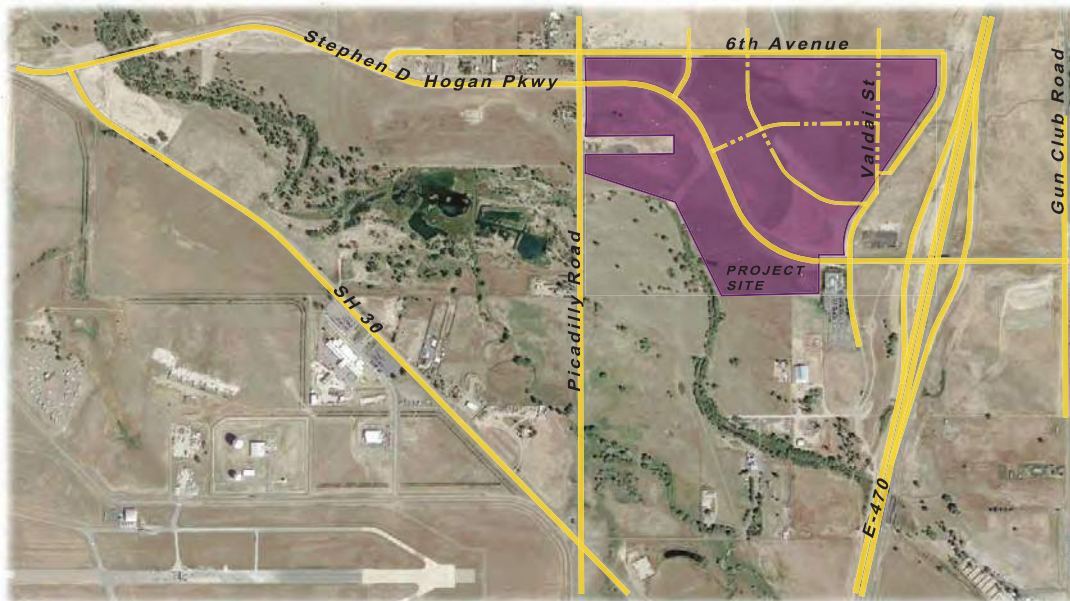
Note: For comparison purposes, it was assumed the 2040 roadway network recommended in the NEATS (2018) report and in the 6th Avenue Parkway Extension Project (2017) was constructed and forecasted traffic was adjusted to reflect assumptions in NEATS with new connections and available capacity.

15%
To/From West
via 6th/ Hogan
Parkway

30%
To/From North
via Picadilly Road

7%
To/From North
via E-470

13%
To/From North/East
via Gun Club Road
and Colfax Avenue



6%
To/From East
via 6th/
Hogan
Parkway

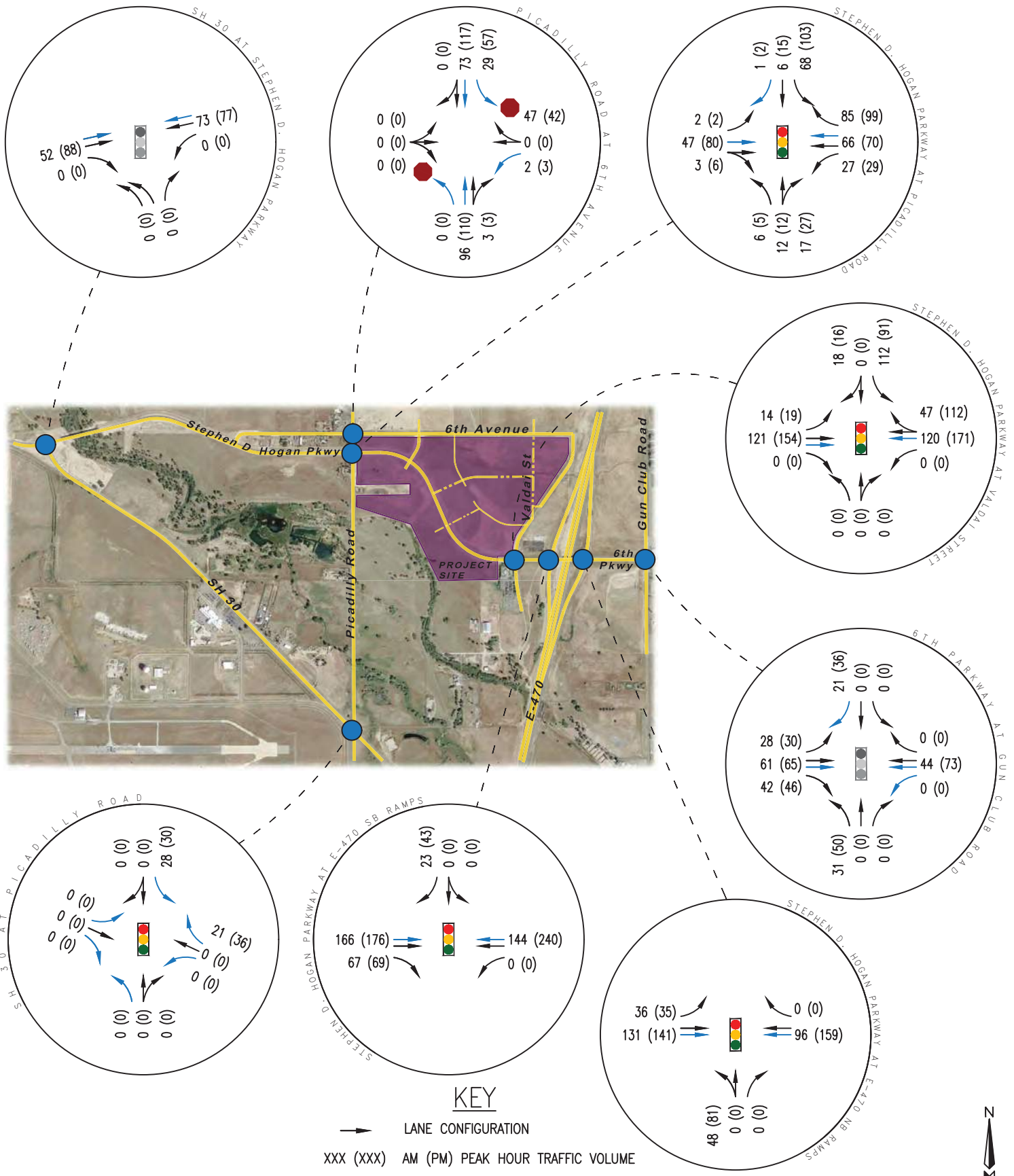
6%
To/From South
via SH 30

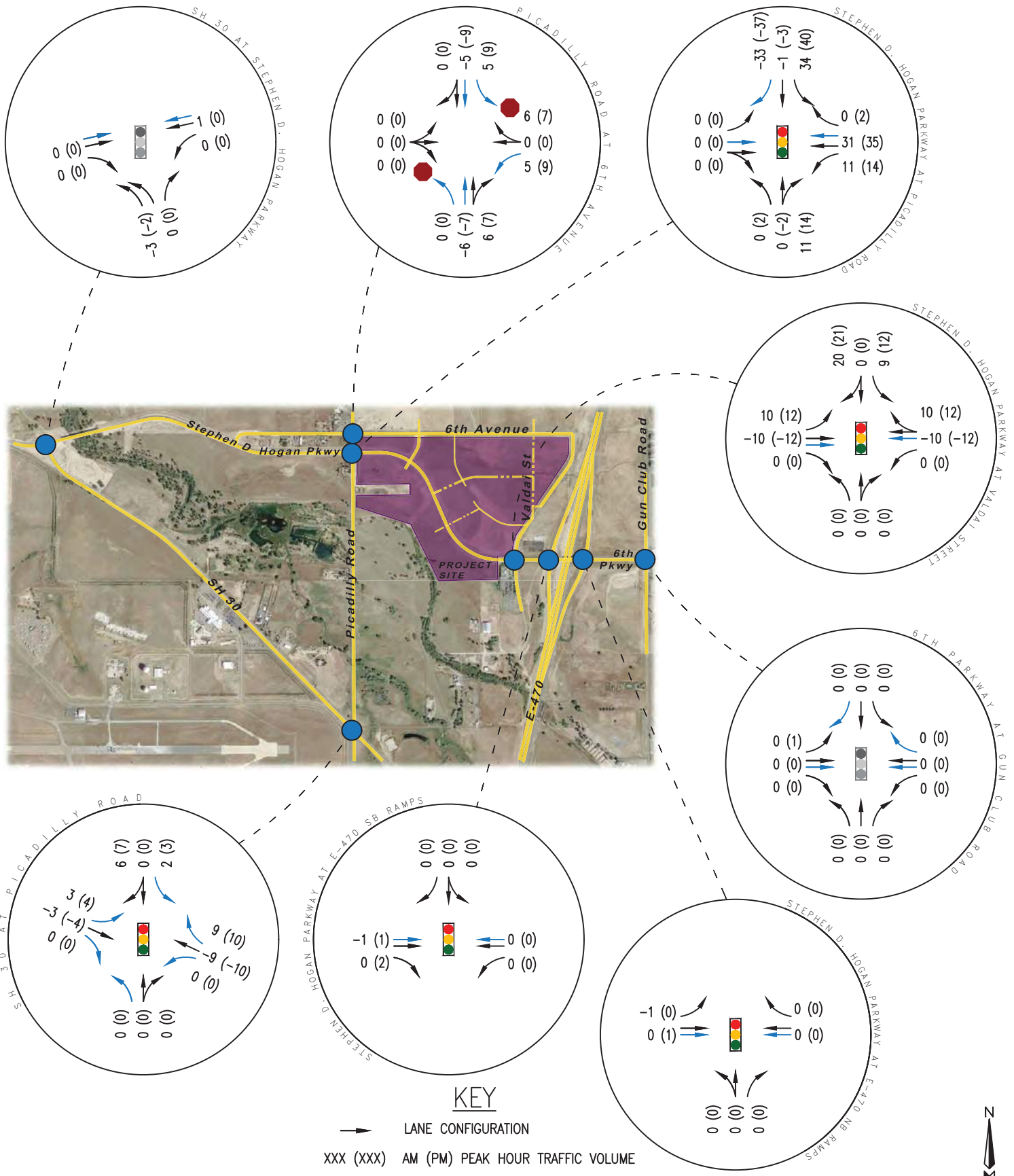
14%
To/From South
via E-470

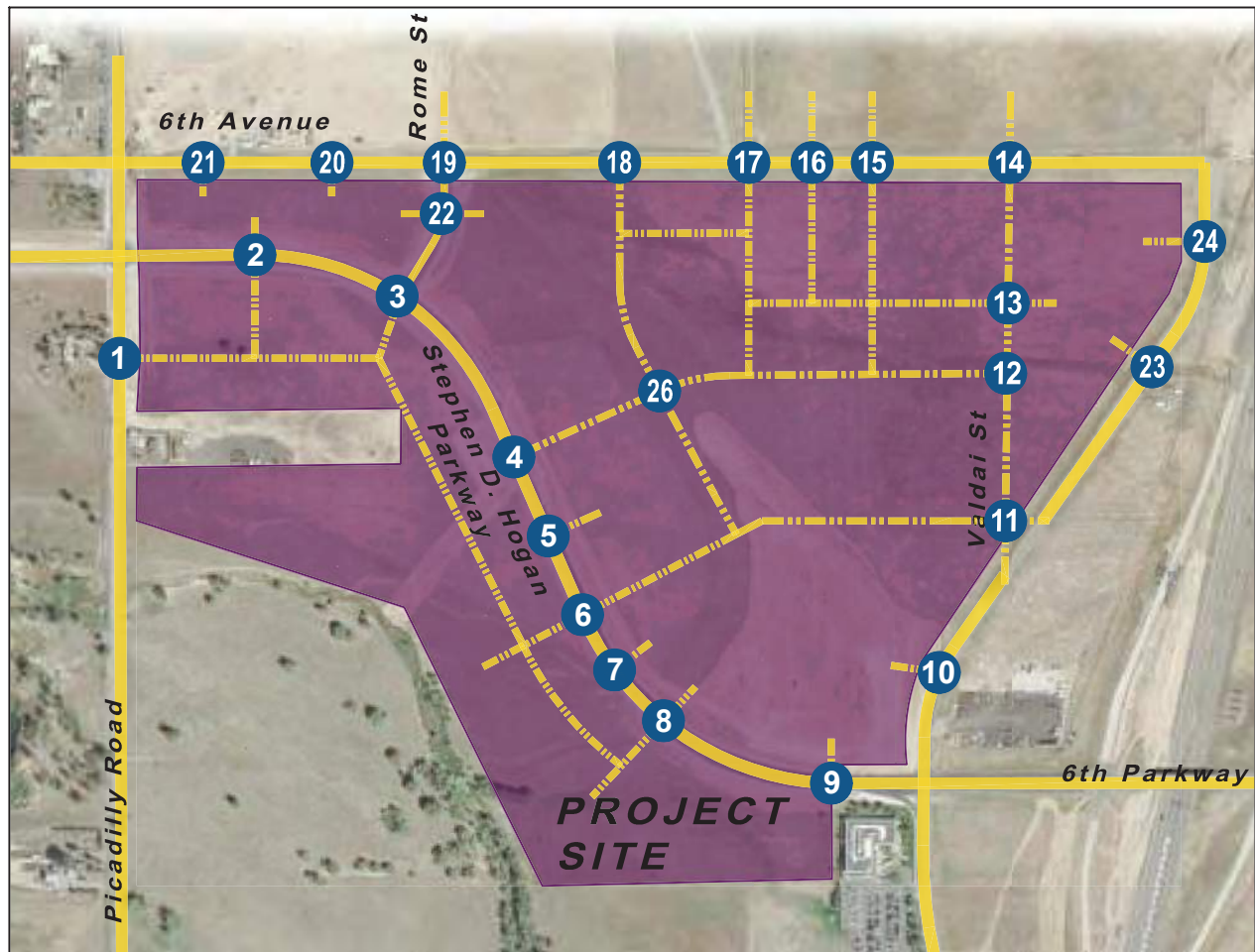
9%
To/From South
via Gun Club
Road

KEY

- PROPOSED PROJECT ROADWAY NETWORK
- X% TRIP DISTRIBUTION





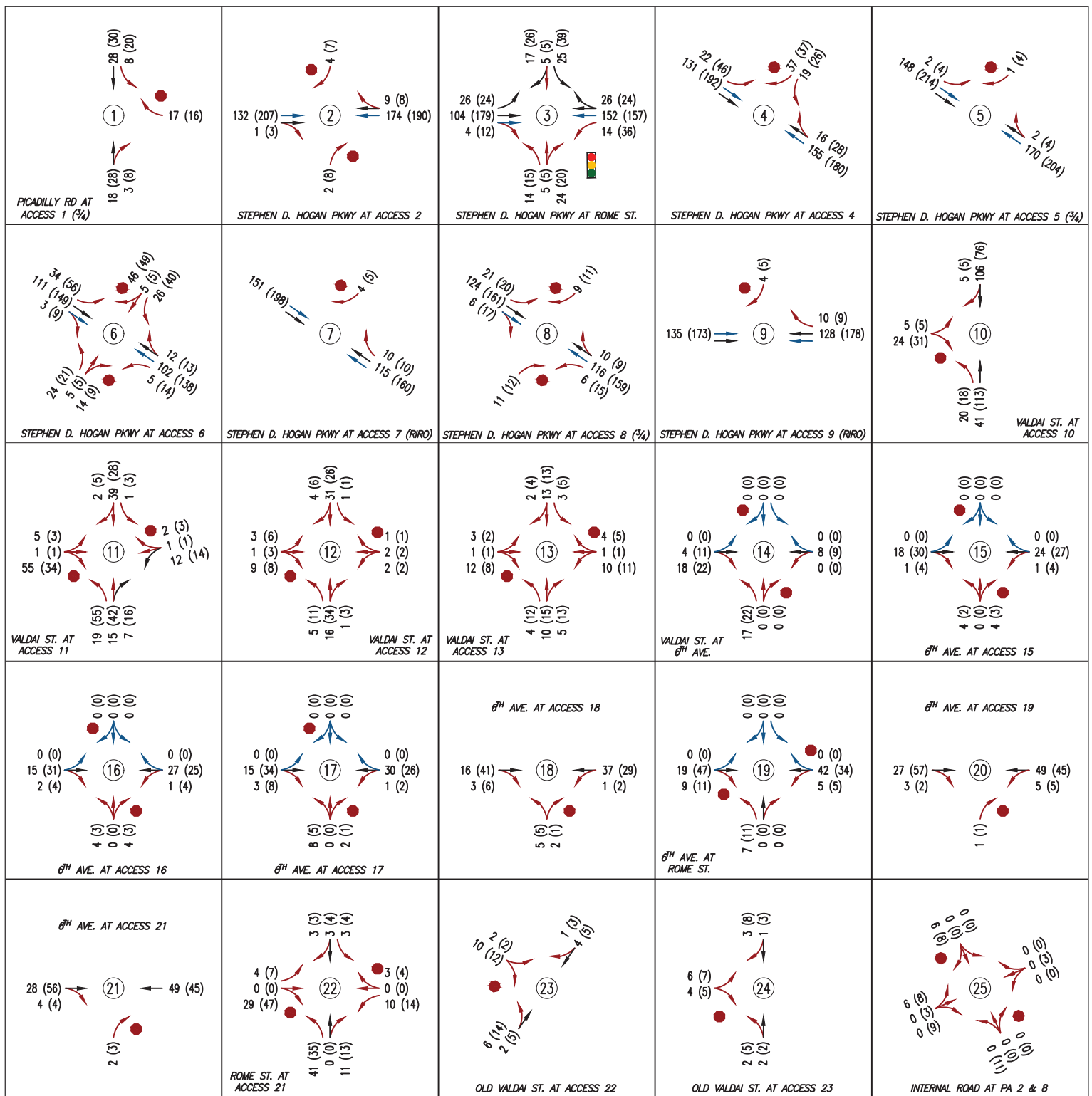


NOTE: FOR INTERNAL INTERSECTIONS NOT ANALYZED IN THIS STUDY, ANTICIPATED VOLUMES ARE LOW AND SIDE-STREET STOP-CONTROL SHALL BE CONSIDERED ACCEPTABLE UNLESS STUDIED BY A LATER TRAFFIC IMPACT STUDY. ALL-WAY STOP-CONTROL SHALL NOT BE USED UNLESS AN ALL-WAY STOP WARRANT HAS BEEN MET PER CRITERIA SET FORTH IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

KEY

--- PROPOSED PROJECT ROADWAY NETWORK

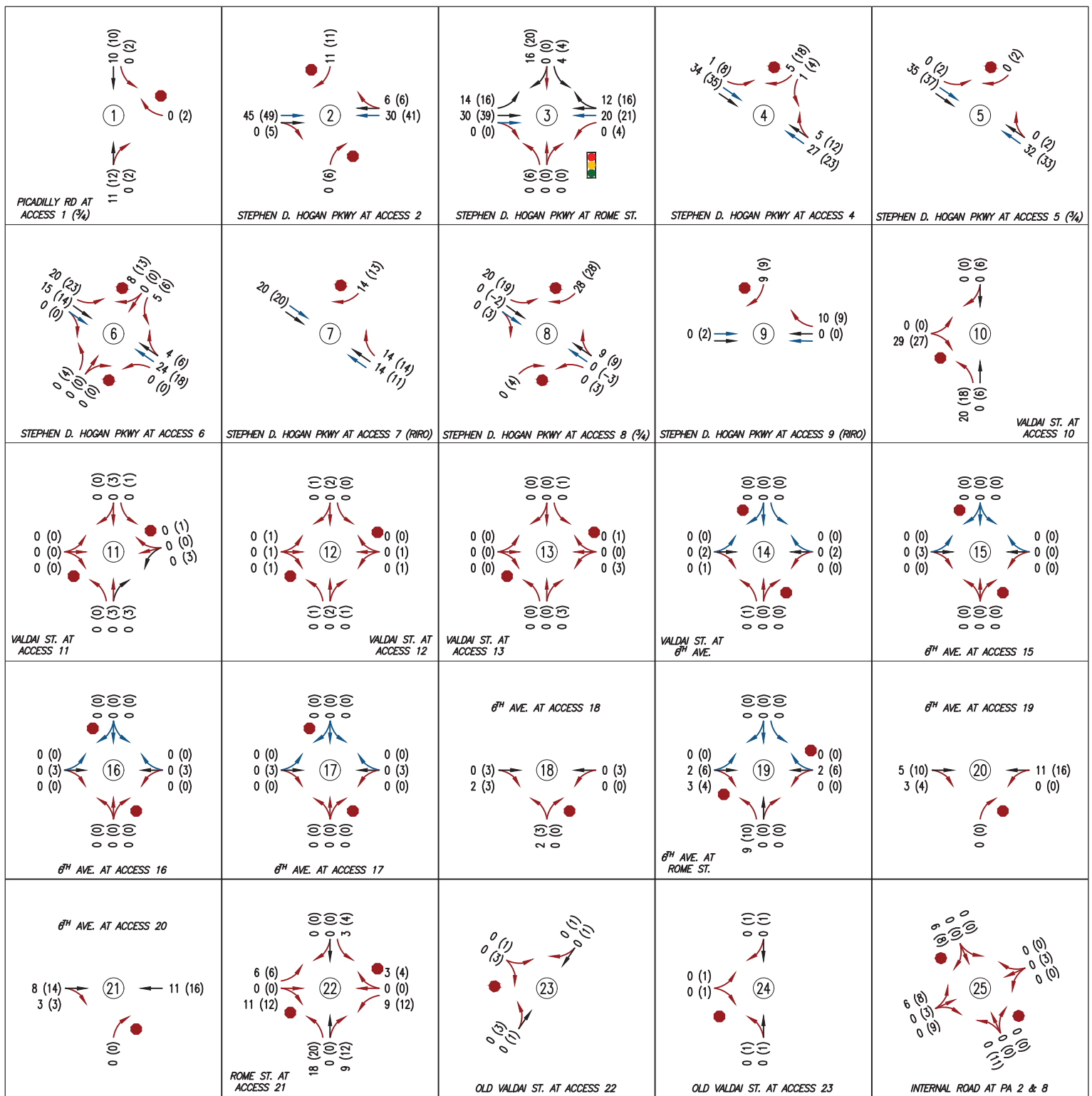
ACCESS INTERSECTION ID NUMBER



KEY

- XX (XX) AM (PM) PEAK HOUR TRIPS
- EXISTING LANE CONFIGURATION
- NEW BACKGROUND LANE CONFIGURATION
- NEW PROJECT LANE CONFIGURATION
- EXISTING / BKGRD TRAFFIC CONTROL
- NEW PROJECT TRAFFIC CONTROL





KEY

- XX (XX) AM (PM) PEAK HOUR TRIPS
- EXISTING LANE CONFIGURATION
- NEW BACKGROUND LANE CONFIGURATION
- NEW PROJECT LANE CONFIGURATION
- ◫ EXISTING / BKGRD TRAFFIC CONTROL
- ◫ NEW PROJECT TRAFFIC CONTROL



Thank you for your thorough review and comments. Please see the responses within the report. The trip generation table was updated this impacted only the NB left-turn on Valdai at Access 12.

MEMORANDUM

Added information from the MTIS to the attachments of this letter.

To: Manny Nuno, PE, CFM, LEED AP, CPESC, Ware Malcomb

From: Cassie Slade, PE, PTOE

Date: August 1, 2024

Project: Aurora One Planning Area 4 in Aurora, Colorado

Subject: Traffic Conformance Memo – Updated

The Fox Tuttle Transportation Group has completed a traffic analysis for the proposed development of Planning Area 4 within the Aurora One project in Aurora, Colorado. The 150-acre property is located on both sides of Stephen D. Hogan Parkway between Picadilly Road and E-470. It is understood that the entire project will have a mix of land uses including commercial retail/service, medical office, single-family attached residential, and multi-family residential. The project area is bounded by Picadilly Road to the west, 6th Avenue to the north, Valdai Street to the east, and the Coal Creek to the south. Planning Area 4 is located in the southwest corner of 6th Avenue and the new alignment of Valdai Street, as shown in **Figure 1**.

Planning Area 4 proposes constructing 204 townhomes and 76 duplexes. The existing and future roadways and intersections have been planned or built to support Aurora One



Figure 1. Vicinity Map

traffic including Planning Area 4. The master development includes realigning Valdai Street to connect to 6th Avenue approximately 670 feet west of the current intersection and constructing new internal roadways to provide connectivity for vehicular and multi-modal travel through Aurora One.

The purpose of this “traffic conformance memo” is to determine if the proposed Aurora One Planning Area 4 project compares to the trip generation assumptions as analyzed in the master traffic study and to determine if additional traffic analyses are necessary.

Comparison to the Master Traffic Study

A “Master” traffic impact study¹ (TIS) was previously prepared for the entire Aurora One development including Planning Area 4, as shown in **Figure 2**. The proposed roadways and intersections have been planned and will be built to support this full buildout traffic of Aurora One and other projects within the area. A review of the Aurora One TIS shows that Planning Area 4 included 272 townhomes. The current site plan includes 280 townhomes/duplexes, which is an increase of eight (8) dwelling units (3% increase). Proposed access will remain the same along 6th Avenue and Valdai Street (new alignment) and as previously evaluated. One (1) additional access is proposed on 6th Avenue to serve the homes on the west end of Planning Area 4. It is not anticipated that this new access will

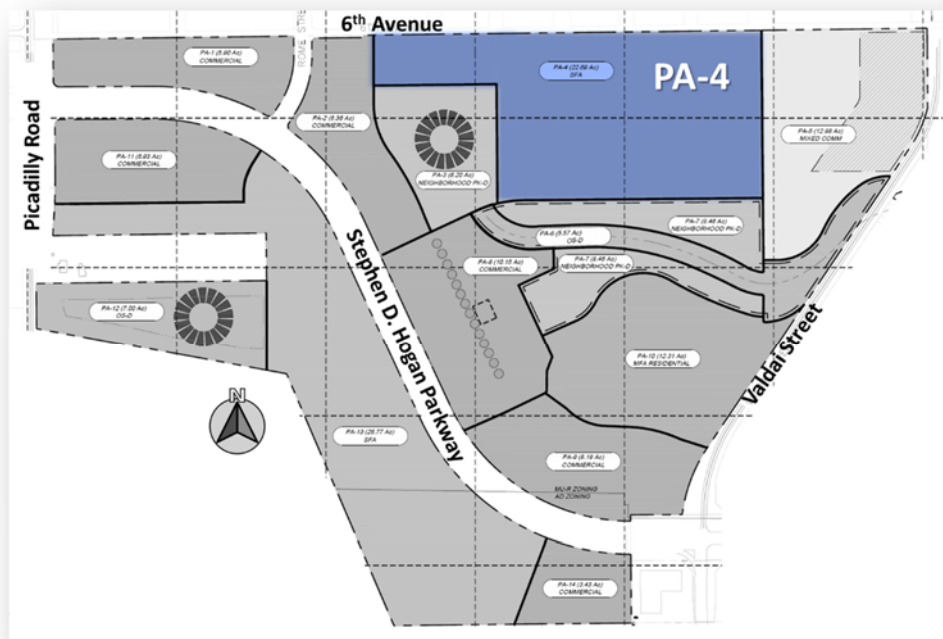


Figure 2. Proposed Planning Area 4 of Aurora One Map

¹ Aurora One Traffic Impact Study. Fox Tuttle Transportation Group, LLC. January 2021.

create any issues with adjacent accesses and intersections.

Trip Generation

To establish the volume of trips associated with the proposed Aurora One Planning Area 4 project, the data contained in the Institute of Transportation Engineers' (ITE) *Trip Generation Handbook and Manual* (10th Edition, Year 2017) was utilized in the Master Traffic Study and a newer version of the *Trip Generation Manual*, has since been released in Year 2021 (11th Edition). The new version was applied to the current site plan for Planning Area 4. The proposed land use is estimated to mostly be new trips, known as 'primary trips', and non-auto trips which are discussed below:

Primary Trips. These trips are made specifically to visit the site and are considered "new" trips. Primary trips would not have been made if the proposed project did not exist. Therefore, this is the only trip type that increases the number of trips made on a regional basis.

Non-Auto Trips. These trips are those that are completed by walking, biking, or transit. The future pedestrian and bicycle amenities will encourage residents, employees, customers, and visitors to make non-auto trips to/from the Aurora One community.

In the Aurora One TIS, it was assumed that there will 15% internal capture/non-auto reduction with the mix of land uses and connectivity to multi-modal facilities. For comparison purposes, the same percentage was applied to Planning Area 4. The estimated trip generation is summarized in **Table 1** for weekday daily, weekday AM, and weekday PM periods.

Cite or add reference
to the Aurora One
Master Traffic Study
1/25/2021.

Refer to Page 2
footnotes for the
reference.

Aurora One Planning Area 4

PA-4							
ITE 220: Multi-Family Housing (Low-Rise)	272	DU	0.90	0.95	7.32	1,702	8
Subtotal of New Trips						1,702	8

Table 1. Trip Generation Estim

Land Use	Size	Unit	Internal Capture & Non-Auto	Average Daily New Trips		
				Rate	Total	In
Master Traffic Study ¹						
ITE 220: Multi-Family Housing (Low-Rise)	272	DU	15%	7.32	1,692	846
Planning Area 4 ²						
ITE 220: Multi-Family Housing (Low-Rise)	204	DU	15%	6.74	1,169	585
ITE 215: Single-Family Attached Housing	76	DU	15%	7.20	465	233
Subtotal					1,634	818
Change from Previous Land Use Assumptions					-58	-28
Percent Difference					-3%	

Source: ¹ ITE Trip Generation 10th Edition, 2017. This is the version that was used in the Master Traffic Study.

² ITE Trip Generation 11th Edition, 2021. Most current version of ITE data.

Based on the comparison to the Aurora One TIS, **it was estimated that the latest site plan for Planning Area 4 will have a 3% decrease in daily and 3-6% decrease in peak hour traffic.** The daily traffic volume was estimated to be reduced by 58 vehicles per day (vpd). The AM and PM peak hours were estimated to be reduced by six (6) trips and four (4) trips, respectively. The slight increase does not impact the recommendations or require additional improvements.

A sentence that trip distribution is the same as the MTIS.

Traffic Operations

Updated

The proposed intersections on Valdai Street adjacent to Planning Area 4 were evaluated for delay and queuing at the anticipated buildout year of the project and full buildout of Aurora One. The following intersections were included, and the numbering is consistent with the MTIS:

#112. Valdai Street and Access 12 (PA-4 & 5)

#113. Valdai Street and Access 13 (PA-4 & 5)

#114. Valdai Street and 6th Avenue

#213. Valdai Street and Access 13.5 (New PA-4 Access)

Planning Area 4 trip volumes for Year 2025 are shown on **Figure 3**.

The values don't match the MTIS exactly. This is due to how the reduction is applied. In the MTIS the total amount was multiplied by .9 and then by .95. This is report it is taking the full 15% at once. For this conformance letter we should follow the approved MTIS methodology.

Updated. Thank you for catching this

9	0.56	130	79	51
9		130	79	51

PM Peak Hour New Trips			
ate	Total	In	Out
.56	129	79	50
0.51	88	55	33
0.57	37	22	15
	125	77	48
PM >	-4	-2	-2
-3%			

Site-generated trips were added to the background Year 2025 volumes and are illustrated on **Figure 4**. The Year 2040 full buildout traffic volumes are shown on **Figure 5**. The necessary traffic control and lane configurations for the near-term and long-term scenarios are shown on the appropriate figures.

Evaluation Methodology

The traffic operations analysis addressed the signalized and unsignalized intersection operations using the procedures and methodologies set forth by the Highway Capacity Manual (HCM)². Study intersections were evaluated using Synchro software.

Level of Service Capacity Analysis

A Level of Service analysis was conducted to determine the existing and future performance of the study area intersections and accesses to determine the most appropriate intersection traffic controls and auxiliary lanes for future conditions.

To measure and describe the operational status of the study intersections, transportation engineers and planners commonly use a grading system referred to as “Level of Service” (LOS) that is defined by the HCM. LOS characterizes the operational conditions of an intersections traffic flow, ranging from LOS A (indicating very good, free flow operations) and LOS F (indicating congested and sometimes oversaturated conditions). These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with traveling through the intersections. The intersection LOS is represented as a delay in seconds per vehicle for the intersection as a whole and for each turning movement.

Typically, LOS A through C is considered to be acceptable for the overall intersection operations and LOS D overall during peak hours is acceptable. Individual movements may be allowed to fall to LOS E at signalized intersections. Minor movements at unsignalized intersections, such as left turns onto a major arterial, may be allowed to fall below LOS D. Individual movements are allowed to fall to LOS E if traffic volume is low, or there is not a viable alternative. Criteria contained in the HCM was applied for these analyses in order to determine peak hour LOS for each scenario. A more detailed discussion of LOS methodology is contained in the Appendix for reference.

² Highway Capacity Manual, Highway Research Board Special Report 209, Transportation Research Board, National Research Council, 7th Edition (2022).

Planning Area 4 Buildout Year

It was assumed that Planning Area 4 will be completed and generating traffic by Year 2025. To estimate the background growth associated with Horizon (development project to the north) and other Aurora One planning areas, it was assumed that the trip Generation was completed and 25% of Aurora One Planning Areas 5 and 10 was completed. The trip Generation showed a decrease in trips. Updated. Thank you for catching this. Projects that were anticipated to utilize Valdai Street or 6th Avenue within the area, including Planning Area 4 in the MTIS.

Trips for Planning Area 4 were slightly increased as discussed in the **Trip Generation Section** and the volumes were redistributed to include the one (1) additional access proposed on Valdai Street, just south of 6th Avenue. The Year 2025 traffic volumes are shown on **Figure 4**.

The results of the LOS calculations for the intersections are summarized in **Table 2** (attached to this letter). The details of queuing for each movement are provided in **Table 3** (attached to this letter). The intersection Level of Service worksheets are included in the attachments.

All of the side-street stop-controlled intersections operate overall at LOS A in both peak hours with all movements operating at LOS A or B. The 95th percentile queues were calculated to be one (1) vehicle or less.

Year 2040 Full Buildout of Aurora One

The MTIS volumes for Aurora One were adjusted to account for the increase in dwelling units in Planning Area 4. These new trip volumes were redistributed to account for the proposed additional access on Valdai Street, just south of 6th Avenue. The background forecasts and other Aurora One Planning Areas remained the same as estimated in the MTIS for this focused analysis.

The results of the LOS calculations for the intersections are summarized in **Table 2** (attached to this letter). The details of queuing for each movement are provided in **Table 3** (attached to this letter). The intersection Level of Service worksheets are included in the attachments. The long-term full buildout traffic volumes are shown on **Figure 6**.

All of the side-street stop-controlled intersections operate overall at LOS A in both peak hours with majority of the movements operating at LOS C or better. The eastbound approach at the intersection of **Valdai Street at 6th Avenue** was estimated to operate at LOS E in the PM peak hour, consistent with the MTIS findings. The 95th percentile queue for this movement was calculated to be up to 83 feet (about three vehicles). The westbound approach at the intersection of **Valdai Street at Access 13** was estimated to operate at LOS E in the PM peak hour with a 95th percentile queue of 80 feet (about three vehicles).

No mitigation measures are recommended at either intersection since the delay is reasonable for a side-street approach, the queue is minimal, and volumes do not warrant a change in traffic control. The 95th percentile queues for the other study intersections and movements were calculated to be one (1) vehicle or less.

Auxiliary Lanes

The recommended auxiliary lanes and minimum storage lengths are presented in **Table 3**. It is understood that Valdai Street will include a center left-turn lane, therefore, each access for Planning Area 4 is recommended to include a minimum of 50 feet of storage. The northbound left-turn at 6th Avenue (#14) is recommended to be a minimum of 90 feet to accommodate the estimated 95th percentile queue at full buildout of Aurora One. It should be noted that the new proposed access on Valdai Street (#213) is approximately 115 feet (flowline to flowline) south of 6th Avenue. The recommended northbound left-turn storage can be accommodated in the center left-turn lane since there will not be a back-to-back left-turn into Planning Area 5. The intersection at Valdai Street and Access 13 has a northbound right-turn volume that places a consideration for needing a separate turn lane. Based on operations and minor through volume, it is recommended that this northbound right-turn remain shared with the through.

Conclusions

It is anticipated that the existing and proposed roadway network, intersections, and accesses can accommodate the Aurora One Planning Area 4 project since the associated trips were estimated to be slightly more than the Master TIS trip forecasts. Planning Area 4 increased the number of townhomes from 272 units to 280 units (3% increase). As noted, the **proposed land use is consistent with the trip generation assumptions, lane configurations, and access needs as presented in the Aurora One MTIS, and thus the findings and recommendations of that study are still valid.** No additional traffic analysis is necessary to support this project.

I hope that the contents of this memorandum are helpful to you. If you have any questions, please feel free to give me a call.

Sincerely,

FOX TUTTLE TRANSPORTATION GROUP, LLC



Cassie Slade, P.E., PTOE
Principal



Attachments:

Table 2 – Peak Hour Intersection Level of Service Summary

Table 3 – Peak Hour Estimated 95th Percentile Queue Lengths

Figure 3 – New Site-Generated Traffic Volumes

Figure 4 – Year 2025 Background + Project Traffic Volumes

Figure 5 – Year 2040 Background + Project Traffic Volumes

Intersection Capacity Analysis Worksheets

Include background volumes from MTIS, site generated traffic and Site distribution.

Added



Table 2 - Peak Hour Intersection Level of Service Summary

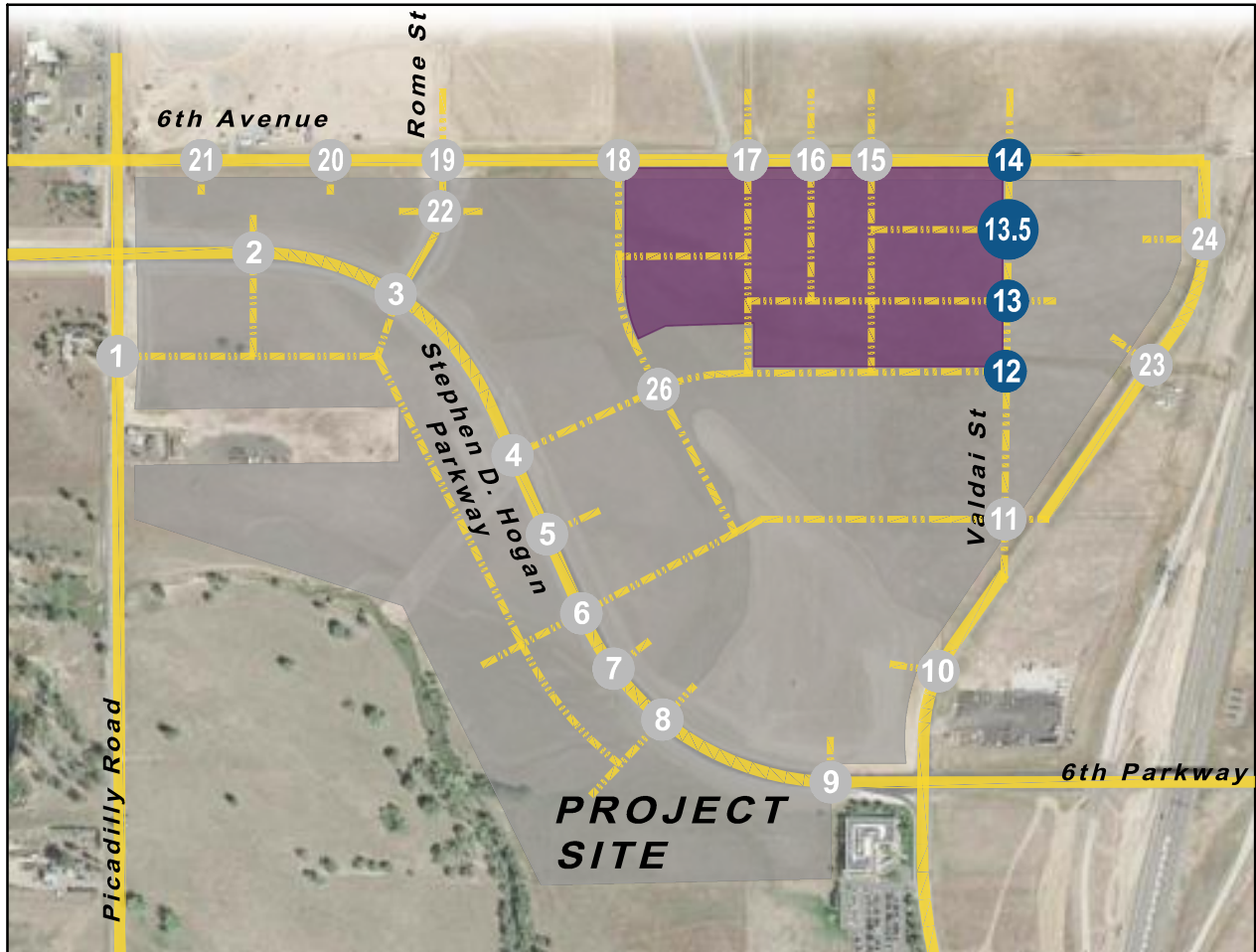
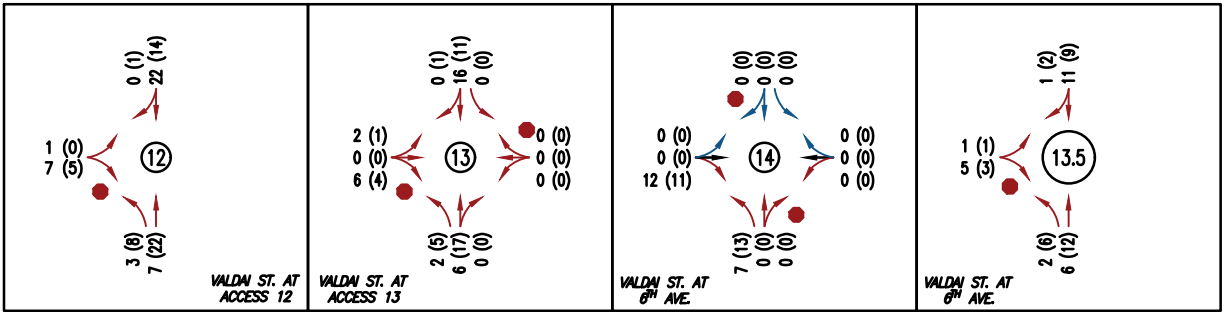
Intersection and Critical Lane Groups	2025 Bkgrd + Project				2040 Bkgrd + Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
STOP SIGN CONTROL								
#112. Valdai Street at Access 12 (PA 4 & 5)	1	A	1	A	1	A	0	A
Eastbound Left+Right	10	A	10	A	16	C	17	C
Northbound Left	8	A	8	A	8	A	9	A
#113. Valdai Street at Access 13 (PA 4 & 5)	1	A	3	A	1	A	5	A
Eastbound Left+Through+Right	9	A	9	A	13	B	14	B
Westbound Left+Through+Right	10	A	11	B	17	C	36	E
Northbound Left	8	A	7	A	8	A	8	A
Southbound Left	8	A	8	A	8	A	9	A
#114. Valdai Street at 6th Avenue	4	A	3	A	6	A	8	A
Eastbound Left+Through+Right	10	A	11	B	23	C	39	E
Westbound Left+Through+Right	9	A	11	B	13	B	27	D
Northbound Left	7	A	8	A	9	A	8	A
Southbound Left	7	A	8	A	8	A	8	A
#213. Valdai Street at Access 13.5 (PA 4 NEW)	0	A	0	A	0	A	0	A
Eastbound Left+Right	9	A	9	A	11	B	12	B
Northbound Left	8	A	7	A	8	A	8	A
Southbound Through+Right	0	A	0	A	0	A	0	A

Note: Delay represented in average seconds per vehicle.



Table 3 - Peak Hour Estimated 95th Percentile Queue Lengths

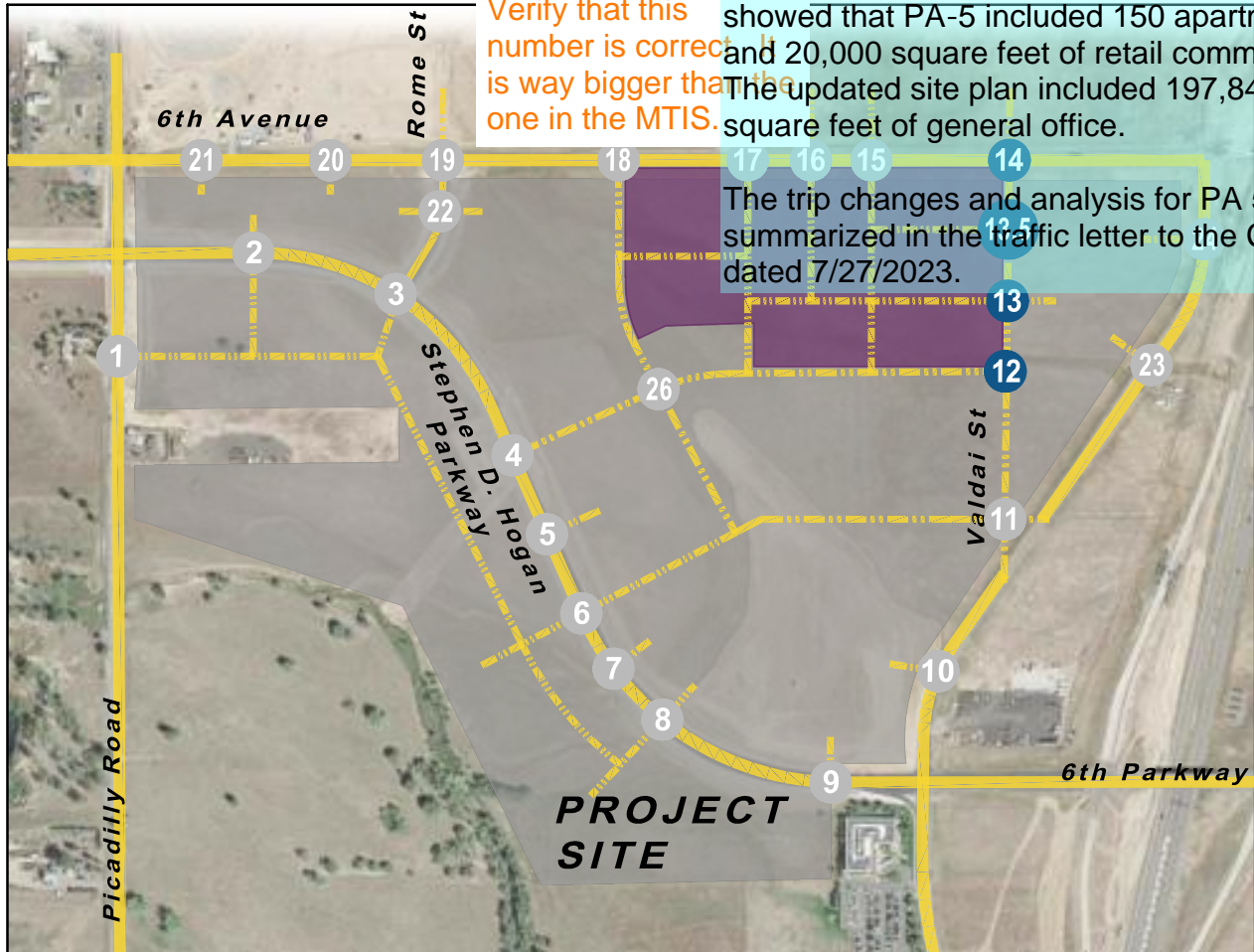
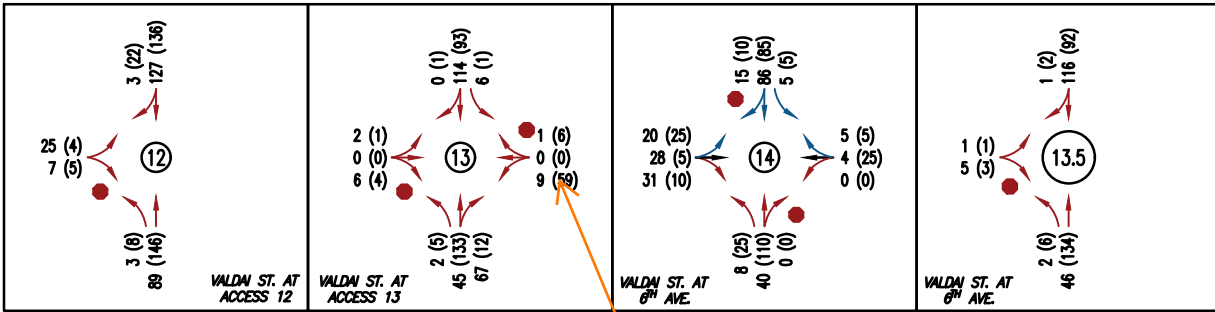
Intersection and Critical Lane Groups	Ex. Storage Length	Prop. Storage Length	2025 Bkgrd + Project		2040 Bkgrd + Project		Max. Queue	Max Vol. (vph)	City Requirement (NR-C) Storage + Taper				Proposed Minimum Future Storage
			AM Peak	PM Peak	AM Peak	PM Peak			Speed (mph)	Storage (feet)	Taper (feet)	Total (feet)	
#112. Valdai Street at Access 12 (PA 4 & 5)			Stop-Control		Stop-Control								
Eastbound Left+Right	-	-	3'	0'	15'	5'	-	-	-	-	-	-	-
Northbound Left	-	50'	0'	0'	0'	0'	0'	11'	30	25	96	121'	50'
#113. Valdai Street at Access 13 (PA 4 & 5)			Stop-Control		Stop-Control								
Eastbound Left+Through+Right	-	-	0'	0'	3'	0'	-	-	-	-	-	-	-
Westbound Left+Through+Right	-	-	0'	8'	5'	80'	-	-	-	-	-	-	-
Northbound Left	-	50'	0'	0'	0'	0'	0'	2'	30	25	96	121'	50'
Southbound Left	-	50'	0'	0'	0'	0'	0'	3'	30	25	96	121'	50'
#114. Valdai Street at 6th Avenue			Stop-Control		Stop-Control								
Eastbound Left+Through+Right	-	-	10'	5'	63'	83'	-	-	-	-	-	-	-
Westbound Left+Through+Right	-	-	0'	5'	3'	28'	-	-	-	-	-	-	-
Northbound Left	-	50'	0'	3'	8'	10'	10'	91'	30	90'	96	186'	90'
Southbound Left	-	50'	0'	0'	0'	0'	0'	10'	30	25	96	121'	50'
#213. Valdai Street at Access 13.5 (PA 4 NEW)			Stop-Control		Stop-Control								
Eastbound Left+Right	-	-	0'	0'	0'	0'	-	-	-	-	-	-	-
Northbound Left	-	50'	0'	0'	0'	0'	0'	5'	30	25	96	121'	50'
Southbound Through+Right	-	-	0'	0'	0'	0'	0'	1'	30	25	96	121'	50'



KEY

- XX (XX) AM (PM) PEAK HOUR TRIPS
- EXISTING LANE CONFIGURATION
- NEW BACKGROUND LANE CONFIGURATION
- NEW PROJECT LANE CONFIGURATION
- EXISTING / BKGRD TRAFFIC CONTROL
- NEW PROJECT TRAFFIC CONTROL
- PROPOSED PROJECT ROADWAY NETWORK
- # ACCESS INTERSECTION ID NUMBER





Verify that this number is correct. It is way bigger than the one in the MTIS.

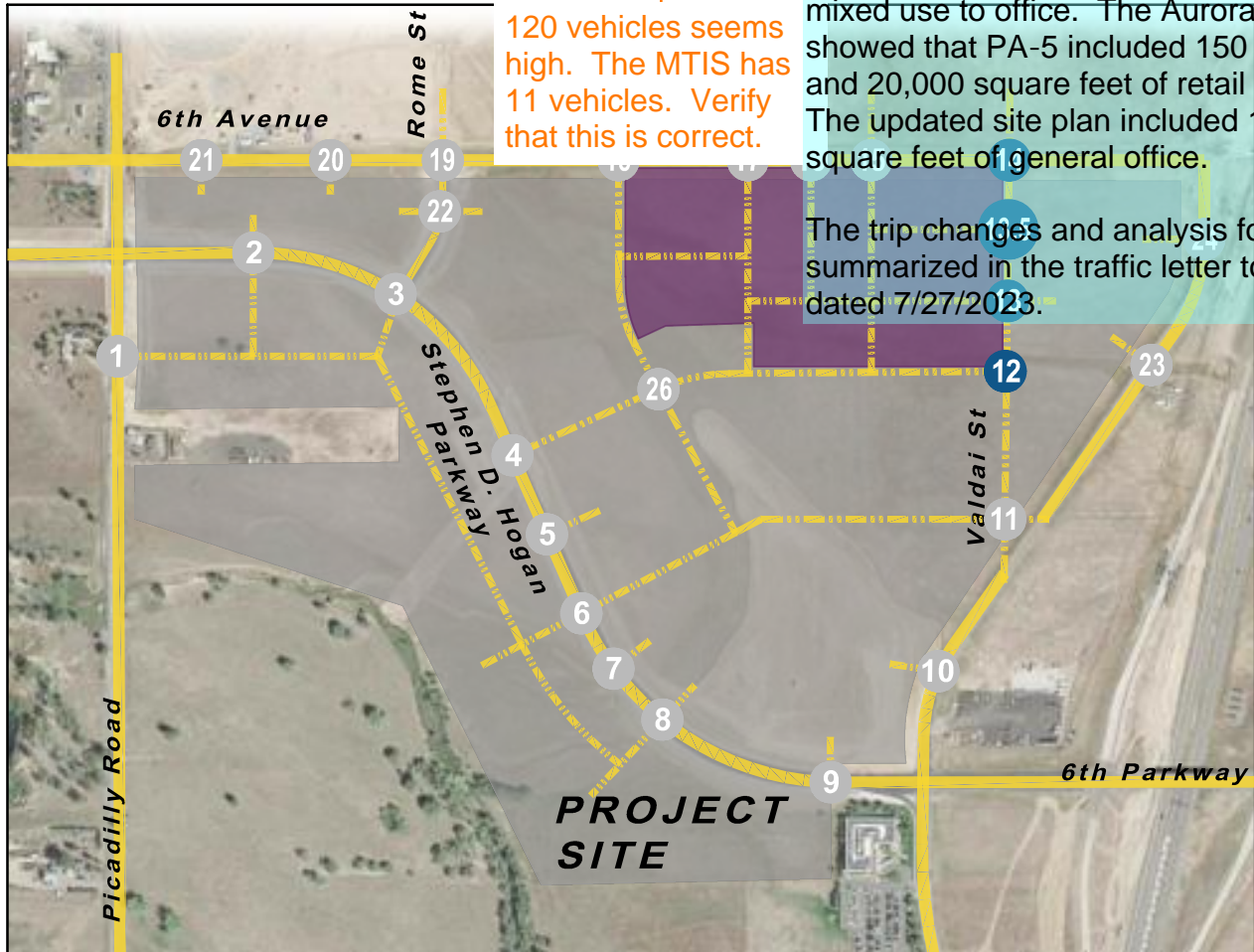
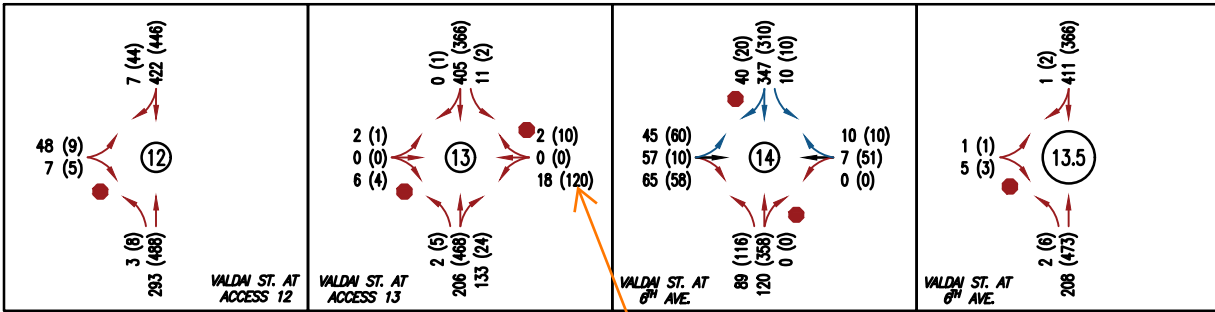
This is correct. PA 5 (Innovus) changed from mixed use to office. The Aurora One TIS showed that PA-5 included 150 apartments and 20,000 square feet of retail commercial. The updated site plan included 197,840 square feet of general office.

The trip changes and analysis for PA 5 were summarized in the traffic letter to the City dated 7/27/2023.

KEY

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- EXISTING LANE CONFIGURATION
- NEW BACKGROUND LANE CONFIGURATION
- NEW PROJECT LANE CONFIGURATION
- EXISTING / BKGRD TRAFFIC CONTROL
- NEW PROJECT TRAFFIC CONTROL
- PROPOSED PROJECT ROADWAY NETWORK
- # ACCESS INTERSECTION ID NUMBER





120 vehicles seems high. The MTIS has 11 vehicles. Verify that this is correct.






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- NEW PROJECT TRAFFIC CONTROL
- PROPOSED PROJECT ROADWAY NETWORK
- # ACCESS INTERSECTION ID NUMBER







Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	7	3	89	127	3
Future Vol, veh/h	25	7	3	89	127	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
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	27	8	3	97	138	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	243	140	141	0	-	0
Stage 1	140	-	-	-	-	-
Stage 2	103	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	745	908	1442	-	-	-
Stage 1	887	-	-	-	-	-
Stage 2	921	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	744	908	1442	-	-	-
Mov Cap-2 Maneuver	744	-	-	-	-	-
Stage 1	885	-	-	-	-	-
Stage 2	921	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.9	0.2		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1442	-	775	-	-	
HCM Lane V/C Ratio	0.002	-	0.045	-	-	
HCM Control Delay (s)	7.5	-	9.9	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	2	1	6	9	1	1	2	45	67	6	114	0
Future Vol, veh/h	2	1	6	9	1	1	2	45	67	6	114	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	1	7	10	1	1	2	49	73	7	124	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	229	264	124	232	228	86	124	0	0	122	0	0
Stage 1	138	138	-	90	90	-	-	-	-	-	-	-
Stage 2	91	126	-	142	138	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	726	641	927	723	671	973	1463	-	-	1465	-	-
Stage 1	865	782	-	917	820	-	-	-	-	-	-	-
Stage 2	916	792	-	861	782	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	721	637	927	714	667	973	1463	-	-	1465	-	-
Mov Cap-2 Maneuver	721	637	-	714	667	-	-	-	-	-	-	-
Stage 1	864	778	-	916	819	-	-	-	-	-	-	-
Stage 2	913	791	-	850	778	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.4	10	0.1	0.4
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1463	-	-	832	727	1465	-
HCM Lane V/C Ratio	0.001	-	-	0.012	0.016	0.004	-
HCM Control Delay (s)	7.5	-	-	9.4	10	7.5	-
HCM Lane LOS	A	-	-	A	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	5	2	46	116	1
Future Vol, veh/h	1	5	2	46	116	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
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	1	5	2	50	126	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	181	127	127	0	-	0
Stage 1	127	-	-	-	-	-
Stage 2	54	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	808	923	1459	-	-	-
Stage 1	899	-	-	-	-	-
Stage 2	969	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	807	923	1459	-	-	-
Mov Cap-2 Maneuver	807	-	-	-	-	-
Stage 1	898	-	-	-	-	-
Stage 2	969	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0.3	0
HCM LOS	A		





Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1459	-	901	-	-
HCM Lane V/C Ratio	0.001	-	0.007	-	-
HCM Control Delay (s)	7.5	-	9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	20	28	31	1	4	5	8	40	1	5	86	15
Future Vol, veh/h	20	28	31	1	4	5	8	40	1	5	86	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	30	34	1	4	5	9	43	1	5	93	16

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	177	173	101	205	181	44	109	0	0	44	0	0
Stage 1	111	111	-	62	62	-	-	-	-	-	-	-
Stage 2	66	62	-	143	119	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	785	720	954	753	713	1026	1481	-	-	1564	-	-
Stage 1	894	804	-	949	843	-	-	-	-	-	-	-
Stage 2	945	843	-	860	797	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	772	714	954	698	707	1026	1481	-	-	1564	-	-
Mov Cap-2 Maneuver	772	714	-	698	707	-	-	-	-	-	-	-
Stage 1	889	802	-	943	838	-	-	-	-	-	-	-
Stage 2	929	838	-	796	795	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10	9.4	1.2	0.3
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1481	-	-	809	836	1564	-
HCM Lane V/C Ratio	0.006	-	-	0.106	0.013	0.003	-
HCM Control Delay (s)	7.4	-	-	10	9.4	7.3	-
HCM Lane LOS	A	-	-	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0	0	-

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	5	8	146	136	22
Future Vol, veh/h	4	5	8	146	136	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
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	4	5	9	159	148	24

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	337	160	172	0	-	0
Stage 1	160	-	-	-	-	-
Stage 2	177	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	658	885	1405	-	-	-
Stage 1	869	-	-	-	-	-
Stage 2	854	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	654	885	1405	-	-	-
Mov Cap-2 Maneuver	654	-	-	-	-	-
Stage 1	864	-	-	-	-	-
Stage 2	854	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.8	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1405	-	765	-	-
HCM Lane V/C Ratio	0.006	-	0.013	-	-
HCM Control Delay (s)	7.6	-	9.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	1	4	59	1	6	5	133	12	1	93	1
Future Vol, veh/h	1	1	4	59	1	6	5	133	12	1	93	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	4	64	1	7	5	145	13	1	101	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	270	272	102	268	266	152	102	0	0	158	0	0
Stage 1	104	104	-	162	162	-	-	-	-	-	-	-
Stage 2	166	168	-	106	104	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	683	635	953	685	640	894	1490	-	-	1422	-	-
Stage 1	902	809	-	840	764	-	-	-	-	-	-	-
Stage 2	836	759	-	900	809	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	675	632	953	679	637	894	1490	-	-	1422	-	-
Mov Cap-2 Maneuver	675	632	-	679	637	-	-	-	-	-	-	-
Stage 1	899	808	-	837	762	-	-	-	-	-	-	-
Stage 2	826	757	-	894	808	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.4		10.8		0.2		0.1	
HCM LOS	A		B					





Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1490	-	-	826	693	1422	-
HCM Lane V/C Ratio	0.004	-	-	0.008	0.104	0.001	-
HCM Control Delay (s)	7.4	-	-	9.4	10.8	7.5	-
HCM Lane LOS	A	-	-	A	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0	-

Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	25	5	10	1	25	5	25	110	1	5	85	10
Future Vol, veh/h	25	5	10	1	25	5	25	110	1	5	85	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	5	11	1	27	5	27	120	1	5	92	11

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	299	283	98	291	288	121	103	0	0	121	0	0
Stage 1	108	108	-	175	175	-	-	-	-	-	-	-
Stage 2	191	175	-	116	113	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	653	626	958	661	622	930	1489	-	-	1467	-	-
Stage 1	897	806	-	827	754	-	-	-	-	-	-	-
Stage 2	811	754	-	889	802	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	617	613	958	639	609	930	1489	-	-	1467	-	-
Mov Cap-2 Maneuver	617	613	-	639	609	-	-	-	-	-	-	-
Stage 1	881	804	-	812	740	-	-	-	-	-	-	-
Stage 2	763	740	-	870	800	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.7		10.9		1.4		0.4	
HCM LOS	B		B					





Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1489	-	-	677 646	1467	-	-
HCM Lane V/C Ratio	0.018	-	-	0.064 0.052	0.004	-	-
HCM Control Delay (s)	7.5	-	-	10.7 10.9	7.5	-	-
HCM Lane LOS	A	-	-	B B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2 0.2	0	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	3	6	134	92	2
Future Vol, veh/h	1	3	6	134	92	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
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	1	3	7	146	100	2

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	261	101	102	0	-	0
Stage 1	101	-	-	-	-	-
Stage 2	160	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	728	954	1490	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	869	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	724	954	1490	-	-	-
Mov Cap-2 Maneuver	724	-	-	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	869	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1490	-	884	-	-
HCM Lane V/C Ratio	0.004	-	0.005	-	-
HCM Control Delay (s)	7.4	-	9.1	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	48	7	3	293	422	7
Future Vol, veh/h	48	7	3	293	422	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
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	52	8	3	318	459	8
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	787	463	467	0	-	0
Stage 1	463	-	-	-	-	-
Stage 2	324	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	360	599	1094	-	-	-
Stage 1	634	-	-	-	-	-
Stage 2	733	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	359	599	1094	-	-	-
Mov Cap-2 Maneuver	359	-	-	-	-	-
Stage 1	632	-	-	-	-	-
Stage 2	733	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	16.3	0.1		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1094	-	378	-	-	
HCM Lane V/C Ratio	0.003	-	0.158	-	-	
HCM Control Delay (s)	8.3	-	16.3	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0	-	0.6	-	-	

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	2	1	6	18	1	2	2	206	133	11	405	0
Future Vol, veh/h	2	1	6	18	1	2	2	206	133	11	405	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	1	7	20	1	2	2	224	145	12	440	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	766	837	440	769	765	297	440	0	0	369	0	0
Stage 1	464	464	-	301	301	-	-	-	-	-	-	-
Stage 2	302	373	-	468	464	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	320	303	617	318	333	742	1120	-	-	1190	-	-
Stage 1	578	564	-	708	665	-	-	-	-	-	-	-
Stage 2	707	618	-	575	564	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	316	299	617	311	329	742	1120	-	-	1190	-	-
Mov Cap-2 Maneuver	316	299	-	311	329	-	-	-	-	-	-	-
Stage 1	577	558	-	707	664	-	-	-	-	-	-	-
Stage 2	703	617	-	562	558	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.9	16.7	0	0.2
HCM LOS	B	C		






Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1120	-	-	464	330	1190	-
HCM Lane V/C Ratio	0.002	-	-	0.021	0.069	0.01	-
HCM Control Delay (s)	8.2	-	-	12.9	16.7	8.1	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-

Intersection												
Int Delay, s/veh	6.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	45	57	65	1	7	10	89	120	1	10	347	40
Future Vol, veh/h	45	57	65	1	7	10	89	120	1	10	347	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	62	71	1	8	11	97	130	1	11	377	43

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	755	746	399	812	767	131	420	0	0	131	0	0
Stage 1	421	421	-	325	325	-	-	-	-	-	-	-
Stage 2	334	325	-	487	442	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	325	342	651	298	332	919	1139	-	-	1454	-	-
Stage 1	610	589	-	687	649	-	-	-	-	-	-	-
Stage 2	680	649	-	562	576	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	293	311	651	209	301	919	1139	-	-	1454	-	-
Mov Cap-2 Maneuver	293	311	-	209	301	-	-	-	-	-	-	-
Stage 1	558	584	-	629	594	-	-	-	-	-	-	-
Stage 2	607	594	-	444	571	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.7	13.1	3.6	0.2
HCM LOS	C	B		






Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1139	-	-	382	462	1454	-
HCM Lane V/C Ratio	0.085	-	-	0.475	0.042	0.007	-
HCM Control Delay (s)	8.5	-	-	22.7	13.1	7.5	-
HCM Lane LOS	A	-	-	C	B	A	-
HCM 95th %tile Q(veh)	0.3	-	-	2.5	0.1	0	-

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	5	2	208	411	1
Future Vol, veh/h	1	5	2	208	411	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
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	1	5	2	226	447	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	678	448	448	0	-	0
Stage 1	448	-	-	-	-	-
Stage 2	230	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	418	611	1112	-	-	-
Stage 1	644	-	-	-	-	-
Stage 2	808	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	417	611	1112	-	-	-
Mov Cap-2 Maneuver	417	-	-	-	-	-
Stage 1	643	-	-	-	-	-
Stage 2	808	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1112	-	567	-	-
HCM Lane V/C Ratio	0.002	-	0.012	-	-
HCM Control Delay (s)	8.2	-	11.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	5	8	488	446	44
Future Vol, veh/h	9	5	8	488	446	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
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	10	5	9	530	485	48

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1057	509	533
Stage 1	509	-	-
Stage 2	548	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	249	564	1035
Stage 1	604	-	-
Stage 2	579	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	247	564	1035
Mov Cap-2 Maneuver	247	-	-
Stage 1	599	-	-
Stage 2	579	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.3	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1035	-	309	-	-
HCM Lane V/C Ratio	0.008	-	0.049	-	-
HCM Control Delay (s)	8.5	-	17.3	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	1	4	120	1	10	5	468	24	2	366	1
Future Vol, veh/h	1	1	4	120	1	10	5	468	24	2	366	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	4	130	1	11	5	509	26	2	398	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	941	948	399	937	935	522	399	0	0	535	0	0
Stage 1	403	403	-	532	532	-	-	-	-	-	-	-
Stage 2	538	545	-	405	403	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	243	261	651	245	265	555	1160	-	-	1033	-	-
Stage 1	624	600	-	531	526	-	-	-	-	-	-	-
Stage 2	527	519	-	622	600	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	236	259	651	241	263	555	1160	-	-	1033	-	-
Mov Cap-2 Maneuver	236	259	-	241	263	-	-	-	-	-	-	-
Stage 1	622	599	-	529	524	-	-	-	-	-	-	-
Stage 2	513	517	-	616	599	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.7	36.4	0.1	0
HCM LOS	B	E		






Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1160	-	-	421 252	1033	-	-
HCM Lane V/C Ratio	0.005	-	-	0.015 0.565	0.002	-	-
HCM Control Delay (s)	8.1	-	-	13.7 36.4	8.5	-	-
HCM Lane LOS	A	-	-	B E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0 3.2	0	-	-

Intersection												
Int Delay, s/veh	7.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↖	↗		↖	↗	
Traffic Vol, veh/h	60	10	58	1	51	10	116	358	1	10	310	20
Future Vol, veh/h	60	10	58	1	51	10	116	358	1	10	310	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	65	11	63	1	55	11	126	389	1	11	337	22

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1045	1012	348	1049	1023	390	359	0	0	390	0	0
Stage 1	370	370	-	642	642	-	-	-	-	-	-	-
Stage 2	675	642	-	407	381	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	207	239	695	205	236	658	1200	-	-	1169	-	-
Stage 1	650	620	-	463	469	-	-	-	-	-	-	-
Stage 2	444	469	-	621	613	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	148	212	695	164	209	658	1200	-	-	1169	-	-
Mov Cap-2 Maneuver	148	212	-	164	209	-	-	-	-	-	-	-
Stage 1	582	614	-	414	420	-	-	-	-	-	-	-
Stage 2	339	420	-	549	607	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	39.1		26.5		2		0.2	
HCM LOS	E		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1200	-	-	239	234	1169	-
HCM Lane V/C Ratio	0.105	-	-	0.582	0.288	0.009	-
HCM Control Delay (s)	8.4	-	-	39.1	26.5	8.1	-
HCM Lane LOS	A	-	-	E	D	A	-
HCM 95th %tile Q(veh)	0.4	-	-	3.3	1.1	0	-

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	3	6	473	366	2
Future Vol, veh/h	1	3	6	473	366	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
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	1	3	7	514	398	2

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	927	399	400	0	-	0
Stage 1	399	-	-	-	-	-
Stage 2	528	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	298	651	1159	-	-	-
Stage 1	678	-	-	-	-	-
Stage 2	592	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	296	651	1159	-	-	-
Mov Cap-2 Maneuver	296	-	-	-	-	-
Stage 1	674	-	-	-	-	-
Stage 2	592	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.2	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1159	-	501	-	-
HCM Lane V/C Ratio	0.006	-	0.009	-	-
HCM Control Delay (s)	8.1	-	12.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-