

Rocky Mountain Rail Park - North Area Traffic Impact Study

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Introduction

This study updates the Rocky Mountain Rail Park (RMRP) Traffic Impact Study (TIS) – North Area performed by Matrix Design Group dated May 2023, which itself was an addendum to the RMRP Master Traffic Impact Study (MTIS) performed by Kimley-Horn dated January 2020. The RMRP TIS – North Area analyzed the development for the 2040 Horizon Year. City of Aurora staff have requested that the 2030 buildout year also be analyzed. This memo appends an analysis of the 2030 background condition and the 2030 with Project condition for both the AM and PM peak periods to the May 2023 memo.

This revision to the September 2023 memo demonstrates that a shared southbound turn lane at Colfax Avenue/Peterson Road can handle the projected traffic volume without any issues. The queue on the southbound extends up to 52-ft which is shorter than the approximately 225-ft distance between the railroad and Colfax Avenue/Peterson Road. Refer to page 15 (as well as pages 13 and 14) for detailed information.

The purpose of this addendum is to demonstrate the impact of the RMRP North Area on the adjacent roadways with new information regarding the number of employees in the proposed industrial park. Additionally, the MTIS did not reflect the details of the nearby development to the east of RMRP. This addendum will demonstrate impacts of both developments on the surrounding transportation system. *The Northeast Area Transportation Study Refresh (NEATS)* demand model was used as the basis of both Rocky Mountain Rail Park (RMRP) MTIS. The *Port Colorado - Subarea 6 TIS* was also used in this memo as the basis of the background conditions.

A summary of the required improvements for RMRP at buildout (2030) as prescribed by the MTIS and further referenced in the executed Master Development Agreement between the developer and Adams County, dated September 1, 2020, and recorded, December 14th, 2021, under reception # 2021000145486 is outlined below:

Colfax Avenue/ Peterson Road (#2)

- A 895-ft eastbound left-turn lane. Included a 600-ft deceleration lane and a 293-ft storage lane. A 222-ft taper lane is included within the deceleration lane.
- • A 600-ft westbound right-turn deceleration lane. A 222-ft taper lane is included within the deceleration lane.
- • A 960-ft westbound acceleration lane. A 222-ft taper lane is included within the deceleration lane.

The project is responsible for these improvements.

Intersections along Manilla Road

- Improvements along Manilla Road will be consistent with the executed development agreement with Adams County. The exhibit below shows the summary of improvement per the development agreement. See Appendix F – RMRP Master Development Agreement Improvement Table.

Intersection	Improvements	Project Threshold ADT / Planning Year Needed
Colfax Avenue & Manilla Road	<ul style="list-style-type: none"> Construct Eastbound Left Turn Lane (400-ft + 220-ft Taper) * Construct Westbound Left Turn Lane (770-ft + 220-ft Taper) * Construct Northbound to Eastbound Acceleration Lane (740-ft + 220-ft Taper) * 	<ul style="list-style-type: none"> • ## / 2030 • # / 2030 • 250 ADT / 2030
Colfax Avenue & Petterson Road	<ul style="list-style-type: none"> Construct Eastbound Left Turn Lane (685-ft + 220-ft Taper) * Construct Westbound Right Turn Deceleration Lane (380-ft + 220-ft Taper) * Construct Southbound to Westbound Acceleration Lane (740-ft + 220-ft Taper) * 	<ul style="list-style-type: none"> • 90 ADT NP / 2030 • 2,050 ADT NP / 2030 • 496 ADT NP / 2030
Colfax Avenue South Parcel West Access	<ul style="list-style-type: none"> Construct Eastbound Right Turn Deceleration Lane (380-ft + 220-ft Taper) * Construct Westbound Left Turn Lane (390-ft + 220-ft Taper) * 	<ul style="list-style-type: none"> • 322 ADT SP / 2030 • 794 ADT SP / 2030
Colfax Avenue South Parcel East Right-in/Right-out Access	<ul style="list-style-type: none"> Construct Eastbound Right Turn Deceleration Lane (380-ft + 220-ft Taper) * 	<ul style="list-style-type: none"> • 642 ADT SP / 2030
I-70 Westbound Ramps & Manilla Rd	<ul style="list-style-type: none"> Construct Southbound Right Turn Lane (275-ft + 160-ft Taper) Construct Westbound Right Turn Lane (100-ft + 160-ft Taper) * Traffic Signal 	<ul style="list-style-type: none"> • # / 2030 • 682 ADT / 2030 • ### / 2045
I-70 Eastbound Ramps & Manilla Rd	<ul style="list-style-type: none"> Construct Eastbound Left Turn Lane (275-ft + 160-ft Taper) * 	<ul style="list-style-type: none"> • # / 2030

Improvement Warranted Based on Existing Traffic;

Improvement Not Related to Project;

= Long Term Improvement Not Needed with Full Project Development

* = These improvements are within CDOT jurisdiction and will be either funded or constructed as required by CDOT. County will advise developer if an access permit triggers these improvements.

NP = North Parcel; SP = South Parcel;

The report is organized as follows:

- **Introduction** - Describes the purpose and intent of this study.
- **Area Conditions** - Describes the study area land uses
- **Proposed Development** - Describes the proposed development and the location.
- **Projected Traffic** - Identifies the expected number of daily trips that will be generated by The Rocky Mountain Rail Park. The expected external trip distribution is also shown.
- **Traffic Analysis** - Provides traffic analysis for the buildout year (2030) with and without the project. This report also provides traffic analysis for the horizon year (2040) in the background conditions, and total conditions. The horizon total conditions consist of background traffic plus the RMRP, as well as background traffic plus the RMRP, plus the adjacent development traffic.
- **Findings and Conclusions** - Identifies the future roadway requirements.
- **Recommendations** - Provides a summary of the study findings.

Projected Development Traffic

Trip Generation

The developable area of the RMRP North Section consists of 131 Acres of Paving Operation Plant and 207.35 Acres of Industrial Park. To study the industrial park, it was assumed that there would be three employees per acre in this development. The size of the paving plants remained unchanged since the previous study; therefore the daily and peak hour trips were directly imported from RMRP MTIS for this development. Table 1 shows the trips that are expected to be generated by the RMRP north area in the horizon year.

Table 1. Rocky Mountain Rail Park North Area Trip Generation

Rocky Mountain Railpark - North Area											
ITE Land Use and Code	Size	Units	Weekday			AM Peak Hour			PM Peak Hour		
			Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total
130 - Industrial Park	207.35	Acres	1,120	1,120	2,240	248	40	288	59	237	296
Paving Operation Plant - Truck Trips	131	Acres			534	22	22	44	22	22	44
Paving Operation Plant - Employees	131	Acres			150	50	0	50	0	50	50
Total					2,924	320	62	382	81	309	390

For the sake of comparison, the trip generation table from the MTIS dated January 2020 containing both the north and south area of RMRP is shown in the table below.

Table 2. Rocky Mountain Rail Park (North & South Area) Trip Generation (MTIS 2020)

Land Use	Quantity	Units	Daily	AM			PM		
				In	Out	Total	In	Out	Total
North Section									
Industrial Park (130)	554	Employees	1,612	210	34	244	47	186	233
Paving Operation Plant (Client Data) - Truck Trips	131	Acres	534	22	22	44	22	22	44
Paving Operation Plant (Client Data) - Employees	131	Acres	150	50	0	50	0	50	50
North Section Total Trips			2,296	282	56	338	69	258	327
South Section									
Industrial Park (130)									
South Section Total Trips	300	Employees	874	114	18	132	25	101	126
Total Trips			3,170	396	74	470	94	359	453

This study also used trip distributions from the MTIS, with the results presented in Figure 3.

In this report, Matrix studied two separate scenarios for the horizon year with the addition of the RMRP north area. One included the horizon background volumes plus the RMRP site trips but without the adjacent development. The other included horizon background volumes, with both RMRP and the adjacent development. Figure 4, and Figure 5 show the site traffic in the AM and PM peak, respectively.

Figure 3. Trip Distribution

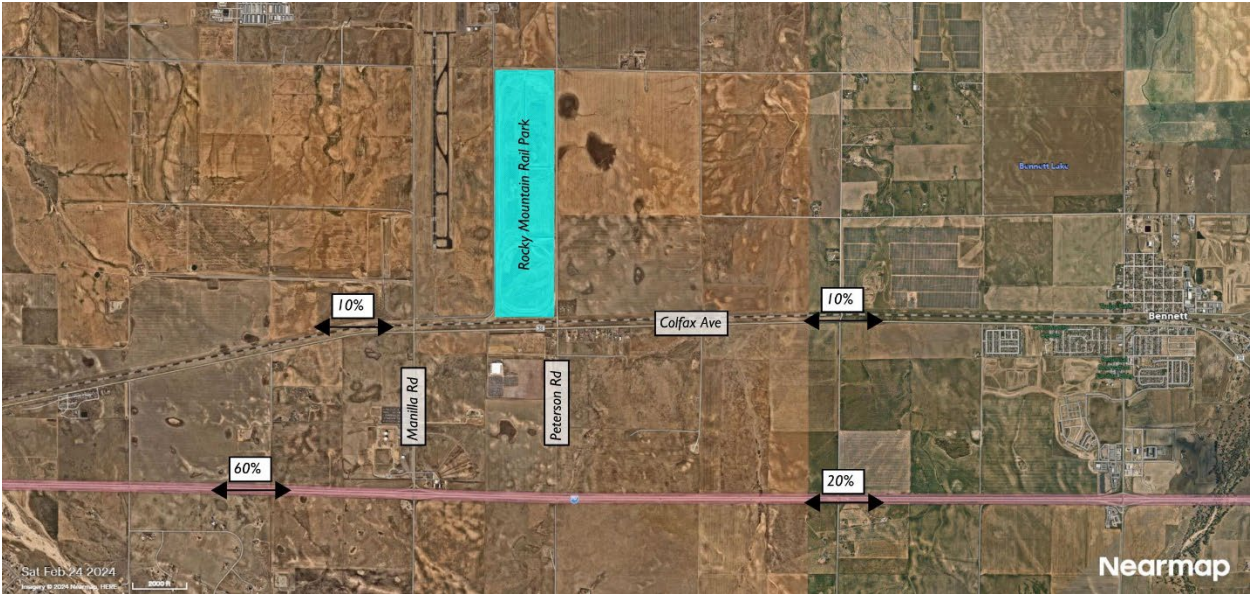


Figure 4. Rocky Mountain Project Trips (AM Peak Hour)

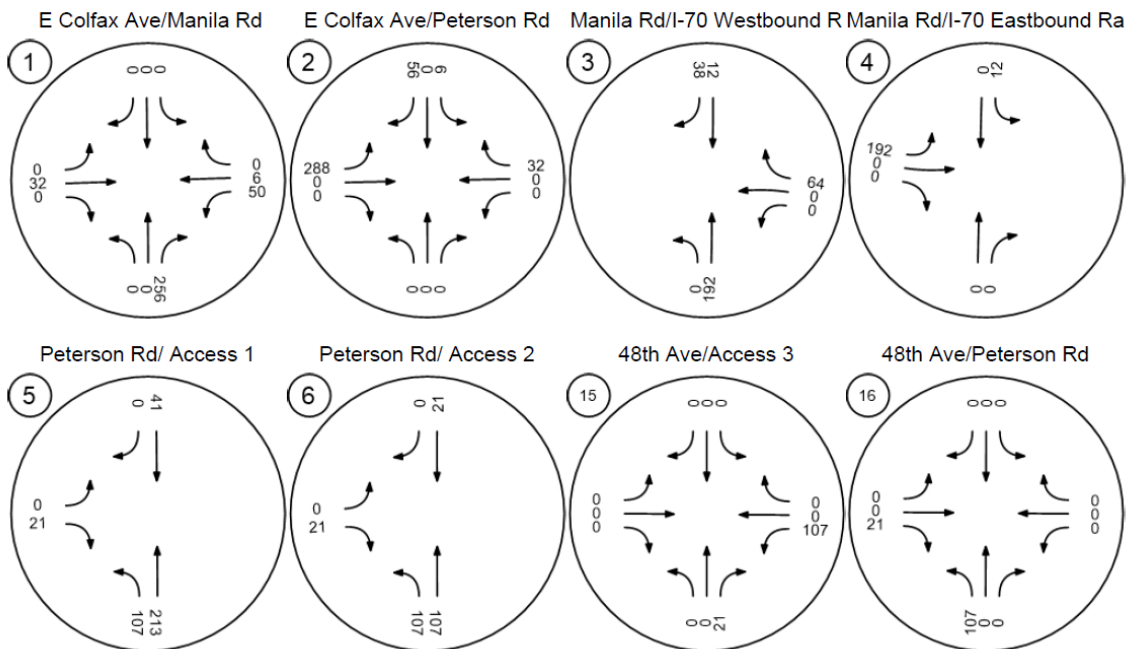
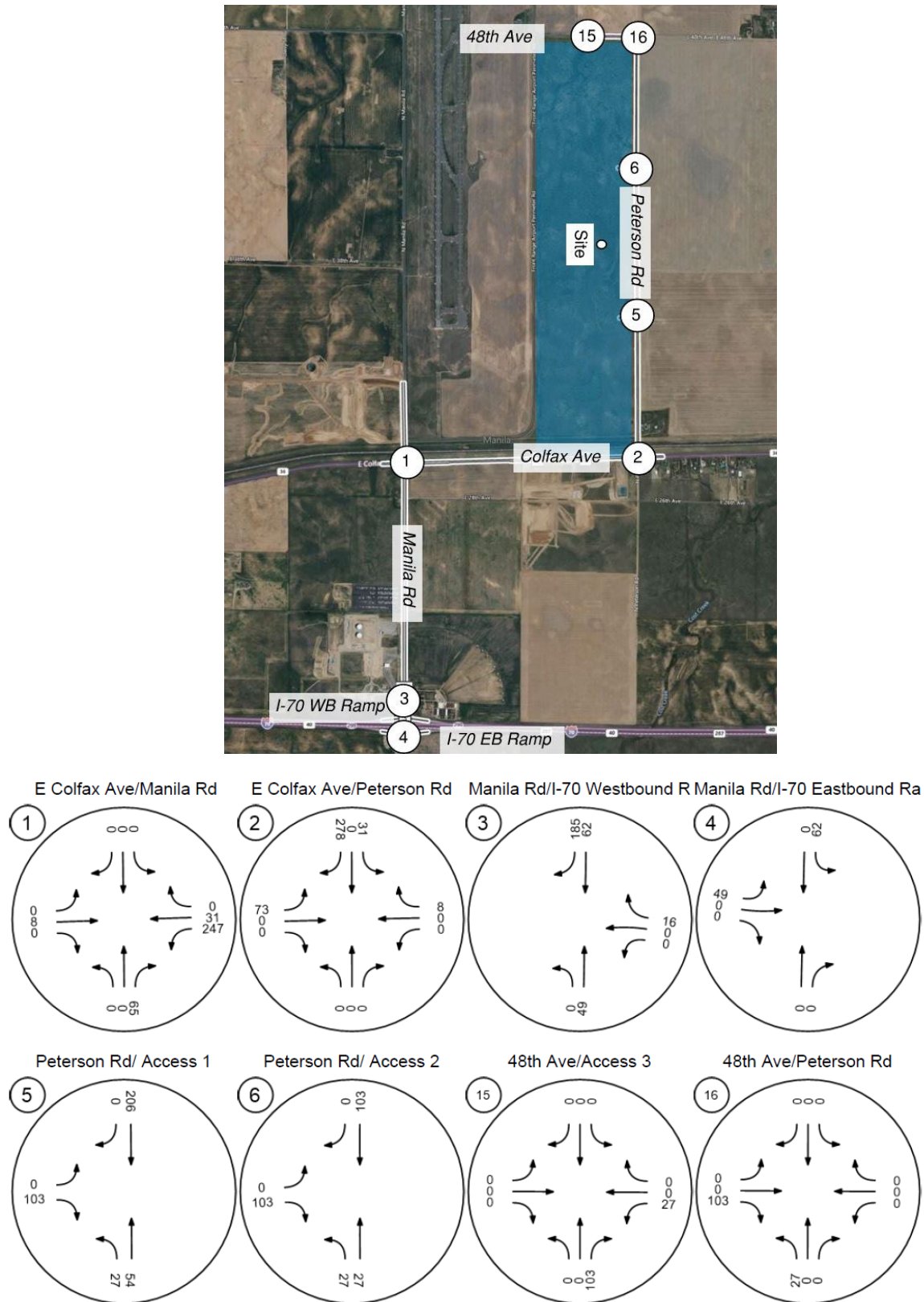


Figure 5. Rocky Mountain Project Trips (PM Peak Hour)



Buildout Year (2030) Analysis

The conditions for the buildout year assessed in this report for the RMRP assume that Port CO Subarea 6 (the neighboring development) has yet to be built. The results of this analysis will highlight which improvements will be necessary because of the RMRP and which will be needed to accommodate traffic from Subarea 6. Figure 6 shows intersection operations and LOS without the RMRP. Figure 7, and Figure 8 show the 2030 Buildout Total Conditions (Without Subarea 6) for the AM and PM Peak Hours, respectively. Total daily volumes are shown in Figure 9.

Figure 6. Buildout (2030) Background Intersection Configurations and LOS

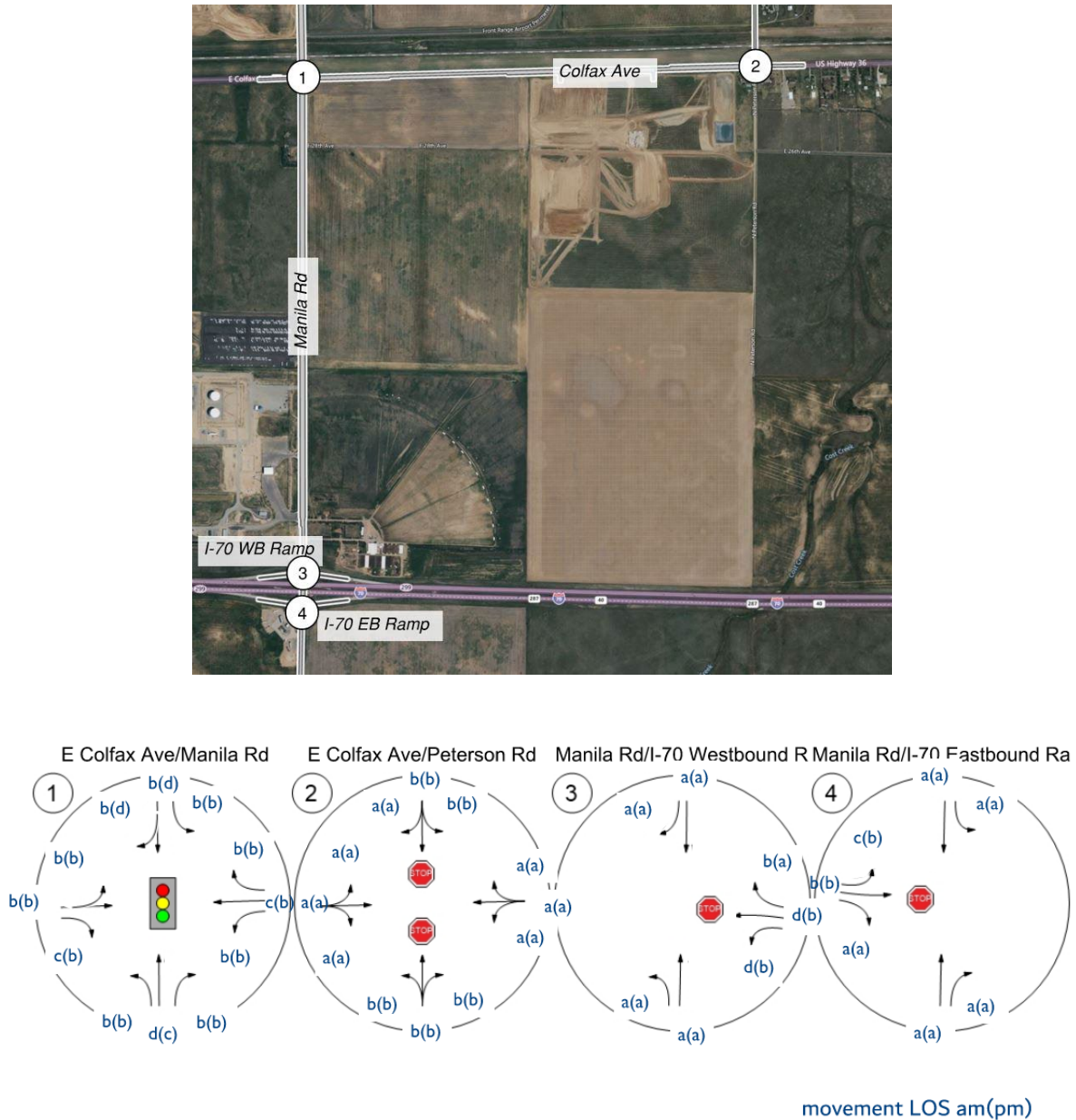


Figure 7. Buildout (2030) Total Conditions (AM Peak Hour) Without Adjacent Development

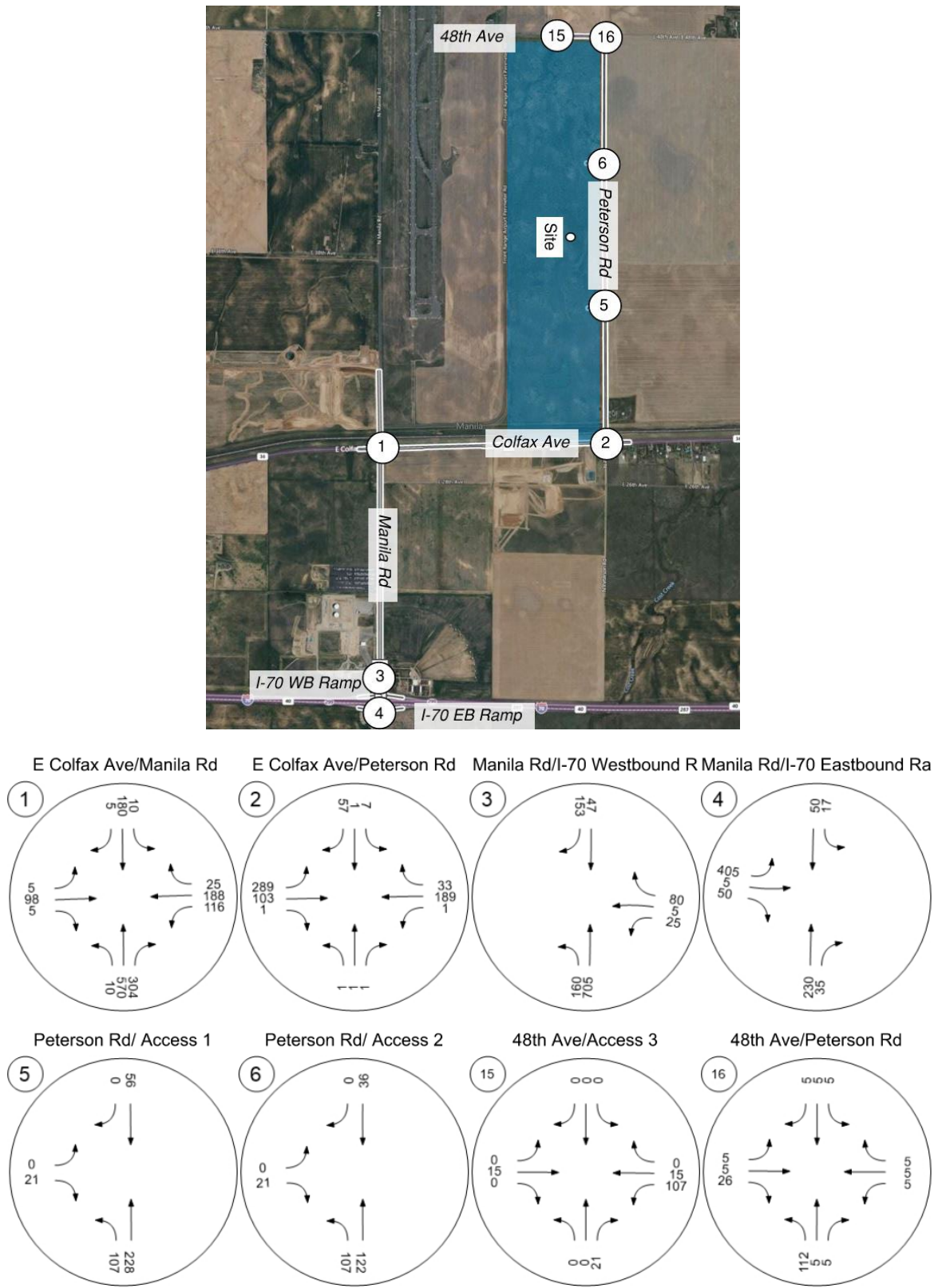


Figure 8. Buildout (2030) Total Conditions (PM Peak Hour) Without Adjacent Development

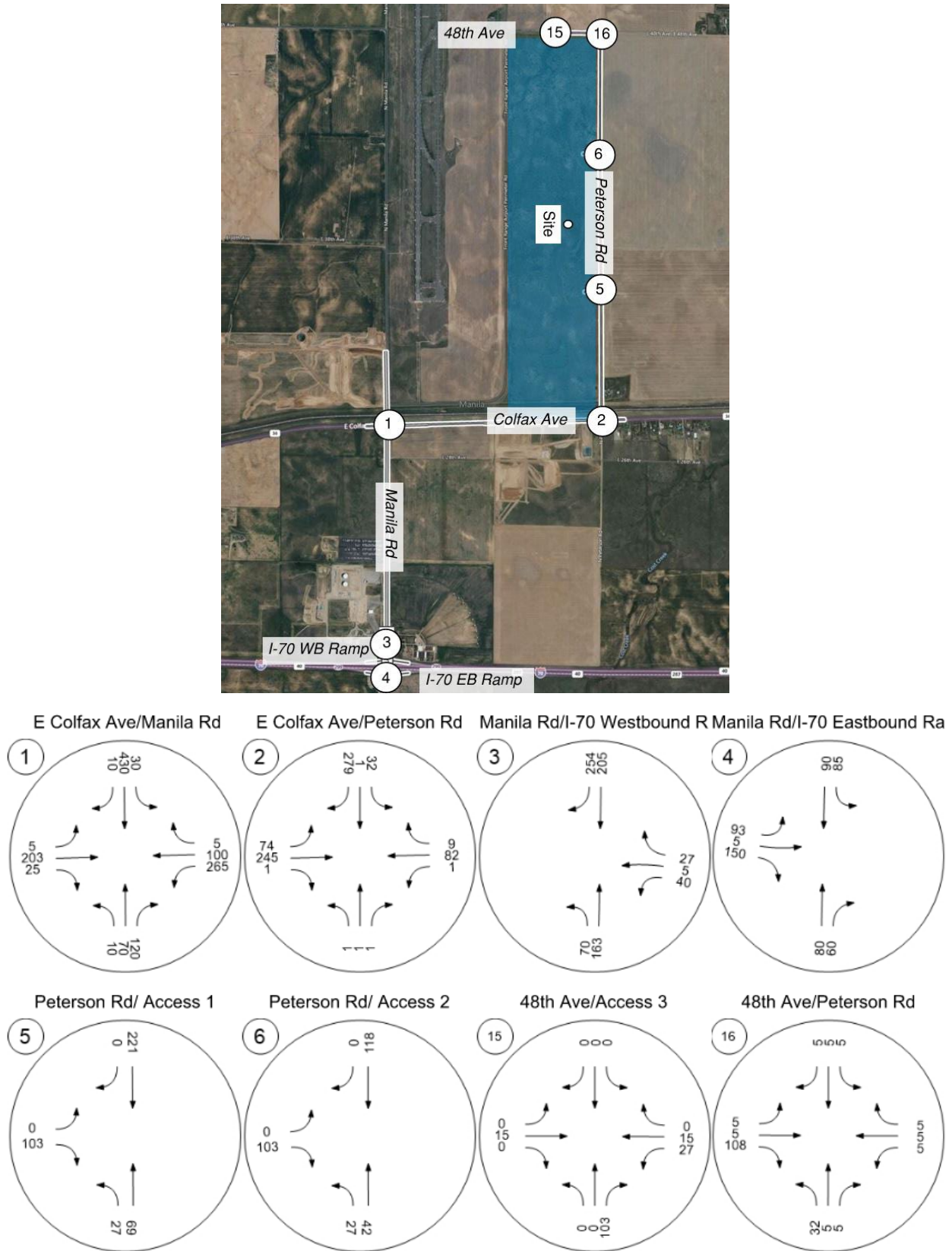


Figure 9. Buildout (2030) Total Conditions Daily Volumes Without Adjacent Development



Intersection operations after buildout of RMRP (without buildout of Port CO Subarea 6) are shown in Table 3 and Table 4 for the AM and PM peak hours, respectively. Figure 10 shows the intersection configurations and LOS for the 2030 buildout conditions.

Table 3. Buildout (2030) Total Operations (AM Peak Hour) Without the Adjacent Development

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	E Colfax Ave/Manila Rd	Signalized	HCM 7th Edition	NB Thru	0.608	27.8	C
2	E Colfax Ave/Peterson Rd	Two-way stop	HCM 7th Edition	NB Left	0.007	29.5	D
3	Manila Rd/I-70 Westbound Ramp	Two-way stop	HCM 7th Edition	WB Left	0.227	44.0	E
4	Manila Rd/I-70 Eastbound Ramp	Two-way stop	HCM 7th Edition	EB Left	0.792	31.7	D
5	Peterson Rd/ Access 1	Two-way stop	HCM 7th Edition	EB Right	0.024	8.9	A
6	Peterson Rd/ Access 2	Two-way stop	HCM 7th Edition	EB Right	0.023	8.7	A
15	48th Ave/Access 3	Two-way stop	HCM 7th Edition	NB Right	0.023	8.6	A
16	48th Ave/Peterson Rd	Two-way stop	HCM 7th Edition	WB Thru	0.009	11.6	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

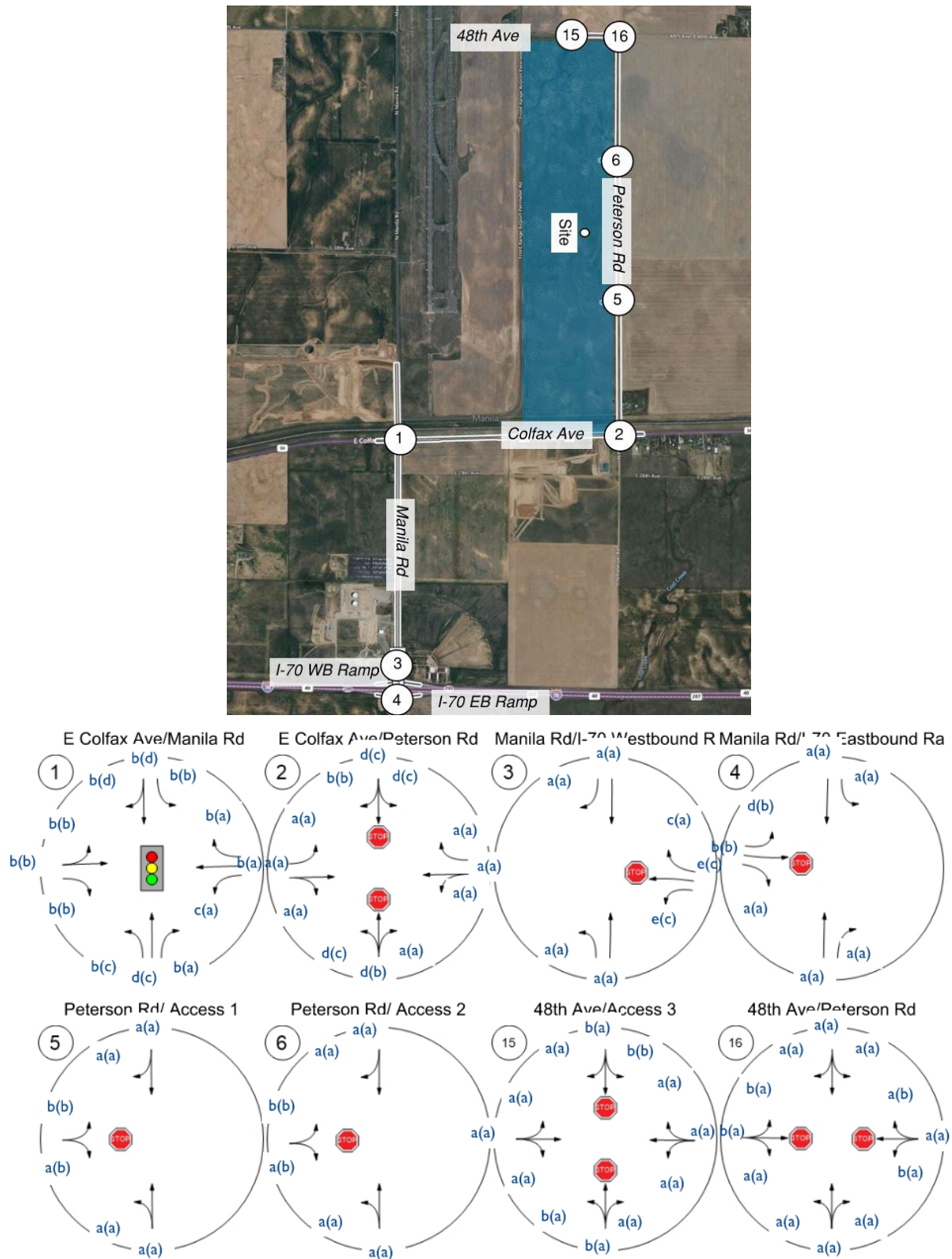
Table 4. Buildout (2030) Total Operations (PM Peak Hour) Without the Adjacent Development

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	E Colfax Ave/Manila Rd	Signalized	HCM 7th Edition	SB Thru	0.601	28.6	C
2	E Colfax Ave/Peterson Rd	Two-way stop	HCM 7th Edition	NB Left	0.004	18.1	C
3	Manila Rd/I-70 Westbound Ramp	Two-way stop	HCM 7th Edition	WB Thru	0.019	18.9	C
4	Manila Rd/I-70 Eastbound Ramp	Two-way stop	HCM 7th Edition	EB Left	0.205	14.2	B
5	Peterson Rd/ Access 1	Two-way stop	HCM 7th Edition	EB Right	0.148	10.6	B
6	Peterson Rd/ Access 2	Two-way stop	HCM 7th Edition	EB Right	0.128	9.7	A
15	48th Ave/Access 3	Two-way stop	HCM 7th Edition	NB Right	0.111	9.0	A
16	48th Ave/Peterson Rd	Two-way stop	HCM 7th Edition	WB Left	0.007	10.1	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Figure 10. Buildout (2030) Total Configurations and LOS Without Adjacent Development



As shown in Table 3 and Table 4, all intersections operate at an acceptable LOS, except for the intersection of Manilla Road/I-70 Westbound Ramp (#3). Although, this intersection operates at LOS E during the AM peak hour, the queue on the deficient approach (westbound) is not more than 22-ft or approximately 0.88 vehicles.

The PTV Vistro uses an NCHRP methodology to estimate the 24 hours traffic counts from the hourly volumes to perform the signal warrant analysis. Using the AM peak hour volumes to generate the 24-hour volumes, projects meeting eight-hour and four-hour traffic signal warrants. However, using the PM peak hour volumes to generate the 24-hour volumes, projects that no warrant is met at this intersection. Since the queue is negligible, Matrix does not recommend a traffic signal at this intersection under buildout conditions. The signal warrant analysis can be found in Appendix C- Buildout Conditions Analyses.

Turn lane evaluations for the buildout (2030) background and buildout (2030) total are shown in Table 5, and Table 6.

Table 5. Buildout (2030) Background Turn Lane Evaluations

ID	Intersection	Movement	No. of Lane	Access Category	Speed Limit (mph)	Turning Volume	Lane Width (ft)	Deceleration (ft)	Storage (ft)	Taper (ft)	Total (ft) (SHAC)
1	Manilla Rd/Colfax Ave	NBL	1	R-B	45	10	12	435	25	162	460
		NBR	1	R-B	45	55	12	435	50	162	435
		SBL	1	R-B	45	30	12	435	40	162	475
		SBR**	1	R-B	45	10	12	435	25	162	435
		EBL**	1	R-B	55	5	12	600	25	222	625
		EBR	1	R-B	55	25	12	600	25	222	600
		WBL	1	R-B	55	66	12	600	100	222	700
		WBR	1	R-B	55	25	12	600	25	222	600
3	Manilla Rd/I-70 WB Ramp	NBL	1	R-B	45	160	12	435	160	162	595
		SBR	1	R-B	45	115	12	435	115	162	435
		WBL	1	R-B	45	40	12	435	50	162	485
		WBR**	1	R-B	45	16	12	435	25	162	435
4	Manilla Rd/I-70 EB Ramp	NBR	1	R-B	45	60	12	435	50	162	435
		SBL	1	R-B	45	23	12	435	25	162	460
		EBL	1	R-B	45	213	12	435	213	162	650
		EBR	1	R-B	45	150	12	435	150	162	435

**Not warranted per SHAC

Table 6. Buildout (2030) Total Turn Lane Evaluations

ID	Intersection	Movement	No. of Lanes	Access Category	Speed Limit (mph)	Turning Volume	Lane Width (ft)	Deceleration (ft)	Storage (ft)	Taper (ft)	Total (ft) (SHAC)
1	Manilla Rd/Colfax Ave	NBL	1	R-B	45	10	12	435	25	162	460
		NBR	1	R-B	45	304	12	435	304	162	435
		SBL	1	R-B	45	30	12	435	40	162	475
		SBR**	1	R-B	45	10	12	435	25	162	435
		EBL**	1	R-B	55	5	12	600	25	222	625
		EBR	1	R-B	55	25	12	600	25	222	600
		WBL	1	R-B	55	265	12	600	265	222	865
		WBR	1	R-B	55	25	12	600	25	222	600
2	Colfax Ave/Peterson Rd	NBL**	1	R-B	30	1	12	250	25	96	275
		NBR**	1	R-B	30	1	12	250	25	96	250
		EBL	1	R-B	55	293	12	600	293	222	895
		EBR	1	R-B	55	1	12	600	25	222	600
		WBL**	1	R-B	55	1	12	600	25	222	625
		WBR	1	R-B	55	37	12	600	50	222	600
3	Manilla Rd/I-70 WB Ramp	NBL	1	R-B	45	160	12	435	160	162	595
		SBR	1	R-B	45	254	12	435	254	162	435
		WBL	1	R-B	45	40	12	435	50	162	485
		WBR	1	R-B	45	80	12	435	100	162	435
4	Manilla Rd/I-70 EB Ramp	NBR	1	R-B	45	60	12	435	50	162	435
		SBL	1	R-B	45	85	12	435	100	162	535
		EBL	1	R-B	45	405	12	435	405	162	840
		EBR	1	R-B	45	150	12	435	150	162	435

**Not warranted per SHAC

Recommended improvements above what is recommended for the 2030 background (no build) conditions are listed below:

Colfax Avenue/Manila Road (#1)

- A 165-ft extension of the westbound left turn. This improvement is already accounted for in the development agreement (see Appendix F for more information).

Colfax Avenue/Peterson Road (#2)

- A 895-ft eastbound left-turn lane. Included a 600-ft deceleration lane and a 293-ft storage lane. A 222-ft taper lane is included within the deceleration lane.
- A 600-ft westbound right-turn deceleration lane. A 222-ft taper lane is included within the deceleration lane.
- A 960-ft westbound acceleration lane. A 222-ft taper lane is included within the deceleration lane.

As shown in Figure 7, and Figure 8, the total number of southbound through and southbound left-turn vehicles at full build-out of for Rocky Mountain Rail Park at this intersection (#2) are only 8, and 33 vehicles in the buildout AM and PM peak hours, respectively.

Section 3.5 (5) of the SHAC states that *“the auxiliary lane may be waived when the 20th year predicted roadway volumes conflicting with the turning vehicles are below the following minimum volume thresholds. The right turn deceleration lane may be dropped if the volume in the travel lane is predicted to be below 150 DHV.”* Although the total amount of vehicles travelling southbound exceeds this threshold, the amount of through and left-turn volumes are below the 150 vph threshold for the right-turn lane waiver. Per our meeting with the City of Aurora , the City agreed that there is no foreseeable development along Peterson Road further to the south of Colfax Avenue and the exclusive left-turn can be shared with the through lane. Matrix has recently studied this intersection with a shared southbound right/thru/left lane. This intersection operates at LOS D during the AM peak hour, and at LOS C during the PM peak hour with the new configuration. All movements maintain an acceptable LOS during both AM and PM peaks, and queues do not exceed 52 feet, significantly below the 225-foot distance between the railroad and the intersection. In addition, the intersection control on southbound approach is a stop condition, with drivers expecting to slow as they approach Colfax. This should serve to reduce both the likelihood and severity of any rear-end collisions.

Manila Road/I-70 Westbound Ramp (#3)

- A 435-ft westbound right-turn deceleration lane. A 162-ft taper lane is included within the deceleration lane. Construction of the right turn lane will be coordinated with the CDOT at the time the improvements are made.

Manila Road/I-70 Eastbound Ramp (#4)

- A 75-ft extension of the southbound left-turn.
- A 190-ft extension of eastbound left-turn lanes.
- Extension of the turn lanes will be coordinated with the CDOT at the time the improvements are made.

The total turn lane is rounded to the nearest 5 ft.

Horizon Year (2040) Analysis

The 2040 Port Colorado-Subarea 6 TIS (May 2022) and RMRP MTIS were used to capture the level of development in this time frame. The NEATS Refresh (2018) provides a travel demand model as well as future land use data for the study area and was used as the basis of these studies. To address the future conditions on the roadway network, Matrix used the combination of Adjusted NEATS 2040 background traffic volumes, adjusted Port Colorado-Subarea 6 background volumes, and RMRP South section traffic volumes as the 2040 background volumes. For more information see Appendix A – Traffic Counts.

This section is organized as follows:

- Horizon (2040) Background Analysis
- Horizon (2040) Total Without the adjacent development
- Horizon (2040) Total With the adjacent development

Figure 11, and Figure 12 Show the 2040 traffic background conditions (without the RMRP North area, and without the adjacent development) in AM and PM peak hours, respectively.

Figure 11. Horizon (2040) Background Conditions (AM Peak Hour)

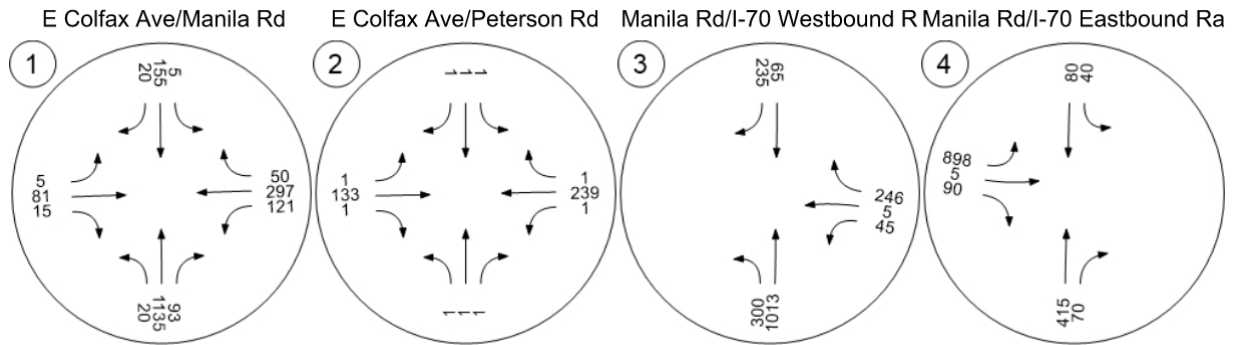


Figure 12. Horizon (2040) Background Conditions (PM Peak Hour)

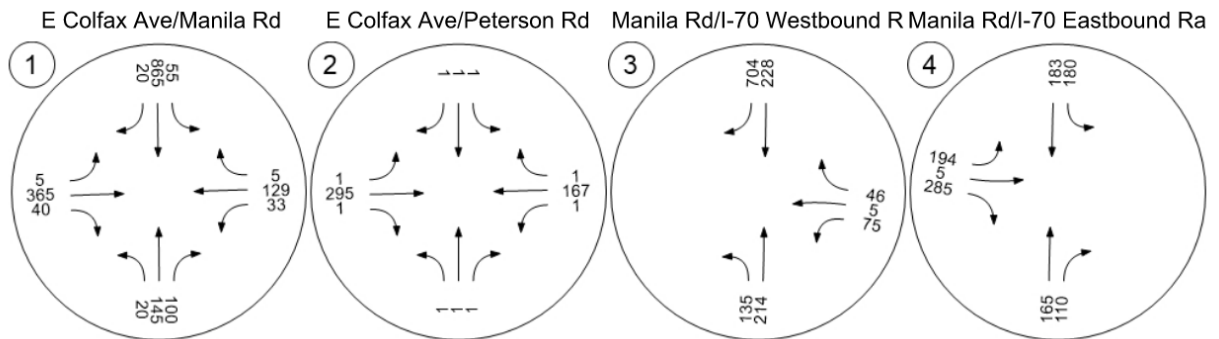


Figure 13. Horizon (2040) Background Daily Traffic



Intersection operations in the horizon background conditions are shown in Table 7 and Table 8. Intersection configurations and LOS for each movement are shown in Figure 14.

Figure 14. Horizon (2040) Background Intersection Configurations and LOS

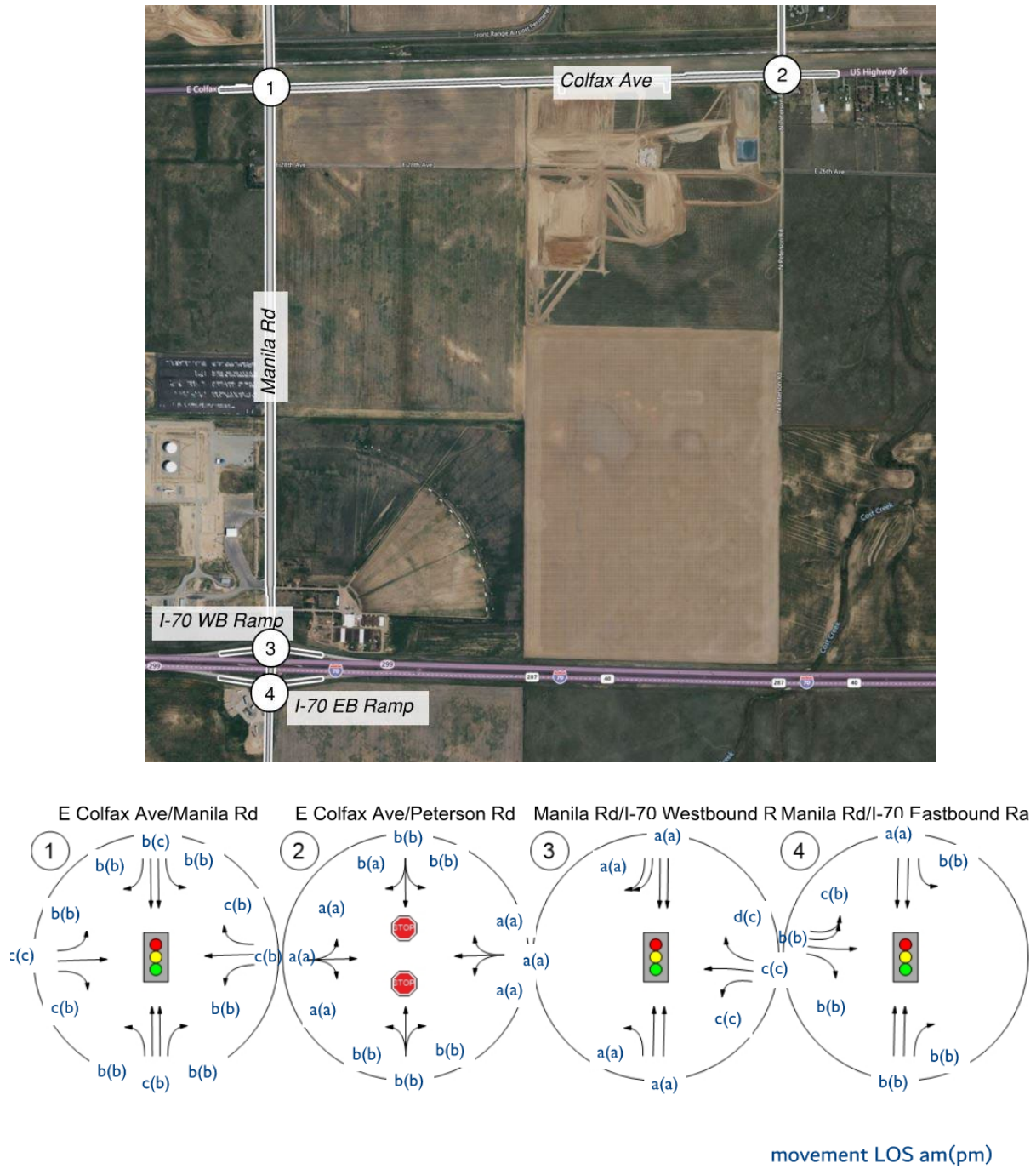


Table 7. Horizon (2040) Background Intersection Operations (AM Peak Hour)

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	E Colfax Ave/Manila Rd	Signalized	HCM 7th Edition	WB Thru	0.685	27.9	C
2	E Colfax Ave/Peterson Rd	Two-way stop	HCM 7th Edition	SB Thru	0.010	12.6	B
3	Manila Rd/I-70 Westbound Ramp	Signalized	HCM 7th Edition	WB Right	0.511	7.7	A
4	Manila Rd/I-70 Eastbound Ramp	Signalized	HCM 7th Edition	EB Left	0.549	21.0	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Table 8. Horizon (2040) Background Intersection Operations (PM Peak Hour)

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	E Colfax Ave/Manila Rd	Signalized	HCM 7th Edition	EB Thru	0.644	25.8	C
2	E Colfax Ave/Peterson Rd	Two-way stop	HCM 7th Edition	NB Left	0.012	13.8	B
3	Manila Rd/I-70 Westbound Ramp	Signalized	HCM 7th Edition	WB Left	0.273	7.1	A
4	Manila Rd/I-70 Eastbound Ramp	Signalized	HCM 7th Edition	EB Right	0.284	12.9	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

As shown in Table 7 and Table 8, all intersections operate at LOS D or better in the horizon background conditions. Recommended changes in the horizon year without the project are summarized below and also shown in Table 9.

Table 9. Horizon (2040) Background Turn Lane Evaluations

ID	Intersection	Movement	No. of Lanes	Access Category	Speed Limit (mph)	Turning Volume	Lane Width (ft)	Deceleration (ft)	Storage (ft)	Taper (ft)	Total (ft) (SHAC)
1	Manilla Rd/Colfax Ave	NBL	1	R-B	45	20	12	435	25	162	460
		NBR	1	R-B	45	100	12	435	100	162	435
		SBR**	1	R-B	30	20	12	250		96	250
		EBL**	1	R-B	55	5	12	600	25	222	625
		EBR	1	R-B	55	40	12	600	50	222	600
		WBL	1	R-B	55	121	12	600	121	222	720
		WBR	1	R-B	55	50	12	600	50	222	600
3	Manilla Rd/I-70 VVB Ramp	NBL	1	R-B	45	300	12	435	300	162	735
		SBR	1	R-B	45	704	12	435	704	162	435
		WBL	1	R-B	45	75	12	435	100	162	535
		WBR	1	R-B	45	246	12	435	246	162	435
4	Manilla Rd/I-70 EB Ramp	NBR	1	R-B	45	110	12	435	110	162	435
		SBL	1	R-B	45	183	12	435	183	162	620
		EBL	2	R-B	45	898	12	435	449	162	885
		EBR	1	R-B	45	285	12	435	285	162	435

**Turn lane was not warranted based on the SHAC

Colfax Avenue/Manilla Road (#1)

- A 460-ft northbound left-turn. Included a 435-ft deceleration lane and a 25-ft storage. A 162-ft taper lane is included within the deceleration lane.
- A 435-ft northbound right-turn deceleration lane. A 162-ft taper lane is included within the deceleration lane.
- A 300-ft southbound left-turn. Included a 250-ft deceleration lane and a 50-ft storage. A 96-ft taper lane is included within the deceleration lane.
- A 600-ft eastbound right-turn deceleration lane. A 222-ft taper lane is included within the deceleration lane.
- A 720-ft westbound left-turn lane. Included a 600-ft deceleration lane and 121-ft storage. A 222-ft taper lane is included within the deceleration lane.
- A 600-ft westbound right-turn deceleration lane. A 222-ft taper lane is included within the deceleration lane.
- A 960-ft northbound acceleration lane. A 222-ft taper lane is included within the acceleration lane.

Manilla Road/I-70 Westbound Ramp (#3)

- A traffic signal.
- A 735-ft northbound left-turn. Included a 435-ft deceleration lane and a 300-ft storage. A 162-ft taper lane is included within the deceleration lane.
- Two 435-ft southbound right-turn deceleration lanes. A 162-ft taper lane is included within the deceleration lane.
- A 535-ft westbound left-turn. Included a 435-ft deceleration lane and a 100-ft storage. A 162-ft taper is included within the deceleration lane.
- A 435-ft westbound right-turn deceleration lane. A 162-ft taper lane is included within the deceleration lane.

Manilla Road/I-70 Eastbound Ramp (#4)

- A traffic signal.
- A 435-ft northbound right-turn deceleration lane. A 162-ft taper lane is included within the deceleration lane.
- A 620-ft southbound left-turn lane. Included a 435-ft deceleration lane and a 183-ft storage. A 162-ft taper lane is included within the deceleration lane. Since there is a geometry constraint for the entire improvement, it is up to the City of Aurora and CDOT to determine how to address this deficiency. Currently, less than 300 feet of the lane is available for the southbound left-turn at the I-70 underpass.
- Two 885-ft eastbound left-turn lanes. Included 435-ft deceleration lane and 449-ft storage. A 162-ft taper lane is included within the deceleration lane.
- A 435-ft eastbound right-turn deceleration lane. A 162-ft taper lane is included within the deceleration lane.

The total turn lane is rounded to the nearest 5 ft.

Figure 15. Horizon (2040) Total (AM Peak Hour) Without the Adjacent Development

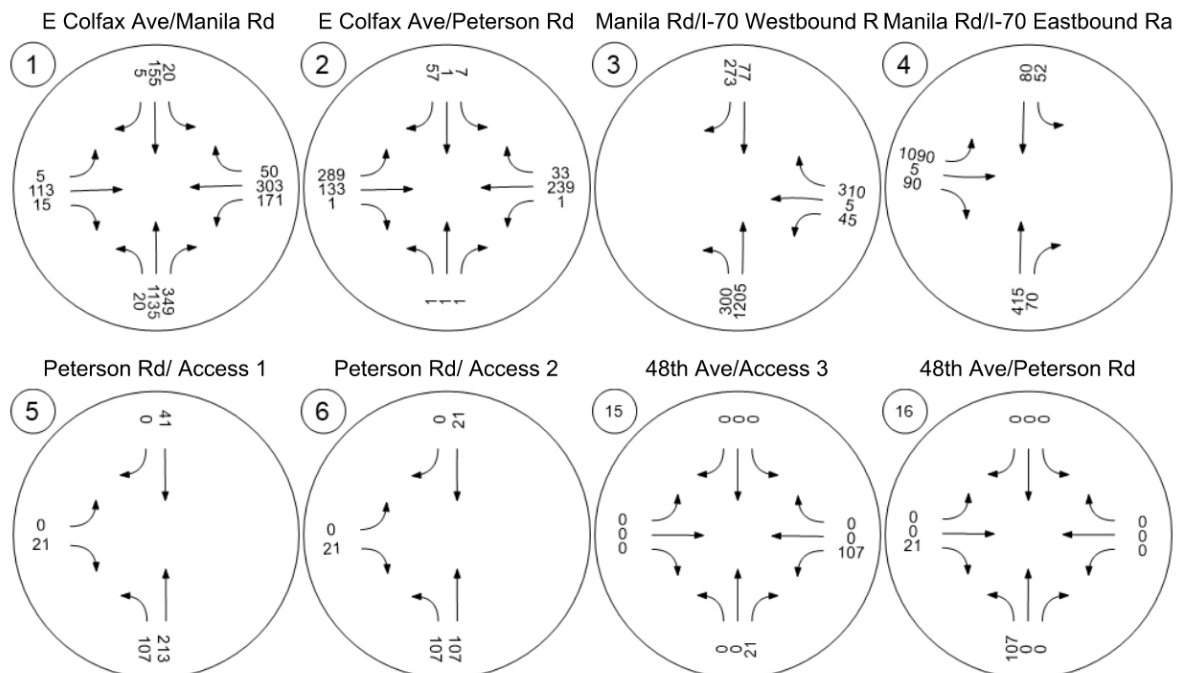


Figure 16. Horizon (2040) Total (PM Peak Hour) Without the Adjacent Development

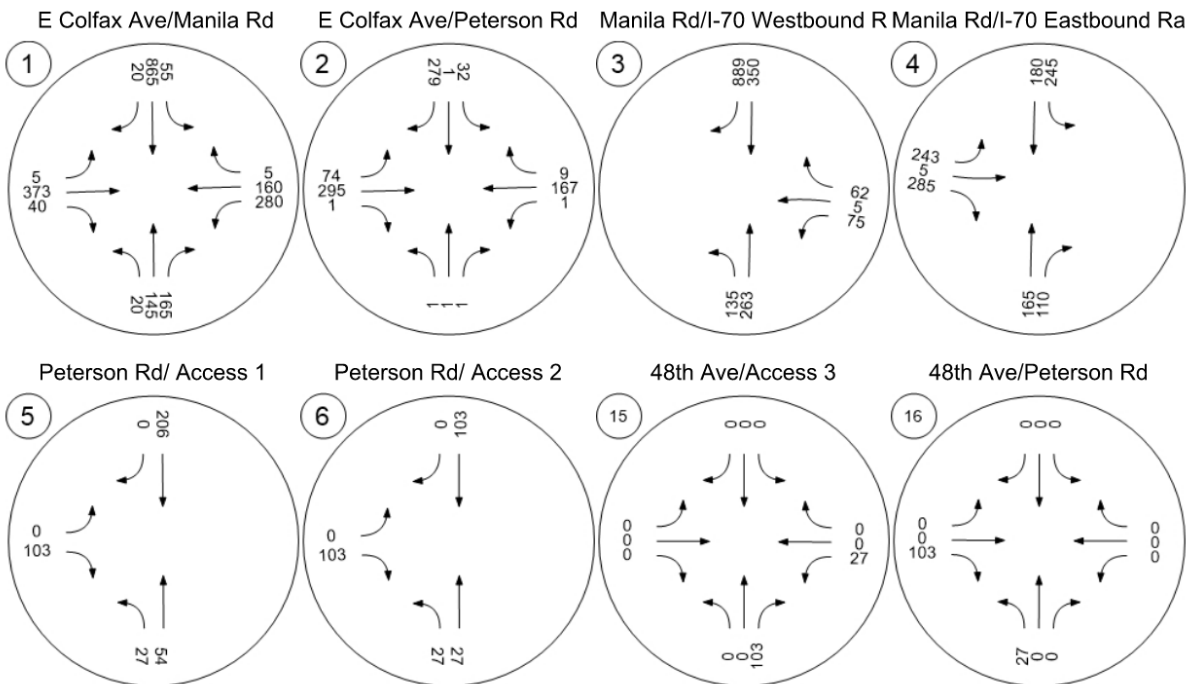
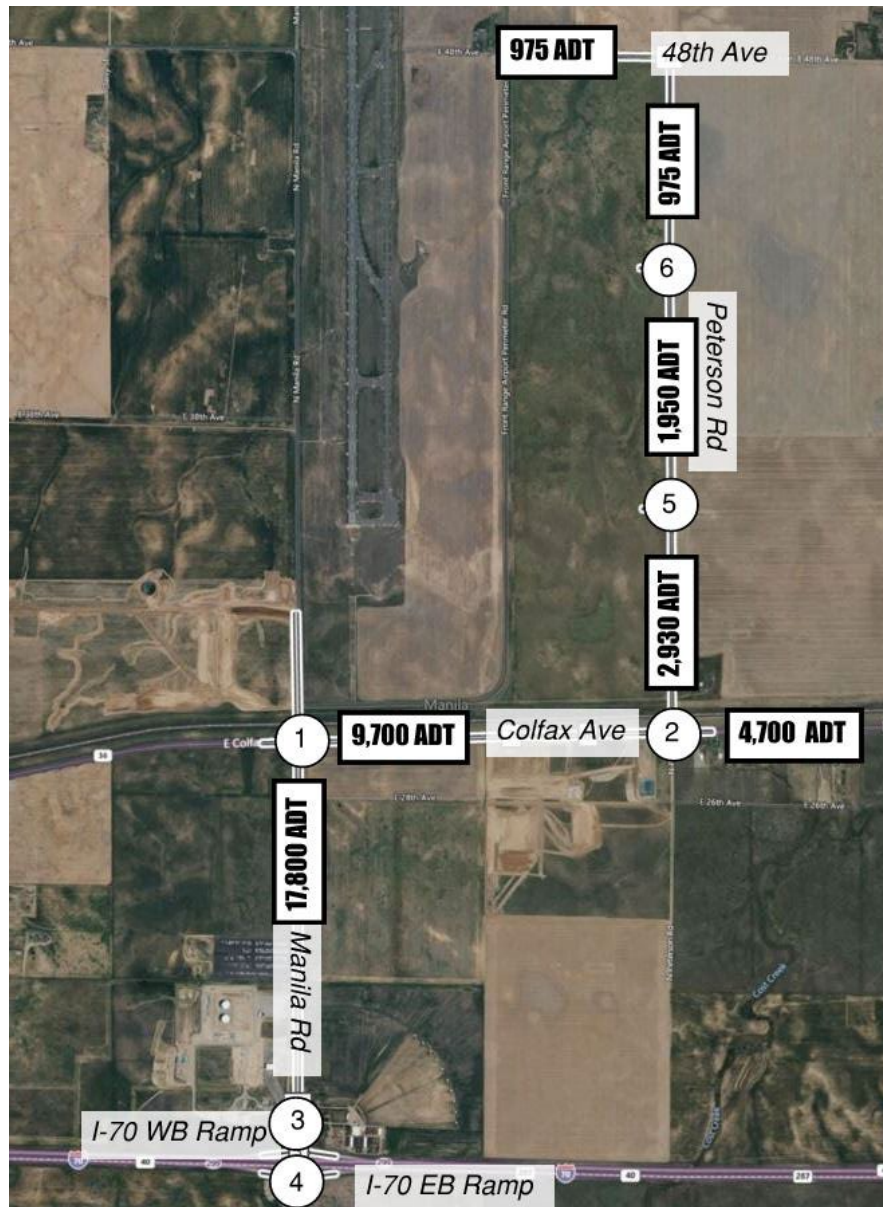
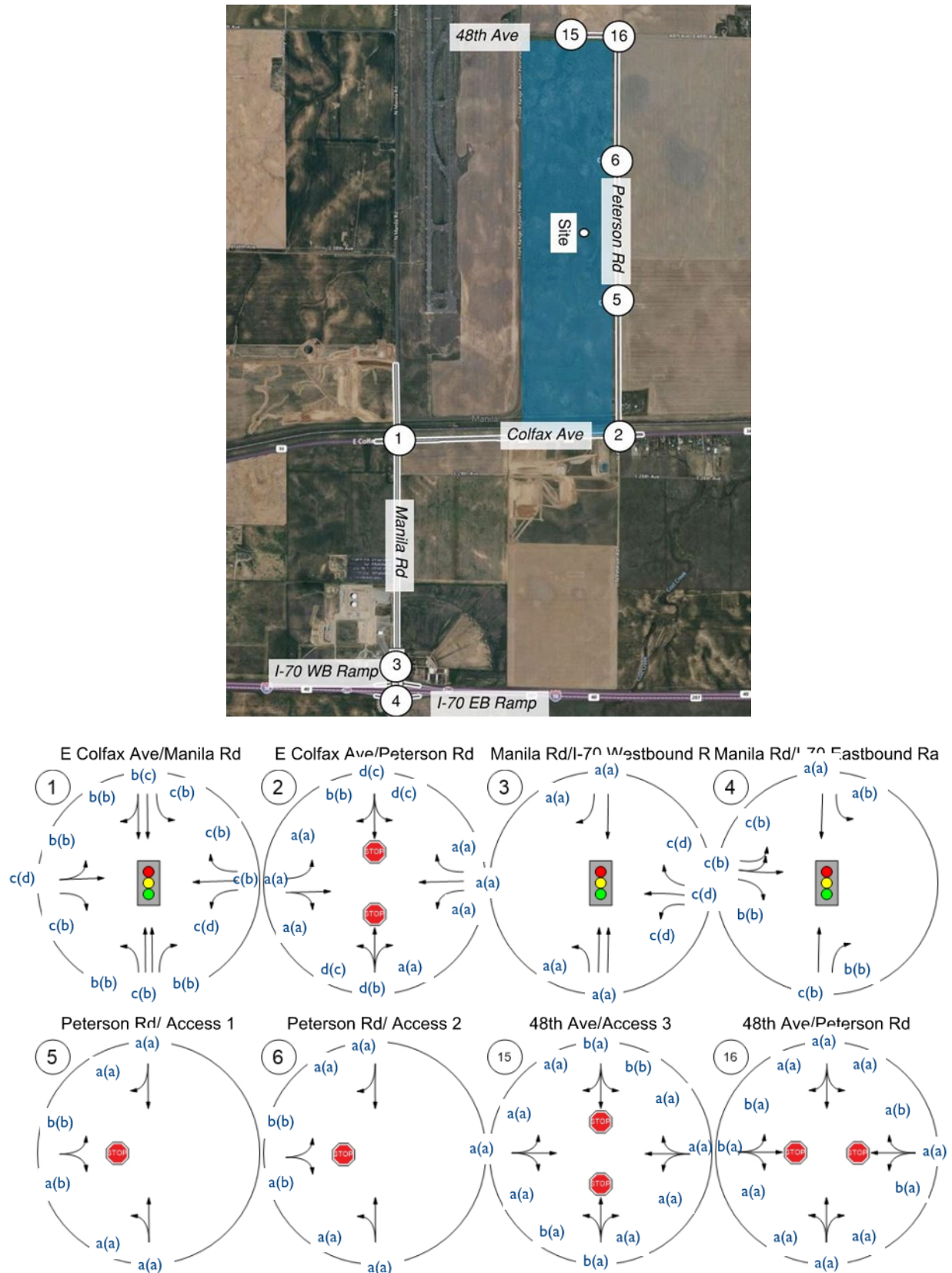


Figure 17. Horizon (2040) Total Daily Traffic Without the Adjacent Development



Turn lane configurations and movement's LOS are shown in Figure 18.

Figure 18. Horizon (2040) Total Configurations and LOS Without the Adjacent Development



Intersection operations with the addition of the projects (no adjacent development) are shown in Table 10 and Table 11.

Table 10. Horizon (2040) Total Operations (AM Peak Hour) Without the Adjacent Development

Intersection Analysis Summary							
ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	E Colfax Ave/Manila Rd	Signalized	HCM 7th Edition	NB Thru	0.721	27.4	C
2	E Colfax Ave/Peterson Rd	Two-way stop	HCM 7th Edition	NB Left	0.008	34.0	D
3	Manila Rd/I-70 Westbound Ramp	Signalized	HCM 7th Edition	WB Right	0.554	8.0	A
4	Manila Rd/I-70 Eastbound Ramp	Signalized	HCM 7th Edition	EB Left	0.695	30.1	C
5	Peterson Rd/ Access 1	Two-way stop	HCM 7th Edition	EB Right	0.023	8.7	A
6	Peterson Rd/ Access 2	Two-way stop	HCM 7th Edition	EB Right	0.023	8.7	A
15	48th Ave/Access 3	Two-way stop	HCM 7th Edition	NB Right	0.022	8.6	A
16	48th Ave/Peterson Rd	Two-way stop	HCM 7th Edition	EB Right	0.022	8.6	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Table 11. Horizon (2040) Total Operations (PM Peak Hour) Without the Adjacent Development

Intersection Analysis Summary							
ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	E Colfax Ave/Manila Rd	Signalized	HCM 7th Edition	WB Left	0.743	31.8	C
2	E Colfax Ave/Peterson Rd	Two-way stop	HCM 7th Edition	NB Left	0.005	22.8	C
3	Manila Rd/I-70 Westbound Ramp	Signalized	HCM 7th Edition	WB Left	0.435	8.4	A
4	Manila Rd/I-70 Eastbound Ramp	Signalized	HCM 7th Edition	NB Thru	0.333	13.0	B
5	Peterson Rd/ Access 1	Two-way stop	HCM 7th Edition	EB Right	0.145	10.4	B
6	Peterson Rd/ Access 2	Two-way stop	HCM 7th Edition	EB Right	0.125	9.6	A
15	48th Ave/Access 3	Two-way stop	HCM 7th Edition	NB Right	0.108	8.9	A
16	48th Ave/Peterson Rd	Two-way stop	HCM 7th Edition	EB Right	0.108	8.9	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

As shown in Table 10 and Table 11 all intersections operate at an acceptable LOS.

The intersection of Colfax Avenue/Peterson Road (#2) was also analyzed in Synchro. Matrix increased the heavy vehicle percentage to 80 percent and increased the critical gap for permitted left-turn movement from 4.5 seconds to 8.5 seconds. Queue analysis showed the 95-percentile queue length will not exceed 39 feet for the eastbound left-turn movement. Assuming that the length of a truck is equivalent to the length of three passenger vehicles, the queue length is approximately half of a truck at the eastbound left-turn lane in the critical scenario. As shown in the recommendation section below, an 895-ft eastbound left-turn lane is recommended at this intersection. Since a traffic signal is not warranted at this intersection, we do not recommend a double eastbound left turn due to safety concerns between conflicting movements.

Given all other movements operate at an acceptable LOS (LOS D or better), and the queue length and turning volumes for eastbound left-turn movement are minor, no mitigation is recommended for this intersection. The traffic signal warrant analysis indicated that a signal was not needed at this intersection for the horizon year. Using the AM peak hour volumes to estimate 24-hour traffic, projects no warrants were met. Using the PM peak hour volumes projects two out of three warrants were satisfied.

Under the assumption that the RMRP will be the only development on Peterson Road. Recommended improvements are listed below and shown in Table 12.

Table 12. Horizon (2040) Total Turn Lane Evaluations Without the Adjacent Development

ID	Intersection	Movement	No. of Lanes	Access Category	Speed Limit (mph)	Turning Volume	Lane Width (ft)	Deceleration (ft)	Storage (ft)	Taper (ft)	Total (ft) (SHAC)
1	Colfax Ave/Manilla Rd	NBL	1	R-B	45	20	12	435	25	162	460
		NBR	1	R-B	45	349	12	435	349	162	435
		SBL	1	R-B	30	55	12	250	50	96	300
		SBR**	1	R-B	30	20	12	250		96	250
		EBL**	1	R-B	55	5	12	600	25	222	625
		EBR	1	R-B	55	40	12	600	50	222	600
		WBL	1	R-B	55	280	12	600	280	222	880
		WBR	1	R-B	55	50	12	600	50	222	600
2	Colfax Ave/Peterson Rd	EBL	1	R-B	55	293	12	600	293	222	895
		WBR	1	R-B	55	37	12	600	50	222	600
		SBR*	1	R-B	55	78	12			222	960
3	Manilla Rd/I-70 WB Ramp	NBL	1	R-B	45	300	12	435	300	162	735
		SBR	2	R-B	45	889	12	435	444.5	162	435
		WBL	1	R-B	45	75	12	435	100	162	535
		WBR	1	R-B	45	310	12	435	310	162	435
4	Manilla Rd/I-70 EB Ramp	NBR	1	R-B	45	110	12	435	110	162	435
		SBL	1	R-B	45	245	12	435	245	162	680
		EBL	2	R-B	45	1090	12	435	545	162	980
		EBR	1	R-B	45	285	12	435	285	162	435

*Acceleration Lane

** Turn Lane not warranted per SHAC

Manilla Road/I-70 Eastbound Ramp (#4)

- A 60-ft extension of the southbound left-turn.
- A 95-ft extension of eastbound left-turn lanes.
- These required extensions will be coordinated with CDOT when the improvements are completed.

Finally, Matrix analyzed the horizon conditions with both the RMRP and Port CO Subarea 6 traffic.

AM and PM peak hours volumes are shown in Figure 19 and Figure 20 Daily volumes are shown Figure 21. Intersection configurations and LOS for each movement are shown in Figure 22.

Figure 19. Horizon Total (AM Peak Hour)

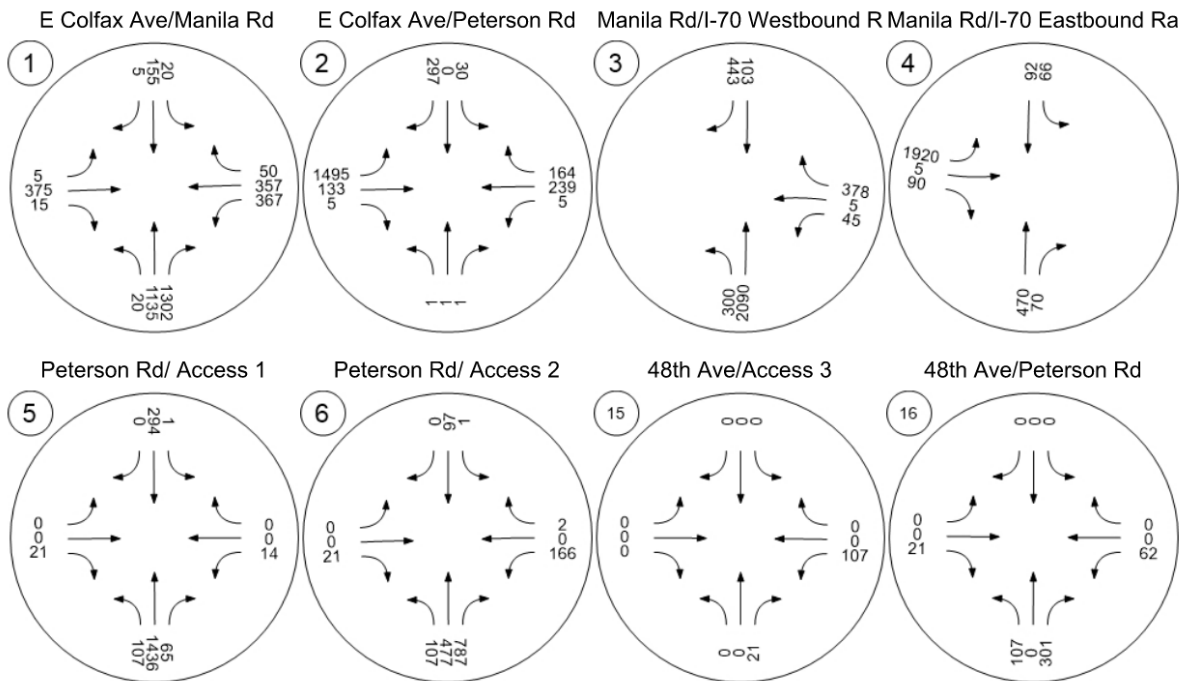
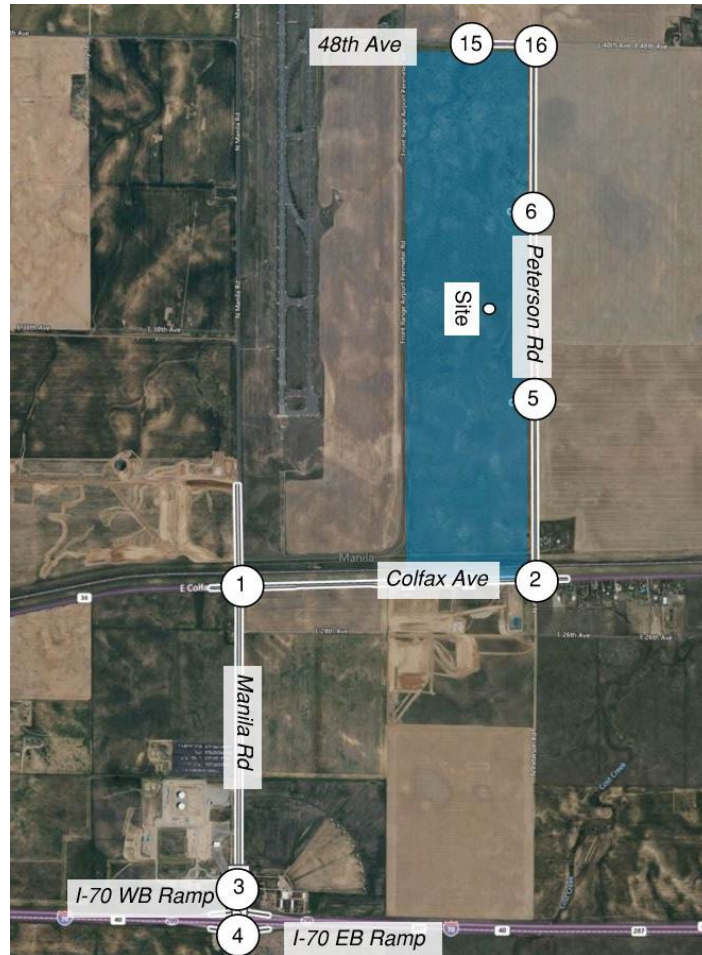


Figure 20. Horizon Total (PM Peak Hour)

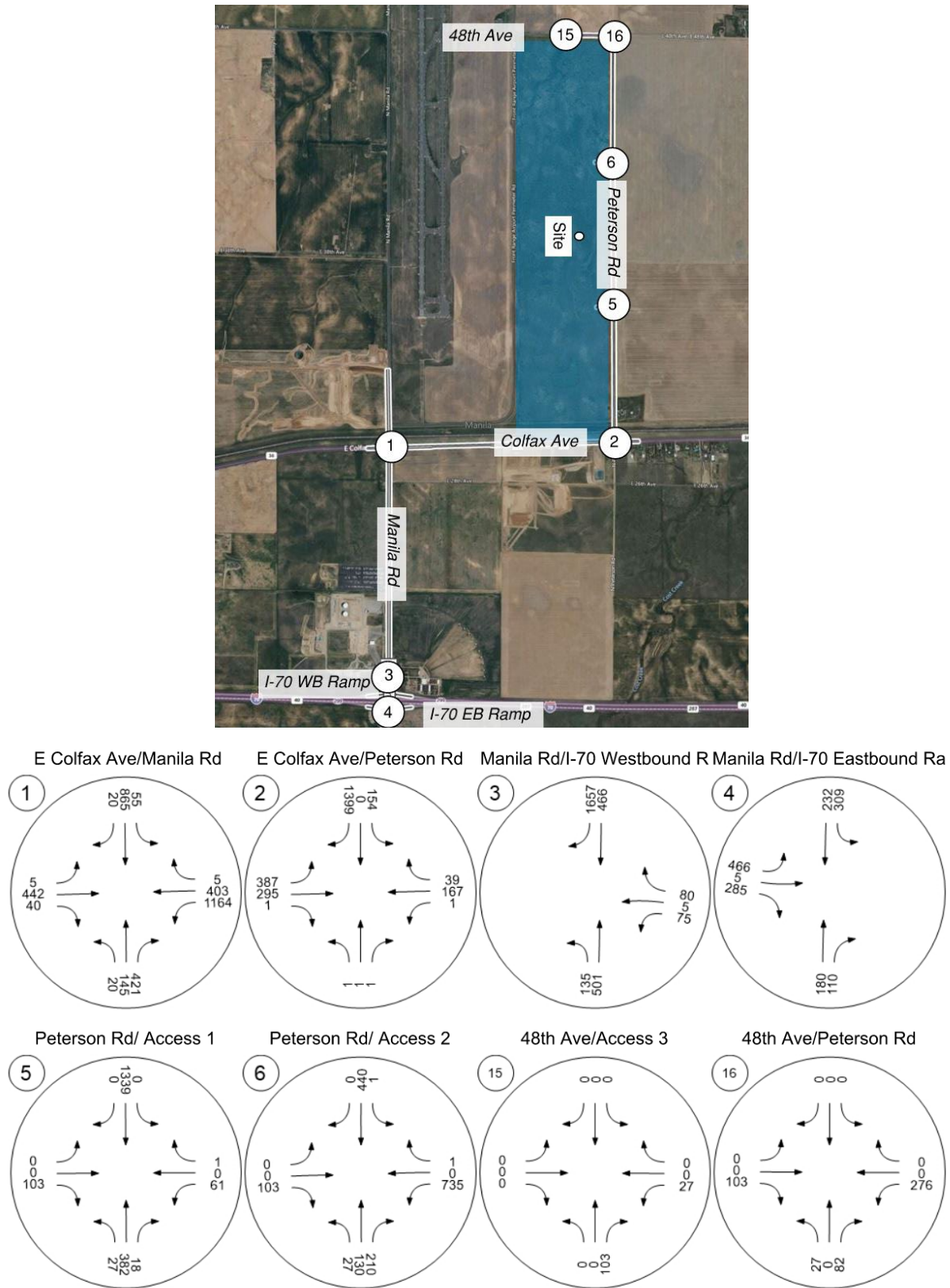
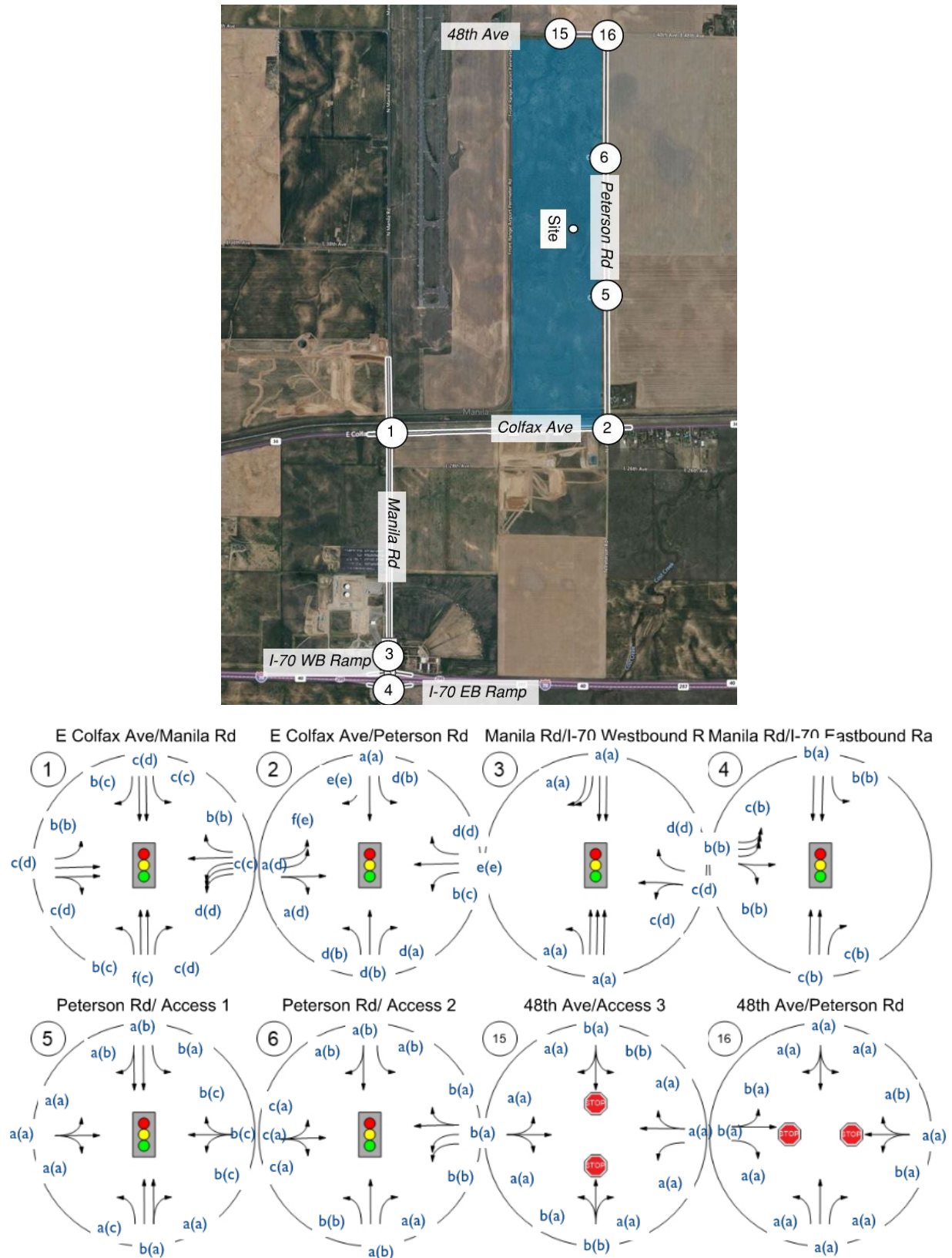


Figure 21. Horizon Total Daily Traffic



Figure 22. Horizon Total Intersection Configurations and LOS



Intersection operations with the addition of the projects are shown in Table 7 and Table 8.

Table 13. Horizon Total Intersection Operations (AM Peak Hour)

Intersection Analysis Summary							
ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	E Colfax Ave/Manila Rd	Signalized	HCM 7th Edition	WB Left	0.658	39.3	D
2	E Colfax Ave/Peterson Rd	Signalized	HCM 7th Edition	SB Right	0.831	53.9	D
3	Manila Rd/I-70 Westbound Ramp	Signalized	HCM 7th Edition	WB Right	0.672	9.6	A
4	Manila Rd/I-70 Eastbound Ramp	Signalized	HCM 7th Edition	NB Thru	0.669	24.4	C
5	Peterson Rd/ Access 1	Signalized	HCM 7th Edition	SB Left	0.587	14.9	B
6	Peterson Rd/ Access 2	Signalized	HCM 7th Edition	WB Left	0.401	11.0	B
15	48th Ave/Access 3	Two-way stop	HCM 7th Edition	NB Right	0.022	8.6	A
16	48th Ave/Peterson Rd	Two-way stop	HCM 7th Edition	WB Left	0.110	11.6	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Table 14. Horizon Total Intersection Operations (PM Peak Hour)

Intersection Analysis Summary							
ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	E Colfax Ave/Manila Rd	Signalized	HCM 7th Edition	EB Right	0.762	43.0	D
2	E Colfax Ave/Peterson Rd	Signalized	HCM 7th Edition	EB Left	0.815	54.9	D
3	Manila Rd/I-70 Westbound Ramp	Signalized	HCM 7th Edition	WB Left	0.453	7.2	A
4	Manila Rd/I-70 Eastbound Ramp	Signalized	HCM 7th Edition	NB Thru	0.320	13.0	B
5	Peterson Rd/ Access 1	Signalized	HCM 7th Edition	WB Left	0.565	14.3	B
6	Peterson Rd/ Access 2	Signalized	HCM 7th Edition	WB Left	0.655	19.8	B
15	48th Ave/Access 3	Two-way stop	HCM 7th Edition	NB Right	0.108	8.9	A
16	48th Ave/Peterson Rd	Two-way stop	HCM 7th Edition	WB Left	0.417	13.5	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

As shown in Table 13, and Table 14, all intersections operate at an acceptable LOS in the horizon with project scenarios. The improvements are summarized in Table 15..

Table 15. Horizon Total Turn Lane Evaluations

ID	Intersection	Movement	No. of Lanes	Access Category	Speed Limit (mph)	Turning Volume	Lane Width (ft)	Deceleration (ft)	Storage (ft)	Taper (ft)	Total (ft) (SHAC)
1	Colfax Ave/Manilla Rd	NBL	1	R-B	45	20	12	435	25	162	460
		NBR	1	R-B	45	1302	12	435	1302	162	435
		SBL	1	R-B	30	55	12	250	50	96	300
		SBR**	1	R-B	30	20	12	250		96	250
		EBL**	1	R-B	55	5	12	600	25	222	625
		EBR	1	R-B	55	40	12	600	50	222	600
		WBL	3	R-B	55	1164	12	600	388	222	990
		WBR	1	R-B	55	50	12	600	50	222	600
2	Colfax Ave/Peterson Rd	SBL	1	R-B	30	158	12	250	158	96	410
		SBR	1	R-B	30	1403	12	250	1403	96	250
		EBL	2	R-B	55	1499	12	600	749.5	222	1350
		WBR	1	R-B	55	168	12	600	168	222	600
3	Manilla Rd/I-70 WB Ramp	NBL	1	R-B	45	300	12	435	300	162	735
		SBR	2	R-B	45	1657	12	435	828.5	162	435
		WBL	1	R-B	45	75	12	435	100	162	535
		WBR	1	R-B	45	378	12	435	378	162	435
4	Manilla Rd/I-70 EB Ramp	NBR	1	R-B	45	110	12	435	110	162	435
		SBL	1	R-B	45	309	12	435	309	162	745
		EBL	3	R-B	45	1920	12	435	640	162	1075
		EBR	1	R-B	45	285	12	435	285	162	435
5	Peterson Rd/Access #1	NBL	1	R-B	30	107	12	250	107	96	355
6	Peterson Rd/Access #2	NBL	1	R-B	30	107	12	250	107	96	355
16	48th Ave/Peterson Rd	NBL	1	R-B	30	107	12	250	107	96	355
		EBR	1	R-B	30	103	12	250	103	96	250

**Turn lane was not warranted based on the SHAC

Colfax Avenue/Manilla Road (#1)

- A 600-ft shared eastbound thru and eastbound right-turn lane. A 660-ft receiving lane should be added to the end of the northbound right-turn acceleration lane on the west leg of the intersection. The Project share is calculated in Table 16.
- Three 990-ft westbound left-turn lanes. Included a 600-ft deceleration lane and 388-ft storage. A 222-ft taper lane is included within the deceleration lane.

Colfax Avenue/Peterson Road (#2)

- Install a traffic signal
- A 410-ft southbound left-turn. Included a 250-ft deceleration lane and a 158-ft storage lane. A 96-ft taper is included within the deceleration lane.
- Two 1350-ft eastbound left-turn lanes. Included 600-ft deceleration lane and 750-ft storage. 222-ft taper is included within the deceleration lane.

Manilla Road/I-70 Eastbound Ramp (#4)

- A 745-ft southbound left-turn lane. Included a 435-ft deceleration lane and a 309-ft storage. A 162-ft taper is included within the deceleration lane. Since there is a geometry constraint for the entire improvement, it is up to the City of Aurora and CDOT to determine how to address this deficiency. Currently, less than 300 feet of lane is available for the southbound left-turn at the I-70 underpass.
- Three 1075-ft eastbound left-turn lanes. Included 435-ft deceleration lane and 640-ft storage. A 162-ft taper is included within the deceleration lane.

The total turn lane is rounded to the nearest 5 ft.

Conclusion and Recommendations

In this memo, the traffic impact of Rocky Mountain Rail Park North Area on the adjacent network was analyzed. *NEATS (2018)*, *Port Colorado Subarea 6 (2022)*, and *Rocky Mountain Rail Park MTIS (2020)* were used to obtain lane configurations, and background volumes. RMRP North Area trips were then added to the background traffic and results showed all intersections and approaches operate at an acceptable LOS.

The summary of improvements are shown in Table 16 and Table 17.

Table 16. Summary of Required Improvements (Buildout 2030)

ID	Intersection	Improvement	Year	Responsibility
1	Manilla Rd/Colfax Ave	A traffic Signal	Buildout 2030 Background	The project has no responsibility for these improvements.
		A 460-ft northbound left turn. Included a 435-ft deceleration lane and a 25-ft storage. Taper is included within the deceleration lane.		
		A 435-ft northbound right-turn. Taper is included within the deceleration lane.		
		A 600-ft eastbound right-turn lane. Taper is included within the deceleration lane.		
		A 700-ft westbound left-turn lane. Included a 600-ft deceleration lane and a 100-ft storage. Taper is included within the deceleration lane.		
		A 600-ft westbound right-turn lane. Taper is included within the deceleration lane.		
3	Manilla Rd/I-70 VVB Ramp	A 595-ft northbound left-turn lane. Included a 435-ft deceleration lane and a 160-ft storage. Taper is included within the deceleration lane.	Buildout 2030 Background	The project has no responsibility for these improvements.
		A 435-ft southbound right-turn lane. Taper is included within the deceleration lane.		
		A 485-ft westbound left-turn. Included a 435-ft deceleration lane and a 25-ft storage. Taper is included within the deceleration lane.		
4	Manilla Rd/I-70 EB Ramp	A 435-ft northbound right-turn. Taper is included within the deceleration lane.	Buildout 2030 Background	The project has no responsibility for these improvements.
		A 460-ft southbound left turn. Included a 435-ft deceleration lane and a 25-ft storage. Taper is included within the deceleration lane.		
		A 650-ft eastbound left-turn lane. Included a 435-ft deceleration lane and a 215-ft storage. Taper is included within the deceleration lane.		
		A 435 eastbound right-turn lane. Taper is included within the deceleration lane.		
1	Manilla Rd/Colfax Ave	A 165-ft extension of the westbound left turn.	Buildout 2030 Total	This improvement is already accounted for in the development agreement.
2	Colfax Avenue/Peterson Road	A 895-ft eastbound left-turn lane. Included a 600-ft deceleration lane and a 293-ft storage lane. A 222-ft taper lane is included within the deceleration lane.	Buildout 2030 Total	The project is responsible for these improvements.
		A 600-ft westbound right-turn deceleration lane. A 222-ft taper lane is included within the deceleration lane.		
		A 960-ft westbound acceleration lane. A 222-ft taper lane is included within the deceleration lane.		
3	Manila Road/I-70 Westbound Ramp	A 435-ft westbound right-turn deceleration lane. A 162-ft taper lane is included within the deceleration lane.	Buildout 2030 Total	Construction of the right turn lane will be coordinated with the CDOT at the time the improvements are made.
4	Manila Road/I-70 Eastbound Ramp	A 75-ft extension of the southbound left-turn.	Buildout 2030 Total	Required extensions will be coordinated with the CDOT at the time the planned improvements are made.
		A 190-ft extension of eastbound left-turn lanes.		

Table 17. Summary of Required Improvements (Horizon Year)

ID	Intersection	Improvement	Year	Responsibility
1	Manilla Rd/Colfax Ave	A 300-ft southbound left-turn. Included a 250-ft deceleration lane and a 50-ft storage. A 96-ft taper lane is included within the deceleration lane. A 960-ft northbound acceleration lane. A 222-ft taper lane is included within the acceleration lane.	Horizon 2040 Background	The project has no responsibility for these improvements.
3	Manilla Rd/I-70 WB Ramp	A traffic Signal A 735-ft northbound left-turn. Included a 435-ft deceleration lane and a 300-ft storage. A 162-ft taper lane is included within the deceleration lane. Two 435-ft southbound right-turn deceleration lanes. A 162-ft taper lane is included within the deceleration lane. A 535-ft westbound left-turn. Included a 435-ft deceleration lane and a 100-ft storage. A 162-ft taper is included within the deceleration lane. A 435-ft westbound right-turn deceleration lane. A 162-ft taper lane is included within the deceleration lane.	Horizon 2040 Background	The project has no responsibility for these improvements.
4	Manilla Rd/I-70 EB Ramp	A traffic Signal A 620-ft southbound left-turn lane. Included a 435-ft deceleration lane and a 183-ft storage. A 162-ft taper lane is included within the deceleration lane. Since there is a geometry constraint for the entire improvement, it is up to the City of Aurora and CDOT to determine how to address this deficiency. Currently, less than 300 feet of the lane is available for the southbound left-turn at the I-70 underpass. Two 885-ft eastbound left-turn lanes. Included 435-ft deceleration lane and 449-ft storage. A 162-ft taper lane is included within the deceleration lane.	Horizon 2040 Background	The project has no responsibility for these improvements.
4	Manilla Rd/I-70 EB Ramp	A 60-ft extension of the southbound left-turn. A 95-ft extension of eastbound left-turn lanes.	Horizon 2040 Total Without the Adjacent Development	Required extensions will be coordinated with the CDOT at the time the planned improvements are made.
1	Manilla Rd/Colfax Ave	A 600-ft shared eastbound thru and eastbound right-turn lane. A 660-ft receiving lane should be added to the end of the northbound right-turn acceleration lane on the west leg of the intersection. Three 990-ft westbound left-turn lanes. Included a 600-ft deceleration lane and 388-ft storage. A 222-ft taper lane is included within the deceleration lane.	Horizon Total With the Adjacent Development	Required only with the addition of the adjacent development.
2	Colfax Avenue/Peterson Road	A traffic Signal A 410-ft southbound left-turn. Included a 250-ft deceleration lane and a 158-ft storage lane. A 96-ft taper is included within the deceleration lane. Two 1350-ft eastbound left-turn lanes. Included 600-ft deceleration lane and 750-ft storage. 222-ft taper is included within the deceleration lane.		
4	Manilla Rd/I-70 EB Ramp	A 745-ft southbound left-turn lane. Included a 435-ft deceleration lane and a 309-ft storage. A 162-ft taper is included within the deceleration lane. Since there is a geometry constraint for the entire improvement, it is up to the City of Aurora and CDOT to determine how to address this deficiency. Currently, less than 300 feet of lane is available for the southbound left-turn at the I-70 underpass. Three 1075-ft eastbound left-turn lanes. Included 435-ft deceleration lane and 640-ft storage. A 162-ft taper is included within the deceleration lane.		
5	Peterson Road/ Access 1	A 355-ft northbound left-turn. Included a 250-ft deceleration lane and 107-ft storage. A 96-ft taper lane is included within the deceleration lane.		
6	Peterson Road/ Access 2	A 355-ft northbound left-turn. Included a 250-ft deceleration lane and 107-ft storage. A 96-ft taper lane is included within the deceleration lane.		
16	48th Avenue/Peterson Road	A 360-ft northbound left turn. Included a 250-ft deceleration lane and 112-ft storage. A 96-ft taper lane is included within the deceleration lane. A 250-ft eastbound right-turn deceleration lane. A 96-ft taper lane is included within the deceleration lane.		

Appendix A – Traffic Counts

Date Start: 23-Mar-22
Site Code: 5
Station ID: 5
N MANILA RD N.O. I70 WB RAMPS

Start Time	23-Mar-22	NB	SB							Total
12:00 AM		9	3							12
01:00		2	4							6
02:00		6	4							10
03:00		9	2							11
04:00		15	5							20
05:00		32	29							61
06:00		89	48							137
07:00		45	66							111
08:00		54	43							97
09:00		38	30							68
10:00		35	45							80
11:00		39	54							93
12:00 PM		36	40							76
01:00		44	38							82
02:00		33	39							72
03:00		42	49							91
04:00		68	56							124
05:00		81	55							136
06:00		53	37							90
07:00		26	16							42
08:00		14	16							30
09:00		7	8							15
10:00		7	10							17
11:00		4	4							8
Total		788	701							1489
Percent		52.9%	47.1%							
AM Peak	-	06:00	07:00	-	-	-	-	-	-	06:00
Vol.	-	89	66	-	-	-	-	-	-	137
PM Peak	-	17:00	16:00	-	-	-	-	-	-	17:00
Vol.	-	81	56	-	-	-	-	-	-	136
Grand Total		788	701							1489
Percent		52.9%	47.1%							
ADT		ADT 1,489	AADT 1,489							

Date Start: 23-Mar-22
Site Code: 6
Station ID: 6
COLFAX AVE E.O. MANILA RD

Start Time	23-Mar-22 Wed	EB	WB							Total
12:00 AM		12	6							18
01:00		9	5							14
02:00		10	8							18
03:00		14	13							27
04:00		19	29							48
05:00		26	70							96
06:00		71	105							176
07:00		114	114							228
08:00		98	96							194
09:00		89	84							173
10:00		93	89							182
11:00		90	85							175
12:00 PM		132	91							223
01:00		111	80							191
02:00		116	69							185
03:00		128	79							207
04:00		245	65							310
05:00		268	61							329
06:00		151	54							205
07:00		68	39							107
08:00		33	30							63
09:00		45	17							62
10:00		21	9							30
11:00		21	3							24
Total		1984	1301							3285
Percent		60.4%	39.6%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	114	114	-	-	-	-	-	-	228
PM Peak	-	17:00	12:00	-	-	-	-	-	-	17:00
Vol.	-	268	91	-	-	-	-	-	-	329
Grand Total		1984	1301							3285
Percent		60.4%	39.6%							
ADT		ADT 3,285	AADT 3,285							



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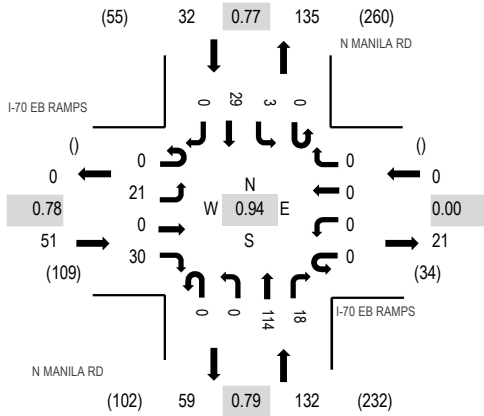
Location: 1 N MANILA RD & I-70 EB RAMPS AM

Date: Wednesday, March 23, 2022

Peak Hour: 07:15 AM - 08:15 AM

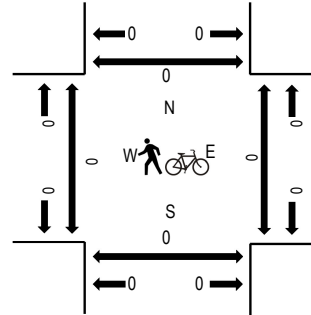
Peak 15-Minutes: 07:15 AM - 07:30 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	I-70 EB RAMPS Eastbound				I-70 EB RAMPS Westbound				N MANILA RD Northbound				N MANILA RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	6	0	2	0	0	0	0	0	0	27	2	0	0	5	0	42	206	0	0	0	0
7:15 AM	0	4	0	5	0	0	0	0	0	0	40	4	0	0	4	0	57	215	0	0	0	0
7:30 AM	0	4	0	6	0	0	0	0	0	0	32	5	0	1	7	0	55	212	0	0	0	0
7:45 AM	0	4	0	10	0	0	0	0	0	0	23	6	0	2	7	0	52	205	0	0	0	0
8:00 AM	0	9	0	9	0	0	0	0	0	0	19	3	0	0	11	0	51	190	0	0	0	0
8:15 AM	0	12	0	3	0	0	0	0	0	0	29	4	0	1	5	0	54		0	0	0	0
8:30 AM	0	9	0	13	0	0	0	0	0	0	20	2	0	0	4	0	48		1	0	0	0
8:45 AM	0	9	0	4	0	0	0	0	0	0	13	3	0	1	7	0	37		1	0	0	0
Count Total	0	57	0	52	0	0	0	0	0	0	203	29	0	5	50	0	396		2	0	0	0
Peak Hour	0	21	0	30	0	0	0	0	0	0	114	18	0	3	29	0	215		0	0	0	0



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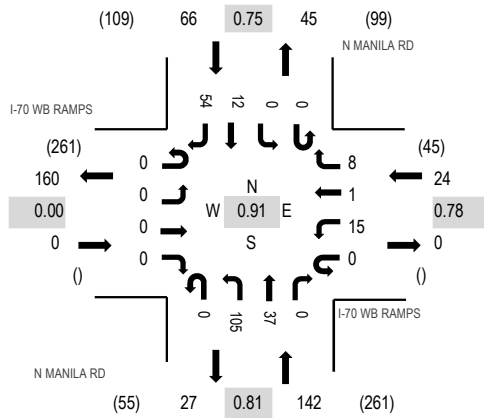
Location: 2 N MANILA RD & I-70 WB RAMPS AM

Date: Wednesday, March 23, 2022

Peak Hour: 07:00 AM - 08:00 AM

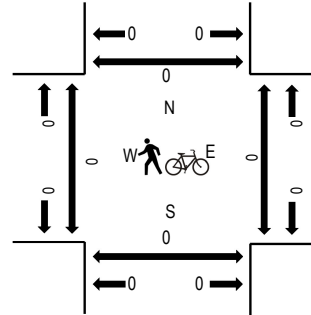
Peak 15-Minutes: 07:15 AM - 07:30 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	I-70 WB RAMPS Eastbound				I-70 WB RAMPS Westbound				N MANILA RD Northbound				N MANILA RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	0	0	0	3	1	1	0	25	10	0	0	0	2	16	58	232	0	0	0	0
7:15 AM	0	0	0	0	0	3	0	4	0	34	10	0	0	0	1	12	64	224	0	0	0	0
7:30 AM	0	0	0	0	0	3	0	1	0	26	10	0	0	0	5	17	62	215	0	0	0	0
7:45 AM	0	0	0	0	0	6	0	2	0	20	7	0	0	0	4	9	48	198	0	0	0	0
8:00 AM	0	0	0	0	0	4	0	1	0	16	12	0	0	0	6	11	50	183	0	0	0	0
8:15 AM	0	0	0	0	0	3	1	2	0	25	16	0	0	0	3	5	55		0	0	0	0
8:30 AM	0	0	0	0	0	2	1	3	0	18	11	0	0	0	2	8	45		0	0	0	0
8:45 AM	0	0	0	0	0	4	0	0	0	12	9	0	0	0	4	4	33		0	0	0	0
Count Total	0	0	0	0	0	28	3	14	0	176	85	0	0	0	27	82	415		0	0	0	0
Peak Hour	0	0	0	0	0	15	1	8	0	105	37	0	0	0	12	54	232		0	0	0	0



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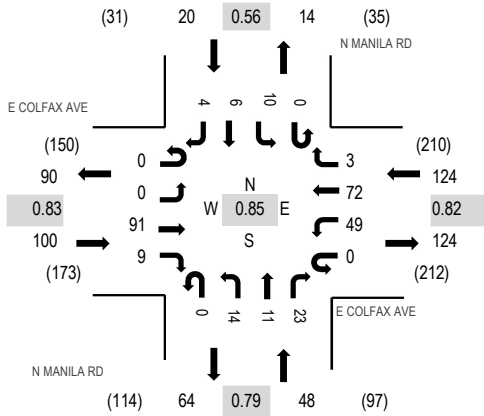
Location: 3 N MANILA RD & E COLFAX AVE AM

Date: Wednesday, March 23, 2022

Peak Hour: 07:15 AM - 08:15 AM

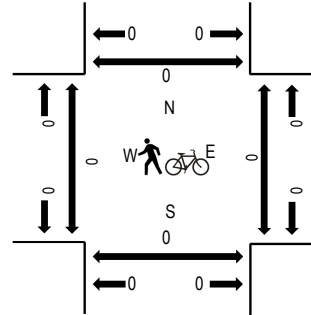
Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	E COLFAX AVE Eastbound				E COLFAX AVE Westbound				N MANILA RD Northbound				N MANILA RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	9	1	0	18	9	1	0	1	2	6	0	0	2	0	49	267	0	0	0	0
7:15 AM	0	0	20	1	0	10	14	1	0	4	2	5	0	3	1	2	63	292	0	0	0	0
7:30 AM	0	0	25	2	0	14	20	0	0	5	1	10	0	3	4	2	86	286	0	0	0	0
7:45 AM	0	0	26	4	0	12	15	0	0	3	2	4	0	3	0	0	69	260	0	0	0	0
8:00 AM	0	0	20	2	0	13	23	2	0	2	6	4	0	1	1	0	74	244	0	0	0	0
8:15 AM	0	1	14	3	0	4	14	1	0	4	3	10	0	0	2	1	57		0	0	0	0
8:30 AM	0	2	18	2	0	7	15	0	0	4	4	4	0	1	3	0	60		0	0	0	0
8:45 AM	0	3	19	1	0	5	11	1	0	1	3	7	0	0	2	0	53		0	0	0	0
Count Total	0	6	151	16	0	83	121	6	0	24	23	50	0	11	15	5	511		0	0	0	0
Peak Hour	0	0	91	9	0	49	72	3	0	14	11	23	0	10	6	4	292		0	0	0	0



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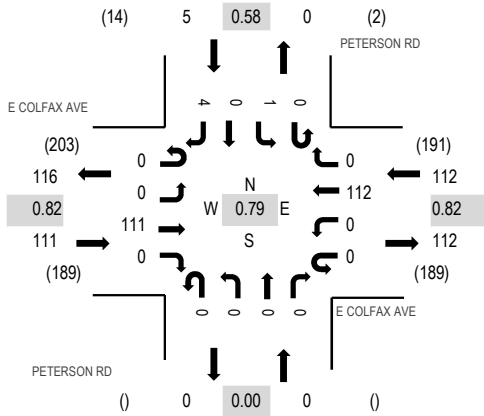
Location: 4 PETERSON RD & E COLFAX AVE AM

Date: Wednesday, March 23, 2022

Peak Hour: 07:15 AM - 08:15 AM

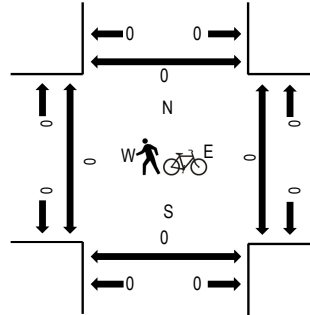
Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	E COLFAX AVE				E COLFAX AVE				PETERSON RD				PETERSON RD				Total	Rolling Hour	Pedestrian Crossings			
	Eastbound				Westbound				Northbound				Southbound						West	East	South	North
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right						
7:00 AM	0	0	10	0	0	0	27	0	0	0	0	0	0	0	0	3	40	212	0	0	0	0
7:15 AM	0	0	20	0	0	0	20	0	0	0	0	0	0	0	0	1	41	228	0	0	0	0
7:30 AM	0	0	35	0	0	0	34	0	0	0	0	0	0	1	0	2	72	228	0	0	0	0
7:45 AM	0	0	32	0	0	0	27	0	0	0	0	0	0	0	0	0	59	200	0	0	0	0
8:00 AM	0	0	24	0	0	0	31	0	0	0	0	0	0	0	0	1	56	182	0	0	0	0
8:15 AM	0	0	24	0	0	0	15	0	0	0	0	0	0	0	0	2	41		0	0	0	0
8:30 AM	0	0	21	0	0	0	19	1	0	0	0	0	0	0	0	3	44		0	0	0	0
8:45 AM	0	1	22	0	0	0	17	0	0	0	0	0	0	0	0	1	41		0	0	0	0
Count Total	0	1	188	0	0	0	190	1	0	0	0	0	0	1	0	13	394		0	0	0	0
Peak Hour	0	0	111	0	0	0	112	0	0	0	0	0	0	1	0	4	228		0	0	0	0



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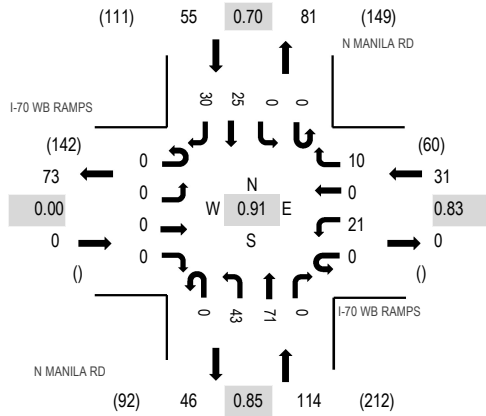
Location: 2 N MANILA RD & I-70 WB RAMPS PM

Date: Wednesday, March 23, 2022

Peak Hour: 05:00 PM - 06:00 PM

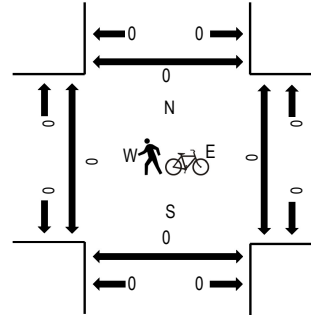
Peak 15-Minutes: 05:45 PM - 06:00 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	I-70 WB RAMPS Eastbound				I-70 WB RAMPS Westbound				N MANILA RD Northbound				N MANILA RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	0	0	0	0	4	0	1	0	7	12	0	0	0	6	14	44	183	0	0	0	0
4:15 PM	0	0	0	0	0	5	0	3	0	15	12	0	0	0	4	5	44	188	0	0	0	0
4:30 PM	0	0	0	0	0	4	0	2	0	10	12	0	0	0	6	9	43	197	0	0	0	0
4:45 PM	0	0	0	0	0	8	0	2	0	6	24	0	0	0	9	3	52	197	0	0	0	0
5:00 PM	0	0	0	0	0	6	0	2	0	14	16	0	0	0	2	9	49	200	0	0	0	0
5:15 PM	0	0	0	0	0	2	0	3	0	6	28	0	0	0	7	7	53		0	0	0	0
5:30 PM	0	0	0	0	0	8	0	2	0	9	11	0	0	0	6	7	43		0	0	0	0
5:45 PM	0	0	0	0	0	5	0	3	0	14	16	0	0	0	10	7	55		0	0	0	0
Count Total	0	0	0	0	0	42	0	18	0	81	131	0	0	0	50	61	383		0	0	0	0
Peak Hour	0	0	0	0	0	21	0	10	0	43	71	0	0	0	25	30	200		0	0	0	0



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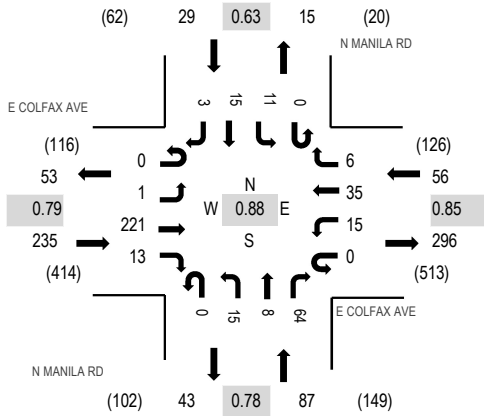
Location: 3 N MANILA RD & E COLFAX AVE PM

Date: Wednesday, March 23, 2022

Peak Hour: 04:45 PM - 05:45 PM

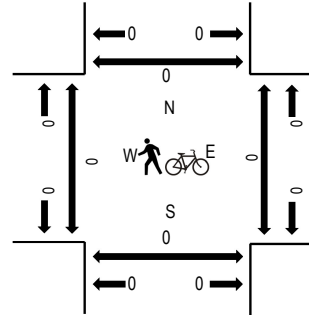
Peak 15-Minutes: 04:45 PM - 05:00 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	E COLFAX AVE Eastbound				E COLFAX AVE Westbound				N MANILA RD Northbound				N MANILA RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	0	32	3	0	5	12	0	0	7	0	9	0	1	9	1	79	367	0	0	0	0
4:15 PM	0	0	41	4	0	5	12	0	0	1	1	11	0	2	3	0	80	377	0	0	0	0
4:30 PM	0	0	45	5	0	8	11	1	0	3	1	10	0	1	4	3	92	405	0	0	0	0
4:45 PM	0	0	71	3	0	3	8	0	0	3	2	21	0	1	4	0	116	407	0	0	0	0
5:00 PM	0	1	41	1	0	5	11	4	0	1	1	17	0	3	3	1	89	384	0	0	0	0
5:15 PM	0	0	56	6	0	4	9	1	0	9	5	14	0	2	2	0	108		0	0	0	0
5:30 PM	0	0	53	3	0	3	7	1	0	2	0	12	0	5	6	2	94		0	0	0	0
5:45 PM	0	0	47	2	0	5	10	1	0	3	1	15	0	3	6	0	93		0	0	0	0
Count Total	0	1	386	27	0	38	80	8	0	29	11	109	0	18	37	7	751		0	0	0	0
Peak Hour	0	1	221	13	0	15	35	6	0	15	8	64	0	11	15	3	407		0	0	0	0



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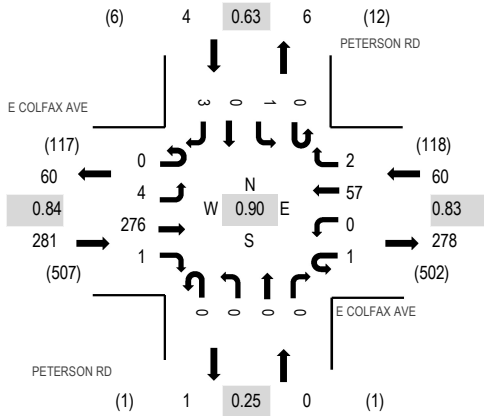
Location: 4 PETERSON RD & E COLFAX AVE PM

Date: Wednesday, March 23, 2022

Peak Hour: 04:30 PM - 05:30 PM

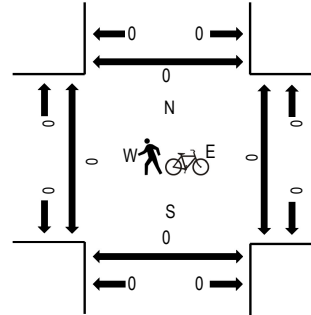
Peak 15-Minutes: 04:45 PM - 05:00 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	E COLFAX AVE Eastbound				E COLFAX AVE Westbound				PETERSON RD Northbound				PETERSON RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	0	46	0	0	0	16	0	0	0	0	0	0	0	0	0	62	307	0	0	0	0
4:15 PM	0	1	52	0	0	0	18	0	0	0	0	1	0	1	0	0	73	326	0	0	0	0
4:30 PM	0	1	53	1	0	0	19	0	0	0	0	0	0	0	0	2	76	345	0	0	0	0
4:45 PM	0	1	85	0	0	0	8	1	0	0	0	0	0	1	0	0	96	343	0	0	0	0
5:00 PM	0	2	58	0	1	0	19	0	0	0	0	0	0	0	0	1	81	325	0	0	0	0
5:15 PM	0	0	80	0	0	0	11	1	0	0	0	0	0	0	0	0	92		0	0	0	0
5:30 PM	0	2	62	0	0	0	9	0	0	0	0	0	0	1	0	0	74		0	0	0	0
5:45 PM	0	2	61	0	0	0	14	1	0	0	0	0	0	0	0	0	78		0	0	0	0
Count Total	0	9	497	1	1	0	114	3	0	0	0	1	0	3	0	3	632		0	0	0	0
Peak Hour	0	4	276	1	1	0	57	2	0	0	0	0	0	1	0	3	345		0	0	0	0

Date Start: 23-Mar-22
Site Code: 5
Station ID: 5
N MANILA RD N.O. I70 WB RAMPS

Start Time	23-Mar-22	NB	SB							Total
12:00 AM		9	3							12
01:00		2	4							6
02:00		6	4							10
03:00		9	2							11
04:00		15	5							20
05:00		32	29							61
06:00		89	48							137
07:00		45	66							111
08:00		54	43							97
09:00		38	30							68
10:00		35	45							80
11:00		39	54							93
12:00 PM		36	40							76
01:00		44	38							82
02:00		33	39							72
03:00		42	49							91
04:00		68	56							124
05:00		81	55							136
06:00		53	37							90
07:00		26	16							42
08:00		14	16							30
09:00		7	8							15
10:00		7	10							17
11:00		4	4							8
Total		788	701							1489
Percent		52.9%	47.1%							
AM Peak	-	06:00	07:00	-	-	-	-	-	-	06:00
Vol.	-	89	66	-	-	-	-	-	-	137
PM Peak	-	17:00	16:00	-	-	-	-	-	-	17:00
Vol.	-	81	56	-	-	-	-	-	-	136
Grand Total		788	701							1489
Percent		52.9%	47.1%							
ADT		ADT 1,489	AADT 1,489							

Date Start: 23-Mar-22
Site Code: 6
Station ID: 6
COLFAX AVE E.O. MANILA RD

Start Time	23-Mar-22 Wed	EB	WB							Total
12:00 AM		12	6							18
01:00		9	5							14
02:00		10	8							18
03:00		14	13							27
04:00		19	29							48
05:00		26	70							96
06:00		71	105							176
07:00		114	114							228
08:00		98	96							194
09:00		89	84							173
10:00		93	89							182
11:00		90	85							175
12:00 PM		132	91							223
01:00		111	80							191
02:00		116	69							185
03:00		128	79							207
04:00		245	65							310
05:00		268	61							329
06:00		151	54							205
07:00		68	39							107
08:00		33	30							63
09:00		45	17							62
10:00		21	9							30
11:00		21	3							24
Total		1984	1301							3285
Percent		60.4%	39.6%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	114	114	-	-	-	-	-	-	228
PM Peak	-	17:00	12:00	-	-	-	-	-	-	17:00
Vol.	-	268	91	-	-	-	-	-	-	329
Grand Total		1984	1301							3285
Percent		60.4%	39.6%							
ADT		ADT 3,285	AADT 3,285							



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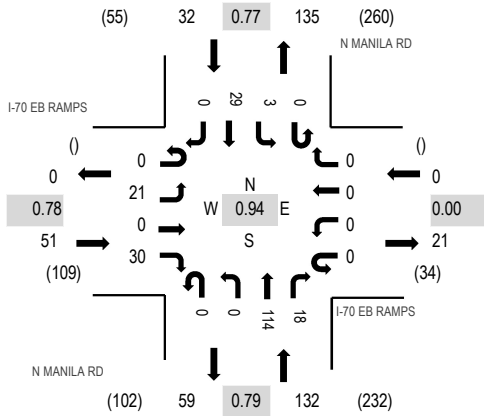
Location: 1 N MANILA RD & I-70 EB RAMPS AM

Date: Wednesday, March 23, 2022

Peak Hour: 07:15 AM - 08:15 AM

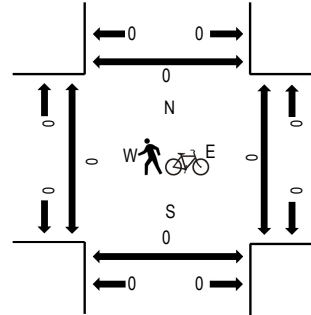
Peak 15-Minutes: 07:15 AM - 07:30 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	I-70 EB RAMPS Eastbound				I-70 EB RAMPS Westbound				N MANILA RD Northbound				N MANILA RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	6	0	2	0	0	0	0	0	0	27	2	0	0	5	0	42	206	0	0	0	0
7:15 AM	0	4	0	5	0	0	0	0	0	0	40	4	0	0	4	0	57	215	0	0	0	0
7:30 AM	0	4	0	6	0	0	0	0	0	0	32	5	0	1	7	0	55	212	0	0	0	0
7:45 AM	0	4	0	10	0	0	0	0	0	0	23	6	0	2	7	0	52	205	0	0	0	0
8:00 AM	0	9	0	9	0	0	0	0	0	0	19	3	0	0	11	0	51	190	0	0	0	0
8:15 AM	0	12	0	3	0	0	0	0	0	0	29	4	0	1	5	0	54		0	0	0	0
8:30 AM	0	9	0	13	0	0	0	0	0	0	20	2	0	0	4	0	48		1	0	0	0
8:45 AM	0	9	0	4	0	0	0	0	0	0	13	3	0	1	7	0	37		1	0	0	0
Count Total	0	57	0	52	0	0	0	0	0	0	203	29	0	5	50	0	396		2	0	0	0
Peak Hour	0	21	0	30	0	0	0	0	0	0	114	18	0	3	29	0	215		0	0	0	0



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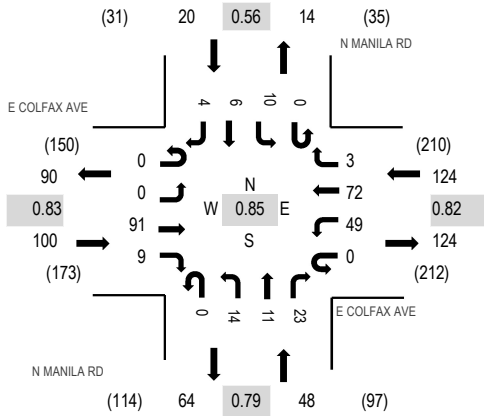
Location: 3 N MANILA RD & E COLFAX AVE AM

Date: Wednesday, March 23, 2022

Peak Hour: 07:15 AM - 08:15 AM

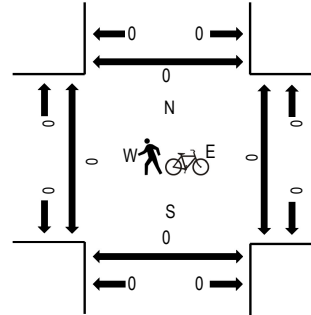
Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	E COLFAX AVE Eastbound				E COLFAX AVE Westbound				N MANILA RD Northbound				N MANILA RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	9	1	0	18	9	1	0	1	2	6	0	0	2	0	49	267	0	0	0	0
7:15 AM	0	0	20	1	0	10	14	1	0	4	2	5	0	3	1	2	63	292	0	0	0	0
7:30 AM	0	0	25	2	0	14	20	0	0	5	1	10	0	3	4	2	86	286	0	0	0	0
7:45 AM	0	0	26	4	0	12	15	0	0	3	2	4	0	3	0	0	69	260	0	0	0	0
8:00 AM	0	0	20	2	0	13	23	2	0	2	6	4	0	1	1	0	74	244	0	0	0	0
8:15 AM	0	1	14	3	0	4	14	1	0	4	3	10	0	0	2	1	57		0	0	0	0
8:30 AM	0	2	18	2	0	7	15	0	0	4	4	4	0	1	3	0	60		0	0	0	0
8:45 AM	0	3	19	1	0	5	11	1	0	1	3	7	0	0	2	0	53		0	0	0	0
Count Total	0	6	151	16	0	83	121	6	0	24	23	50	0	11	15	5	511		0	0	0	0
Peak Hour	0	0	91	9	0	49	72	3	0	14	11	23	0	10	6	4	292		0	0	0	0



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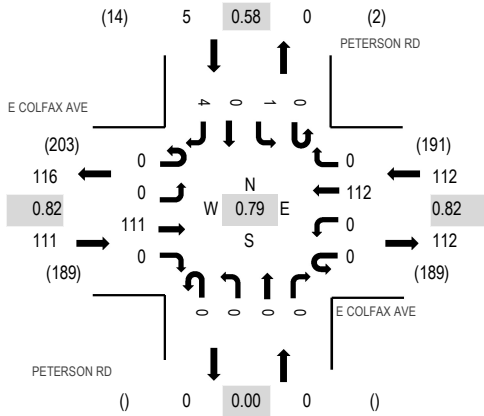
Location: 4 PETERSON RD & E COLFAX AVE AM

Date: Wednesday, March 23, 2022

Peak Hour: 07:15 AM - 08:15 AM

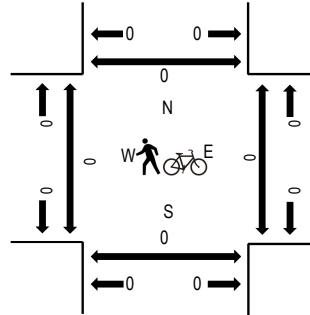
Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	E COLFAX AVE				E COLFAX AVE				PETERSON RD				PETERSON RD				Total	Rolling Hour	Pedestrian Crossings			
	Eastbound				Westbound				Northbound				Southbound						West	East	South	North
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right						
7:00 AM	0	0	10	0	0	0	27	0	0	0	0	0	0	0	0	3	40	212	0	0	0	0
7:15 AM	0	0	20	0	0	0	20	0	0	0	0	0	0	0	0	1	41	228	0	0	0	0
7:30 AM	0	0	35	0	0	0	34	0	0	0	0	0	0	1	0	2	72	228	0	0	0	0
7:45 AM	0	0	32	0	0	0	27	0	0	0	0	0	0	0	0	0	59	200	0	0	0	0
8:00 AM	0	0	24	0	0	0	31	0	0	0	0	0	0	0	0	1	56	182	0	0	0	0
8:15 AM	0	0	24	0	0	0	15	0	0	0	0	0	0	0	0	2	41		0	0	0	0
8:30 AM	0	0	21	0	0	0	19	1	0	0	0	0	0	0	0	3	44		0	0	0	0
8:45 AM	0	1	22	0	0	0	17	0	0	0	0	0	0	0	0	1	41		0	0	0	0
Count Total	0	1	188	0	0	0	190	1	0	0	0	0	0	1	0	13	394		0	0	0	0
Peak Hour	0	0	111	0	0	0	112	0	0	0	0	0	0	1	0	4	228		0	0	0	0

Interval Start Time	I-70 WB RAMPS				I-70 WB RAMPS				N MANILA RD				N MANILA RD				Total	Rolling Hour	Pedestrian Crossings			
	Eastbound				Westbound				Northbound				Southbound						West	East	South	North
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right						
4:00 PM	0	0	0	0	0	4	0	1	0	7	12	0	0	0	6	14	44	183	0	0	0	0
4:15 PM	0	0	0	0	0	5	0	3	0	15	12	0	0	0	4	5	44	188	0	0	0	0
4:30 PM	0	0	0	0	0	4	0	2	0	10	12	0	0	0	6	9	43	197	0	0	0	0
4:45 PM	0	0	0	0	0	8	0	2	0	6	24	0	0	0	9	3	52	197	0	0	0	0
5:00 PM	0	0	0	0	0	6	0	2	0	14	16	0	0	0	2	9	49	200	0	0	0	0
5:15 PM	0	0	0	0	0	2	0	3	0	6	28	0	0	0	7	7	53		0	0	0	0
5:30 PM	0	0	0	0	0	8	0	2	0	9	11	0	0	0	6	7	43		0	0	0	0
5:45 PM	0	0	0	0	0	5	0	3	0	14	16	0	0	0	10	7	55		0	0	0	0
Count Total	0	0	0	0	0	42	0	18	0	81	131	0	0	0	50	61	383		0	0	0	0
Peak Hour	0	0	0	0	0	21	0	10	0	43	71	0	0	0	25	30	200		0	0	0	0



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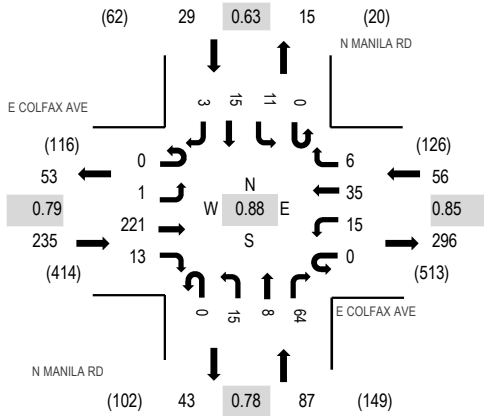
Location: 3 N MANILA RD & E COLFAX AVE PM

Date: Wednesday, March 23, 2022

Peak Hour: 04:45 PM - 05:45 PM

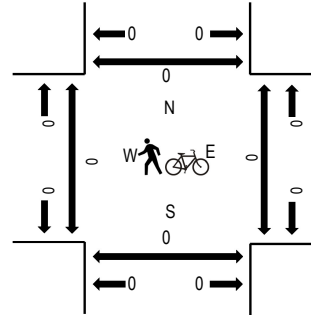
Peak 15-Minutes: 04:45 PM - 05:00 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	E COLFAX AVE Eastbound				E COLFAX AVE Westbound				N MANILA RD Northbound				N MANILA RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	0	32	3	0	5	12	0	0	7	0	9	0	1	9	1	79	367	0	0	0	0
4:15 PM	0	0	41	4	0	5	12	0	0	1	1	11	0	2	3	0	80	377	0	0	0	0
4:30 PM	0	0	45	5	0	8	11	1	0	3	1	10	0	1	4	3	92	405	0	0	0	0
4:45 PM	0	0	71	3	0	3	8	0	0	3	2	21	0	1	4	0	116	407	0	0	0	0
5:00 PM	0	1	41	1	0	5	11	4	0	1	1	17	0	3	3	1	89	384	0	0	0	0
5:15 PM	0	0	56	6	0	4	9	1	0	9	5	14	0	2	2	0	108		0	0	0	0
5:30 PM	0	0	53	3	0	3	7	1	0	2	0	12	0	5	6	2	94		0	0	0	0
5:45 PM	0	0	47	2	0	5	10	1	0	3	1	15	0	3	6	0	93		0	0	0	0
Count Total	0	1	386	27	0	38	80	8	0	29	11	109	0	18	37	7	751		0	0	0	0
Peak Hour	0	1	221	13	0	15	35	6	0	15	8	64	0	11	15	3	407		0	0	0	0



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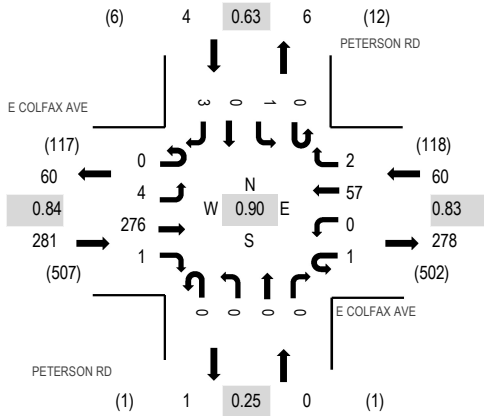
Location: 4 PETERSON RD & E COLFAX AVE PM

Date: Wednesday, March 23, 2022

Peak Hour: 04:30 PM - 05:30 PM

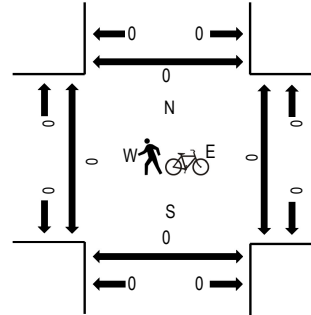
Peak 15-Minutes: 04:45 PM - 05:00 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	E COLFAX AVE Eastbound				E COLFAX AVE Westbound				PETERSON RD Northbound				PETERSON RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	0	46	0	0	0	16	0	0	0	0	0	0	0	0	0	62	307	0	0	0	0
4:15 PM	0	1	52	0	0	0	18	0	0	0	0	1	0	1	0	0	73	326	0	0	0	0
4:30 PM	0	1	53	1	0	0	19	0	0	0	0	0	0	0	0	2	76	345	0	0	0	0
4:45 PM	0	1	85	0	0	0	8	1	0	0	0	0	0	1	0	0	96	343	0	0	0	0
5:00 PM	0	2	58	0	1	0	19	0	0	0	0	0	0	0	0	1	81	325	0	0	0	0
5:15 PM	0	0	80	0	0	0	11	1	0	0	0	0	0	0	0	0	92		0	0	0	0
5:30 PM	0	2	62	0	0	0	9	0	0	0	0	0	0	1	0	0	74		0	0	0	0
5:45 PM	0	2	61	0	0	0	14	1	0	0	0	0	0	0	0	0	78		0	0	0	0
Count Total	0	9	497	1	1	0	114	3	0	0	0	1	0	3	0	3	632		0	0	0	0
Peak Hour	0	4	276	1	1	0	57	2	0	0	0	0	0	1	0	3	345		0	0	0	0

Appendix B – Trip Generations

PROJECT DETAILS		
Project Name:	Rocky Mountain Rail Park	Type of Project:
Project No:		City:
Country:		Built-up Area(Sq.ft):
Analyst Name:	Scott Barnhart	Clients Name:
Date:	7/25/2022	ZIP/Postal Code:
State/Province:		No. of Scenarios: 3
Analysis Region:		
SCENARIO SUMMARY		

Scenarios	Name	No. of Land Uses	Phases of Development	No. of Years to Project Traffic	User Group	Estimated New Vehicle Trips		
						Entry	Exit	Total
Scenario - 1	Weekday	1	1	0		1120	1120	2240
Scenario - 2	AM Peak Hour	1	1	0		248	40	288
Scenario - 3	PM Peak Hour	1	1	0		59	237	296

Scenario - 1

Scenario Name: Weekday

Dev. phase: 1

Analyst Note:

User Group:

No. of Years to Project 0

Traffic :

Warning:

VEHICLE TRIPS BEFORE REDUCTION

Land Use & Data Source	Location	IV	Size	Time Period	Method	Entry	Exit	Total
					Rate/Equation	Split%	Split%	
130 - Industrial Park	General Urban/Suburban	Employees	622	Weekday	Best Fit (LOG)	1120	1120	2240
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.68Ln(X) + 3.34	50%	50%	

VEHICLE TO PERSON TRIP CONVERSION

BASELINE SITE VEHICLE CHARACTERISTICS:

Land Use	Baseline Site Vehicle Mode Share		Baseline Site Vehicle Occupancy		Baseline Site Vehicle Directional Split	
	Entry (%)	Exit (%)	Entry	Exit	Entry (%)	Exit (%)
130 - Industrial Park	100	100	1.4	1.4	50	50

ESTIMATED BASELINE SITE PERSON TRIPS:

Land Use	Person Trips by Vehicle		Person Trips by Other Modes		Total Baseline Site Person Trips	
	Entry	Exit	Entry	Exit	Entry	Exit
130 - Industrial Park	1568	1568	0	0	1568	1568
	3136		0		3136	

INTERNAL VEHICLE TRIP REDUCTION

LAND USE GROUP ASSIGNMENT:

Land Use	Land Use Group
130 - Industrial Park	Others

BALANCED PERSON TRIPS:

INTERNAL PERSON TRIPS:

130 - Industrial Park

Internal Person Trips From	Entry	Exit	Total
Total Internal Person Trips	0	0	0

INTERNAL VEHICLE TRIPS AND CAPTURE:

130 - Industrial Park

Total Internal Person Trips	0	0	0
Vehicle Mode Share	100%	100%	-
Vehicle Occupancy	1.00	1.00	-
Total Vehicle Internal Trips	0	0	0
Total External Vehicle Trips	1120	1120	2240
Internal Vehicle Trip Capture	0%	0%	0%

PASS-BY VEHICLE TRIP REDUCTION

Land Use	External Vehicle Trips		Pass-by Vehicle Trip %		Pass-by Vehicle Trips	
	Entry	Exit	Entry (%)	Exit (%)	Entry	Exit
130 - Industrial Park	1120	1120	0.00%	0.00%	0	0

DIVERTED VEHICLE TRIP REDUCTION

Land Use	External Vehicle Trips		Diverted Vehicle Trip %		Diverted Vehicle Trips	
	Entry	Exit	Entry (%)	Exit (%)	Entry	Exit
130 - Industrial Park	1120	1120	0.00%	0.00%	0	0

EXTRA VEHICLE TRIP REDUCTION

Land Use	(External - (Pass-by + Diverted)) Vehicle Trips		Extra Vehicle Trip Reduction %		Extra Reduced Vehicle Trips	
	Entry	Exit	Entry (%)	Exit (%)	Entry	Exit
130 - Industrial Park	1120	1120	0.00%	0.00%	0	0

NEW VEHICLE TRIPS

Land Use	New Vehicle Trips		
	Entry	Exit	Total
130 - Industrial Park	1120	1120	2240

RESULTS

Site Totals	Entry	Exit	Total
Vehicle Trips Before Reduction	1120	1120	2240
Internal Vehicle Trips	0	0	0
External Vehicle Trips	1120	1120	2240
Internal Vehicle Trip Capture	0%	0%	0%
Pass-by Vehicle Trips	0	0	0
Diverted Vehicle Trips	0	0	0
Extra Reduced Vehicle Trips	0	0	0
New Vehicle Trips	1120	1120	2240

Scenario - 2

Scenario Name: AM Peak Hour

User Group:

Dev. phase: 1

No. of Years to Project 0

Analyst Note:

Traffic :

Warning:

VEHICLE TRIPS BEFORE REDUCTION

Land Use & Data Source	Location	IV	Size	Time Period	Method	Entry	Exit	Total
					Rate/Equation	Split%	Split%	
130 - Industrial Park	General Urban/Suburban	Employees	622	Weekday, Peak Hour of Adjacent Street Traffic,	Best Fit (LOG)	248	40	288
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.82Ln(X) + 0.39	86%	14%	

VEHICLE TO PERSON TRIP CONVERSION

BASELINE SITE VEHICLE CHARACTERISTICS:

Land Use	Baseline Site Vehicle Mode Share		Baseline Site Vehicle Occupancy		Baseline Site Vehicle Directional Split	
	Entry (%)	Exit (%)	Entry	Exit	Entry (%)	Exit (%)
130 - Industrial Park	100	100	1	1	86	14

ESTIMATED BASELINE SITE PERSON TRIPS:

Land Use	Person Trips by Vehicle		Person Trips by Other Modes		Total Baseline Site Person Trips	
	Entry	Exit	Entry	Exit	Entry	Exit
130 - Industrial Park	248	40	0	0	248	40
	288		0		288	

NEW VEHICLE TRIPS

Land Use	New Vehicle Trips		
	Entry	Exit	Total
130 - Industrial Park	248	40	288

RESULTS

Site Totals	Entry	Exit	Total
Vehicle Trips Before Reduction	248	40	288
External Vehicle Trips	248	40	288
New Vehicle Trips	248	40	288

Scenario - 3

Scenario Name: PM Peak Hour

User Group:

Dev. phase: 1

No. of Years to Project 0

Analyst Note:

Traffic :

Warning:

VEHICLE TRIPS BEFORE REDUCTION

Land Use & Data Source	Location	IV	Size	Time Period	Method	Entry	Exit	Total
					Rate/Equation	Split%	Split%	
130 - Industrial Park	General Urban/Suburban	Employees	622	Weekday, Peak Hour of Adjacent Street Traffic,	Best Fit (LOG)	59	237	296
Data Source: Trip Generation Manual, 11th Ed					$\ln(T) = 0.74\ln(X) + 0.93$	20%	80%	

VEHICLE TO PERSON TRIP CONVERSION

BASELINE SITE VEHICLE CHARACTERISTICS:

Land Use	Baseline Site Vehicle Mode Share		Baseline Site Vehicle Occupancy		Baseline Site Vehicle Directional Split	
	Entry (%)	Exit (%)	Entry	Exit	Entry (%)	Exit (%)
130 - Industrial Park	100	100	1	1	20	80

ESTIMATED BASELINE SITE PERSON TRIPS:

Land Use	Person Trips by Vehicle		Person Trips by Other Modes		Total Baseline Site Person Trips	
	Entry	Exit	Entry	Exit	Entry	Exit
130 - Industrial Park	59	237	0	0	59	237
	296		0		296	

NEW VEHICLE TRIPS

Land Use	New Vehicle Trips		
	Entry	Exit	Total
130 - Industrial Park	59	237	296

RESULTS

Site Totals	Entry	Exit	Total
Vehicle Trips Before Reduction	59	237	296
External Vehicle Trips	59	237	296
New Vehicle Trips	59	237	296

Appendix C – Buildout Year Conditions Analyses

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Intersection 4: Manila Rd/I-70 Eastbound Ramp	8

Signal Warrants Report For Intersection 1: E Colfax Ave/Manila Rd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	273	76	628	195
2	265	74	609	189
3	259	72	597	185
4	243	68	559	174
5	216	60	496	154
6	213	59	490	152
7	210	59	484	150
8	191	53	440	137
9	188	52	433	135
10	186	52	427	133
11	161	45	371	115
12	150	42	345	107
13	147	41	339	105
14	109	30	251	78
15	109	30	251	78
16	76	21	176	55
17	44	12	100	31
18	44	12	100	31
19	25	7	57	18
20	14	4	31	10
21	8	2	19	6
22	3	1	6	2
23	3	1	6	2
24	3	1	6	2

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	349	1	628	No	No	No	Yes	No	No	No	No	Yes	Yes
2	1	339	1	609	No	No	No	Yes	No	No	No	No	Yes	Yes
3	1	331	1	597	No	No	No	Yes	No	No	No	No	Yes	Yes
4	1	311	1	559	No	No	No	Yes	No	No	No	No	Yes	Yes
5	1	276	1	496	No	No	No	No	No	No	No	No	Yes	Yes
6	1	272	1	490	No	No	No	No	No	No	No	No	Yes	Yes
7	1	269	1	484	No	No	No	No	No	No	No	No	Yes	Yes
8	1	244	1	440	No	No	No	No	No	No	No	No	Yes	Yes
9	1	240	1	433	No	No	No	No	No	No	No	No	Yes	Yes
10	1	238	1	427	No	No	No	No	No	No	No	No	Yes	Yes
11	1	206	1	371	No	No	No	No	No	No	No	No	Yes	Yes
12	1	192	1	345	No	No	No	No	No	No	No	No	Yes	Yes
13	1	188	1	339	No	No	No	No	No	No	No	No	Yes	No
14	1	139	1	251	No	No	No	No	No	No	No	No	Yes	No
15	1	139	1	251	No	No	No	No	No	No	No	No	Yes	No
16	1	97	1	176	No	No	No	No	No	No	No	No	No	No
17	1	56	1	100	No	No	No	No	No	No	No	No	No	No
18	1	56	1	100	No	No	No	No	No	No	No	No	No	No
19	1	32	1	57	No	No	No	No	No	No	No	No	No	No
20	1	18	1	31	No	No	No	No	No	No	No	No	No	No
21	1	10	1	19	No	No	No	No	No	No	No	No	No	No
22	1	4	1	6	No	No	No	No	No	No	No	No	No	No
23	1	4	1	6	No	No	No	No	No	No	No	No	No	No
24	1	4	1	6	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	4	0	0	0	0	15	12

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	255.5	18.3
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	44:34	0:59
Delay Condition Met	Yes	No
Volume on Minor Street Approach During Same Hour	628	195
High Minor Volume Condition Met	Yes	Yes
Total Entering Volume on All Approaches During Same Hour	1172	1172
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	Yes	No
Warrant Met for Intersection	Yes	

Signal Warrants Report For Intersection 2: E Colfax Ave/Peterson Rd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	199	113	15	15
2	193	110	15	15
3	189	107	14	14
4	177	101	13	13
5	157	89	12	12
6	155	88	12	12
7	153	87	12	12
8	139	79	11	11
9	137	78	10	10
10	135	77	10	10
11	117	67	9	9
12	109	62	8	8
13	107	61	8	8
14	80	45	6	6
15	80	45	6	6
16	56	32	4	4
17	32	18	2	2
18	32	18	2	2
19	18	10	1	1
20	10	6	1	1
21	6	3	0	0
22	2	1	0	0
23	2	1	0	0
24	2	1	0	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	312	1	15	No	No	No	No	No	No	No	No	No	No
2	1	303	1	15	No	No	No	No	No	No	No	No	No	No
3	1	296	1	14	No	No	No	No	No	No	No	No	No	No
4	1	278	1	13	No	No	No	No	No	No	No	No	No	No
5	1	246	1	12	No	No	No	No	No	No	No	No	No	No
6	1	243	1	12	No	No	No	No	No	No	No	No	No	No
7	1	240	1	12	No	No	No	No	No	No	No	No	No	No
8	1	218	1	11	No	No	No	No	No	No	No	No	No	No
9	1	215	1	10	No	No	No	No	No	No	No	No	No	No
10	1	212	1	10	No	No	No	No	No	No	No	No	No	No
11	1	184	1	9	No	No	No	No	No	No	No	No	No	No
12	1	171	1	8	No	No	No	No	No	No	No	No	No	No
13	1	168	1	8	No	No	No	No	No	No	No	No	No	No
14	1	125	1	6	No	No	No	No	No	No	No	No	No	No
15	1	125	1	6	No	No	No	No	No	No	No	No	No	No
16	1	88	1	4	No	No	No	No	No	No	No	No	No	No
17	1	50	1	2	No	No	No	No	No	No	No	No	No	No
18	1	50	1	2	No	No	No	No	No	No	No	No	No	No
19	1	28	1	1	No	No	No	No	No	No	No	No	No	No
20	1	16	1	1	No	No	No	No	No	No	No	No	No	No
21	1	9	1	0	No	No	No	No	No	No	No	No	No	No
22	1	3	1	0	No	No	No	No	No	No	No	No	No	No
23	1	3	1	0	No	No	No	No	No	No	No	No	No	No
24	1	3	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	10.8	11
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:02	0:02
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	15	15
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	342	342
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

Signal Warrants Report For Intersection 3: Manila Rd/I-70 Westbound Ramp

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	N	S	E
1	150	673	46
2	146	653	45
3	143	639	44
4	134	599	41
5	119	532	36
6	117	525	36
7	116	518	35
8	105	471	32
9	103	464	32
10	102	458	31
11	89	397	27
12	83	370	25
13	81	363	25
14	60	269	18
15	60	269	18
16	42	188	13
17	24	108	7
18	24	108	7
19	14	61	4
20	8	34	2
21	5	20	1
22	2	7	0
23	2	7	0
24	2	7	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	823	1	46	No	No	No	No	No	No	No	Yes	No	No
2	1	799	1	45	No	No	No	No	No	No	No	Yes	No	No
3	1	782	1	44	No	No	No	No	No	No	No	Yes	No	No
4	1	733	1	41	No	No	No	No	No	No	No	No	No	No
5	1	651	1	36	No	No	No	No	No	No	No	No	No	No
6	1	642	1	36	No	No	No	No	No	No	No	No	No	No
7	1	634	1	35	No	No	No	No	No	No	No	No	No	No
8	1	576	1	32	No	No	No	No	No	No	No	No	No	No
9	1	567	1	32	No	No	No	No	No	No	No	No	No	No
10	1	560	1	31	No	No	No	No	No	No	No	No	No	No
11	1	486	1	27	No	No	No	No	No	No	No	No	No	No
12	1	453	1	25	No	No	No	No	No	No	No	No	No	No
13	1	444	1	25	No	No	No	No	No	No	No	No	No	No
14	1	329	1	18	No	No	No	No	No	No	No	No	No	No
15	1	329	1	18	No	No	No	No	No	No	No	No	No	No
16	1	230	1	13	No	No	No	No	No	No	No	No	No	No
17	1	132	1	7	No	No	No	No	No	No	No	No	No	No
18	1	132	1	7	No	No	No	No	No	No	No	No	No	No
19	1	75	1	4	No	No	No	No	No	No	No	No	No	No
20	1	42	1	2	No	No	No	No	No	No	No	No	No	No
21	1	25	1	1	No	No	No	No	No	No	No	No	No	No
22	1	9	1	0	No	No	No	No	No	No	No	No	No	No
23	1	9	1	0	No	No	No	No	No	No	No	No	No	No
24	1	9	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	3	0	0

Warrant 3 Condition A

Orientation	E
Total Stopped Delay Per Vehicle on Minor Approach (s)	26.7
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:20
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	46
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	869
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	No

Signal Warrants Report For Intersection 4: Manila Rd/I-70 Eastbound Ramp

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	N	S	W
1	55	265	268
2	53	257	260
3	52	252	255
4	49	236	239
5	43	209	212
6	43	207	209
7	42	204	206
8	39	186	188
9	38	183	185
10	37	180	182
11	32	156	158
12	30	146	147
13	30	143	145
14	22	106	107
15	22	106	107
16	15	74	75
17	9	42	43
18	9	42	43
19	5	24	24
20	3	13	13
21	2	8	8
22	1	3	3
23	1	3	3
24	1	3	3

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	320	1	268	No	No	No	Yes	No	No	No	No	No	No
2	1	310	1	260	No	No	No	Yes	No	No	No	No	No	No
3	1	304	1	255	No	No	No	Yes	No	No	No	No	No	No
4	1	285	1	239	No	No	No	Yes	No	No	No	No	No	No
5	1	252	1	212	No	No	No	No	No	No	No	No	No	No
6	1	250	1	209	No	No	No	No	No	No	No	No	No	No
7	1	246	1	206	No	No	No	No	No	No	No	No	No	No
8	1	225	1	188	No	No	No	No	No	No	No	No	No	No
9	1	221	1	185	No	No	No	No	No	No	No	No	No	No
10	1	217	1	182	No	No	No	No	No	No	No	No	No	No
11	1	188	1	158	No	No	No	No	No	No	No	No	No	No
12	1	176	1	147	No	No	No	No	No	No	No	No	No	No
13	1	173	1	145	No	No	No	No	No	No	No	No	No	No
14	1	128	1	107	No	No	No	No	No	No	No	No	No	No
15	1	128	1	107	No	No	No	No	No	No	No	No	No	No
16	1	89	1	75	No	No	No	No	No	No	No	No	No	No
17	1	51	1	43	No	No	No	No	No	No	No	No	No	No
18	1	51	1	43	No	No	No	No	No	No	No	No	No	No
19	1	29	1	24	No	No	No	No	No	No	No	No	No	No
20	1	16	1	13	No	No	No	No	No	No	No	No	No	No
21	1	10	1	8	No	No	No	No	No	No	No	No	No	No
22	1	4	1	3	No	No	No	No	No	No	No	No	No	No
23	1	4	1	3	No	No	No	No	No	No	No	No	No	No
24	1	4	1	3	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	4	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	15.5
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	1:09
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	268
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	588
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No

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Rocky Mountain Rail Park TIS

Vistro File: R:\...\2023-09-17 Rocky Mountain Rail Park
TIS.vistro

Scenario 8 2030 PM

Report File: R:\...\2030 Background PM_20230918.pdf

9/18/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	E Colfax Ave/Manila Rd	Signalized	HCM 7th Edition	SB Thru	0.435	26.1	C
2	E Colfax Ave/Peterson Rd	Two-way stop	HCM 7th Edition	NB Thru	0.010	12.1	B
3	Manila Rd/I-70 Westbound Ramp	Two-way stop	HCM 7th Edition	WB Left	0.096	13.9	B
4	Manila Rd/I-70 Eastbound Ramp	Two-way stop	HCM 7th Edition	EB Thru	0.009	11.3	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: E Colfax Ave/Manila Rd

Control Type:	Signalized	Delay (sec / veh):	26.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.435

Intersection Setup

Name	Manila Rd			Manila Rd			E Colfax Ave			E Colfax Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	0	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	2
Exit Pocket Length [ft]	0.00	0.00	550.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1620.00
Speed [mph]	45.00			45.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Manila Rd			Manila Rd			E Colfax Ave			E Colfax Ave		
Base Volume Input [veh/h]	10	70	55	30	430	10	5	195	25	18	69	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	28	0	0	5	0	0	13	0	0	3
Total Hourly Volume [veh/h]	10	70	27	30	430	5	5	195	12	18	69	2
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	19	7	8	117	1	1	53	3	5	19	1
Total Analysis Volume [veh/h]	11	76	29	33	467	5	5	212	13	20	75	2
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	3	8	1	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	5	5	10	0	5	10	0	5	10	0
Maximum Green [s]	10	30	10	10	30	0	10	30	0	10	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	18	36	9	10	28	0	9	25	0	9	25	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	14	0	0	11	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	Yes	No		Yes	No		Yes	No		Yes	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	R	L	C	R
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	0.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	31	24	24	31	26	41	34	41	32	32
g / C, Green / Cycle	0.39	0.30	0.30	0.39	0.32	0.51	0.42	0.51	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.01	0.05	0.02	0.03	0.30	0.14	0.01	0.02	0.05	0.00
s, saturation flow rate [veh/h]	862	1600	1360	1166	1597	1521	1360	989	1600	1360
c, Capacity [veh/h]	238	486	413	543	515	853	574	527	641	545
d1, Uniform Delay [s]	18.42	20.37	19.82	15.43	26.06	11.32	13.51	13.43	15.09	14.40
k, delay calibration	0.11	0.11	0.11	0.11	0.19	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.08	0.15	0.07	0.05	11.33	0.72	0.07	0.03	0.37	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.05	0.16	0.07	0.06	0.92	0.25	0.02	0.04	0.12	0.00
d, Delay for Lane Group [s/veh]	18.50	20.51	19.89	15.48	37.40	12.04	13.58	13.46	15.46	14.41
Lane Group LOS	B	C	B	B	D	B	B	B	B	B
Critical Lane Group	Yes	No	No	No	Yes	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.12	0.97	0.36	0.35	9.33	2.01	0.13	0.18	0.80	0.02
50th-Percentile Queue Length [ft/ln]	2.92	24.27	9.03	8.67	233.13	50.30	3.18	4.57	19.93	0.51
95th-Percentile Queue Length [veh/ln]	0.21	1.75	0.65	0.62	14.33	3.62	0.23	0.33	1.44	0.04
95th-Percentile Queue Length [ft/ln]	5.26	43.69	16.26	15.61	358.34	90.54	5.73	8.22	35.88	0.92

Movement, Approach, & Intersection Results

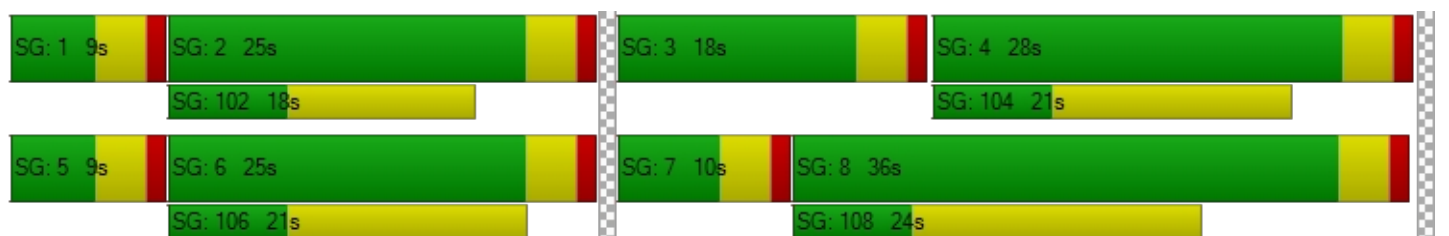
d_M, Delay for Movement [s/veh]	18.50	20.51	19.89	15.48	37.40	37.40	12.04	12.04	13.58	13.46	15.46	14.41
Movement LOS	B	C	B	B	D	D	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	20.17			35.97			12.13			15.03		
Approach LOS	C			D			B			B		
d_I, Intersection Delay [s/veh]	26.11											
Intersection LOS	C											
Intersection V/C	0.435											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	29.77			29.77			29.77			29.77		
I_p,int, Pedestrian LOS Score for Intersection	2.675			2.658			2.300			2.586		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	800			600			750			525		
d_b, Bicycle Delay [s]	14.41			19.61			15.64			21.77		
I_b,int, Bicycle LOS Score for Intersection	1.797			2.401			1.961			1.725		
Bicycle LOS	A			B			A			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







Intersection Level Of Service Report
Intersection 2: E Colfax Ave/Peterson Rd

Control Type: Two-way stop
 Analysis Method: HCM 7th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 12.1
 Level Of Service: B
 Volume to Capacity (v/c): 0.010

Intersection Setup

Name	Peterson Rd			Peterson Rd			E Colfax Ave			E Colfax Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	960.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd			Peterson Rd			E Colfax Ave			E Colfax Ave		
Base Volume Input [veh/h]	5	5	5	5	5	5	5	245	5	5	82	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	5	5	5	5	5	5	245	5	5	82	5
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	1	1	1	1	1	1	67	1	1	22	1
Total Analysis Volume [veh/h]	5	5	5	5	5	5	5	266	5	5	89	5
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.94	12.10	10.11	11.93	12.09	9.07	7.59	0.00	0.00	8.02	0.00	0.00
Movement LOS	B	B	B	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.08	0.08	0.08	0.08	0.08	0.08	0.01	0.01	0.01	0.01	0.01	0.01
95th-Percentile Queue Length [ft/ln]	1.99	1.99	1.99	1.88	1.88	1.88	0.21	0.21	0.21	0.21	0.21	0.21
d_A, Approach Delay [s/veh]	11.38			11.03			0.14			0.40		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.02											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 3: Manila Rd/I-70 Westbound Ramp

Control Type:	Two-way stop	Delay (sec / veh):	13.9
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.096

Intersection Setup

Name	Manila Rd			Manila Rd			Eastbound			Westbound Ramp		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1	0	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Manila Rd			Manila Rd			Eastbound			Westbound Ramp		
Base Volume Input [veh/h]	70	114	0	0	143	69	0	0	0	40	5	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	2.00	2.00	20.00	20.00	2.00	2.00	2.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	114	0	0	143	69	0	0	0	40	5	11
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	31	0	0	39	19	0	0	0	11	1	3
Total Analysis Volume [veh/h]	76	124	0	0	155	75	0	0	0	43	5	12
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance				No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.01	0.01
d_M, Delay for Movement [s/veh]	8.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.91	13.78	9.23
Movement LOS	A	A			A	A				B	B	A
95th-Percentile Queue Length [veh/ln]	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.08	0.08
95th-Percentile Queue Length [ft/ln]	4.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.93	1.97	1.97
d_A, Approach Delay [s/veh]	3.08			0.00			0.00			12.96		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	2.84											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 4: Manila Rd/I-70 Eastbound Ramp

Control Type:	Two-way stop	Delay (sec / veh):	11.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.009

Intersection Setup

Name	Manila Rd			Manila Rd			Eastbound Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Manila Rd			Manila Rd			Eastbound Ramp					
Base Volume Input [veh/h]	0	80	60	23	90	0	44	5	150	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	20.00	20.00	20.00	20.00	2.00	20.00	20.00	20.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	80	60	23	90	0	44	5	150	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	22	16	6	24	0	12	1	41	0	0	0
Total Analysis Volume [veh/h]	0	87	65	25	98	0	48	5	163	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.02	0.00	0.00	0.08	0.01	0.18	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	7.77	0.00	0.00	11.10	11.34	9.81	0.00	0.00	0.00
Movement LOS		A	A	A	A		B	B	A			
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.06	0.00	0.00	0.24	0.03	0.65	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	1.44	0.00	0.00	6.08	0.66	16.23	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00			1.58			10.13			0.00		
Approach LOS	A			A			B			A		
d_I, Intersection Delay [s/veh]	4.85											
Intersection LOS	B											

Traffic Volume - Future Total Volume

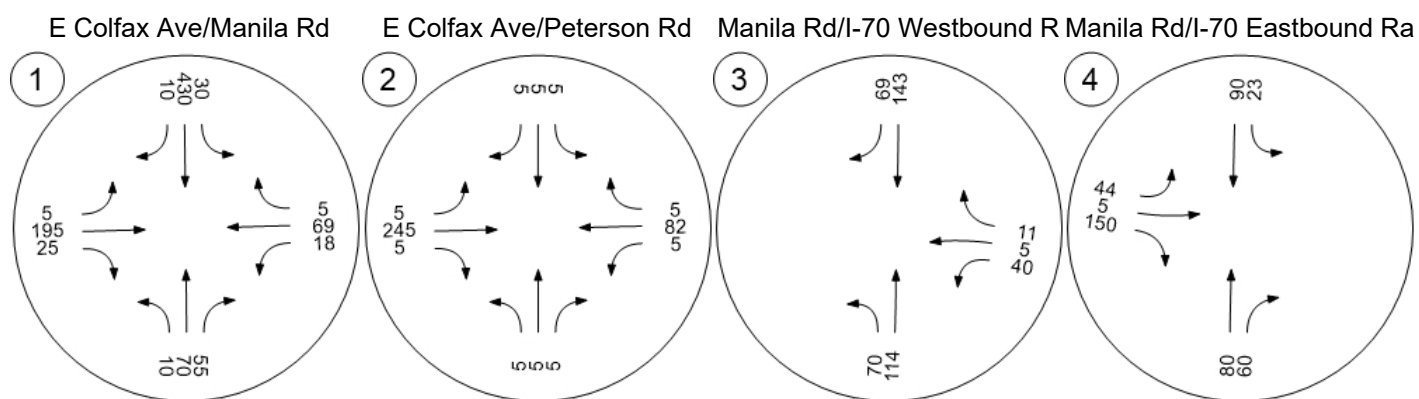


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Signal Warrants Report For Intersection 1: E Colfax Ave/Manila Rd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	92	225	135	470
2	89	218	131	456
3	87	214	128	447
4	82	200	120	418
5	73	178	107	371
6	72	176	105	367
7	71	173	104	362
8	64	158	95	329
9	63	155	93	324
10	63	153	92	320
11	54	133	80	277
12	51	124	74	259
13	50	122	73	254
14	37	90	54	188
15	37	90	54	188
16	26	63	38	132
17	15	36	22	75
18	15	36	22	75
19	8	20	12	42
20	5	11	7	24
21	3	7	4	14
22	1	2	1	5
23	1	2	1	5
24	1	2	1	5

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	317	1	470	No	No	No	Yes	No	No	No	No	Yes	Yes
2	1	307	1	456	No	No	No	Yes	No	No	No	No	Yes	Yes
3	1	301	1	447	No	No	No	Yes	No	No	No	No	Yes	Yes
4	1	282	1	418	No	No	No	Yes	No	No	No	No	Yes	Yes
5	1	251	1	371	No	No	No	No	No	No	No	No	Yes	Yes
6	1	248	1	367	No	No	No	No	No	No	No	No	Yes	Yes
7	1	244	1	362	No	No	No	No	No	No	No	No	Yes	Yes
8	1	222	1	329	No	No	No	No	No	No	No	No	Yes	No
9	1	218	1	324	No	No	No	No	No	No	No	No	Yes	No
10	1	216	1	320	No	No	No	No	No	No	No	No	Yes	No
11	1	187	1	277	No	No	No	No	No	No	No	No	Yes	No
12	1	175	1	259	No	No	No	No	No	No	No	No	Yes	No
13	1	172	1	254	No	No	No	No	No	No	No	No	Yes	No
14	1	127	1	188	No	No	No	No	No	No	No	No	No	No
15	1	127	1	188	No	No	No	No	No	No	No	No	No	No
16	1	89	1	132	No	No	No	No	No	No	No	No	No	No
17	1	51	1	75	No	No	No	No	No	No	No	No	No	No
18	1	51	1	75	No	No	No	No	No	No	No	No	No	No
19	1	28	1	42	No	No	No	No	No	No	No	No	No	No
20	1	16	1	24	No	No	No	No	No	No	No	No	No	No
21	1	10	1	14	No	No	No	No	No	No	No	No	No	No
22	1	3	1	5	No	No	No	No	No	No	No	No	No	No
23	1	3	1	5	No	No	No	No	No	No	No	No	No	No
24	1	3	1	5	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	4	0	0	0	0	13	7

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	27.4	63.7
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	1:01	8:18
Delay Condition Met	No	Yes
Volume on Minor Street Approach During Same Hour	135	470
High Minor Volume Condition Met	Yes	Yes
Total Entering Volume on All Approaches During Same Hour	922	922
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	Yes
Warrant Met for Intersection	Yes	

Signal Warrants Report For Intersection 2: E Colfax Ave/Peterson Rd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	92	255	15	15
2	89	247	15	15
3	87	242	14	14
4	82	227	13	13
5	73	201	12	12
6	72	199	12	12
7	71	196	12	12
8	64	179	11	11
9	63	176	10	10
10	63	173	10	10
11	54	150	9	9
12	51	140	8	8
13	50	138	8	8
14	37	102	6	6
15	37	102	6	6
16	26	71	4	4
17	15	41	2	2
18	15	41	2	2
19	8	23	1	1
20	5	13	1	1
21	3	8	0	0
22	1	3	0	0
23	1	3	0	0
24	1	3	0	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	347	1	15	No	No	No	No	No	No	No	No	No	No
2	1	336	1	15	No	No	No	No	No	No	No	No	No	No
3	1	329	1	14	No	No	No	No	No	No	No	No	No	No
4	1	309	1	13	No	No	No	No	No	No	No	No	No	No
5	1	274	1	12	No	No	No	No	No	No	No	No	No	No
6	1	271	1	12	No	No	No	No	No	No	No	No	No	No
7	1	267	1	12	No	No	No	No	No	No	No	No	No	No
8	1	243	1	11	No	No	No	No	No	No	No	No	No	No
9	1	239	1	10	No	No	No	No	No	No	No	No	No	No
10	1	236	1	10	No	No	No	No	No	No	No	No	No	No
11	1	204	1	9	No	No	No	No	No	No	No	No	No	No
12	1	191	1	8	No	No	No	No	No	No	No	No	No	No
13	1	188	1	8	No	No	No	No	No	No	No	No	No	No
14	1	139	1	6	No	No	No	No	No	No	No	No	No	No
15	1	139	1	6	No	No	No	No	No	No	No	No	No	No
16	1	97	1	4	No	No	No	No	No	No	No	No	No	No
17	1	56	1	2	No	No	No	No	No	No	No	No	No	No
18	1	56	1	2	No	No	No	No	No	No	No	No	No	No
19	1	31	1	1	No	No	No	No	No	No	No	No	No	No
20	1	18	1	1	No	No	No	No	No	No	No	No	No	No
21	1	11	1	0	No	No	No	No	No	No	No	No	No	No
22	1	4	1	0	No	No	No	No	No	No	No	No	No	No
23	1	4	1	0	No	No	No	No	No	No	No	No	No	No
24	1	4	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	11.4	11
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:02	0:02
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	15	15
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	377	377
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

Signal Warrants Report For Intersection 3: Manila Rd/I-70 Westbound Ramp

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	N	S	E
1	212	184	56
2	206	178	54
3	201	175	53
4	189	164	50
5	167	145	44
6	165	144	44
7	163	142	43
8	148	129	39
9	146	127	39
10	144	125	38
11	125	109	33
12	117	101	31
13	114	99	30
14	85	74	22
15	85	74	22
16	59	52	16
17	34	29	9
18	34	29	9
19	19	17	5
20	11	9	3
21	6	6	2
22	2	2	1
23	2	2	1
24	2	2	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	396	1	56	No	No	No	No	No	No	No	No	No	No
2	1	384	1	54	No	No	No	No	No	No	No	No	No	No
3	1	376	1	53	No	No	No	No	No	No	No	No	No	No
4	1	353	1	50	No	No	No	No	No	No	No	No	No	No
5	1	312	1	44	No	No	No	No	No	No	No	No	No	No
6	1	309	1	44	No	No	No	No	No	No	No	No	No	No
7	1	305	1	43	No	No	No	No	No	No	No	No	No	No
8	1	277	1	39	No	No	No	No	No	No	No	No	No	No
9	1	273	1	39	No	No	No	No	No	No	No	No	No	No
10	1	269	1	38	No	No	No	No	No	No	No	No	No	No
11	1	234	1	33	No	No	No	No	No	No	No	No	No	No
12	1	218	1	31	No	No	No	No	No	No	No	No	No	No
13	1	213	1	30	No	No	No	No	No	No	No	No	No	No
14	1	159	1	22	No	No	No	No	No	No	No	No	No	No
15	1	159	1	22	No	No	No	No	No	No	No	No	No	No
16	1	111	1	16	No	No	No	No	No	No	No	No	No	No
17	1	63	1	9	No	No	No	No	No	No	No	No	No	No
18	1	63	1	9	No	No	No	No	No	No	No	No	No	No
19	1	36	1	5	No	No	No	No	No	No	No	No	No	No
20	1	20	1	3	No	No	No	No	No	No	No	No	No	No
21	1	12	1	2	No	No	No	No	No	No	No	No	No	No
22	1	4	1	1	No	No	No	No	No	No	No	No	No	No
23	1	4	1	1	No	No	No	No	No	No	No	No	No	No
24	1	4	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E
Total Stopped Delay Per Vehicle on Minor Approach (s)	13.4
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:12
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	56
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	452
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No

Signal Warrants Report For Intersection 4: Manila Rd/I-70 Eastbound Ramp

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	N	S	W
1	113	140	199
2	110	136	193
3	107	133	189
4	101	125	177
5	89	111	157
6	88	109	155
7	87	108	153
8	79	98	139
9	78	97	137
10	77	95	135
11	67	83	117
12	62	77	109
13	61	76	107
14	45	56	80
15	45	56	80
16	32	39	56
17	18	22	32
18	18	22	32
19	10	13	18
20	6	7	10
21	3	4	6
22	1	1	2
23	1	1	2
24	1	1	2

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	253	1	199	No	No	No	No	No	No	No	No	No	No
2	1	246	1	193	No	No	No	No	No	No	No	No	No	No
3	1	240	1	189	No	No	No	No	No	No	No	No	No	No
4	1	226	1	177	No	No	No	No	No	No	No	No	No	No
5	1	200	1	157	No	No	No	No	No	No	No	No	No	No
6	1	197	1	155	No	No	No	No	No	No	No	No	No	No
7	1	195	1	153	No	No	No	No	No	No	No	No	No	No
8	1	177	1	139	No	No	No	No	No	No	No	No	No	No
9	1	175	1	137	No	No	No	No	No	No	No	No	No	No
10	1	172	1	135	No	No	No	No	No	No	No	No	No	No
11	1	150	1	117	No	No	No	No	No	No	No	No	No	No
12	1	139	1	109	No	No	No	No	No	No	No	No	No	No
13	1	137	1	107	No	No	No	No	No	No	No	No	No	No
14	1	101	1	80	No	No	No	No	No	No	No	No	No	No
15	1	101	1	80	No	No	No	No	No	No	No	No	No	No
16	1	71	1	56	No	No	No	No	No	No	No	No	No	No
17	1	40	1	32	No	No	No	No	No	No	No	No	No	No
18	1	40	1	32	No	No	No	No	No	No	No	No	No	No
19	1	23	1	18	No	No	No	No	No	No	No	No	No	No
20	1	13	1	10	No	No	No	No	No	No	No	No	No	No
21	1	7	1	6	No	No	No	No	No	No	No	No	No	No
22	1	2	1	2	No	No	No	No	No	No	No	No	No	No
23	1	2	1	2	No	No	No	No	No	No	No	No	No	No
24	1	2	1	2	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	10.9
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:36
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	199
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	452
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No

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Intersection Level Of Service Report
Intersection 1: E Colfax Ave/Manila Rd

Control Type:	Signalized	Delay (sec / veh):	27.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.608

Intersection Setup

Name	Manila Rd			Manila Rd			E Colfax Ave			E Colfax Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	0	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Manila Rd			Manila Rd			E Colfax Ave			E Colfax Ave		
Base Volume Input [veh/h]	10	570	48	10	180	5	5	66	5	66	182	25
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	256	0	0	0	0	32	0	50	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	152	0	0	3	0	0	3	0	0	13
Total Hourly Volume [veh/h]	10	570	152	10	180	2	5	98	2	116	188	12
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	155	41	3	49	1	1	27	1	32	51	3
Total Analysis Volume [veh/h]	11	620	165	11	196	2	5	107	2	126	204	13
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	10	30	0	10	30	0	10	30	0	10	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	14	0	0	11	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	9	37	0	9	37	0	9	25	0	9	25	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	Yes	No		Yes	No		Yes	No		Yes	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	R	L	C	R
C, Calculated Cycle Length [s]	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	0.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	38	33	33	38	33	34	25	34	25	25
g / C, Green / Cycle	0.48	0.41	0.41	0.48	0.41	0.42	0.31	0.42	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.01	0.39	0.12	0.02	0.12	0.08	0.00	0.11	0.13	0.01
s, saturation flow rate [veh/h]	1056	1600	1360	668	1597	1432	1360	1099	1600	1360
c, Capacity [veh/h]	546	658	560	226	657	668	423	444	497	423
d1, Uniform Delay [s]	11.32	22.62	15.77	16.73	15.81	14.37	19.02	18.05	21.77	19.18
k, delay calibration	0.11	0.34	0.11	0.11	0.11	0.50	0.50	0.32	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.01	18.05	0.29	0.09	0.26	0.54	0.02	1.01	2.49	0.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.02	0.94	0.29	0.05	0.30	0.17	0.00	0.28	0.41	0.03
d, Delay for Lane Group [s/veh]	11.34	40.68	16.06	16.82	16.07	14.91	19.04	19.06	24.26	19.31
Lane Group LOS	B	D	B	B	B	B	B	B	C	B
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.09	12.93	1.83	0.10	2.20	1.16	0.02	1.65	2.98	0.16
50th-Percentile Queue Length [ft/ln]	2.29	323.17	45.77	2.38	54.89	28.95	0.62	41.23	74.54	4.10
95th-Percentile Queue Length [veh/ln]	0.17	18.82	3.30	0.17	3.95	2.08	0.04	2.97	5.37	0.30
95th-Percentile Queue Length [ft/ln]	4.13	470.58	82.38	4.28	98.80	52.11	1.12	74.22	134.18	7.38

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.34	40.68	16.06	16.82	16.07	16.07	14.91	14.91	19.04	19.06	24.26	19.31
Movement LOS	B	D	B	B	B	B	B	B	B	B	C	B
d_A, Approach Delay [s/veh]	35.17			16.11			14.98			22.16		
Approach LOS	D			B			B			C		
d_I, Intersection Delay [s/veh]	27.82											
Intersection LOS	C											
Intersection V/C	0.608											

Emissions

Vehicle Miles Traveled [mph]	10.76	606.51	161.41	3.81	68.65	10.93	0.20	72.52	117.42	7.48
Stops [stops/h]	4.13	581.70	82.38	4.28	98.80	52.11	1.12	74.22	134.18	7.38
Fuel consumption [US gal/h]	0.45	33.15	7.10	0.22	4.23	1.67	0.04	4.29	7.43	0.44
CO [g/h]	31.14	2317.48	496.02	15.49	295.61	116.97	2.46	300.10	519.17	30.64
NOx [g/h]	6.06	450.90	96.51	3.01	57.51	22.76	0.48	58.39	101.01	5.96
VOC [g/h]	7.22	537.10	114.96	3.59	68.51	27.11	0.57	69.55	120.32	7.10

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	29.76			29.76			29.76			29.76		
I_p,int, Pedestrian LOS Score for Intersectio	3.062			2.604			2.145			2.503		
Crosswalk LOS	C			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	825			825			750			525		
d_b, Bicycle Delay [s]	13.81			13.81			15.63			21.76		
I_b,int, Bicycle LOS Score for Intersection	3.124			1.909			1.753			2.147		
Bicycle LOS	C			A			A			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: E Colfax Ave/Peterson Rd

Control Type: Two-way stop
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 29.5
Level Of Service: D
Volume to Capacity (v/c): 0.007

Intersection Setup

Name	Peterson Rd			Peterson Rd			E Colfax Ave			E Colfax Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⬆			⬆			⬆			⬆		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	895.00	100.00	100.00	100.00	100.00	600.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	960.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd			Peterson Rd			E Colfax Ave			E Colfax Ave		
Base Volume Input [veh/h]	1	1	1	1	1	1	1	103	1	1	189	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	6	0	56	288	0	0	0	0	32
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	1	1	7	1	57	289	103	1	1	189	33
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	2	0	15	79	28	0	0	51	9
Total Analysis Volume [veh/h]	1	1	1	8	1	62	314	112	1	1	205	36
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.00	0.05	0.01	0.08	0.26	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	29.52	26.13	9.25	27.83	25.92	10.56	8.94	0.00	0.00	7.63	0.00	0.00
Movement LOS	D	D	A	D	D	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.04	0.04	0.04	0.45	0.45	0.45	1.02	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.04	1.04	1.04	11.34	11.34	11.34	25.56	0.00	0.00	0.04	0.04	0.00
d_A, Approach Delay [s/veh]	21.64			12.73			6.57			0.03		
Approach LOS	C			B			A			A		
d_I, Intersection Delay [s/veh]	5.09											
Intersection LOS	D											

Intersection Level Of Service Report
Intersection 3: Manila Rd/I-70 Westbound Ramp

Control Type:	Two-way stop	Delay (sec / veh):	44.0
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.227

Intersection Setup

Name	Manila Rd			Manila Rd			Eastbound			Westbound Ramp		
Approach	Northbound			Southbound						Westbound		
Lane Configuration	↵			↵						↵↵		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1	0	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Manila Rd			Manila Rd						Westbound Ramp		
Base Volume Input [veh/h]	160	513	0	0	35	115	0	0	0	25	5	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	2.00	2.00	20.00	20.00	2.00	2.00	2.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	192	0	0	12	38	0	0	0	0	0	64
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	160	705	0	0	47	153	0	0	0	25	5	80
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	192	0	0	13	42	0	0	0	7	1	22
Total Analysis Volume [veh/h]	174	766	0	0	51	166	0	0	0	27	5	87
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance				No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.04	0.23
d_M, Delay for Movement [s/veh]	8.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.04	35.68	17.47
Movement LOS	A	A			A	A				E	E	C
95th-Percentile Queue Length [veh/ln]	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.82	0.13	0.88
95th-Percentile Queue Length [ft/ln]	12.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.60	3.17	22.10
d_A, Approach Delay [s/veh]	1.54			0.00			0.00			24.26		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	3.40											
Intersection LOS	E											

Intersection Level Of Service Report
Intersection 4: Manila Rd/I-70 Eastbound Ramp

Control Type:	Two-way stop	Delay (sec / veh):	31.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.792

Intersection Setup

Name	Manila Rd			Manila Rd			Eastbound Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰↱			↱↰			↰↱↰					
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Manila Rd			Manila Rd			Eastbound Ramp					
Base Volume Input [veh/h]	0	230	35	5	50	0	213	5	50	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	20.00	20.00	20.00	20.00	2.00	20.00	20.00	20.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	12	0	0	192	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	230	35	17	50	0	405	5	50	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	63	10	5	14	0	110	1	14	0	0	0
Total Analysis Volume [veh/h]	0	250	38	18	54	0	440	5	54	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	
Number of Storage Spaces in Median	0	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.02	0.00	0.00	0.79	0.01	0.06	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	8.10	0.00	0.00	31.73	12.01	8.95	0.00	0.00	0.00
Movement LOS		A	A	A	A		D	B	A			
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.05	0.00	0.00	7.51	0.03	0.18	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	1.16	0.00	0.00	187.71	0.73	4.44	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00			2.03			29.07			0.00		
Approach LOS	A			A			D			A		
d_I, Intersection Delay [s/veh]	17.06											
Intersection LOS	D											

Intersection Level Of Service Report
Intersection 5: Peterson Rd/ Access 1

Control Type:	Two-way stop	Delay (sec / veh):	8.9
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.024

Intersection Setup

Name	Peterson Rd		Peterson Rd		Access 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Peterson Rd		Peterson Rd		Access 1	
Base Volume Input [veh/h]	0	15	15	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	107	213	41	0	0	21
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	228	56	0	0	21
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	62	15	0	0	6
Total Analysis Volume [veh/h]	116	248	61	0	0	23
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.00	0.00	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	7.65	0.00	0.00	0.00	13.50	8.86
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.21	0.21	0.00	0.00	0.07	0.07
95th-Percentile Queue Length [ft/ln]	5.16	5.16	0.00	0.00	1.85	1.85
d_A, Approach Delay [s/veh]	2.44		0.00		8.86	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.43					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 6: Peterson Rd/ Access 2

Control Type:	Two-way stop	Delay (sec / veh):	8.7
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.023

Intersection Setup

Name	Peterson Rd		Peterson Rd		Access 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Peterson Rd		Peterson Rd		Access 2	
Base Volume Input [veh/h]	0	15	15	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	107	107	21	0	0	21
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	122	36	0	0	21
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	33	10	0	0	6
Total Analysis Volume [veh/h]	116	133	39	0	0	23
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.00	0.00	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	7.60	0.00	0.00	0.00	12.00	8.75
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.21	0.21	0.00	0.00	0.07	0.07
95th-Percentile Queue Length [ft/ln]	5.16	5.16	0.00	0.00	1.79	1.79
d_A, Approach Delay [s/veh]	3.54		0.00		8.75	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.48					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 15: 48th Ave/Access 3

Control Type: Two-way stop
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 8.6
Level Of Service: A
Volume to Capacity (v/c): 0.023

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	0	0	0	0	0	0	15	0	0	15	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	21	0	0	0	0	0	0	107	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	21	0	0	0	0	15	0	107	15	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	6	0	0	0	0	4	0	29	4	0
Total Analysis Volume [veh/h]	0	0	23	0	0	0	0	16	0	116	16	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00
d_M, Delay for Movement [s/veh]	11.06	11.47	8.64	11.23	11.39	8.55	7.41	0.00	0.00	7.57	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.07	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.22	0.22
95th-Percentile Queue Length [ft/ln]	1.74	1.74	1.74	0.00	0.00	0.00	0.00	0.00	0.00	5.55	5.55	5.55
d_A, Approach Delay [s/veh]	8.64			10.39			0.00			6.65		
Approach LOS	A			B			A			A		
d_I, Intersection Delay [s/veh]	6.30											
Intersection LOS	A											

Intersection Level Of Service Report
Intersection 16: 48th Ave/Peterson Rd

Control Type: Two-way stop
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 11.7
Level Of Service: B
Volume to Capacity (v/c): 0.009

Intersection Setup

Name	Peterson Rd											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd											
Base Volume Input [veh/h]	5	5	5	5	5	5	5	5	5	5	5	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	107	0	0	0	0	0	0	0	21	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	112	5	5	5	5	5	5	5	26	5	5	5
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	1	1	1	1	1	1	1	7	1	1	1
Total Analysis Volume [veh/h]	122	5	5	5	5	5	5	5	28	5	5	5
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.03	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	7.58	0.00	0.00	7.41	0.00	0.00	11.40	11.69	8.71	11.58	11.62	8.64
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh/ln]	0.25	0.25	0.25	0.01	0.01	0.01	0.14	0.14	0.14	0.07	0.07	0.07
95th-Percentile Queue Length [ft/ln]	6.13	6.13	6.13	0.23	0.23	0.23	3.53	3.53	3.53	1.75	1.75	1.75
d_A, Approach Delay [s/veh]	7.01			2.47			9.46			10.61		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	7.40											
Intersection LOS	B											

Signal Warrants Report For Intersection 2: E Colfax Ave/Peterson Rd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	223	393	3	65
2	216	381	3	63
3	212	373	3	62
4	198	350	3	58
5	176	310	2	51
6	174	307	2	51
7	172	303	2	50
8	156	275	2	46
9	154	271	2	45
10	152	267	2	44
11	132	232	2	38
12	123	216	2	36
13	120	212	2	35
14	89	157	1	26
15	89	157	1	26
16	62	110	1	18
17	36	63	0	10
18	36	63	0	10
19	20	35	0	6
20	11	20	0	3
21	7	12	0	2
22	2	4	0	1
23	2	4	0	1
24	2	4	0	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	616	1	65	No	No	No	No	No	No	No	Yes	No	No
2	2	597	1	63	No	No	No	No	No	No	No	Yes	No	No
3	2	585	1	62	No	No	No	No	No	No	No	Yes	No	No
4	2	548	1	58	No	No	No	No	No	No	No	Yes	No	No
5	2	486	1	51	No	No	No	No	No	No	No	No	No	No
6	2	481	1	51	No	No	No	No	No	No	No	No	No	No
7	2	475	1	50	No	No	No	No	No	No	No	No	No	No
8	2	431	1	46	No	No	No	No	No	No	No	No	No	No
9	2	425	1	45	No	No	No	No	No	No	No	No	No	No
10	2	419	1	44	No	No	No	No	No	No	No	No	No	No
11	2	364	1	38	No	No	No	No	No	No	No	No	No	No
12	2	339	1	36	No	No	No	No	No	No	No	No	No	No
13	2	332	1	35	No	No	No	No	No	No	No	No	No	No
14	2	246	1	26	No	No	No	No	No	No	No	No	No	No
15	2	246	1	26	No	No	No	No	No	No	No	No	No	No
16	2	172	1	18	No	No	No	No	No	No	No	No	No	No
17	2	99	1	10	No	No	No	No	No	No	No	No	No	No
18	2	99	1	10	No	No	No	No	No	No	No	No	No	No
19	2	55	1	6	No	No	No	No	No	No	No	No	No	No
20	2	31	1	3	No	No	No	No	No	No	No	No	No	No
21	2	19	1	2	No	No	No	No	No	No	No	No	No	No
22	2	6	1	1	No	No	No	No	No	No	No	No	No	No
23	2	6	1	1	No	No	No	No	No	No	No	No	No	No
24	2	6	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	4	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	21.6	12.7
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:01	0:13
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	3	65
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	684	684
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

Signal Warrants Report For Intersection 3: Manila Rd/I-70 Westbound Ramp

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	N	S	E
1	200	865	110
2	194	839	107
3	190	822	105
4	178	770	98
5	158	683	87
6	156	675	86
7	154	666	85
8	140	606	77
9	138	597	76
10	136	588	75
11	118	510	65
12	110	476	61
13	108	467	59
14	80	346	44
15	80	346	44
16	56	242	31
17	32	138	18
18	32	138	18
19	18	78	10
20	10	43	6
21	6	26	3
22	2	9	1
23	2	9	1
24	2	9	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	1065	3	110	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No
2	2	1033	3	107	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No
3	2	1012	3	105	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No
4	2	948	3	98	No	No	No	No	No	Yes	Yes	Yes	Yes	No
5	2	841	3	87	No	No	No	No	No	Yes	Yes	Yes	No	No
6	2	831	3	86	No	No	No	No	No	Yes	Yes	Yes	No	No
7	2	820	3	85	No	No	No	No	No	Yes	Yes	Yes	No	No
8	2	746	3	77	No	No	No	No	No	No	Yes	Yes	No	No
9	2	735	3	76	No	No	No	No	No	No	Yes	Yes	No	No
10	2	724	3	75	No	No	No	No	No	No	Yes	Yes	No	No
11	2	628	3	65	No	No	No	No	No	No	No	Yes	No	No
12	2	586	3	61	No	No	No	No	No	No	No	Yes	No	No
13	2	575	3	59	No	No	No	No	No	No	No	Yes	No	No
14	2	426	3	44	No	No	No	No	No	No	No	No	No	No
15	2	426	3	44	No	No	No	No	No	No	No	No	No	No
16	2	298	3	31	No	No	No	No	No	No	No	No	No	No
17	2	170	3	18	No	No	No	No	No	No	No	No	No	No
18	2	170	3	18	No	No	No	No	No	No	No	No	No	No
19	2	96	3	10	No	No	No	No	No	No	No	No	No	No
20	2	53	3	6	No	No	No	No	No	No	No	No	No	No
21	2	32	3	3	No	No	No	No	No	No	No	No	No	No
22	2	11	3	1	No	No	No	No	No	No	No	No	No	No
23	2	11	3	1	No	No	No	No	No	No	No	No	No	No
24	2	11	3	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	3	7	10	13	4	0

Warrant 3 Condition A

Orientation	E
Total Stopped Delay Per Vehicle on Minor Approach (s)	24.3
Number of Lanes on Minor Street Approach	3
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:44
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	110
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	1175
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	No

Signal Warrants Report For Intersection 4: Manila Rd/I-70 Eastbound Ramp

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	N	S	W
1	67	265	460
2	65	257	446
3	64	252	437
4	60	236	409
5	53	209	363
6	52	207	359
7	52	204	354
8	47	186	322
9	46	183	317
10	46	180	313
11	40	156	271
12	37	146	253
13	36	143	248
14	27	106	184
15	27	106	184
16	19	74	129
17	11	42	74
18	11	42	74
19	6	24	41
20	3	13	23
21	2	8	14
22	1	3	5
23	1	3	5
24	1	3	5

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	332	3	460	No	No	No	No	No	No	No	No	No	No
2	2	322	3	446	No	No	No	No	No	No	No	No	No	No
3	2	316	3	437	No	No	No	No	No	No	No	No	No	No
4	2	296	3	409	No	No	No	No	No	No	No	No	No	No
5	2	262	3	363	No	No	No	No	No	No	No	No	No	No
6	2	259	3	359	No	No	No	No	No	No	No	No	No	No
7	2	256	3	354	No	No	No	No	No	No	No	No	No	No
8	2	233	3	322	No	No	No	No	No	No	No	No	No	No
9	2	229	3	317	No	No	No	No	No	No	No	No	No	No
10	2	226	3	313	No	No	No	No	No	No	No	No	No	No
11	2	196	3	271	No	No	No	No	No	No	No	No	No	No
12	2	183	3	253	No	No	No	No	No	No	No	No	No	No
13	2	179	3	248	No	No	No	No	No	No	No	No	No	No
14	2	133	3	184	No	No	No	No	No	No	No	No	No	No
15	2	133	3	184	No	No	No	No	No	No	No	No	No	No
16	2	93	3	129	No	No	No	No	No	No	No	No	No	No
17	2	53	3	74	No	No	No	No	No	No	No	No	No	No
18	2	53	3	74	No	No	No	No	No	No	No	No	No	No
19	2	30	3	41	No	No	No	No	No	No	No	No	No	No
20	2	16	3	23	No	No	No	No	No	No	No	No	No	No
21	2	10	3	14	No	No	No	No	No	No	No	No	No	No
22	2	4	3	5	No	No	No	No	No	No	No	No	No	No
23	2	4	3	5	No	No	No	No	No	No	No	No	No	No
24	2	4	3	5	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	29.1
Number of Lanes on Minor Street Approach	3
VehicleHours of Stopped Delay on Minor Approach (h:mm)	3:42
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	460
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	792
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	No

Signal Warrants Report For Intersection 5: Peterson Rd/ Access 1

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	335	56	21
2	325	54	20
3	318	53	20
4	298	50	19
5	265	44	17
6	261	44	16
7	258	43	16
8	234	39	15
9	231	39	14
10	228	38	14
11	198	33	12
12	184	31	12
13	181	30	11
14	134	22	8
15	134	22	8
16	94	16	6
17	54	9	3
18	54	9	3
19	30	5	2
20	17	3	1
21	10	2	1
22	3	1	0
23	3	1	0
24	3	1	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	391	1	21	No	No	No	No	No	No	No	No	No	No
2	1	379	1	20	No	No	No	No	No	No	No	No	No	No
3	1	371	1	20	No	No	No	No	No	No	No	No	No	No
4	1	348	1	19	No	No	No	No	No	No	No	No	No	No
5	1	309	1	17	No	No	No	No	No	No	No	No	No	No
6	1	305	1	16	No	No	No	No	No	No	No	No	No	No
7	1	301	1	16	No	No	No	No	No	No	No	No	No	No
8	1	273	1	15	No	No	No	No	No	No	No	No	No	No
9	1	270	1	14	No	No	No	No	No	No	No	No	No	No
10	1	266	1	14	No	No	No	No	No	No	No	No	No	No
11	1	231	1	12	No	No	No	No	No	No	No	No	No	No
12	1	215	1	12	No	No	No	No	No	No	No	No	No	No
13	1	211	1	11	No	No	No	No	No	No	No	No	No	No
14	1	156	1	8	No	No	No	No	No	No	No	No	No	No
15	1	156	1	8	No	No	No	No	No	No	No	No	No	No
16	1	110	1	6	No	No	No	No	No	No	No	No	No	No
17	1	63	1	3	No	No	No	No	No	No	No	No	No	No
18	1	63	1	3	No	No	No	No	No	No	No	No	No	No
19	1	35	1	2	No	No	No	No	No	No	No	No	No	No
20	1	20	1	1	No	No	No	No	No	No	No	No	No	No
21	1	12	1	1	No	No	No	No	No	No	No	No	No	No
22	1	4	1	0	No	No	No	No	No	No	No	No	No	No
23	1	4	1	0	No	No	No	No	No	No	No	No	No	No
24	1	4	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.9
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:03
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	21
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	412
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No

Signal Warrants Report For Intersection 6: Peterson Rd/ Access 2

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	229	36	21
2	222	35	20
3	218	34	20
4	204	32	19
5	181	28	17
6	179	28	16
7	176	28	16
8	160	25	15
9	158	25	14
10	156	24	14
11	135	21	12
12	126	20	12
13	124	19	11
14	92	14	8
15	92	14	8
16	64	10	6
17	37	6	3
18	37	6	3
19	21	3	2
20	11	2	1
21	7	1	1
22	2	0	0
23	2	0	0
24	2	0	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	265	1	21	No	No	No	No	No	No	No	No	No	No
2	1	257	1	20	No	No	No	No	No	No	No	No	No	No
3	1	252	1	20	No	No	No	No	No	No	No	No	No	No
4	1	236	1	19	No	No	No	No	No	No	No	No	No	No
5	1	209	1	17	No	No	No	No	No	No	No	No	No	No
6	1	207	1	16	No	No	No	No	No	No	No	No	No	No
7	1	204	1	16	No	No	No	No	No	No	No	No	No	No
8	1	185	1	15	No	No	No	No	No	No	No	No	No	No
9	1	183	1	14	No	No	No	No	No	No	No	No	No	No
10	1	180	1	14	No	No	No	No	No	No	No	No	No	No
11	1	156	1	12	No	No	No	No	No	No	No	No	No	No
12	1	146	1	12	No	No	No	No	No	No	No	No	No	No
13	1	143	1	11	No	No	No	No	No	No	No	No	No	No
14	1	106	1	8	No	No	No	No	No	No	No	No	No	No
15	1	106	1	8	No	No	No	No	No	No	No	No	No	No
16	1	74	1	6	No	No	No	No	No	No	No	No	No	No
17	1	43	1	3	No	No	No	No	No	No	No	No	No	No
18	1	43	1	3	No	No	No	No	No	No	No	No	No	No
19	1	24	1	2	No	No	No	No	No	No	No	No	No	No
20	1	13	1	1	No	No	No	No	No	No	No	No	No	No
21	1	8	1	1	No	No	No	No	No	No	No	No	No	No
22	1	2	1	0	No	No	No	No	No	No	No	No	No	No
23	1	2	1	0	No	No	No	No	No	No	No	No	No	No
24	1	2	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.7
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:03
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	21
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	286
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No

Signal Warrants Report For Intersection 15: 48th Ave/Access 3

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	122	15	21	0
2	118	15	20	0
3	116	14	20	0
4	109	13	19	0
5	96	12	17	0
6	95	12	16	0
7	94	12	16	0
8	85	11	15	0
9	84	10	14	0
10	83	10	14	0
11	72	9	12	0
12	67	8	12	0
13	66	8	11	0
14	49	6	8	0
15	49	6	8	0
16	34	4	6	0
17	20	2	3	0
18	20	2	3	0
19	11	1	2	0
20	6	1	1	0
21	4	0	1	0
22	1	0	0	0
23	1	0	0	0
24	1	0	0	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	137	1	21	No	No	No	No	No	No	No	No	No	No
2	1	133	1	20	No	No	No	No	No	No	No	No	No	No
3	1	130	1	20	No	No	No	No	No	No	No	No	No	No
4	1	122	1	19	No	No	No	No	No	No	No	No	No	No
5	1	108	1	17	No	No	No	No	No	No	No	No	No	No
6	1	107	1	16	No	No	No	No	No	No	No	No	No	No
7	1	106	1	16	No	No	No	No	No	No	No	No	No	No
8	1	96	1	15	No	No	No	No	No	No	No	No	No	No
9	1	94	1	14	No	No	No	No	No	No	No	No	No	No
10	1	93	1	14	No	No	No	No	No	No	No	No	No	No
11	1	81	1	12	No	No	No	No	No	No	No	No	No	No
12	1	75	1	12	No	No	No	No	No	No	No	No	No	No
13	1	74	1	11	No	No	No	No	No	No	No	No	No	No
14	1	55	1	8	No	No	No	No	No	No	No	No	No	No
15	1	55	1	8	No	No	No	No	No	No	No	No	No	No
16	1	38	1	6	No	No	No	No	No	No	No	No	No	No
17	1	22	1	3	No	No	No	No	No	No	No	No	No	No
18	1	22	1	3	No	No	No	No	No	No	No	No	No	No
19	1	12	1	2	No	No	No	No	No	No	No	No	No	No
20	1	7	1	1	No	No	No	No	No	No	No	No	No	No
21	1	4	1	1	No	No	No	No	No	No	No	No	No	No
22	1	1	1	0	No	No	No	No	No	No	No	No	No	No
23	1	1	1	0	No	No	No	No	No	No	No	No	No	No
24	1	1	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.6	10.4
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:03	0:00
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	21	0
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	158	158
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

Signal Warrants Report For Intersection 16: 48th Ave/Peterson Rd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	N	S	E	W
1	15	122	15	36
2	15	118	15	35
3	14	116	14	34
4	13	109	13	32
5	12	96	12	28
6	12	95	12	28
7	12	94	12	28
8	11	85	11	25
9	10	84	10	25
10	10	83	10	24
11	9	72	9	21
12	8	67	8	20
13	8	66	8	19
14	6	49	6	14
15	6	49	6	14
16	4	34	4	10
17	2	20	2	6
18	2	20	2	6
19	1	11	1	3
20	1	6	1	2
21	0	4	0	1
22	0	1	0	0
23	0	1	0	0
24	0	1	0	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	137	1	36	No	No	No	No	No	No	No	No	No	No
2	1	133	1	35	No	No	No	No	No	No	No	No	No	No
3	1	130	1	34	No	No	No	No	No	No	No	No	No	No
4	1	122	1	32	No	No	No	No	No	No	No	No	No	No
5	1	108	1	28	No	No	No	No	No	No	No	No	No	No
6	1	107	1	28	No	No	No	No	No	No	No	No	No	No
7	1	106	1	28	No	No	No	No	No	No	No	No	No	No
8	1	96	1	25	No	No	No	No	No	No	No	No	No	No
9	1	94	1	25	No	No	No	No	No	No	No	No	No	No
10	1	93	1	24	No	No	No	No	No	No	No	No	No	No
11	1	81	1	21	No	No	No	No	No	No	No	No	No	No
12	1	75	1	20	No	No	No	No	No	No	No	No	No	No
13	1	74	1	19	No	No	No	No	No	No	No	No	No	No
14	1	55	1	14	No	No	No	No	No	No	No	No	No	No
15	1	55	1	14	No	No	No	No	No	No	No	No	No	No
16	1	38	1	10	No	No	No	No	No	No	No	No	No	No
17	1	22	1	6	No	No	No	No	No	No	No	No	No	No
18	1	22	1	6	No	No	No	No	No	No	No	No	No	No
19	1	12	1	3	No	No	No	No	No	No	No	No	No	No
20	1	7	1	2	No	No	No	No	No	No	No	No	No	No
21	1	4	1	1	No	No	No	No	No	No	No	No	No	No
22	1	1	1	0	No	No	No	No	No	No	No	No	No	No
23	1	1	1	0	No	No	No	No	No	No	No	No	No	No
24	1	1	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	10.6	9.5
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:02	0:05
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	15	36
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	188	188
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

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Intersection Level Of Service Report
Intersection 1: E Colfax Ave/Manila Rd

Control Type:	Signalized	Delay (sec / veh):	28.6
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.601

Intersection Setup

Name	Manila Rd			Manila Rd			E Colfax Ave			E Colfax Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	1	0	0	1	1	0	1
Entry Pocket Length [ft]	460.00	100.00	435.00	100.00	100.00	250.00	100.00	100.00	600.00	990.00	100.00	600.00
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	2
Exit Pocket Length [ft]	0.00	0.00	550.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1620.00
Speed [mph]	45.00			45.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Manila Rd			Manila Rd			E Colfax Ave			E Colfax Ave		
Base Volume Input [veh/h]	10	70	55	30	430	10	5	195	25	18	69	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	65	0	0	0	0	8	0	247	31	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	60	0	0	5	0	0	13	0	0	3
Total Hourly Volume [veh/h]	10	70	60	30	430	5	5	203	12	265	100	2
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	19	16	8	117	1	1	55	3	72	27	1
Total Analysis Volume [veh/h]	11	76	65	33	467	5	5	221	13	288	109	2
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Unsigna	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	3	8	1	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	30	30	10	30	30	0	10	30	0	10	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	14	0	0	14	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	9	36	16	13	40	0	9	25	0	16	32	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	5	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		No	No		Yes	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	L	C	R
C, Calculated Cycle Length [s]	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	0.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	34	27	34	29	48	32	48	39	39
g / C, Green / Cycle	0.38	0.30	0.38	0.32	0.53	0.36	0.53	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.01	0.05	0.03	0.30	0.14	0.01	0.29	0.07	0.00
s, saturation flow rate [veh/h]	860	1600	1189	1597	1593	1360	981	1600	1360
c, Capacity [veh/h]	220	481	527	510	941	483	458	692	588
d1, Uniform Delay [s]	21.04	23.10	17.82	29.59	11.45	18.90	22.16	15.55	14.51
k, delay calibration	0.11	0.11	0.11	0.22	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.09	0.15	0.05	13.59	0.60	0.10	6.43	0.49	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.05	0.16	0.06	0.93	0.24	0.03	0.63	0.16	0.00
d, Delay for Lane Group [s/veh]	21.13	23.25	17.86	43.18	12.05	19.01	28.59	16.03	14.52
Lane Group LOS	C	C	B	D	B	B	C	B	B
Critical Lane Group	Yes	No	No	Yes	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.14	1.13	0.41	10.94	2.17	0.17	3.44	1.28	0.02
50th-Percentile Queue Length [ft/ln]	3.46	28.25	10.29	273.47	54.25	4.31	85.98	32.00	0.55
95th-Percentile Queue Length [veh/ln]	0.25	2.03	0.74	16.36	3.91	0.31	6.19	2.30	0.04
95th-Percentile Queue Length [ft/ln]	6.23	50.85	18.53	409.07	97.65	7.76	154.76	57.60	0.99

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	21.13	23.25	0.00	17.86	43.18	43.18	12.05	12.05	19.01	28.59	16.03	14.52
Movement LOS	C	C		B	D	D	B	B	B	C	B	B
d_A, Approach Delay [s/veh]	13.60			41.53			12.43			25.09		
Approach LOS	B			D			B			C		
d_I, Intersection Delay [s/veh]	28.57											
Intersection LOS	C											
Intersection V/C	0.601											

Emissions

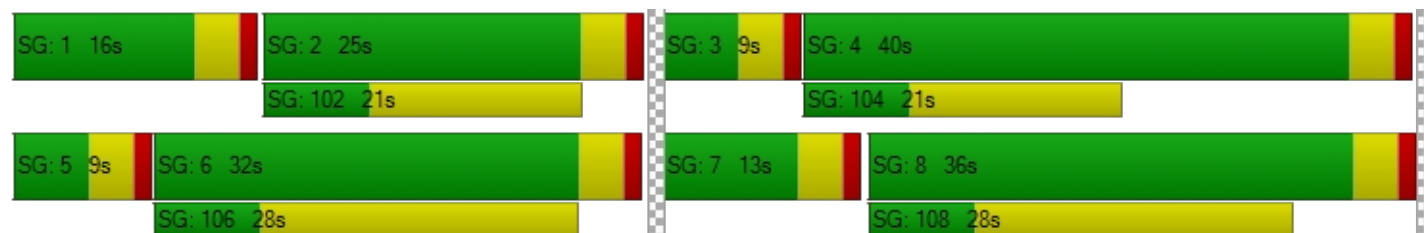
Vehicle Miles Traveled [mph]	10.74	74.17	11.44	163.64	33.18	1.91	165.76	62.74	1.15
Stops [stops/h]	5.54	45.20	16.47	437.55	86.80	6.90	137.57	51.20	0.88
Fuel consumption [US gal/h]	0.48	3.46	0.72	15.20	3.28	0.24	9.78	3.41	0.06
CO [g/h]	33.85	242.14	50.11	1062.27	229.02	16.93	683.32	238.04	4.25
NOx [g/h]	6.59	47.11	9.75	206.68	44.56	3.29	132.95	46.31	0.83
VOC [g/h]	7.84	56.12	11.61	246.19	53.08	3.92	158.37	55.17	0.98

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
I_p,int, Pedestrian LOS Score for Intersectio	3.074	2.677	2.325	2.667
Crosswalk LOS	C	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	711	800	822	622
d_b, Bicycle Delay [s]	18.69	16.20	15.61	21.36
I_b,int, Bicycle LOS Score for Intersection	1.703	2.401	1.975	2.223
Bicycle LOS	A	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: E Colfax Ave/Peterson Rd

Control Type:	Two-way stop	Delay (sec / veh):	18.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Peterson Rd			Peterson Rd			E Colfax Ave			E Colfax Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⬆			⬆			⬆			⬆		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	890.00	100.00	100.00	100.00	100.00	600.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	960.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd			Peterson Rd			E Colfax Ave			E Colfax Ave		
Base Volume Input [veh/h]	1	1	1	1	1	1	1	245	1	1	82	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	31	0	278	73	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	1	1	32	1	279	74	245	1	1	82	9
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	9	0	76	20	67	0	0	22	2
Total Analysis Volume [veh/h]	1	1	1	35	1	303	80	266	1	1	89	10
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.08	0.00	0.33	0.06	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	18.12	13.93	9.99	16.81	16.86	12.01	7.75	0.00	0.00	8.00	0.00	0.00
Movement LOS	C	B	A	C	C	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.02	2.06	2.06	2.06	0.18	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.56	0.56	0.56	51.60	51.60	51.60	4.58	0.00	0.00	0.04	0.04	0.00
d_A, Approach Delay [s/veh]	14.01			12.52			1.79			0.08		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	6.23											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 3: Manila Rd/I-70 Westbound Ramp

Control Type:	Two-way stop	Delay (sec / veh):	18.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.019

Intersection Setup

Name	Manila Rd			Manila Rd			Eastbound			Westbound Ramp		
Approach	Northbound			Southbound						Westbound		
Lane Configuration	↰			↱						↰↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1	0	0	0	1	0	1
Entry Pocket Length [ft]	735.00	100.00	100.00	100.00	100.00	435.00	100.00	100.00	100.00	100.00	100.00	435.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Manila Rd			Manila Rd						Westbound Ramp		
Base Volume Input [veh/h]	70	114	0	0	143	69	0	0	0	40	5	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	2.00	2.00	20.00	20.00	2.00	2.00	2.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	49	0	0	62	185	0	0	0	0	0	16
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	163	0	0	205	254	0	0	0	40	5	27
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	44	0	0	56	69	0	0	0	11	1	7
Total Analysis Volume [veh/h]	76	177	0	0	223	276	0	0	0	43	5	29
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance				No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.02	0.04
d_M, Delay for Movement [s/veh]	8.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.46	18.86	9.54
Movement LOS	A	A				A	A			C	C	A
95th-Percentile Queue Length [veh/ln]	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.06	0.11
95th-Percentile Queue Length [ft/ln]	6.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.89	1.44	2.74
d_A, Approach Delay [s/veh]	2.70			0.00			0.00			15.12		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	2.23											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 4: Manila Rd/I-70 Eastbound Ramp

Control Type:	Two-way stop	Delay (sec / veh):	14.2
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.205

Intersection Setup

Name	Manila Rd			Manila Rd			Eastbound Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰↱			↱↰			↰↱↰					
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	435.00	745.00	100.00	100.00	100.00	100.00	435.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Manila Rd			Manila Rd			Eastbound Ramp					
Base Volume Input [veh/h]	0	80	60	23	90	0	44	5	150	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	20.00	20.00	20.00	20.00	2.00	20.00	20.00	20.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	62	0	0	49	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	80	60	85	90	0	93	5	150	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	22	16	23	24	0	25	1	41	0	0	0
Total Analysis Volume [veh/h]	0	87	65	92	98	0	101	5	163	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	
Number of Storage Spaces in Median	0	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.07	0.00	0.00	0.21	0.01	0.18	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	7.92	0.00	0.00	14.20	13.00	9.81	0.00	0.00	0.00
Movement LOS		A	A	A	A		B	B	A			
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.22	0.00	0.00	0.76	0.03	0.65	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	5.58	0.00	0.00	19.09	0.83	16.23	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00			3.83			11.52			0.00		
Approach LOS	A			A			B			A		
d_I, Intersection Delay [s/veh]	6.26											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 5: Peterson Rd/ Access 1

Control Type:	Two-way stop	Delay (sec / veh):	10.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.148

Intersection Setup

Name	Peterson Rd		Peterson Rd		Access 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Peterson Rd		Peterson Rd		Access 1	
Base Volume Input [veh/h]	0	15	15	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	27	54	206	0	0	103
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	69	221	0	0	103
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	19	60	0	0	28
Total Analysis Volume [veh/h]	29	75	240	0	0	112
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.15
d_M, Delay for Movement [s/veh]	7.96	0.00	0.00	0.00	12.04	10.58
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.05	0.05	0.00	0.00	0.52	0.52
95th-Percentile Queue Length [ft/ln]	1.23	1.23	0.00	0.00	12.95	12.95
d_A, Approach Delay [s/veh]	2.22		0.00		10.58	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	3.11					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 6: Peterson Rd/ Access 2

Control Type:	Two-way stop	Delay (sec / veh):	9.7
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.128

Intersection Setup

Name	Peterson Rd		Peterson Rd		Access 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Peterson Rd		Peterson Rd		Access 2	
Base Volume Input [veh/h]	0	15	15	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	27	27	103	0	0	103
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	42	118	0	0	103
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	11	32	0	0	28
Total Analysis Volume [veh/h]	29	46	128	0	0	112
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.13
d_M, Delay for Movement [s/veh]	7.69	0.00	0.00	0.00	10.73	9.71
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.05	0.05	0.00	0.00	0.44	0.44
95th-Percentile Queue Length [ft/ln]	1.23	1.23	0.00	0.00	10.95	10.95
d_A, Approach Delay [s/veh]	2.97		0.00		9.71	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.16					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 15: 48th Ave/Access 3

Control Type: Two-way stop
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 9.0
Level Of Service: A
Volume to Capacity (v/c): 0.111

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	0	0	0	0	0	0	15	0	0	15	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	103	0	0	0	0	0	0	27	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	103	0	0	0	0	15	0	27	15	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	28	0	0	0	0	4	0	7	4	0
Total Analysis Volume [veh/h]	0	0	112	0	0	0	0	16	0	29	16	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
d_M, Delay for Movement [s/veh]	9.75	10.23	8.99	10.27	9.79	8.55	7.41	0.00	0.00	7.45	0.00	0.00
Movement LOS	A	B	A	B	A	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.37	0.37	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.05
95th-Percentile Queue Length [ft/ln]	9.29	9.29	9.29	0.00	0.00	0.00	0.00	0.00	0.00	1.23	1.23	1.23
d_A, Approach Delay [s/veh]	8.99			9.54			0.00			4.80		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	7.07											
Intersection LOS	A											

Intersection Level Of Service Report
Intersection 16: 48th Ave/Peterson Rd

Control Type:	Two-way stop	Delay (sec / veh):	10.5
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.008

Intersection Setup

Name	Peterson Rd											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd											
Base Volume Input [veh/h]	5	5	5	5	5	5	5	5	5	5	5	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	27	0	0	0	0	0	0	0	103	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	5	5	5	5	5	5	5	108	5	5	5
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	1	1	1	1	1	1	1	29	1	1	1
Total Analysis Volume [veh/h]	35	5	5	5	5	5	5	5	117	5	5	5
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.11	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	7.45	0.00	0.00	7.41	0.00	0.00	9.98	10.39	9.04	10.54	9.96	8.60
Movement LOS	A	A	A	A	A	A	A	B	A	B	A	A
95th-Percentile Queue Length [veh/ln]	0.07	0.07	0.07	0.01	0.01	0.01	0.44	0.44	0.44	0.06	0.06	0.06
95th-Percentile Queue Length [ft/ln]	1.64	1.64	1.64	0.23	0.23	0.23	10.88	10.88	10.88	1.47	1.47	1.47
d_A, Approach Delay [s/veh]	5.79			2.47			9.13			9.70		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	7.93											
Intersection LOS	B											

Signal Warrants Report For Intersection 2: E Colfax Ave/Peterson Rd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	92	320	3	312
2	89	310	3	303
3	87	304	3	296
4	82	285	3	278
5	73	253	2	246
6	72	250	2	243
7	71	246	2	240
8	64	224	2	218
9	63	221	2	215
10	63	218	2	212
11	54	189	2	184
12	51	176	2	172
13	50	173	2	168
14	37	128	1	125
15	37	128	1	125
16	26	90	1	87
17	15	51	0	50
18	15	51	0	50
19	8	29	0	28
20	5	16	0	16
21	3	10	0	9
22	1	3	0	3
23	1	3	0	3
24	1	3	0	3

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	412	1	312	No	No	No	Yes	No	No	No	No	Yes	No
2	2	399	1	303	No	No	No	Yes	No	No	No	No	Yes	No
3	2	391	1	296	No	No	No	Yes	No	No	No	No	Yes	No
4	2	367	1	278	No	No	No	Yes	No	No	No	No	Yes	No
5	2	326	1	246	No	No	No	No	No	No	No	No	No	No
6	2	322	1	243	No	No	No	No	No	No	No	No	No	No
7	2	317	1	240	No	No	No	No	No	No	No	No	No	No
8	2	288	1	218	No	No	No	No	No	No	No	No	No	No
9	2	284	1	215	No	No	No	No	No	No	No	No	No	No
10	2	281	1	212	No	No	No	No	No	No	No	No	No	No
11	2	243	1	184	No	No	No	No	No	No	No	No	No	No
12	2	227	1	172	No	No	No	No	No	No	No	No	No	No
13	2	223	1	168	No	No	No	No	No	No	No	No	No	No
14	2	165	1	125	No	No	No	No	No	No	No	No	No	No
15	2	165	1	125	No	No	No	No	No	No	No	No	No	No
16	2	116	1	87	No	No	No	No	No	No	No	No	No	No
17	2	66	1	50	No	No	No	No	No	No	No	No	No	No
18	2	66	1	50	No	No	No	No	No	No	No	No	No	No
19	2	37	1	28	No	No	No	No	No	No	No	No	No	No
20	2	21	1	16	No	No	No	No	No	No	No	No	No	No
21	2	13	1	9	No	No	No	No	No	No	No	No	No	No
22	2	4	1	3	No	No	No	No	No	No	No	No	No	No
23	2	4	1	3	No	No	No	No	No	No	No	No	No	No
24	2	4	1	3	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	4	0	0	0	0	4	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	14	12.5
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:00	1:05
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	3	312
High Minor Volume Condition Met	No	Yes
Total Entering Volume on All Approaches During Same Hour	727	727
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

Signal Warrants Report For Intersection 3: Manila Rd/I-70 Westbound Ramp

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	N	S	E
1	459	233	72
2	445	226	70
3	436	221	68
4	409	207	64
5	363	184	57
6	358	182	56
7	353	179	55
8	321	163	50
9	317	161	50
10	312	158	49
11	271	137	42
12	252	128	40
13	248	126	39
14	184	93	29
15	184	93	29
16	129	65	20
17	73	37	12
18	73	37	12
19	41	21	6
20	23	12	4
21	14	7	2
22	5	2	1
23	5	2	1
24	5	2	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	692	3	72	No	No	No	No	No	No	Yes	Yes	No	No
2	2	671	3	70	No	No	No	No	No	No	Yes	Yes	No	No
3	2	657	3	68	No	No	No	No	No	No	No	Yes	No	No
4	2	616	3	64	No	No	No	No	No	No	No	Yes	No	No
5	2	547	3	57	No	No	No	No	No	No	No	Yes	No	No
6	2	540	3	56	No	No	No	No	No	No	No	Yes	No	No
7	2	532	3	55	No	No	No	No	No	No	No	No	No	No
8	2	484	3	50	No	No	No	No	No	No	No	No	No	No
9	2	478	3	50	No	No	No	No	No	No	No	No	No	No
10	2	470	3	49	No	No	No	No	No	No	No	No	No	No
11	2	408	3	42	No	No	No	No	No	No	No	No	No	No
12	2	380	3	40	No	No	No	No	No	No	No	No	No	No
13	2	374	3	39	No	No	No	No	No	No	No	No	No	No
14	2	277	3	29	No	No	No	No	No	No	No	No	No	No
15	2	277	3	29	No	No	No	No	No	No	No	No	No	No
16	2	194	3	20	No	No	No	No	No	No	No	No	No	No
17	2	110	3	12	No	No	No	No	No	No	No	No	No	No
18	2	110	3	12	No	No	No	No	No	No	No	No	No	No
19	2	62	3	6	No	No	No	No	No	No	No	No	No	No
20	2	35	3	4	No	No	No	No	No	No	No	No	No	No
21	2	21	3	2	No	No	No	No	No	No	No	No	No	No
22	2	7	3	1	No	No	No	No	No	No	No	No	No	No
23	2	7	3	1	No	No	No	No	No	No	No	No	No	No
24	2	7	3	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	2	6	0	0

Warrant 3 Condition A

Orientation	E
Total Stopped Delay Per Vehicle on Minor Approach (s)	15.1
Number of Lanes on Minor Street Approach	3
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:18
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	72
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	764
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	No

Signal Warrants Report For Intersection 4: Manila Rd/I-70 Eastbound Ramp

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	N	S	W
1	175	140	248
2	170	136	241
3	166	133	236
4	156	125	221
5	138	111	196
6	137	109	193
7	135	108	191
8	122	98	174
9	121	97	171
10	119	95	169
11	103	83	146
12	96	77	136
13	95	76	134
14	70	56	99
15	70	56	99
16	49	39	69
17	28	22	40
18	28	22	40
19	16	13	22
20	9	7	12
21	5	4	7
22	2	1	2
23	2	1	2
24	2	1	2

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	315	3	248	No	No	No	No	No	No	No	No	No	No
2	2	306	3	241	No	No	No	No	No	No	No	No	No	No
3	2	299	3	236	No	No	No	No	No	No	No	No	No	No
4	2	281	3	221	No	No	No	No	No	No	No	No	No	No
5	2	249	3	196	No	No	No	No	No	No	No	No	No	No
6	2	246	3	193	No	No	No	No	No	No	No	No	No	No
7	2	243	3	191	No	No	No	No	No	No	No	No	No	No
8	2	220	3	174	No	No	No	No	No	No	No	No	No	No
9	2	218	3	171	No	No	No	No	No	No	No	No	No	No
10	2	214	3	169	No	No	No	No	No	No	No	No	No	No
11	2	186	3	146	No	No	No	No	No	No	No	No	No	No
12	2	173	3	136	No	No	No	No	No	No	No	No	No	No
13	2	171	3	134	No	No	No	No	No	No	No	No	No	No
14	2	126	3	99	No	No	No	No	No	No	No	No	No	No
15	2	126	3	99	No	No	No	No	No	No	No	No	No	No
16	2	88	3	69	No	No	No	No	No	No	No	No	No	No
17	2	50	3	40	No	No	No	No	No	No	No	No	No	No
18	2	50	3	40	No	No	No	No	No	No	No	No	No	No
19	2	29	3	22	No	No	No	No	No	No	No	No	No	No
20	2	16	3	12	No	No	No	No	No	No	No	No	No	No
21	2	9	3	7	No	No	No	No	No	No	No	No	No	No
22	2	3	3	2	No	No	No	No	No	No	No	No	No	No
23	2	3	3	2	No	No	No	No	No	No	No	No	No	No
24	2	3	3	2	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	11.5
Number of Lanes on Minor Street Approach	3
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:47
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	248
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	563
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No

Signal Warrants Report For Intersection 5: Peterson Rd/ Access 1

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	Yes
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	96	221	103
2	93	214	100
3	91	210	98
4	85	197	92
5	76	175	81
6	75	172	80
7	74	170	79
8	67	155	72
9	66	152	71
10	65	150	70
11	57	130	61
12	53	122	57
13	52	119	56
14	38	88	41
15	38	88	41
16	27	62	29
17	15	35	16
18	15	35	16
19	9	20	9
20	5	11	5
21	3	7	3
22	1	2	1
23	1	2	1
24	1	2	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	317	1	103	No	No	No	Yes	No	No	No	No	No	No
2	1	307	1	100	No	No	No	Yes	No	No	No	No	No	No
3	1	301	1	98	No	No	No	Yes	No	No	No	No	No	No
4	1	282	1	92	No	No	No	Yes	No	No	No	No	No	No
5	1	251	1	81	No	No	No	No	No	No	No	No	No	No
6	1	247	1	80	No	No	No	No	No	No	No	No	No	No
7	1	244	1	79	No	No	No	No	No	No	No	No	No	No
8	1	222	1	72	No	No	No	No	No	No	No	No	No	No
9	1	218	1	71	No	No	No	No	No	No	No	No	No	No
10	1	215	1	70	No	No	No	No	No	No	No	No	No	No
11	1	187	1	61	No	No	No	No	No	No	No	No	No	No
12	1	175	1	57	No	No	No	No	No	No	No	No	No	No
13	1	171	1	56	No	No	No	No	No	No	No	No	No	No
14	1	126	1	41	No	No	No	No	No	No	No	No	No	No
15	1	126	1	41	No	No	No	No	No	No	No	No	No	No
16	1	89	1	29	No	No	No	No	No	No	No	No	No	No
17	1	50	1	16	No	No	No	No	No	No	No	No	No	No
18	1	50	1	16	No	No	No	No	No	No	No	No	No	No
19	1	29	1	9	No	No	No	No	No	No	No	No	No	No
20	1	16	1	5	No	No	No	No	No	No	No	No	No	No
21	1	10	1	3	No	No	No	No	No	No	No	No	No	No
22	1	3	1	1	No	No	No	No	No	No	No	No	No	No
23	1	3	1	1	No	No	No	No	No	No	No	No	No	No
24	1	3	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	4	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	10.6
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:18
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	103
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	420
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No

Signal Warrants Report For Intersection 6: Peterson Rd/ Access 2

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	69	118	103
2	67	114	100
3	66	112	98
4	61	105	92
5	55	93	81
6	54	92	80
7	53	91	79
8	48	83	72
9	48	81	71
10	47	80	70
11	41	70	61
12	38	65	57
13	37	64	56
14	28	47	41
15	28	47	41
16	19	33	29
17	11	19	16
18	11	19	16
19	6	11	9
20	3	6	5
21	2	4	3
22	1	1	1
23	1	1	1
24	1	1	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	187	1	103	No	No	No	No	No	No	No	No	No	No
2	1	181	1	100	No	No	No	No	No	No	No	No	No	No
3	1	178	1	98	No	No	No	No	No	No	No	No	No	No
4	1	166	1	92	No	No	No	No	No	No	No	No	No	No
5	1	148	1	81	No	No	No	No	No	No	No	No	No	No
6	1	146	1	80	No	No	No	No	No	No	No	No	No	No
7	1	144	1	79	No	No	No	No	No	No	No	No	No	No
8	1	131	1	72	No	No	No	No	No	No	No	No	No	No
9	1	129	1	71	No	No	No	No	No	No	No	No	No	No
10	1	127	1	70	No	No	No	No	No	No	No	No	No	No
11	1	111	1	61	No	No	No	No	No	No	No	No	No	No
12	1	103	1	57	No	No	No	No	No	No	No	No	No	No
13	1	101	1	56	No	No	No	No	No	No	No	No	No	No
14	1	75	1	41	No	No	No	No	No	No	No	No	No	No
15	1	75	1	41	No	No	No	No	No	No	No	No	No	No
16	1	52	1	29	No	No	No	No	No	No	No	No	No	No
17	1	30	1	16	No	No	No	No	No	No	No	No	No	No
18	1	30	1	16	No	No	No	No	No	No	No	No	No	No
19	1	17	1	9	No	No	No	No	No	No	No	No	No	No
20	1	9	1	5	No	No	No	No	No	No	No	No	No	No
21	1	6	1	3	No	No	No	No	No	No	No	No	No	No
22	1	2	1	1	No	No	No	No	No	No	No	No	No	No
23	1	2	1	1	No	No	No	No	No	No	No	No	No	No
24	1	2	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	9.7
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:16
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	103
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	290
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No

Signal Warrants Report For Intersection 15: 48th Ave/Access 3

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	42	15	103	0
2	41	15	100	0
3	40	14	98	0
4	37	13	92	0
5	33	12	81	0
6	33	12	80	0
7	32	12	79	0
8	29	11	72	0
9	29	10	71	0
10	29	10	70	0
11	25	9	61	0
12	23	8	57	0
13	23	8	56	0
14	17	6	41	0
15	17	6	41	0
16	12	4	29	0
17	7	2	16	0
18	7	2	16	0
19	4	1	9	0
20	2	1	5	0
21	1	0	3	0
22	0	0	1	0
23	0	0	1	0
24	0	0	1	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	57	1	103	No	No	No	No	No	No	No	No	No	No
2	1	56	1	100	No	No	No	No	No	No	No	No	No	No
3	1	54	1	98	No	No	No	No	No	No	No	No	No	No
4	1	50	1	92	No	No	No	No	No	No	No	No	No	No
5	1	45	1	81	No	No	No	No	No	No	No	No	No	No
6	1	45	1	80	No	No	No	No	No	No	No	No	No	No
7	1	44	1	79	No	No	No	No	No	No	No	No	No	No
8	1	40	1	72	No	No	No	No	No	No	No	No	No	No
9	1	39	1	71	No	No	No	No	No	No	No	No	No	No
10	1	39	1	70	No	No	No	No	No	No	No	No	No	No
11	1	34	1	61	No	No	No	No	No	No	No	No	No	No
12	1	31	1	57	No	No	No	No	No	No	No	No	No	No
13	1	31	1	56	No	No	No	No	No	No	No	No	No	No
14	1	23	1	41	No	No	No	No	No	No	No	No	No	No
15	1	23	1	41	No	No	No	No	No	No	No	No	No	No
16	1	16	1	29	No	No	No	No	No	No	No	No	No	No
17	1	9	1	16	No	No	No	No	No	No	No	No	No	No
18	1	9	1	16	No	No	No	No	No	No	No	No	No	No
19	1	5	1	9	No	No	No	No	No	No	No	No	No	No
20	1	3	1	5	No	No	No	No	No	No	No	No	No	No
21	1	1	1	3	No	No	No	No	No	No	No	No	No	No
22	1	0	1	1	No	No	No	No	No	No	No	No	No	No
23	1	0	1	1	No	No	No	No	No	No	No	No	No	No
24	1	0	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	9	9.5
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:15	0:00
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	103	0
High Minor Volume Condition Met	Yes	No
Total Entering Volume on All Approaches During Same Hour	160	160
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

Signal Warrants Report For Intersection 16: 48th Ave/Peterson Rd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	N	S	E	W
1	15	42	15	118
2	15	41	15	114
3	14	40	14	112
4	13	37	13	105
5	12	33	12	93
6	12	33	12	92
7	12	32	12	91
8	11	29	11	83
9	10	29	10	81
10	10	29	10	80
11	9	25	9	70
12	8	23	8	65
13	8	23	8	64
14	6	17	6	47
15	6	17	6	47
16	4	12	4	33
17	2	7	2	19
18	2	7	2	19
19	1	4	1	11
20	1	2	1	6
21	0	1	0	4
22	0	0	0	1
23	0	0	0	1
24	0	0	0	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	57	1	118	No	No	No	No	No	No	No	No	No	No
2	1	56	1	114	No	No	No	No	No	No	No	No	No	No
3	1	54	1	112	No	No	No	No	No	No	No	No	No	No
4	1	50	1	105	No	No	No	No	No	No	No	No	No	No
5	1	45	1	93	No	No	No	No	No	No	No	No	No	No
6	1	45	1	92	No	No	No	No	No	No	No	No	No	No
7	1	44	1	91	No	No	No	No	No	No	No	No	No	No
8	1	40	1	83	No	No	No	No	No	No	No	No	No	No
9	1	39	1	81	No	No	No	No	No	No	No	No	No	No
10	1	39	1	80	No	No	No	No	No	No	No	No	No	No
11	1	34	1	70	No	No	No	No	No	No	No	No	No	No
12	1	31	1	65	No	No	No	No	No	No	No	No	No	No
13	1	31	1	64	No	No	No	No	No	No	No	No	No	No
14	1	23	1	47	No	No	No	No	No	No	No	No	No	No
15	1	23	1	47	No	No	No	No	No	No	No	No	No	No
16	1	16	1	33	No	No	No	No	No	No	No	No	No	No
17	1	9	1	19	No	No	No	No	No	No	No	No	No	No
18	1	9	1	19	No	No	No	No	No	No	No	No	No	No
19	1	5	1	11	No	No	No	No	No	No	No	No	No	No
20	1	3	1	6	No	No	No	No	No	No	No	No	No	No
21	1	1	1	4	No	No	No	No	No	No	No	No	No	No
22	1	0	1	1	No	No	No	No	No	No	No	No	No	No
23	1	0	1	1	No	No	No	No	No	No	No	No	No	No
24	1	0	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	9.7	9.1
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:02	0:17
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	15	118
High Minor Volume Condition Met	No	Yes
Total Entering Volume on All Approaches During Same Hour	190	190
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

Appendix D – Horizon Year Conditions Analyses

Horizon Background

Horizon Total Without the Adjacent Development

Horizon Total



Intersection Level Of Service Report

Intersection 1: E Colfax Ave/Manila Rd

Control Type:	Signalized	Delay (sec / veh):	27.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.685

Intersection Setup

Name	Manila Rd			Manila Rd			E Colfax Ave			E Colfax Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	625.0	100.0	600.0	650.0	100.0	100.0	100.0	100.0	600.0	770.0	100.0	600.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Manila Rd			Manila Rd			E Colfax Ave			E Colfax Ave		
Base Volume Input [veh/h]	20	1135	93	20	155	5	5	81	15	121	297	50
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	47	0	0	3	0	0	8	0	0	25
Total Hourly Volume [veh/h]	20	1135	46	20	155	2	5	81	7	121	297	25
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	5	308	13	5	42	1	1	22	2	33	81	7
Total Analysis Volume [veh/h]	22	1234	50	22	168	2	5	88	8	132	323	27
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtP	Permi	Permi	ProtP	Permi	Permi	ProtP	Permi	Permi	ProtP	Permi	Permi
Signal Group	3	8	1	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	5	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	30	30	30	0	10	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	43	13	9	43	0	9	25	0	13	29	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	22	0	0	14	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		Yes	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	48	42	42	48	42	42	34	23	23	34	30	30
g / C, Green / Cycle	0.53	0.46	0.46	0.53	0.46	0.46	0.38	0.25	0.25	0.38	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.02	0.45	0.04	0.05	0.06	0.00	0.01	0.06	0.01	0.12	0.22	0.02
s, saturation flow rate [veh/h]	973	2741	1224	421	2741	1224	837	1440	1224	1105	1440	1224
c, Capacity [veh/h]	591	1270	567	187	1270	567	279	361	307	486	474	403
d1, Uniform Delay [s]	10.12	23.58	13.52	19.53	13.81	12.99	18.98	26.90	25.43	19.25	26.13	20.73
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.03	6.84	0.07	0.28	0.05	0.00	0.12	1.60	0.16	0.30	7.74	0.32
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.04	0.97	0.09	0.12	0.13	0.00	0.02	0.24	0.03	0.27	0.68	0.07
d, Delay for Lane Group [s/veh]	10.15	30.42	13.58	19.81	13.86	12.99	19.10	28.50	25.58	19.55	33.87	21.05
Lane Group LOS	B	C	B	B	B	B	B	C	C	B	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.19	12.25	0.52	0.20	0.89	0.02	0.07	1.54	0.13	1.72	6.33	0.39
50th-Percentile Queue Length [ft/ln]	4.66	306.3	13.09	4.91	22.23	0.50	1.67	38.52	3.30	42.96	158.3	9.71
95th-Percentile Queue Length [veh/ln]	0.34	18.00	0.94	0.35	1.60	0.04	0.12	2.77	0.24	3.09	10.46	0.70
95th-Percentile Queue Length [ft/ln]	8.38	449.9	23.57	8.84	40.02	0.90	3.01	69.33	5.94	77.33	261.5	17.48

**Movement, Approach, & Intersection Results**

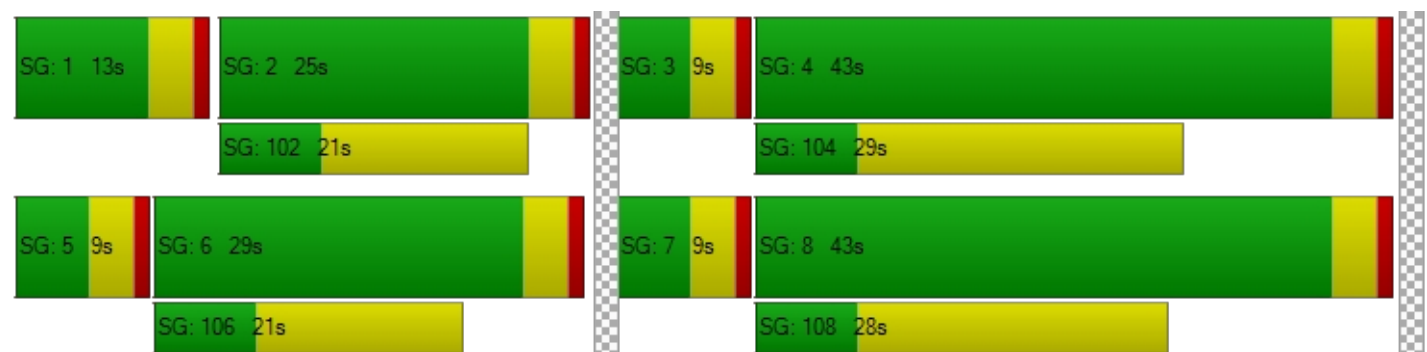
d_M, Delay for Movement [s/veh]	10.15	30.42	13.58	19.81	13.86	12.99	19.10	28.50	25.58	19.55	33.87	21.05
Movement LOS	B	C	B	B	B	B	B	C	C	B	C	C
d_A, Approach Delay [s/veh]	29.44			14.53			27.81			29.23		
Approach LOS	C			B			C			C		
d_I, Intersection Delay [s/veh]	27.93											
Intersection LOS	C											
Intersection V/C	0.685											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	34.67			34.67			34.67			34.67		
I_p,int, Pedestrian LOS Score for Intersection	2.977			2.821			2.362			2.500		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	867			867			467			556		
d_b, Bicycle Delay [s]	14.45			14.45			26.45			23.47		
I_b,int, Bicycle LOS Score for Intersection	2.676			1.720			1.739			2.396		
Bicycle LOS	B			A			A			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**
Intersection 2: E Colfax Ave/Peterson Rd

Control Type: Two-way stop
 Analysis Method: HCM 7th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 12.6
 Level Of Service: B
 Volume to Capacity (v/c): 0.010

Intersection Setup

Name	Peterson Rd			Peterson Rd			E Colfax Ave			E Colfax Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd			Peterson Rd			E Colfax Ave			E Colfax Ave		
Base Volume Input [veh/h]	5	5	5	5	5	5	5	133	5	5	239	5
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	5	5	5	5	5	5	133	5	5	239	5
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	1	1	1	1	1	1	1	36	1	1	65	1
Total Analysis Volume [veh/h]	5	5	5	5	5	5	5	145	5	5	260	5
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	12.54	12.59	9.39	12.54	12.60	10.09	8.00	0.00	0.00	7.72	0.00	0.00
Movement LOS	B	B	A	B	B	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.08	0.08	0.08	0.08	0.08	0.08	0.01	0.01	0.01	0.01	0.01	0.01
95th-Percentile Queue Length [ft/ln]	2.03	2.03	2.03	2.10	2.10	2.10	0.21	0.21	0.21	0.21	0.21	0.21
d_A, Approach Delay [s/veh]	11.50			11.74			0.26			0.14		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	0.94											
Intersection LOS	B											



Intersection Level Of Service Report
Intersection 3: Manila Rd/I-70 Westbound Ramp

Control Type:	Signalized	Delay (sec / veh):	7.7
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.511

Intersection Setup

Name	Manila Rd			Manila Rd						Westbound Ramp		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1	0	0	0	1	0	1
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			No			Yes		

**Volumes**

Name	Manila Rd			Manila Rd						Westbound Ramp		
Base Volume Input [veh/h]	300	1013	0	0	65	235	0	0	0	45	5	246
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	20.00	20.00	2.00	2.00	20.00	20.00	2.00	2.00	2.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	118	0	0	0	0	0	123
Total Hourly Volume [veh/h]	300	1013	0	0	65	117	0	0	0	45	5	123
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	82	275	0	0	18	32	0	0	0	12	1	33
Total Analysis Volume [veh/h]	326	1101	0	0	71	127	0	0	0	49	5	134
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtP	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	1	6	0	0	2	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	10	0	0	10	0	0	0	0	0	10	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	9	41	0	0	32	0	0	0	0	0	29	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	21	0	0	0	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	R		L	C	R
C, Cycle Length [s]	70	70	70	70		70	70	70
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
I2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	52	52	43	43		10	10	10
g / C, Green / Cycle	0.75	0.75	0.62	0.62		0.14	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.33	0.40	0.03	0.06		0.04	0.00	0.11
s, saturation flow rate [veh/h]	974	2741	2741	2166		1371	1440	1224
c, Capacity [veh/h]	855	2044	1688	1334		192	202	172
d1, Uniform Delay [s]	2.99	3.79	5.31	5.49		26.88	26.01	29.10
k, delay calibration	0.29	0.50	0.50	0.50		0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	0.75	1.02	0.05	0.14		0.69	0.05	7.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.38	0.54	0.04	0.10		0.25	0.02	0.78
d, Delay for Lane Group [s/veh]	3.74	4.81	5.36	5.64		27.57	26.05	36.59
Lane Group LOS	A	A	A	A		C	C	D
Critical Lane Group	No	Yes	No	No		No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.77	1.56	0.15	0.29		0.74	0.07	2.44
50th-Percentile Queue Length [ft/ln]	19.19	38.92	3.82	7.22		18.53	1.81	61.06
95th-Percentile Queue Length [veh/ln]	1.38	2.80	0.27	0.52		1.33	0.13	4.40
95th-Percentile Queue Length [ft/ln]	34.53	70.06	6.87	12.99		33.35	3.25	109.9

**Movement, Approach, & Intersection Results**

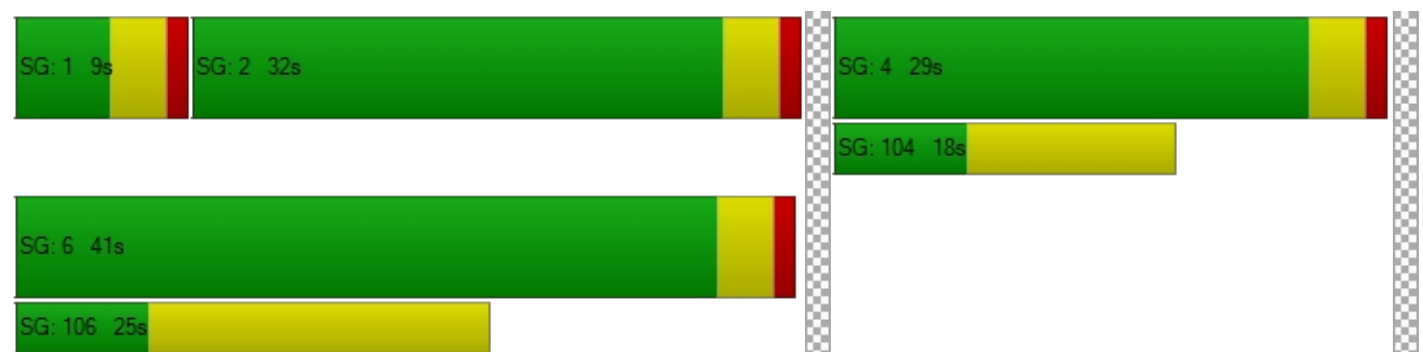
d_M, Delay for Movement [s/veh]	3.74	4.81	0.00	0.00	5.36	5.64	0.00	0.00	0.00	27.57	26.05	36.59
Movement LOS	A	A			A	A				C	C	D
d_A, Approach Delay [s/veh]	4.57			5.54			0.00			33.96		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	7.72											
Intersection LOS	A											
Intersection V/C	0.511											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		11.0		0.0		11.0					
M_corner, Corner Circulation Area [ft²/ped]	0.00		0.00		0.00		0.00					
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00		0.00		0.00		0.00					
d_p, Pedestrian Delay [s]	24.89		24.89		0.00		24.89					
I_p,int, Pedestrian LOS Score for Intersection	2.739		3.015		0.000		2.202					
Crosswalk LOS	B		C		F		B					
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000		2000		2000		2000					
c_b, Capacity of the bicycle lane [bicycles/h]	1056		799		0		714					
d_b, Bicycle Delay [s]	7.80		12.63		35.03		14.49					
I_b,int, Bicycle LOS Score for Intersection	2.737		1.820		4.132		2.073					
Bicycle LOS	B		A		D		B					

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report
Intersection 4: Manila Rd/I-70 Eastbound Ramp

Control Type:	Signalized	Delay (sec / veh):	21.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.549

Intersection Setup

Name	Manila Rd			Manila Rd			Eastbound Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↑↑↑			↑↑↑			↑↑↑					
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	2	0	1	0	0	0
Entry Pocket Length [ft]	100.0	100.0	435.0	620.0	100.0	100.0	885.0	100.0	435.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Manila Rd			Manila Rd			Eastbound Ramp					
Base Volume Input [veh/h]	0	415	70	40	80	0	898	5	90	0	0	0
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	20.00	20.00	20.00	20.00	2.00	20.00	20.00	20.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	35	0	0	0	0	0	45	0	0	0
Total Hourly Volume [veh/h]	0	415	35	40	80	0	898	5	45	0	0	0
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	0	113	10	11	22	0	244	1	12	0	0	0
Total Analysis Volume [veh/h]	0	451	38	43	87	0	976	5	49	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permi	Permi	Permi	ProtP	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	5	2	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	5	10	0	0	10	0	0	0	0
Maximum Green [s]	0	30	0	10	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	9	38	0	0	32	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	14	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		Yes	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	70	70	70	70	70	70	70	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
I2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	28	28	35	35	27	27	27	
g / C, Green / Cycle	0.40	0.40	0.50	0.50	0.39	0.39	0.39	
(v / s)_i Volume / Saturation Flow Rate	0.16	0.03	0.05	0.03	0.37	0.00	0.04	
s, saturation flow rate [veh/h]	2741	1224	795	2741	2663	1440	1224	
c, Capacity [veh/h]	1084	484	449	1357	1042	563	479	
d1, Uniform Delay [s]	15.35	13.23	9.81	9.25	20.53	13.05	13.55	
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	1.18	0.32	0.42	0.09	4.75	0.01	0.09	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.42	0.08	0.10	0.06	0.94	0.01	0.10	
d, Delay for Lane Group [s/veh]	16.52	13.55	10.23	9.34	25.28	13.06	13.64	
Lane Group LOS	B	B	B	A	C	B	B	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	2.57	0.39	0.36	0.33	7.61	0.05	0.47	
50th-Percentile Queue Length [ft/ln]	64.22	9.75	9.03	8.23	190.1	1.15	11.77	
95th-Percentile Queue Length [veh/ln]	4.62	0.70	0.65	0.59	12.13	0.08	0.85	
95th-Percentile Queue Length [ft/ln]	115.60	17.55	16.25	14.81	303.2	2.07	21.18	

**Movement, Approach, & Intersection Results**

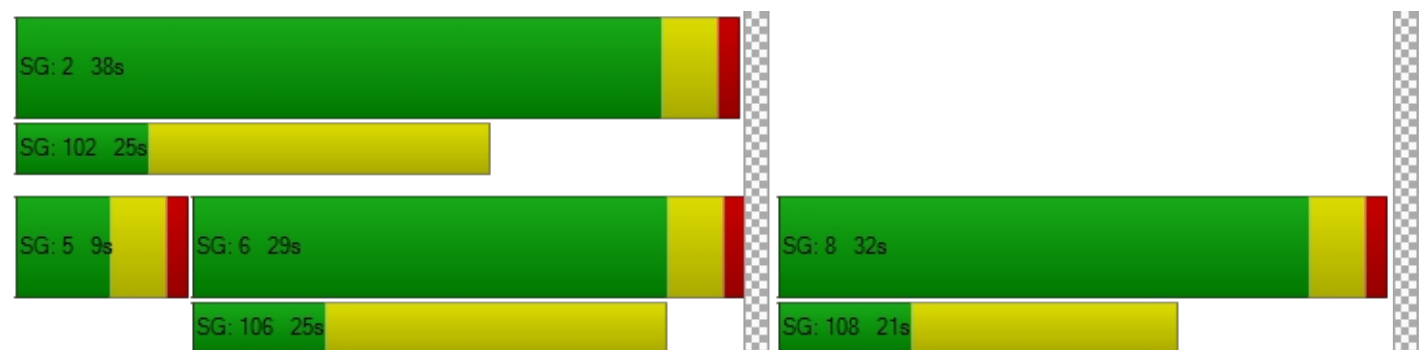
d_M, Delay for Movement [s/veh]	0.00	16.52	13.55	10.23	9.34	0.00	25.28	13.06	13.64	0.00	0.00	0.00
Movement LOS		B	B	B	A		C	B	B			
d_A, Approach Delay [s/veh]	16.29			9.63			24.67			0.00		
Approach LOS	B			A			C			A		
d_I, Intersection Delay [s/veh]	21.00											
Intersection LOS	C											
Intersection V/C	0.549											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	24.91			24.91			24.91			24.91		
I_p,int, Pedestrian LOS Score for Intersection	2.473			2.590			2.443			1.554		
Crosswalk LOS	B			B			B			A		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	713			970			799			0		
d_b, Bicycle Delay [s]	14.51			9.29			12.64			35.05		
I_b,int, Bicycle LOS Score for Intersection	1.992			1.667			3.333			4.132		
Bicycle LOS	A			A			C			D		

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Signal Warrants Report For Intersection 2: E Colfax Ave/Peterson Rd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	249	143	15	15
2	242	139	15	15
3	237	136	14	14
4	222	127	13	13
5	197	113	12	12
6	194	112	12	12
7	192	110	12	12
8	174	100	11	11
9	172	99	10	10
10	169	97	10	10
11	147	84	9	9
12	137	79	8	8
13	134	77	8	8
14	100	57	6	6
15	100	57	6	6
16	70	40	4	4
17	40	23	2	2
18	40	23	2	2
19	22	13	1	1
20	12	7	1	1
21	7	4	0	0
22	2	1	0	0
23	2	1	0	0
24	2	1	0	0



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	392	1	15	No	No	No	No	No	No	No	No	No	No
2	1	381	1	15	No	No	No	No	No	No	No	No	No	No
3	1	373	1	14	No	No	No	No	No	No	No	No	No	No
4	1	349	1	13	No	No	No	No	No	No	No	No	No	No
5	1	310	1	12	No	No	No	No	No	No	No	No	No	No
6	1	306	1	12	No	No	No	No	No	No	No	No	No	No
7	1	302	1	12	No	No	No	No	No	No	No	No	No	No
8	1	274	1	11	No	No	No	No	No	No	No	No	No	No
9	1	271	1	10	No	No	No	No	No	No	No	No	No	No
10	1	266	1	10	No	No	No	No	No	No	No	No	No	No
11	1	231	1	9	No	No	No	No	No	No	No	No	No	No
12	1	216	1	8	No	No	No	No	No	No	No	No	No	No
13	1	211	1	8	No	No	No	No	No	No	No	No	No	No
14	1	157	1	6	No	No	No	No	No	No	No	No	No	No
15	1	157	1	6	No	No	No	No	No	No	No	No	No	No
16	1	110	1	4	No	No	No	No	No	No	No	No	No	No
17	1	63	1	2	No	No	No	No	No	No	No	No	No	No
18	1	63	1	2	No	No	No	No	No	No	No	No	No	No
19	1	35	1	1	No	No	No	No	No	No	No	No	No	No
20	1	19	1	1	No	No	No	No	No	No	No	No	No	No
21	1	11	1	0	No	No	No	No	No	No	No	No	No	No
22	1	3	1	0	No	No	No	No	No	No	No	No	No	No
23	1	3	1	0	No	No	No	No	No	No	No	No	No	No
24	1	3	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	11.5	11.7
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:02	0:02
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	15	15
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	422	422
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	



Intersection Level Of Service Report
Intersection 1: E Colfax Ave/Manila Rd

Control Type:	Signalized	Delay (sec / veh):	25.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.644

Intersection Setup

Name	Manila Rd			Manila Rd			E Colfax Ave			E Colfax Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	625.0	100.0	600.0	650.0	100.0	100.0	100.0	100.0	600.0	720.0	100.0	600.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Manila Rd			Manila Rd			E Colfax Ave			E Colfax Ave		
Base Volume Input [veh/h]	20	145	100	55	865	20	5	365	40	33	129	5
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	50	0	0	10	0	0	20	0	0	3
Total Hourly Volume [veh/h]	20	145	50	55	865	10	5	365	20	33	129	2
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	5	39	14	15	235	3	1	99	5	9	35	1
Total Analysis Volume [veh/h]	22	158	54	60	940	11	5	397	22	36	140	2
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtP	Permi	Permi	ProtP	Permi	Permi	ProtP	Permi	Permi	ProtP	Permi	Permi
Signal Group	3	8	1	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	5	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	30	30	30	0	10	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	33	9	9	33	0	9	29	0	9	29	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	22	0	0	14	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		Yes	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	36	28	28	36	30	30	36	30	30	36	32	32
g / C, Green / Cycle	0.44	0.35	0.35	0.44	0.37	0.37	0.46	0.37	0.37	0.46	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.04	0.06	0.04	0.06	0.34	0.01	0.01	0.28	0.02	0.04	0.10	0.00
s, saturation flow rate [veh/h]	557	2741	1224	976	2741	1224	988	1440	1224	827	1440	1224
c, Capacity [veh/h]	218	952	425	513	1011	452	523	535	455	332	576	489
d1, Uniform Delay [s]	17.38	18.11	17.85	13.07	24.26	16.08	11.99	21.82	16.09	14.32	15.97	14.44
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.20	0.08	0.13	0.10	4.44	0.02	0.03	8.97	0.20	0.14	1.00	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.10	0.17	0.13	0.12	0.93	0.02	0.01	0.74	0.05	0.11	0.24	0.00
d, Delay for Lane Group [s/veh]	17.58	18.19	17.98	13.17	28.69	16.11	12.02	30.79	16.29	14.46	16.97	14.46
Lane Group LOS	B	B	B	B	C	B	B	C	B	B	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.21	0.93	0.63	0.57	8.09	0.12	0.05	6.79	0.25	0.31	1.61	0.02
50th-Percentile Queue Length [ft/ln]	5.22	23.18	15.83	14.15	202.3	2.97	1.13	169.7	6.21	7.79	40.19	0.52
95th-Percentile Queue Length [veh/ln]	0.38	1.67	1.14	1.02	12.76	0.21	0.08	11.06	0.45	0.56	2.89	0.04
95th-Percentile Queue Length [ft/ln]	9.39	41.72	28.49	25.47	318.9	5.34	2.04	276.6	11.18	14.02	72.34	0.93

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	17.58	18.19	17.98	13.17	28.69	16.11	12.02	30.79	16.29	14.46	16.97	14.46
Movement LOS	B	B	B	B	C	B	B	C	B	B	B	B
d_A, Approach Delay [s/veh]	18.08			27.64			29.81			16.44		
Approach LOS	B			C			C			B		
d_I, Intersection Delay [s/veh]	25.85											
Intersection LOS	C											
Intersection V/C	0.644											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	29.77			29.77			29.77			29.77		
I_p,int, Pedestrian LOS Score for Intersection	2.855			2.753			2.445			2.492		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	725			725			625			625		
d_b, Bicycle Delay [s]	16.27			16.27			18.92			18.92		
I_b,int, Bicycle LOS Score for Intersection	1.794			2.402			2.292			1.858		
Bicycle LOS	A			B			B			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 2: E Colfax Ave/Peterson Rd

Control Type: Two-way stop
 Analysis Method: HCM 7th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 13.8
 Level Of Service: B
 Volume to Capacity (v/c): 0.012

Intersection Setup

Name	Peterson Rd			Peterson Rd			E Colfax Ave			E Colfax Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd			Peterson Rd			E Colfax Ave			E Colfax Ave		
Base Volume Input [veh/h]	5	5	5	5	5	5	5	295	5	5	167	5
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	5	5	5	5	5	5	295	5	5	167	5
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	1	1	1	1	1	1	1	80	1	1	45	1
Total Analysis Volume [veh/h]	5	5	5	5	5	5	5	321	5	5	182	5
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	13.83	13.70	10.55	13.79	13.68	9.64	7.80	0.00	0.00	8.17	0.00	0.00
Movement LOS	B	B	B	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.10	0.10	0.10	0.09	0.09	0.09	0.01	0.01	0.01	0.01	0.01	0.01
95th-Percentile Queue Length [ft/ln]	2.40	2.40	2.40	2.30	2.30	2.30	0.21	0.21	0.21	0.21	0.21	0.21
d_A, Approach Delay [s/veh]	12.69			12.37			0.12			0.21		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	0.82											
Intersection LOS	B											



Intersection Level Of Service Report
Intersection 3: Manila Rd/I-70 Westbound Ramp

Control Type:	Signalized	Delay (sec / veh):	7.1
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.273

Intersection Setup

Name	Manila Rd			Manila Rd						Westbound Ramp		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1	0	0	0	1	0	1
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			No			Yes		

**Volumes**

Name	Manila Rd			Manila Rd						Westbound Ramp		
Base Volume Input [veh/h]	135	214	0	0	288	704	0	0	0	75	5	46
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	20.00	20.00	2.00	2.00	20.00	20.00	2.00	2.00	2.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	352	0	0	0	0	0	23
Total Hourly Volume [veh/h]	135	214	0	0	288	352	0	0	0	75	5	23
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	37	58	0	0	78	96	0	0	0	20	1	6
Total Analysis Volume [veh/h]	147	233	0	0	313	383	0	0	0	82	5	25
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtP	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	1	6	0	0	2	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	10	0	0	10	0	0	0	0	0	10	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	9	47	0	0	38	0	0	0	0	0	23	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	21	0	0	0	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	R		L	C	R
C, Cycle Length [s]	70	70	70	70		70	70	70
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
I2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	53	53	44	44		9	9	9
g / C, Green / Cycle	0.76	0.76	0.63	0.63		0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.22	0.08	0.11	0.18		0.06	0.00	0.02
s, saturation flow rate [veh/h]	679	2741	2741	2166		1371	1440	1224
c, Capacity [veh/h]	625	2078	1733	1369		176	184	157
d1, Uniform Delay [s]	2.44	2.25	5.36	5.77		28.35	26.75	27.21
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	0.19	0.11	0.23	0.51		1.93	0.06	0.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.24	0.11	0.18	0.28		0.47	0.03	0.16
d, Delay for Lane Group [s/veh]	2.63	2.36	5.59	6.28		30.28	26.81	27.69
Lane Group LOS	A	A	A	A		C	C	C
Critical Lane Group	Yes	No	No	Yes		Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.22	0.18	0.69	0.93		1.32	0.07	0.38
50th-Percentile Queue Length [ft/ln]	5.51	4.41	17.15	23.20		33.09	1.84	9.51
95th-Percentile Queue Length [veh/ln]	0.40	0.32	1.24	1.67		2.38	0.13	0.68
95th-Percentile Queue Length [ft/ln]	9.91	7.93	30.88	41.76		59.56	3.32	17.11

**Movement, Approach, & Intersection Results**

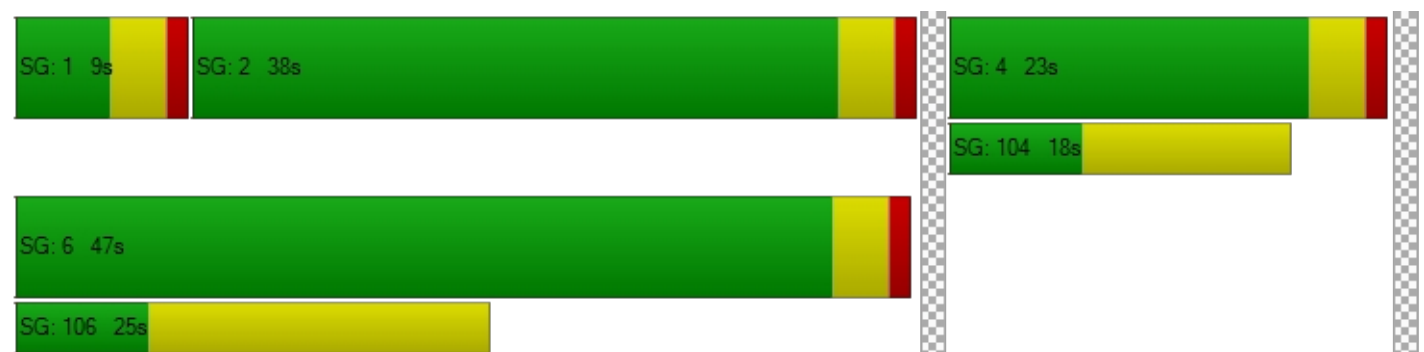
d_M, Delay for Movement [s/veh]	2.63	2.36	0.00	0.00	5.59	6.28	0.00	0.00	0.00	30.28	26.81	27.69
Movement LOS	A	A			A	A				C	C	C
d_A, Approach Delay [s/veh]	2.46			5.97			0.00			29.55		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	7.07											
Intersection LOS	A											
Intersection V/C	0.273											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		11.0		0.0		11.0					
M_corner, Corner Circulation Area [ft²/ped]	0.00		0.00		0.00		0.00					
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00		0.00		0.00		0.00					
d_p, Pedestrian Delay [s]	24.89		24.89		0.00		24.89					
I_p,int, Pedestrian LOS Score for Intersection	2.513		3.264		0.000		2.003					
Crosswalk LOS	B		C		F		B					
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000		2000		2000		2000					
c_b, Capacity of the bicycle lane [bicycles/h]	1227		971		0		542					
d_b, Bicycle Delay [s]	5.23		9.28		35.03		18.61					
I_b,int, Bicycle LOS Score for Intersection	1.873		2.424		4.132		1.782					
Bicycle LOS	A		B		D		A					

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report
Intersection 4: Manila Rd/I-70 Eastbound Ramp

Control Type:	Signalized	Delay (sec / veh):	12.9
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.284

Intersection Setup

Name	Manila Rd			Manila Rd			Eastbound Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↑↑↑			↑↑↑			↑↑↑					
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	2	0	1	0	0	0
Entry Pocket Length [ft]	100.0	100.0	435.0	620.0	100.0	100.0	885.0	100.0	435.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Manila Rd			Manila Rd			Eastbound Ramp					
Base Volume Input [veh/h]	0	165	110	183	180	0	194	5	285	0	0	0
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	20.00	20.00	20.00	20.00	2.00	20.00	20.00	20.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	55	0	0	0	0	0	143	0	0	0
Total Hourly Volume [veh/h]	0	165	55	183	180	0	194	5	142	0	0	0
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	0	45	15	50	49	0	53	1	39	0	0	0
Total Analysis Volume [veh/h]	0	179	60	199	196	0	211	5	154	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permi	Permi	Permi	ProtP	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	5	2	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	5	10	0	0	10	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	24	0	9	33	0	0	27	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	14	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	61	61	61	61	61	61	61	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
I2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	20	20	29	29	23	23	23	
g / C, Green / Cycle	0.33	0.33	0.48	0.48	0.38	0.38	0.38	
(v / s)_i Volume / Saturation Flow Rate	0.07	0.05	0.20	0.07	0.08	0.00	0.13	
s, saturation flow rate [veh/h]	2741	1224	997	2741	2663	1440	1224	
c, Capacity [veh/h]	899	401	596	1303	1004	543	461	
d1, Uniform Delay [s]	14.74	14.49	9.91	9.04	12.85	11.88	13.54	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.50	0.79	1.51	0.24	0.48	0.03	1.94	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.20	0.15	0.33	0.15	0.21	0.01	0.33	
d, Delay for Lane Group [s/veh]	15.24	15.28	11.41	9.28	13.33	11.91	15.48	
Lane Group LOS	B	B	B	A	B	B	B	
Critical Lane Group	Yes	No	Yes	No	No	No	Yes	
50th-Percentile Queue Length [veh/ln]	0.88	0.62	1.65	0.68	0.95	0.04	1.60	
50th-Percentile Queue Length [ft/ln]	21.91	15.61	41.18	16.95	23.63	1.08	40.01	
95th-Percentile Queue Length [veh/ln]	1.58	1.12	2.96	1.22	1.70	0.08	2.88	
95th-Percentile Queue Length [ft/ln]	39.44	28.09	74.12	30.51	42.54	1.94	72.01	

**Movement, Approach, & Intersection Results**

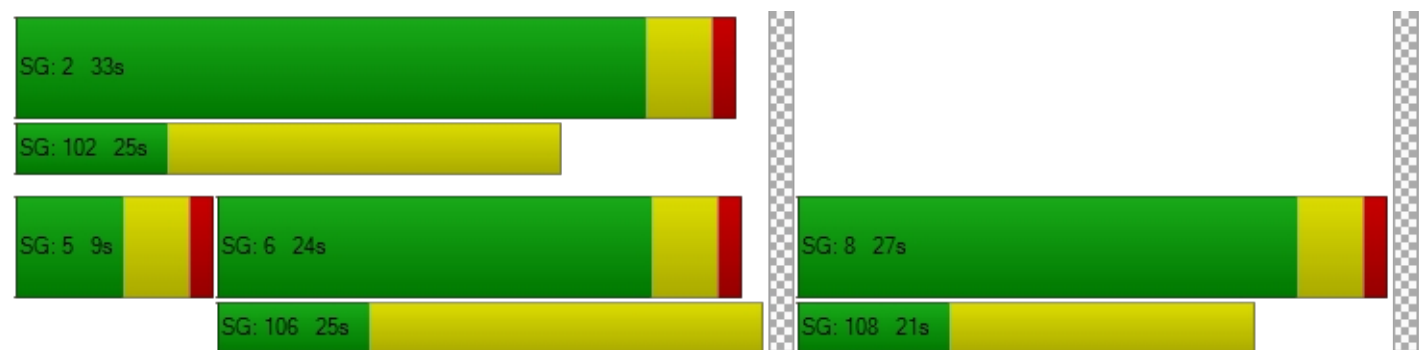
d_M, Delay for Movement [s/veh]	0.00	15.24	15.28	11.41	9.28	0.00	13.33	11.91	15.48	0.00	0.00	0.00
Movement LOS		B	B	B	A		B	B	B			
d_A, Approach Delay [s/veh]	15.25			10.36			14.21			0.00		
Approach LOS	B			B			B			A		
d_I, Intersection Delay [s/veh]	12.94											
Intersection LOS	B											
Intersection V/C	0.284											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	20.49			20.49			20.49			20.49		
I_p,int, Pedestrian LOS Score for Intersection	2.510			2.431			2.438			1.815		
Crosswalk LOS	B			B			B			A		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	656			951			754			0		
d_b, Bicycle Delay [s]	13.78			8.39			11.84			30.50		
I_b,int, Bicycle LOS Score for Intersection	1.802			1.885			2.406			4.132		
Bicycle LOS	A			A			B			D		

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Signal Warrants Report For Intersection 2: E Colfax Ave/Peterson Rd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	177	305	15	15
2	172	296	15	15
3	168	290	14	14
4	158	271	13	13
5	140	241	12	12
6	138	238	12	12
7	136	235	12	12
8	124	214	11	11
9	122	210	10	10
10	120	207	10	10
11	104	180	9	9
12	97	168	8	8
13	96	165	8	8
14	71	122	6	6
15	71	122	6	6
16	50	85	4	4
17	28	49	2	2
18	28	49	2	2
19	16	27	1	1
20	9	15	1	1
21	5	9	0	0
22	2	3	0	0
23	2	3	0	0
24	2	3	0	0



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	482	1	15	No	No	No	No	No	No	No	No	No	No
2	1	468	1	15	No	No	No	No	No	No	No	No	No	No
3	1	458	1	14	No	No	No	No	No	No	No	No	No	No
4	1	429	1	13	No	No	No	No	No	No	No	No	No	No
5	1	381	1	12	No	No	No	No	No	No	No	No	No	No
6	1	376	1	12	No	No	No	No	No	No	No	No	No	No
7	1	371	1	12	No	No	No	No	No	No	No	No	No	No
8	1	338	1	11	No	No	No	No	No	No	No	No	No	No
9	1	332	1	10	No	No	No	No	No	No	No	No	No	No
10	1	327	1	10	No	No	No	No	No	No	No	No	No	No
11	1	284	1	9	No	No	No	No	No	No	No	No	No	No
12	1	265	1	8	No	No	No	No	No	No	No	No	No	No
13	1	261	1	8	No	No	No	No	No	No	No	No	No	No
14	1	193	1	6	No	No	No	No	No	No	No	No	No	No
15	1	193	1	6	No	No	No	No	No	No	No	No	No	No
16	1	135	1	4	No	No	No	No	No	No	No	No	No	No
17	1	77	1	2	No	No	No	No	No	No	No	No	No	No
18	1	77	1	2	No	No	No	No	No	No	No	No	No	No
19	1	43	1	1	No	No	No	No	No	No	No	No	No	No
20	1	24	1	1	No	No	No	No	No	No	No	No	No	No
21	1	14	1	0	No	No	No	No	No	No	No	No	No	No
22	1	5	1	0	No	No	No	No	No	No	No	No	No	No
23	1	5	1	0	No	No	No	No	No	No	No	No	No	No
24	1	5	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	12.7	12.4
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:03	0:03
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	15	15
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	512	512
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	



Signal Warrants Report For Intersection 2: E Colfax Ave/Peterson Rd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	249	143	15	15
2	242	139	15	15
3	237	136	14	14
4	222	127	13	13
5	197	113	12	12
6	194	112	12	12
7	192	110	12	12
8	174	100	11	11
9	172	99	10	10
10	169	97	10	10
11	147	84	9	9
12	137	79	8	8
13	134	77	8	8
14	100	57	6	6
15	100	57	6	6
16	70	40	4	4
17	40	23	2	2
18	40	23	2	2
19	22	13	1	1
20	12	7	1	1
21	7	4	0	0
22	2	1	0	0
23	2	1	0	0
24	2	1	0	0



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	392	1	15	No	No	No	No	No	No	No	No	No	No
2	1	381	1	15	No	No	No	No	No	No	No	No	No	No
3	1	373	1	14	No	No	No	No	No	No	No	No	No	No
4	1	349	1	13	No	No	No	No	No	No	No	No	No	No
5	1	310	1	12	No	No	No	No	No	No	No	No	No	No
6	1	306	1	12	No	No	No	No	No	No	No	No	No	No
7	1	302	1	12	No	No	No	No	No	No	No	No	No	No
8	1	274	1	11	No	No	No	No	No	No	No	No	No	No
9	1	271	1	10	No	No	No	No	No	No	No	No	No	No
10	1	266	1	10	No	No	No	No	No	No	No	No	No	No
11	1	231	1	9	No	No	No	No	No	No	No	No	No	No
12	1	216	1	8	No	No	No	No	No	No	No	No	No	No
13	1	211	1	8	No	No	No	No	No	No	No	No	No	No
14	1	157	1	6	No	No	No	No	No	No	No	No	No	No
15	1	157	1	6	No	No	No	No	No	No	No	No	No	No
16	1	110	1	4	No	No	No	No	No	No	No	No	No	No
17	1	63	1	2	No	No	No	No	No	No	No	No	No	No
18	1	63	1	2	No	No	No	No	No	No	No	No	No	No
19	1	35	1	1	No	No	No	No	No	No	No	No	No	No
20	1	19	1	1	No	No	No	No	No	No	No	No	No	No
21	1	11	1	0	No	No	No	No	No	No	No	No	No	No
22	1	3	1	0	No	No	No	No	No	No	No	No	No	No
23	1	3	1	0	No	No	No	No	No	No	No	No	No	No
24	1	3	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	11.5	11.7
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:02	0:02
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	15	15
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	422	422
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	



Signal Warrants Report For Intersection 3: Manila Rd/I-70 Westbound Ramp

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	N	S	E
1	300	1313	296
2	291	1274	287
3	285	1247	281
4	267	1169	263
5	237	1037	234
6	234	1024	231
7	231	1011	228
8	210	919	207
9	207	906	204
10	204	893	201
11	177	775	175
12	165	722	163
13	162	709	160
14	120	525	118
15	120	525	118
16	84	368	83
17	48	210	47
18	48	210	47
19	27	118	27
20	15	66	15
21	9	39	9
22	3	13	3
23	3	13	3
24	3	13	3



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	4	1613	3	296	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	4	1565	3	287	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	4	1532	3	281	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	4	1436	3	263	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	4	1274	3	234	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	4	1258	3	231	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	4	1242	3	228	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	4	1129	3	207	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	4	1113	3	204	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	4	1097	3	201	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	4	952	3	175	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12	4	887	3	163	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
13	4	871	3	160	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
14	4	645	3	118	No	No	No	Yes	No	No	Yes	Yes	No	No
15	4	645	3	118	No	No	No	Yes	No	No	Yes	Yes	No	No
16	4	452	3	83	No	No	No	No	No	No	No	No	No	No
17	4	258	3	47	No	No	No	No	No	No	No	No	No	No
18	4	258	3	47	No	No	No	No	No	No	No	No	No	No
19	4	145	3	27	No	No	No	No	No	No	No	No	No	No
20	4	81	3	15	No	No	No	No	No	No	No	No	No	No
21	4	48	3	9	No	No	No	No	No	No	No	No	No	No
22	4	16	3	3	No	No	No	No	No	No	No	No	No	No
23	4	16	3	3	No	No	No	No	No	No	No	No	No	No
24	4	16	3	3	No	No	No	No	No	No	No	No	No	No
Hours Met					10	13	13	15	11	13	15	15	13	11

Warrant 3 Condition A

Orientation	E
Total Stopped Delay Per Vehicle on Minor Approach (s)	116.2
Number of Lanes on Minor Street Approach	3
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	9:33
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	296
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1909
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	Yes
Warrant Met for Intersection	Yes



Signal Warrants Report For Intersection 4: Manila Rd/I-70 Eastbound Ramp

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	W
Minor Approaches	N, S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets	Minor Streets	
		N	S
1	993	120	485
2	963	116	470
3	943	114	461
4	884	107	432
5	784	95	383
6	775	94	378
7	765	92	373
8	695	84	340
9	685	83	335
10	675	82	330
11	586	71	286
12	546	66	267
13	536	65	262
14	397	48	194
15	397	48	194
16	278	34	136
17	159	19	78
18	159	19	78
19	89	11	44
20	50	6	24
21	30	4	15
22	10	1	5
23	10	1	5
24	10	1	5



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	4	993	3	485	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	4	963	3	470	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	4	943	3	461	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	4	884	3	432	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
5	4	784	3	383	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
6	4	775	3	378	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
7	4	765	3	373	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
8	4	695	3	340	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No
9	4	685	3	335	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
10	4	675	3	330	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
11	4	586	3	286	No	Yes	Yes	Yes	No	No	No	Yes	No	No
12	4	546	3	267	No	Yes	Yes	Yes	No	No	No	Yes	No	No
13	4	536	3	262	No	Yes	Yes	Yes	No	No	No	Yes	No	No
14	4	397	3	194	No	No	No	Yes	No	No	No	No	No	No
15	4	397	3	194	No	No	No	Yes	No	No	No	No	No	No
16	4	278	3	136	No	No	No	No	No	No	No	No	No	No
17	4	159	3	78	No	No	No	No	No	No	No	No	No	No
18	4	159	3	78	No	No	No	No	No	No	No	No	No	No
19	4	89	3	44	No	No	No	No	No	No	No	No	No	No
20	4	50	3	24	No	No	No	No	No	No	No	No	No	No
21	4	30	3	15	No	No	No	No	No	No	No	No	No	No
22	4	10	3	5	No	No	No	No	No	No	No	No	No	No
23	4	10	3	5	No	No	No	No	No	No	No	No	No	No
24	4	10	3	5	No	No	No	No	No	No	No	No	No	No
Hours Met					10	13	13	15	3	7	10	13	8	4

Warrant 3 Condition A

Orientation	N	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	154.1	1277.8
Number of Lanes on Minor Street Approach	3	3
VehicleHours of Stopped Delay on Minor Approach (h:mm)	5:08	172:09
Delay Condition Met	Yes	Yes
Volume on Minor Street Approach During Same Hour	120	485
High Minor Volume Condition Met	No	Yes
Total Entering Volume on All Approaches During Same Hour	1598	1598
Number of Approaches on Intersection	3	3
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	Yes
Warrant Met for Intersection	Yes	

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Intersection Level Of Service Report
Intersection 1: E Colfax Ave/Manila Rd

Control Type:	Signalized	Delay (sec / veh):	27.4
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.721

Intersection Setup

Name	Manila Rd			Manila Rd			E Colfax Ave			E Colfax Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	0	0	1	1	0	1
Entry Pocket Length [ft]	460.00	100.00	432.00	300.00	100.00	100.00	100.00	100.00	600.00	880.00	100.00	600.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	960.00
Speed [mph]	45.00			45.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Manila Rd			Manila Rd			E Colfax Ave			E Colfax Ave		
Base Volume Input [veh/h]	20	1135	349	20	155	5	5	113	15	171	303	50
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	175	0	0	3	0	0	8	0	0	25
Total Hourly Volume [veh/h]	20	1135	174	20	155	2	5	113	7	171	303	25
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	308	47	5	42	1	1	31	2	46	82	7
Total Analysis Volume [veh/h]	22	1234	189	22	168	2	5	123	8	186	329	27
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	3	8	1	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	30	30	30	30	30	0	10	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	19	0	0	11	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	9	34	9	9	34	0	9	28	0	9	28	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	5	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		No	No		Yes	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	C	R	L	C	R
C, Calculated Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	39	33	33	39	33	33	33	24	33	24	24
g / C, Green / Cycle	0.49	0.41	0.41	0.49	0.41	0.41	0.41	0.30	0.41	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.02	0.41	0.14	0.05	0.05	0.05	0.09	0.01	0.17	0.21	0.02
s, saturation flow rate [veh/h]	1089	3046	1360	445	1600	1593	1427	1360	1077	1600	1360
c, Capacity [veh/h]	618	1252	559	214	657	655	650	411	439	483	411
d1, Uniform Delay [s]	10.80	23.33	16.12	17.76	14.66	14.66	15.17	19.60	20.36	24.53	19.88
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	8.98	0.36	0.21	0.09	0.09	0.68	0.09	0.65	7.55	0.31
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.04	0.99	0.34	0.10	0.13	0.13	0.20	0.02	0.42	0.68	0.07
d, Delay for Lane Group [s/veh]	10.83	32.31	16.48	17.97	14.75	14.75	15.84	19.69	21.01	32.07	20.19
Lane Group LOS	B	C	B	B	B	B	B	B	C	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.18	11.42	2.14	0.19	0.87	0.87	1.38	0.10	2.50	5.78	0.35
50th-Percentile Queue Length [ft/ln]	4.48	285.41	53.52	4.69	21.74	21.72	34.39	2.56	62.57	144.48	8.80
95th-Percentile Queue Length [veh/ln]	0.32	16.96	3.85	0.34	1.57	1.56	2.48	0.18	4.50	9.72	0.63
95th-Percentile Queue Length [ft/ln]	8.07	423.94	96.34	8.44	39.14	39.09	61.90	4.61	112.62	243.05	15.85

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.83	32.31	16.48	17.97	14.75	14.75	15.84	15.84	19.69	21.01	32.07	20.19
Movement LOS	B	C	B	B	B	B	B	B	B	C	C	C
d_A, Approach Delay [s/veh]	29.91			15.12			16.07			27.68		
Approach LOS	C			B			B			C		
d_I, Intersection Delay [s/veh]	27.35											
Intersection LOS	C											
Intersection V/C	0.721											

Emissions

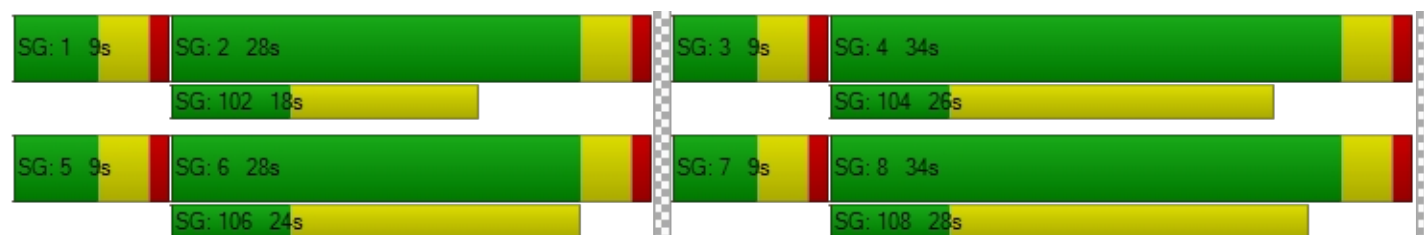
Vehicle Miles Traveled [mph]	21.52	1207.15	184.89	7.63	29.49	29.45	12.49	0.78	107.06	189.36	15.54
Stops [stops/h]	8.07	1027.47	96.34	8.44	39.14	39.09	61.90	4.61	112.62	260.07	15.85
Fuel consumption [US gal/h]	0.89	62.27	8.17	0.45	1.75	1.75	1.98	0.14	6.47	13.31	0.93
CO [g/h]	61.96	4352.50	571.02	31.24	122.52	122.35	138.43	10.06	452.14	930.54	64.67
NOx [g/h]	12.06	846.84	111.10	6.08	23.84	23.80	26.93	1.96	87.97	181.05	12.58
VOC [g/h]	14.36	1008.73	132.34	7.24	28.40	28.36	32.08	2.33	104.79	215.66	14.99

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	29.76			29.76			29.76			29.76		
I_p,int, Pedestrian LOS Score for Intersectio	3.445			2.914			2.257			2.727		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	750			750			825			600		
d_b, Bicycle Delay [s]	15.63			15.63			13.81			19.60		
I_b,int, Bicycle LOS Score for Intersection	2.896			1.720			1.797			2.495		
Bicycle LOS	C			A			A			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: E Colfax Ave/Peterson Rd

Control Type:	Two-way stop	Delay (sec / veh):	34.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.008

Intersection Setup

Name	Peterson Rd			Peterson Rd			E Colfax Ave			E Colfax Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⬆			⬆			⬆			⬆		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	890.00	100.00	100.00	100.00	100.00	600.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	960.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd			Peterson Rd			E Colfax Ave			E Colfax Ave		
Base Volume Input [veh/h]	1	1	1	7	1	57	289	133	1	1	239	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	1	1	7	1	57	289	133	1	1	239	33
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	2	0	15	79	36	0	0	65	9
Total Analysis Volume [veh/h]	1	1	1	8	1	62	314	145	1	1	260	36
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.00	0.06	0.01	0.08	0.27	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	33.96	29.34	9.51	31.84	29.16	11.17	9.20	0.00	0.00	7.70	0.00	0.00
Movement LOS	D	D	A	D	D	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.05	0.05	0.05	0.51	0.51	0.51	1.09	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.20	1.20	1.20	12.83	12.83	12.83	27.25	0.00	0.00	0.06	0.00	0.00
d_A, Approach Delay [s/veh]	24.27			13.75			6.28			0.03		
Approach LOS	C			B			A			A		
d_I, Intersection Delay [s/veh]	4.75											
Intersection LOS	D											

Intersection Level Of Service Report
Intersection 3: Manila Rd/I-70 Westbound Ramp

Control Type:	Signalized	Delay (sec / veh):	8.0
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.554

Intersection Setup

Name	Manila Rd			Manila Rd						Westbound Ramp		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1	0	0	0	1	0	1
Entry Pocket Length [ft]	735.00	100.00	100.00	100.00	100.00	435.00	100.00	100.00	100.00	535.00	100.00	435.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Manila Rd			Manila Rd						Westbound Ramp		
Base Volume Input [veh/h]	300	1205	0	0	77	273	0	0	0	45	5	310
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	2.00	2.00	20.00	20.00	2.00	2.00	2.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	137	0	0	0	0	0	155
Total Hourly Volume [veh/h]	300	1205	0	0	77	136	0	0	0	45	5	155
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	82	327	0	0	21	37	0	0	0	12	1	42
Total Analysis Volume [veh/h]	326	1310	0	0	84	148	0	0	0	49	5	168
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	1	6	0	0	2	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	0	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	9	34	0	0	25	0	0	0	0	0	26	0
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	10	0	0	10	0	0	0	0	0	10	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R		L	C	R
C, Calculated Cycle Length [s]	60	60	60	60		60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	42	42	33	33		10	10	10
g / C, Green / Cycle	0.70	0.70	0.55	0.55		0.16	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.30	0.43	0.05	0.11		0.03	0.00	0.12
s, saturation flow rate [veh/h]	1072	3046	1600	1360		1524	1600	1360
c, Capacity [veh/h]	888	2135	881	749		253	265	225
d1, Uniform Delay [s]	3.47	4.71	6.39	6.79		21.57	20.95	23.82
k, delay calibration	0.16	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	0.38	1.33	0.22	0.59		0.37	0.03	4.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.37	0.61	0.10	0.20		0.19	0.02	0.75
d, Delay for Lane Group [s/veh]	3.85	6.04	6.60	7.38		21.94	20.97	28.67
Lane Group LOS	A	A	A	A		C	C	C
Critical Lane Group	No	Yes	No	No		No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.67	1.99	0.40	0.77		0.59	0.06	2.42
50th-Percentile Queue Length [ft/ln]	16.80	49.87	9.94	19.23		14.63	1.44	60.52
95th-Percentile Queue Length [veh/ln]	1.21	3.59	0.72	1.38		1.05	0.10	4.36
95th-Percentile Queue Length [ft/ln]	30.24	89.76	17.90	34.62		26.34	2.59	108.94

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	3.85	6.04	0.00	0.00	6.60	7.38	0.00	0.00	0.00	21.94	20.97	28.67
Movement LOS	A	A			A	A				C	C	C
d_A, Approach Delay [s/veh]	5.60			7.10			0.00			27.01		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	8.04											
Intersection LOS	A											
Intersection V/C	0.554											

Emissions

Vehicle Miles Traveled [mph]	22.68	91.15	10.26	18.08		4.93	0.50	16.89
Stops [stops/h]	40.33	239.36	23.87	46.16		35.12	3.45	145.26
Fuel consumption [US gal/h]	1.53	7.71	0.76	1.42		0.62	0.06	2.48
CO [g/h]	107.27	538.91	53.21	98.97		43.03	4.27	173.20
NOx [g/h]	20.87	104.85	10.35	19.26		8.37	0.83	33.70
VOC [g/h]	24.86	124.90	12.33	22.94		9.97	0.99	40.14

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	20.01
I_p,int, Pedestrian LOS Score for Intersectio	2.755	3.035	2.264	2.261
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1000	700	0	733
d_b, Bicycle Delay [s]	7.50	12.68	30.00	12.03
I_b,int, Bicycle LOS Score for Intersection	2.909	2.168	4.132	2.182
Bicycle LOS	C	B	D	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Manila Rd/I-70 Eastbound Ramp

Control Type:	Signalized	Delay (sec / veh):	30.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.695

Intersection Setup

Name	Manila Rd			Manila Rd			Eastbound Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↑↱			↰↑			↰↱↲					
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	435.00	680.00	100.00	100.00	980.00	100.00	435.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Manila Rd			Manila Rd			Eastbound Ramp					
Base Volume Input [veh/h]	0	415	70	52	80	0	1090	5	90	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	20.00	20.00	20.00	20.00	2.00	20.00	20.00	20.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	35	0	0	0	0	0	45	0	0	0
Total Hourly Volume [veh/h]	0	415	35	52	80	0	1090	5	45	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	113	10	14	22	0	296	1	12	0	0	0
Total Analysis Volume [veh/h]	0	451	38	57	87	0	1185	5	49	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Maximum Green [s]	0	30	0	10	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	0	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	11	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	25	0	9	34	0	0	46	0	0	0	0
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	5	10	0	0	10	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Minimum Recall		No		Yes	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	R	
C, Calculated Cycle Length [s]	80	80	80	80	80	80	80	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	30	30	38	38	34	34	34	
g / C, Green / Cycle	0.38	0.38	0.47	0.47	0.43	0.43	0.43	
(v / s)_i Volume / Saturation Flow Rate	0.28	0.03	0.06	0.05	0.39	0.39	0.04	
s, saturation flow rate [veh/h]	1600	1360	889	1600	1524	1524	1360	
c, Capacity [veh/h]	600	510	344	754	653	654	583	
d1, Uniform Delay [s]	21.74	16.06	14.57	11.83	21.42	21.41	13.54	
k, delay calibration	0.50	0.50	0.50	0.50	0.27	0.27	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	8.42	0.28	1.04	0.31	11.85	11.80	0.06	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.75	0.07	0.17	0.12	0.91	0.91	0.08	
d, Delay for Lane Group [s/veh]	30.16	16.34	15.61	12.14	33.26	33.21	13.60	
Lane Group LOS	C	B	B	B	C	C	B	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	8.30	0.47	0.62	0.88	11.73	11.72	0.51	
50th-Percentile Queue Length [ft/ln]	207.56	11.74	15.60	22.01	293.26	293.01	12.72	
95th-Percentile Queue Length [veh/ln]	13.03	0.85	1.12	1.58	17.35	17.34	0.92	
95th-Percentile Queue Length [ft/ln]	325.70	21.13	28.07	39.62	433.68	433.38	22.89	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	30.16	16.34	15.61	12.14	0.00	33.24	33.21	13.60	0.00	0.00	0.00
Movement LOS		C	B	B	B		C	C	B			
d_A, Approach Delay [s/veh]	29.09			13.51			32.46			0.00		
Approach LOS	C			B			C			A		
d_I, Intersection Delay [s/veh]	30.12											
Intersection LOS	C											
Intersection V/C	0.695											

Emissions

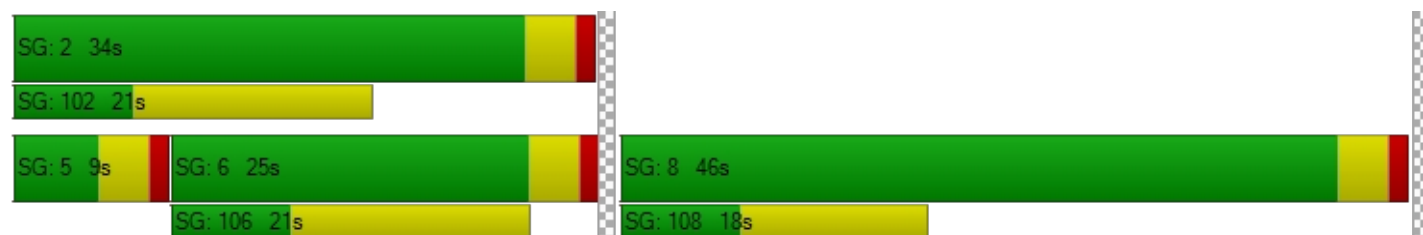
Vehicle Miles Traveled [mph]	97.17	8.19	3.97	6.05	59.18	59.18	4.87	
Stops [stops/h]	373.61	21.13	28.07	39.62	527.87	527.42	22.89	
Fuel consumption [US gal/h]	8.83	0.58	0.50	0.68	9.38	9.37	0.46	
CO [g/h]	617.41	40.56	34.91	47.74	655.67	655.07	32.35	
NOx [g/h]	120.13	7.89	6.79	9.29	127.57	127.45	6.29	
VOC [g/h]	143.09	9.40	8.09	11.07	151.96	151.82	7.50	

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
I_p,int, Pedestrian LOS Score for Intersectio	2.346	2.558	2.415	1.581
Crosswalk LOS	B	B	B	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	525	750	1050	0
d_b, Bicycle Delay [s]	21.76	15.63	9.03	40.00
I_b,int, Bicycle LOS Score for Intersection	2.424	1.797	3.678	4.132
Bicycle LOS	B	A	D	D

Sequence




Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peterson Rd/ Access 1

Control Type:	Two-way stop	Delay (sec / veh):	8.7
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.023

Intersection Setup

Name	Peterson Rd		Peterson Rd		Access 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Peterson Rd		Peterson Rd		Access 1	
Base Volume Input [veh/h]	107	213	41	0	0	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	16.00	16.00	16.00	16.00	16.00	16.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	213	41	0	0	21
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	58	11	0	0	6
Total Analysis Volume [veh/h]	116	232	45	0	0	23
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results




V/C, Movement V/C Ratio	0.08	0.00	0.00	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	7.57	0.00	0.00	0.00	13.00	8.74
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.21	0.21	0.00	0.00	0.07	0.07
95th-Percentile Queue Length [ft/ln]	5.16	5.16	0.00	0.00	1.79	1.79
d_A, Approach Delay [s/veh]	2.52		0.00		8.74	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.60					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 6: Peterson Rd/ Access 2

Control Type:	Two-way stop	Delay (sec / veh):	8.7
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.023

Intersection Setup

Name	Peterson Rd		Peterson Rd		Access 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Peterson Rd		Peterson Rd		Access 2	
Base Volume Input [veh/h]	107	107	21	0	0	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	107	21	0	0	21
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	29	6	0	0	6
Total Analysis Volume [veh/h]	116	116	23	0	0	23
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.00	0.00	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	7.57	0.00	0.00	0.00	11.68	8.67
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.21	0.21	0.00	0.00	0.07	0.07
95th-Percentile Queue Length [ft/ln]	5.16	5.16	0.00	0.00	1.76	1.76
d_A, Approach Delay [s/veh]	3.78		0.00		8.67	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.87					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 15: 48th Ave/Access 3

Control Type: Two-way stop
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 8.6
Level Of Service: A
Volume to Capacity (v/c): 0.022

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	0	21	0	0	0	0	0	0	107	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	21	0	0	0	0	0	0	107	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	6	0	0	0	0	0	0	29	0	0
Total Analysis Volume [veh/h]	0	0	23	0	0	0	0	0	0	116	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00
d_M, Delay for Movement [s/veh]	10.76	11.19	8.56	10.91	11.11	8.48	7.38	0.00	0.00	7.58	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.07	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.25	0.25
95th-Percentile Queue Length [ft/ln]	1.70	1.70	1.70	0.00	0.00	0.00	0.00	0.00	0.00	6.22	6.22	6.22
d_A, Approach Delay [s/veh]	8.56			10.17			2.46			7.58		
Approach LOS	A			B			A			A		
d_I, Intersection Delay [s/veh]	7.74											
Intersection LOS	A											

Intersection Level Of Service Report
Intersection 16: 48th Ave/Peterson Rd

Control Type:	Two-way stop	Delay (sec / veh):	8.6
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.022

Intersection Setup

Name	Peterson Rd											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd											
Base Volume Input [veh/h]	107	0	0	0	0	0	0	0	21	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	0	0	0	0	0	0	0	21	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	0	0	0	0	0	0	0	6	0	0	0
Total Analysis Volume [veh/h]	116	0	0	0	0	0	0	0	23	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.58	0.00	0.00	7.38	0.00	0.00	10.76	11.19	8.56	10.91	11.11	8.48
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh/ln]	0.25	0.25	0.25	0.00	0.00	0.00	0.07	0.07	0.07	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	6.22	6.22	6.22	0.00	0.00	0.00	1.70	1.70	1.70	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	7.58			2.46			8.56			10.17		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	7.74											
Intersection LOS	A											

Signal Warrants Report For Intersection 2: E Colfax Ave/Peterson Rd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	273	423	3	65
2	265	410	3	63
3	259	402	3	62
4	243	376	3	58
5	216	334	2	51
6	213	330	2	51
7	210	326	2	50
8	191	296	2	46
9	188	292	2	45
10	186	288	2	44
11	161	250	2	38
12	150	233	2	36
13	147	228	2	35
14	109	169	1	26
15	109	169	1	26
16	76	118	1	18
17	44	68	0	10
18	44	68	0	10
19	25	38	0	6
20	14	21	0	3
21	8	13	0	2
22	3	4	0	1
23	3	4	0	1
24	3	4	0	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	696	1	65	No	No	No	No	No	No	Yes	Yes	No	No
2	3	675	1	63	No	No	No	No	No	No	Yes	Yes	No	No
3	3	661	1	62	No	No	No	No	No	No	Yes	Yes	No	No
4	3	619	1	58	No	No	No	No	No	No	No	Yes	No	No
5	3	550	1	51	No	No	No	No	No	No	No	Yes	No	No
6	3	543	1	51	No	No	No	No	No	No	No	Yes	No	No
7	3	536	1	50	No	No	No	No	No	No	No	Yes	No	No
8	3	487	1	46	No	No	No	No	No	No	No	No	No	No
9	3	480	1	45	No	No	No	No	No	No	No	No	No	No
10	3	474	1	44	No	No	No	No	No	No	No	No	No	No
11	3	411	1	38	No	No	No	No	No	No	No	No	No	No
12	3	383	1	36	No	No	No	No	No	No	No	No	No	No
13	3	375	1	35	No	No	No	No	No	No	No	No	No	No
14	3	278	1	26	No	No	No	No	No	No	No	No	No	No
15	3	278	1	26	No	No	No	No	No	No	No	No	No	No
16	3	194	1	18	No	No	No	No	No	No	No	No	No	No
17	3	112	1	10	No	No	No	No	No	No	No	No	No	No
18	3	112	1	10	No	No	No	No	No	No	No	No	No	No
19	3	63	1	6	No	No	No	No	No	No	No	No	No	No
20	3	35	1	3	No	No	No	No	No	No	No	No	No	No
21	3	21	1	2	No	No	No	No	No	No	No	No	No	No
22	3	7	1	1	No	No	No	No	No	No	No	No	No	No
23	3	7	1	1	No	No	No	No	No	No	No	No	No	No
24	3	7	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	3	7	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	24.3	13.8
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:01	0:14
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	3	65
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	764	764
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

Signal Warrants Report For Intersection 5: Peterson Rd/ Access 1

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	320	41	21
2	310	40	20
3	304	39	20
4	285	36	19
5	253	32	17
6	250	32	16
7	246	32	16
8	224	29	15
9	221	28	14
10	218	28	14
11	189	24	12
12	176	23	12
13	173	22	11
14	128	16	8
15	128	16	8
16	90	11	6
17	51	7	3
18	51	7	3
19	29	4	2
20	16	2	1
21	10	1	1
22	3	0	0
23	3	0	0
24	3	0	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	361	1	21	No	No	No	No	No	No	No	No	No	No
2	1	350	1	20	No	No	No	No	No	No	No	No	No	No
3	1	343	1	20	No	No	No	No	No	No	No	No	No	No
4	1	321	1	19	No	No	No	No	No	No	No	No	No	No
5	1	285	1	17	No	No	No	No	No	No	No	No	No	No
6	1	282	1	16	No	No	No	No	No	No	No	No	No	No
7	1	278	1	16	No	No	No	No	No	No	No	No	No	No
8	1	253	1	15	No	No	No	No	No	No	No	No	No	No
9	1	249	1	14	No	No	No	No	No	No	No	No	No	No
10	1	246	1	14	No	No	No	No	No	No	No	No	No	No
11	1	213	1	12	No	No	No	No	No	No	No	No	No	No
12	1	199	1	12	No	No	No	No	No	No	No	No	No	No
13	1	195	1	11	No	No	No	No	No	No	No	No	No	No
14	1	144	1	8	No	No	No	No	No	No	No	No	No	No
15	1	144	1	8	No	No	No	No	No	No	No	No	No	No
16	1	101	1	6	No	No	No	No	No	No	No	No	No	No
17	1	58	1	3	No	No	No	No	No	No	No	No	No	No
18	1	58	1	3	No	No	No	No	No	No	No	No	No	No
19	1	33	1	2	No	No	No	No	No	No	No	No	No	No
20	1	18	1	1	No	No	No	No	No	No	No	No	No	No
21	1	11	1	1	No	No	No	No	No	No	No	No	No	No
22	1	3	1	0	No	No	No	No	No	No	No	No	No	No
23	1	3	1	0	No	No	No	No	No	No	No	No	No	No
24	1	3	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.7
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:03
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	21
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	382
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No

Signal Warrants Report For Intersection 6: Peterson Rd/ Access 2

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	214	21	21
2	208	20	20
3	203	20	20
4	190	19	19
5	169	17	17
6	167	16	16
7	165	16	16
8	150	15	15
9	148	14	14
10	146	14	14
11	126	12	12
12	118	12	12
13	116	11	11
14	86	8	8
15	86	8	8
16	60	6	6
17	34	3	3
18	34	3	3
19	19	2	2
20	11	1	1
21	6	1	1
22	2	0	0
23	2	0	0
24	2	0	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	235	1	21	No	No	No	No	No	No	No	No	No	No
2	1	228	1	20	No	No	No	No	No	No	No	No	No	No
3	1	223	1	20	No	No	No	No	No	No	No	No	No	No
4	1	209	1	19	No	No	No	No	No	No	No	No	No	No
5	1	186	1	17	No	No	No	No	No	No	No	No	No	No
6	1	183	1	16	No	No	No	No	No	No	No	No	No	No
7	1	181	1	16	No	No	No	No	No	No	No	No	No	No
8	1	165	1	15	No	No	No	No	No	No	No	No	No	No
9	1	162	1	14	No	No	No	No	No	No	No	No	No	No
10	1	160	1	14	No	No	No	No	No	No	No	No	No	No
11	1	138	1	12	No	No	No	No	No	No	No	No	No	No
12	1	130	1	12	No	No	No	No	No	No	No	No	No	No
13	1	127	1	11	No	No	No	No	No	No	No	No	No	No
14	1	94	1	8	No	No	No	No	No	No	No	No	No	No
15	1	94	1	8	No	No	No	No	No	No	No	No	No	No
16	1	66	1	6	No	No	No	No	No	No	No	No	No	No
17	1	37	1	3	No	No	No	No	No	No	No	No	No	No
18	1	37	1	3	No	No	No	No	No	No	No	No	No	No
19	1	21	1	2	No	No	No	No	No	No	No	No	No	No
20	1	12	1	1	No	No	No	No	No	No	No	No	No	No
21	1	7	1	1	No	No	No	No	No	No	No	No	No	No
22	1	2	1	0	No	No	No	No	No	No	No	No	No	No
23	1	2	1	0	No	No	No	No	No	No	No	No	No	No
24	1	2	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.7
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:03
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	21
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	256
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No

Signal Warrants Report For Intersection 15: 48th Ave/Access 3

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	107	0	21	0
2	104	0	20	0
3	102	0	20	0
4	95	0	19	0
5	85	0	17	0
6	83	0	16	0
7	82	0	16	0
8	75	0	15	0
9	74	0	14	0
10	73	0	14	0
11	63	0	12	0
12	59	0	12	0
13	58	0	11	0
14	43	0	8	0
15	43	0	8	0
16	30	0	6	0
17	17	0	3	0
18	17	0	3	0
19	10	0	2	0
20	5	0	1	0
21	3	0	1	0
22	1	0	0	0
23	1	0	0	0
24	1	0	0	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	107	1	21	No	No	No	No	No	No	No	No	No	No
2	1	104	1	20	No	No	No	No	No	No	No	No	No	No
3	1	102	1	20	No	No	No	No	No	No	No	No	No	No
4	1	95	1	19	No	No	No	No	No	No	No	No	No	No
5	1	85	1	17	No	No	No	No	No	No	No	No	No	No
6	1	83	1	16	No	No	No	No	No	No	No	No	No	No
7	1	82	1	16	No	No	No	No	No	No	No	No	No	No
8	1	75	1	15	No	No	No	No	No	No	No	No	No	No
9	1	74	1	14	No	No	No	No	No	No	No	No	No	No
10	1	73	1	14	No	No	No	No	No	No	No	No	No	No
11	1	63	1	12	No	No	No	No	No	No	No	No	No	No
12	1	59	1	12	No	No	No	No	No	No	No	No	No	No
13	1	58	1	11	No	No	No	No	No	No	No	No	No	No
14	1	43	1	8	No	No	No	No	No	No	No	No	No	No
15	1	43	1	8	No	No	No	No	No	No	No	No	No	No
16	1	30	1	6	No	No	No	No	No	No	No	No	No	No
17	1	17	1	3	No	No	No	No	No	No	No	No	No	No
18	1	17	1	3	No	No	No	No	No	No	No	No	No	No
19	1	10	1	2	No	No	No	No	No	No	No	No	No	No
20	1	5	1	1	No	No	No	No	No	No	No	No	No	No
21	1	3	1	1	No	No	No	No	No	No	No	No	No	No
22	1	1	1	0	No	No	No	No	No	No	No	No	No	No
23	1	1	1	0	No	No	No	No	No	No	No	No	No	No
24	1	1	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.6	10.2
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:02	0:00
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	21	0
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	128	128
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

Signal Warrants Report For Intersection 16: 48th Ave/Peterson Rd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	N	S	E	W
1	0	107	0	21
2	0	104	0	20
3	0	102	0	20
4	0	95	0	19
5	0	85	0	17
6	0	83	0	16
7	0	82	0	16
8	0	75	0	15
9	0	74	0	14
10	0	73	0	14
11	0	63	0	12
12	0	59	0	12
13	0	58	0	11
14	0	43	0	8
15	0	43	0	8
16	0	30	0	6
17	0	17	0	3
18	0	17	0	3
19	0	10	0	2
20	0	5	0	1
21	0	3	0	1
22	0	1	0	0
23	0	1	0	0
24	0	1	0	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	107	1	21	No	No	No	No	No	No	No	No	No	No
2	1	104	1	20	No	No	No	No	No	No	No	No	No	No
3	1	102	1	20	No	No	No	No	No	No	No	No	No	No
4	1	95	1	19	No	No	No	No	No	No	No	No	No	No
5	1	85	1	17	No	No	No	No	No	No	No	No	No	No
6	1	83	1	16	No	No	No	No	No	No	No	No	No	No
7	1	82	1	16	No	No	No	No	No	No	No	No	No	No
8	1	75	1	15	No	No	No	No	No	No	No	No	No	No
9	1	74	1	14	No	No	No	No	No	No	No	No	No	No
10	1	73	1	14	No	No	No	No	No	No	No	No	No	No
11	1	63	1	12	No	No	No	No	No	No	No	No	No	No
12	1	59	1	12	No	No	No	No	No	No	No	No	No	No
13	1	58	1	11	No	No	No	No	No	No	No	No	No	No
14	1	43	1	8	No	No	No	No	No	No	No	No	No	No
15	1	43	1	8	No	No	No	No	No	No	No	No	No	No
16	1	30	1	6	No	No	No	No	No	No	No	No	No	No
17	1	17	1	3	No	No	No	No	No	No	No	No	No	No
18	1	17	1	3	No	No	No	No	No	No	No	No	No	No
19	1	10	1	2	No	No	No	No	No	No	No	No	No	No
20	1	5	1	1	No	No	No	No	No	No	No	No	No	No
21	1	3	1	1	No	No	No	No	No	No	No	No	No	No
22	1	1	1	0	No	No	No	No	No	No	No	No	No	No
23	1	1	1	0	No	No	No	No	No	No	No	No	No	No
24	1	1	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	10.2	8.6
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:00	0:02
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	0	21
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	128	128
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

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Intersection Level Of Service Report
Intersection 1: E Colfax Ave/Manila Rd

Control Type:	Signalized	Delay (sec / veh):	31.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.743

Intersection Setup

Name	Manila Rd			Manila Rd			E Colfax Ave			E Colfax Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	0	0	1	1	0	1
Entry Pocket Length [ft]	460.00	100.00	435.00	300.00	100.00	100.00	100.00	100.00	600.00	880.00	100.00	600.00
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Manila Rd			Manila Rd			E Colfax Ave			E Colfax Ave		
Base Volume Input [veh/h]	20	145	165	55	865	20	5	373	40	280	160	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	83	0	0	10	0	0	20	0	0	3
Total Hourly Volume [veh/h]	20	145	82	55	865	10	5	373	20	280	160	2
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	39	22	15	235	3	1	101	5	76	43	1
Total Analysis Volume [veh/h]	22	158	89	60	940	11	5	405	22	304	174	2
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	3	8	1	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	30	30	30	30	30	0	10	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	19	0	0	11	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	9	32	15	9	32	0	9	24	0	15	30	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	5	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		No	No		Yes	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	C	R	L	C	R
C, Calculated Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	32	25	25	32	26	26	40	25	40	31	31
g / C, Green / Cycle	0.40	0.31	0.31	0.40	0.33	0.33	0.50	0.31	0.50	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.03	0.05	0.07	0.06	0.30	0.30	0.26	0.02	0.37	0.11	0.00
s, saturation flow rate [veh/h]	634	3046	1360	1067	1600	1593	1585	1360	822	1600	1360
c, Capacity [veh/h]	243	940	420	529	527	524	884	418	343	611	519
d1, Uniform Delay [s]	17.65	20.17	20.46	14.75	25.64	25.64	13.80	19.52	26.68	17.15	15.31
k, delay calibration	0.11	0.11	0.11	0.11	0.29	0.29	0.50	0.50	0.44	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	0.08	0.25	0.09	14.08	14.13	1.75	0.24	24.33	1.17	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.09	0.17	0.21	0.11	0.90	0.90	0.46	0.05	0.89	0.28	0.00
d, Delay for Lane Group [s/veh]	17.81	20.25	20.71	14.85	39.72	39.76	15.55	19.76	51.01	18.32	15.32
Lane Group LOS	B	C	C	B	D	D	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.23	0.99	1.15	0.62	9.75	9.72	4.44	0.28	5.79	2.09	0.02
50th-Percentile Queue Length [ft/ln]	5.66	24.87	28.84	15.43	243.80	242.98	111.05	7.04	144.69	52.29	0.53
95th-Percentile Queue Length [veh/ln]	0.41	1.79	2.08	1.11	14.87	14.83	7.90	0.51	9.73	3.76	0.04
95th-Percentile Queue Length [ft/ln]	10.19	44.76	51.91	27.78	371.84	370.80	197.47	12.68	243.33	94.12	0.96

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	17.81	20.25	20.71	14.85	39.74	39.76	15.55	15.55	19.76	51.01	18.32	15.32
Movement LOS	B	C	C	B	D	D	B	B	B	D	B	B
d_A, Approach Delay [s/veh]	20.20			38.26			15.77			39.01		
Approach LOS	C			D			B			D		
d_I, Intersection Delay [s/veh]	31.78											
Intersection LOS	C											
Intersection V/C	0.743											

Emissions

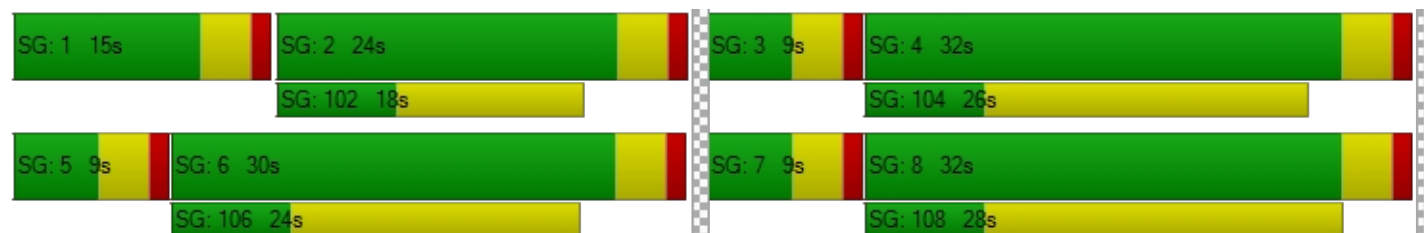
Vehicle Miles Traveled [mph]	21.47	154.20	86.86	20.80	165.19	164.52	40.01	2.15	174.97	100.15	1.15
Stops [stops/h]	10.19	89.53	51.91	27.78	438.84	437.37	199.90	12.68	260.44	94.12	0.96
Fuel consumption [US gal/h]	0.94	7.05	4.00	1.24	14.97	14.92	6.35	0.40	13.85	5.75	0.06
CO [g/h]	65.87	492.78	279.45	86.66	1046.39	1042.71	443.79	27.67	967.86	401.72	4.38
NOx [g/h]	12.82	95.88	54.37	16.86	203.59	202.87	86.35	5.38	188.31	78.16	0.85
VOC [g/h]	15.27	114.21	64.76	20.08	242.51	241.66	102.85	6.41	224.31	93.10	1.01

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	29.76			29.76			29.76			29.76		
I_p,int, Pedestrian LOS Score for Intersectio	3.480			3.238			2.463			2.658		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	700			700			875			650		
d_b, Bicycle Delay [s]	16.90			16.90			12.66			18.23		
I_b,int, Bicycle LOS Score for Intersection	1.850			2.402			2.305			2.357		
Bicycle LOS	A			B			B			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: E Colfax Ave/Peterson Rd

Control Type:	Two-way stop	Delay (sec / veh):	22.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Peterson Rd			Peterson Rd			E Colfax Ave			E Colfax Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	890.00	100.00	100.00	100.00	100.00	600.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	960.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd			Peterson Rd			E Colfax Ave			E Colfax Ave		
Base Volume Input [veh/h]	1	1	1	32	1	279	74	295	1	1	167	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	1	1	32	1	279	74	295	1	1	167	9
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	9	0	76	20	80	0	0	45	2
Total Analysis Volume [veh/h]	1	1	1	35	1	303	80	321	1	1	182	10
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.11	0.00	0.37	0.06	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	22.78	15.98	10.40	20.71	20.39	14.07	8.00	0.00	0.00	8.15	0.00	0.00
Movement LOS	C	C	B	C	C	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.03	0.03	0.03	2.64	2.64	2.64	0.20	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.71	0.71	0.71	65.88	65.88	65.88	4.99	0.00	0.00	0.07	0.00	0.00
d_A, Approach Delay [s/veh]	16.39			14.77			1.59			0.04		
Approach LOS	C			B			A			A		
d_I, Intersection Delay [s/veh]	6.09											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 3: Manila Rd/I-70 Westbound Ramp

Control Type:	Signalized	Delay (sec / veh):	8.4
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.435

Intersection Setup

Name	Manila Rd			Manila Rd						Westbound Ramp		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1	0	0	0	1	0	1
Entry Pocket Length [ft]	735.00	100.00	100.00	100.00	100.00	435.00	100.00	100.00	100.00	535.00	100.00	435.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Manila Rd			Manila Rd						Westbound Ramp		
Base Volume Input [veh/h]	135	263	0	0	350	889	0	0	0	75	5	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	2.00	2.00	20.00	20.00	2.00	2.00	2.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	445	0	0	0	0	0	31
Total Hourly Volume [veh/h]	135	263	0	0	350	444	0	0	0	75	5	31
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	71	0	0	95	121	0	0	0	20	1	8
Total Analysis Volume [veh/h]	147	286	0	0	380	483	0	0	0	82	5	34
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	1	6	0	0	2	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	0	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	9	67	0	0	58	0	0	0	0	0	23	0
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	10	0	0	10	0	0	0	0	0	10	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R		L	C	R
C, Calculated Cycle Length [s]	90	90	90	90		90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	72	72	64	64		10	10	10
g / C, Green / Cycle	0.80	0.80	0.71	0.71		0.11	0.11	0.11
(v / s)_i Volume / Saturation Flow Rate	0.23	0.09	0.24	0.36		0.05	0.00	0.03
s, saturation flow rate [veh/h]	641	3046	1600	1360		1524	1600	1360
c, Capacity [veh/h]	574	2448	1128	959		164	172	146
d1, Uniform Delay [s]	2.53	1.91	5.13	6.07		37.90	35.97	36.78
k, delay calibration	0.22	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	0.48	0.10	0.81	1.89		2.36	0.07	0.81
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.26	0.12	0.34	0.50		0.50	0.03	0.23
d, Delay for Lane Group [s/veh]	3.01	2.01	5.94	7.96		40.26	36.04	37.58
Lane Group LOS	A	A	A	A		D	D	D
Critical Lane Group	Yes	No	No	Yes		Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.29	0.24	2.14	3.34		1.79	0.10	0.71
50th-Percentile Queue Length [ft/ln]	7.28	6.04	53.50	83.47		44.83	2.52	17.78
95th-Percentile Queue Length [veh/ln]	0.52	0.43	3.85	6.01		3.23	0.18	1.28
95th-Percentile Queue Length [ft/ln]	13.10	10.87	96.30	150.25		80.70	4.54	32.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	3.01	2.01	0.00	0.00	5.94	7.96	0.00	0.00	0.00	40.26	36.04	37.58
Movement LOS	A	A			A	A				D	D	D
d_A, Approach Delay [s/veh]	2.35			7.07			0.00			39.33		
Approach LOS	A			A			A			D		
d_I, Intersection Delay [s/veh]	8.38											
Intersection LOS	A											
Intersection V/C	0.435											

Emissions

Vehicle Miles Traveled [mph]	10.23	19.90	47.28	60.10		8.24	0.50	3.42
Stops [stops/h]	11.64	19.32	85.60	133.56		71.73	4.03	28.44
Fuel consumption [US gal/h]	0.59	1.04	3.14	4.50		1.41	0.08	0.56
CO [g/h]	40.92	72.65	219.80	314.75		98.38	5.57	38.99
NOx [g/h]	7.96	14.13	42.77	61.24		19.14	1.08	7.59
VOC [g/h]	9.48	16.84	50.94	72.95		22.80	1.29	9.04

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
I_p,int, Pedestrian LOS Score for Intersectio	2.458	3.370	2.393	2.033
Crosswalk LOS	B	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1400	1200	0	422
d_b, Bicycle Delay [s]	4.05	7.20	45.00	28.01
I_b,int, Bicycle LOS Score for Intersection	1.917	3.718	4.132	1.810
Bicycle LOS	A	D	D	A

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Manila Rd/I-70 Eastbound Ramp

Control Type:	Signalized	Delay (sec / veh):	13.0
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.333

Intersection Setup

Name	Manila Rd			Manila Rd			Eastbound Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	435.00	680.00	100.00	100.00	980.00	100.00	435.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Manila Rd			Manila Rd			Eastbound Ramp					
Base Volume Input [veh/h]	0	165	110	245	180	0	243	5	285	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	20.00	20.00	20.00	20.00	2.00	20.00	20.00	20.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	55	0	0	0	0	0	143	0	0	0
Total Hourly Volume [veh/h]	0	165	55	245	180	0	243	5	142	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	45	15	67	49	0	66	1	39	0	0	0
Total Analysis Volume [veh/h]	0	179	60	266	196	0	264	5	154	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	0	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	11	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	25	0	9	34	0	0	26	0	0	0	0
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	5	10	0	0	10	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	R	
C, Calculated Cycle Length [s]	60	60	60	60	60	60	60	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	21	21	30	30	22	22	22	
g / C, Green / Cycle	0.35	0.35	0.50	0.50	0.37	0.37	0.37	
(v / s)_i Volume / Saturation Flow Rate	0.11	0.04	0.24	0.12	0.09	0.09	0.11	
s, saturation flow rate [veh/h]	1600	1360	1104	1600	1524	1526	1360	
c, Capacity [veh/h]	560	476	643	800	559	560	499	
d1, Uniform Delay [s]	14.27	13.26	9.36	8.55	13.20	13.20	13.57	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	1.50	0.54	1.96	0.73	1.02	1.02	1.61	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.32	0.13	0.41	0.25	0.24	0.24	0.31	
d, Delay for Lane Group [s/veh]	15.78	13.80	11.33	9.28	14.21	14.21	15.18	
Lane Group LOS	B	B	B	A	B	B	B	
Critical Lane Group	Yes	No	Yes	No	No	No	Yes	
50th-Percentile Queue Length [veh/ln]	1.84	0.57	2.11	1.38	1.29	1.29	1.55	
50th-Percentile Queue Length [ft/ln]	45.90	14.27	52.66	34.48	32.21	32.26	38.86	
95th-Percentile Queue Length [veh/ln]	3.30	1.03	3.79	2.48	2.32	2.32	2.80	
95th-Percentile Queue Length [ft/ln]	82.62	25.69	94.79	62.06	57.98	58.07	69.96	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	15.78	13.80	11.33	9.28	0.00	14.21	14.21	15.18	0.00	0.00	0.00
Movement LOS		B	B	B	A		B	B	B			
d_A, Approach Delay [s/veh]	15.28			10.46			14.56			0.00		
Approach LOS	B			B			B			A		
d_I, Intersection Delay [s/veh]	13.03											
Intersection LOS	B											
Intersection V/C	0.333											

Emissions

Vehicle Miles Traveled [mph]	38.57	12.93	18.51	13.64	13.37	13.39	15.32	
Stops [stops/h]	110.16	34.26	126.39	82.74	77.31	77.43	93.27	
Fuel consumption [US gal/h]	2.77	0.89	2.07	1.39	1.37	1.37	1.62	
CO [g/h]	193.69	62.21	144.93	97.06	95.49	95.65	113.34	
NOx [g/h]	37.69	12.10	28.20	18.89	18.58	18.61	22.05	
VOC [g/h]	44.89	14.42	33.59	22.50	22.13	22.17	26.27	

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	20.01
I_p,int, Pedestrian LOS Score for Intersectio	2.379	2.329	2.305	1.922
Crosswalk LOS	B	B	B	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	700	1000	733	0
d_b, Bicycle Delay [s]	12.68	7.50	12.03	30.00
I_b,int, Bicycle LOS Score for Intersection	2.045	2.322	2.494	4.132
Bicycle LOS	B	B	B	D

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






Intersection Level Of Service Report

Intersection 5: Peterson Rd/ Access 1

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.145

Intersection Setup

Name	Peterson Rd		Peterson Rd		Access 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Peterson Rd		Peterson Rd		Access 1	
Base Volume Input [veh/h]	27	54	206	0	0	103
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	54	206	0	0	103
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	15	56	0	0	28
Total Analysis Volume [veh/h]	29	59	224	0	0	112
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.14
d_M, Delay for Movement [s/veh]	7.92	0.00	0.00	0.00	11.74	10.45
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.05	0.05	0.00	0.00	0.51	0.51
95th-Percentile Queue Length [ft/ln]	1.23	1.23	0.00	0.00	12.64	12.64
d_A, Approach Delay [s/veh]	2.61		0.00		10.45	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	3.30					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 6: Peterson Rd/ Access 2

Control Type:	Two-way stop	Delay (sec / veh):	9.6
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.125

Intersection Setup

Name	Peterson Rd		Peterson Rd		Access 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	↰		↱		↻	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Peterson Rd		Peterson Rd		Access 2	
Base Volume Input [veh/h]	27	27	103	0	0	103
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	27	103	0	0	103
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	7	28	0	0	28
Total Analysis Volume [veh/h]	29	29	112	0	0	112
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.13
d_M, Delay for Movement [s/veh]	7.66	0.00	0.00	0.00	10.48	9.60
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.05	0.05	0.00	0.00	0.43	0.43
95th-Percentile Queue Length [ft/ln]	1.23	1.23	0.00	0.00	10.69	10.69
d_A, Approach Delay [s/veh]	3.83		0.00		9.60	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.60					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 15: 48th Ave/Access 3

Control Type: Two-way stop
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 8.9
Level Of Service: A
Volume to Capacity (v/c): 0.108

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	0	103	0	0	0	0	0	0	27	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	103	0	0	0	0	0	0	27	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	28	0	0	0	0	0	0	7	0	0
Total Analysis Volume [veh/h]	0	0	112	0	0	0	0	0	0	29	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
d_M, Delay for Movement [s/veh]	9.52	10.01	8.90	10.00	9.59	8.48	7.38	0.00	0.00	7.43	0.00	0.00
Movement LOS	A	B	A	B	A	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.36	0.36	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06	0.06
95th-Percentile Queue Length [ft/ln]	9.08	9.08	9.08	0.00	0.00	0.00	0.00	0.00	0.00	1.47	1.47	1.47
d_A, Approach Delay [s/veh]	8.90			9.36			2.46			7.43		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	8.60											
Intersection LOS	A											

Intersection Level Of Service Report
Intersection 16: 48th Ave/Peterson Rd

Control Type:	Two-way stop	Delay (sec / veh):	8.9
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.108

Intersection Setup

Name	Peterson Rd											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd											
Base Volume Input [veh/h]	27	0	0	0	0	0	0	0	103	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	0	0	0	0	0	0	0	103	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	0	0	0	0	0	0	0	28	0	0	0
Total Analysis Volume [veh/h]	29	0	0	0	0	0	0	0	112	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.43	0.00	0.00	7.38	0.00	0.00	9.52	10.01	8.90	10.00	9.59	8.48
Movement LOS	A	A	A	A	A	A	A	B	A	B	A	A
95th-Percentile Queue Length [veh/ln]	0.06	0.06	0.06	0.00	0.00	0.00	0.36	0.36	0.36	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.47	1.47	1.47	0.00	0.00	0.00	9.08	9.08	9.08	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	7.43			2.46			8.90			9.36		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	8.60											
Intersection LOS	A											

Signal Warrants Report For Intersection 2: E Colfax Ave/Peterson Rd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	Yes
Population < 10,000	Yes
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	177	370	3	312
2	172	359	3	303
3	168	352	3	296
4	158	329	3	278
5	140	292	2	246
6	138	289	2	243
7	136	285	2	240
8	124	259	2	218
9	122	255	2	215
10	120	252	2	212
11	104	218	2	184
12	97	204	2	172
13	96	200	2	168
14	71	148	1	125
15	71	148	1	125
16	50	104	1	87
17	28	59	0	50
18	28	59	0	50
19	16	33	0	28
20	9	19	0	16
21	5	11	0	9
22	2	4	0	3
23	2	4	0	3
24	2	4	0	3

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	547	1	312	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
2	3	531	1	303	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
3	3	520	1	296	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
4	3	487	1	278	No	Yes	Yes	Yes	No	No	No	No	Yes	No
5	3	432	1	246	No	No	Yes	Yes	No	No	No	No	Yes	No
6	3	427	1	243	No	No	Yes	Yes	No	No	No	No	Yes	No
7	3	421	1	240	No	No	Yes	Yes	No	No	No	No	Yes	No
8	3	383	1	218	No	No	No	Yes	No	No	No	No	No	No
9	3	377	1	215	No	No	No	Yes	No	No	No	No	No	No
10	3	372	1	212	No	No	No	Yes	No	No	No	No	No	No
11	3	322	1	184	No	No	No	No	No	No	No	No	No	No
12	3	301	1	172	No	No	No	No	No	No	No	No	No	No
13	3	296	1	168	No	No	No	No	No	No	No	No	No	No
14	3	219	1	125	No	No	No	No	No	No	No	No	No	No
15	3	219	1	125	No	No	No	No	No	No	No	No	No	No
16	3	154	1	87	No	No	No	No	No	No	No	No	No	No
17	3	87	1	50	No	No	No	No	No	No	No	No	No	No
18	3	87	1	50	No	No	No	No	No	No	No	No	No	No
19	3	49	1	28	No	No	No	No	No	No	No	No	No	No
20	3	28	1	16	No	No	No	No	No	No	No	No	No	No
21	3	16	1	9	No	No	No	No	No	No	No	No	No	No
22	3	6	1	3	No	No	No	No	No	No	No	No	No	No
23	3	6	1	3	No	No	No	No	No	No	No	No	No	No
24	3	6	1	3	No	No	No	No	No	No	No	No	No	No
Hours Met					0	4	7	10	0	0	0	3	7	3

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	16.4	14.8
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:00	1:16
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	3	312
High Minor Volume Condition Met	No	Yes
Total Entering Volume on All Approaches During Same Hour	862	862
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

Signal Warrants Report For Intersection 5: Peterson Rd/ Access 1

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	81	206	103
2	79	200	100
3	77	196	98
4	72	183	92
5	64	163	81
6	63	161	80
7	62	159	79
8	57	144	72
9	56	142	71
10	55	140	70
11	48	122	61
12	45	113	57
13	44	111	56
14	32	82	41
15	32	82	41
16	23	58	29
17	13	33	16
18	13	33	16
19	7	19	9
20	4	10	5
21	2	6	3
22	1	2	1
23	1	2	1
24	1	2	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	287	1	103	No	No	No	Yes	No	No	No	No	No	No
2	1	279	1	100	No	No	No	No	No	No	No	No	No	No
3	1	273	1	98	No	No	No	No	No	No	No	No	No	No
4	1	255	1	92	No	No	No	No	No	No	No	No	No	No
5	1	227	1	81	No	No	No	No	No	No	No	No	No	No
6	1	224	1	80	No	No	No	No	No	No	No	No	No	No
7	1	221	1	79	No	No	No	No	No	No	No	No	No	No
8	1	201	1	72	No	No	No	No	No	No	No	No	No	No
9	1	198	1	71	No	No	No	No	No	No	No	No	No	No
10	1	195	1	70	No	No	No	No	No	No	No	No	No	No
11	1	170	1	61	No	No	No	No	No	No	No	No	No	No
12	1	158	1	57	No	No	No	No	No	No	No	No	No	No
13	1	155	1	56	No	No	No	No	No	No	No	No	No	No
14	1	114	1	41	No	No	No	No	No	No	No	No	No	No
15	1	114	1	41	No	No	No	No	No	No	No	No	No	No
16	1	81	1	29	No	No	No	No	No	No	No	No	No	No
17	1	46	1	16	No	No	No	No	No	No	No	No	No	No
18	1	46	1	16	No	No	No	No	No	No	No	No	No	No
19	1	26	1	9	No	No	No	No	No	No	No	No	No	No
20	1	14	1	5	No	No	No	No	No	No	No	No	No	No
21	1	8	1	3	No	No	No	No	No	No	No	No	No	No
22	1	3	1	1	No	No	No	No	No	No	No	No	No	No
23	1	3	1	1	No	No	No	No	No	No	No	No	No	No
24	1	3	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	1	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	10.4
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:17
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	103
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	390
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No

Signal Warrants Report For Intersection 6: Peterson Rd/ Access 2

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	54	103	103
2	52	100	100
3	51	98	98
4	48	92	92
5	43	81	81
6	42	80	80
7	42	79	79
8	38	72	72
9	37	71	71
10	37	70	70
11	32	61	61
12	30	57	57
13	29	56	56
14	22	41	41
15	22	41	41
16	15	29	29
17	9	16	16
18	9	16	16
19	5	9	9
20	3	5	5
21	2	3	3
22	1	1	1
23	1	1	1
24	1	1	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	157	1	103	No	No	No	No	No	No	No	No	No	No
2	1	152	1	100	No	No	No	No	No	No	No	No	No	No
3	1	149	1	98	No	No	No	No	No	No	No	No	No	No
4	1	140	1	92	No	No	No	No	No	No	No	No	No	No
5	1	124	1	81	No	No	No	No	No	No	No	No	No	No
6	1	122	1	80	No	No	No	No	No	No	No	No	No	No
7	1	121	1	79	No	No	No	No	No	No	No	No	No	No
8	1	110	1	72	No	No	No	No	No	No	No	No	No	No
9	1	108	1	71	No	No	No	No	No	No	No	No	No	No
10	1	107	1	70	No	No	No	No	No	No	No	No	No	No
11	1	93	1	61	No	No	No	No	No	No	No	No	No	No
12	1	87	1	57	No	No	No	No	No	No	No	No	No	No
13	1	85	1	56	No	No	No	No	No	No	No	No	No	No
14	1	63	1	41	No	No	No	No	No	No	No	No	No	No
15	1	63	1	41	No	No	No	No	No	No	No	No	No	No
16	1	44	1	29	No	No	No	No	No	No	No	No	No	No
17	1	25	1	16	No	No	No	No	No	No	No	No	No	No
18	1	25	1	16	No	No	No	No	No	No	No	No	No	No
19	1	14	1	9	No	No	No	No	No	No	No	No	No	No
20	1	8	1	5	No	No	No	No	No	No	No	No	No	No
21	1	5	1	3	No	No	No	No	No	No	No	No	No	No
22	1	2	1	1	No	No	No	No	No	No	No	No	No	No
23	1	2	1	1	No	No	No	No	No	No	No	No	No	No
24	1	2	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	9.6
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:16
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	103
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	260
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No

Signal Warrants Report For Intersection 15: 48th Ave/Access 3

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	27	0	103	0
2	26	0	100	0
3	26	0	98	0
4	24	0	92	0
5	21	0	81	0
6	21	0	80	0
7	21	0	79	0
8	19	0	72	0
9	19	0	71	0
10	18	0	70	0
11	16	0	61	0
12	15	0	57	0
13	15	0	56	0
14	11	0	41	0
15	11	0	41	0
16	8	0	29	0
17	4	0	16	0
18	4	0	16	0
19	2	0	9	0
20	1	0	5	0
21	1	0	3	0
22	0	0	1	0
23	0	0	1	0
24	0	0	1	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	27	1	103	No	No	No	No	No	No	No	No	No	No
2	1	26	1	100	No	No	No	No	No	No	No	No	No	No
3	1	26	1	98	No	No	No	No	No	No	No	No	No	No
4	1	24	1	92	No	No	No	No	No	No	No	No	No	No
5	1	21	1	81	No	No	No	No	No	No	No	No	No	No
6	1	21	1	80	No	No	No	No	No	No	No	No	No	No
7	1	21	1	79	No	No	No	No	No	No	No	No	No	No
8	1	19	1	72	No	No	No	No	No	No	No	No	No	No
9	1	19	1	71	No	No	No	No	No	No	No	No	No	No
10	1	18	1	70	No	No	No	No	No	No	No	No	No	No
11	1	16	1	61	No	No	No	No	No	No	No	No	No	No
12	1	15	1	57	No	No	No	No	No	No	No	No	No	No
13	1	15	1	56	No	No	No	No	No	No	No	No	No	No
14	1	11	1	41	No	No	No	No	No	No	No	No	No	No
15	1	11	1	41	No	No	No	No	No	No	No	No	No	No
16	1	8	1	29	No	No	No	No	No	No	No	No	No	No
17	1	4	1	16	No	No	No	No	No	No	No	No	No	No
18	1	4	1	16	No	No	No	No	No	No	No	No	No	No
19	1	2	1	9	No	No	No	No	No	No	No	No	No	No
20	1	1	1	5	No	No	No	No	No	No	No	No	No	No
21	1	1	1	3	No	No	No	No	No	No	No	No	No	No
22	1	0	1	1	No	No	No	No	No	No	No	No	No	No
23	1	0	1	1	No	No	No	No	No	No	No	No	No	No
24	1	0	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.9	9.4
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:15	0:00
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	103	0
High Minor Volume Condition Met	Yes	No
Total Entering Volume on All Approaches During Same Hour	130	130
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

Signal Warrants Report For Intersection 16: 48th Ave/Peterson Rd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	N	S	E	W
1	0	27	0	103
2	0	26	0	100
3	0	26	0	98
4	0	24	0	92
5	0	21	0	81
6	0	21	0	80
7	0	21	0	79
8	0	19	0	72
9	0	19	0	71
10	0	18	0	70
11	0	16	0	61
12	0	15	0	57
13	0	15	0	56
14	0	11	0	41
15	0	11	0	41
16	0	8	0	29
17	0	4	0	16
18	0	4	0	16
19	0	2	0	9
20	0	1	0	5
21	0	1	0	3
22	0	0	0	1
23	0	0	0	1
24	0	0	0	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	27	1	103	No	No	No	No	No	No	No	No	No	No
2	1	26	1	100	No	No	No	No	No	No	No	No	No	No
3	1	26	1	98	No	No	No	No	No	No	No	No	No	No
4	1	24	1	92	No	No	No	No	No	No	No	No	No	No
5	1	21	1	81	No	No	No	No	No	No	No	No	No	No
6	1	21	1	80	No	No	No	No	No	No	No	No	No	No
7	1	21	1	79	No	No	No	No	No	No	No	No	No	No
8	1	19	1	72	No	No	No	No	No	No	No	No	No	No
9	1	19	1	71	No	No	No	No	No	No	No	No	No	No
10	1	18	1	70	No	No	No	No	No	No	No	No	No	No
11	1	16	1	61	No	No	No	No	No	No	No	No	No	No
12	1	15	1	57	No	No	No	No	No	No	No	No	No	No
13	1	15	1	56	No	No	No	No	No	No	No	No	No	No
14	1	11	1	41	No	No	No	No	No	No	No	No	No	No
15	1	11	1	41	No	No	No	No	No	No	No	No	No	No
16	1	8	1	29	No	No	No	No	No	No	No	No	No	No
17	1	4	1	16	No	No	No	No	No	No	No	No	No	No
18	1	4	1	16	No	No	No	No	No	No	No	No	No	No
19	1	2	1	9	No	No	No	No	No	No	No	No	No	No
20	1	1	1	5	No	No	No	No	No	No	No	No	No	No
21	1	1	1	3	No	No	No	No	No	No	No	No	No	No
22	1	0	1	1	No	No	No	No	No	No	No	No	No	No
23	1	0	1	1	No	No	No	No	No	No	No	No	No	No
24	1	0	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	9.4	8.9
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:00	0:15
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	0	103
High Minor Volume Condition Met	No	Yes
Total Entering Volume on All Approaches During Same Hour	130	130
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

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Intersection Level Of Service Report
Intersection 1: E Colfax Ave/Manila Rd

Control Type:	Signalized	Delay (sec / veh):	39.3
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.658

Intersection Setup

Name	Manila Rd			Manila Rd			E Colfax Ave			E Colfax Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	460.00	100.00	435.00	300.00	100.00	250.00	625.00	100.00	600.00	990.00	100.00	600.00
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	2
Exit Pocket Length [ft]	0.00	0.00	550.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1620.00
Speed [mph]	45.00			45.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Manila Rd			Manila Rd			E Colfax Ave			E Colfax Ave		
Base Volume Input [veh/h]	20	1135	1046	20	155	5	5	343	15	317	351	50
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	256	0	0	0	0	32	0	50	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	651	0	0	3	0	0	8	0	0	25
Total Hourly Volume [veh/h]	20	1135	651	20	155	2	5	375	7	367	357	25
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	308	177	5	42	1	1	102	2	100	97	7
Total Analysis Volume [veh/h]	22	1234	708	22	168	2	5	408	8	399	388	27
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Unsigna	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	1	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	30	0	0	21	0	0	14	0	0	34	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	9	46	30	9	46	0	9	25	0	30	46	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	5	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	R
C, Calculated Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	51	44	51	44	44	51	34	34	13	46	46
g / C, Green / Cycle	0.46	0.40	0.46	0.40	0.40	0.46	0.31	0.31	0.12	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.02	0.41	0.05	0.06	0.00	0.01	0.13	0.13	0.09	0.24	0.02
s, saturation flow rate [veh/h]	1082	3046	486	3046	1360	868	1600	1589	4438	1600	1360
c, Capacity [veh/h]	555	1229	163	1229	549	343	501	497	513	675	574
d1, Uniform Delay [s]	16.21	32.80	25.53	20.71	19.59	17.69	29.86	29.87	47.26	24.27	18.76
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.03	12.85	0.37	0.05	0.00	0.08	2.54	2.57	2.58	3.54	0.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.04	1.00	0.14	0.14	0.00	0.01	0.42	0.42	0.78	0.57	0.05
d, Delay for Lane Group [s/veh]	16.24	45.65	25.90	20.76	19.60	17.77	32.40	32.44	49.84	27.82	18.91
Lane Group LOS	B	F	C	C	B	B	C	C	D	C	B
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.29	17.28	0.30	1.31	0.03	0.07	4.42	4.41	3.48	7.66	0.40
50th-Percentile Queue Length [ft/ln]	7.28	432.00	7.59	32.75	0.74	1.73	110.62	110.22	87.12	191.51	10.02
95th-Percentile Queue Length [veh/ln]	0.52	24.16	0.55	2.36	0.05	0.12	7.87	7.85	6.27	12.20	0.72
95th-Percentile Queue Length [ft/ln]	13.10	604.09	13.66	58.95	1.34	3.12	196.86	196.30	156.82	304.99	18.04

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	16.24	45.65	0.00	25.90	20.76	19.60	17.77	32.42	32.44	49.84	27.82	18.91
Movement LOS	B	F		C	C	B	B	C	C	D	C	B
d_A, Approach Delay [s/veh]	45.13			21.33			32.25			38.32		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	39.34											
Intersection LOS	D											
Intersection V/C	0.658											

Emissions

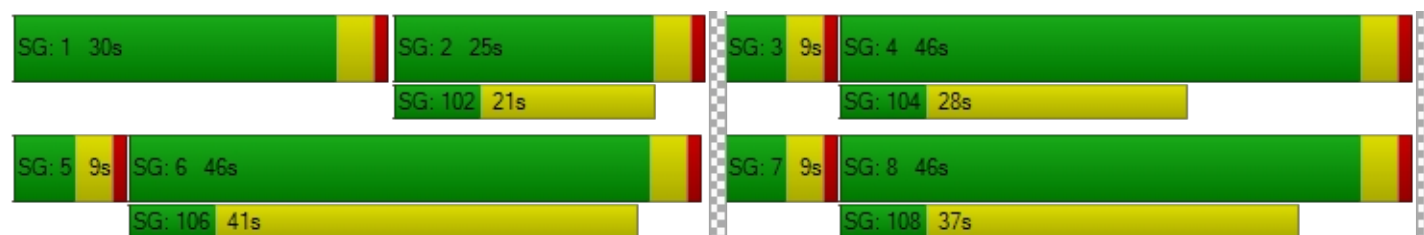
Vehicle Miles Traveled [mph]	21.52	1207.15	7.63	58.25	0.69	0.49	20.34	20.25	229.65	223.32	15.54
Stops [stops/h]	9.53	1131.07	9.94	85.75	0.97	2.27	144.81	144.28	342.15	250.71	13.12
Fuel consumption [US gal/h]	0.93	66.90	0.50	3.77	0.04	0.08	4.74	4.73	18.08	14.32	0.87
CO [g/h]	64.93	4676.60	35.02	263.69	3.06	5.35	331.66	330.43	1264.06	1001.22	60.64
NOx [g/h]	12.63	909.90	6.81	51.30	0.60	1.04	64.53	64.29	245.94	194.80	11.80
VOC [g/h]	15.05	1083.85	8.12	61.11	0.71	1.24	76.87	76.58	292.96	232.04	14.05

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersectio	3.071			2.832			2.542			3.067		
Crosswalk LOS	C			C			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	764			764			382			764		
d_b, Bicycle Delay [s]	21.02			21.02			36.00			21.02		
I_b,int, Bicycle LOS Score for Intersection	2.596			1.720			1.914			2.944		
Bicycle LOS	B			A			A			C		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: E Colfax Ave/Peterson Rd

Control Type:	Signalized	Delay (sec / veh):	53.9
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.831

Intersection Setup

Name	Peterson Rd			Peterson Rd			E Colfax Ave			E Colfax Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			↔			↔			↔		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	410.00	100.00	250.00	1350.00	100.00	100.00	625.00	100.00	600.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	190.00	0.00	0.00	960.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd			Peterson Rd			E Colfax Ave			E Colfax Ave		
Base Volume Input [veh/h]	1	1	1	28	1	245	1211	133	5	5	239	136
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	6	0	56	288	0	0	0	0	32
Diverted Trips [veh/h]	0	0	0	-4	-4	-4	-4	0	0	0	0	-4
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	1	0	0	149	0	0	3	0	0	82
Total Hourly Volume [veh/h]	1	1	0	30	0	148	1495	133	2	5	239	82
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	8	0	40	406	36	1	1	65	22
Total Analysis Volume [veh/h]	1	1	0	33	0	161	1625	145	2	5	260	89
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	10	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	14	0	0	17	0	0	14	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	9	14	0	9	14	0	61	78	0	9	26	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	Yes	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	R	L	C	L	C	R
C, Calculated Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	19	19	15	15	57	78	50	22	22
g / C, Green / Cycle	0.17	0.17	0.13	0.13	0.52	0.71	0.45	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.00	0.03	0.00	0.12	0.55	0.09	0.00	0.16	0.07
s, saturation flow rate [veh/h]	1291	1211	1600	1360	2959	1596	1248	1600	1360
c, Capacity [veh/h]	316	287	211	179	1533	1138	625	322	274
d1, Uniform Delay [s]	37.83	38.87	0.00	47.01	26.50	4.99	16.62	41.87	37.52
k, delay calibration	0.11	0.11	0.11	0.11	0.12	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.01	0.18	0.00	14.43	31.15	0.23	0.01	19.07	3.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.01	0.11	0.00	0.90	1.06	0.13	0.01	0.81	0.32
d, Delay for Lane Group [s/veh]	37.84	39.05	0.00	61.44	57.65	5.22	16.62	60.94	40.65
Lane Group LOS	D	D	A	E	F	A	B	E	D
Critical Lane Group	Yes	No	No	Yes	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.05	0.78	0.00	5.03	23.66	0.85	0.06	8.04	2.18
50th-Percentile Queue Length [ft/ln]	1.14	19.39	0.00	125.80	591.53	21.13	1.62	201.02	54.51
95th-Percentile Queue Length [veh/ln]	0.08	1.40	0.00	8.71	33.09	1.52	0.12	12.69	3.92
95th-Percentile Queue Length [ft/ln]	2.05	34.90	0.00	217.77	827.26	38.04	2.91	317.28	98.12

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	37.84	37.84	37.84	39.05	0.00	61.44	57.65	5.22	5.22	16.62	60.94	40.65
Movement LOS	D	D	D	D	A	E	F	A	A	B	E	D
d_A, Approach Delay [s/veh]	37.84			57.63			53.30			55.21		
Approach LOS	D			E			D			E		
d_I, Intersection Delay [s/veh]	53.94											
Intersection LOS	D											
Intersection V/C	0.831											

Emissions

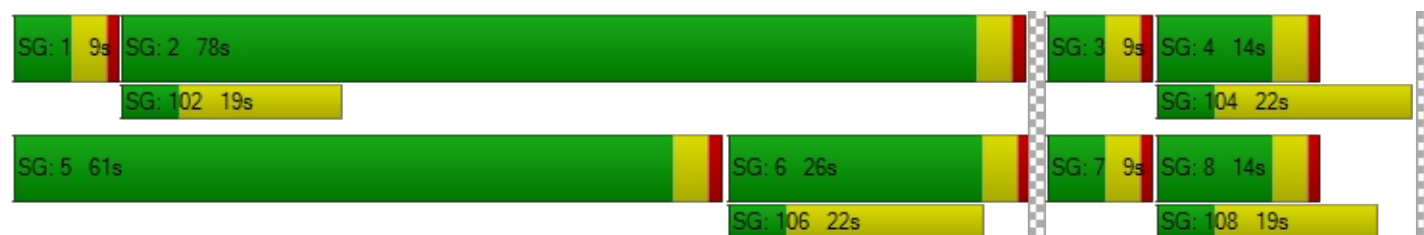
Vehicle Miles Traveled [mph]	0.05	19.86	0.00	96.88	368.42	33.33	0.68	35.47	12.14
Stops [stops/h]	1.49	25.38	0.00	164.68	1548.73	27.67	2.12	263.15	71.36
Fuel consumption [US gal/h]	0.03	1.22	0.00	6.91	60.15	1.78	0.08	9.30	2.47
CO [g/h]	1.79	85.27	0.00	483.06	4204.83	124.77	5.53	649.97	172.50
NOx [g/h]	0.35	16.59	0.00	93.99	818.11	24.27	1.08	126.46	33.56
VOC [g/h]	0.41	19.76	0.00	111.95	974.51	28.92	1.28	150.64	39.98

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	46.37	46.37	46.37	46.37
I_p,int, Pedestrian LOS Score for Intersectio	1.736	2.940	3.157	2.581
Crosswalk LOS	A	C	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	345	182	1345	400
d_b, Bicycle Delay [s]	37.64	45.45	5.89	35.20
I_b,int, Bicycle LOS Score for Intersection	1.565	2.126	4.488	2.279
Bicycle LOS	A	B	E	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Manila Rd/I-70 Westbound Ramp

Control Type:	Signalized	Delay (sec / veh):	9.6
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.672

Intersection Setup

Name	Manila Rd			Manila Rd			Eastbound			Westbound Ramp		
Approach	Northbound			Southbound						Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1	0	0	0	0	0	1
Entry Pocket Length [ft]	735.00	100.00	100.00	100.00	100.00	435.00	100.00	100.00	100.00	100.00	100.00	435.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	550.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Manila Rd			Manila Rd						Westbound Ramp		
Base Volume Input [veh/h]	300	1898	0	0	91	405	0	0	0	45	5	314
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	2.00	2.00	20.00	20.00	2.00	2.00	2.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	192	0	0	12	38	0	0	0	0	0	64
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	222	0	0	0	0	0	189
Total Hourly Volume [veh/h]	300	2090	0	0	103	221	0	0	0	45	5	189
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	82	568	0	0	28	60	0	0	0	12	1	51
Total Analysis Volume [veh/h]	326	2272	0	0	112	240	0	0	0	49	5	205
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	1	6	0	0	2	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	26	0	0	0	0	0	9	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	9	46	0	0	37	0	0	0	0	0	24	0
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	10	0	0	10	0	0	0	0	0	10	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R		C	R
C, Calculated Cycle Length [s]	70	70	70	70		70	70
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00		2.00	2.00
g_i, Effective Green Time [s]	49	49	40	40		13	13
g / C, Green / Cycle	0.71	0.71	0.58	0.58		0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.34	0.52	0.04	0.10		0.04	0.15
s, saturation flow rate [veh/h]	971	4358	3046	2407		1530	1360
c, Capacity [veh/h]	811	3073	1756	1388		276	245
d1, Uniform Delay [s]	3.90	6.35	6.51	6.97		24.36	27.68
k, delay calibration	0.29	0.50	0.50	0.50		0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00
d2, Incremental Delay [s]	0.87	1.64	0.07	0.27		0.34	7.31
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00

Lane Group Results

X, volume / capacity	0.40	0.74	0.06	0.17		0.20	0.84
d, Delay for Lane Group [s/veh]	4.77	7.99	6.58	7.24		24.71	34.99
Lane Group LOS	A	A	A	A		C	C
Critical Lane Group	No	Yes	No	No		No	Yes
50th-Percentile Queue Length [veh/ln]	1.09	3.87	0.29	0.67		0.76	3.65
50th-Percentile Queue Length [ft/ln]	27.20	96.78	7.19	16.81		18.94	91.30
95th-Percentile Queue Length [veh/ln]	1.96	6.97	0.52	1.21		1.36	6.57
95th-Percentile Queue Length [ft/ln]	48.96	174.20	12.94	30.25		34.09	164.35

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	4.77	7.99	0.00	0.00	6.58	7.24	0.00	0.00	0.00	24.71	24.71	34.99
Movement LOS	A	A			A	A				C	C	C
d_A, Approach Delay [s/veh]	7.59			7.03			0.00			32.84		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	9.57											
Intersection LOS	A											
Intersection V/C	0.672											

Emissions

Vehicle Miles Traveled [mph]	22.68	158.09	13.68	29.31		5.43	20.60
Stops [stops/h]	55.95	597.27	29.57	69.15		38.96	187.83
Fuel consumption [US gal/h]	1.79	16.54	0.99	2.22		0.71	3.35
CO [g/h]	125.09	1156.19	68.96	155.05		49.64	233.85
NOx [g/h]	24.34	224.95	13.42	30.17		9.66	45.50
VOC [g/h]	28.99	267.96	15.98	35.93		11.51	54.20

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	24.86	24.86	0.00	24.86
I_p,int, Pedestrian LOS Score for Intersectio	3.112	3.573	0.000	2.188
Crosswalk LOS	C	D	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1200	943	0	571
d_b, Bicycle Delay [s]	5.60	9.78	35.00	17.86
I_b,int, Bicycle LOS Score for Intersection	2.989	2.033	4.132	2.299
Bicycle LOS	C	B	D	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Manila Rd/I-70 Eastbound Ramp

Control Type:	Signalized	Delay (sec / veh):	24.4
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.669

Intersection Setup

Name	Manila Rd			Manila Rd			Eastbound Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	435.00	745.00	100.00	100.00	1075.00	100.00	435.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Manila Rd			Manila Rd			Eastbound Ramp					
Base Volume Input [veh/h]	0	470	70	54	92	0	1728	5	90	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	20.00	20.00	20.00	20.00	2.00	20.00	20.00	20.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	12	0	0	192	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	35	0	0	0	0	0	45	0	0	0
Total Hourly Volume [veh/h]	0	470	35	66	92	0	1920	5	45	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	128	10	18	25	0	522	1	12	0	0	0
Total Analysis Volume [veh/h]	0	511	38	72	100	0	2087	5	49	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Maximum Green [s]	0	30	0	10	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	0	0
Pedestrian Clearance [s]	0	19	0	0	22	0	0	14	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	32	0	9	41	0	0	49	0	0	0	0
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	5	10	0	0	10	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Minimum Recall		No		Yes	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	
C, Calculated Cycle Length [s]	90	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	29	29	38	38	44	44	
g / C, Green / Cycle	0.33	0.33	0.42	0.42	0.49	0.49	
(v / s)_i Volume / Saturation Flow Rate	0.17	0.03	0.08	0.03	0.47	0.04	
s, saturation flow rate [veh/h]	3046	1360	866	3046	4438	1379	
c, Capacity [veh/h]	991	442	373	1271	2192	681	
d1, Uniform Delay [s]	24.62	21.07	17.01	15.80	21.76	12.00	
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	1.92	0.38	1.15	0.12	3.09	0.05	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.52	0.09	0.19	0.08	0.95	0.08	
d, Delay for Lane Group [s/veh]	26.53	21.46	18.16	15.92	24.85	12.05	
Lane Group LOS	C	C	B	B	C	B	
Critical Lane Group	Yes	No	Yes	No	Yes	No	
50th-Percentile Queue Length [veh/ln]	4.55	0.59	1.00	0.63	13.46	0.56	
50th-Percentile Queue Length [ft/ln]	113.78	14.82	25.05	15.63	336.53	13.97	
95th-Percentile Queue Length [veh/ln]	8.05	1.07	1.80	1.13	19.48	1.01	
95th-Percentile Queue Length [ft/ln]	201.24	26.68	45.09	28.13	486.96	25.14	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	26.53	21.46	18.16	15.92	0.00	24.85	12.05	12.05	0.00	0.00	0.00
Movement LOS		C	C	B	B		C	B	B			
d_A, Approach Delay [s/veh]	26.18			16.86			24.52			0.00		
Approach LOS	C			B			C			A		
d_I, Intersection Delay [s/veh]	24.38											
Intersection LOS	C											
Intersection V/C	0.669											

Emissions

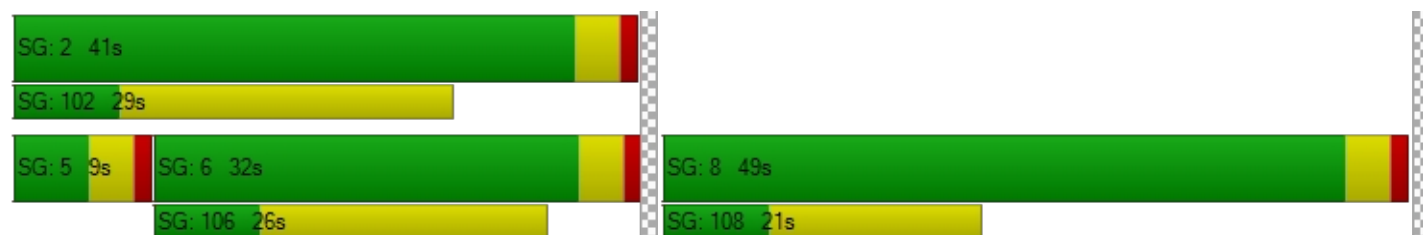
Vehicle Miles Traveled [mph]	110.10	8.19	5.01	6.96	207.57	5.37	
Stops [stops/h]	364.08	23.71	40.08	50.01	1615.37	22.34	
Fuel consumption [US gal/h]	9.30	0.63	0.69	0.89	28.02	0.48	
CO [g/h]	650.28	44.32	48.50	61.98	1958.76	33.34	
NOx [g/h]	126.52	8.62	9.44	12.06	381.10	6.49	
VOC [g/h]	150.71	10.27	11.24	14.37	453.96	7.73	

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
I_p,int, Pedestrian LOS Score for Intersectio	2.501	2.902	2.727	1.605
Crosswalk LOS	B	C	B	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	622	822	1000	0
d_b, Bicycle Delay [s]	21.36	15.61	11.25	45.00
I_b,int, Bicycle LOS Score for Intersection	2.041	1.702	5.167	4.132
Bicycle LOS	B	A	F	D

Sequence





Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peterson Rd/ Access 1

Control Type:	Signalized	Delay (sec / veh):	14.9
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.587

Intersection Setup

Name	Peterson Rd			Peterson Rd			Access 1					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	0	0	0	0	0	0
Entry Pocket Length [ft]	355.00	100.00	250.00	250.00	100.00	250.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd			Peterson Rd			Access 1					
Base Volume Input [veh/h]	0	1223	65	1	253	0	0	0	0	14	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	107	213	0	0	41	0	0	0	21	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	21	0	0	0
Total Hourly Volume [veh/h]	107	1436	65	1	294	0	0	0	0	14	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	390	18	0	80	0	0	0	0	4	0	0
Total Analysis Volume [veh/h]	116	1561	71	1	320	0	0	0	0	15	0	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	60
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	7	0	0	7	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	44	0	0	44	0	0	16	0	0	16	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	0	10	0	0	10	0	0	10	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Calculated Cycle Length [s]	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	40	40	40	40	40	40	12	12
g / C, Green / Cycle	0.67	0.67	0.67	0.67	0.67	0.67	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.14	0.57	0.57	0.00	0.11	0.11	0.00	0.01
s, saturation flow rate [veh/h]	816	1440	1418	237	1440	1440	1440	1138
c, Capacity [veh/h]	603	960	945	164	960	960	348	348
d1, Uniform Delay [s]	5.83	7.72	7.82	20.04	3.75	3.75	0.00	19.41
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.71	9.48	10.13	0.07	0.37	0.37	0.00	0.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.19	0.85	0.86	0.01	0.17	0.17	0.00	0.04
d, Delay for Lane Group [s/veh]	6.54	17.20	17.96	20.10	4.12	4.12	0.00	19.65
Lane Group LOS	A	B	B	C	A	A	A	B
Critical Lane Group	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.65	7.59	7.76	0.01	0.58	0.58	0.00	0.18
50th-Percentile Queue Length [ft/ln]	16.23	189.81	194.04	0.35	14.52	14.52	0.00	4.53
95th-Percentile Queue Length [veh/ln]	1.17	12.11	12.33	0.02	1.05	1.05	0.00	0.33
95th-Percentile Queue Length [ft/ln]	29.22	302.78	308.27	0.62	26.13	26.13	0.00	8.15

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	6.54	17.56	17.96	20.10	4.12	4.12	0.00	0.00	0.00	19.65	19.65	19.65
Movement LOS	A	B	B	C	A	A	A	A	A	B	B	B
d_A, Approach Delay [s/veh]	16.85			4.17			0.00			19.65		
Approach LOS	B			A			A			B		
d_I, Intersection Delay [s/veh]	14.91											
Intersection LOS	B											
Intersection V/C	0.587											

Emissions

Vehicle Miles Traveled [mph]	69.80	492.40	489.65	0.65	103.87	103.87	0.00			0.36		
Stops [stops/h]	38.95	455.54	465.70	0.83	34.85	34.85	0.00			10.86		
Fuel consumption [US gal/h]	3.24	25.65	25.70	0.04	4.60	4.60	0.00			0.13		
CO [g/h]	226.70	1793.10	1796.66	2.47	321.74	321.74	0.00			9.41		
NOx [g/h]	44.11	348.87	349.56	0.48	62.60	62.60	0.00			1.83		
VOC [g/h]	52.54	415.57	416.39	0.57	74.57	74.57	0.00			2.18		

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	21.68			21.68			21.68			21.68		
I_p,int, Pedestrian LOS Score for Intersectio	2.712			2.648			1.957			1.739		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1333			1333			400			400		
d_b, Bicycle Delay [s]	3.33			3.33			19.20			19.20		
I_b,int, Bicycle LOS Score for Intersection	3.002			1.824			1.594			1.584		
Bicycle LOS	C			A			A			A		

Sequence





Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Peterson Rd/ Access 2

Control Type:	Signalized	Delay (sec / veh):	11.0
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.401

Intersection Setup

Name	Peterson Rd			Peterson Rd			Access 2					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	0	0	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	190.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd			Peterson Rd			Access 2					
Base Volume Input [veh/h]	0	370	787	1	76	0	0	0	0	166	0	2
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	107	107	0	0	21	0	0	0	21	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	394	0	0	0	0	0	11	0	0	1
Total Hourly Volume [veh/h]	107	477	393	1	97	0	0	0	10	166	0	1
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	130	107	0	26	0	0	0	3	45	0	0
Total Analysis Volume [veh/h]	116	518	427	1	105	0	0	0	11	180	0	1
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	9	0	0	7	0	0	16	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	65	0	0	65	0	0	25	0	0	25	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	0	10	0	0	10	0	0	10	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	C	C	L	C
C, Calculated Cycle Length [s]	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	61	61	61	61	21	21	21
g / C, Green / Cycle	0.68	0.68	0.68	0.68	0.23	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.11	0.32	0.31	0.07	0.01	0.08	0.00
s, saturation flow rate [veh/h]	1103	1600	1360	1595	1360	2331	1360
c, Capacity [veh/h]	778	1084	922	1122	357	558	317
d1, Uniform Delay [s]	5.30	6.91	6.81	5.00	26.67	28.74	26.47
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.41	1.51	1.67	0.17	0.16	1.53	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.15	0.48	0.46	0.09	0.03	0.32	0.00
d, Delay for Lane Group [s/veh]	5.71	8.42	8.49	5.17	26.83	30.27	26.49
Lane Group LOS	A	A	A	A	C	C	C
Critical Lane Group	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.77	4.42	3.65	0.64	0.20	1.71	0.02
50th-Percentile Queue Length [ft/ln]	19.20	110.40	91.19	15.98	4.91	42.75	0.45
95th-Percentile Queue Length [veh/ln]	1.38	7.86	6.57	1.15	0.35	3.08	0.03
95th-Percentile Queue Length [ft/ln]	34.57	196.55	164.14	28.76	8.84	76.95	0.80

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	5.71	8.42	8.49	5.17	5.17	5.17	26.83	26.83	26.83	30.27	26.49	26.49
Movement LOS	A	A	A	A	A	A	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	8.15			5.17			26.83			30.25		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	11.01											
Intersection LOS	B											
Intersection V/C	0.401											

Emissions

Vehicle Miles Traveled [mph]	75.31	336.28	277.20	59.18			0.88		4.27		0.02	
Stops [stops/h]	30.73	176.63	145.90	25.57			7.86		136.79		0.72	
Fuel consumption [US gal/h]	3.40	15.71	12.95	2.69			0.14		2.04		0.01	
CO [g/h]	237.98	1097.90	905.55	187.96			9.76		142.63		0.72	
NOx [g/h]	46.30	213.61	176.19	36.57			1.90		27.75		0.14	
VOC [g/h]	55.15	254.45	209.87	43.56			2.26		33.06		0.17	

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersectio	3.461			2.022			1.964			2.380		
Crosswalk LOS	C			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1356			1356			467			467		
d_b, Bicycle Delay [s]	4.67			4.67			26.45			26.45		
I_b,int, Bicycle LOS Score for Intersection	3.960			1.735			1.596			1.860		
Bicycle LOS	D			A			A			A		

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: 48th Ave/Access 3

Control Type: Two-way stop
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 8.6
Level Of Service: A
Volume to Capacity (v/c): 0.022

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+			+T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	355.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	21	0	0	0	0	0	0	107	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	21	0	0	0	0	0	0	107	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	6	0	0	0	0	0	0	29	0	0
Total Analysis Volume [veh/h]	0	0	23	0	0	0	0	0	0	116	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results





V/C, Movement V/C Ratio	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00
d_M, Delay for Movement [s/veh]	10.76	11.19	8.56	10.91	11.11	8.48	7.38	0.00	0.00	7.58	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.07	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.70	1.70	1.70	0.00	0.00	0.00	0.00	0.00	0.00	6.22	0.00	0.00
d_A, Approach Delay [s/veh]	8.56			10.17			2.46			7.58		
Approach LOS	A			B			A			A		
d_I, Intersection Delay [s/veh]	7.74											
Intersection LOS	A											

Intersection Level Of Service Report
Intersection 16: 48th Ave/Peterson Rd

Control Type: Two-way stop
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 11.6
Level Of Service: B
Volume to Capacity (v/c): 0.110

Intersection Setup

Name	Peterson Rd											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	355.00	100.00	250.00	100.00	100.00	100.00	100.00	100.00	250.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd											
Base Volume Input [veh/h]	0	0	301	0	0	0	0	0	0	62	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	107	0	0	0	0	0	0	0	21	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	0	301	0	0	0	0	0	21	62	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	0	82	0	0	0	0	0	6	17	0	0
Total Analysis Volume [veh/h]	116	0	327	0	0	0	0	0	23	67	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.11	0.00	0.00
d_M, Delay for Movement [s/veh]	7.58	0.00	0.00	8.16	0.00	0.00	12.31	14.43	8.56	11.64	11.84	9.21
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh/ln]	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.37	0.37	0.37
95th-Percentile Queue Length [ft/ln]	6.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.70	9.22	9.22	9.22
d_A, Approach Delay [s/veh]	1.98			2.72			8.56			11.64		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	3.48											
Intersection LOS	B											

Signal Warrants Report For Intersection 15: 48th Ave/Access 3

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	107	0	21	0
2	104	0	20	0
3	102	0	20	0
4	95	0	19	0
5	85	0	17	0
6	83	0	16	0
7	82	0	16	0
8	75	0	15	0
9	74	0	14	0
10	73	0	14	0
11	63	0	12	0
12	59	0	12	0
13	58	0	11	0
14	43	0	8	0
15	43	0	8	0
16	30	0	6	0
17	17	0	3	0
18	17	0	3	0
19	10	0	2	0
20	5	0	1	0
21	3	0	1	0
22	1	0	0	0
23	1	0	0	0
24	1	0	0	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	107	1	21	No	No	No	No	No	No	No	No	No	No
2	2	104	1	20	No	No	No	No	No	No	No	No	No	No
3	2	102	1	20	No	No	No	No	No	No	No	No	No	No
4	2	95	1	19	No	No	No	No	No	No	No	No	No	No
5	2	85	1	17	No	No	No	No	No	No	No	No	No	No
6	2	83	1	16	No	No	No	No	No	No	No	No	No	No
7	2	82	1	16	No	No	No	No	No	No	No	No	No	No
8	2	75	1	15	No	No	No	No	No	No	No	No	No	No
9	2	74	1	14	No	No	No	No	No	No	No	No	No	No
10	2	73	1	14	No	No	No	No	No	No	No	No	No	No
11	2	63	1	12	No	No	No	No	No	No	No	No	No	No
12	2	59	1	12	No	No	No	No	No	No	No	No	No	No
13	2	58	1	11	No	No	No	No	No	No	No	No	No	No
14	2	43	1	8	No	No	No	No	No	No	No	No	No	No
15	2	43	1	8	No	No	No	No	No	No	No	No	No	No
16	2	30	1	6	No	No	No	No	No	No	No	No	No	No
17	2	17	1	3	No	No	No	No	No	No	No	No	No	No
18	2	17	1	3	No	No	No	No	No	No	No	No	No	No
19	2	10	1	2	No	No	No	No	No	No	No	No	No	No
20	2	5	1	1	No	No	No	No	No	No	No	No	No	No
21	2	3	1	1	No	No	No	No	No	No	No	No	No	No
22	2	1	1	0	No	No	No	No	No	No	No	No	No	No
23	2	1	1	0	No	No	No	No	No	No	No	No	No	No
24	2	1	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.6	10.2
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:02	0:00
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	21	0
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	128	128
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

Signal Warrants Report For Intersection 16: 48th Ave/Peterson Rd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	N	S	E	W
1	0	408	62	21
2	0	396	60	20
3	0	388	59	20
4	0	363	55	19
5	0	322	49	17
6	0	318	48	16
7	0	314	48	16
8	0	286	43	15
9	0	282	43	14
10	0	277	42	14
11	0	241	37	12
12	0	224	34	12
13	0	220	33	11
14	0	163	25	8
15	0	163	25	8
16	0	114	17	6
17	0	65	10	3
18	0	65	10	3
19	0	37	6	2
20	0	20	3	1
21	0	12	2	1
22	0	4	1	0
23	0	4	1	0
24	0	4	1	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	408	1	62	No	No	No	No	No	No	No	No	No	No
2	3	396	1	60	No	No	No	No	No	No	No	No	No	No
3	3	388	1	59	No	No	No	No	No	No	No	No	No	No
4	3	363	1	55	No	No	No	No	No	No	No	No	No	No
5	3	322	1	49	No	No	No	No	No	No	No	No	No	No
6	3	318	1	48	No	No	No	No	No	No	No	No	No	No
7	3	314	1	48	No	No	No	No	No	No	No	No	No	No
8	3	286	1	43	No	No	No	No	No	No	No	No	No	No
9	3	282	1	43	No	No	No	No	No	No	No	No	No	No
10	3	277	1	42	No	No	No	No	No	No	No	No	No	No
11	3	241	1	37	No	No	No	No	No	No	No	No	No	No
12	3	224	1	34	No	No	No	No	No	No	No	No	No	No
13	3	220	1	33	No	No	No	No	No	No	No	No	No	No
14	3	163	1	25	No	No	No	No	No	No	No	No	No	No
15	3	163	1	25	No	No	No	No	No	No	No	No	No	No
16	3	114	1	17	No	No	No	No	No	No	No	No	No	No
17	3	65	1	10	No	No	No	No	No	No	No	No	No	No
18	3	65	1	10	No	No	No	No	No	No	No	No	No	No
19	3	37	1	6	No	No	No	No	No	No	No	No	No	No
20	3	20	1	3	No	No	No	No	No	No	No	No	No	No
21	3	12	1	2	No	No	No	No	No	No	No	No	No	No
22	3	4	1	1	No	No	No	No	No	No	No	No	No	No
23	3	4	1	1	No	No	No	No	No	No	No	No	No	No
24	3	4	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	11.6	8.6
Number of Lanes on Minor Street Approach	1	2
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:12	0:02
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	62	21
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	491	491
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

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Intersection Level Of Service Report
Intersection 1: E Colfax Ave/Manila Rd

Control Type:	Signalized	Delay (sec / veh):	43.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.762

Intersection Setup

Name	Manila Rd			Manila Rd			E Colfax Ave			E Colfax Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	460.00	100.00	435.00	300.00	100.00	250.00	625.00	100.00	600.00	990.00	100.00	600.00
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	2
Exit Pocket Length [ft]	0.00	0.00	550.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1620.00
Speed [mph]	45.00			45.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Manila Rd			Manila Rd			E Colfax Ave			E Colfax Ave		
Base Volume Input [veh/h]	20	145	356	55	865	20	5	434	40	917	372	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	65	0	0	0	0	8	0	247	31	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	211	0	0	10	0	0	20	0	0	3
Total Hourly Volume [veh/h]	20	145	210	55	865	10	5	442	20	1164	403	2
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	39	57	15	235	3	1	120	5	316	110	1
Total Analysis Volume [veh/h]	22	158	228	60	940	11	5	480	22	1265	438	2
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Unsigna	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	1	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	21	0	0	14	0	0	34	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	9	42	39	9	42	0	9	30	0	39	60	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	5	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	R
C, Calculated Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	46	37	46	39	39	66	27	27	35	62	62
g / C, Green / Cycle	0.38	0.31	0.38	0.32	0.32	0.55	0.23	0.23	0.29	0.51	0.51
(v / s)_i Volume / Saturation Flow Rate	0.04	0.05	0.05	0.31	0.01	0.01	0.16	0.16	0.29	0.27	0.00
s, saturation flow rate [veh/h]	609	3046	1117	3046	1360	843	1600	1575	4438	1600	1360
c, Capacity [veh/h]	164	945	470	988	441	398	365	360	1295	820	697
d1, Uniform Delay [s]	29.17	30.11	24.09	39.60	27.60	14.18	42.43	42.46	42.10	19.64	14.28
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.37	0.08	0.12	6.01	0.02	0.06	10.28	10.54	7.46	2.49	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.13	0.17	0.13	0.95	0.02	0.01	0.69	0.69	0.98	0.53	0.00
d, Delay for Lane Group [s/veh]	29.54	30.19	24.22	45.61	27.63	14.24	52.72	53.00	49.56	22.13	14.29
Lane Group LOS	C	C	C	D	C	B	D	D	D	C	B
Critical Lane Group	Yes	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.40	1.63	1.08	13.70	0.21	0.06	7.55	7.49	12.45	7.93	0.03
50th-Percentile Queue Length [ft/ln]	9.96	40.73	27.09	342.54	5.32	1.52	188.77	187.18	311.19	198.34	0.65
95th-Percentile Queue Length [veh/ln]	0.72	2.93	1.95	19.77	0.38	0.11	12.06	11.97	18.23	12.55	0.05
95th-Percentile Queue Length [ft/ln]	17.93	73.32	48.77	494.30	9.58	2.74	301.43	299.37	455.84	313.82	1.17

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	29.54	30.19	0.00	24.22	45.61	27.63	14.24	52.85	53.00	49.56	22.13	14.29
Movement LOS	C	C		C	D	C	B	D	D	D	C	B
d_A, Approach Delay [s/veh]	13.90			44.15			52.48			42.47		
Approach LOS	B			D			D			D		
d_I, Intersection Delay [s/veh]	42.95											
Intersection LOS	D											
Intersection V/C	0.762											

Emissions

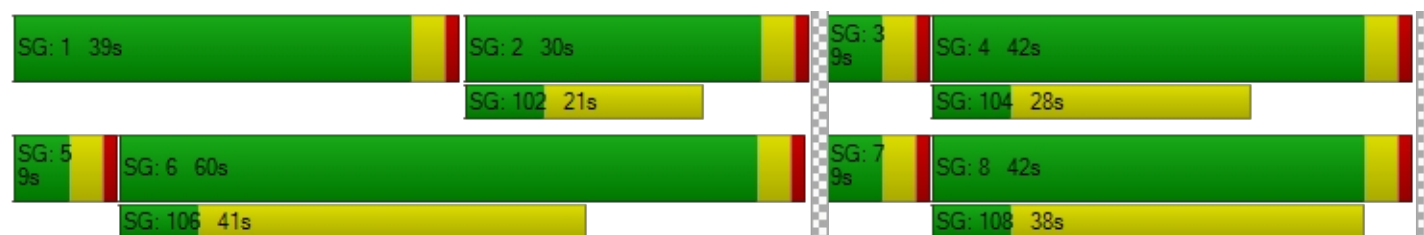
Vehicle Miles Traveled [mph]	21.47	154.20	20.80	325.90	3.81	0.73	37.06	36.63	728.10	252.10	1.15
Stops [stops/h]	11.95	97.76	32.51	822.09	6.38	1.83	226.52	224.62	1120.27	238.01	0.78
Fuel consumption [US gal/h]	1.02	7.47	1.41	30.12	0.27	0.07	8.16	8.09	57.92	14.83	0.06
CO [g/h]	71.08	522.28	98.76	2105.21	19.01	5.10	570.09	565.37	4048.77	1036.37	4.11
NOx [g/h]	13.83	101.62	19.22	409.60	3.70	0.99	110.92	110.00	787.74	201.64	0.80
VOC [g/h]	16.47	121.04	22.89	487.90	4.41	1.18	132.12	131.03	938.34	240.19	0.95

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	49.50			49.50			49.50			49.50		
I_p,int, Pedestrian LOS Score for Intersectio	3.115			2.774			2.713			3.274		
Crosswalk LOS	C			C			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	633			633			433			933		
d_b, Bicycle Delay [s]	28.02			28.02			36.82			17.07		
I_b,int, Bicycle LOS Score for Intersection	1.708			2.402			1.994			4.378		
Bicycle LOS	A			B			A			E		

Sequence





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: E Colfax Ave/Peterson Rd

Control Type:	Signalized	Delay (sec / veh):	54.9
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.815

Intersection Setup

Name	Peterson Rd			Peterson Rd			E Colfax Ave			E Colfax Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	275.00	100.00	250.00	410.00	100.00	250.00	1350.00	100.00	100.00	625.00	100.00	600.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	190.00	0.00	0.00	960.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd			Peterson Rd			E Colfax Ave			E Colfax Ave		
Base Volume Input [veh/h]	1	1	1	127	1	1125	318	295	1	1	167	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	31	0	278	73	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	-4	-4	-4	-4	0	0	0	0	-4
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	1	0	0	700	0	0	1	0	0	20
Total Hourly Volume [veh/h]	1	1	0	154	0	699	387	295	0	1	167	19
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	42	0	190	105	80	0	0	45	5
Total Analysis Volume [veh/h]	1	1	0	167	0	760	421	321	0	1	182	21
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	3	8	0	7	4	5	5	2	0	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	11	0	0	24	0	0	21	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	40	77	0	13	50	25	25	41	0	9	25	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	5	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	L	C	R
C, Calculated Cycle Length [s]	140	140	140	140	140	140	140	140	140	140	140
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	84	71	71	84	80	80	21	44	48	23	23
g / C, Green / Cycle	0.60	0.51	0.51	0.60	0.57	0.57	0.15	0.31	0.34	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.00	0.00	0.00	0.13	0.00	0.56	0.14	0.20	0.00	0.11	0.02
s, saturation flow rate [veh/h]	628	1600	1360	1252	1600	1360	2959	1600	934	1600	1360
c, Capacity [veh/h]	446	810	689	816	910	774	444	502	245	264	225
d1, Uniform Delay [s]	11.27	17.06	0.00	12.65	0.00	29.48	58.96	41.21	32.05	55.03	49.53
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.45	0.11	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.00	0.00	0.00	0.12	0.00	26.61	10.96	6.12	0.01	13.68	0.82
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.00	0.00	0.00	0.20	0.00	0.98	0.95	0.64	0.00	0.69	0.09
d, Delay for Lane Group [s/veh]	11.27	17.06	0.00	12.77	0.00	56.08	69.93	47.33	32.06	68.71	50.36
Lane Group LOS	B	B	A	B	A	E	E	D	C	E	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.01	0.02	0.00	2.41	0.00	29.63	7.80	9.95	0.02	6.85	0.66
50th-Percentile Queue Length [ft/ln]	0.32	0.41	0.00	60.30	0.00	740.63	195.04	248.82	0.55	171.14	16.45
95th-Percentile Queue Length [veh/ln]	0.02	0.03	0.00	4.34	0.00	38.55	12.38	15.13	0.04	11.14	1.18
95th-Percentile Queue Length [ft/ln]	0.58	0.74	0.00	108.53	0.00	963.79	309.56	378.16	0.99	278.41	29.61

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.27	17.06	0.00	12.77	0.00	56.08	69.93	47.33	47.33	32.06	68.71	50.36
Movement LOS	B	B	A	B	A	E	E	D	D	C	E	D
d_A, Approach Delay [s/veh]	14.17			48.28			60.15			66.64		
Approach LOS	B			D			E			E		
d_I, Intersection Delay [s/veh]	54.94											
Intersection LOS	D											
Intersection V/C	0.815											

Emissions

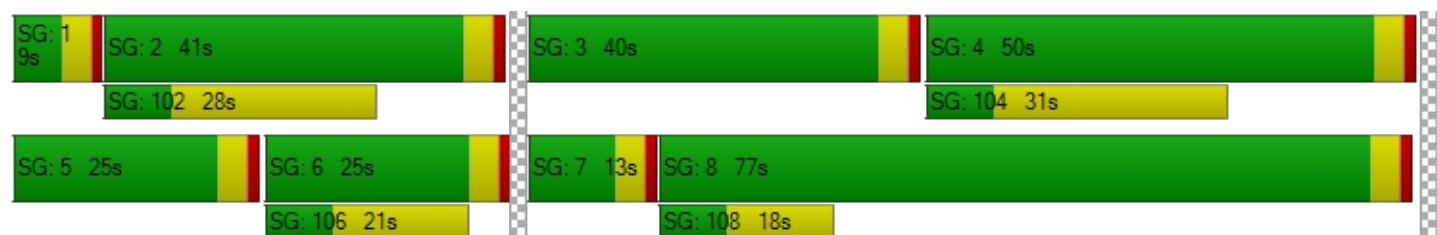
Vehicle Miles Traveled [mph]	0.02	0.02	0.00	100.49	0.00	457.33	95.45	72.78	0.15	26.63	3.07
Stops [stops/h]	0.33	0.42	0.00	62.02	0.00	761.79	401.22	255.93	0.56	176.03	16.92
Fuel consumption [US gal/h]	0.01	0.01	0.00	4.91	0.00	31.71	16.64	10.28	0.02	6.70	0.63
CO [g/h]	0.36	0.47	0.00	343.45	0.00	2216.41	1162.84	718.55	1.53	468.67	44.19
NOx [g/h]	0.07	0.09	0.00	66.82	0.00	431.23	226.25	139.80	0.30	91.19	8.60
VOC [g/h]	0.08	0.11	0.00	79.60	0.00	513.68	269.50	166.53	0.35	108.62	10.24

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	59.43			59.43			59.43			59.43		
I_p,int, Pedestrian LOS Score for Intersectio	2.155			3.724			3.176			2.728		
Crosswalk LOS	B			D			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1043			657			529			300		
d_b, Bicycle Delay [s]	16.03			31.56			37.89			50.58		
I_b,int, Bicycle LOS Score for Intersection	1.565			4.244			2.786			1.929		
Bicycle LOS	A			D			C			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Manila Rd/I-70 Westbound Ramp

Control Type:	Signalized	Delay (sec / veh):	7.2
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.453

Intersection Setup

Name	Manila Rd			Manila Rd			Eastbound			Westbound Ramp		
Approach	Northbound			Southbound						Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1	0	0	0	0	0	1
Entry Pocket Length [ft]	735.00	100.00	100.00	100.00	100.00	435.00	100.00	100.00	100.00	100.00	100.00	435.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	550.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Manila Rd			Manila Rd						Westbound Ramp		
Base Volume Input [veh/h]	135	452	0	0	404	1472	0	0	0	75	5	64
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	2.00	2.00	20.00	20.00	2.00	2.00	2.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	49	0	0	62	185	0	0	0	0	0	16
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	829	0	0	0	0	0	40
Total Hourly Volume [veh/h]	135	501	0	0	466	828	0	0	0	75	5	40
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	136	0	0	127	225	0	0	0	20	1	11
Total Analysis Volume [veh/h]	147	545	0	0	507	900	0	0	0	82	5	43
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	1	6	0	0	2	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	26	0	0	0	0	0	9	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	9	83	0	0	74	0	0	0	0	0	27	0
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	10	0	0	10	0	0	0	0	0	10	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R		C	R
C, Calculated Cycle Length [s]	110	110	110	110		110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00		2.00	2.00
g_i, Effective Green Time [s]	92	92	83	83		10	10
g / C, Green / Cycle	0.84	0.84	0.76	0.76		0.09	0.09
(v / s)_i Volume / Saturation Flow Rate	0.35	0.13	0.17	0.37		0.06	0.03
s, saturation flow rate [veh/h]	417	4358	3046	2407		1528	1360
c, Capacity [veh/h]	425	3648	2302	1819		138	123
d1, Uniform Delay [s]	1.90	1.67	3.93	5.24		48.28	47.02
k, delay calibration	0.50	0.50	0.50	0.50		0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00
d2, Incremental Delay [s]	2.22	0.09	0.22	0.96		4.71	1.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00

Lane Group Results

X, volume / capacity	0.35	0.15	0.22	0.49		0.63	0.35
d, Delay for Lane Group [s/veh]	4.12	1.75	4.15	6.20		52.99	48.72
Lane Group LOS	A	A	A	A		D	D
Critical Lane Group	Yes	No	No	Yes		Yes	No
50th-Percentile Queue Length [veh/ln]	0.49	0.32	1.25	3.03		2.48	1.17
50th-Percentile Queue Length [ft/ln]	12.24	7.98	31.27	75.84		62.01	29.13
95th-Percentile Queue Length [veh/ln]	0.88	0.57	2.25	5.46		4.46	2.10
95th-Percentile Queue Length [ft/ln]	22.03	14.37	56.29	136.51		111.61	52.43

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	4.12	1.75	0.00	0.00	4.15	6.20	0.00	0.00	0.00	52.99	52.99	48.72
Movement LOS	A	A			A	A				D	D	D
d_A, Approach Delay [s/veh]	2.26			5.46			0.00			51.58		
Approach LOS	A			A			A			D		
d_I, Intersection Delay [s/veh]	7.16											
Intersection LOS	A											
Intersection V/C	0.453											

Emissions

Vehicle Miles Traveled [mph]	10.23	37.92	63.09	111.99		8.74	4.32
Stops [stops/h]	16.02	31.35	81.88	198.56		81.17	38.13
Fuel consumption [US gal/h]	0.67	1.88	3.61	7.44		1.75	0.81
CO [g/h]	47.04	131.70	252.29	520.32		122.08	56.96
NOx [g/h]	9.15	25.62	49.09	101.23		23.75	11.08
VOC [g/h]	10.90	30.52	58.47	120.59		28.29	13.20

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	44.55
I_p,int, Pedestrian LOS Score for Intersectio	2.775	4.381	0.000	1.864
Crosswalk LOS	C	E	F	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1436	1273	0	418
d_b, Bicycle Delay [s]	4.37	7.27	55.00	34.40
I_b,int, Bicycle LOS Score for Intersection	1.940	3.404	4.132	1.840
Bicycle LOS	A	C	D	A

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Manila Rd/I-70 Eastbound Ramp

Control Type:	Signalized	Delay (sec / veh):	13.0
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.320

Intersection Setup

Name	Manila Rd			Manila Rd			Eastbound Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	435.00	745.00	100.00	100.00	1075.00	100.00	435.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Manila Rd			Manila Rd			Eastbound Ramp					
Base Volume Input [veh/h]	0	180	110	247	232	0	417	5	285	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	20.00	20.00	20.00	20.00	2.00	20.00	20.00	20.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	62	0	0	49	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	55	0	0	0	0	0	143	0	0	0
Total Hourly Volume [veh/h]	0	180	55	309	232	0	466	5	142	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	49	15	84	63	0	127	1	39	0	0	0
Total Analysis Volume [veh/h]	0	196	60	336	252	0	507	5	154	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	0	0
Pedestrian Clearance [s]	0	19	0	0	22	0	0	14	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	24	0	9	33	0	0	27	0	0	0	0
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	5	10	0	0	10	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	
C, Calculated Cycle Length [s]	60	60	60	60	60	60	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	20	20	29	29	23	23	
g / C, Green / Cycle	0.33	0.33	0.48	0.48	0.38	0.38	
(v / s)_i Volume / Saturation Flow Rate	0.06	0.04	0.31	0.08	0.11	0.12	
s, saturation flow rate [veh/h]	3046	1360	1097	3046	4438	1366	
c, Capacity [veh/h]	1015	453	657	1472	1701	524	
d1, Uniform Delay [s]	14.25	13.95	10.90	8.73	12.88	12.91	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.42	0.60	2.83	0.25	0.45	1.49	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.19	0.13	0.51	0.17	0.30	0.30	
d, Delay for Lane Group [s/veh]	14.67	14.55	13.73	8.98	13.33	14.40	
Lane Group LOS	B	B	B	A	B	B	
Critical Lane Group	Yes	No	Yes	No	No	Yes	
50th-Percentile Queue Length [veh/ln]	0.92	0.59	2.99	0.84	1.48	1.55	
50th-Percentile Queue Length [ft/ln]	23.04	14.81	74.64	20.96	37.03	38.68	
95th-Percentile Queue Length [veh/ln]	1.66	1.07	5.37	1.51	2.67	2.79	
95th-Percentile Queue Length [ft/ln]	41.46	26.67	134.35	37.72	66.66	69.63	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	14.67	14.55	13.73	8.98	0.00	13.33	14.40	14.40	0.00	0.00	0.00
Movement LOS		B	B	B	A		B	B	B			
d_A, Approach Delay [s/veh]	14.65			11.69			13.58			0.00		
Approach LOS	B			B			B			A		
d_I, Intersection Delay [s/veh]	13.03											
Intersection LOS	B											
Intersection V/C	0.320											

Emissions

Vehicle Miles Traveled [mph]	42.23	12.93	23.38	17.53	50.42	15.81	
Stops [stops/h]	110.57	35.55	179.14	100.59	266.64	92.84	
Fuel consumption [US gal/h]	2.93	0.91	2.89	1.74	4.92	1.63	
CO [g/h]	205.13	63.35	202.08	121.51	344.20	113.94	
NOx [g/h]	39.91	12.33	39.32	23.64	66.97	22.17	
VOC [g/h]	47.54	14.68	46.83	28.16	79.77	26.41	

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	20.01	20.01
I_p,int, Pedestrian LOS Score for Intersectio	2.523	2.640	2.509	2.021
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	667	967	767	0
d_b, Bicycle Delay [s]	13.33	8.01	11.41	30.00
I_b,int, Bicycle LOS Score for Intersection	1.816	2.045	2.894	4.132
Bicycle LOS	A	B	C	D

Sequence





Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peterson Rd/ Access 1

Control Type:	Signalized	Delay (sec / veh):	14.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.565

Intersection Setup

Name	Peterson Rd			Peterson Rd			Access 1					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	0	0	0	0	0	0
Entry Pocket Length [ft]	355.00	100.00	250.00	250.00	100.00	250.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	190.00	0.00	0.00	190.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd			Peterson Rd			Access 1					
Base Volume Input [veh/h]	0	328	18	0	1133	0	0	0	0	61	0	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	27	54	0	0	206	0	0	0	103	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	103	0	0	0
Total Hourly Volume [veh/h]	27	382	18	0	1339	0	0	0	0	61	0	1
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	104	5	0	364	0	0	0	0	17	0	0
Total Analysis Volume [veh/h]	29	415	20	0	1455	0	0	0	0	66	0	1
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	7	0	0	7	0	0	17	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	64	0	0	64	0	0	26	0	0	26	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	0	10	0	0	10	0	0	10	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Calculated Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	60	60	60	60	60	60	22	22
g / C, Green / Cycle	0.67	0.67	0.67	0.67	0.67	0.67	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.10	0.15	0.15	0.00	0.51	0.51	0.00	0.06
s, saturation flow rate [veh/h]	281	1440	1417	734	1440	1440	1440	1118
c, Capacity [veh/h]	166	960	944	509	960	960	392	353
d1, Uniform Delay [s]	24.30	5.90	5.90	0.00	10.11	10.11	0.00	27.07
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.30	0.55	0.56	0.00	5.58	5.58	0.00	1.19
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.18	0.23	0.23	0.00	0.76	0.76	0.00	0.19
d, Delay for Lane Group [s/veh]	26.60	6.45	6.47	0.00	15.69	15.69	0.00	28.26
Lane Group LOS	C	A	A	A	B	B	A	C
Critical Lane Group	No	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.57	1.55	1.54	0.00	9.50	9.50	0.00	1.25
50th-Percentile Queue Length [ft/ln]	14.37	38.83	38.47	0.00	237.55	237.55	0.00	31.23
95th-Percentile Queue Length [veh/ln]	1.03	2.80	2.77	0.00	14.56	14.56	0.00	2.25
95th-Percentile Queue Length [ft/ln]	25.87	69.89	69.24	0.00	363.93	363.93	0.00	56.21

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	26.60	6.46	6.47	0.00	15.69	15.69	0.00	0.00	0.00	28.26	28.26	28.26
Movement LOS	C	A	A	A	B	B	A	A	A	C	C	C
d_A, Approach Delay [s/veh]	7.72			15.69			0.00			28.26		
Approach LOS	A			B			A			C		
d_I, Intersection Delay [s/veh]	14.25											
Intersection LOS	B											
Intersection V/C	0.565											

Emissions

Vehicle Miles Traveled [mph]	17.45	131.65	130.11	0.00	472.28	472.28	0.00		1.59			
Stops [stops/h]	23.00	62.13	61.54	0.00	380.08	380.08	0.00		49.96			
Fuel consumption [US gal/h]	1.00	6.05	5.98	0.00	23.87	23.87	0.00		0.73			
CO [g/h]	70.07	422.89	418.05	0.00	1668.18	1668.18	0.00		50.81			
NOx [g/h]	13.63	82.28	81.34	0.00	324.57	324.57	0.00		9.89			
VOC [g/h]	16.24	98.01	96.89	0.00	386.62	386.62	0.00		11.77			

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersectio	2.802			2.666			1.968			1.759		
Crosswalk LOS	C			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1333			1333			489			489		
d_b, Bicycle Delay [s]	5.00			5.00			25.69			25.69		
I_b,int, Bicycle LOS Score for Intersection	1.942			2.760			1.730			1.670		
Bicycle LOS	A			C			A			A		

Sequence





Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Peterson Rd/ Access 2

Control Type:	Signalized	Delay (sec / veh):	19.8
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.655

Intersection Setup

Name	Peterson Rd			Peterson Rd			Access 2			38th Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	0	0	0	1	0	0
Entry Pocket Length [ft]	355.00	100.00	250.00	250.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	190.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd			Peterson Rd			Access 2			38th Ave		
Base Volume Input [veh/h]	0	103	210	1	337	0	0	0	0	735	0	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	27	27	0	0	103	0	0	0	103	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	105	0	0	0	0	0	52	0	0	1
Total Hourly Volume [veh/h]	27	130	105	1	440	0	0	0	51	735	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	35	29	0	120	0	0	0	14	200	0	0
Total Analysis Volume [veh/h]	29	141	114	1	478	0	0	0	55	799	0	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	9	0	0	7	0	0	16	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	30	0	0	30	0	0	30	0	0	30	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	0	10	0	0	10	0	0	10	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C
C, Calculated Cycle Length [s]	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	26	26	26	26	26	26	26	26
g / C, Green / Cycle	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.04	0.09	0.08	0.00	0.30	0.04	0.36	0.00
s, saturation flow rate [veh/h]	784	1600	1360	962	1600	1360	2240	1600
c, Capacity [veh/h]	244	693	589	452	693	649	963	693
d1, Uniform Delay [s]	22.06	10.56	10.51	12.88	13.74	10.04	15.10	0.00
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.99	0.66	0.73	0.01	5.55	0.26	8.24	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.12	0.20	0.19	0.00	0.69	0.08	0.83	0.00
d, Delay for Lane Group [s/veh]	23.05	11.23	11.25	12.88	19.28	10.30	23.35	0.00
Lane Group LOS	C	B	B	B	B	B	C	A
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.40	1.14	0.94	0.01	5.54	0.42	5.20	0.00
50th-Percentile Queue Length [ft/ln]	10.07	28.55	23.40	0.23	138.50	10.56	130.09	0.00
95th-Percentile Queue Length [veh/ln]	0.72	2.06	1.68	0.02	9.40	0.76	8.94	0.00
95th-Percentile Queue Length [ft/ln]	18.12	51.38	42.12	0.41	235.00	19.00	223.62	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.05	11.23	11.25	12.88	19.28	19.28	10.30	10.30	10.30	23.35	0.00	0.00
Movement LOS	C	B	B	B	B	B	B	B	B	C	A	A
d_A, Approach Delay [s/veh]	12.44			19.27			10.30			23.35		
Approach LOS	B			B			B			C		
d_I, Intersection Delay [s/veh]	19.78											
Intersection LOS	B											
Intersection V/C	0.655											

Emissions

Vehicle Miles Traveled [mph]	18.83	91.54	74.01	0.56	267.93	4.39	29.05	0.00
Stops [stops/h]	24.16	68.51	56.16	0.55	332.40	25.34	624.43	0.00
Fuel consumption [US gal/h]	1.04	4.47	3.62	0.03	14.74	0.44	8.44	0.00
CO [g/h]	73.01	312.37	252.89	2.01	1030.49	30.47	590.09	0.00
NOx [g/h]	14.21	60.78	49.20	0.39	200.50	5.93	114.81	0.00
VOC [g/h]	16.92	72.40	58.61	0.47	238.83	7.06	136.76	0.00

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	21.68	21.68	21.68	21.68
I_p,int, Pedestrian LOS Score for Intersectio	3.912	2.123	1.877	2.363
Crosswalk LOS	D	B	A	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	867	867	867	867
d_b, Bicycle Delay [s]	9.63	9.63	9.63	9.63
I_b,int, Bicycle LOS Score for Intersection	2.201	2.350	1.736	2.880
Bicycle LOS	B	B	A	C

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: 48th Ave/Access 3

Control Type: Two-way stop
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 8.9
Level Of Service: A
Volume to Capacity (v/c): 0.108

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+			+T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	355.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	103	0	0	0	0	0	0	27	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	103	0	0	0	0	0	0	27	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	28	0	0	0	0	0	0	7	0	0
Total Analysis Volume [veh/h]	0	0	112	0	0	0	0	0	0	29	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results





V/C, Movement V/C Ratio	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
d_M, Delay for Movement [s/veh]	9.52	10.01	8.90	10.00	9.59	8.48	7.38	0.00	0.00	7.43	0.00	0.00
Movement LOS	A	B	A	B	A	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.36	0.36	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
95th-Percentile Queue Length [ft/ln]	9.08	9.08	9.08	0.00	0.00	0.00	0.00	0.00	0.00	1.47	0.00	0.00
d_A, Approach Delay [s/veh]	8.90			9.36			2.46			7.43		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	8.60											
Intersection LOS	A											

Intersection Level Of Service Report
Intersection 16: 48th Ave/Peterson Rd

Control Type: Two-way stop
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 13.5
Level Of Service: B
Volume to Capacity (v/c): 0.417

Intersection Setup

Name	Peterson Rd											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	355.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	250.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peterson Rd											
Base Volume Input [veh/h]	0	0	82	0	0	0	0	0	0	276	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	27	0	0	0	0	0	0	0	103	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	0	82	0	0	0	0	0	103	276	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	0	22	0	0	0	0	0	28	75	0	0
Total Analysis Volume [veh/h]	29	0	89	0	0	0	0	0	112	300	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.42	0.00	0.00
d_M, Delay for Movement [s/veh]	7.43	0.00	0.00	7.57	0.00	0.00	9.38	10.15	8.90	13.54	13.12	12.01
Movement LOS	A	A	A	A	A	A	A	B	A	B	B	B
95th-Percentile Queue Length [veh/ln]	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	2.06	2.06	2.06
95th-Percentile Queue Length [ft/ln]	1.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.08	51.62	51.62	51.62
d_A, Approach Delay [s/veh]	1.83			2.52			8.90			13.54		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	9.95											
Intersection LOS	B											

Signal Warrants Report For Intersection 15: 48th Ave/Access 3

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	27	0	103	0
2	26	0	100	0
3	26	0	98	0
4	24	0	92	0
5	21	0	81	0
6	21	0	80	0
7	21	0	79	0
8	19	0	72	0
9	19	0	71	0
10	18	0	70	0
11	16	0	61	0
12	15	0	57	0
13	15	0	56	0
14	11	0	41	0
15	11	0	41	0
16	8	0	29	0
17	4	0	16	0
18	4	0	16	0
19	2	0	9	0
20	1	0	5	0
21	1	0	3	0
22	0	0	1	0
23	0	0	1	0
24	0	0	1	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	27	1	103	No	No	No	No	No	No	No	No	No	No
2	2	26	1	100	No	No	No	No	No	No	No	No	No	No
3	2	26	1	98	No	No	No	No	No	No	No	No	No	No
4	2	24	1	92	No	No	No	No	No	No	No	No	No	No
5	2	21	1	81	No	No	No	No	No	No	No	No	No	No
6	2	21	1	80	No	No	No	No	No	No	No	No	No	No
7	2	21	1	79	No	No	No	No	No	No	No	No	No	No
8	2	19	1	72	No	No	No	No	No	No	No	No	No	No
9	2	19	1	71	No	No	No	No	No	No	No	No	No	No
10	2	18	1	70	No	No	No	No	No	No	No	No	No	No
11	2	16	1	61	No	No	No	No	No	No	No	No	No	No
12	2	15	1	57	No	No	No	No	No	No	No	No	No	No
13	2	15	1	56	No	No	No	No	No	No	No	No	No	No
14	2	11	1	41	No	No	No	No	No	No	No	No	No	No
15	2	11	1	41	No	No	No	No	No	No	No	No	No	No
16	2	8	1	29	No	No	No	No	No	No	No	No	No	No
17	2	4	1	16	No	No	No	No	No	No	No	No	No	No
18	2	4	1	16	No	No	No	No	No	No	No	No	No	No
19	2	2	1	9	No	No	No	No	No	No	No	No	No	No
20	2	1	1	5	No	No	No	No	No	No	No	No	No	No
21	2	1	1	3	No	No	No	No	No	No	No	No	No	No
22	2	0	1	1	No	No	No	No	No	No	No	No	No	No
23	2	0	1	1	No	No	No	No	No	No	No	No	No	No
24	2	0	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.9	9.4
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:15	0:00
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	103	0
High Minor Volume Condition Met	Yes	No
Total Entering Volume on All Approaches During Same Hour	130	130
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

Signal Warrants Report For Intersection 16: 48th Ave/Peterson Rd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	N	S	E	W
1	0	109	276	103
2	0	106	268	100
3	0	104	262	98
4	0	97	246	92
5	0	86	218	81
6	0	85	215	80
7	0	84	213	79
8	0	76	193	72
9	0	75	190	71
10	0	74	188	70
11	0	64	163	61
12	0	60	152	57
13	0	59	149	56
14	0	44	110	41
15	0	44	110	41
16	0	31	77	29
17	0	17	44	16
18	0	17	44	16
19	0	10	25	9
20	0	5	14	5
21	0	3	8	3
22	0	1	3	1
23	0	1	3	1
24	0	1	3	1

Warrant Analysis by Hour

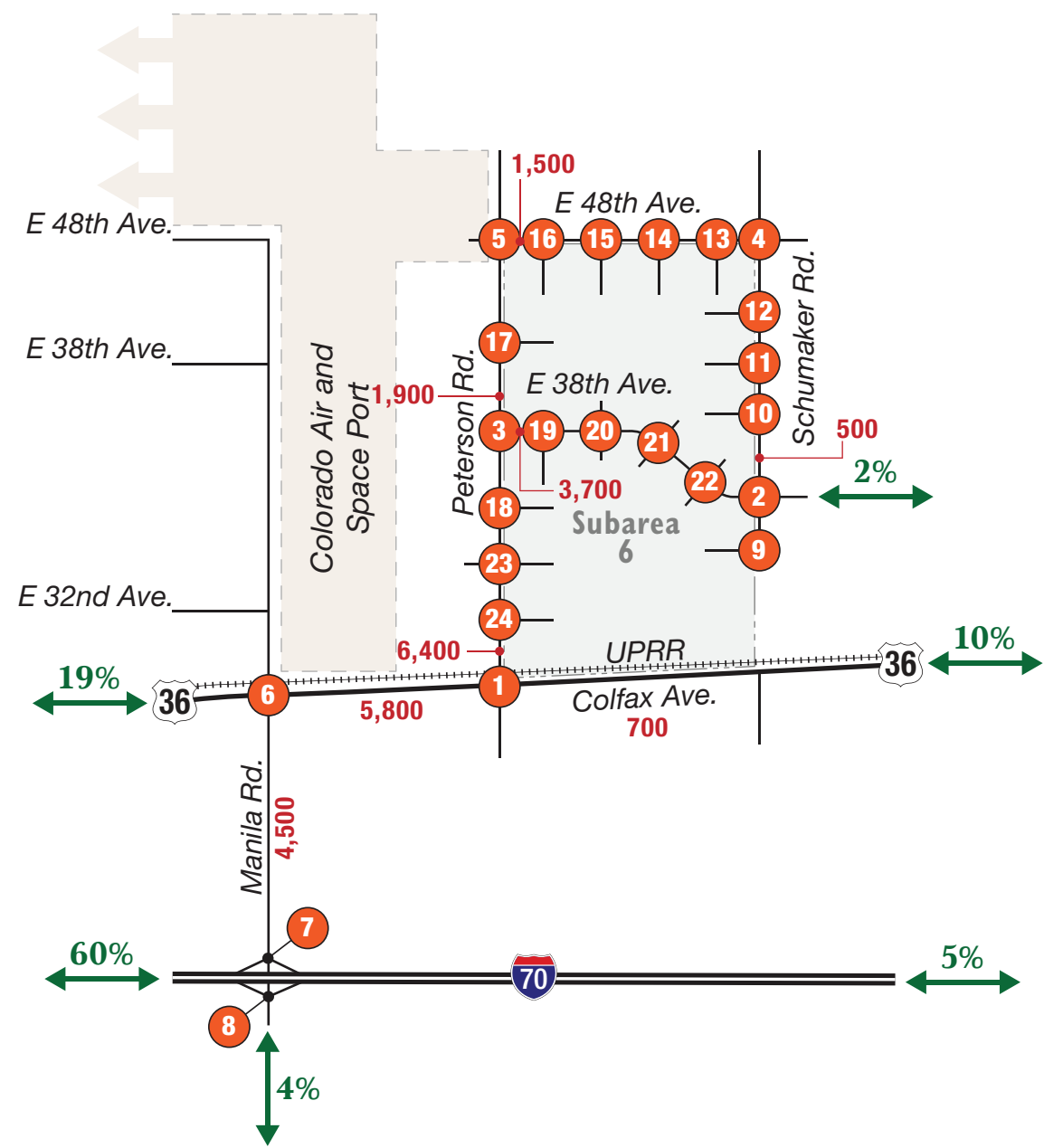
Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	109	1	276	No	No	No	No	No	No	No	No	No	No
2	3	106	1	268	No	No	No	No	No	No	No	No	No	No
3	3	104	1	262	No	No	No	No	No	No	No	No	No	No
4	3	97	1	246	No	No	No	No	No	No	No	No	No	No
5	3	86	1	218	No	No	No	No	No	No	No	No	No	No
6	3	85	1	215	No	No	No	No	No	No	No	No	No	No
7	3	84	1	213	No	No	No	No	No	No	No	No	No	No
8	3	76	1	193	No	No	No	No	No	No	No	No	No	No
9	3	75	1	190	No	No	No	No	No	No	No	No	No	No
10	3	74	1	188	No	No	No	No	No	No	No	No	No	No
11	3	64	1	163	No	No	No	No	No	No	No	No	No	No
12	3	60	1	152	No	No	No	No	No	No	No	No	No	No
13	3	59	1	149	No	No	No	No	No	No	No	No	No	No
14	3	44	1	110	No	No	No	No	No	No	No	No	No	No
15	3	44	1	110	No	No	No	No	No	No	No	No	No	No
16	3	31	1	77	No	No	No	No	No	No	No	No	No	No
17	3	17	1	44	No	No	No	No	No	No	No	No	No	No
18	3	17	1	44	No	No	No	No	No	No	No	No	No	No
19	3	10	1	25	No	No	No	No	No	No	No	No	No	No
20	3	5	1	14	No	No	No	No	No	No	No	No	No	No
21	3	3	1	8	No	No	No	No	No	No	No	No	No	No
22	3	1	1	3	No	No	No	No	No	No	No	No	No	No
23	3	1	1	3	No	No	No	No	No	No	No	No	No	No
24	3	1	1	3	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

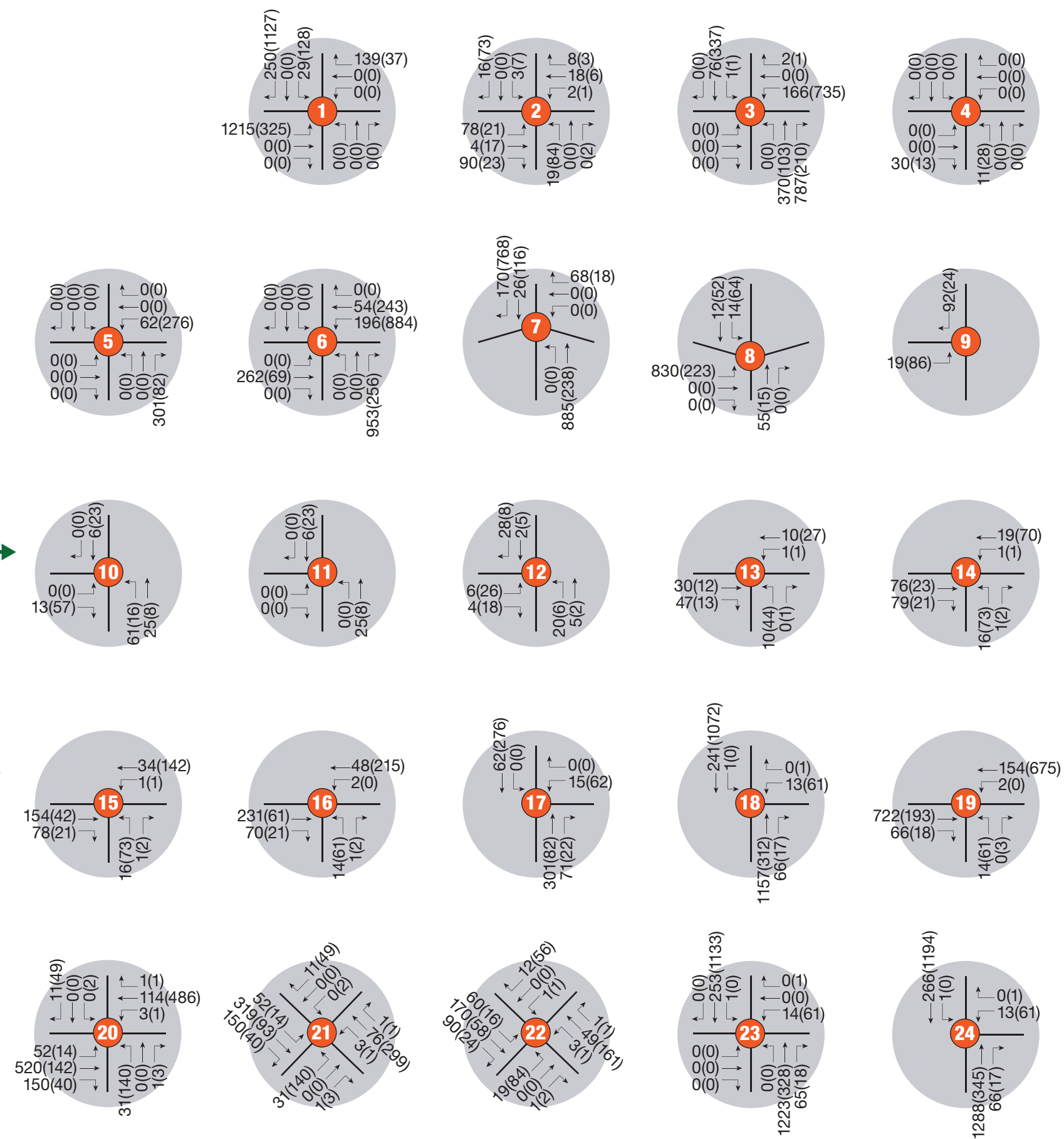
Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	13.5	8.9
Number of Lanes on Minor Street Approach	1	2
VehicleHours of Stopped Delay on Minor Approach (h:mm)	1:02	0:15
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	276	103
High Minor Volume Condition Met	Yes	No
Total Entering Volume on All Approaches During Same Hour	488	488
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

Appendix E – Supplementary Documents

KEY MAP



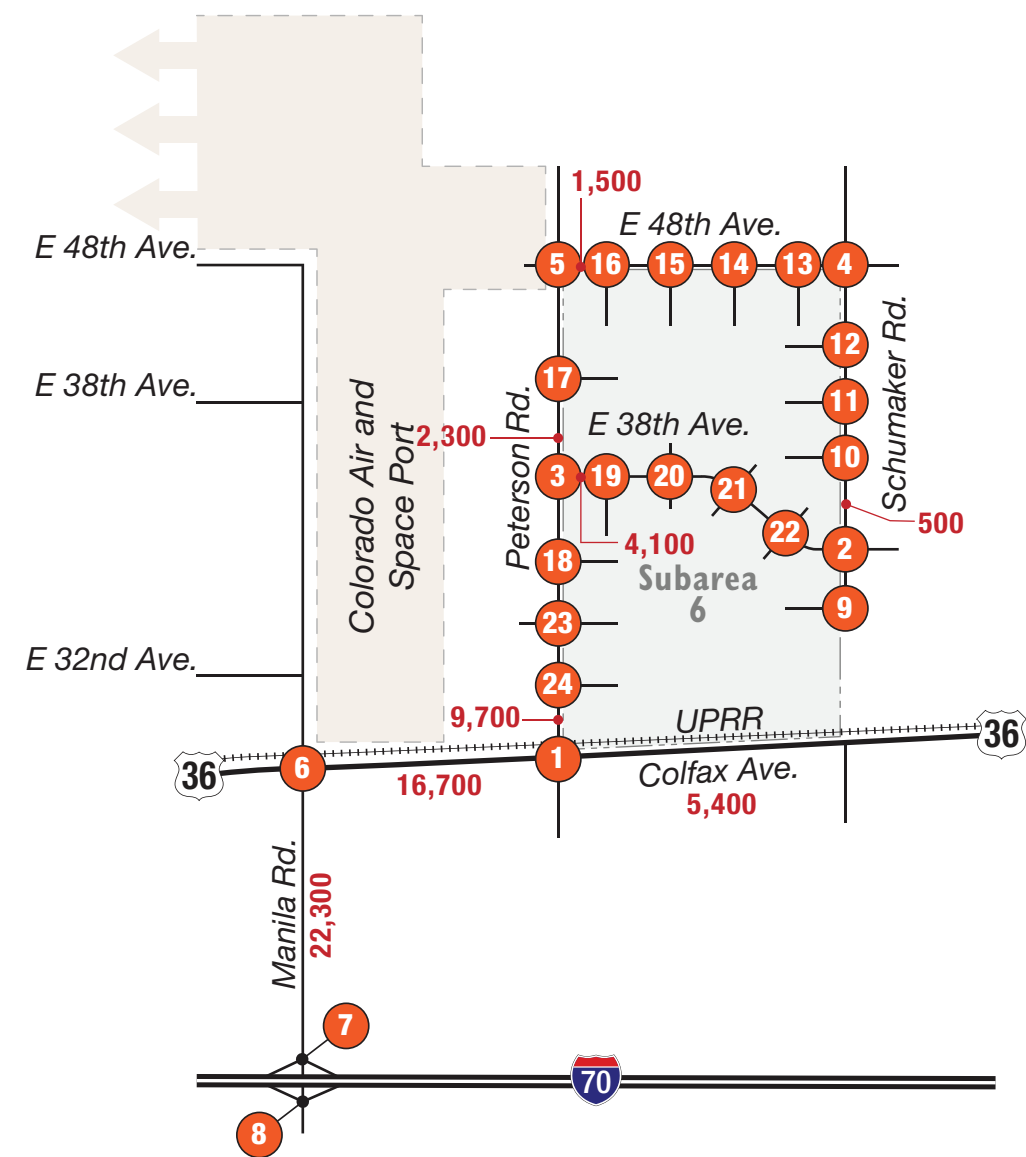
- LEGEND**
- xxx(xxx) = AM(PM) Peak Hour Traffic Volumes
 - XXXX = Daily Traffic Volumes
 - XX% = Site Trip Distribution



NOTE: Drawing Not to Scale

FIGURE 4
Site Generated Volumes and Distribution Percentage
Port Colorado - PA-6 UPDATE | 21-358-01 | 1/19/22

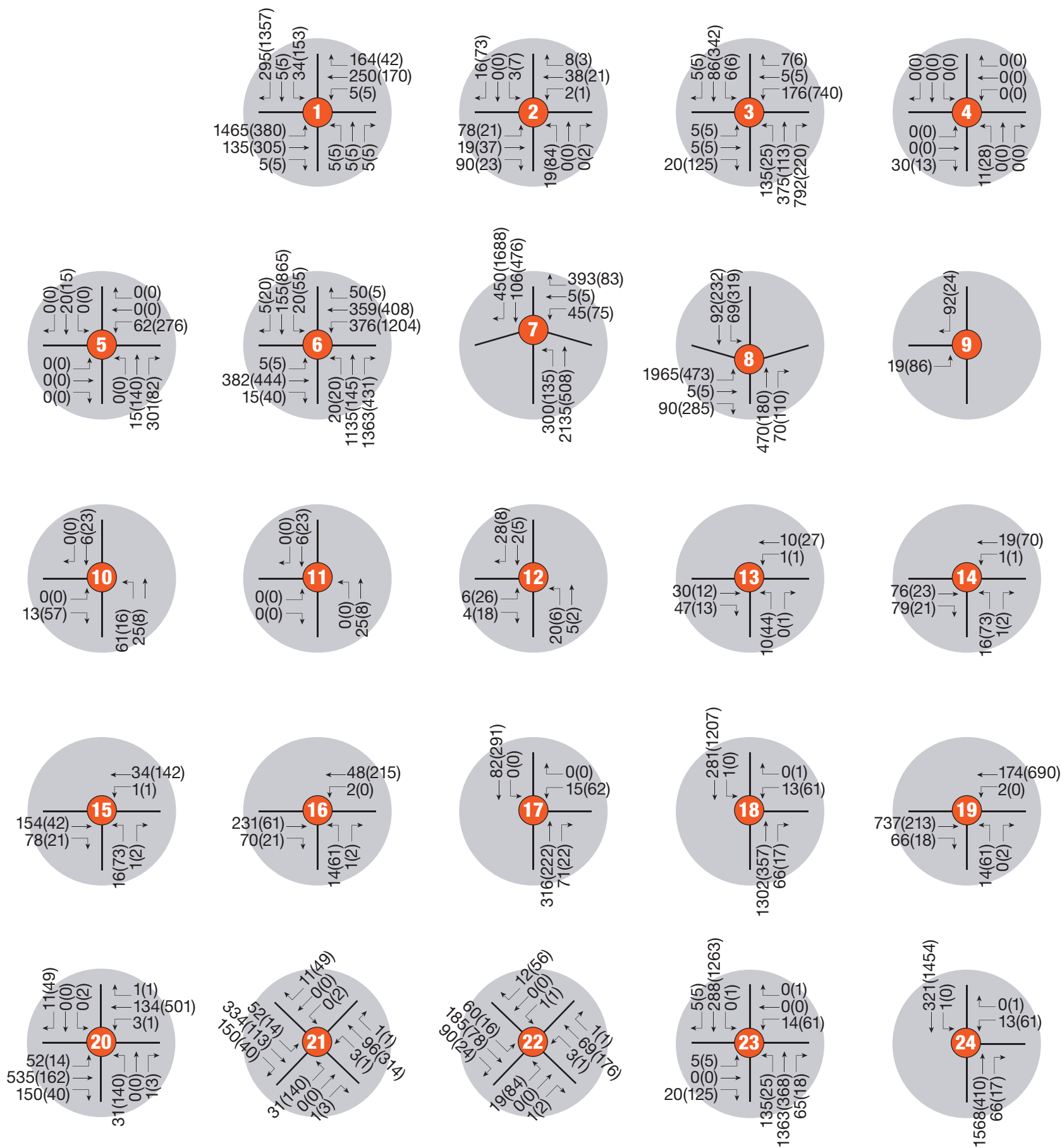
KEY MAP



LEGEND

xxx(xxx) = AM(PM) Peak Hour Traffic Volumes
XXXX = Daily Traffic Volumes

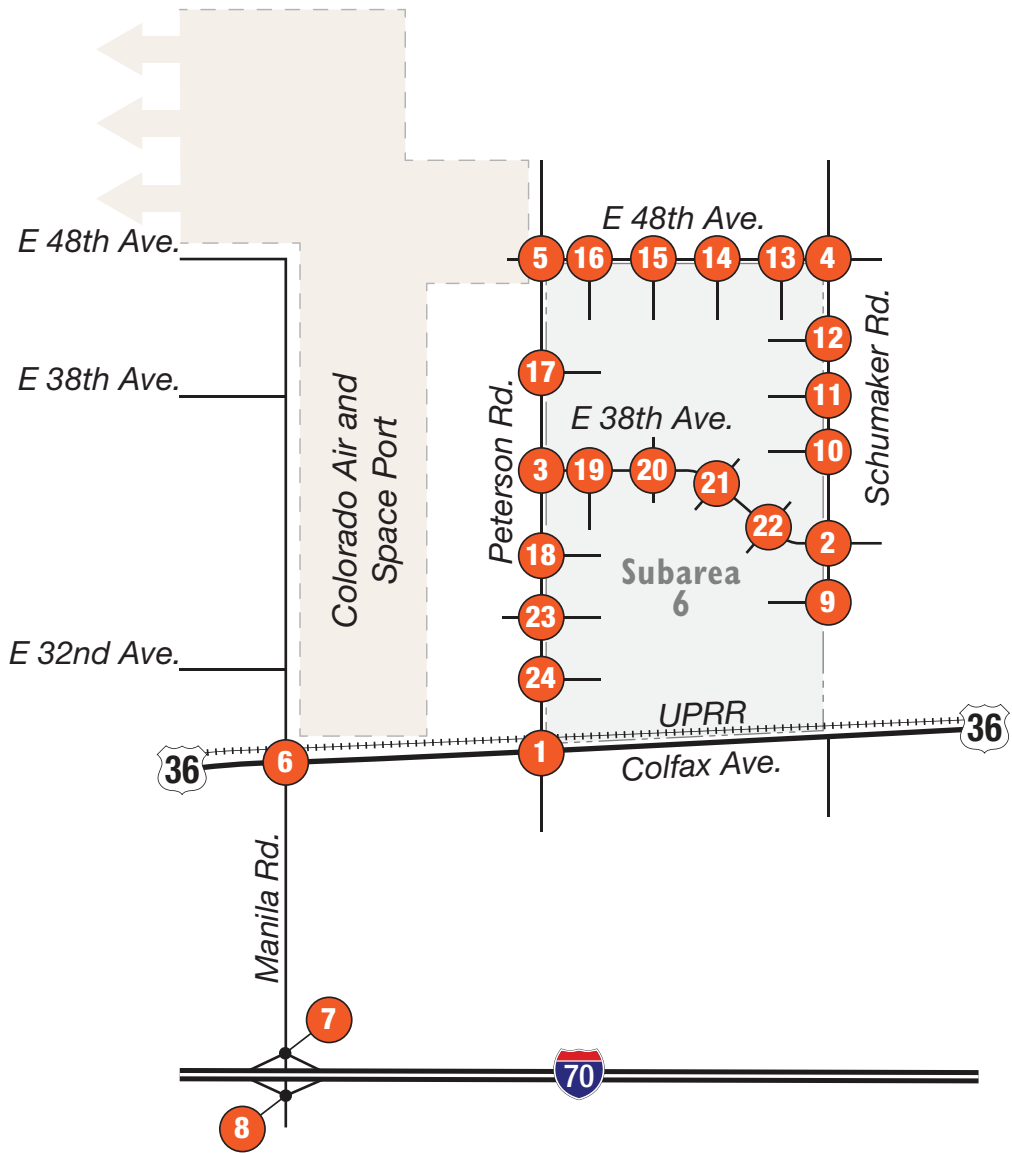
NOTE: Drawing Not to Scale



NORTH
FIGURE 8

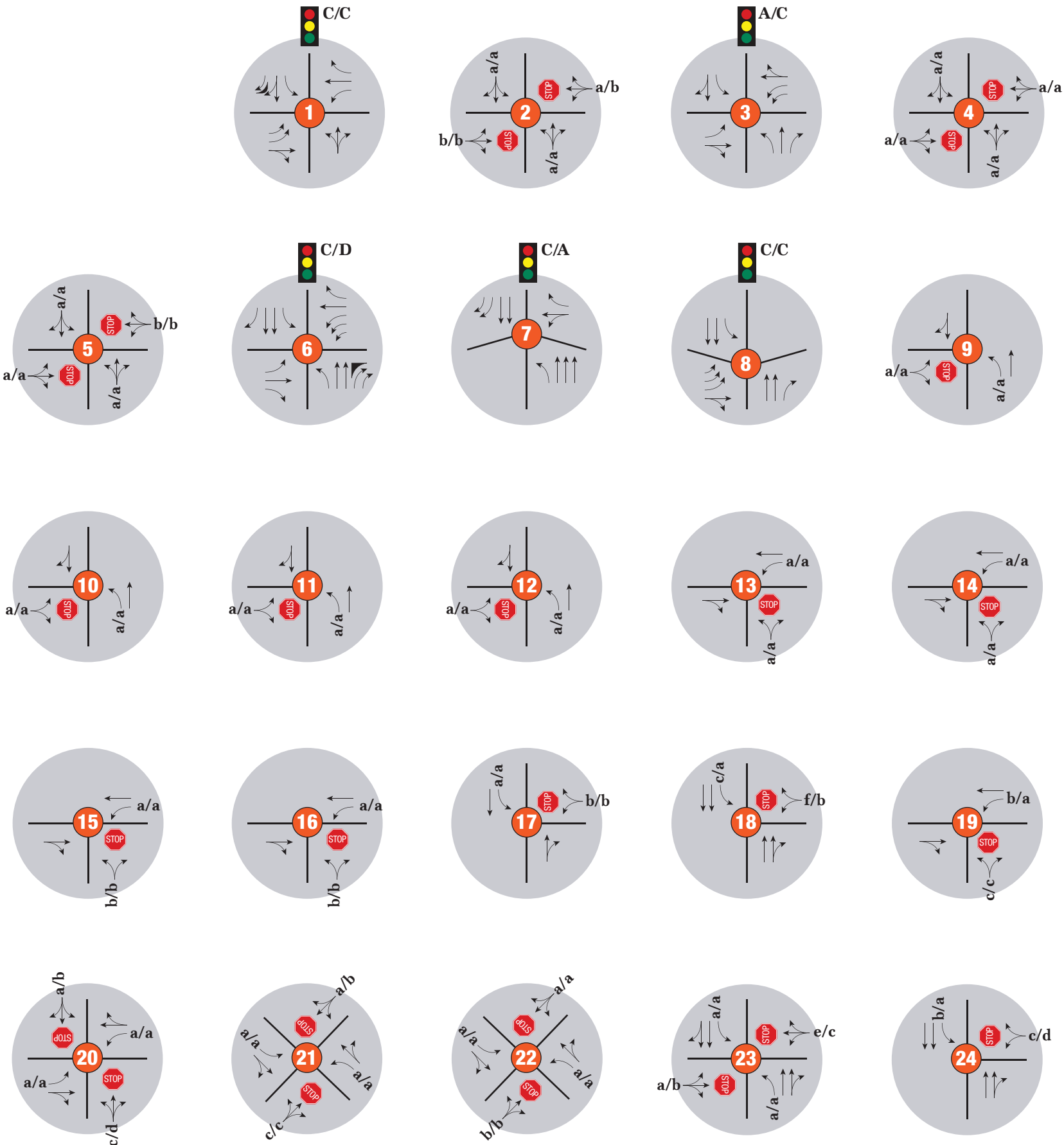
Long Term Total (2040)
Traffic Volumes

KEY MAP



LEGEND

- x/x = AM/PM Unsignalized Intersection Level of Service
- X/X = AM/PM Signalized Intersection Level of Service
- ↗ = Lane Assignment
- STOP = Stop Sign
- 🚦 = Traffic Signal



Appendix F - RMRP Master Development Agreement Improvement Table

Exhibit F - RMRP Master Development Agreement Improvement Table

Intersection	Improvements	Project Threshold ADT / Planning Year Needed
Colfax Avenue & Manilla Road	<ul style="list-style-type: none"> Construct Eastbound Left Turn Lane (400-ft + 220-ft Taper) * Construct Westbound Left Turn Lane (770-ft + 220-ft Taper) * Construct Northbound to Eastbound Acceleration Lane (740-ft + 220-ft Taper) * 	<ul style="list-style-type: none"> • ## / 2030 • # / 2030 • 250 ADT / 2030
Colfax Avenue & Petterson Road	<ul style="list-style-type: none"> Construct Eastbound Left Turn Lane (685-ft + 220-ft Taper) * Construct Westbound Right Turn Deceleration Lane (380-ft + 220-ft Taper) * Construct Southbound to Westbound Acceleration Lane (740-ft + 220-ft Taper) * 	<ul style="list-style-type: none"> • 90 ADT NP / 2030 • 2,050 ADT NP / 2030 • 496 ADT NP / 2030
Colfax Avenue South Parcel West Access	<ul style="list-style-type: none"> Construct Eastbound Right Turn Deceleration Lane (380-ft + 220-ft Taper) * Construct Westbound Left Turn Lane (390-ft + 220-ft Taper) * 	<ul style="list-style-type: none"> • 322 ADT SP / 2030 • 794 ADT SP / 2030
Colfax Avenue South Parcel East Right-in/Right-out Access	<ul style="list-style-type: none"> Construct Eastbound Right Turn Deceleration Lane (380-ft + 220-ft Taper) * 	<ul style="list-style-type: none"> • 642 ADT SP / 2030
I-70 Westbound Ramps & Manilla Rd	<ul style="list-style-type: none"> Construct Southbound Right Turn Lane (275-ft + 160-ft Taper) Construct Westbound Right Turn Lane (100-ft + 160-ft Taper) * Traffic Signal 	<ul style="list-style-type: none"> • # / 2030 • 682 ADT / 2030 • ### / 2045
I-70 Eastbound Ramps & Manilla Rd	<ul style="list-style-type: none"> Construct Eastbound Left Turn Lane (275-ft + 160-ft Taper) * 	<ul style="list-style-type: none"> • # / 2030

Improvement Warranted Based on Existing Traffic;

Improvement Not Related to Project;

= Long Term Improvement Not Needed with Full Project Development

* = These improvements are within CDOT jurisdiction and will be either funded or constructed as required by CDOT. County will advise developer if an access permit triggers these improvements.

NP = North Parcel; SP = South Parcel;

Notes:

- SIA's submitted with individual development plans may include fair share reimbursement in accordance with Adams County Standards.
- The timing of the City of Aurora improvements will be in accordance with Aurora requirements.
- The County and Developer acknowledge that fair share reimbursement is allowed for required offsite County improvements in accordance with the Adams County Development Standards and Regulations, Section 5-02-04. Reimbursement may be provided for in the Development Agreements pursuant to this Master Agreement.