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Lorson Ranch PK-8 School
Traffic Impact and Access Analysis
(LSC #184180)
May 11, 2018

Traffic Engineer's Statement

This traffic report and supporting information were prepared under my responsible charge and they comport with the standard of care. So far as is consistent with the standard of care, said report was prepared in general conformance with the criteria established by the County for traffic reports.

Developer's Statement

I, the Developer, have read and will comply with all commitments made on my behalf within this report.

5/11/18
Date

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May 11, 2018

Mr. Dennis Neal
Widefield School District
3645 Widefield Drive
Colorado Springs, CO 80911

RE: Lorson Ranch PK-8 School
El Paso County, Colorado
Traffic Impact and Access Analysis
LSC #184180

Dear Mr. Neal:

LSC Transportation Consultants, Inc. has prepared this traffic impact analysis for the proposed Lorson Ranch school to be located within the Lorson Ranch East development in El Paso County, Colorado. The site location is shown on Figure 1.

REPORT CONTENTS

The report contains the following:

- Recent/current street and traffic conditions in the vicinity of the site and the recent report for Lorson Ranch East for identification of existing and planned street widths, lane geometries, traffic controls, posted speed limits, street classification, etc.
- Existing traffic volumes at the key intersections in the vicinity of the site and estimates of short-term and 2040 background traffic volumes.
- The projected average weekday and peak-hour vehicle trips to be generated by the proposed school.
- The assignment of the projected trips to the existing and planned street system.
- The resulting short-term and 2040 total traffic volumes on the street system.
- The resulting traffic impacts. The traffic impacts have been quantified by determining the future levels of service at the intersections of Marksheffel Road/Fontaine Boulevard, Lamprey Drive/Fontaine Boulevard and the proposed site access point intersections on Fontaine Boulevard.
- An estimate of the on-site vehicle stacking/queuing distances needed to accommodate buses and morning and afternoon peak parent drop-off and pick-up queues.
- Recommendations for street functional classification, traffic controls, and auxiliary turn lanes.

SITE DEVELOPMENT AND LAND USE

Land Use

A school for students from pre-school to eighth grade is planned to be located northeast of the future intersection of Fontaine Boulevard and Lamprey Drive within the Lorson Ranch development. The school is planned to be constructed in a single phase. At buildout the school is planned to support about 990 students. This includes about 90 preschool-aged students (45 students during the morning session and 45 students in the afternoon session) and 100 students in each grade from kindergarten to eighth grade.

The school district is currently in the process of updating their school boundary map, however they anticipate that a very high percentage of the students who will attend the proposed school would live within the Lorson Ranch development. A bell schedule has also not been set, however, based on the bell schedule of existing schools within the district and the constraints of the school bus schedules, it is anticipated that the middle level students (sixth through eighth grade) would start 30 to 45 minutes before the elementary level students and the preschool would start 30 minutes after the elementary level students.

Provide times assumed in this report.

Access Points

The site plan is shown in Figure 2. A bus loop is planned on the north side of the campus with access to Lamprey Drive about 1,250 feet northeast of Fontaine Boulevard aligning with Shavers Drive. The district estimates about four buses will serve the proposed school.

Access for staff and visitor parking and the parent pick-up and drop-off loop is proposed to Fontaine Boulevard. An entrance-only access is proposed about 955 feet east of Lamprey. A right-turn only exit is proposed about 480 feet to the west (475 feet east of Lamprey). Vehicles wishing to travel east on Fontaine Boulevard after exiting the school will be able to perform a U-turn at the Fontaine/Lamprey roundabout intersection.

Sight Distance

Figure 3 shows the sight distance analysis for the bus loop intersection to Lamprey Drive. The analysis is based on a design speed of 40 miles per hour.

Pedestrian and Bicycle Route Analysis

Figure 4 shows a pedestrian and bicycle route analysis for the school.

On-Site Circulation

The parent pick-up/drop-off loop shown on the site plan shows about 500 feet of on-site stacking distance. Based on an empirical formula developed by the Municipal School Transportation

Assistance (MSTA) for the North Carolina Department of Transportation (note: this is used locally by the City of Colorado Springs), a high demand stacking distance of 1,391 feet would be required during the elementary school peak period and 659 feet would be required during the middle school peak periods. The high demand queue length is a precaution for atypical events, including bad weather, school performances, and other special events. The proposed 30- to 45-minute offset between the middle level and elementary bell times should provide adequate time for the queues to dissipate such that it will only be necessary to provide the higher of the two predicted stacking lengths (1,391 feet). This queue distance is exclusive of a recommended five- to seven-vehicle-long drop-off/pick-up zone. Figure 5 shows the proposed circulation plan proposed by the applicant to be implemented during peak pick-up and drop-off times to prevent vehicles from queuing on public streets. As shown on Figure 5 the circulation plan provides for about 1,375 feet of stacking in addition to a 175-foot drop-off/pick-up zone.

ROADWAY AND TRAFFIC CONDITIONS

Area Roadways

Figure 1 shows the roadways in the vicinity of the site. The major roadways are identified below followed by a brief description of each.

- **Marksheffel Road** extends north from the Link Road/C&S Road intersection in Fountain, Colorado to north of Woodmen Road. Marksheffel Road is shown as a future four-lane Expressway on the County *Major Transportation Corridors Plan (MTCP)*. The posted speed limit on Marksheffel Road at Fontaine Boulevard is 45 miles per hour (mph). The PPRTA has completed the Marksheffel Road upgrade between Mesa Ridge Parkway and Bradley Road. This included intersection improvements at the Fontaine Boulevard intersection.

- **Fontaine Boulevard** is designated as a four-lane Urban Principal Arterial east of Marksheffel Road and it has been constructed as such from Marksheffel Road east to Old Glory Drive. As part of the Lorson Ranch East development Fontaine Boulevard will be extended east from Old Glory Drive. In the interim, an Urban Non-Residential Collector Street will be constructed east of Stingray Lane as development progresses. The posted speed limit on Fontaine Boulevard is 35 mph just east of (and a short distance west of) Marksheffel Road. The speed limit increases to 45 mph just east of the bridge over Jimmy Camp Creek.

Baseline Traffic Volumes

Figure 6 shows the recent traffic volumes at the intersection of Marksheffel Road/Fontaine Boulevard. These “baseline” traffic volumes were based on traffic counts conducted by LSC in March 2017. The traffic count reports are attached.

Baseline Levels of Service

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection. Level of service is indicated on a scale from "A" to "F." LOS A represents control delay of less than 10 seconds for unsignalized and signalized intersections. LOS F represents control delay of more than 50 seconds for unsignalized intersections and more than 80 seconds for signalized intersections. Table 1 shows the level of service delay ranges.

Table 1
Intersection Levels of Service Delay Ranges

	Signalized Intersections		Unsignalized Intersections
Level of Service	Average Control Delay (seconds per vehicle)	V/C(1)	Average Control Delay (seconds per vehicle)(2)
A	10.0 sec or less	less than 0.60	10.0 sec or less
B	10.1-20.0 sec	0.60-0.69	10.1-15.0 sec
C	20.1-35.0 sec	0.70-0.79	15.1-25.0 sec
D	35.1-55.0 sec	0.80-0.89	25.1-35.0 sec
E	55.1-80.0 sec	0.90-0.99	35.1-50.0 sec
F	80.1 sec or more	1.00 and greater	50.1 sec or more

(1) Source: *Transportation Research Circular 212*
(2) For unsignalized intersections if V/C ratio is greater than 1.0 the level of service is LOS F regardless of the projected average control delay per vehicle.

The intersection of Marksheffel/Fontaine was analyzed to determine the baseline levels of service using Synchro. Figure 6 shows the level of service analysis results. As shown on the figure, all movements this intersection are level of service C or better during the peak hours. The level of service (LOS) reports are attached.

SHORT-TERM (YEAR 2020) BACKGROUND TRAFFIC

Background traffic is the traffic estimated to be on the roadways without the school traffic. Background traffic includes the baseline (from March 2017 counts) traffic and increases in through traffic on Marksheffel Road due to both regional growth and the recent extension of Mesa Ridge Parkway east to Marksheffel Road. The portion of the baseline traffic volumes was also assumed to be rerouted due to the extension of Mesa Ridge Parkway east to Marksheffel Road. A portion of the existing traffic that currently travels to and from the west on Fontaine Boulevard was assumed to shift to travel to and from the south on Marksheffel Road to this new connection. The short-term background traffic also includes traffic generated by buildout of the residential portion of Lorson Ranch subdivisions north of Lorson Boulevard between Jimmy Camp Creek and the east tributary, the Carriage Meadows North and Carriage Meadows South subdivisions located west of Jimmy Camp Creek, and Lorson Ranch East but assumes zero traffic generated by school. The short-term background volumes assume Lorson Boulevard has been

constructed east of Marksheffel Road to serve the Carriage Meadows South subdivision (with a street connection north to Fontaine Boulevard) but does **not** cross Jimmy Camp Creek (main channel). The short-term background traffic volumes are shown in Figure 7.

2040 BACKGROUND TRAFFIC

Figure 8 shows the projected 2040 background traffic volumes. The 2040 background traffic volumes are based on estimates of traffic projected to be generated at buildout of the Lorson Ranch Sketch Plan (excluding the traffic projected to be generated by Lorson Ranch East) and traffic volumes shown in the *Marksheffel Road South Corridor Preservation Plan* dated July 2014. Appendix Table 1 shows the trip generation estimates for all existing and future land uses assumed to be built out by 2040 in the Lorson Ranch development. The 2040 background volumes also assume full buildout of the street network within Lorson Ranch but assume Meridian Road has not been extended south to Fontaine Boulevard.

TRIP GENERATION

Estimates of the traffic volumes expected to be generated by the site have been made using the nationally published trip generation rates found in *Trip Generation, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE). Table 2 shows the results of the trip generation estimates. Table 2 also shows a comparison of the trip generation estimate for this same site assumed in the *Lorson Ranch East Updated Traffic Impact and Access Analysis* by LSC dated November 9, 2017. The estimate contained in the Lorson Ranch East TIA assumed a school serving 1,000 students (500 elementary aged students and 500 middle school aged students). The estimate was made using the 9th edition of the *Trip Generation* manual. The trip generation rates shown in the current 10th edition showed an increase for both elementary and middle schools.

As shown in Table 2, the proposed school is projected to generate about 1,943 new vehicle trips on the average weekday, with about one-half of the vehicles entering and one-half of the vehicles exiting in a 24-hour period. This is about 488 more vehicle trips than were estimated in the Lorson Ranch East TIA. During the morning peak hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 344 vehicles would enter and 293 vehicles would exit the site. During the afternoon peak hour of the school, which was assumed to occur for one hour between 2:30 to 4:30 p.m., about 154 vehicles would enter and 186 vehicles would exit the site. During the afternoon peak hour of the adjacent street traffic, which generally occurs for one hour between 4:30 and 6:30 p.m., about 73 vehicles would enter and 76 vehicles would exit the site.

TRIP DISTRIBUTION AND ASSIGNMENT

The directional distribution of the site-generated traffic volumes on the street and roadway system serving the site is one of the most important factors in determining the site's traffic impacts. The number of vehicle trips assigned within the Lorson Ranch development were based on the internal trip estimates shown in Appendix Table 1. These trips were assigned based on number and location of existing and planned residential dwellings within Lorson Ranch. Figure 9

shows the external trip distribution estimates (external to Lorson Ranch). The directional distribution estimates have been based on the location of the site with respect to the regional residential, employment, commercial, and activity centers; the land use proposed; the access/roadway connections assumed; and the roadway network.

Figures 10 and 11 show the short-term and long-term site-generated traffic volume estimates, respectively. These volumes were determined by first assigning the internal vehicle trips to the street network based on the location of the existing and planned residential dwellings within Lorson Ranch. The short-term estimate assumes buildout of the residential portion of Lorson Ranch subdivisions north of Lorson Boulevard between Jimmy Camp Creek and the east tributary, the Carriage Meadows North and Carriage Meadows South subdivisions located west of Jimmy Camp Creek, and Lorson Ranch East Filing No. 1. The long-term site-generated traffic volumes assume buildout of the Lorson Ranch development. The external vehicle trips were then assigned to the street network by applying the trip distribution percentages (from Figure 9) to the external trip generation estimates. The internal and external site-generated traffic volumes were then summed to determine the total site-generated traffic volumes.

PROJECTED TOTAL TRAFFIC

Figure 12 shows the short-term total traffic volumes. These volumes are the sum of the short-term background traffic volumes (from Figure 7) plus the short-term site-generated traffic volumes (from Figure 10).

Figure 13 shows the 2040 total traffic volumes. These volumes are the sum of the 2040 background traffic volumes (from Figure 8) plus the long-term site-generated traffic volumes (from Figure11).

PROJECTED LEVELS OF SERVICE

The intersections of Marksheffel Road/Fontaine Boulevard and Fontaine/Lamprey and the site access points have been analyzed to determine the projected levels of service for the short-term and 2040 background and total traffic volumes based on the signalized method of analysis from Synchro and the unsignalized method of analysis procedures outlined in the *Highway Capacity Manual, 2010 Edition* by the Transportation Research Board. The level of service reports are attached. The results of the analysis are shown in Figures 7,8, 12, and 13.

Marksheffel/Fontaine

The signal-controlled Marksheffel Road/Fontaine Boulevard intersection is projected to continue to operate at a level of service D overall or better based on the short-term and 2040 background and total traffic conditions.

Fontaine/Lamprey

The intersection of Fontaine/Lamprey is planned to be constructed as a one-lane modern roundabout. The one-lane roundabout would work with the interim Non-Residential Collector cross-section and all approaches are projected to operate at a LOS D or better during peak hours based on the projected short-term and 2040 total traffic volumes.

Fontaine Boulevard Site Access Points

All movements at the site access points to Fontaine Boulevard are projected to operate at LOS D or better during the peak hours based on the projected short-term and 2040 total traffic volumes as two-way stop-sign-controlled intersections.

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

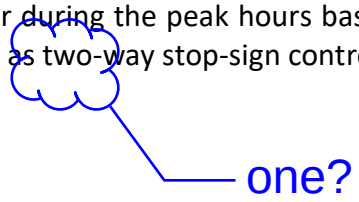
- The proposed school is projected to generate about 1,943 new vehicle trips on the average weekday, with about one-half of the vehicles entering and one-half of the vehicles exiting in a 24-hour period. During the morning peak hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 344 vehicles would enter and 293 vehicles would exit the site. During the afternoon peak hour of the school, which was assumed to occur for one hour between 2:30 to 4:30 p.m., about 154 vehicles would enter and 186 vehicles would exit the site. During the afternoon peak hour of the adjacent street traffic, which generally occurs for one hour between 4:30 and 6:30 p.m., about 73 vehicles would enter and 76 vehicles would exit the site.

Projected Levels of Service

- The signal-controlled Marksheffel Road/Fontaine Boulevard intersection is projected to continue to operate at level of service D or better based on the short-term and 2040 background and total traffic conditions.

- The intersection of Fontaine/Lamprey is planned to be constructed as a one-lane modern roundabout. The one-lane roundabout would work with the interim Non-Residential Collector cross section and all approaches are projected to operate at a LOS D or better during peak hours based on the projected short-term and 2040 total traffic volumes.

- All movements at the site access points to Fontaine Boulevard are projected to operate at LOS D or better during the peak hours based on the projected short-term and 2040 total traffic volumes as two-way stop-sign controlled intersections.



Circulation

- During peak drop-off and pick-up times LSC recommends traffic cones be used to direct traffic in the pattern shown in Figure 5 to prevent vehicles from queuing on public streets. During afternoon parent pick-up time, as the proposed circulation plan routes parent pick-up vehicles through the parking lot drive aisles, parents will not be able to pull to a curb, temporarily park their vehicles (remaining in their vehicles) and wait for their children to exit the building and walk to the vehicles. Therefore, the school will need to develop a system using vehicle identification numbers and staff coordination whereby students are lined up in the loading zone ready to load the parent vehicles in order of position in queue.

Recommended Auxiliary Turn Lanes on Fontaine Boulevard

- Based on the projected long-term traffic volumes, a westbound right-turn deceleration lane would be required on Fontaine Boulevard approaching the proposed school entrance. This lane should be 235 feet long plus a 200-foot taper.

- Based on the projected long-term traffic volumes, an eastbound left-turn lane would be required on Fontaine Boulevard approaching the proposed school entrance. The Non-Residential Collector would provide one through lane in each direction plus a center two-way left-turn lane. This center painted median would accommodate left turns at this intersection.

Discuss if these improvements were (will be) provided with the Fontaine Blvd. improvements or will be provided by the school district, and when. If justified not to be constructed initially escrow may be required.

Please contact me if you have any questions or need further assistance.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

By _____
Jeffrey C. Hodsdon, P.E., PTOE
Principal

Address the countywide traffic fee.

JCH:KDF:bjwb

Enclosures: Table 2
Appendix Table 1
Figures 1-13
Traffic Count Reports
Level of Service Reports

Table 2
Trip Generation Estimate
Lorson Ranch PK-8 School

Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates [1]							Total Trips Generated						
			Average Weekday Traffic	Morning Peak Hour		Mid-Afternoon Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Mid-Afternoon Peak Hour		Afternoon Peak Hour	
				In	Out	In	Out	In	Out		In	Out	In	Out	In	Out
Trip Generation for the Proposed Elementary School																
520	Elementary School	690 Students	1.89	0.36	0.31	0.15	0.19	0.07	0.08	1,304	250	213	106	129	51	53
522	Middle School/Junior High School	300 Students	2.13	0.31	0.27	0.16	0.19	0.07	0.08	639	94	80	48	57	22	23
										1,943	**344**	**293**	**154**	**186**	**73**	**76**
Trip Generation Estimate From the *Lorson Ranch East Updated TIA* by LSC November 9, 2017																
520	Elementary School	500 Students	1.29	0.25	0.20	- - -	- - -	0.07	0.08	645	124	101	- - -	- - -	37	38
522	Middle School/Junior High School	500 Students	1.62	0.30	0.24	- - -	- - -	0.08	0.08	810	149	122	- - -	- - -	39	41
										1,455	**273**	**223**			**76**	**79**
								Change in Trip Generation Estimate		**488**	**71**	**70**	- - -	- - -	**-3**	**-3**

Notes:

(1) Source: "*Trip Generation, 9th Edition, 2012*" by the Institute of Transportation Engineers (ITE)

(2) See attached School Calculator Worksheet

Source: LSC Transportation Consultants, Inc.

MSTA School Traffic Calculations

AM and PM Peak Traffic Estimates

(These numbers do not reflect peak hour traffic volumes)

School Name: Lorson Ranch PK-8 School

Type: **Typical Public with buses**

Version: 102816

MSTA School Queue Input

Type School	Student Population	Number of Buses	Staff Members	Student Drivers
Elementary	645	3	76	
		9	76	
Middle	300	1	31	
		6	31	
High				

Calculations

PM Total Vehicles	PM Peak Vehicles	Average Queue Length	Total AM Trips	Total PM Trips	High Demand Length
					30%
106	48	**1070**	551	215	**1391**
43	22	**507**	239	87	**659**
		1577	790	302	2050
					473

Elementary School Data

Direction	AM Trips Generated Parents	Buses	Staff	Trips	PM Trips Generated Parents	Buses	Staff	Trips
IN	236	3	76	315	106			106
OUT	236			236	106	3		109
		AM Elementary Trips		**551**		PM Elementary Trips		**215**

Middle School Data

Direction	AM Trips Generated Parents	Buses	Staff	Trips	PM Trips Generated Parents	Buses	Staff	Trips
IN	104	1	31	136	43			43
OUT	104			104	43	1		44
		AM Middle Trips		**239**		PM Middle Trips		**87**

High School Data

Direction	AM Trips Generated Parents	Buses	Staff		Trips	PM Trips Generated Parents	Buses	Staff		Trips
IN										
OUT										
			AM High Trips					PM High Trips		

All AM TRIPS	In	451	**All PM TRIPS**	In	149
	Out	340		Out	153
	Total	790		Total	302

ADT
842
357
1199

Calculated 5/8/2018 By:_____

Appendix Table 1
Lorson Ranch K-8 School
Internal Trip Estimate

ITE Land Use	ITE Code	Quantity	Unit	Trip Generation Rates[1] Daily	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour In	PM Peak Hour Out	Raw ITE Trip Generation (Individual Driveway Trips) Daily	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour In	PM Peak Hour Out
Single-Family Detached Housing	210	5,045	DU[2]	9.52	0.19	0.56	0.63	0.37	48,028	946	2,838	3,178	1,867
Residential Condominium/Townhouse	210	118	DU	5.81	0.07	0.37	0.35	0.17	686	9	43	41	20
									48,714	**955**	**2,881**	**3,219**	**1,887**
Elementary School	520	690	Students	1.89	0.36	0.31	0.07	0.08	1,304	250	213	51	53
Middle School/Junior High School	522	300	Students	2.13	0.31	0.27	0.07	0.08	639	94	80	22	23
								Total School	**1,943**	**344**	**293**	**73**	**76**
Shopping Center	820	219	KSF[3]	51.58	0.71	0.44	2.22	2.40	11,320	156	96	487	528
								Total School and Retail	**13,263**	**500**	**389**	**560**	**604**

	Percent Internal Trips Daily	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour In	PM Peak Hour Out	Total Internal Trips Daily	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour In	PM Peak Hour Out	Total External Trips Daily	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour In	PM Peak Hour Out
School	3%	12%	8%	2%	2%	1,360	117	241	53	29					
Retail	12%	3%	3%	8%	6%	5,660	24	78	264	122					
Total	14%	15%	11%	10%	8%	**7,020**	**141**	**319**	**317**	**151**	**41,694**	**814**	**2,562**	**2,902**	**1,736**
	70%	70%	40%	40%	70%	913	175	85	20	37	391	75	128	31	16
	70%	70%	40%	40%	70%	447	66	32	9	16	192	28	48	13	7
						1,360	**241**	**117**	**29**	**53**	**583**	**103**	**176**	**44**	**23**
	50%	50%	25%	25%	50%	5,660	78	24	122	264	5,659	77	72	365	263
						7,020	**319**	**141**	**151**	**317**					
											47,936	**994**	**2,810**	**3,311**	**2,022**

Notes:
(1) Source: "Trip Generation, 9th Edition, 2012" by the Institute of Transportation Engineers (ITE)
(2) DU = dwelling Unit
(3) KSF = thousand square feet of floor area

LSC Transportation Consultants, Inc.

N

Approximate Scale
Scale: 1"= 3,000'

Figure 1

Vicinity Map

Lorson Ranch PK-8 School (LSC #184180)

LSC TRANSPORTATION CONSULTANTS, INC.

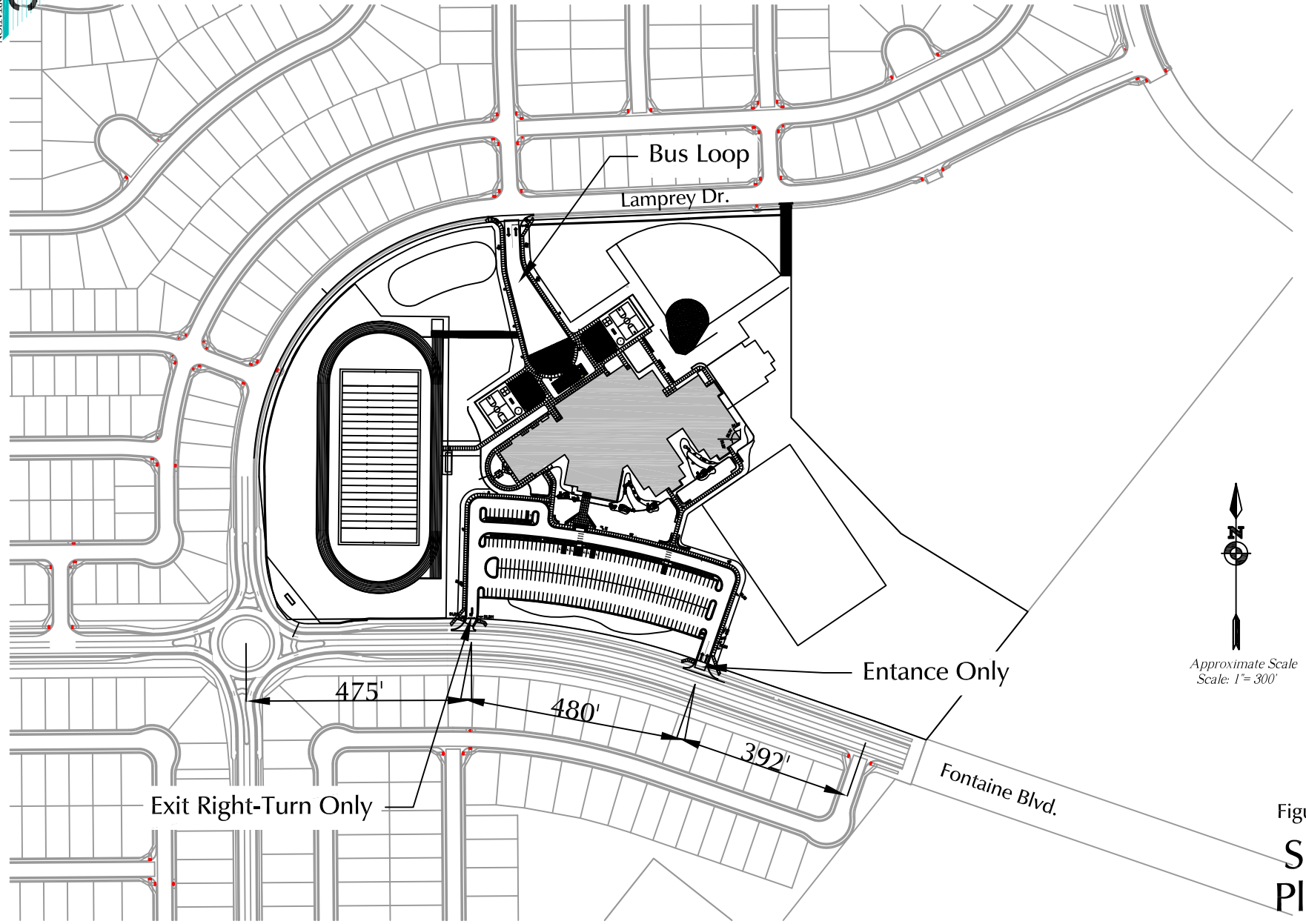


Figure 2

Site Plan

Lorson Ranch PK-8 School (LSC #184180)

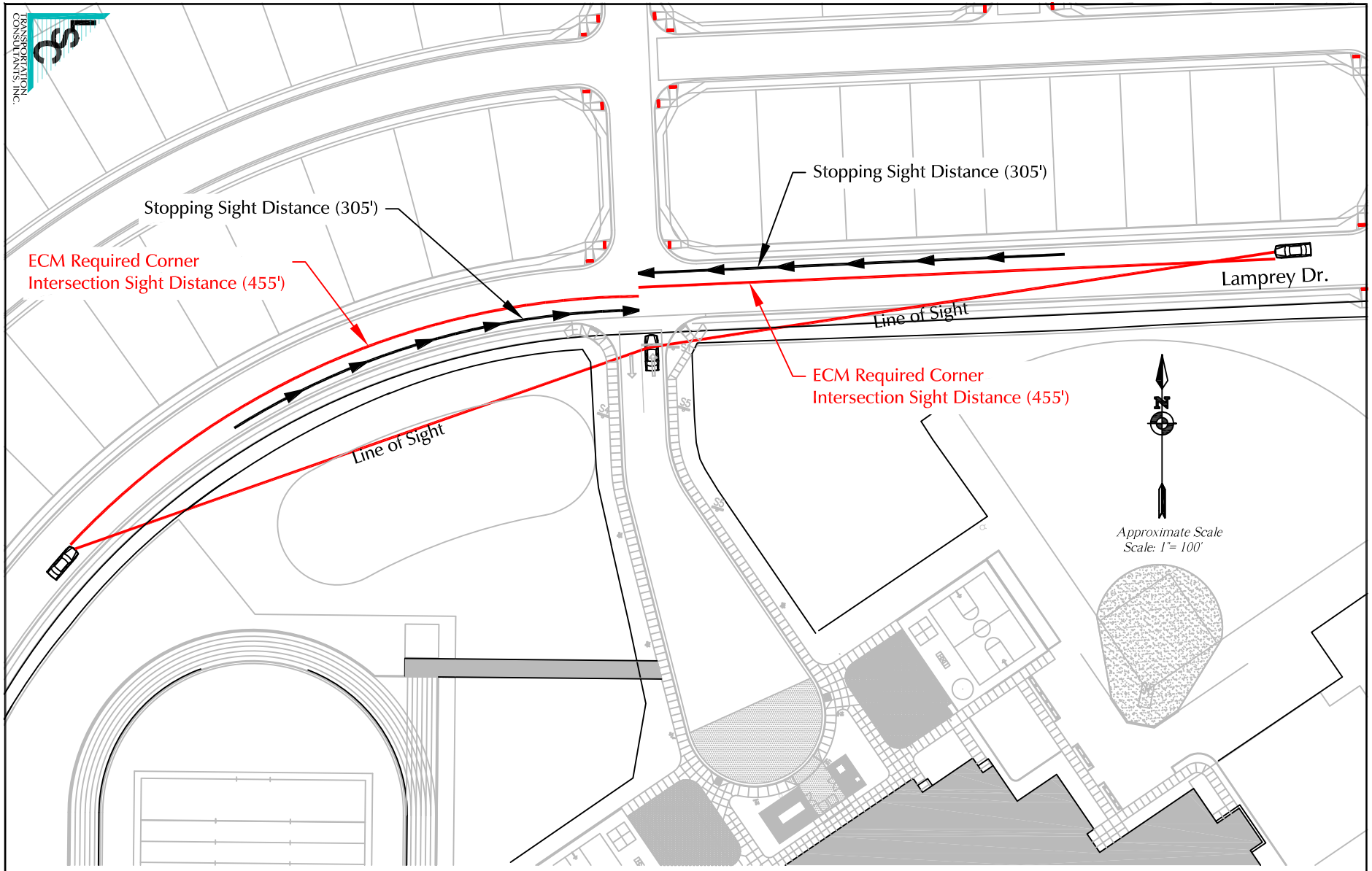
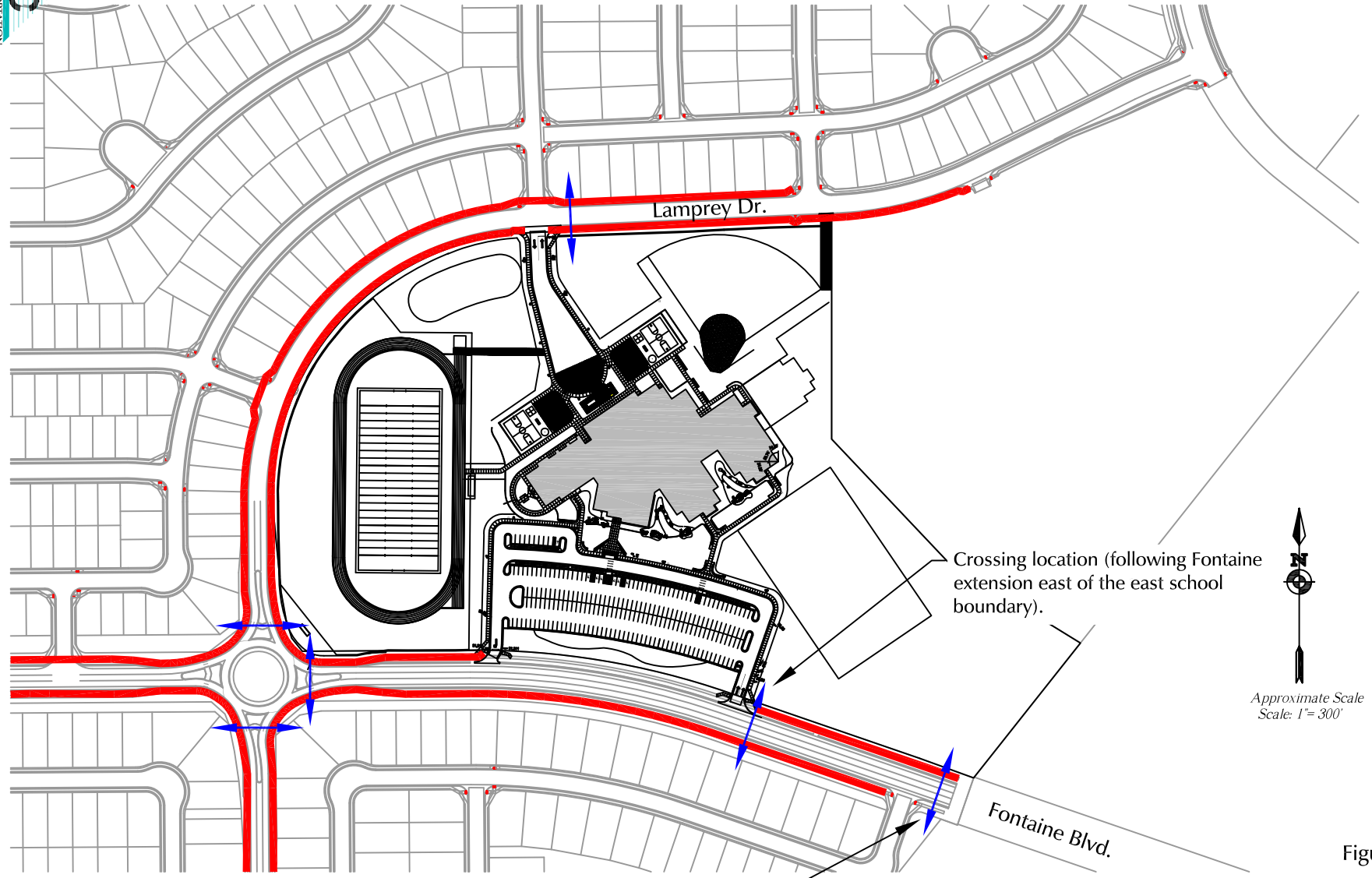


Figure 3

Sight Distance

Lorson Ranch PK-8 School (LSC #184180)



LEGEND:

= School Pedestrian Route

= School Crossing

Figure 4

School Pedestrian Crossings

Lorson Ranch PK-8 School (LSC #184180)

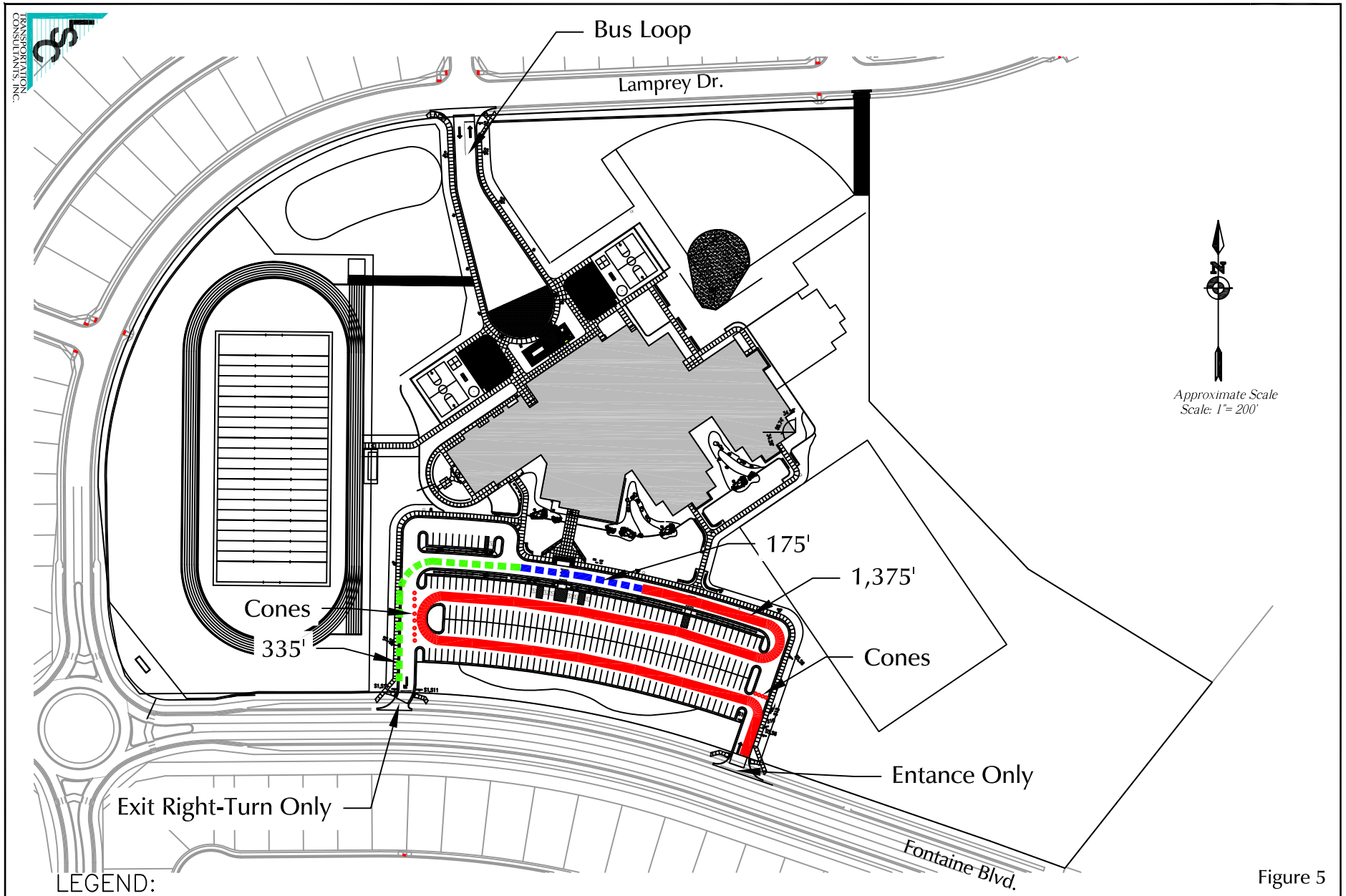
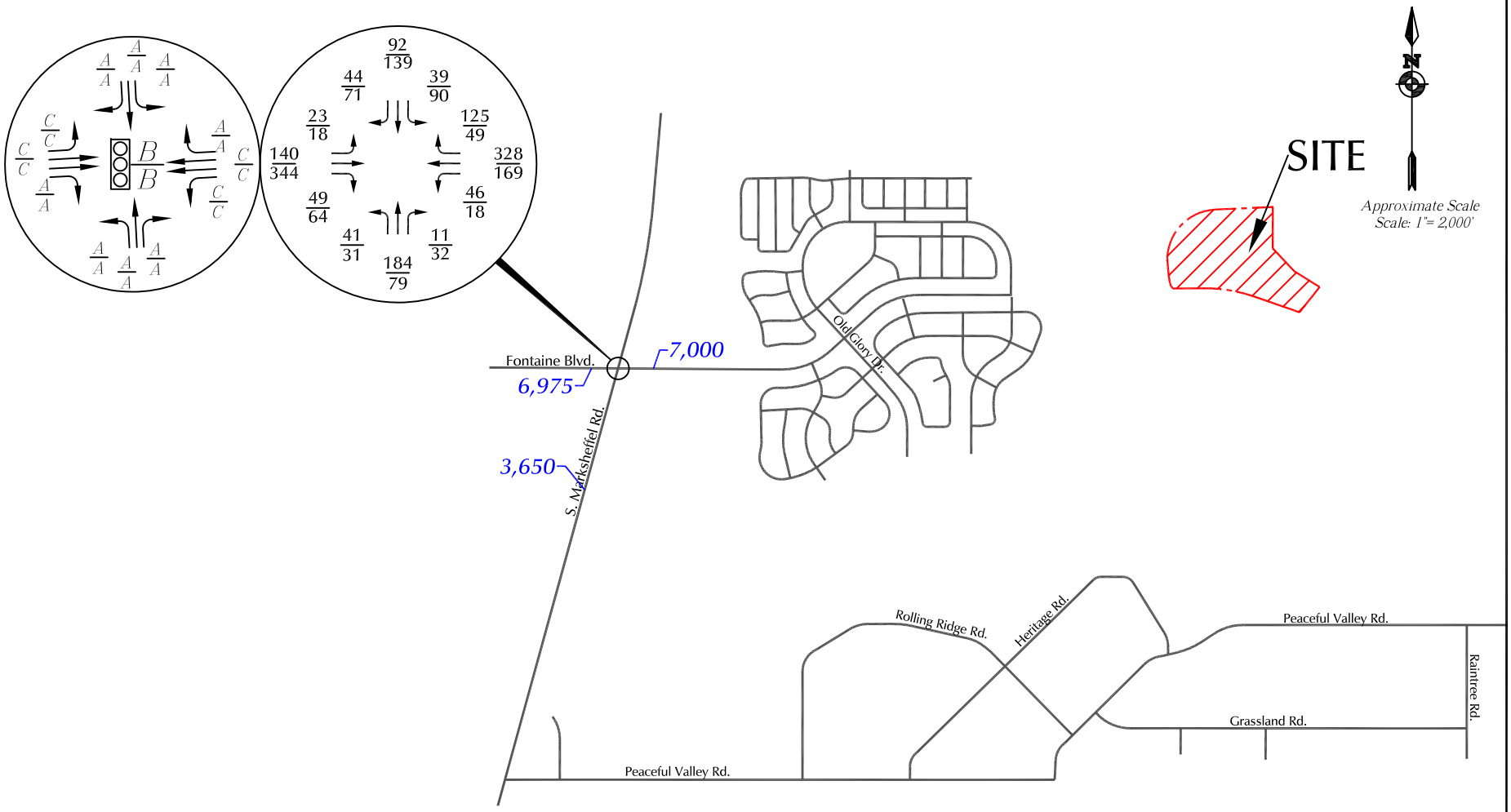


Figure 5

Circulation Plan

Lorson Ranch PK-8 School (LSC #184180)



LEGEND:

$\frac{XX}{XX}$ = $\frac{\text{AM Weekday Peak-Hour Traffic (vehicles per hour)}}{\text{PM Weekday Peak-Hour Traffic (vehicles per hour)}}$ Based on counts by LSC March 2017

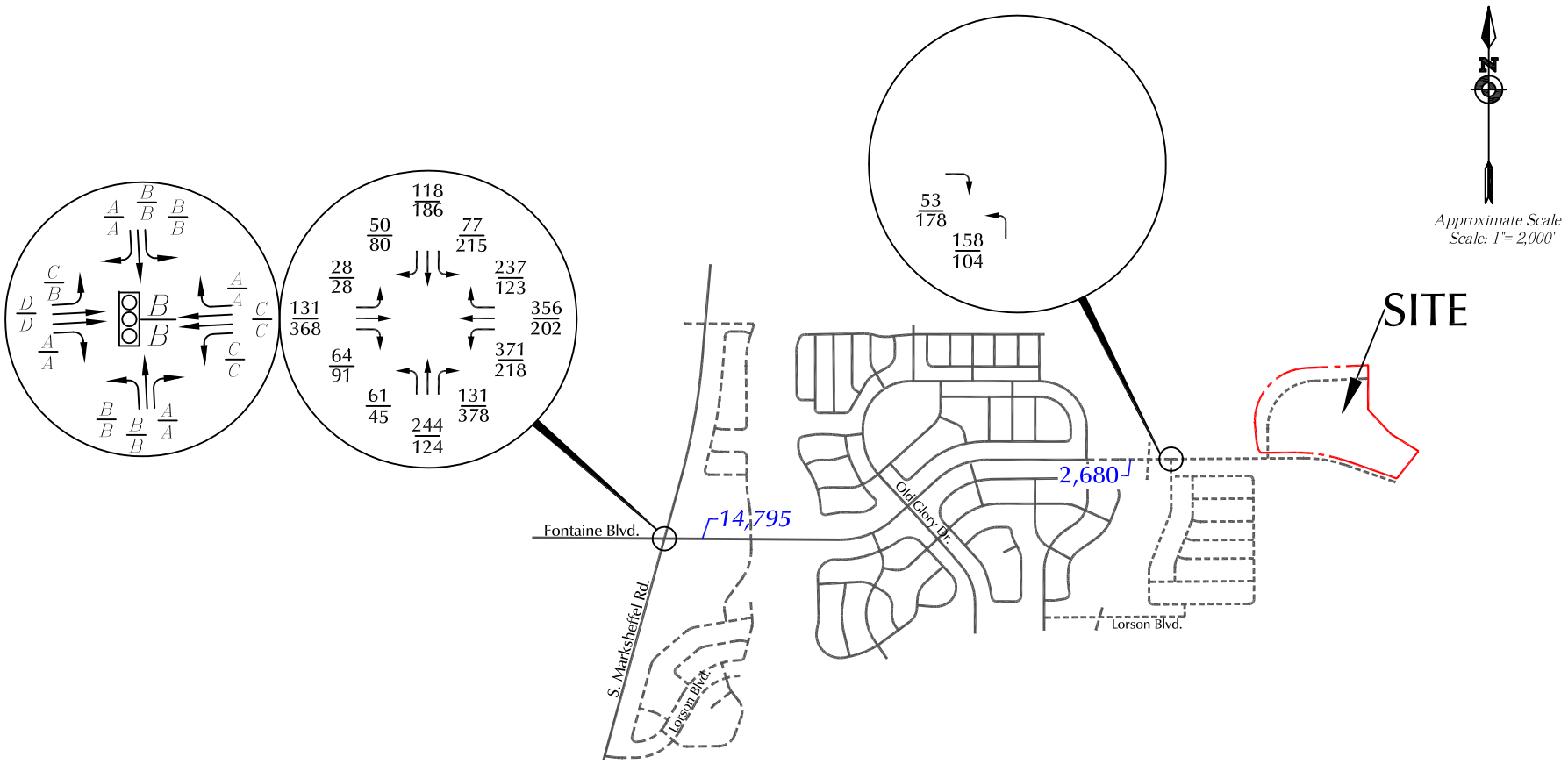
X,XXX = Average Weekday Traffic (vehicles per day)(Estimates by LSC)

TRANSPORTATION CONSULTANTS, INC.

Figure 6

Baseline Traffic Volumes

Lorson Ranch PK-8 School (LSC #184180)



* Based on the short-term total traffic projections from the "Lorson Ranch East Updated Traffic Impact and Access Analysis" dated November 9, 2017.

LEGEND:

= Traffic Signal

$\frac{XX}{XX}$ = $\frac{\text{AM Weekday Peak-Hour Traffic (vehicles per hour)}}{\text{PM Weekday Peak-Hour Traffic (vehicles per hour)}}$

$\frac{A}{B}$ = $\frac{\text{AM Individual Movement Peak-Hour Level of Service}}{\text{PM Individual Movement Peak-Hour Level of Service}}$

$\frac{C}{D}$ = $\frac{\text{AM Entire Intersection Peak-Hour Level of Service}}{\text{PM Entire Intersection Peak-Hour Level of Service}}$

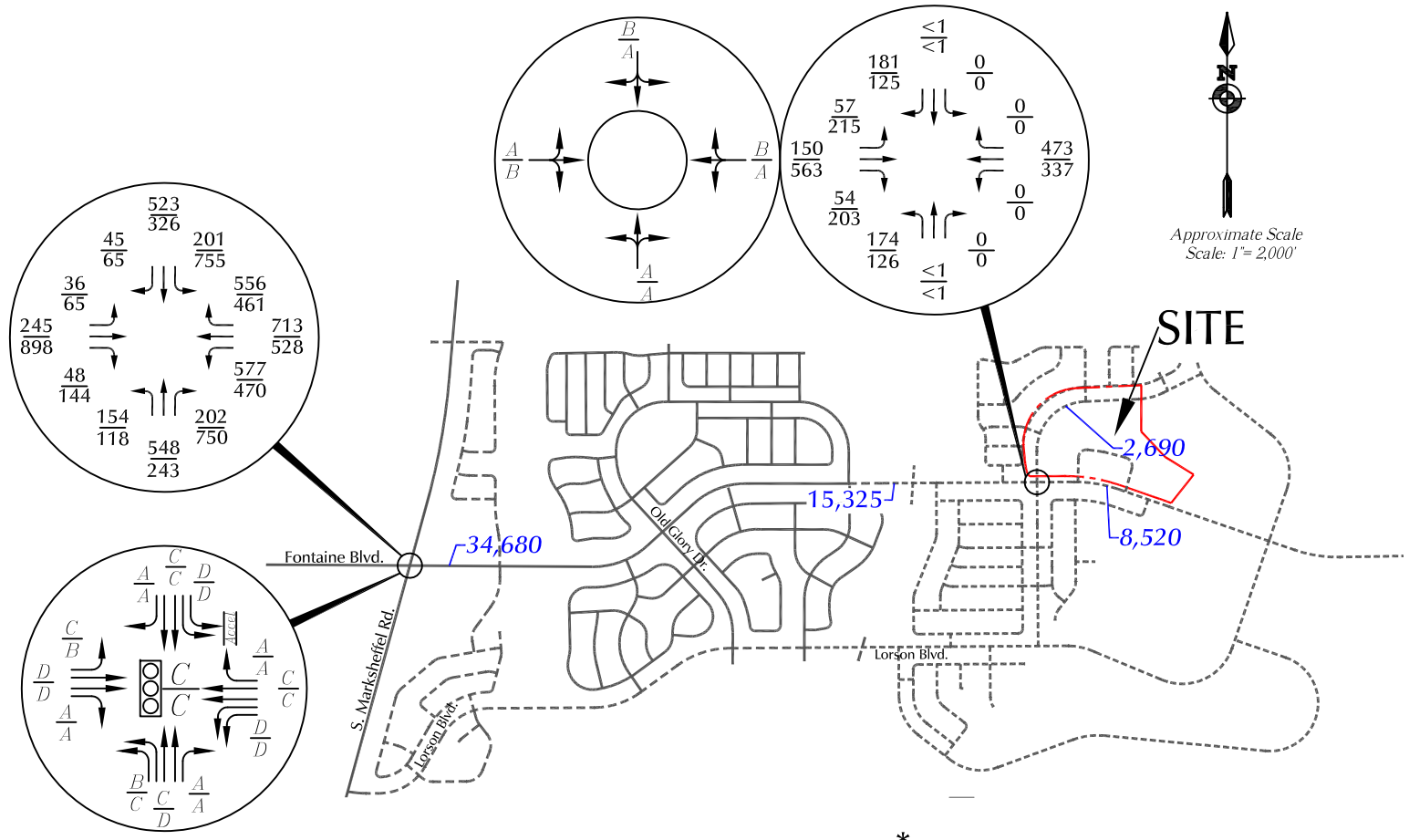
X,XXX = Average Weekday Traffic (vehicles per day)

TRANSPORTATION CONSULTANTS, INC.

Figure 7

Short-Term Background Traffic*

Lorson Ranch PK-8 School (LSC #184180)



LEGEND:

= Stop Sign

= Traffic Signal

= Roundabout

$\frac{XX}{XX}$ = AM Weekday Peak–Hour Traffic (vehicles per hour) / PM Weekday Peak–Hour Traffic (vehicles per hour)

$\frac{A}{B}$ = AM Individual Movement Peak–Hour Level of Service / PM Individual Movement Peak–Hour Level of Service

$\frac{C}{D}$ = AM Entire Intersection Peak–Hour Level of Service / PM Entire Intersection Peak–Hour Level of Service

X,XXX = Average Weekday Traffic (vehicles per day)

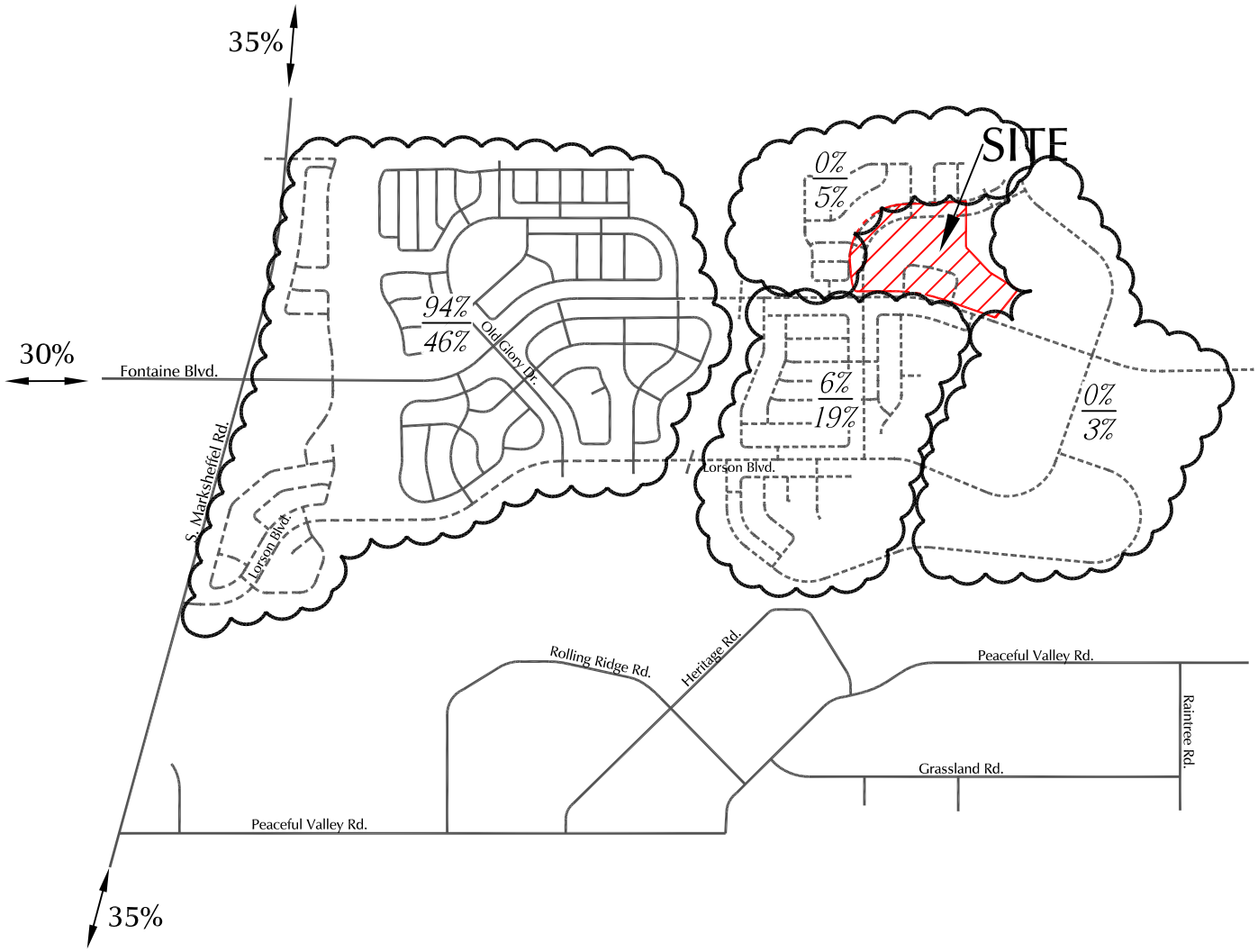
* Based on the long-term total traffic projections from the "Lorson Ranch East Updated Traffic Impact and Access Analysis" dated November 9, 2017.

TRANSPORTATION CONSULTANTS, INC.

Figure 8

Year 2040 Background Traffic*

Lorson Ranch PK-8 School (LSC #184180)



LEGEND:

XX% = Percent Directional Distribution of School Traffic External to Lorson Ranch

XX% / XX% = Short–Term Percent Directional Distribution of School Traffic Internal to Lorson Ranch / Long–Term Percent Directional Distribution of School Traffic Internal to Lorson Ranch

TRANSPORTATION CONSULTANTS, INC.

Figure 9

Directional Distribution of External Site-Generated Traffic

Lorson Ranch PK-8 School (LSC #184180)

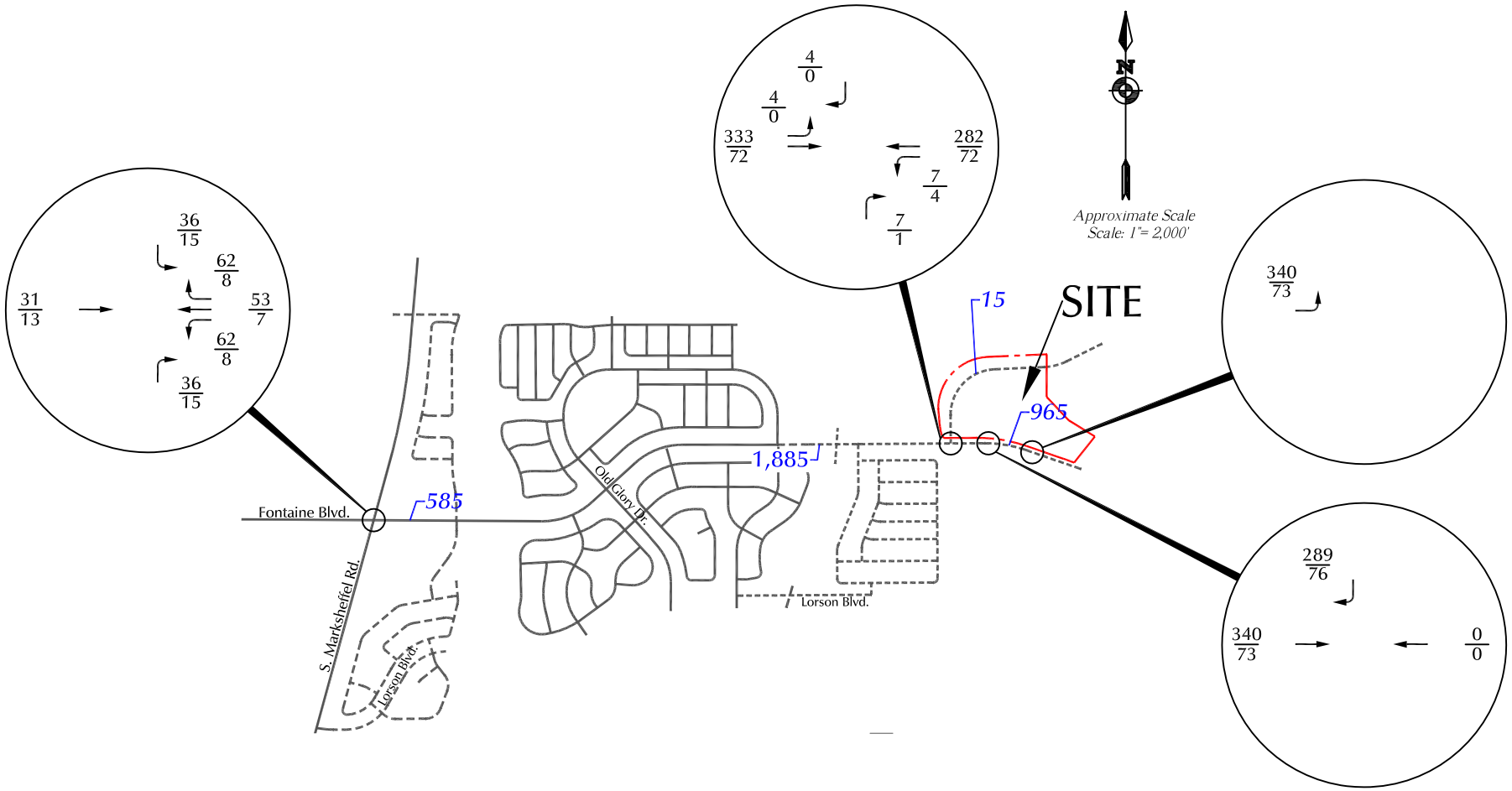


Figure 10

Short-Term Assignment of Site-Generated Traffic

Lorson Ranch PK-8 School (LSC #184180)

LEGEND:

XX/XX = AM Weekday Peak-Hour Traffic (vehicles per hour) / PM Weekday Peak-Hour Traffic (vehicles per hour)

X,XXX = Average Weekday Traffic (vehicles per day)

TRANSPORTATION CONSULTANTS, INC.

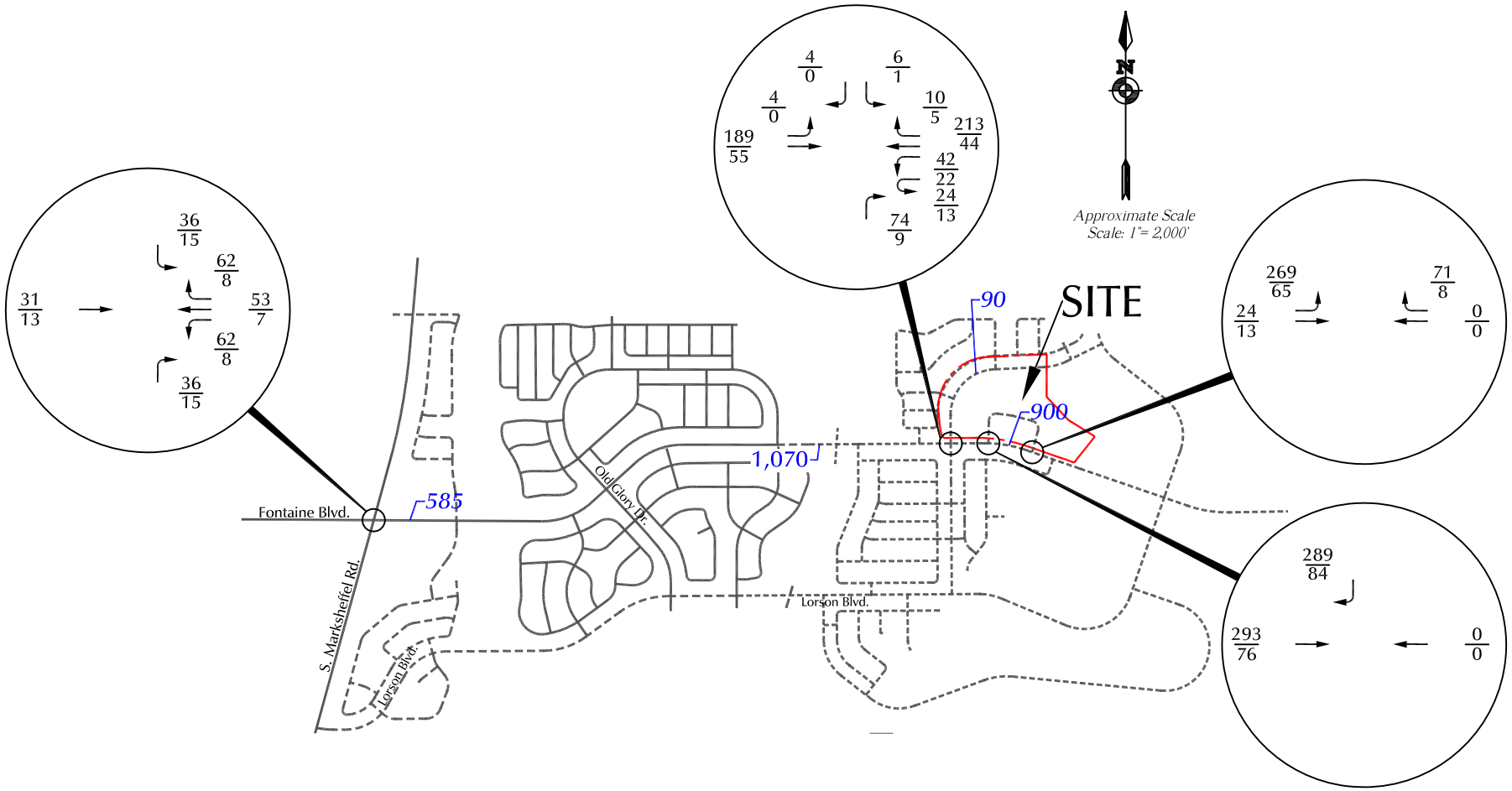


Figure 11

Long-Term Assignment of Site-Generated Traffic

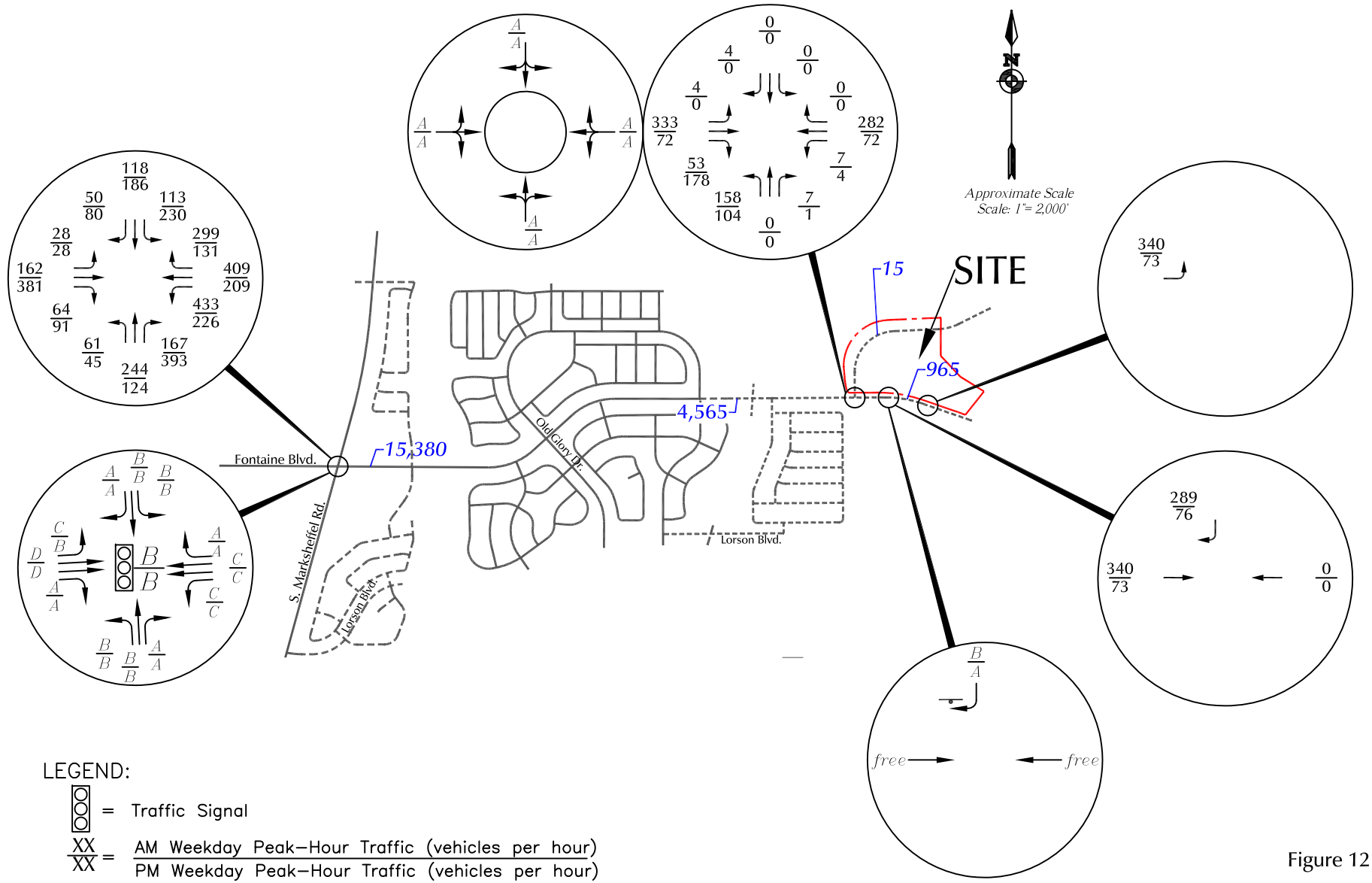
Lorson Ranch PK-8 School (LSC #184180)

LEGEND:

XX/XX = AM Weekday Peak–Hour Traffic (vehicles per hour) / PM Weekday Peak–Hour Traffic (vehicles per hour)

X,XXX = Average Weekday Traffic (vehicles per day)

LSC TRANSPORTATION CONSULTANTS, INC.



LEGEND:

= Traffic Signal

XX/XX = AM Weekday Peak-Hour Traffic (vehicles per hour) / PM Weekday Peak-Hour Traffic (vehicles per hour)

A/B = AM Individual Movement Peak-Hour Level of Service / PM Individual Movement Peak-Hour Level of Service

C/D = AM Entire Intersection Peak-Hour Level of Service / PM Entire Intersection Peak-Hour Level of Service

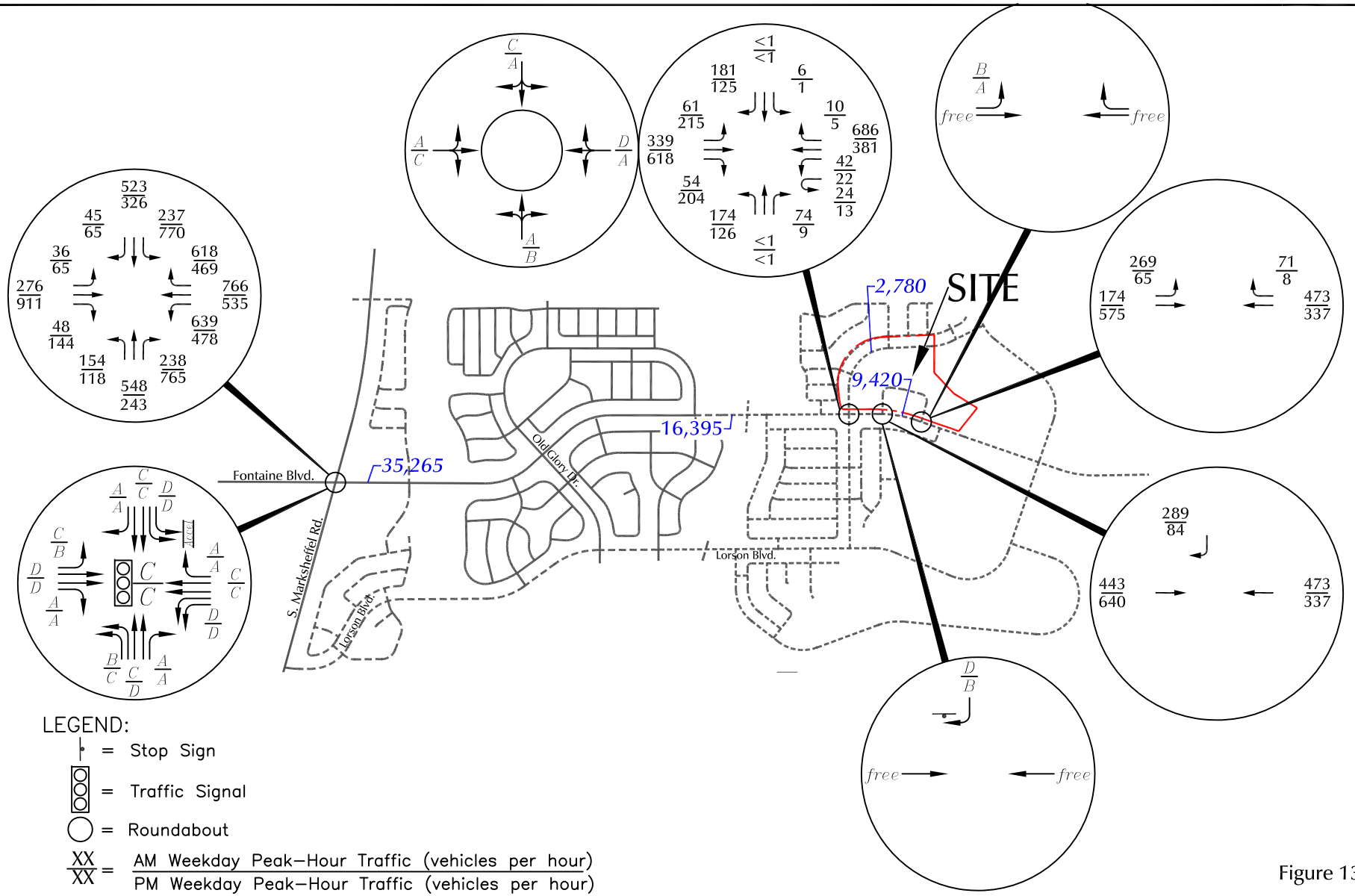
X,XXX = Average Weekday Traffic (vehicles per day)

TRANSPORTATION CONSULTANTS, INC.

Figure 12

Short-Term Total Traffic

Lorson Ranch PK-8 School (LSC #184180)



TRANSPORTATION CONSULTANTS, INC.

Figure 13

Year 2040 Total Traffic

Lorson Ranch PK-8 School (LSC #184180)

Counts by LSC

LSC Transportation Consultants, Inc.

File Name : Marksheffel Rd - Fontaine AM
Site Code : 00174860
Start Date : 12/05/2017
Page No : 1

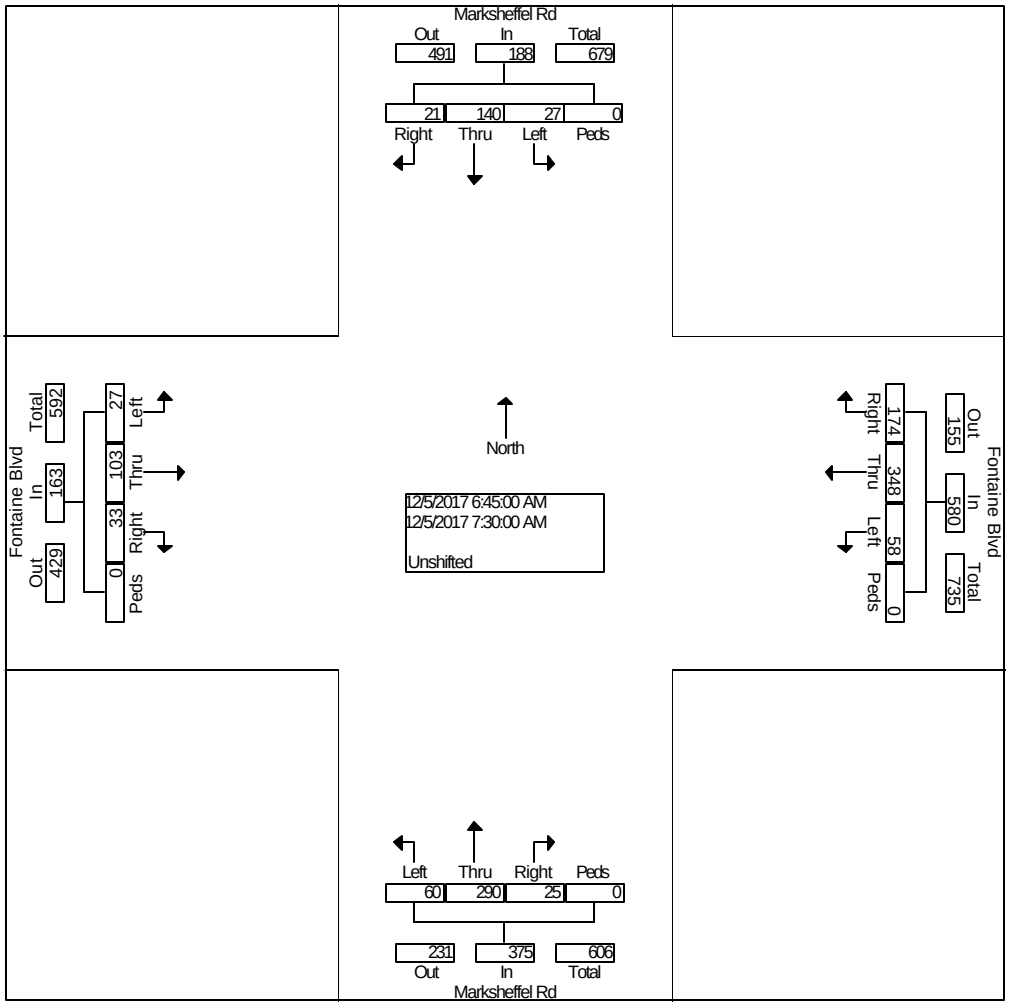
Groups Printed- Unshifted

	Marksheffel Rd From North				Fontaine Blvd From East				Marksheffel Rd From South				Fontaine Blvd From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	5	34	5	0	30	92	16	0	4	70	7	0	7	9	6	0	285
06:45 AM	6	29	4	0	35	107	11	0	5	69	15	0	3	17	8	0	309
Total	11	63	9	0	65	199	27	0	9	139	22	0	10	26	14	0	594
07:00 AM	3	48	5	0	61	108	14	0	11	91	11	0	5	19	8	0	384
07:15 AM	7	31	6	0	46	85	15	0	4	62	15	0	13	32	8	0	324
07:30 AM	5	32	12	0	32	48	18	0	5	68	19	0	12	35	3	0	289
07:45 AM	5	30	15	0	18	54	3	0	11	67	4	0	9	37	6	0	259
Total	20	141	38	0	157	295	50	0	31	288	49	0	39	123	25	0	1256
08:00 AM	2	27	8	0	22	90	10	0	4	35	9	0	4	37	3	0	251
08:15 AM	3	35	7	0	19	92	9	0	5	40	8	0	11	37	4	0	270
Grand Total	36	266	62	0	263	676	96	0	49	502	88	0	64	223	46	0	2371
Apprch %	9.9	73.1	17.0	0.0	25.4	65.3	9.3	0.0	7.7	78.6	13.8	0.0	19.2	67.0	13.8	0.0	
Total %	1.5	11.2	2.6	0.0	11.1	28.5	4.0	0.0	2.1	21.2	3.7	0.0	2.7	9.4	1.9	0.0	

Counts by LSC

File Name : Marksheffel Rd - Fontaine AM
Site Code : 00174860
Start Date : 12/05/2017
Page No : 2

	Marksheffel Rd From North					Fontaine Blvd From East					Marksheffel Rd From South					Fontaine Blvd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Intersection	06:45 AM																				
Volume	21	140	27	0	188	174	348	58	0	580	25	290	60	0	375	33	103	27	0	163	1306
Percent	11.2	74.5	14.4	0.0		30.0	60.0	10.0	0.0		6.7	77.3	16.0	0.0		20.2	63.2	16.6	0.0		
07:00 Volume	3	48	5	0	56	61	108	14	0	183	11	91	11	0	113	5	19	8	0	32	384
Peak Factor																					0.850
High Int.	07:00 AM					07:00 AM					07:00 AM					07:15 AM					
Volume	3	48	5	0	56	61	108	14	0	183	11	91	11	0	113	13	32	8	0	53	
Peak Factor					0.839					0.792					0.830					0.769	



Counts by LSC

LSC Transportation Consultants, Inc.

File Name : Marksheffel Rd - Fontaine PM
Site Code : 00174860
Start Date : 12/05/2017
Page No : 1

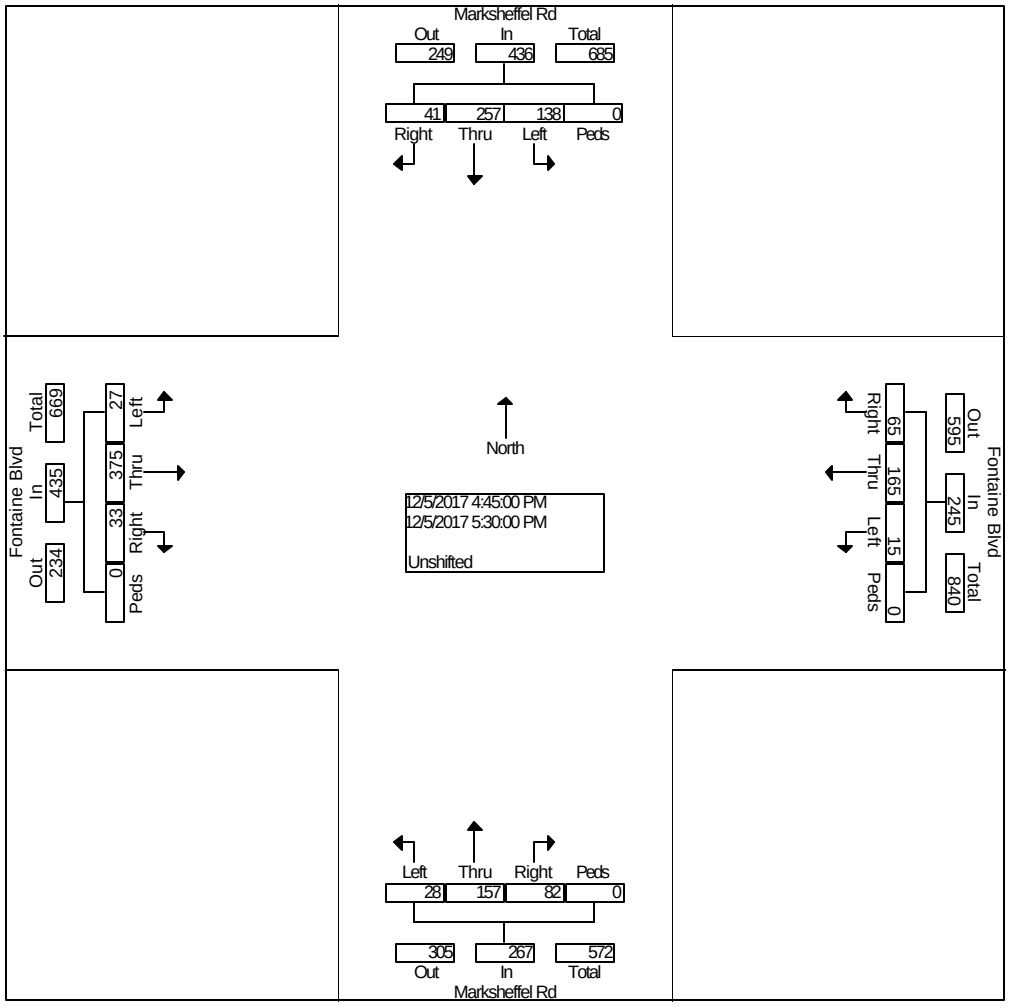
Groups Printed- Unshifted

	Marksheffel Rd From North				Fontaine Blvd From East				Marksheffel Rd From South				Fontaine Blvd From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
04:00 PM	10	56	30	0	12	36	1	0	13	46	10	0	14	74	4	0	306
04:15 PM	11	61	28	0	14	45	4	0	15	38	13	0	10	86	6	0	331
04:30 PM	9	55	36	0	15	38	8	0	18	40	8	0	15	81	7	0	330
04:45 PM	14	73	33	0	16	30	4	0	12	37	3	0	9	81	9	0	321
Total	44	245	127	0	57	149	17	0	58	161	34	0	48	322	26	0	1288
05:00 PM	12	64	40	0	16	45	5	0	28	46	4	0	6	105	6	0	377
05:15 PM	9	73	34	0	13	45	3	0	16	33	8	0	8	96	5	0	343
05:30 PM	6	47	31	0	20	45	3	0	26	41	13	0	10	93	7	0	342
05:45 PM	6	38	31	0	8	37	2	0	14	27	5	0	10	86	7	0	271
Total	33	222	136	0	57	172	13	0	84	147	30	0	34	380	25	0	1333
Grand Total	77	467	263	0	114	321	30	0	142	308	64	0	82	702	51	0	2621
Apprch %	9.5	57.9	32.6	0.0	24.5	69.0	6.5	0.0	27.6	59.9	12.5	0.0	9.8	84.1	6.1	0.0	
Total %	2.9	17.8	10.0	0.0	4.3	12.2	1.1	0.0	5.4	11.8	2.4	0.0	3.1	26.8	1.9	0.0	

Counts by LSC

File Name : Marksheffel Rd - Fontaine PM
Site Code : 00174860
Start Date : 12/05/2017
Page No : 2

	Marksheffel Rd From North					Fontaine Blvd From East					Marksheffel Rd From South					Fontaine Blvd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:45 PM																				
Volume	41	257	138	0	436	65	165	15	0	245	82	157	28	0	267	33	375	27	0	435	1383
Percent	9.4	58.9	31.7	0.0		26.5	67.3	6.1	0.0		30.7	58.8	10.5	0.0		7.6	86.2	6.2	0.0		
05:00 Volume	12	64	40	0	116	16	45	5	0	66	28	46	4	0	78	6	105	6	0	117	377
Peak Factor																					0.917
High Int.	04:45 PM					05:30 PM					05:30 PM					05:00 PM					
Volume	14	73	33	0	120	20	45	3	0	68	26	41	13	0	80	6	105	6	0	117	
Peak Factor					0.908					0.901					0.834					0.929	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	140	49	46	328	125	41	184	11	39	92	44
Future Volume (vph)	23	140	49	46	328	125	41	184	11	39	92	44
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (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
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	14.0	14.0	14.0	14.0	14.0	14.0	55.1	55.1	55.1	55.1	55.1	55.1
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.18	0.18	0.70	0.70	0.70	0.70	0.70	0.70
v/c Ratio	0.16	0.22	0.15	0.23	0.58	0.35	0.05	0.14	0.01	0.05	0.07	0.04
Control Delay	29.9	28.4	9.7	30.3	33.7	8.0	4.7	4.9	1.1	4.7	4.6	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.9	28.4	9.7	30.3	33.7	8.0	4.7	4.9	1.1	4.7	4.6	1.8
LOS	C	C	A	C	C	A	A	A	A	A	A	A
Approach Delay		24.2			26.9			4.7			3.9	
Approach LOS		C			C			A			A	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 79.1			
Natural Cycle: 40			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 18.5		Intersection LOS: B	
Intersection Capacity Utilization 43.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	344	64	18	169	49	31	79	32	90	139	71
Future Volume (vph)	18	344	64	18	169	49	31	79	32	90	139	71
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (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
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	13.0	13.0	13.0	13.0	13.0	13.0	55.1	55.1	55.1	55.1	55.1	55.1
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17	0.17	0.71	0.71	0.71	0.71	0.71	0.71
v/c Ratio	0.09	0.59	0.21	0.17	0.36	0.19	0.04	0.06	0.03	0.12	0.13	0.08
Control Delay	28.1	34.3	9.4	30.4	30.4	9.5	4.3	4.3	1.8	4.6	4.4	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	34.3	9.4	30.4	30.4	9.5	4.3	4.3	1.8	4.6	4.4	1.3
LOS	C	C	A	C	C	A	A	A	A	A	A	A
Approach Delay		30.3			26.1			3.7			3.7	
Approach LOS		C			C			A			A	

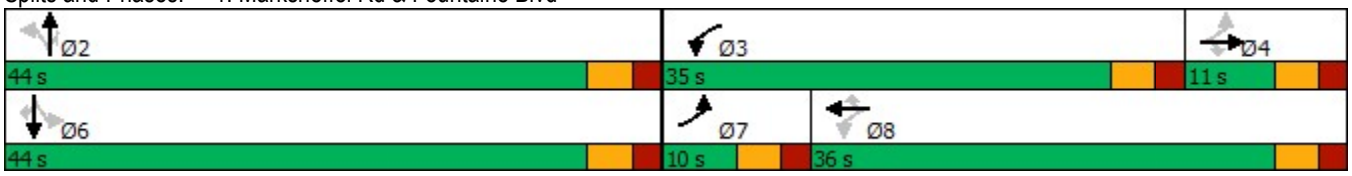
Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 78.1		
Natural Cycle: 40		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.59		
Intersection Signal Delay: 18.3	Intersection LOS: B	
Intersection Capacity Utilization 38.9%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	131	64	371	356	237	61	244	131	77	118	50
Future Volume (vph)	28	131	64	371	356	237	61	244	131	77	118	50
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	10.0	10.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	11.0	11.0	35.0	36.0	36.0	44.0	44.0	44.0	44.0	44.0	44.0
Total Split (%)	11.1%	12.2%	12.2%	38.9%	40.0%	40.0%	48.9%	48.9%	48.9%	48.9%	48.9%	48.9%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (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
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	11.0	6.0	6.0	31.5	27.8	27.8	39.2	39.2	39.2	39.2	39.2	39.2
Actuated g/C Ratio	0.14	0.07	0.07	0.39	0.34	0.34	0.49	0.49	0.49	0.49	0.49	0.49
v/c Ratio	0.16	0.54	0.28	0.74	0.33	0.37	0.11	0.29	0.17	0.17	0.14	0.06
Control Delay	20.5	45.5	2.7	28.1	21.1	4.6	13.7	14.8	3.1	14.5	13.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	45.5	2.7	28.1	21.1	4.6	13.7	14.8	3.1	14.5	13.4	0.1
LOS	C	D	A	C	C	A	B	B	A	B	B	A
Approach Delay		30.0			19.7			11.1			11.1	
Approach LOS		C			B			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 80.7	
Natural Cycle: 45	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 58.5%	ICU Level of Service B
Analysis Period (min) 15	

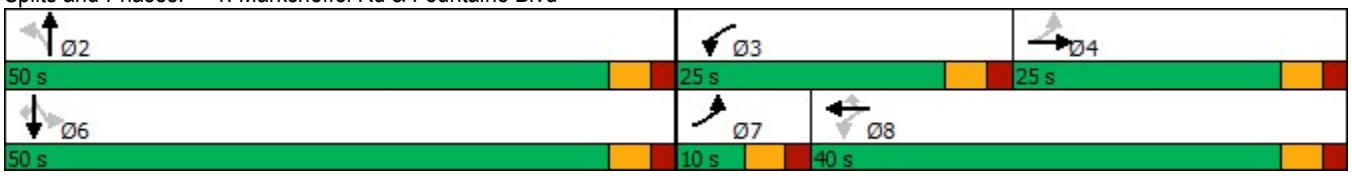
Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	381	91	226	209	131	45	124	393	230	186	80
Future Volume (vph)	28	381	91	226	209	131	45	124	393	230	186	80
Turn Type	pm+pt	NA	Free	pm+pt	NA	Perm	Perm	NA	Free	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		Free	8		8	2		Free	6		6
Detector Phase	7	4		3	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.0	10.0		9.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Total Split (s)	10.0	25.0		25.0	40.0	40.0	50.0	50.0		50.0	50.0	50.0
Total Split (%)	10.0%	25.0%		25.0%	40.0%	40.0%	50.0%	50.0%		50.0%	50.0%	50.0%
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	Max
Act Effct Green (s)	20.0	15.0	90.9	35.6	31.9	31.9	45.2	45.2	90.9	45.2	45.2	45.2
Actuated g/C Ratio	0.22	0.17	1.00	0.39	0.35	0.35	0.50	0.50	1.00	0.50	0.50	0.50
v/c Ratio	0.10	0.66	0.06	0.66	0.21	0.25	0.09	0.14	0.26	0.44	0.24	0.11
Control Delay	18.8	41.7	0.1	27.5	21.8	4.8	14.7	14.4	0.4	19.1	15.3	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.8	41.7	0.1	27.5	21.8	4.8	14.7	14.4	0.4	19.1	15.3	1.6
LOS	B	D	A	C	C	A	B	B	A	B	B	A
Approach Delay		32.8			20.2			4.6			14.9	
Approach LOS		C			C			A			B	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 90.9	
Natural Cycle: 50	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 17.7	Intersection LOS: B
Intersection Capacity Utilization 59.0%	ICU Level of Service B
Analysis Period (min) 15	

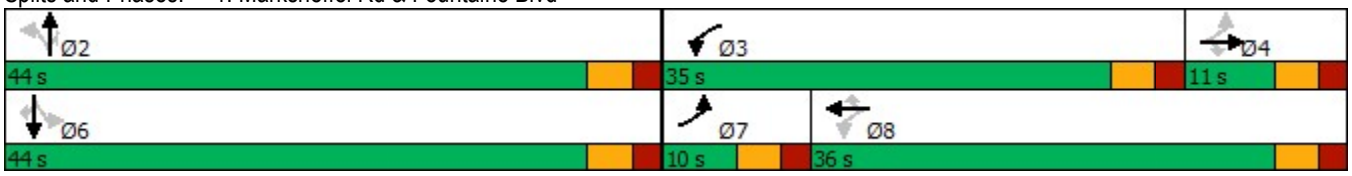
Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	162	64	433	409	299	61	244	167	113	118	50
Future Volume (vph)	28	162	64	433	409	299	61	244	167	113	118	50
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	10.0	10.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	11.0	11.0	35.0	36.0	36.0	44.0	44.0	44.0	44.0	44.0	44.0
Total Split (%)	11.1%	12.2%	12.2%	38.9%	40.0%	40.0%	48.9%	48.9%	48.9%	48.9%	48.9%	48.9%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (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
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	11.0	6.0	6.0	34.2	30.5	30.5	39.1	39.1	39.1	39.1	39.1	39.1
Actuated g/C Ratio	0.13	0.07	0.07	0.41	0.37	0.37	0.47	0.47	0.47	0.47	0.47	0.47
v/c Ratio	0.17	0.69	0.28	0.81	0.35	0.42	0.11	0.30	0.22	0.26	0.15	0.07
Control Delay	21.0	54.5	2.8	31.4	20.9	4.4	14.8	16.0	3.2	16.7	14.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.0	54.5	2.8	31.4	20.9	4.4	14.8	16.0	3.2	16.7	14.5	0.2
LOS	C	D	A	C	C	A	B	B	A	B	B	A
Approach Delay		37.8			20.6			11.3			12.9	
Approach LOS		D			C			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 83.4	
Natural Cycle: 50	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 19.6	Intersection LOS: B
Intersection Capacity Utilization 64.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd



Intersection	
Intersection Delay, s/veh	6.2
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	504	362	177	4
Demand Flow Rate, veh/h	514	369	180	4
Vehicles Circulating, veh/h	9	175	457	540
Vehicles Exiting, veh/h	535	462	66	4
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.2	6.3	6.4	4.6
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	514	369	180	4
Cap Entry Lane, veh/h	1367	1154	866	796
Entry HV Adj Factor	0.981	0.981	0.983	1.000
Flow Entry, veh/h	504	362	177	4
Cap Entry, veh/h	1341	1132	851	796
V/C Ratio	0.376	0.320	0.208	0.005
Control Delay, s/veh	6.2	6.3	6.4	4.6
LOS	A	A	A	A
95th %tile Queue, veh	2	1	1	0

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑			↱
Traffic Vol, veh/h	0	340	0	0	0	289
Future Vol, veh/h	0	340	0	0	0	289
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	75	80	95	95	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	453	0	0	0	385

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	1
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.319
Pot Cap-1 Maneuver	0	-	-	0	0	1083
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	1083
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

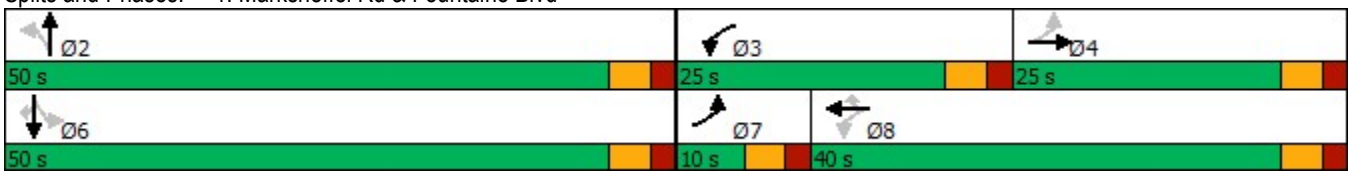
Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	1083
HCM Lane V/C Ratio	-	-	0.356
HCM Control Delay (s)	-	-	10.1
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	1.6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	381	91	226	209	131	45	124	393	230	186	80
Future Volume (vph)	28	381	91	226	209	131	45	124	393	230	186	80
Turn Type	pm+pt	NA	Free	pm+pt	NA	Perm	Perm	NA	Free	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		Free	8		8	2		Free	6		6
Detector Phase	7	4		3	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.0	10.0		9.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Total Split (s)	10.0	25.0		25.0	40.0	40.0	50.0	50.0		50.0	50.0	50.0
Total Split (%)	10.0%	25.0%		25.0%	40.0%	40.0%	50.0%	50.0%		50.0%	50.0%	50.0%
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	Max
Act Effct Green (s)	20.0	15.0	90.9	35.6	31.9	31.9	45.2	45.2	90.9	45.2	45.2	45.2
Actuated g/C Ratio	0.22	0.17	1.00	0.39	0.35	0.35	0.50	0.50	1.00	0.50	0.50	0.50
v/c Ratio	0.10	0.66	0.06	0.66	0.21	0.25	0.09	0.14	0.26	0.44	0.24	0.11
Control Delay	18.8	41.7	0.1	27.5	21.8	4.8	14.7	14.4	0.4	19.1	15.3	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.8	41.7	0.1	27.5	21.8	4.8	14.7	14.4	0.4	19.1	15.3	1.6
LOS	B	D	A	C	C	A	B	B	A	B	B	A
Approach Delay		32.8			20.2			4.6			14.9	
Approach LOS		C			C			A			B	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 90.9	
Natural Cycle: 50	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 17.7	Intersection LOS: B
Intersection Capacity Utilization 59.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd



Intersection	
Intersection Delay, s/veh	4.0
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	263	80	110	0
Demand Flow Rate, veh/h	269	82	112	0
Vehicles Circulating, veh/h	4	111	78	193
Vehicles Exiting, veh/h	189	79	195	0
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.3	3.5	3.6	0.0
Approach LOS	A	A	A	-

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	269	82	112	0
Cap Entry Lane, veh/h	1374	1232	1274	1133
Entry HV Adj Factor	0.979	0.981	0.982	1.000
Flow Entry, veh/h	263	80	110	0
Cap Entry, veh/h	1346	1209	1252	1133
V/C Ratio	0.196	0.067	0.088	0.000
Control Delay, s/veh	4.3	3.5	3.6	3.2
LOS	A	A	A	A
95th %tile Queue, veh	1	0	0	0

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑			↱
Traffic Vol, veh/h	0	73	0	0	0	76
Future Vol, veh/h	0	73	0	0	0	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	75	80	95	95	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	97	0	0	0	101

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	1
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.319
Pot Cap-1 Maneuver	0	-	-	0	0	1083
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	1083
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	1083
HCM Lane V/C Ratio	-	-	0.094
HCM Control Delay (s)	-	-	8.7
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	245	48	577	713	556	154	548	202	201	523	45
Future Volume (vph)	36	245	48	577	713	556	154	548	202	201	523	45
Turn Type	pm+pt	NA	Perm	Prot	NA	Free	pm+pt	NA	Free	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			Free	2		Free			6
Detector Phase	7	4	4	3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.0	9.0	9.0	9.0	9.0		9.0	9.0		9.0	9.0	9.0
Total Split (s)	10.0	15.0	15.0	25.0	30.0		10.0	35.0		15.0	40.0	40.0
Total Split (%)	11.1%	16.7%	16.7%	27.8%	33.3%		11.1%	38.9%		16.7%	44.4%	44.4%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	Max		None	Max	Max
Act Effct Green (s)	14.7	9.7	9.7	18.8	27.6	88.5	35.6	30.6	88.5	9.4	35.0	35.0
Actuated g/C Ratio	0.17	0.11	0.11	0.21	0.31	1.00	0.40	0.35	1.00	0.11	0.40	0.40
v/c Ratio	0.22	0.67	0.14	0.83	0.68	0.37	0.43	0.47	0.13	0.58	0.39	0.06
Control Delay	22.7	47.3	0.8	44.7	31.3	0.7	18.1	24.7	0.2	44.7	20.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	47.3	0.8	44.7	31.3	0.7	18.1	24.7	0.2	44.7	20.5	0.2
LOS	C	D	A	D	C	A	B	C	A	D	C	A
Approach Delay		37.8			26.3			18.1			25.7	
Approach LOS		D			C			B			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 88.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 25.2	Intersection LOS: C
Intersection Capacity Utilization 62.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

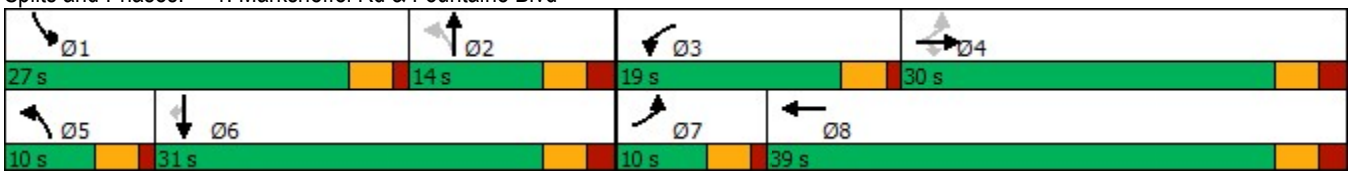
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	278	573	185	193
Demand Flow Rate, veh/h	283	584	189	197
Vehicles Circulating, veh/h	71	251	225	773
Vehicles Exiting, veh/h	899	163	129	62
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.8	10.2	4.9	10.1
Approach LOS	A	B	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	283	584	189	197
Cap Entry Lane, veh/h	1283	1068	1097	627
Entry HV Adj Factor	0.982	0.981	0.979	0.980
Flow Entry, veh/h	278	573	185	193
Cap Entry, veh/h	1260	1048	1074	615
V/C Ratio	0.220	0.547	0.172	0.314
Control Delay, s/veh	4.8	10.2	4.9	10.1
LOS	A	B	A	B
95th %tile Queue, veh	1	3	1	1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	898	144	470	528	461	118	243	750	755	326	65
Future Volume (vph)	65	898	144	470	528	461	118	243	750	755	326	65
Turn Type	pm+pt	NA	Perm	Prot	NA	Free	pm+pt	NA	Free	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			Free	2		Free			6
Detector Phase	7	4	4	3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.0	9.0	9.0	9.0	9.0		9.0	9.0		9.0	9.0	9.0
Total Split (s)	10.0	30.0	30.0	19.0	39.0		10.0	14.0		27.0	31.0	31.0
Total Split (%)	11.1%	33.3%	33.3%	21.1%	43.3%		11.1%	15.6%		30.0%	34.4%	34.4%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0		1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0		4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	Max		None	Max	Max
Act Effct Green (s)	31.9	25.0	25.0	14.8	35.8	89.8	16.5	9.5	89.8	22.5	26.0	26.0
Actuated g/C Ratio	0.36	0.28	0.28	0.16	0.40	1.00	0.18	0.11	1.00	0.25	0.29	0.29
v/c Ratio	0.19	0.95	0.25	0.87	0.39	0.31	0.52	0.69	0.50	0.91	0.33	0.12
Control Delay	14.2	51.7	2.1	53.7	20.9	0.5	29.0	49.7	1.1	49.1	26.3	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	51.7	2.1	53.7	20.9	0.5	29.0	49.7	1.1	49.1	26.3	0.4
LOS	B	D	A	D	C	A	C	D	A	D	C	A
Approach Delay		42.9			24.9			14.7			39.8	
Approach LOS		D			C			B			D	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 89.8	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 30.2	Intersection LOS: C
Intersection Capacity Utilization 81.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd



Intersection	
Intersection Delay, s/veh	12.1
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	1034	355	133	132
Demand Flow Rate, veh/h	1055	362	136	135
Vehicles Circulating, veh/h	0	367	836	498
Vehicles Exiting, veh/h	633	605	219	231
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	14.5	8.1	9.3	6.1
Approach LOS	B	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	1055	362	136	135
Cap Entry Lane, veh/h	1380	949	588	830
Entry HV Adj Factor	0.980	0.980	0.978	0.978
Flow Entry, veh/h	1034	355	133	132
Cap Entry, veh/h	1353	930	575	812
V/C Ratio	0.765	0.381	0.231	0.163
Control Delay, s/veh	14.5	8.1	9.3	6.1
LOS	B	A	A	A
95th %tile Queue, veh	8	2	1	1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	276	48	639	766	618	154	548	238	237	523	45
Future Volume (vph)	36	276	48	639	766	618	154	548	238	237	523	45
Turn Type	pm+pt	NA	Perm	Prot	NA	Free	pm+pt	NA	Free	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			Free	2		Free			6
Detector Phase	7	4	4	3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.0	9.0	9.0	9.0	9.0		9.0	9.0		9.0	9.0	9.0
Total Split (s)	10.0	15.0	15.0	25.0	30.0		10.0	35.0		15.0	40.0	40.0
Total Split (%)	11.1%	16.7%	16.7%	27.8%	33.3%		11.1%	38.9%		16.7%	44.4%	44.4%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	Max		None	Max	Max
Act Effct Green (s)	14.9	9.9	9.9	19.6	28.5	89.4	35.3	30.3	89.4	9.7	35.0	35.0
Actuated g/C Ratio	0.17	0.11	0.11	0.22	0.32	1.00	0.39	0.34	1.00	0.11	0.39	0.39
v/c Ratio	0.22	0.75	0.14	0.90	0.72	0.41	0.44	0.48	0.16	0.67	0.40	0.06
Control Delay	22.9	51.7	0.8	50.4	32.4	0.8	18.4	25.2	0.2	48.0	20.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	51.7	0.8	50.4	32.4	0.8	18.4	25.2	0.2	48.0	20.8	0.2
LOS	C	D	A	D	C	A	B	C	A	D	C	A
Approach Delay		42.0			28.4			17.8			27.7	
Approach LOS		D			C			B			C	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 89.4		
Natural Cycle: 60		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.90		
Intersection Signal Delay: 27.0	Intersection LOS: C	
Intersection Capacity Utilization 65.5%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd

Intersection	
Intersection Delay, s/veh	20.5
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	574	959	284	201
Demand Flow Rate, veh/h	585	978	290	205
Vehicles Circulating, veh/h	98	255	535	1154
Vehicles Exiting, veh/h	1261	570	148	79
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.8	31.8	9.0	18.8
Approach LOS	A	D	A	C

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	585	978	290	205
Cap Entry Lane, veh/h	1249	1064	800	425
Entry HV Adj Factor	0.981	0.980	0.979	0.980
Flow Entry, veh/h	574	959	284	201
Cap Entry, veh/h	1225	1043	783	417
V/C Ratio	0.469	0.919	0.363	0.482
Control Delay, s/veh	7.8	31.8	9.0	18.8
LOS	A	D	A	C
95th %tile Queue, veh	3	14	2	3

Intersection	
Int Delay, s/veh	7.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑			↱
Traffic Vol, veh/h	0	443	473	0	0	289
Future Vol, veh/h	0	443	473	0	0	289
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	75	80	95	95	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	591	591	0	0	385

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	591
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.319
Pot Cap-1 Maneuver	0	-	-	0	0	506
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	506
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	31.4
HCM LOS			D

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	506
HCM Lane V/C Ratio	-	-	0.762
HCM Control Delay (s)	-	-	31.4
HCM Lane LOS	-	-	D
HCM 95th %tile Q(veh)	-	-	6.6

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	269	174	473	71	0	0
Future Vol, veh/h	269	174	473	71	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	235	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	94	94	75	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	359	185	503	95	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	598	0	-	0	-	503
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	-	-	3.318
Pot Cap-1 Maneuver	979	-	-	-	0	569
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	979	-	-	-	-	569
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

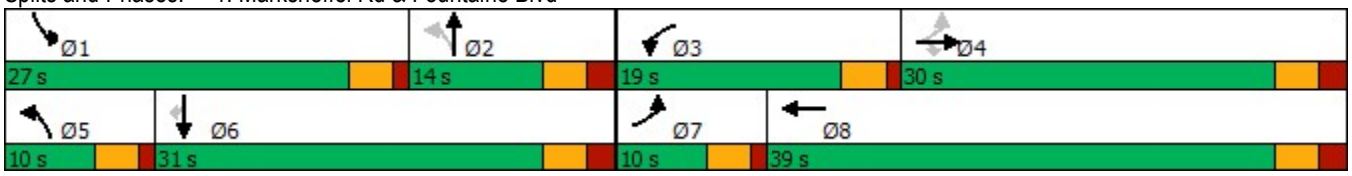
Approach	EB	WB	SB
HCM Control Delay, s	7.1	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	979	-	-	-	-
HCM Lane V/C Ratio	0.366	-	-	-	-
HCM Control Delay (s)	10.8	-	-	-	0
HCM Lane LOS	B	-	-	-	A
HCM 95th %tile Q(veh)	1.7	-	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	911	144	478	535	469	118	243	765	770	326	65
Future Volume (vph)	65	911	144	478	535	469	118	243	765	770	326	65
Turn Type	pm+pt	NA	Perm	Prot	NA	Free	pm+pt	NA	Free	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			Free	2		Free			6
Detector Phase	7	4	4	3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.0	9.0	9.0	9.0	9.0		9.0	9.0		9.0	9.0	9.0
Total Split (s)	10.0	30.0	30.0	19.0	39.0		10.0	14.0		27.0	31.0	31.0
Total Split (%)	11.1%	33.3%	33.3%	21.1%	43.3%		11.1%	15.6%		30.0%	34.4%	34.4%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0		1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0		4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	Max		None	Max	Max
Act Effct Green (s)	31.9	25.0	25.0	14.9	35.9	89.9	16.3	9.3	89.9	22.7	26.0	26.0
Actuated g/C Ratio	0.35	0.28	0.28	0.17	0.40	1.00	0.18	0.10	1.00	0.25	0.29	0.29
v/c Ratio	0.19	0.96	0.25	0.88	0.40	0.31	0.53	0.70	0.51	0.93	0.34	0.12
Control Delay	14.2	54.5	2.1	54.8	21.0	0.5	29.2	50.5	1.2	50.9	26.3	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	54.5	2.1	54.8	21.0	0.5	29.2	50.5	1.2	50.9	26.3	0.4
LOS	B	D	A	D	C	A	C	D	A	D	C	A
Approach Delay		45.3			25.3			14.8			41.1	
Approach LOS		D			C			B			D	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 89.9	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 31.2	Intersection LOS: C
Intersection Capacity Utilization 82.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd



Intersection	
Intersection Delay, s/veh	15.4
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	1092	443	142	133
Demand Flow Rate, veh/h	1114	452	145	136
Vehicles Circulating, veh/h	39	367	896	583
Vehicles Exiting, veh/h	680	674	257	236
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	19.4	9.7	10.3	6.8
Approach LOS	C	A	B	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	1114	452	145	136
Cap Entry Lane, veh/h	1326	949	553	761
Entry HV Adj Factor	0.980	0.980	0.979	0.978
Flow Entry, veh/h	1092	443	142	133
Cap Entry, veh/h	1300	930	542	745
V/C Ratio	0.840	0.476	0.262	0.179
Control Delay, s/veh	19.4	9.7	10.3	6.8
LOS	C	A	B	A
95th %tile Queue, veh	11	3	1	1

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑			↱
Traffic Vol, veh/h	0	640	337	0	0	84
Future Vol, veh/h	0	640	337	0	0	84
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	674	355	0	0	88

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	355
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.319
Pot Cap-1 Maneuver	0	-	-	0	0	688
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	688
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	688
HCM Lane V/C Ratio	-	-	0.129
HCM Control Delay (s)	-	-	11
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.4

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	65	575	337	8	0	0
Future Vol, veh/h	65	575	337	8	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	235	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	68	605	355	8	0	0

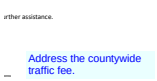
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	363	0	-	0	-	355
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	-	-	3.318
Pot Cap-1 Maneuver	1196	-	-	-	0	689
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1196	-	-	-	-	689
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1196	-	-	-	-
HCM Lane V/C Ratio	0.057	-	-	-	-
HCM Control Delay (s)	8.2	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	-

Markup Summary

dsdrice (4)



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Date: 7/5/2018 11:52:56 AM
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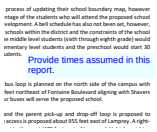
Address the countywide traffic fee.



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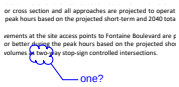
Provide times assumed in this report.



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one?

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Discuss if these improvements were (will be) provided with the Fontaine Blvd. improvements or will be provided by the school district, and when. If justified not to be constructed initially escrow may be required.