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Creekside at Lorson Ranch Filing No. 1
Traffic Impact and Access Analysis
(LSC #184520)
PUDSP-18-005
October 25, 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.



10/26/18
Date



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October 25, 2018

Mr. Jeff Mark
The Landhuis Company
212 North Wahsatch Avenue, Suite 301
Colorado Springs, CO 80903

RE: Creekside at Lorson Ranch Filing No. 1
PUDSP-18-005
El Paso County, Colorado
Traffic Impact and Access Analysis
LSC #184520

Dear Mr. Mark:

LSC Transportation Consultants, Inc. has prepared this traffic impact analysis for the proposed Creekside at Lorson Ranch Filing No. 1 residential development to be located south of the future Lorson Boulevard between Jimmy Camp Creek and the Jimmy Camp Creek East Tributary in El Paso County, Colorado. The site location is shown on Figure 1.

REPORT CONTENTS

This 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 residential development.
- 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, Marksheffel Road/Lorson Boulevard and the intersections on Lorson Boulevard adjacent to the site.
- Recommendations for street functional classification, traffic controls, and auxiliary turn lanes.

SITE DEVELOPMENT AND LAND USE

Creekside at Lorson Ranch Filing No. 1 is planned to include 235 lots for single-family homes in the area south of the future Lorson Boulevard between Jimmy Camp Creek and the Jimmy Camp Creek East Tributary. This area was included as traffic analysis zones 26 and 126 in the *Lorson Ranch Sketch Plan Traffic Technical Memorandum* by LSC dated April 15, 2016. The Sketch Plan memorandum assumed this area would be developed with 449 single family homes.

Three full-movement access points are proposed to the future Lorson Boulevard. Two of the access points would align with Stingray Drive and Kearsarge Drive. The third access point is located about 768 feet west of Kearsarge Drive. Figure 2 shows the site plan and the proposed access spacing.

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 55 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.
- **Lorson Boulevard** is a planned future roadway that will extend from Marksheffel Road about one-half mile south of Fontaine Boulevard. Lorson Boulevard will be classified as an Urban Non-Residential Collector Street (modified for a 44-foot street width rather than the standard 52-foot street width) with an 80-foot-wide right-of-way. East of Stingray Lane, Lorson Boulevard will be classified as an Urban Non-Residential Collector Street (modified for a 44-foot street width rather than the standard 52-foot street width). The right-of-way will vary from 64 feet to 72 feet to accommodate anticipated future right-turn deceleration lanes. The right-of-way not adjacent to right-turn lanes would be 64 feet. Also, tracts adjacent to the right-of-way will allow for future right-of-way expansion to 80 feet if ever needed. The

proposed cross section includes two 14-foot "shared-use" travel lanes, a striped two-way left-turn lane and right-turn deceleration lanes where warranted.

Baseline Traffic Volumes

Figure 3 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 2018. 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			
Level of Service	Signalized Intersections		Unsignalized Intersections
	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: <i>Transportation Research Circular 212</i>			
(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 3 shows the level of service analysis results. As shown on the figure, all movements at 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 Creekside at Lorson Ranch East Filing 1 traffic. The short-term background traffic volumes are shown in Figure 4. The background traffic volumes are based on the existing traffic volumes shown in Figure 3 with a portion of the volumes assumed to be rerouted with the construction of Lorson Boulevard from

Marksheffel Road to Lamprey Drive including crossing both the Jimmy Camp Creek main channel and east tributary. The short-term background traffic also includes additional 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, Lorson Ranch East Filings 1 and 2, and the school located northeast of Fontaine Boulevard and Lamprey Drive, but assumes zero traffic generated by Creekside at Lorson Ranch East Filing 1.

2040 BACKGROUND TRAFFIC

Figure 5 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 Creekside Lorson Ranch Filing 1) 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 area assumed in the *Lorson Ranch Sketch Plan Traffic Technical Memorandum* by LSC dated April 15, 2016. The estimate contained in the Sketch Plan memorandum was made using the 9th edition of the *Trip Generation* manual.

As shown in Table 2, Creekside at Lorson Ranch East Filing 1 is projected to generate about 2,218 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 43 vehicles would enter and 130 vehicles would exit the site. During the afternoon peak hour, which generally occurs for one hour between 4:30 and 6:30 p.m., about 147 vehicles would enter and 86 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. Figure 6 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; the roadway network; and the most recent traffic counts

conducted at the intersection of Marksheffel/Fontaine. The number of external vehicle trips were based on the internal trip estimates shown in Appendix Table 2.

Figures 7 and 8 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 planned school site located northeast of the intersection of Fontaine Boulevard and Lamprey Drive and the future retail sites located near the intersection of Fontaine Boulevard and Carriage Meadows Drive. The short-term internal trip assignment included only trips to and from the school site. For the short-term scenario the retail internal trips were included in the external trip assignment. The long-term internal trip assignment included both trips to and from the school and the retail sites.

The external vehicle trips were then assigned to the street network by applying the trip distribution percentages (from Figure 6) 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 9 shows the short-term total traffic volumes. These volumes are the sum of the short-term background traffic volumes (from Figure 4) plus the short-term site-generated traffic volumes (from Figure 7).

Figure 10 shows the 2040 total traffic volumes. These volumes are the sum of the 2040 background traffic volumes (from Figure 5) plus the long-term site-generated traffic volumes (from Figure 8).

PROJECTED LEVELS OF SERVICE

The intersections of Marksheffel Road/Fontaine Boulevard and Marksheffel Road/Lorson Boulevard and the access points along Lorson Boulevard adjacent to the site 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 4, 5, 9, and 10.

Marksheffel/Fontaine

The signal-controlled Marksheffel Road/Fontaine Boulevard intersection is projected to continue to operate at level of service D or better for all movements based on the short-term total traffic volumes. By 2040 this intersection is projected to operate at an overall LOS D or better during the peak hours; however, the southbound left-turn and westbound left-turn movements are projected to operate at LOS E during the afternoon peak hour based on both the background and total traffic volumes.

Marksheffel/Lorson

Unsignalized (Stop-Sign Controlled) and Signalized Intersection Traffic Control

Based on the projected short-term total traffic volumes the westbound left-turn movement at the intersection of Marksheffel/Lorson is projected to operate at LOS F during the morning peak hour and LOS E during the afternoon peak hour if this intersection remains a conventional, stop-sign-controlled, full-movement intersection. Assuming a conventional, signal-controlled intersection, all movements are projected to operate at LOS B or better during the peak hours based on both short-term and 2040 total traffic volumes.

Alternative Intersection Configuration/Traffic Control

The following are two potential alternatives to a conventional full-movement intersection (Stop-sign controlled or signal controlled, for which analysis results are presented in the preceding paragraph). These include modern roundabout and “channelized T” type intersections.

Modern Roundabout Intersection

A modern roundabout intersection at Lorson/Marksheffel (hypothetically) would initially be a single-lane roundabout but would need to be designed to be expandable to a two-lane roundabout.

All of the approaches at the intersection of Marksheffel/Lorson are projected to operate at LOS A during the peak hours based on the short-term total traffic volumes assuming a single-lane roundabout. By 2040 it was assumed that the intersection would be expanded to a two-lane roundabout. Based on the 2040 total traffic volumes the westbound approach is projected to operate at LOS C (18.1 seconds control delay) during the peak hour.

Advantages

- The overall intersection delay is projected to be slightly lower with a two-lane roundabout. Based on the 2040 total morning peak-hour volumes, the projected overall intersection delay is 10.2 seconds per vehicle (LOS B) with a two-lane roundabout and 10.5 seconds per vehicle (LOS B) with a signal-controlled intersection. Based on the 2040 total afternoon peak-hour volumes the projected overall intersection delay is 8.8 seconds (LOS A) with a two-lane roundabout and 8.9 seconds (LOS A) with a signal-controlled intersection.
- Generally, modern roundabouts have safety advantages over a signal-controlled intersection. This is because crashes tend to be lower speed, there are fewer conflict points, and the types (angle) of crashes tend to be those which generally result in less severe accidents. Granted, as a conventional T intersection (which would be the case

until (and if) a fourth leg is added to this intersection) this intersection. Conventional T intersections have significantly fewer conflict points than a four-leg conventional intersection.

- A roundabout may be more aesthetically appealing than a traditional signal-controlled intersection and generally lower traffic noise levels.
- Long-term operation and maintenance cost is likely to be lower with a roundabout than a traffic signal.

Disadvantages

- The travel speed through the intersection compared with a signalized intersection during the signal green phase would be slower for through traffic on Marksheffel Road. This may affect travel times along the corridor if, in the future, other Marksheffel intersections to the north and south are controlled by a series of coordinated traffic signals. However, the average intersection delay should be factored into the overall corridor travel time. This analysis may show no overall disadvantage.

Channelized T Intersection

The channelized T type intersection allows for an intersection with generally lower overall and side-street delay than with a conventional T intersection and with fewer stops for the through traffic on the major roadway when compared to a conventional signalized T intersection. An example of a channelized T-type intersection is at the intersection of US Highway 24 and Garrett Road near Falcon (El Paso County). That particular intersection is signalized with a “directional signal,” but a channelized T can also operate as an unsignalized intersection with Stop-sign control on the minor street. Whether signalized or unsignalized, the raised median configuration would allow for “free” (no stopping) movement for the southbound through movement through the intersection. The westbound left turn would cross the northbound lanes and into a channelized southbound left-turn acceleration lane for merging into southbound through traffic.

Based on the projected short-term morning peak-hour traffic volumes and assuming a conventional T intersection, the projected delay for the westbound left-turn movement at the intersection of Marksheffel/Lorson is 63.9 seconds per vehicle (LOS F). If the intersection were constructed with a channelized T the delay for this movement is projected to be 16.1 seconds per vehicle (LOS C). By 2040 the delay for this movement is projected to be LOS F during the morning peak hour even with the channelized T. If the channelized T intersection were signalized with a “directional signal,” the delay for the westbound left-turn movement is projected to be 16.2 seconds (LOS B).

Advantages

- The intersection of Marksheffel/Lorson could likely operate at a satisfactory level of service as a Stop-sign-controlled intersection for longer as an unsignalized, channelized T intersection than if it were to remain a conventional T intersection.
- Once signal control would be required to maintain an acceptable level of service, the channelized T configuration would result in lower delay for through traffic especially for the southbound traffic which would operate freely. The overall intersection delay is projected to be lower with a channelized T intersection. Based on the 2040 total morning peak-hour volumes, the projected overall intersection delay is 6.8 seconds per vehicle (LOS A) with a signal-controlled channelized T intersection and 10.5 seconds per vehicle (LOS B) with a conventional signal-controlled intersection. Based on the 2040 total afternoon peak-hour volumes the projected overall intersection delay is 5.7 seconds per vehicle (LOS A) with a signal-controlled channelized T intersection and 8.9 seconds per vehicle (LOS A) with a conventional signal-controlled intersection.
- There is the potential, depending on the time of day and traffic volumes, to allow for a longer side-street signal phase due to one-way signal progression and no red phase for southbound traffic.

Disadvantages

- The channelized T configuration would only work on an interim basis prior to the addition of a potential fourth leg of this intersection. It is anticipated that development of the Singer property on the west side of Marksheffel Road would result in a request for a full-movement-capable, fourth/west leg of this intersection. If/when that occurs, many of the channelized T improvements would need to be removed or modified.
- The channelized T configuration may be confusing for some drivers and the merging movement into southbound traffic requires a more complex movement than with a signal. However, most motorists entering the intersection from the east would be regular users and would quickly learn to navigate the intersection.
- A channelized T intersection would require the construction of raised channelizing medians on Marksheffel Road and the ongoing maintenance of those medians.
- The section of Marksheffel Road between Lorson Boulevard and Poa Annua would need to be designed to accommodate a southbound left-turn acceleration lane from Lorson Boulevard, a taper, and a southbound left-turn lane approaching Poa Annua. Based on a posted speed limit of 55 mph, the El Paso County *Engineering Criteria Manual* (ECM) requires a 960-foot-long acceleration lane plus a 222-foot taper. Based on a design speed of 60 mph the ECM requires a 290-foot-long left-turn lane approach Poa Annua plus 50 to 75 feet of storage length. The total length of the acceleration lane, taper, and

left-turn lane would be between 1,522 and 1,547 feet. The total distance between Lorson Boulevard and Poa Annua street is about 1,025 feet centerline to centerline. The construction of a channelized T intersection would therefore require a deviation(s) to the ECM.

- A channelized T can be more difficult for pedestrians than a conventional signalized intersection. However, there may be ways to better accommodate pedestrians – such as adding a pedestrian-only phase for southbound traffic. More research would be needed regarding pedestrian accommodation.

Lorson Boulevard Intersections

All movements at the intersections of Lorson/Tensas, Lorson/Kearsarge, Lorson/Old Glory, and Lorson/Stingray 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.

TRAFFIC SIGNAL WARRANT ANALYSIS

The intersection of Marksheffel/Lorson was analyzed to determine when the Four-Hour Vehicular Volume Traffic Signal Warrant thresholds would be reached or exceeded based on the projected morning and afternoon peak-hour short-term traffic volumes. The results of the analysis are shown in Figure 11. The minor approach volumes were assumed to include the westbound left-turn movements only.

As shown in the figure, the thresholds for a Four-Hour Vehicular Volume Traffic Signal Warrant are projected to be exceeded during the morning and afternoon peak hours based on the projected short-term background and total traffic volumes. In order for a Four-Hour Traffic Signal Warrant to be satisfied, the volume threshold would need to be met for two additional hours of the day. For example, the four-hour warrant would be satisfied with the volume thresholds met for the one hour in the morning, two hours (instead of the one-hour peak) during the afternoon peak period, and an hour during the mid-afternoon. The satisfaction of warrants does not indicate that a signal must be installed. The decision to require a signal to be installed at this location rests with the El Paso County Department of Transportation.

TRAFFIC SIGNAL ESCROW PERCENTAGES/AMOUNTS

As shown in Figure 11, the intersection of Marksheffel/Lorson is likely to meet a traffic signal warrant based on the short-term total traffic volumes. Table 3 shows the projected number of westbound left-turning vehicles at the intersection of Lorson/Marksheffel estimated to be generated by future developments within Lorson Ranch. Estimates of westbound left-turning vehicles due to existing or approved developments were not included as they will not participate in funding of this signal. The specific developments included in the calculation are listed in the table. These volumes were used to calculate a fair share contribution toward a future signal at

this intersection. Assuming a total signal cost of \$300,000, a fair share contribution toward a future signal at this intersection would be \$74,216 for Creekside at Lorson Ranch East Filing 1.

ROADWAY CLASSIFICATIONS

As shown on Figure 12, all of the internal streets within Creekside at Lorson Ranch Filing 1 should be classified as either Urban Local (Low Volume) or Urban Local.

ROADWAY IMPROVEMENT FEE PROGRAM

This project will be required to participate in the El Paso County Road Improvement Fee Program. Creekside at Lorson Ranch Filing 1 will join the ten-mil PID. The ten-mil PID building permit fee portion associated with this option is \$923 per single-family dwelling unit. Based on 235 lots, the total building permit fee would be \$216,905.

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

- Creekside at Lorson Ranch Filing 1 is projected to generate about 2,218 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 about 43 vehicles would enter and 130 vehicles would exit the site. During the afternoon peak hour about 147 vehicles would enter and 86 vehicles would exit the site.

Projected Levels of Service

- The signal-controlled Marksheffel Road/Fontaine Boulevard intersection is projected to operate at an overall level of service D or better based on the short-term and 2040 background and total traffic conditions. The southbound left-turn and westbound left-turn movements are projected to operate at LOS E during the afternoon peak hour based on both the background and total traffic volumes.
- Based on the projected short-term total traffic volumes, the westbound left-turn movement at the intersection of Marksheffel/Lorson is projected to operate at LOS F during the morning peak hour and LOS E during the afternoon peak hour if this intersection is two-way stop-sign controlled. If this intersection were to be signal-controlled all movements are projected to operate at LOS B or better during the peak hours based on both short-term and 2040 total traffic volumes.
- All movements at the intersections of Lorson/Tensas, Lorson/Kearsarge, Lorson/Old Glory and Lorson/Stingray 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.

- As requested by staff, this report includes discussion and general analysis of intersection traffic control/intersection type alternatives for Lorson Boulevard/Marksheffel Road.

Recommended Auxiliary Turn Lanes on Lorson Boulevard

- Based on the projected long-term traffic volumes, a westbound right-turn deceleration lane would be required on Lorson Boulevard approaching Old Glory Drive. This lane should be 155 feet long plus a 160-foot taper. A westbound right-turn deceleration lane would **not** be required approaching Kearsarge Drive and Stingray Drive.
- Based on the projected short-term and 2040 traffic volumes, eastbound right-turn deceleration lanes would be **not** be required on Lorson Boulevard approaching Tensas Drive, Kearsarge Drive, and Stingray Drive.
- Based on the projected short-term and 2040 traffic volumes, left-turn lanes would be **not** be required on Lorson Boulevard approaching Tensas Drive, Kearsarge Drive, Old Glory Drive, and Stingray Drive. However, 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 these intersections.

* * * * *

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

JCH:KDF:bjwb

Enclosures: Table 2
Appendix Tables 1 and 2
Figures 1-12
Traffic Count Reports
Level of Service Reports

<p style="text-align: center;"> Table 2 Trip Generation Estimate Lorson Ranch PK-8 School </p>

Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾				Total Trips Generated					
			Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour	
				In	Out	In	Out		In	Out	In	Out
Trip Generation for Creekside at Lorson Ranch Filing No. 1												
210	Single Family Detached Housing	235 DU ⁽²⁾	9.44	0.19	0.56	0.62	0.37	2,218	43	130	147	86
Trip Generation Estimate For Traffic Zones 26 & 126 From the <i>Lorson Ranch Sketch Plan Traffic Technical Memorandum</i> by LSC April 15, 2016												
210	Single Family Detached Housing	226 DU	9.52	0.19	0.56	0.63	0.37	2,152	42	127	142	84
210	Single Family Detached Housing	223 DU	9.52	0.19	0.56	0.63	0.37	2,123	42	125	140	83
		449 DU						4,275	84	252	282	167
			Change in Trip Generation Estimate					-2,057	-41	-122	-135	-81

Notes:

(1) Source: "Trip Generation, 10th Edition, 2017" by the Institute of Transportation Engineers (ITE)

(2) DU = dwelling unit

Source: LSC Transportation Consultants, Inc.

Appendix Table 1 Lorson Ranch Sketch Plan Trip Generation Estimate																																				
Land Use Data						Trip Generation Rates ⁽¹⁾					Raw ITE Trip Generation (Individual Driveway Trips)					School Internal Trips ⁽²⁾					Retail Internal Trips ⁽²⁾					Pass-by ⁽³⁾ (%)	Pass-by Trips					Total New External Trips				
Traffic Zone	Name	ITE Land Use	ITE Code	Quantity	Unit	Daily	AM Peak Hour		PM Peak Hour		Daily	AM Peak Hour		PM Peak Hour		Daily	AM Peak Hour		PM Peak Hour		Daily	AM Peak Hour		PM Peak Hour			Daily	AM Peak Hour		PM Peak Hour		Daily	AM Peak Hour		PM Peak Hour	
							In	Out	In	Out		In	Out	In	Out		In	Out	In	Out		In	Out	In	Out			In	Out	In	Out		In	Out	In	Out
RESIDENTIAL																																				
All Residential North of Lorson Boulevard "Between the Creeks"																																				
8	Ponderosa	Single-Family Detached Housing	210	102	DJ ⁽⁴⁾	9.44	0.19	0.56	0.62	0.37	963	19	57	64	37	28	2	5	1	1	106	1	2	5	2	0%	0	0	0	0	0	829	16	50	58	34
9	Ponderosa	Single-Family Detached Housing	210	102	DU	9.44	0.19	0.56	0.62	0.37	963	19	57	64	37	28	2	5	1	1	106	1	2	5	2	0%	0	0	0	0	0	829	16	50	58	34
10	Meadows Fil 1	Single-Family Detached Housing	210	97	DU	9.44	0.19	0.56	0.62	0.37	916	18	54	60	36	27	2	5	1	1	101	0	2	5	2	0%	0	0	0	0	0	788	16	47	54	33
11	Meadows Fil 3	Single-Family Detached Housing	210	51	DU	9.44	0.19	0.56	0.62	0.37	481	9	28	32	19	14	1	2	1	0	53	0	1	3	1	0%	0	0	0	0	0	414	8	25	28	18
12	Meadows Fil 3	Single-Family Detached Housing	210	87	DU	9.44	0.19	0.56	0.62	0.37	821	16	48	54	32	24	2	4	1	1	91	0	1	4	2	0%	0	0	0	0	0	706	14	43	49	29
3	The Meadows Fil 2	Single-Family Detached Housing	210	109	DU	9.44	0.19	0.56	0.62	0.37	1,029	20	60	68	40	30	3	5	1	1	114	1	2	6	3	0%	0	0	0	0	0	885	16	53	61	36
13	Allegiant Fil 1	Single-Family Detached Housing	210	97	DU	9.44	0.19	0.56	0.62	0.37	916	18	54	60	36	27	2	5	1	1	101	0	2	5	2	0%	0	0	0	0	0	788	16	47	54	33
5	Buffalo Crossing	Single-Family Detached Housing	210	204	DU	9.44	0.19	0.56	0.62	0.37	1,926	38	113	127	75	56	5	10	2	1	213	1	3	10	5	0%	0	0	0	0	0	1,657	32	100	115	69
	Townhomes at Lorson Ranch	Multifamily Housing	210	46	DU	7.32	0.11	0.35	0.35	0.21	337	5	16	16	10	10	1	2	0	0	37	0	1	2	1	0%	0	0	0	0	0	290	4	13	14	9
6	Pioneer Landing	Single-Family Detached Housing	210	59	DU	9.44	0.19	0.56	0.62	0.37	557	11	33	37	22	16	1	3	1	0	62	0	1	3	1	0%	0	0	0	0	0	479	10	29	33	21
7	Pioneer Landing	Single-Family Detached Housing	210	59	DU	9.44	0.19	0.56	0.62	0.37	557	11	33	37	22	16	1	3	1	0	62	0	1	3	1	0%	0	0	0	0	0	479	10	29	33	21
15	Meadows Future Fil 4 West	Single-Family Detached Housing	210	110	DU	9.44	0.19	0.56	0.62	0.37	1,038	20	61	69	40	30	3	5	1	1	115	1	2	6	3	0%	0	0	0	0	0	893	16	54	62	36
16	Meadows Future Fil 4 East	Single-Family Detached Housing	210	126	DU	9.44	0.19	0.56	0.62	0.37	1,189	23	70	79	46	35	3	6	1	1	131	1	2	6	3	0%	0	0	0	0	0	1,023	19	62	72	42
18	Ponderosa Future Fil	Single-Family Detached Housing	210	31	DU	9.44	0.19	0.56	0.62	0.37	293	6	17	19	11	9	1	2	0	0	32	0	1	2	1	0%	0	0	0	0	0	252	5	14	17	10
39	Pioneer Landing Fil 2	Single-Family Detached Housing	210	170	DU	9.44	0.19	0.56	0.62	0.37	1,605	31	94	106	62	47	4	8	2	1	177	1	3	9	4	0%	0	0	0	0	0	1,381	26	83	95	57
Total All Residential "Between the Creeks"						1,450	DU				13,591	264	795	892	525	397	33	70	15	10	1,501	7	26	74	33						11,693	224	699	803	482	
Residential Adjacent to Marksheffel																																				
1	Carriage Meadows North	Single-Family Detached Housing	210	159	DU	9.44	0.19	0.56	0.62	0.37	1,501	29	88	99	58	44	4	8	2	1	166	1	3	8	4	0%	0	0	0	0	0	1,291	24	77	89	53
147	Carriage Meadows South	Multifamily Housing	210	72	DU	7.32	0.11	0.35	0.35	0.21	527	8	26	25	15	15	1	3	1	0	58	0	1	3	1	0%	0	0	0	0	0	454	7	22	21	14
47		Single-Family Detached Housing	210	86	DU	9.44	0.19	0.56	0.62	0.37	812	16	48	54	32	24	2	4	1	1	90	0	1	4	2	0%	0	0	0	0	0	698	14	43	49	29
247		Single-Family Detached Housing	210	51	DU	9.44	0.19	0.56	0.62	0.37	481	9	28	32	19	14	1	2	1	0	53	0	1	3	1	0%	0	0	0	0	0	414	8	25	28	18
347		Single-Family Detached Housing	210	97	DU	9.44	0.19	0.56	0.62	0.37	916	18	54	60	36	27	2	5	1	1	101	0	2	5	2	0%	0	0	0	0	0	788	16	47	54	33
Total All Residential Adjacent to Marksheffel						465	DU				4,237	80	244	270	160	124	10	22	6	3	468	1	8	23	10						3,645	69	214	241	147	
Total All Residential "Between the Creeks" and Adjacent to Marksheffel						1,915	DU				17,828	344	1,039	1,162	685	521	43	92	21	13	1,969	8	34	97	43						15,338	293	913	1,044	629	
Lorson Ranch East																																				
42	North of Fontaine	Single-Family Detached Housing	210	277	DU	9.44	0.19	0.56	0.62	0.37	2,615	51	154	173	101	77	7	14	3	2	289	1	5	14	7	0%	0	0	0	0	0	2,249	43	135	156	92
37	East of Lamprey	Single-Family Detached Housing	210	122	DU	9.44	0.19	0.56	0.62	0.37	1,152	23	68	76	45	34	3	6	1	1	127	1	2	6	3	0%	0	0	0	0	0	991	19	60	69	41
27	West of Lamprey	Single-Family Detached Housing	210	303	DU	9.44	0.19	0.56	0.62	0.37	2,860	56	168	189	111	84	7	15	3	2	316	2	5	16	7	0%	0	0	0	0	0	2,460	47	148	170	102
127	South of Lorson - West	Single-Family Detached Housing	210	76	DU	9.44	0.19	0.56	0.62	0.37	717	14	42	47	28	21	2	4	1	0	79	0	1	4	2	0%	0	0	0	0	0	617	12	37	42	26
227	South of Lorson - East	Single-Family Detached Housing	210	48	DU	9.44	0.19	0.56	0.62	0.37	453	9	27	30	18	13	1	2	1	0	50	0	1	2	1	0%	0	0	0	0	0	390	8	24	27	17
Total Lorson Ranch East						826	DU				7,797	153	459	515	303	229	20	41	9	5	861	4	14	42	20						6,707	129	404	464	278	
Total All Residential "Between the Creeks", Adjacent to Marksheffel & Lorson Ranch East						2,741	DU				25,625	497	1,498	1,677	988	750	63	133	30	18	2,830	12	48	139	63						22,045	353	1,103	1,267	760	
Creekside at Lorson Ranch Filing No. 1																																				
26	Creekside East	Single-Family Detached Housing	210	97	DU	9.44	0.19	0.56	0.62	0.37	916	18	54	60	36	27	2	5	1	1	101	0	2	5	2	0%	0	0	0	0	0	788	16	47	54	33
126	Creekside West	Single-Family Detached Housing	210	138	DU	9.44	0.19	0.56	0.62	0.37	1,303	26	77	86	51	38	3	7	1	1	144	1	2	7	3	0%	0	0	0	0	0	1,121	22	68	78	47
Creekside at Lorson Ranch Filing No. 1						235	DU				2,219	44	131	146	87	65	5	12	2	2	245	1	4	12	5						1,909	38	115	132	80	
Short-Term Total						2,976	DU				27,844	541	1,629	1,823	1,075	815	68	145	32	20	3,075	13	52	151	68						23,954	460	1,432	1,640	987	
All Other Future Residential West of the Power Line																																				
43	North of Fontaine and South of Lamprey	Single-Family Detached Housing	210	73	DU	9.44	0.19	0.56	0.62	0.37	689	14	41	46	27	20	2	4	1	0	76	0	1	4	2	0%	0	0	0	0	0	593	12	36	41	25
45	North of Fontaine and NE Lamprey/Lorson	Single-Family Detached Housing	210	58	DU	9.44	0.19	0.56	0.62	0.37	548	11	32	36	21	16	1	3	1	0	61	0	1	3	1	0%	0	0	0	0	0	471	10	28	32	20
327	South of Lorson and west of Trappe	Single-Family Detached Housing	210	417	DU	9.44	0.19	0.56	0.62	0.37	3,936	77	231	260	153	115	10	20	4	2	435	2	7	21	10	0%	0	0	0	0	0	3,386	65	204	235	141
Other Future Residential Between the Power Line						548	DU				5,173																									

Appendix Table 2
Creekside at Lorson Ranch Filing No. 1
Internal Trip Estimate

Raw ITE Trip Generation (Individual Driveway Trips)									Percent Internal Trips										Total Internal Trips										Total External Trips				
ITE Land Use	ITE Code	Quantity	Unit	Daily	Trip Generation Rates ⁽¹⁾				Daily	Trips				Daily	Percent Internal Trips				Daily	Total Internal Trips				Daily	Total External Trips								
					AM Peak Hour		PM Peak Hour			AM Peak Hour		PM Peak Hour			AM Peak Hour		PM Peak Hour			AM Peak Hour		PM Peak Hour			AM Peak Hour		PM Peak Hour						
					In	Out	In	Out		In	Out	In	Out		In	Out	In	Out		In	Out	In	Out		In	Out	In	Out					
Single-Family Detached Housing	210	4,831	DU ⁽²⁾	9.44	0.19	0.56	0.62	0.37	45,605	894	2,681	3,013	1,770	School Retail Total	3%	13%	9%	2%	2%	1,360	117	241	53	29	39,978	764	2,401	2,749	1,648				
Residential Condominium/Townhouse	210	118	DU	7.32	0.11	0.35	0.35	0.21	864	12	42	42	24		11%	3%	3%	8%	7%	5,131	25	81	253	117									
									46,469	906	2,723	3,055	1,794		14%	16%	12%	10%	8%	6,491	142	322	306	146									
Elementary School	520	690	Students	1.89	0.36	0.31	0.07	0.08	1,304	250	213	51	53	70%	70%	40%	40%	70%	913	175	85	20	37	391	75	128	31	16					
Middle School/Junior High School	522	300	Students	2.13	0.31	0.27	0.07	0.08	639	94	80	22	23		70%	70%	40%	40%	70%	447	66	32	9	16	192	28	48	13	7				
Total School									1,943	344	293	73	76							1,360	241	117	29	53	583	103	176	44	23				
Shopping Center	820	219	KSF ⁽³⁾	46.75	0.74	0.45	2.13	2.30	10,261	162	99	467	506	50%	50%	25%	25%	50%	5,131	81	25	117	253	5,129	80	74	350	252					
Total School and Retail									12,204	506	392	540	582							6,491	322	142	146	306	45,690	947	2,651	3,143	1,923				
Notes: (1) Source: "Trip Generation, 10th Edition, 2017" by the Institute of Transportation Engineers (ITE) (2) DU = dwelling Unit (3) KSF = thousand square feet of floor area LSC Transportation Consultants, Inc.																																	

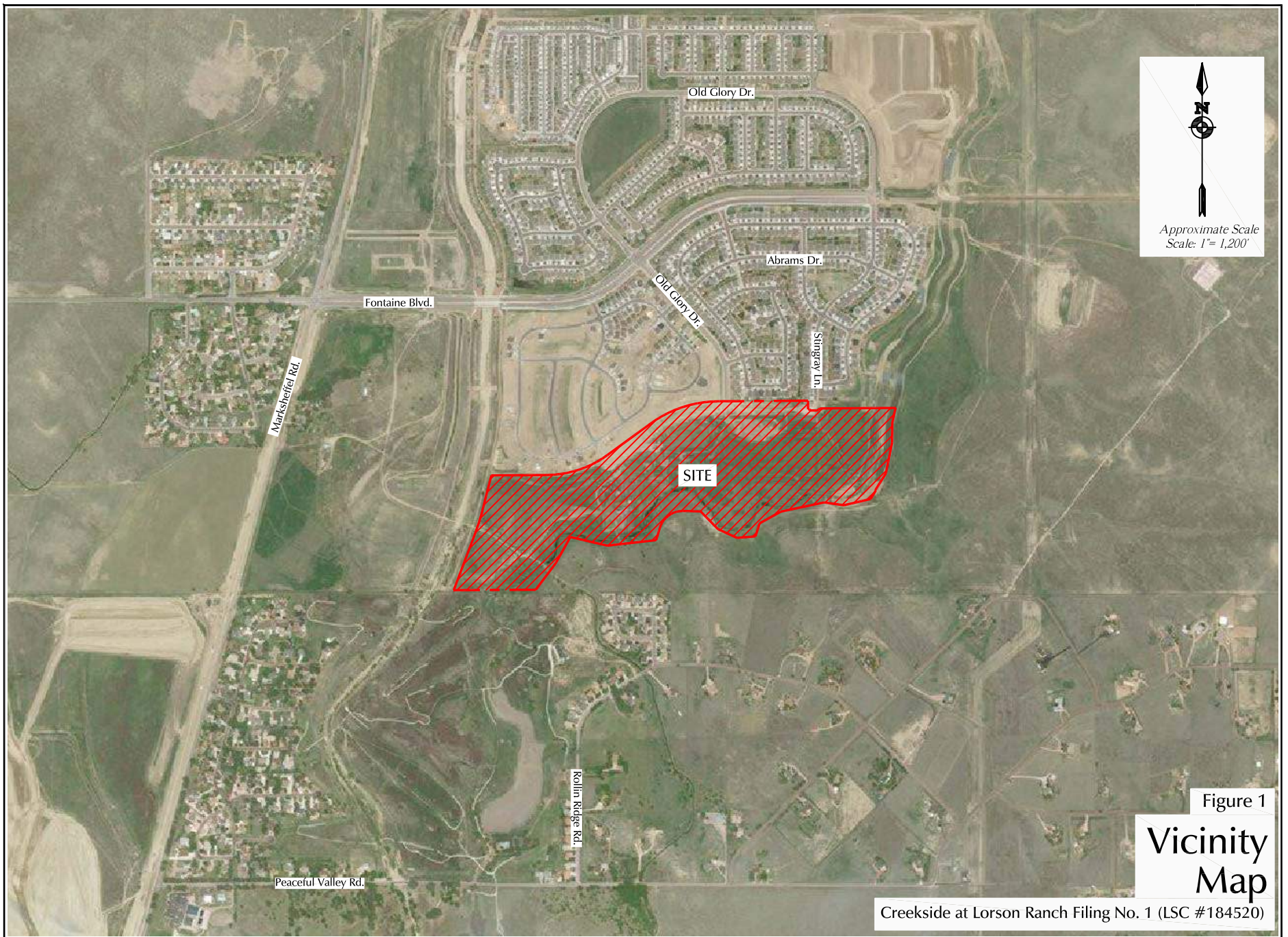
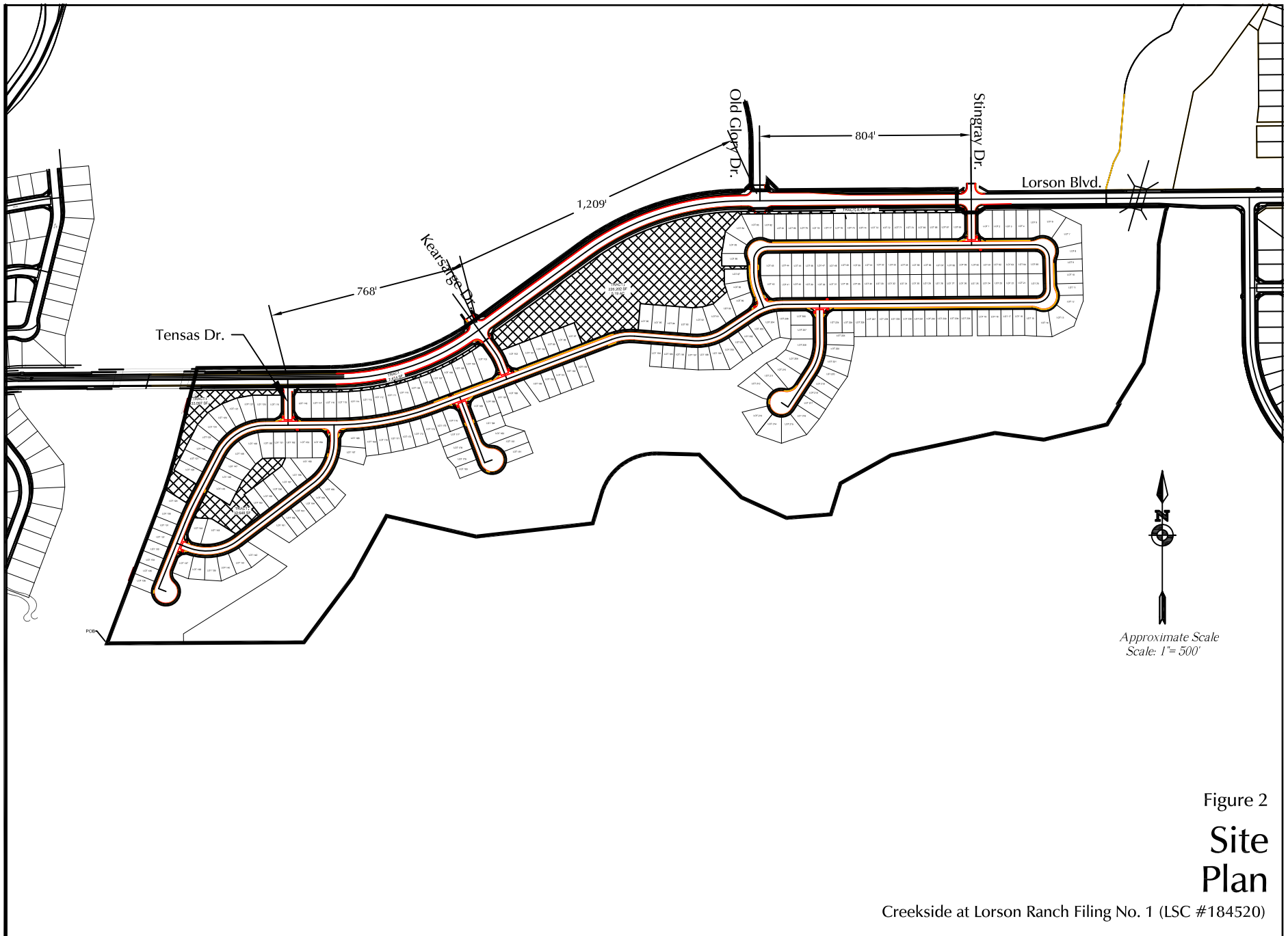


Figure 1

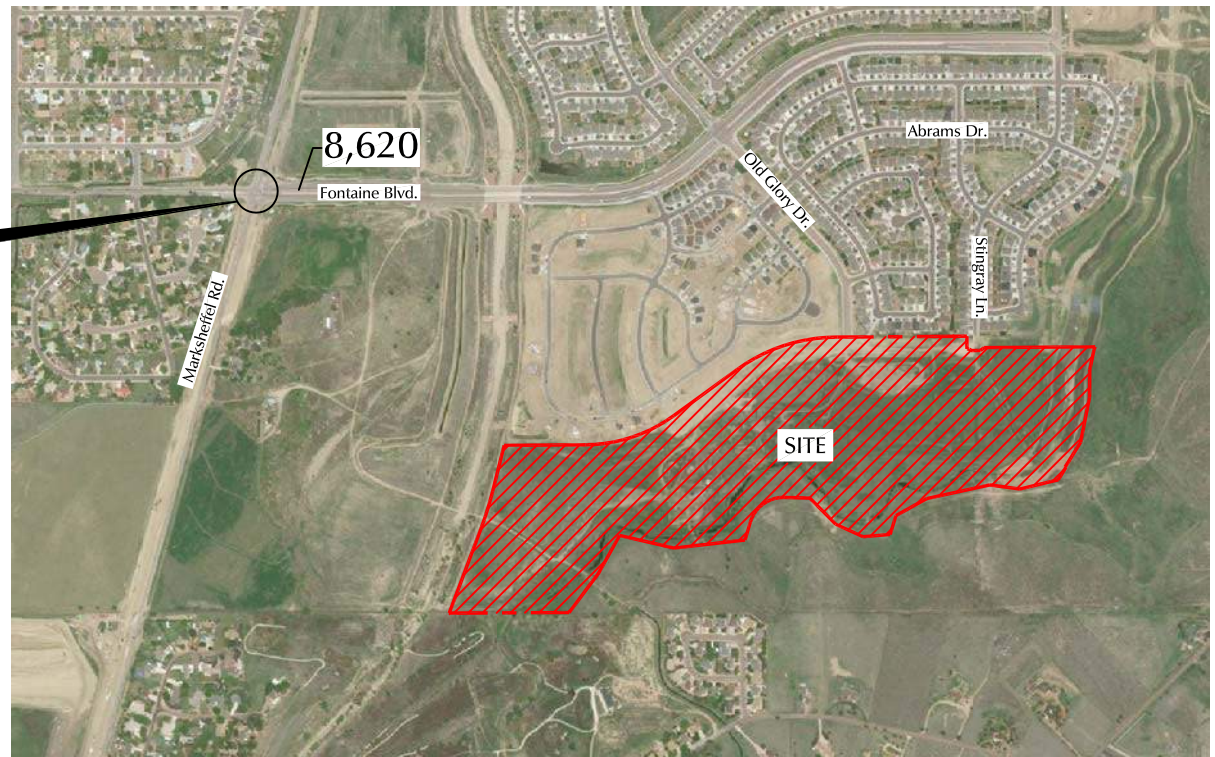
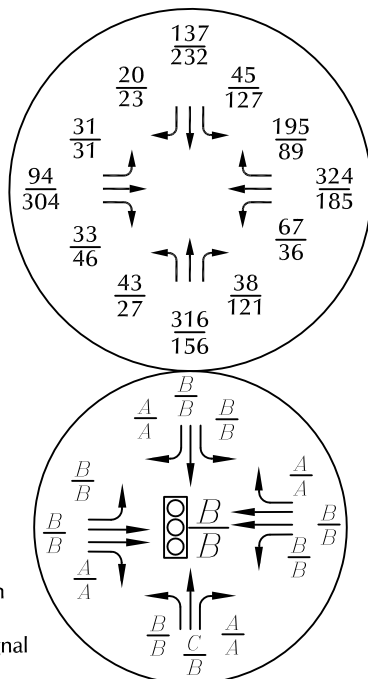
Vicinity Map

Creekside at Lorson Ranch Filing No. 1 (LSC #184520)





Approximate Scale
Scale: 1" = 1,200'



LEGEND:

⊥ = Stop Sign

⊞ = Traffic Signal

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

PM Weekday Peak-Hour Traffic (vehicles per hour) Based on counts by LSC March 2018

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

PM Individual Movement Peak-Hour Level of Service

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

PM Entire Intersection Peak-Hour Level of Service

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

Figure 3

Existing Traffic, Lane Geometry, Traffic Control and Level of Service

Creekside at Lorson Ranch Filing No. 1 (LSC #184520)

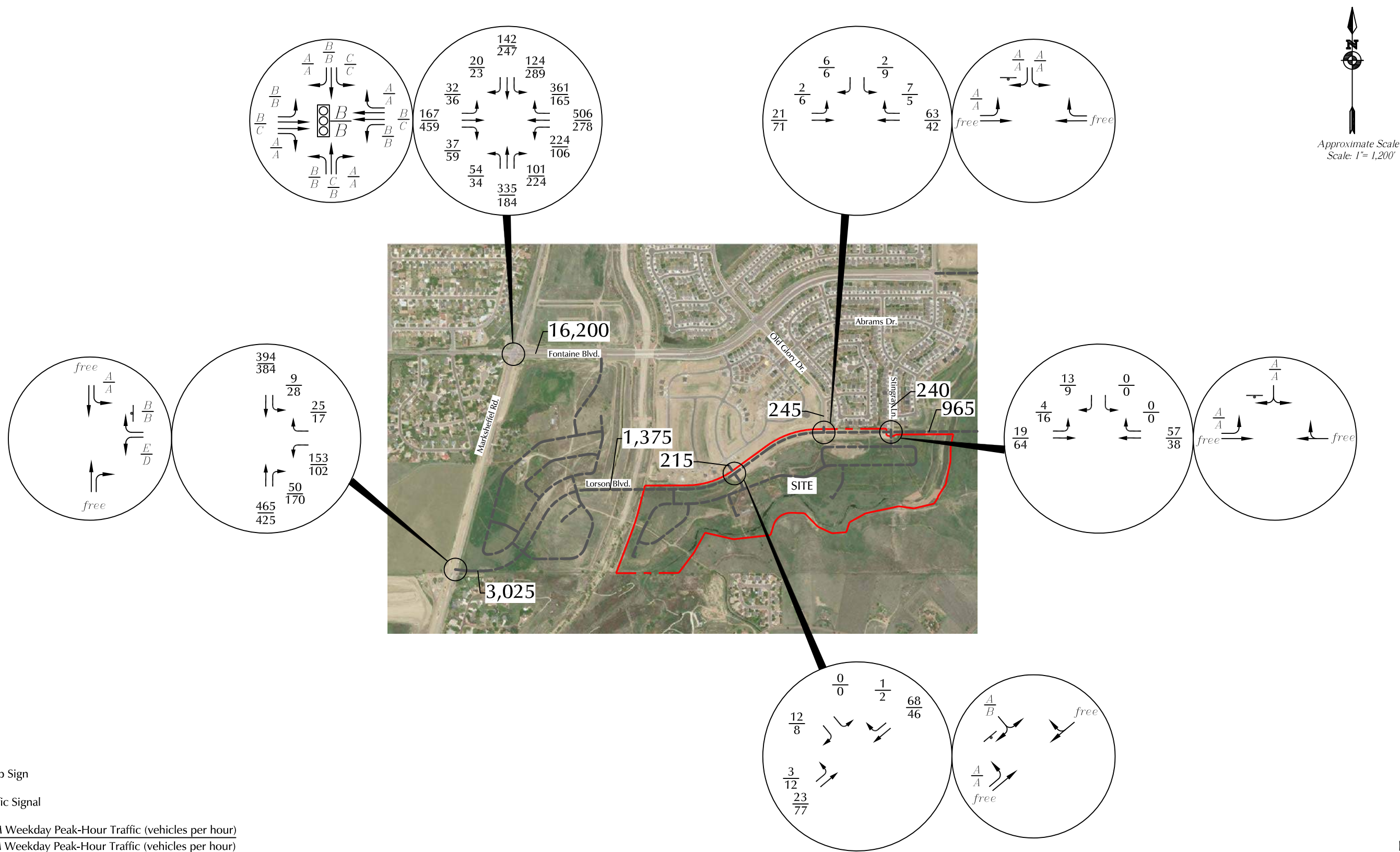


Figure 4
Short-Term Background Traffic, Lane Geometry, Traffic Control and Level of Service
 Creekside at Lorson Ranch Filing No. 1 (LSC #184520)

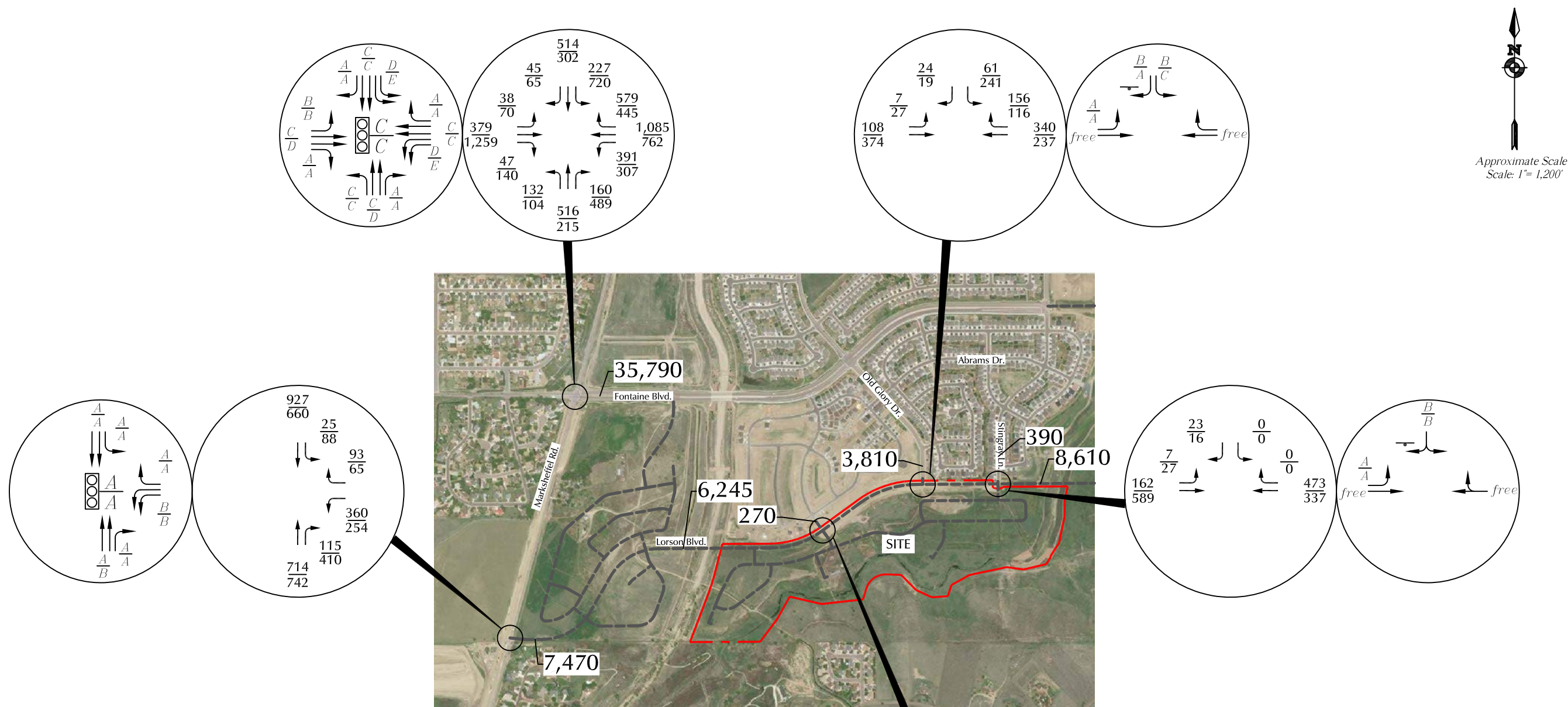



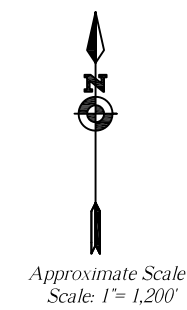
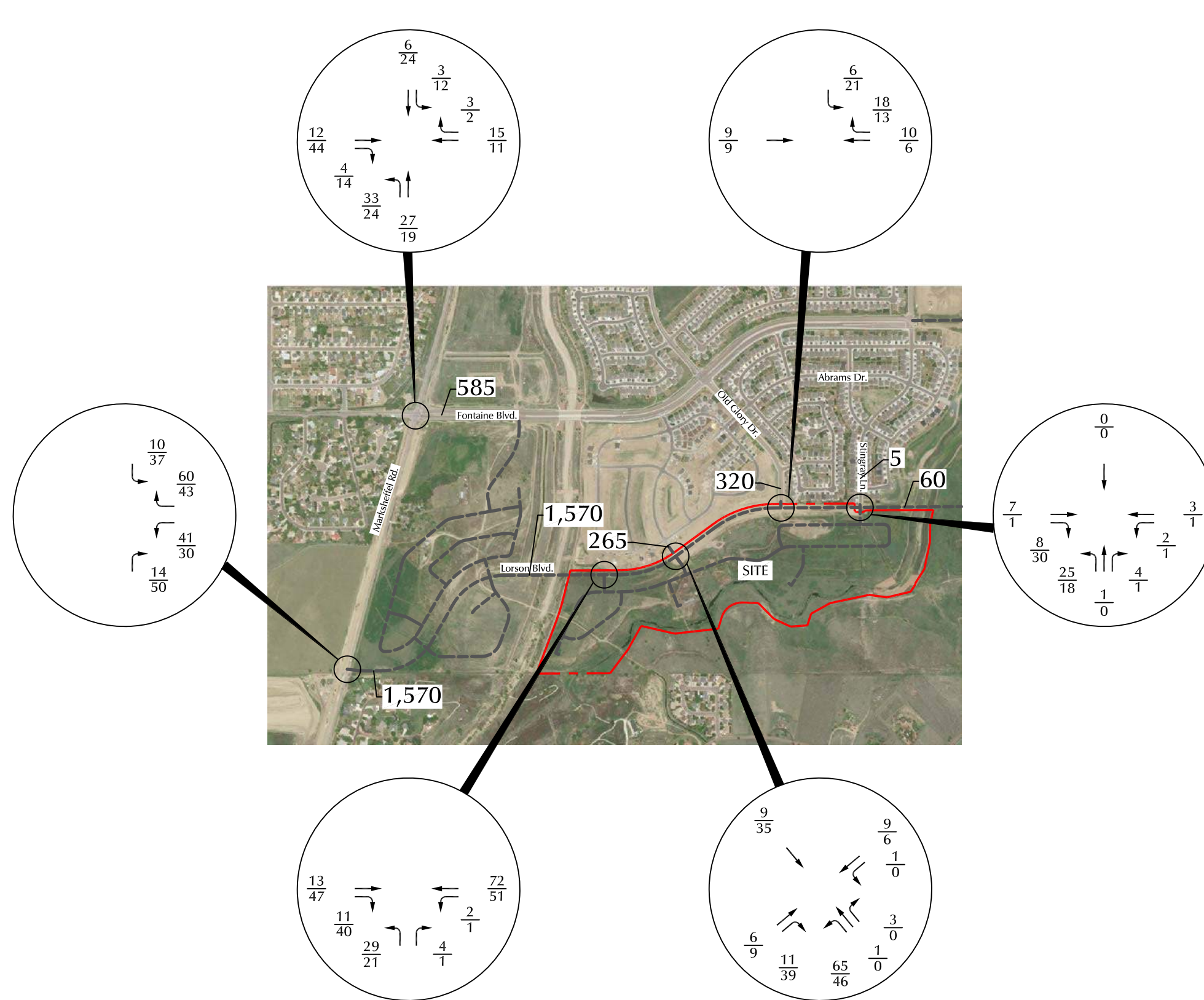
Figure 5
2040 Background Traffic, Lane
Geometry, Traffic Control and Level of Service
Creekside at Lorson Ranch Filing No. 1 (LSC #184520)




 Approximate Scale
 Scale: 1" = 1,200'

LEGEND:
 = Percent Directional Distribution

Figure 6
**Directional Distribution
 of Site-Generated Traffic**
 Creekside at Lorson Ranch Filing No. 1 (LSC #184520)



LEGEND:

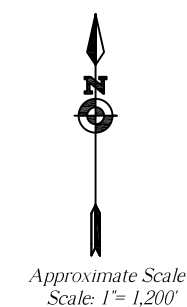
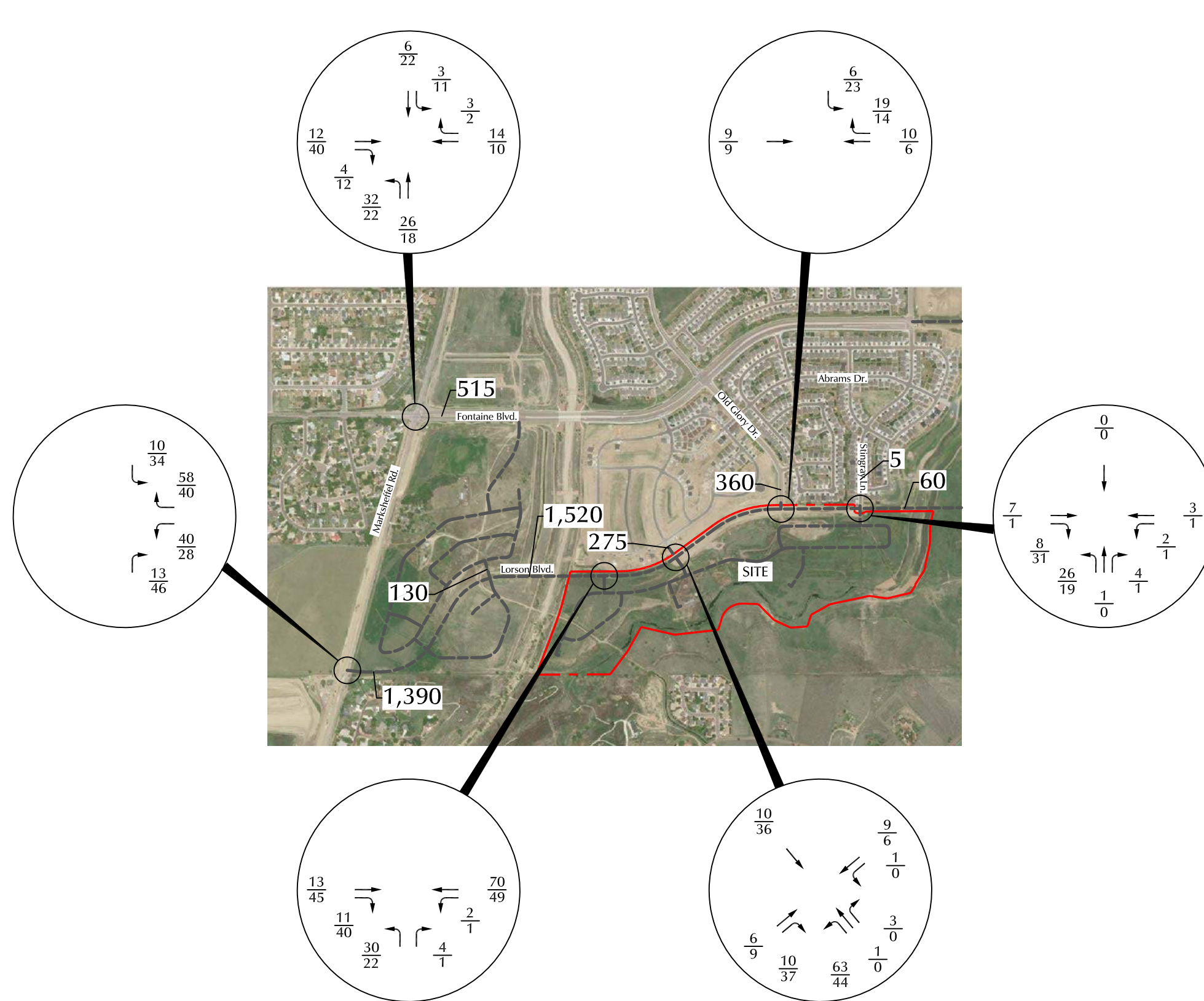
$\frac{XX}{XX}$ = $\frac{\text{AM Weekday Peak-Hour Traffic (vehicles per hour)}}{\text{PM Weekday Peak-Hour Traffic (vehicles per hour)}}$

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

Figure 7

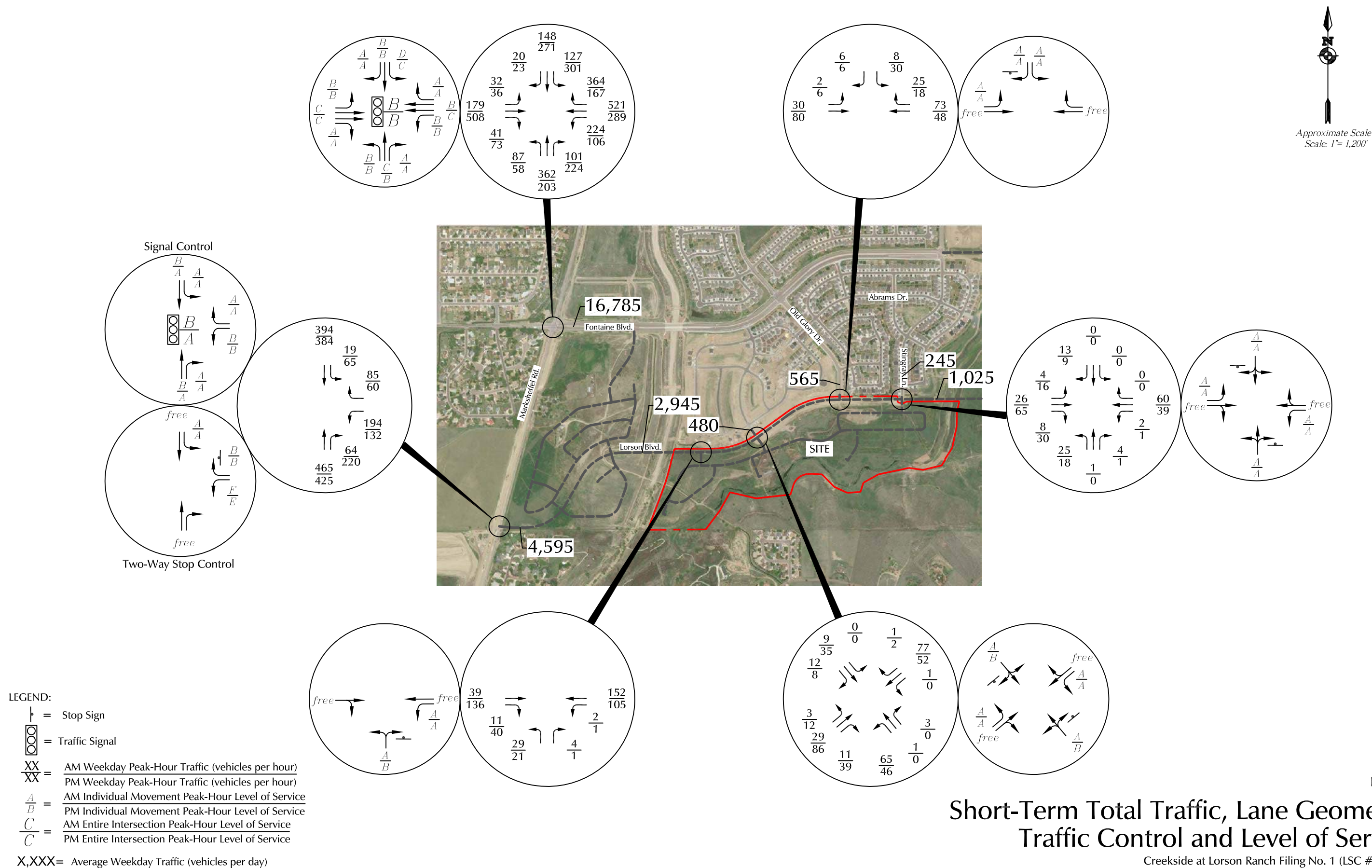
Assignment of Short-Term Site-Generated Traffic

Creekside at Lorson Ranch Filing No. 1 (LSC #184520)



LEGEND:
 $\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
 $\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)
 X,XXX= Average Weekday Traffic (vehicles per day)

Figure 8
**Assignment of
 2040 Site-Generated Traffic**
 Creekside at Lorson Ranch Filing No. 1 (LSC #184520)



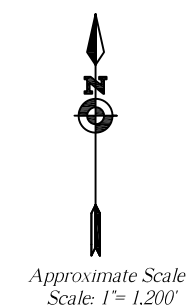
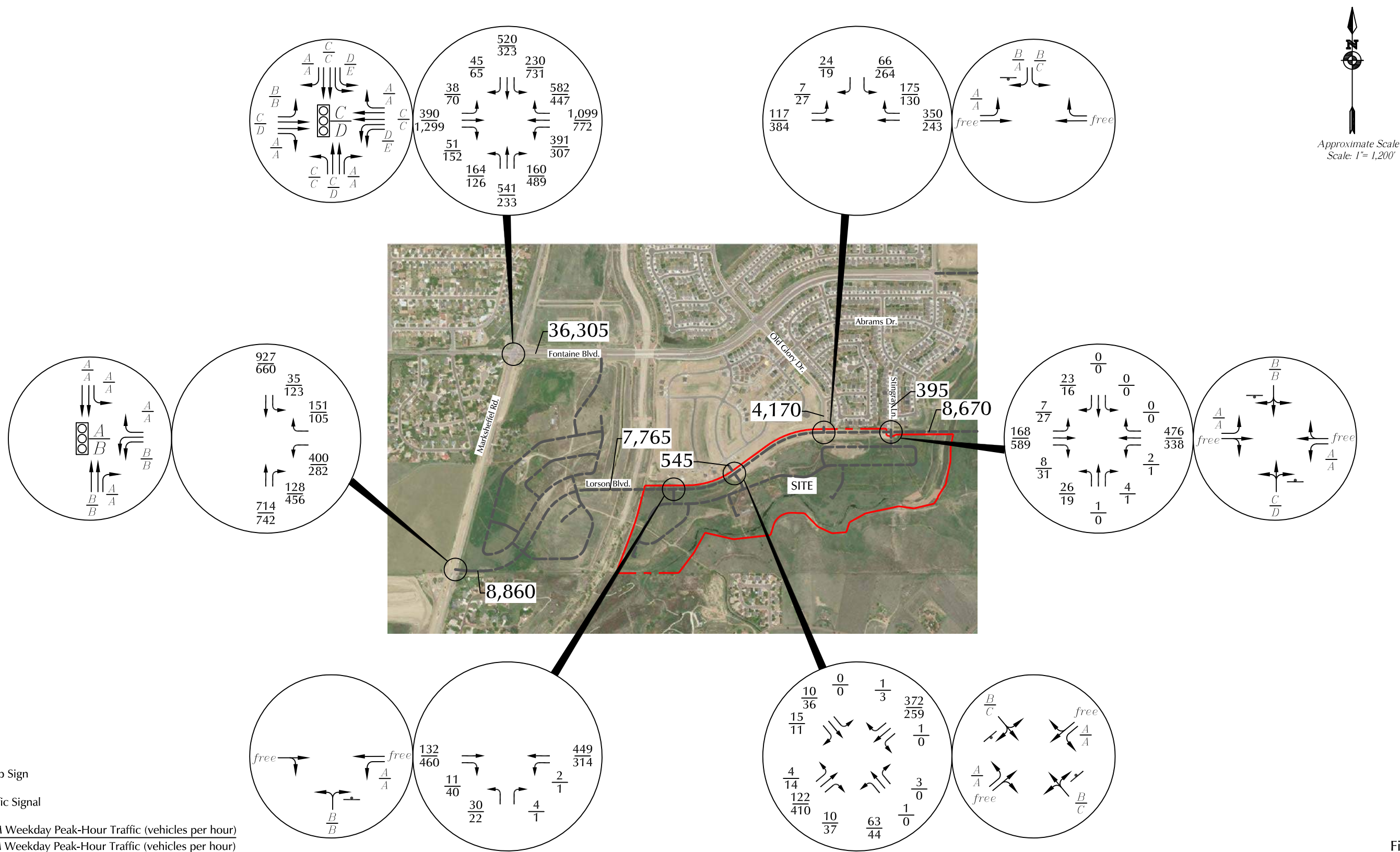


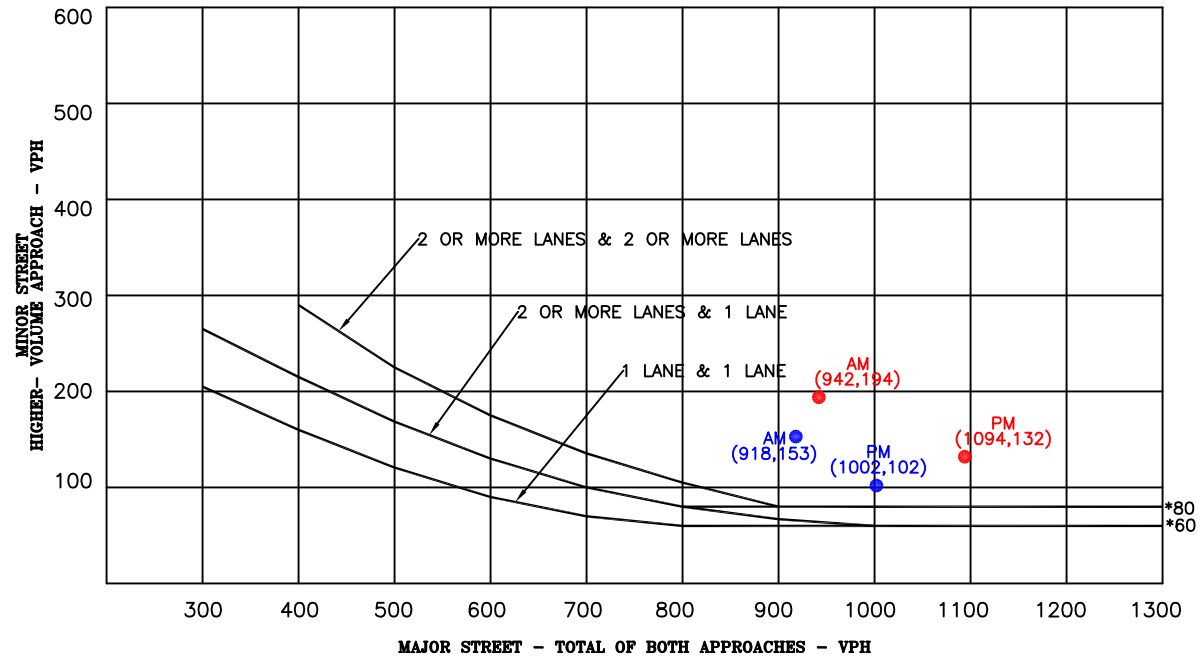
Figure 10

2040 Total Traffic, Lane Geometry, Traffic Control and Level of Service

Creekside at Lorson Ranch Filing No. 1 (LSC #184520)

Figure 4C-2. Warrant 2 Four-Hour Vehicular Volume (70% Factor)

(Community Less than 10,000 population or above 40 mph on Major Street)



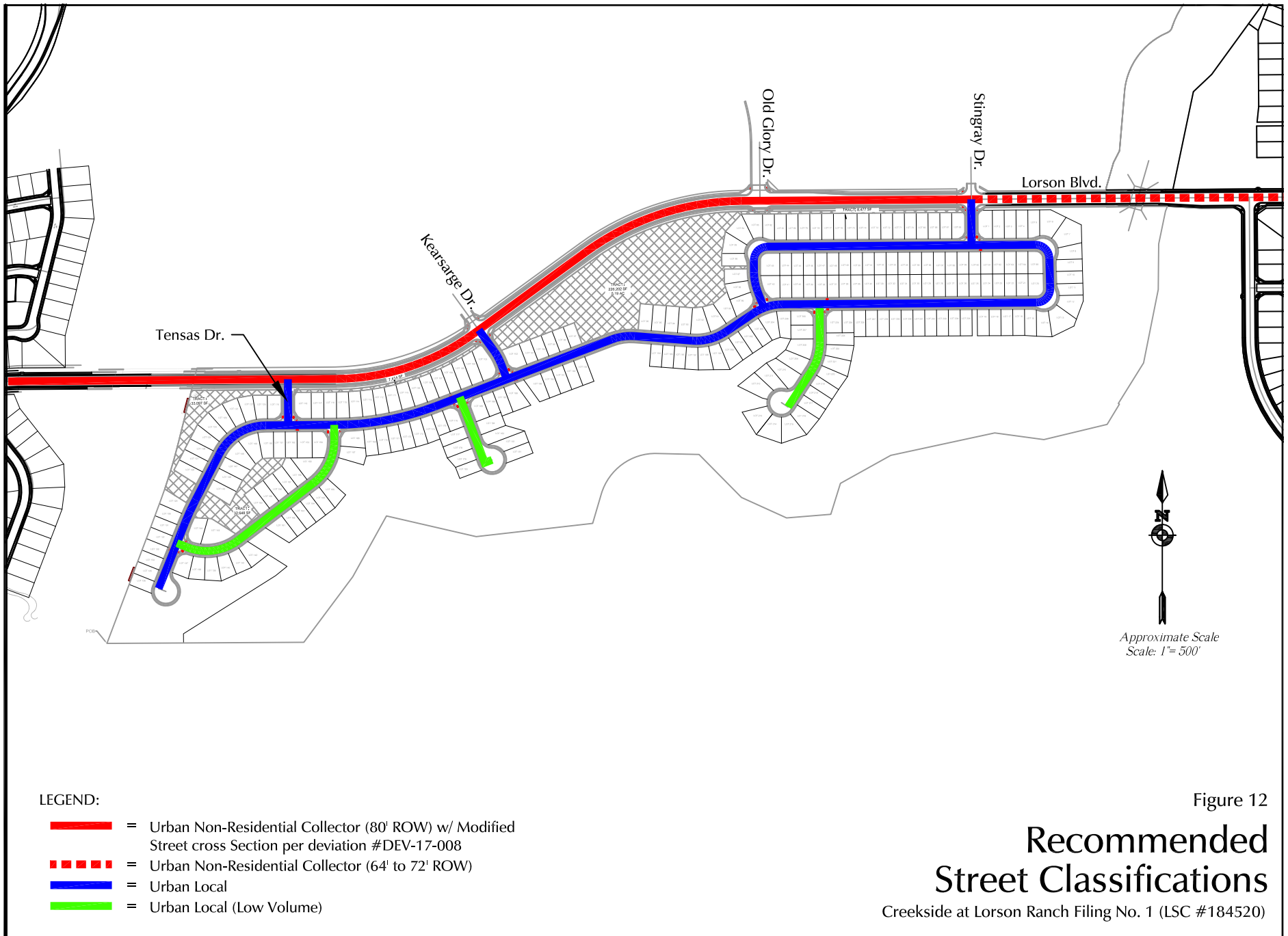
* Note: 80 vph applies as the lower threshold volumes for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

- Short-Term Background Traffic
- Short-Term Total Traffic

Figure 11

Signal Warrant Analysis Marksheffel/Lorson

Creekside at Lorson Ranch Filing No. 1 (LSC #184520)



COUNTER MEASURES INC.

1889 YORK STREET
DENVER, COLORADO
303-333-7409

N/S STREET:
E/W STREET:
CITY:
COUNTY:

File Name : Marksheffel Rd - Fontaine Blvd AM
Site Code : 00174850
Start Date : 3/1/2018
Page No : 1

Groups Printed- VEHICLES

	Marksheffel Rd Southbound				Fontaine Blvd Westbound				Marksheffel Rd Northbound				Fontaine Blvd Eastbound				Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
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	30	4	0	21	74	38	0	10	80	7	0	8	18	6	0	301
06:45 AM	7	37	2	0	15	104	45	0	8	72	8	0	4	22	6	0	330
Total	12	67	6	0	36	178	83	0	18	152	15	0	12	40	12	0	631
07:00 AM	9	28	4	0	20	86	65	0	12	96	11	0	15	18	8	0	372
07:15 AM	14	32	7	0	12	84	45	0	9	74	11	0	5	29	12	0	334
07:30 AM	15	40	7	0	20	50	40	0	14	74	8	0	7	25	7	0	307
07:45 AM	14	20	2	0	13	59	25	0	5	42	12	0	7	38	5	0	242
Total	52	120	20	0	65	279	175	0	40	286	42	0	34	110	32	0	1255
08:00 AM	13	37	2	0	20	93	38	0	8	53	10	0	6	32	3	0	315
08:15 AM	6	34	4	0	18	96	23	0	12	39	6	0	5	22	9	0	274
Grand Total	83	258	32	0	139	646	319	0	78	530	73	0	57	204	56	0	2475
Apprch %	22.3	69.2	8.6	0.0	12.6	58.5	28.9	0.0	11.5	77.8	10.7	0.0	18.0	64.4	17.7	0.0	
Total %	3.4	10.4	1.3	0.0	5.6	26.1	12.9	0.0	3.2	21.4	2.9	0.0	2.3	8.2	2.3	0.0	

COUNTER MEASURES INC.

1889 YORK STREET
DENVER, COLORADO
303-333-7409

N/S STREET:
E/W STREET:
CITY:
COUNTY:

File Name : Marksheffel Rd - Fontaine Blvd PM
Site Code : 00174850
Start Date : 3/1/2018
Page No : 1

Groups Printed- VEHICLES

























	Marksheffel Rd Southbound				Fontaine Blvd Westbound				Marksheffel Rd Northbound				Marksheffel Blvd Eastbound				Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
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	31	70	8	0	5	35	16	0	4	46	19	0	11	68	12	0	325
04:15 PM	42	74	11	0	4	40	19	0	4	51	21	0	10	77	10	0	363
04:30 PM	35	59	12	0	8	45	20	0	11	46	23	0	10	70	14	0	353
04:45 PM	30	67	15	0	6	34	14	0	4	35	34	0	13	72	8	0	332
Total	138	270	46	0	23	154	69	0	23	178	97	0	44	287	44	0	1373
05:00 PM	27	54	8	0	6	40	22	0	4	37	35	0	6	54	18	0	311
05:15 PM	30	60	4	0	8	44	22	0	7	42	26	0	12	76	12	0	343
05:30 PM	33	65	6	0	9	42	25	0	9	41	23	0	4	103	10	0	370
05:45 PM	37	53	5	0	13	59	20	0	7	36	37	0	9	71	6	0	353
Total	127	232	23	0	36	185	89	0	27	156	121	0	31	304	46	0	1377
Grand Total	265	502	69	0	59	339	158	0	50	334	218	0	75	591	90	0	2750
Apprch %	31.7	60.0	8.3	0.0	10.6	61.0	28.4	0.0	8.3	55.5	36.2	0.0	9.9	78.2	11.9	0.0	
Total %	9.6	18.3	2.5	0.0	2.1	12.3	5.7	0.0	1.8	12.1	7.9	0.0	2.7	21.5	3.3	0.0	

Timings

1: Marksheffel Rd & Fountaine Blvd

Existing Traffic

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	94	33	67	324	195	43	316	38	45	137	20
Future Volume (vph)	31	94	33	67	324	195	43	316	38	45	137	20
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)	5.0	20.0	20.0	5.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	11.5	26.5	26.5	11.5	26.5	26.5	27.5	27.5	27.5	27.5	27.5	27.5
Total Split (s)	12.0	28.0	28.0	12.0	28.0	28.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	15.0%	35.0%	35.0%	15.0%	35.0%	35.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	5.5	5.5	5.5	5.5	5.5	5.5
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)	6.5	6.5	6.5	6.5	6.5	6.5	7.5	7.5	7.5	7.5	7.5	7.5
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	None	None	None	None	None	None
Act Effect Green (s)	24.4	20.2	20.2	27.0	24.9	24.9	21.8	21.8	21.8	21.8	21.8	21.8
Actuated g/C Ratio	0.37	0.31	0.31	0.41	0.38	0.38	0.33	0.33	0.33	0.33	0.33	0.33
v/c Ratio	0.07	0.09	0.06	0.15	0.28	0.30	0.13	0.61	0.07	0.18	0.22	0.03
Control Delay	11.2	18.3	0.2	11.6	16.5	4.6	17.0	24.0	0.2	18.5	17.7	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	11.2	18.3	0.2	11.6	16.5	4.6	17.0	24.0	0.2	18.5	17.7	0.1
LOS	B	B	A	B	B	A	B	C	A	B	B	A
Approach Delay		13.1			12.0			21.0			16.1	
Approach LOS		B			B			C			B	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 65.3

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 15.5










Intersection LOS: B

Intersection Capacity Utilization 74.8%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd

























								
Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10
40 s	12 s	28 s	12 s	28 s	12 s	28 s	12 s	28 s
Ø11	Ø12	Ø13	Ø14	Ø15	Ø16	Ø17	Ø18	Ø19
40 s	12 s	28 s	12 s	28 s	12 s	28 s	12 s	28 s

Timings

1: Marksheffel Rd & Fountaine Blvd

Existing Traffic

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	304	46	36	185	89	27	156	121	127	232	23
Future Volume (vph)	31	304	46	36	185	89	27	156	121	127	232	23
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)	5.0	20.0	20.0	5.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	11.5	26.5	26.5	11.5	26.5	26.5	27.5	27.5	27.5	27.5	27.5	27.5
Total Split (s)	12.0	28.0	28.0	12.0	28.0	28.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	15.0%	35.0%	35.0%	15.0%	35.0%	35.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	5.5	5.5	5.5	5.5	5.5	5.5
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)	6.5	6.5	6.5	6.5	6.5	6.5	7.5	7.5	7.5	7.5	7.5	7.5
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	None	None	None	None	None	None
Act Effect Green (s)	22.2	20.2	20.2	22.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2
Actuated g/C Ratio	0.38	0.34	0.34	0.38	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
v/c Ratio	0.08	0.31	0.09	0.08	0.15	0.14	0.07	0.24	0.19	0.33	0.39	0.04
Control Delay	10.1	16.2	0.3	10.2	15.2	1.5	16.1	16.8	4.0	18.9	18.4	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	10.1	16.2	0.3	10.2	15.2	1.5	16.1	16.8	4.0	18.9	18.4	0.1
LOS	B	B	A	B	B	A	B	B	A	B	B	A
Approach Delay		13.8			10.7			11.6			17.5	
Approach LOS		B			B			B			B	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 58.8

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.39

Intersection Signal Delay: 13.7



















Intersection LOS: B

Intersection Capacity Utilization 77.5%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd

























								
40 s			12 s			28 s		
								
40 s			12 s			28 s		

Timings

1: Marksheffel Rd & Fountaine Blvd

Short-Term Background Traffic

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	167	37	224	506	361	54	335	101	124	142	20
Future Volume (vph)	32	167	37	224	506	361	54	335	101	124	142	20
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)	5.0	20.0	20.0	5.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	11.5	26.5	26.5	11.5	26.5	26.5	27.5	27.5	27.5	27.5	27.5	27.5
Total Split (s)	12.0	28.0	28.0	12.0	28.0	28.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	15.0%	35.0%	35.0%	15.0%	35.0%	35.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	5.5	5.5	5.5	5.5	5.5	5.5
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)	6.5	6.5	6.5	6.5	6.5	6.5	7.5	7.5	7.5	7.5	7.5	7.5
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	None	None	None	None	None	None
Act Effect Green (s)	26.2	20.6	20.6	30.3	28.2	28.2	22.6	22.6	22.6	22.6	22.6	22.6
Actuated g/C Ratio	0.38	0.30	0.30	0.44	0.41	0.41	0.33	0.33	0.33	0.33	0.33	0.33
v/c Ratio	0.09	0.17	0.07	0.51	0.41	0.48	0.16	0.67	0.20	0.62	0.25	0.04
Control Delay	12.0	19.3	0.2	18.2	18.0	5.7	17.6	26.2	3.6	34.0	18.2	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	12.0	19.3	0.2	18.2	18.0	5.7	17.6	26.2	3.6	34.0	18.2	0.1
LOS	B	B	A	B	B	A	B	C	A	C	B	A
Approach Delay		15.3			14.0			20.6			23.8	
Approach LOS		B			B			C			C	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 69.3

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 17.0










Intersection LOS: B







Intersection Capacity Utilization 86.7%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd





								
Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10
40 s	12 s	28 s	12 s	28 s	12 s	28 s	12 s	28 s
Ø6	Ø7	Ø8	Ø9	Ø10	Ø11	Ø12	Ø13	Ø14
40 s	12 s	28 s	12 s	28 s	12 s	28 s	12 s	28 s







Intersection						
Int Delay, s/veh	5.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	153	25	465	50	9	394
Future Vol, veh/h	153	25	465	50	9	394
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	250	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	15
Peak Hour Factor	92	92	83	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	166	27	560	54	10	428





Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1008	560	0	0	614
Stage 1	560	-	-	-	-
Stage 2	448	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	267	528	-	-	965
Stage 1	572	-	-	-	-
Stage 2	644	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	264	528	-	-	965
Mov Cap-2 Maneuver	264	-	-	-	-
Stage 1	566	-	-	-	-
Stage 2	644	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	35.5	0	0.2
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	- 264 528	965	-
HCM Lane V/C Ratio	-	- 0.63 0.051	0.01	-
HCM Control Delay (s)	-	- 39.3 12.2	8.8	-
HCM Lane LOS	-	- E B	A	-
HCM 95th %tile Q(veh)	-	- 3.9 0.2	0	-

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	23	68	1	0	12
Future Vol, veh/h	3	23	68	1	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	25	74	1	0	13
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	75	0	-	0	106	75
Stage 1	-	-	-	-	75	-
Stage 2	-	-	-	-	31	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1524	-	-	-	892	986
Stage 1	-	-	-	-	948	-
Stage 2	-	-	-	-	992	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1524	-	-	-	890	986
Mov Cap-2 Maneuver	-	-	-	-	845	-
Stage 1	-	-	-	-	946	-
Stage 2	-	-	-	-	992	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.9	0		8.7		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1524	-	-	-	986	
HCM Lane V/C Ratio	0.002	-	-	-	0.013	
HCM Control Delay (s)	7.4	-	-	-	8.7	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0	

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	21	63	7	2	6
Future Vol, veh/h	2	21	63	7	2	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	150	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	23	68	8	2	7
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	76	0	-	0	95	68
Stage 1	-	-	-	-	68	-
Stage 2	-	-	-	-	27	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1523	-	-	-	905	995
Stage 1	-	-	-	-	955	-
Stage 2	-	-	-	-	996	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1523	-	-	-	904	995
Mov Cap-2 Maneuver	-	-	-	-	855	-
Stage 1	-	-	-	-	954	-
Stage 2	-	-	-	-	996	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.6	0		8.8		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1523	-	-	-	855	995
HCM Lane V/C Ratio	0.001	-	-	-	0.003	0.007
HCM Control Delay (s)	7.4	-	-	-	9.2	8.6
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	0	0

























Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	19	57	0	0	13
Future Vol, veh/h	4	19	57	0	0	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	21	62	0	0	14
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	62	0	-	0	91	62
Stage 1	-	-	-	-	62	-
Stage 2	-	-	-	-	29	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1541	-	-	-	909	1003
Stage 1	-	-	-	-	961	-
Stage 2	-	-	-	-	994	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1541	-	-	-	906	1003
Mov Cap-2 Maneuver	-	-	-	-	857	-
Stage 1	-	-	-	-	958	-
Stage 2	-	-	-	-	994	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.3	0		8.6		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1541	-	-	-	1003	
HCM Lane V/C Ratio	0.003	-	-	-	0.014	
HCM Control Delay (s)	7.3	-	-	-	8.6	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0	

Timings

1: Marksheffel Rd & Fountaine Blvd

Short-Term Background Traffic

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	459	59	106	278	165	34	184	224	289	247	23
Future Volume (vph)	36	459	59	106	278	165	34	184	224	289	247	23
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)	5.0	20.0	20.0	5.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	11.5	26.5	26.5	11.5	26.5	26.5	27.5	27.5	27.5	27.5	27.5	27.5
Total Split (s)	12.0	28.0	28.0	12.0	28.0	28.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	15.0%	35.0%	35.0%	15.0%	35.0%	35.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	5.5	5.5	5.5	5.5	5.5	5.5
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)	6.5	6.5	6.5	6.5	6.5	6.5	7.5	7.5	7.5	7.5	7.5	7.5
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	None	None	None	None	None	None
Act Effect Green (s)	24.9	20.7	20.7	26.3	23.3	23.3	25.1	25.1	25.1	25.1	25.1	25.1
Actuated g/C Ratio	0.36	0.30	0.30	0.38	0.34	0.34	0.36	0.36	0.36	0.36	0.36	0.36
v/c Ratio	0.10	0.54	0.13	0.34	0.25	0.28	0.09	0.30	0.33	0.74	0.40	0.04
Control Delay	13.6	24.2	0.4	16.4	20.0	5.3	15.9	17.7	3.7	31.5	19.0	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	13.6	24.2	0.4	16.4	20.0	5.3	15.9	17.7	3.7	31.5	19.0	0.1
LOS	B	C	A	B	C	A	B	B	A	C	B	A
Approach Delay		21.0			14.9			10.5			24.7	
Approach LOS		C			B			B			C	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 69.3

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 18.3



















Intersection LOS: B







Intersection Capacity Utilization 79.2%





ICU Level of Service D







Analysis Period (min) 15





Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd

								
Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10
40 s	12 s	28 s	12 s	28 s	12 s	28 s	12 s	28 s
								
Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10
40 s	12 s	28 s	12 s	28 s	12 s	28 s	12 s	28 s

Intersection						
Int Delay, s/veh	2.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	102	17	425	170	28	384
Future Vol, veh/h	102	17	425	170	28	384
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	250	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	15
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	111	18	462	185	30	417
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	939	462	0	0	647	0
Stage 1	462	-	-	-	-	-
Stage 2	477	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	293	600	-	-	939	-
Stage 1	634	-	-	-	-	-
Stage 2	624	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	284	600	-	-	939	-
Mov Cap-2 Maneuver	284	-	-	-	-	-
Stage 1	614	-	-	-	-	-
Stage 2	624	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	23.5	0	0.6			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 284 600	939	-		
HCM Lane V/C Ratio	-	- 0.39 0.031 0.032		-		
HCM Control Delay (s)	-	- 25.6 11.2	9	-		
HCM Lane LOS	-	- D B A		-		
HCM 95th %tile Q(veh)	-	- 1.8 0.1 0.1		-		

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	77	46	2	0	8
Future Vol, veh/h	12	77	46	2	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	84	50	2	0	9
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	52	0	-	0	161	51
Stage 1	-	-	-	-	51	-
Stage 2	-	-	-	-	110	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1554	-	-	-	830	1017
Stage 1	-	-	-	-	971	-
Stage 2	-	-	-	-	915	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1554	-	-	-	823	1017
Mov Cap-2 Maneuver	-	-	-	-	798	-
Stage 1	-	-	-	-	963	-
Stage 2	-	-	-	-	915	-
Approach	EB	WB		SB		
HCM Control Delay, s	1	0		8.6		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1554	-	-	-	1017	
HCM Lane V/C Ratio	0.008	-	-	-	0.009	
HCM Control Delay (s)	7.3	-	-	-	8.6	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0	

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	71	42	5	9	6
Future Vol, veh/h	6	71	42	5	9	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	150	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	77	46	5	10	7
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	51	0	-	0	137	46
Stage 1	-	-	-	-	46	-
Stage 2	-	-	-	-	91	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1555	-	-	-	856	1023
Stage 1	-	-	-	-	976	-
Stage 2	-	-	-	-	933	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1555	-	-	-	852	1023
Mov Cap-2 Maneuver	-	-	-	-	820	-
Stage 1	-	-	-	-	971	-
Stage 2	-	-	-	-	933	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.6	0		9		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1555	-	-	-	820	1023
HCM Lane V/C Ratio	0.004	-	-	-	0.012	0.006
HCM Control Delay (s)	7.3	-	-	-	9.4	8.5
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	0	0

























Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	64	38	0	0	9
Future Vol, veh/h	16	64	38	0	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	70	41	0	0	10
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	41	0	-	0	145	41
Stage 1	-	-	-	-	41	-
Stage 2	-	-	-	-	104	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1568	-	-	-	847	1030
Stage 1	-	-	-	-	981	-
Stage 2	-	-	-	-	920	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1568	-	-	-	838	1030
Mov Cap-2 Maneuver	-	-	-	-	805	-
Stage 1	-	-	-	-	970	-
Stage 2	-	-	-	-	920	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.5	0		8.5		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1568	-	-	-	1030	
HCM Lane V/C Ratio	0.011	-	-	-	0.009	
HCM Control Delay (s)	7.3	-	-	-	8.5	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0	

Timings

1: Marksheffel Rd & Fountaine Blvd

Short-Term Total Traffic

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	179	41	224	521	364	87	362	101	127	148	20
Future Volume (vph)	32	179	41	224	521	364	87	362	101	127	148	20
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)	5.0	20.0	20.0	5.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	11.5	26.5	26.5	11.5	26.5	26.5	27.5	27.5	27.5	27.5	27.5	27.5
Total Split (s)	12.0	28.0	28.0	12.0	28.0	28.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	15.0%	35.0%	35.0%	15.0%	35.0%	35.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	5.5	5.5	5.5	5.5	5.5	5.5
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)	6.5	6.5	6.5	6.5	6.5	6.5	7.5	7.5	7.5	7.5	7.5	7.5
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	None	None	None	None	None	None
Act Effect Green (s)	26.2	20.7	20.7	30.4	28.3	28.3	23.9	23.9	23.9	23.9	23.9	23.9
Actuated g/C Ratio	0.37	0.29	0.29	0.43	0.40	0.40	0.34	0.34	0.34	0.34	0.34	0.34
v/c Ratio	0.09	0.19	0.08	0.52	0.43	0.50	0.26	0.69	0.20	0.68	0.26	0.04
Control Delay	13.0	20.3	0.3	19.7	19.1	7.0	18.5	26.6	3.4	38.4	17.9	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	13.0	20.3	0.3	19.7	19.1	7.0	18.5	26.6	3.4	38.4	17.9	0.1
LOS	B	C	A	B	B	A	B	C	A	D	B	A
Approach Delay		16.1			15.2			21.1			25.5	
Approach LOS		B			B			C			C	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 70.7

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 18.1










Intersection LOS: B

Intersection Capacity Utilization 88.1%

ICU Level of Service E







Analysis Period (min) 15

Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd

								
Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10
40 s	12 s	28 s	12 s	28 s	12 s	28 s	12 s	28 s
Ø6	Ø7	Ø8	Ø9	Ø10	Ø11	Ø12	Ø13	Ø14
40 s	12 s	28 s	12 s	28 s	12 s	28 s	12 s	28 s







HCM 6th TWSC
5: Marksheffel Rd & Lorson Blvd

Short-Term Total Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	10.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	194	85	465	64	19	394
Future Vol, veh/h	194	85	465	64	19	394
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	250	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	15
Peak Hour Factor	92	92	83	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	211	92	560	70	21	428
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1030	560	0	0	630	0
Stage 1	560	-	-	-	-	-
Stage 2	470	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	259	528	-	-	952	-
Stage 1	572	-	-	-	-	-
Stage 2	629	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	253	528	-	-	952	-
Mov Cap-2 Maneuver	253	-	-	-	-	-
Stage 1	559	-	-	-	-	-
Stage 2	629	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	48.5	0	0.4			
HCM LOS	E					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 253 528	952	-		
HCM Lane V/C Ratio	-	- 0.833 0.175	0.022	-		
HCM Control Delay (s)	-	- 63.9 13.3	8.9	-		
HCM Lane LOS	-	- F B	A	-		
HCM 95th %tile Q(veh)	-	- 6.6 0.6	0.1	-		

HCM 6th TWSC
30: Kearsarge Dr & Lorson Blvd







Short-Term Total Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	29	11	1	77	1	65	1	3	0	9	12
Future Vol, veh/h	3	29	11	1	77	1	65	1	3	0	9	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	32	12	1	84	1	71	1	3	0	10	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	85	0	0	44	0	0	142	131	38	133	137	85
Stage 1	-	-	-	-	-	-	44	44	-	87	87	-
Stage 2	-	-	-	-	-	-	98	87	-	46	50	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1512	-	-	1564	-	-	828	760	1034	839	754	974
Stage 1	-	-	-	-	-	-	970	858	-	921	823	-
Stage 2	-	-	-	-	-	-	908	823	-	968	853	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1512	-	-	1564	-	-	807	758	1034	834	752	974
Mov Cap-2 Maneuver	-	-	-	-	-	-	807	758	-	834	752	-
Stage 1	-	-	-	-	-	-	968	856	-	919	822	-
Stage 2	-	-	-	-	-	-	885	822	-	962	851	-







Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.1			9.9			9.3		
HCM LOS							A			A		






Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	814	1512	-	-	1564	-	-	865
HCM Lane V/C Ratio	0.092	0.002	-	-	0.001	-	-	0.026
HCM Control Delay (s)	9.9	7.4	-	-	7.3	-	-	9.3
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	30	73	25	8	6
Future Vol, veh/h	2	30	73	25	8	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	150	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	33	79	27	9	7
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	106	0	-	0	116	79
Stage 1	-	-	-	-	79	-
Stage 2	-	-	-	-	37	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1485	-	-	-	880	981
Stage 1	-	-	-	-	944	-
Stage 2	-	-	-	-	985	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1485	-	-	-	879	981
Mov Cap-2 Maneuver	-	-	-	-	839	-
Stage 1	-	-	-	-	943	-
Stage 2	-	-	-	-	985	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.5	0		9		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1485	-	-	-	839	981
HCM Lane V/C Ratio	0.001	-	-	-	0.01	0.007
HCM Control Delay (s)	7.4	-	-	-	9.3	8.7
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	0	0

HCM 6th TWSC
53: Stingray Dr & Lorson Blvd

Short-Term Total Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	26	8	2	60	0	25	1	4	0	0	13
Future Vol, veh/h	4	26	8	2	60	0	25	1	4	0	0	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	28	9	2	65	0	27	1	4	0	0	14
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	65	0	0	37	0	0	117	110	33	112	114	65
Stage 1	-	-	-	-	-	-	41	41	-	69	69	-
Stage 2	-	-	-	-	-	-	76	69	-	43	45	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1537	-	-	1574	-	-	859	780	1041	866	776	999
Stage 1	-	-	-	-	-	-	974	861	-	941	837	-
Stage 2	-	-	-	-	-	-	933	837	-	971	857	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1537	-	-	1574	-	-	844	777	1041	859	773	999
Mov Cap-2 Maneuver	-	-	-	-	-	-	844	777	-	859	773	-
Stage 1	-	-	-	-	-	-	971	858	-	938	836	-
Stage 2	-	-	-	-	-	-	919	836	-	963	854	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.8			0.2			9.3			8.7		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	863	1537	-	-	1574	-	-	999				
HCM Lane V/C Ratio	0.038	0.003	-	-	0.001	-	-	0.014				
HCM Control Delay (s)	9.3	7.3	-	-	7.3	-	-	8.7				
HCM Lane LOS	A	A	-	-	A	-	-	A				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0				

























Intersection						
Int Delay, s/veh	1.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	39	11	2	152	29	4
Future Vol, veh/h	39	11	2	152	29	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	12	2	165	32	4
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	54	0	217	48
Stage 1	-	-	-	-	48	-
Stage 2	-	-	-	-	169	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1551	-	771	1021
Stage 1	-	-	-	-	974	-
Stage 2	-	-	-	-	861	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1551	-	770	1021
Mov Cap-2 Maneuver	-	-	-	-	760	-
Stage 1	-	-	-	-	973	-
Stage 2	-	-	-	-	861	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0.1		9.8		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	784	-	-	1551	-	
HCM Lane V/C Ratio	0.046	-	-	0.001	-	
HCM Control Delay (s)	9.8	-	-	7.3	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

Timings

1: Marksheffel Rd & Fountaine Blvd

Short-Term Total Traffic

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	508	73	106	289	167	58	203	224	301	271	23
Future Volume (vph)	36	508	73	106	289	167	58	203	224	301	271	23
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)	5.0	20.0	20.0	5.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	11.5	26.5	26.5	11.5	26.5	26.5	27.5	27.5	27.5	27.5	27.5	27.5
Total Split (s)	12.0	28.0	28.0	12.0	28.0	28.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	15.0%	35.0%	35.0%	15.0%	35.0%	35.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	5.5	5.5	5.5	5.5	5.5	5.5
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)	6.5	6.5	6.5	6.5	6.5	6.5	7.5	7.5	7.5	7.5	7.5	7.5
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	None	None	None	None	None	None
Act Effect Green (s)	25.2	21.0	21.0	26.5	23.5	23.5	26.0	26.0	26.0	26.0	26.0	26.0
Actuated g/C Ratio	0.36	0.30	0.30	0.38	0.33	0.33	0.37	0.37	0.37	0.37	0.37	0.37
v/c Ratio	0.10	0.60	0.16	0.37	0.27	0.28	0.17	0.32	0.33	0.77	0.43	0.04
Control Delay	14.0	25.6	1.7	17.5	20.6	5.3	16.9	17.9	3.7	33.7	19.4	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	14.0	25.6	1.7	17.5	20.6	5.3	16.9	17.9	3.7	33.7	19.4	0.1
LOS	B	C	A	B	C	A	B	B	A	C	B	A
Approach Delay		22.1			15.5			11.2			25.9	
Approach LOS		C			B			B			C	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 70.4

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 19.2



















Intersection LOS: B







Intersection Capacity Utilization 79.2%

ICU Level of Service D

Analysis Period (min) 15







Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd







								
40 s	12 s	28 s	40 s	12 s	28 s	40 s	12 s	28 s
								
40 s	12 s	28 s	40 s	12 s	28 s	40 s	12 s	28 s







Intersection						
Int Delay, s/veh	5.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	132	60	425	220	65	384
Future Vol, veh/h	132	60	425	220	65	384
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	250	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	15
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	143	65	462	239	71	417
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1021	462	0	0	701	0
Stage 1	462	-	-	-	-	-
Stage 2	559	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	262	600	-	-	896	-
Stage 1	634	-	-	-	-	-
Stage 2	572	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	241	600	-	-	896	-
Mov Cap-2 Maneuver	241	-	-	-	-	-
Stage 1	584	-	-	-	-	-
Stage 2	572	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	31	0	1.4			
HCM LOS	D					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 241 600	896	-		
HCM Lane V/C Ratio	-	- 0.595 0.109	0.079	-		
HCM Control Delay (s)	-	- 39.8 11.7	9.4	-		
HCM Lane LOS	-	- E B	A	-		
HCM 95th %tile Q(veh)	-	- 3.4 0.4	0.3	-		

HCM 6th TWSC
30: Kearsarge Dr & Lorson Blvd

Short-Term Total Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	86	39	0	52	2	46	0	0	0	35	8
Future Vol, veh/h	12	86	39	0	52	2	46	0	0	0	35	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	93	42	0	57	2	50	0	0	0	38	9
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	59	0	0	135	0	0	222	199	114	198	219	58
Stage 1	-	-	-	-	-	-	140	140	-	58	58	-
Stage 2	-	-	-	-	-	-	82	59	-	140	161	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1545	-	-	1449	-	-	734	697	939	761	679	1008
Stage 1	-	-	-	-	-	-	863	781	-	954	847	-
Stage 2	-	-	-	-	-	-	926	846	-	863	765	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1545	-	-	1449	-	-	692	691	939	756	674	1008
Mov Cap-2 Maneuver	-	-	-	-	-	-	692	691	-	756	674	-
Stage 1	-	-	-	-	-	-	856	775	-	946	847	-
Stage 2	-	-	-	-	-	-	877	846	-	856	759	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0			10.6			10.4		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	692	1545	-	-	1449	-	-	718				
HCM Lane V/C Ratio	0.072	0.008	-	-	-	-	-	0.065				
HCM Control Delay (s)	10.6	7.4	-	-	0	-	-	10.4				
HCM Lane LOS	B	A	-	-	A	-	-	B				
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.2				





Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	80	48	18	30	6
Future Vol, veh/h	6	80	48	18	30	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	150	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	87	52	20	33	7
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	72	0	-	0	153	52
Stage 1	-	-	-	-	52	-
Stage 2	-	-	-	-	101	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1528	-	-	-	839	1016
Stage 1	-	-	-	-	970	-
Stage 2	-	-	-	-	923	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1528	-	-	-	835	1016
Mov Cap-2 Maneuver	-	-	-	-	808	-
Stage 1	-	-	-	-	965	-
Stage 2	-	-	-	-	923	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.5	0		9.4		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1528	-	-	-	808	1016
HCM Lane V/C Ratio	0.004	-	-	-	0.04	0.006
HCM Control Delay (s)	7.4	-	-	-	9.6	8.6
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	65	30	1	39	0	18	0	1	0	0	9
Future Vol, veh/h	16	65	30	1	39	0	18	0	1	0	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	71	33	1	42	0	20	0	1	0	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	42	0	0	104	0	0	171	166	88	166	182	42
Stage 1	-	-	-	-	-	-	122	122	-	44	44	-
Stage 2	-	-	-	-	-	-	49	44	-	122	138	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1567	-	-	1488	-	-	792	727	970	798	712	1029
Stage 1	-	-	-	-	-	-	882	795	-	970	858	-
Stage 2	-	-	-	-	-	-	964	858	-	882	782	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1567	-	-	1488	-	-	778	718	970	790	703	1029
Mov Cap-2 Maneuver	-	-	-	-	-	-	778	718	-	790	703	-
Stage 1	-	-	-	-	-	-	872	786	-	959	857	-
Stage 2	-	-	-	-	-	-	954	857	-	871	773	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.1			0.2			9.7			8.5		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	786	1567	-	-	1488	-	-	1029
HCM Lane V/C Ratio	0.026	0.011	-	-	0.001	-	-	0.01
HCM Control Delay (s)	9.7	7.3	-	-	7.4	-	-	8.5
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection						
Int Delay, s/veh	0.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	136	40	1	105	21	1
Future Vol, veh/h	136	40	1	105	21	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	148	43	1	114	23	1
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	191	0	286	170
Stage 1	-	-	-	-	170	-
Stage 2	-	-	-	-	116	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1383	-	704	874
Stage 1	-	-	-	-	860	-
Stage 2	-	-	-	-	909	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1383	-	703	874
Mov Cap-2 Maneuver	-	-	-	-	723	-
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	909	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.1		10.1	
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	729	-	-	1383	-	
HCM Lane V/C Ratio	0.033	-	-	0.001	-	
HCM Control Delay (s)	10.1	-	-	7.6	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

Timings 5: Marksheffel Rd & Lorson Blvd

Short-Term Total Traffic
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	194	85	465	64	19	394
Future Volume (vph)	194	85	465	64	19	394
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	15.0	15.0	75.0	75.0	75.0	75.0
Total Split (%)	16.7%	16.7%	83.3%	83.3%	83.3%	83.3%
Yellow Time (s)	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
Lost Time Adjust (s)	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
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	None	None
Act Effect Green (s)	10.1	10.1	16.0	16.0	16.0	16.0
Actuated g/C Ratio	0.28	0.28	0.44	0.44	0.44	0.44
v/c Ratio	0.43	0.18	0.68	0.09	0.08	0.56
Control Delay	15.4	5.0	12.6	2.1	6.1	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.4	5.0	12.6	2.1	6.1	10.5
LOS	B	A	B	A	A	B
Approach Delay	12.2		11.5			10.3
Approach LOS	B		B			B

Intersection Summary













Cycle Length: 90
Actuated Cycle Length: 36.3
Natural Cycle: 45
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 11.3
Intersection LOS: B
Intersection Capacity Utilization 43.6%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & Lorson Blvd



Timings 5: Marksheffel Rd & Lorson Blvd

Short-Term Total Traffic
PM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	132	60	425	220	65	384
Future Volume (vph)	132	60	425	220	65	384
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	15.0	15.0	75.0	75.0	75.0	75.0
Total Split (%)	16.7%	16.7%	83.3%	83.3%	83.3%	83.3%
Yellow Time (s)	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
Lost Time Adjust (s)	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
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	None	None
Act Effect Green (s)	9.1	9.1	16.9	16.9	16.9	16.9
Actuated g/C Ratio	0.30	0.30	0.56	0.56	0.56	0.56
v/c Ratio	0.27	0.13	0.45	0.24	0.16	0.43
Control Delay	12.7	4.9	8.2	1.9	6.8	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.7	4.9	8.2	1.9	6.8	8.2
LOS	B	A	A	A	A	A
Approach Delay	10.2		6.0			8.0
Approach LOS	B		A			A

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 30.3
 Natural Cycle: 40
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.45
 Intersection Signal Delay: 7.4
 Intersection Capacity Utilization 45.8%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 5: Marksheffel Rd & Lorson Blvd



























Timings

1: Marksheffel Rd & Fountaine Blvd

2040 Background Traffic

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	379	47	391	1085	579	132	516	160	227	514	45
Future Volume (vph)	38	379	47	391	1085	579	132	516	160	227	514	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)	11.0	39.0	39.0	14.0	42.0		10.0	26.0		11.0	27.0	27.0
Total Split (%)	12.2%	43.3%	43.3%	15.6%	46.7%		11.1%	28.9%		12.2%	30.0%	30.0%
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)	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	None		None	None	None
Act Effect Green (s)	29.9	22.2	22.2	10.5	31.3	75.7	24.1	16.8	75.7	7.3	20.6	20.6
Actuated g/C Ratio	0.39	0.29	0.29	0.14	0.41	1.00	0.32	0.22	1.00	0.10	0.27	0.27
v/c Ratio	0.16	0.37	0.09	0.84	0.78	0.38	0.45	0.69	0.11	0.70	0.56	0.09
Control Delay	11.3	21.3	0.3	53.6	24.9	0.7	24.1	33.6	0.1	50.1	29.2	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	11.3	21.3	0.3	53.6	24.9	0.7	24.1	33.6	0.1	50.1	29.2	0.4
LOS	B	C	A	D	C	A	C	C	A	D	C	A
Approach Delay		18.3			23.3			25.4			33.5	
Approach LOS		B			C			C			C	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 75.7

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 25.1

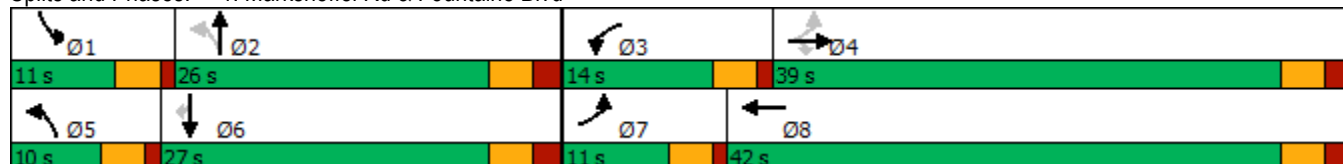
Intersection LOS: C

Intersection Capacity Utilization 69.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd



Timings
5: Marksheffel Rd & Lorson Blvd

2040 Background Traffic
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	360	93	714	115	25	927
Future Volume (vph)	360	93	714	115	25	927
Turn Type	Prot	Perm	NA	Free	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		Free	6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		9.0	20.0
Total Split (s)	20.0	20.0	60.0		10.0	70.0
Total Split (%)	22.2%	22.2%	66.7%		11.1%	77.8%
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effect Green (s)	10.0	10.0	18.7	40.6	20.1	20.1
Actuated g/C Ratio	0.25	0.25	0.46	1.00	0.50	0.50
v/c Ratio	0.45	0.21	0.46	0.08	0.07	0.60
Control Delay	16.0	5.7	9.5	0.1	5.6	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	5.7	9.5	0.1	5.6	9.1
LOS	B	A	A	A	A	A
Approach Delay	13.9		8.2			9.0
Approach LOS	B		A			A

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 40.6

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 9.7

Intersection LOS: A





Intersection Capacity Utilization 44.2%







ICU Level of Service A





Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & Lorson Blvd



Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	116	363	1	0	15
Future Vol, veh/h	4	116	363	1	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	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	4	122	382	1	0	16
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	383	0	-	0	513	383
Stage 1	-	-	-	-	383	-
Stage 2	-	-	-	-	130	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1175	-	-	-	521	664
Stage 1	-	-	-	-	689	-
Stage 2	-	-	-	-	896	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1175	-	-	-	519	664
Mov Cap-2 Maneuver	-	-	-	-	580	-
Stage 1	-	-	-	-	687	-
Stage 2	-	-	-	-	896	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		10.6		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1175	-	-	-	664	
HCM Lane V/C Ratio	0.004	-	-	-	0.024	
HCM Control Delay (s)	8.1	-	-	-	10.6	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	108	340	156	61	24
Future Vol, veh/h	7	108	340	156	61	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	150	0	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	7	114	358	164	64	25
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	522	0	-	0	486	358
Stage 1	-	-	-	-	358	-
Stage 2	-	-	-	-	128	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1044	-	-	-	540	686
Stage 1	-	-	-	-	707	-
Stage 2	-	-	-	-	898	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1044	-	-	-	536	686
Mov Cap-2 Maneuver	-	-	-	-	593	-
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	898	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.5	0		11.4		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1044	-	-	-	593	686
HCM Lane V/C Ratio	0.007	-	-	-	0.108	0.037
HCM Control Delay (s)	8.5	-	-	-	11.8	10.4
HCM Lane LOS	A	-	-	-	B	B
HCM 95th %tile Q(veh)	0	-	-	-	0.4	0.1

























Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	162	473	0	0	23
Future Vol, veh/h	7	162	473	0	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	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	7	171	498	0	0	24
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	498	0	-	0	683	498
Stage 1	-	-	-	-	498	-
Stage 2	-	-	-	-	185	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1066	-	-	-	415	572
Stage 1	-	-	-	-	611	-
Stage 2	-	-	-	-	847	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1066	-	-	-	412	572
Mov Cap-2 Maneuver	-	-	-	-	499	-
Stage 1	-	-	-	-	607	-
Stage 2	-	-	-	-	847	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		11.6		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1066	-	-	-	572	
HCM Lane V/C Ratio	0.007	-	-	-	0.042	
HCM Control Delay (s)	8.4	-	-	-	11.6	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

Timings

1: Marksheffel Rd & Fountaine Blvd

2040 Background Traffic

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	1259	140	307	762	445	104	215	489	720	302	65
Future Volume (vph)	70	1259	140	307	762	445	104	215	489	720	302	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)	11.0	39.0	39.0	14.0	42.0		11.0	14.0		23.0	26.0	26.0
Total Split (%)	12.2%	43.3%	43.3%	15.6%	46.7%		12.2%	15.6%		25.6%	28.9%	28.9%
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	None		None	None	None
Act Effect Green (s)	41.6	34.0	34.0	10.0	39.3	89.8	16.6	8.8	89.8	19.0	23.0	23.0
Actuated g/C Ratio	0.46	0.38	0.38	0.11	0.44	1.00	0.18	0.10	1.00	0.21	0.26	0.26
v/c Ratio	0.22	0.96	0.21	0.82	0.52	0.30	0.44	0.65	0.33	1.01	0.35	0.14
Control Delay	11.8	45.0	3.0	57.7	20.6	0.5	26.8	48.6	0.5	73.3	29.6	1.7
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	11.8	45.0	3.0	57.7	20.6	0.5	26.8	48.6	0.5	73.3	29.6	1.7
LOS	B	D	A	E	C	A	C	D	A	E	C	A
Approach Delay		39.3			22.0			16.7			56.6	
Approach LOS		D			C			B			E	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 89.8

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 33.9

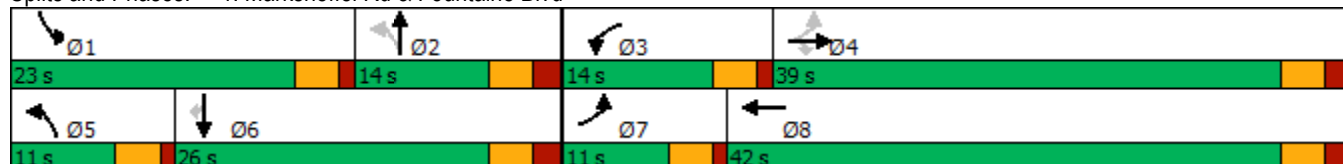
Intersection LOS: C

Intersection Capacity Utilization 85.0%

ICU Level of Service E












Analysis Period (min) 15

Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd



Timings
5: Marksheffel Rd & Lorson Blvd

2040 Background Traffic
PM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	254	65	742	410	88	660
Future Volume (vph)	254	65	742	410	88	660
Turn Type	Prot	Perm	NA	Free	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		Free	6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		9.0	20.0
Total Split (s)	20.0	20.0	60.0		10.0	70.0
Total Split (%)	22.2%	22.2%	66.7%		11.1%	77.8%
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effct Green (s)	9.1	9.1	16.3	43.4	23.7	23.7
Actuated g/C Ratio	0.21	0.21	0.38	1.00	0.55	0.55
v/c Ratio	0.37	0.18	0.59	0.27	0.26	0.39
Control Delay	18.4	7.1	13.4	0.4	6.2	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.4	7.1	13.4	0.4	6.2	6.0
LOS	B	A	B	A	A	A
Approach Delay	16.1		8.8			6.0
Approach LOS	B		A			A

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 43.4

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 8.9

Intersection LOS: A





Intersection Capacity Utilization 45.1%







ICU Level of Service A





Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & Lorson Blvd



Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	401	253	3	0	11
Future Vol, veh/h	14	401	253	3	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	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	15	422	266	3	0	12
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	269	0	-	0	720	268
Stage 1	-	-	-	-	268	-
Stage 2	-	-	-	-	452	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1295	-	-	-	395	771
Stage 1	-	-	-	-	777	-
Stage 2	-	-	-	-	641	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1295	-	-	-	390	771
Mov Cap-2 Maneuver	-	-	-	-	489	-
Stage 1	-	-	-	-	768	-
Stage 2	-	-	-	-	641	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		9.7		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1295	-	-	-	771	
HCM Lane V/C Ratio	0.011	-	-	-	0.015	
HCM Control Delay (s)	7.8	-	-	-	9.7	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0	

Intersection						
Int Delay, s/veh	5.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	374	237	116	241	19
Future Vol, veh/h	27	374	237	116	241	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	150	0	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	28	394	249	122	254	20
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	371	0	-	0	699	249
Stage 1	-	-	-	-	249	-
Stage 2	-	-	-	-	450	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1188	-	-	-	406	790
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	642	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1188	-	-	-	396	790
Mov Cap-2 Maneuver	-	-	-	-	488	-
Stage 1	-	-	-	-	773	-
Stage 2	-	-	-	-	642	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.5	0		19.3		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1188	-	-	-	488	790
HCM Lane V/C Ratio	0.024	-	-	-	0.52	0.025
HCM Control Delay (s)	8.1	-	-	-	20.1	9.7
HCM Lane LOS	A	-	-	-	C	A
HCM 95th %tile Q(veh)	0.1	-	-	-	3	0.1

























Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	589	337	0	0	16
Future Vol, veh/h	27	589	337	0	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	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	28	620	355	0	0	17
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	355	0	-	0	1031	355
Stage 1	-	-	-	-	355	-
Stage 2	-	-	-	-	676	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1204	-	-	-	258	689
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	505	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1204	-	-	-	252	689
Mov Cap-2 Maneuver	-	-	-	-	366	-
Stage 1	-	-	-	-	694	-
Stage 2	-	-	-	-	505	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.4	0		10.4		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1204	-	-	-	-	689
HCM Lane V/C Ratio	0.024	-	-	-	-	0.024
HCM Control Delay (s)	8.1	-	-	-	-	10.4
HCM Lane LOS	A	-	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.1

Timings

1: Marksheffel Rd & Fountaine Blvd

2040 Total Traffic

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	390	51	391	1099	582	164	541	160	230	520	45
Future Volume (vph)	38	390	51	391	1099	582	164	541	160	230	520	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)	11.0	39.0	39.0	14.0	42.0		10.0	26.0		11.0	27.0	27.0
Total Split (%)	12.2%	43.3%	43.3%	15.6%	46.7%		11.1%	28.9%		12.2%	30.0%	30.0%
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)	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	None		None	None	None
Act Effect Green (s)	30.3	22.6	22.6	10.4	31.6	76.4	24.5	17.2	76.4	7.3	18.3	18.3
Actuated g/C Ratio	0.40	0.30	0.30	0.14	0.41	1.00	0.32	0.23	1.00	0.10	0.24	0.24
v/c Ratio	0.16	0.38	0.10	0.85	0.79	0.39	0.61	0.71	0.11	0.72	0.65	0.10
Control Delay	11.4	21.4	0.4	54.9	25.3	0.7	31.0	34.4	0.1	51.5	31.6	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	11.4	21.4	0.4	54.9	25.3	0.7	31.0	34.4	0.1	51.5	31.6	0.4
LOS	B	C	A	D	C	A	C	C	A	D	C	A
Approach Delay		18.3			23.8			27.4			35.5	
Approach LOS		B			C			C			D	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 76.4

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 26.1

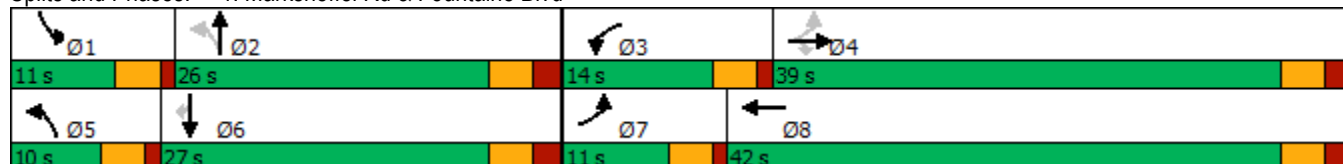
Intersection LOS: C

Intersection Capacity Utilization 72.2%

ICU Level of Service C













Analysis Period (min) 15

Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd



Timings
5: Marksheffel Rd & Lorson Blvd

2040 Total Traffic
AM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	400	151	714	128	35	927
Future Volume (vph)	400	151	714	128	35	927
Turn Type	Prot	Perm	NA	Free	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		Free	6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		9.0	20.0
Total Split (s)	20.0	20.0	60.0		10.0	70.0
Total Split (%)	22.2%	22.2%	66.7%		11.1%	77.8%
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effect Green (s)	11.0	11.0	18.4	43.1	21.6	21.6
Actuated g/C Ratio	0.26	0.26	0.43	1.00	0.50	0.50
v/c Ratio	0.48	0.30	0.50	0.09	0.10	0.60
Control Delay	17.0	5.5	11.7	0.1	6.1	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.0	5.5	11.7	0.1	6.1	9.3
LOS	B	A	B	A	A	A
Approach Delay	13.8		9.9			9.1
Approach LOS	B		A			A

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 43.1

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 10.5

Intersection LOS: B







Intersection Capacity Utilization 47.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & Lorson Blvd















Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	122	10	1	372	1	63	1	3	0	10	15
Future Vol, veh/h	4	122	10	1	372	1	63	1	3	0	10	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	128	11	1	392	1	66	1	3	0	11	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	393	0	0	139	0	0	550	537	134	539	542	393
Stage 1	-	-	-	-	-	-	142	142	-	395	395	-
Stage 2	-	-	-	-	-	-	408	395	-	144	147	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1166	-	-	1445	-	-	446	450	915	453	447	656
Stage 1	-	-	-	-	-	-	861	779	-	630	605	-
Stage 2	-	-	-	-	-	-	620	605	-	859	775	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1166	-	-	1445	-	-	426	448	915	449	445	656
Mov Cap-2 Maneuver	-	-	-	-	-	-	426	448	-	449	445	-
Stage 1	-	-	-	-	-	-	858	777	-	628	604	-
Stage 2	-	-	-	-	-	-	594	604	-	852	773	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	14.8	11.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	437	1166	-	-	1445	-	-	551
HCM Lane V/C Ratio	0.161	0.004	-	-	0.001	-	-	0.048
HCM Control Delay (s)	14.8	8.1	-	-	7.5	-	-	11.9
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.1






Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	117	350	175	66	24
Future Vol, veh/h	7	117	350	175	66	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	150	0	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	7	123	368	184	69	25
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	552	0	-	0	505	368
Stage 1	-	-	-	-	368	-
Stage 2	-	-	-	-	137	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1018	-	-	-	527	677
Stage 1	-	-	-	-	700	-
Stage 2	-	-	-	-	890	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1018	-	-	-	523	677
Mov Cap-2 Maneuver	-	-	-	-	584	-
Stage 1	-	-	-	-	695	-
Stage 2	-	-	-	-	890	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.5	0		11.6		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1018	-	-	-	584	677
HCM Lane V/C Ratio	0.007	-	-	-	0.119	0.037
HCM Control Delay (s)	8.6	-	-	-	12	10.5
HCM Lane LOS	A	-	-	-	B	B
HCM 95th %tile Q(veh)	0	-	-	-	0.4	0.1

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	168	8	2	476	0	26	1	4	0	0	23
Future Vol, veh/h	7	168	8	2	476	0	26	1	4	0	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	177	8	2	501	0	27	1	4	0	0	24

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	501	0	0	185	0	0	712	700	181	703	704	501
Stage 1	-	-	-	-	-	-	195	195	-	505	505	-
Stage 2	-	-	-	-	-	-	517	505	-	198	199	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1063	-	-	1390	-	-	347	363	862	352	361	570
Stage 1	-	-	-	-	-	-	807	739	-	549	540	-
Stage 2	-	-	-	-	-	-	541	540	-	804	736	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1063	-	-	1390	-	-	330	360	862	347	358	570
Mov Cap-2 Maneuver	-	-	-	-	-	-	330	360	-	347	358	-
Stage 1	-	-	-	-	-	-	801	734	-	545	539	-
Stage 2	-	-	-	-	-	-	517	539	-	794	731	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0			16			11.6		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	360	1063	-	-	1390	-	-	570
HCM Lane V/C Ratio	0.091	0.007	-	-	0.002	-	-	0.042
HCM Control Delay (s)	16	8.4	-	-	7.6	-	-	11.6
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.1

























Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	132	11	2	449	30	4
Future Vol, veh/h	132	11	2	449	30	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	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	139	12	2	473	32	4
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	151	0	622	145
Stage 1	-	-	-	-	145	-
Stage 2	-	-	-	-	477	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1430	-	450	902
Stage 1	-	-	-	-	882	-
Stage 2	-	-	-	-	624	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1430	-	450	902
Mov Cap-2 Maneuver	-	-	-	-	523	-
Stage 1	-	-	-	-	881	-
Stage 2	-	-	-	-	624	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		12	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	550	-	-	1430	-	
HCM Lane V/C Ratio	0.065	-	-	0.001	-	
HCM Control Delay (s)	12	-	-	7.5	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

Timings

1: Marksheffel Rd & Fountaine Blvd

2040 Total Traffic

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	1299	152	307	772	447	126	233	489	731	323	65
Future Volume (vph)	70	1299	152	307	772	447	126	233	489	731	323	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)	11.0	39.0	39.0	14.0	42.0		11.0	14.0		23.0	26.0	26.0
Total Split (%)	12.2%	43.3%	43.3%	15.6%	46.7%		12.2%	15.6%		25.6%	28.9%	28.9%
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	None		None	None	None
Act Effect Green (s)	41.6	34.0	34.0	10.0	39.3	89.9	16.8	8.9	89.9	19.0	21.0	21.0
Actuated g/C Ratio	0.46	0.38	0.38	0.11	0.44	1.00	0.19	0.10	1.00	0.21	0.23	0.23
v/c Ratio	0.22	0.99	0.23	0.82	0.53	0.30	0.54	0.70	0.33	1.03	0.41	0.15
Control Delay	11.8	51.6	3.6	57.9	20.7	0.5	30.5	50.9	0.5	77.5	31.1	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	11.8	51.6	3.6	57.9	20.7	0.5	30.5	50.9	0.5	77.5	31.1	1.8
LOS	B	D	A	E	C	A	C	D	A	E	C	A
Approach Delay		44.8			22.0			18.8			59.3	
Approach LOS		D			C			B			E	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 89.9

Natural Cycle: 90

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.03

Intersection Signal Delay: 36.6

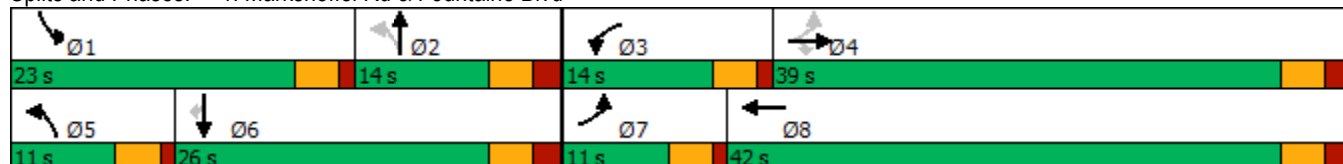
Intersection LOS: D

Intersection Capacity Utilization 87.0%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Marksheffel Rd & Fountaine Blvd



Timings 5: Marksheffel Rd & Lorson Blvd

2040 Total Traffic
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	282	105	742	456	123	660
Future Volume (vph)	282	105	742	456	123	660
Turn Type	Prot	Perm	NA	Free	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		Free	6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		9.0	20.0
Total Split (s)	20.0	20.0	60.0		10.0	70.0
Total Split (%)	22.2%	22.2%	66.7%		11.1%	77.8%
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effect Green (s)	9.5	9.5	17.0	44.5	24.4	24.4
Actuated g/C Ratio	0.21	0.21	0.38	1.00	0.55	0.55
v/c Ratio	0.40	0.26	0.58	0.30	0.36	0.39
Control Delay	18.6	6.5	13.4	0.5	7.5	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.6	6.5	13.4	0.5	7.5	6.2
LOS	B	A	B	A	A	A
Approach Delay	15.3		8.5			6.4
Approach LOS	B		A			A

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 44.5

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 8.9

Intersection LOS: A







Intersection Capacity Utilization 47.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & Lorson Blvd















Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	410	37	0	259	3	44	0	0	0	36	11
Future Vol, veh/h	14	410	37	0	259	3	44	0	0	0	36	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	432	39	0	273	3	46	0	0	0	38	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	276	0	0	471	0	0	782	758	452	757	776	275
Stage 1	-	-	-	-	-	-	482	482	-	275	275	-
Stage 2	-	-	-	-	-	-	300	276	-	482	501	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1287	-	-	1091	-	-	312	336	608	324	328	764
Stage 1	-	-	-	-	-	-	565	553	-	731	683	-
Stage 2	-	-	-	-	-	-	709	682	-	565	543	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1287	-	-	1091	-	-	277	332	608	321	324	764
Mov Cap-2 Maneuver	-	-	-	-	-	-	277	332	-	321	324	-
Stage 1	-	-	-	-	-	-	558	546	-	722	683	-
Stage 2	-	-	-	-	-	-	660	682	-	558	536	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	20.6	16.1
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	277	1287	-	-	1091	-	-	374
HCM Lane V/C Ratio	0.167	0.011	-	-	-	-	-	0.132
HCM Control Delay (s)	20.6	7.8	-	-	0	-	-	16.1
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.5






Intersection						
Int Delay, s/veh	5.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	384	243	130	264	19
Future Vol, veh/h	27	384	243	130	264	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	150	0	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	28	404	256	137	278	20
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	393	0	-	0	716	256
Stage 1	-	-	-	-	256	-
Stage 2	-	-	-	-	460	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1166	-	-	-	397	783
Stage 1	-	-	-	-	787	-
Stage 2	-	-	-	-	636	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1166	-	-	-	387	783
Mov Cap-2 Maneuver	-	-	-	-	481	-
Stage 1	-	-	-	-	768	-
Stage 2	-	-	-	-	636	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.5	0		21.4		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1166	-	-	-	481	783
HCM Lane V/C Ratio	0.024	-	-	-	0.578	0.026
HCM Control Delay (s)	8.2	-	-	-	22.2	9.7
HCM Lane LOS	A	-	-	-	C	A
HCM 95th %tile Q(veh)	0.1	-	-	-	3.6	0.1






Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	589	31	1	338	0	19	0	1	0	0	16
Future Vol, veh/h	27	589	31	1	338	0	19	0	1	0	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	28	620	33	1	356	0	20	0	1	0	0	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	356	0	0	653	0	0	1060	1051	637	1051	1067	356
Stage 1	-	-	-	-	-	-	693	693	-	358	358	-
Stage 2	-	-	-	-	-	-	367	358	-	693	709	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1203	-	-	934	-	-	202	227	477	205	222	688
Stage 1	-	-	-	-	-	-	434	445	-	660	628	-
Stage 2	-	-	-	-	-	-	653	628	-	434	437	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1203	-	-	934	-	-	193	222	477	201	217	688
Mov Cap-2 Maneuver	-	-	-	-	-	-	193	222	-	201	217	-
Stage 1	-	-	-	-	-	-	424	435	-	645	627	-
Stage 2	-	-	-	-	-	-	636	627	-	423	427	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0	25.2	10.4
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	199	1203	-	-	934	-	-	688
HCM Lane V/C Ratio	0.106	0.024	-	-	0.001	-	-	0.024
HCM Control Delay (s)	25.2	8.1	-	-	8.9	-	-	10.4
HCM Lane LOS	D	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0	-	-	0.1






Intersection						
Int Delay, s/veh	0.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	460	40	1	314	22	1
Future Vol, veh/h	460	40	1	314	22	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	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	484	42	1	331	23	1
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	526	0	838	505
Stage 1	-	-	-	-	505	-
Stage 2	-	-	-	-	333	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1041	-	336	567
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	726	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1041	-	336	567
Mov Cap-2 Maneuver	-	-	-	-	452	-
Stage 1	-	-	-	-	605	-
Stage 2	-	-	-	-	726	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		13.3	
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	456	-	-	1041	-	
HCM Lane V/C Ratio	0.053	-	-	0.001	-	
HCM Control Delay (s)	13.3	-	-	8.5	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

Intersection						
Int Delay, s/veh	5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	194	85	465	64	19	0
Future Vol, veh/h	194	85	465	64	19	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	250	-	-
Veh in Median Storage, #	0	-	0	-	-	16979
Grade, %	0	-	0	-	-	15
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	211	92	505	70	21	0

Major/Minor	Minor1		Major1	
Conflicting Flow All	505	253	0	0
Stage 1	505	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.84	6.94	-	-
Critical Hdwy Stg 1	5.84	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-
Pot Cap-1 Maneuver	496	746	-	-
Stage 1	571	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	496	746	-	-
Mov Cap-2 Maneuver	534	-	-	-
Stage 1	571	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	14.4	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2
Capacity (veh/h)	-	- 534 746
HCM Lane V/C Ratio	-	- 0.395 0.124
HCM Control Delay (s)	-	- 16.1 10.5
HCM Lane LOS	-	- C B
HCM 95th %tile Q(veh)	-	- 1.9 0.4

Intersection						
Int Delay, s/veh	2.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	132	60	425	220	65	0
Future Vol, veh/h	132	60	425	220	65	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	250	-	-
Veh in Median Storage, #	0	-	0	-	-	16979
Grade, %	0	-	0	-	-	15
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	143	65	462	239	71	0













Major/Minor	Minor1	Major1		
Conflicting Flow All	462	231	0	0
Stage 1	462	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.84	6.94	-	-
Critical Hdwy Stg 1	5.84	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-
Pot Cap-1 Maneuver	528	771	-	-
Stage 1	601	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	528	771	-	-
Mov Cap-2 Maneuver	559	-	-	-
Stage 1	601	-	-	-
Stage 2	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2
Capacity (veh/h)	-	- 559 771
HCM Lane V/C Ratio	-	- 0.257 0.085
HCM Control Delay (s)	-	- 13.6 10.1
HCM Lane LOS	-	- B B
HCM 95th %tile Q(veh)	-	- 1 0.3

Timings
5: Marksheffel Rd & Lorson Blvd

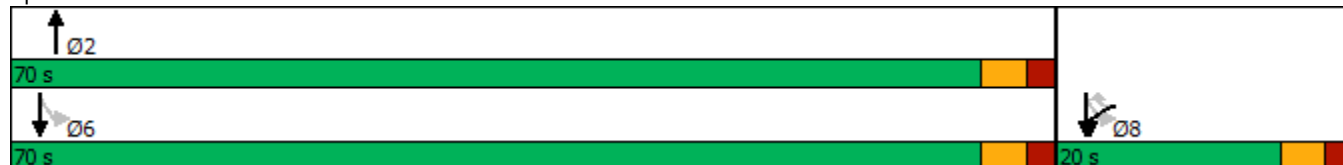
2040 Total Traffic With Siganl Controlled Channelized T
AM Peak Hour

							
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø6
Lane Configurations							
Traffic Volume (vph)	400	151	714	128	35	927	
Future Volume (vph)	400	151	714	128	35	927	
Turn Type	Prot	Perm	NA	Free	Perm	NA	
Protected Phases	8!		2			8 6!	6
Permitted Phases		8		Free	8 6!		
Detector Phase	8	8	2		8 6	8 6	
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0				4.0
Minimum Split (s)	20.0	20.0	20.0				20.0
Total Split (s)	20.0	20.0	70.0				70.0
Total Split (%)	22.2%	22.2%	77.8%				78%
Yellow Time (s)	3.0	3.0	3.0				3.0
All-Red Time (s)	2.0	2.0	2.0				2.0
Lost Time Adjust (s)	0.0	0.0	0.0				
Total Lost Time (s)	5.0	5.0	5.0				
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None				None
Act Effect Green (s)	15.1	15.1	14.1	39.2	39.2	39.2	
Actuated g/C Ratio	0.39	0.39	0.36	1.00	1.00	1.00	
v/c Ratio	0.62	0.23	0.59	0.09	0.07	0.30	
Control Delay	16.2	3.3	12.2	0.1	0.2	0.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	16.2	3.3	12.2	0.1	0.2	0.2	
LOS	B	A	B	A	A	A	
Approach Delay	12.7		10.4			0.2	
Approach LOS	B		B			A	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 39.2
 Natural Cycle: 40
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.62
 Intersection Signal Delay: 6.8
 Intersection Capacity Utilization 57.7%
 Analysis Period (min) 15
 ! Phase conflict between lane groups.

Splits and Phases: 5: Marksheffel Rd & Lorson Blvd








HCM 6th TWSC
5: Marksheffel Rd & Lorson Blvd

2040 Total Traffic
AM Peak Hour

Intersection

Int Delay, s/veh 25.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	400	151	714	128	35	0
Future Vol, veh/h	400	151	714	128	35	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	250	-	-
Veh in Median Storage, #	0	-	0	-	-	16979
Grade, %	0	-	0	-	-	15
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	421	159	752	135	37	0

Major/Minor	Minor1	Major1		
Conflicting Flow All	752	376	0	0
Stage 1	752	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.84	6.94	-	-
Critical Hdwy Stg 1	5.84	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-
Pot Cap-1 Maneuver	~ 346	622	-	-
Stage 1	426	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	~ 346	622	-	-
Mov Cap-2 Maneuver	~ 411	-	-	-
Stage 1	426	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	63.8	0
HCM LOS	F	













Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2
Capacity (veh/h)	-	- 411 622
HCM Lane V/C Ratio	-	- 1.024 0.256
HCM Control Delay (s)	-	- 83 12.8
HCM Lane LOS	-	- F B
HCM 95th %tile Q(veh)	-	- 13.2 1

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
5: Marksheffel Rd & Lorson Blvd

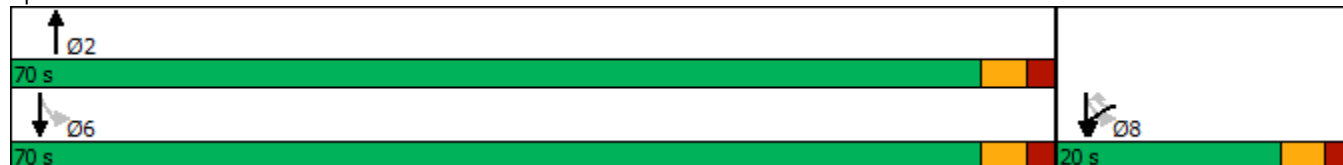
2040 Total Traffic With Signal Controlled Channelized T
PM Peak Hour






							
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø6
Lane Configurations							
Traffic Volume (vph)	282	105	742	456	123	660	
Future Volume (vph)	282	105	742	456	123	660	
Turn Type	Prot	Perm	NA	Free	Perm	NA	
Protected Phases	8!		2			8 6!	6
Permitted Phases		8		Free	8 6!		
Detector Phase	8	8	2		8 6	8 6	
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0				4.0
Minimum Split (s)	20.0	20.0	20.0				20.0
Total Split (s)	20.0	20.0	70.0				70.0
Total Split (%)	22.2%	22.2%	77.8%				78%
Yellow Time (s)	3.0	3.0	3.0				3.0
All-Red Time (s)	2.0	2.0	2.0				2.0
Lost Time Adjust (s)	0.0	0.0	0.0				
Total Lost Time (s)	5.0	5.0	5.0				
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None				None
Act Effect Green (s)	15.1	15.1	14.6	39.8	39.8	39.8	
Actuated g/C Ratio	0.38	0.38	0.37	1.00	1.00	1.00	
v/c Ratio	0.44	0.17	0.60	0.30	0.24	0.21	
Control Delay	12.8	3.6	12.2	0.5	1.0	0.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	12.8	3.6	12.2	0.5	1.0	0.1	
LOS	B	A	B	A	A	A	
Approach Delay	10.3		7.7			0.3	
Approach LOS	B		A			A	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 39.8
 Natural Cycle: 40
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 5.7
 Intersection LOS: A
 Intersection Capacity Utilization 55.4%
 ICU Level of Service B
 Analysis Period (min) 15
 ! Phase conflict between lane groups.

Splits and Phases: 5: Marksheffel Rd & Lorson Blvd



Intersection						
Int Delay, s/veh	7.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	282	105	742	456	123	0
Future Vol, veh/h	282	105	742	456	123	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	250	-	-
Veh in Median Storage, #	0	-	0	-	-	16979
Grade, %	0	-	0	-	-	15
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	297	111	781	480	129	0

Major/Minor	Minor1	Major1		
Conflicting Flow All	781	391	0	0
Stage 1	781	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.84	6.94	-	-
Critical Hdwy Stg 1	5.84	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-
Pot Cap-1 Maneuver	332	608	-	-
Stage 1	412	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	332	608	-	-
Mov Cap-2 Maneuver	399	-	-	-
Stage 1	412	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	29.5	0
HCM LOS	D	

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2
Capacity (veh/h)	-	- 399 608
HCM Lane V/C Ratio	-	- 0.744 0.182
HCM Control Delay (s)	-	- 36 12.2
HCM Lane LOS	-	- E B
HCM 95th %tile Q(veh)	-	- 5.9 0.7

HCM 6th Roundabout
5: Marksheffel Rd & Lorson Blvd

Short-Term Total Traffic
AM Peak Hour

Intersection			
Intersection Delay, s/veh	7.7		
Intersection LOS	A		
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	303	575	449
Demand Flow Rate, veh/h	309	586	458
Vehicles Circulating, veh/h	515	21	215
Vehicles Exiting, veh/h	92	652	609
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	9.1	7.0	7.7
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	309	586	458
Cap Entry Lane, veh/h	816	1351	1108
Entry HV Adj Factor	0.981	0.981	0.981
Flow Entry, veh/h	303	575	449
Cap Entry, veh/h	800	1325	1087
V/C Ratio	0.379	0.434	0.413
Control Delay, s/veh	9.1	7.0	7.7
LOS	A	A	A
95th %tile Queue, veh	2	2	2

HCM 6th Roundabout
5: Marksheffel Rd & Lorson Blvd

Short-Term Total Traffic
PM Peak Hour

Intersection			
Intersection Delay, s/veh	8.2		
Intersection LOS	A		
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	208	701	489
Demand Flow Rate, veh/h	212	715	498
Vehicles Circulating, veh/h	471	72	146
Vehicles Exiting, veh/h	316	572	537
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	7.0	9.2	7.4
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	212	715	498
Cap Entry Lane, veh/h	854	1282	1189
Entry HV Adj Factor	0.981	0.980	0.981
Flow Entry, veh/h	208	701	489
Cap Entry, veh/h	837	1257	1167
V/C Ratio	0.248	0.558	0.419
Control Delay, s/veh	7.0	9.2	7.4
LOS	A	A	A
95th %tile Queue, veh	1	4	2

HCM 6th Roundabout
5: Marksheffel Rd & Lorson Blvd

2040 Total Traffic
AM Peak Hour

Intersection						
Intersection Delay, s/veh	10.2					
Intersection LOS	B					
Approach	WB		NB		SB	
Entry Lanes	2		2		2	
Conflicting Circle Lanes	2		2		2	
Adj Approach Flow, veh/h	580		887		1013	
Demand Flow Rate, veh/h	591		905		1034	
Vehicles Circulating, veh/h	767		38		429	
Vehicles Exiting, veh/h	176		1425		929	
Ped Vol Crossing Leg, #/h	0		0		0	
Ped Cap Adj	1.000		1.000		1.000	
Approach Delay, s/veh	15.2		5.8		11.1	
Approach LOS	C		A		B	
Lane	Left	Right	Left	Right	Left	Right
Designated Moves	L	TR	LT	TR	LT	TR
Assumed Moves	L	TR	LT	TR	LT	TR
RT Channelized						
Lane Util	0.726	0.274	0.470	0.530	0.470	0.530
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.667	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.645	4.328
Entry Flow, veh/h	429	162	425	480	486	548
Cap Entry Lane, veh/h	667	740	1303	1375	910	986
Entry HV Adj Factor	0.981	0.981	0.981	0.979	0.980	0.980
Flow Entry, veh/h	421	159	417	470	476	537
Cap Entry, veh/h	654	726	1279	1347	892	967
V/C Ratio	0.644	0.219	0.326	0.349	0.534	0.556
Control Delay, s/veh	18.1	7.4	5.8	5.8	11.2	11.1
LOS	C	A	A	A	B	B
95th %tile Queue, veh	5	1	1	2	3	4

HCM 6th Roundabout
5: Marksheffel Rd & Lorson Blvd

2040 Total Traffic
PM Peak Hour

Intersection						
Intersection Delay, s/veh	8.8					
Intersection LOS	A					
Approach	WB		NB		SB	
Entry Lanes	2		2		2	
Conflicting Circle Lanes	2		2		2	
Adj Approach Flow, veh/h	408		1261		824	
Demand Flow Rate, veh/h	416		1287		841	
Vehicles Circulating, veh/h	797		132		303	
Vehicles Exiting, veh/h	622		1012		910	
Ped Vol Crossing Leg, #/h	0		0		0	
Ped Cap Adj	1.000		1.000		1.000	
Approach Delay, s/veh	11.2		8.8		7.7	
Approach LOS	B		A		A	
Lane	Left	Right	Left	Right	Left	Right
Designated Moves	L	TR	LT	TR	LT	TR
Assumed Moves	L	TR	LT	TR	LT	TR
RT Channelized						
Lane Util	0.728	0.272	0.470	0.530	0.470	0.530
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.667	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.645	4.328
Entry Flow, veh/h	303	113	605	682	395	446
Cap Entry Lane, veh/h	648	721	1195	1269	1021	1098
Entry HV Adj Factor	0.980	0.982	0.980	0.980	0.981	0.979
Flow Entry, veh/h	297	111	593	669	387	437
Cap Entry, veh/h	636	708	1171	1244	1002	1075
V/C Ratio	0.467	0.157	0.506	0.537	0.387	0.406
Control Delay, s/veh	12.9	6.8	8.7	8.9	7.8	7.7
LOS	B	A	A	A	A	A
95th %tile Queue, veh	2	1	3	3	2	2