



**Planning and Community  
Development Department**  
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## **DEVIATION REQUEST AND DECISION FORM**

Updated: 6/26/2019

### **PROJECT INFORMATION**

Project Name : The Glen at Widefield Filing No. 10

Schedule No.(s) : 5527200004

Legal Description : TR IN SW4 SEC 22-15-65 AND THE NW4 SEC 27-15-65 DESC AS FOLS: BEG AT THE MOST NE COR OF LOT 98, THE GLEN AT WILDWOOD SUB. NO. 8, TH ALG THE SLY R/W LN OF PEACEFUL VALLEY RD ALG THE ARC OF A NON TANG CUR TO THE R HAVING A RAD OF 175.00 FT, A C/A OF 12-07-10, ARC DIST OF 37.02 FT, WHICH CHORD BEARS S33-17-00E, TH S27-13-25E 468.13 FT, TH ALG THE ARC OF A CUR TO THE L HAVING A RAD OF 225.00 FT, A C/A OF 47-14-18, ARC DIST OF 185.50 FT, TH S74-27-43E 162.02 FT TO A PT ON THE WLY R/W LN OF MARKSHEFFEL RD, TH ALG THE WLY R/W LN S15-11-44W 560.50 FT, TH ALG THE ARC OF A CUR TO THE R HAVING A RAD OF 1965.40 FT, A C/A OF 01-53-00, ARC DIST OF 64.60 FT, TH N67-54-25W 293.95 FT, TH ALG THE ARC OF A NON TANG CUR TO THE L HAVING A RAD OF 3025.00, A C/A OF 00-15-40, ARC DIST OF 13.78 FT, WHICH CHORD BEARS N21-57-45E, TH N68-10-05W 175.00 FT, TH N20-47-09E 104.08 FT, TH N70-15-38W 16.28 FT, TH N22-38-09W 239.19 FT, TH N07-13-27W 46.12 FT, TH N12-37-51E 115.00 FT, TH N62-46-35E 250.28 FT, TH N27-13-25W 307.62 FT, TH N12-37-51E 153.08 FT TO THE POB

### **APPLICANT INFORMATION**

Company : Widefield Investment Group

Name : J. Ryan Watson

☒ Owner ☐ Consultant ☐ Contractor

Mailing Address : 3 Widefield Boulevard  
Colorado Springs, CO 80911

Phone Number :

FAX Number :

Email Address :

### **ENGINEER INFORMATION**

Company : LSC Transportation Consultants, Inc.

Name : Jeffrey C. Hodsdon

Colorado P.E. Number : 31684

Mailing Address : 2504 E. Pikes Peak Ave Suite 304  
Colorado Springs, CO 80909

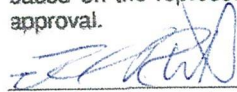
Phone Number : 719-633-2868

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# OWNER, APPLICANT, AND ENGINEER DECLARATION

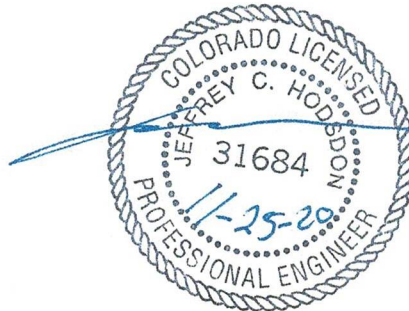
To the best of my knowledge, the information on this application and all additional or supplemental documentation is true, factual and complete. I am fully aware that any misrepresentation of any information on this application may be grounds for denial. I have familiarized myself with the rules, regulations and procedures with respect to preparing and filing this application. I also understand that an incorrect submittal will be cause to have the project removed from the agenda of the Planning Commission, Board of County Commissioners and/or Board of Adjustment or delay review until corrections are made, and that any approval of this application is based on the representations made in the application and may be revoked on any breach of representation or condition(s) of approval.



Signature of owner (or authorized representative)

November 27<sup>th</sup> 2020  
Date

Engineer's Seal, Signature  
And Date of Signature



## DEVIATION REQUEST (Attach diagrams, figures, and other documentation to clarify request)

The request is for a deviation from the standard acceleration lane length to allow for striping of "back to back" interim left-turn acceleration lanes on Marksheffel Road between Mesa Ridge Parkway and Peaceful Valley Road. The construction plans prepared by Kiowa Engineering show the proposed configuration of left-turn acceleration lanes. The intersection of Peaceful Valley Road/Marksheffel was previously striped for a southbound left-turn acceleration lane until it was changed to a northbound left-turn deceleration lane. This deviation would revert back to the use of a southbound left-turn acceleration lane in conjunction with the proposed right-in/right-out configuration on the west leg of the intersection (although the proposed lane length is shorter than the original in order to accommodate the northbound left-turn acceleration lane from Mesa Ridge).

Also, the intersection of Marksheffel/Mesa Ridge is a T intersection, but is striped with center two-way, left-turn lane striping (TWLTL). The deviation would allow for a change to interim striping for a channelized-T configuration with a northbound left-turn acceleration lane extending north from Mesa Ridge, channelization marking, and restriping for an exclusive northbound left-turn lane on the northbound approach to the intersection. The construction plans prepared by Kiowa Engineering show the proposed restriping and lane/taper dimensions.

Identify the specific ECM standard which a deviation is requested:

Section 2.3.7.E of the Engineering Criteria Manual; ECM Design Criteria for Acceleration Lanes (Table 2-27)

State the reason for the requested deviation:

Modified left-turn acceleration lane lengths are needed in order to create back-to-back left-turn acceleration lanes on Marksheffel Road between Mesa Ridge Parkway and Peaceful Valley Road. The intersection of Marksheffel/Mesa Ridge Parkway would be restriped for an interim "channelized-T" type intersection and the Marksheffel/Peaceful Valley intersection would be restriped for a southbound left-turn acceleration lane instead of a northbound left-turn lane (which would not be needed due to the proposed change to a right-in/right-out on the west leg. The deviation is needed as the proposed left-turn acceleration lane lengths would not meet ECM standards.

The restriping would be "interim" until Marksheffel/Mesa Ridge Parkway is either signalized or an east leg of the intersection is added in the future. At Peaceful Valley, the southbound left-turn acceleration lane would be interim - until this intersection is signalized in the future.

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

The painted center median on Marksheffel Road at Mesa Ridge Parkway is currently striped as a two-way left-turn lane. LSC recommended (in the Filings 10 TIS) that this painted center median be restriped to create an interim "channelized-T"-type intersection. This would include a dedicated northbound left-turn lane and a dedicated northbound left-turn acceleration lane similar to the proposed striping at the intersection of Marksheffel/Peaceful Valley.

- Based on a design speed of 60 mph, the **ECM-prescribed** lane length for the northbound left-turn acceleration lane on Marksheffel Road from Mesa Ridge Parkway would be 1,170 feet plus a 300-foot taper.

Please refer to the striping plans included within the construction plan set by Kiowa Engineering. The proposed restriping, with the recommended lengths below, would create the optimal balance/allocation of lane lengths and would create a "buffer" area between the ends of the opposing-direction acceleration lanes. This following summarizes the resulting lane and taper lengths:

- 700' southbound left-turn acceleration lane from Peaceful Valley (470' less than ECM standard)
- 220' southbound lane transition taper (80' less than ECM standard)
- 50' "buffer zone"
- 225' northbound lane transition taper (75' less than ECM standard)
- 900' northbound left-turn acceleration lane from Marksheffel (270' less than ECM standard). Note: for an additional 100' to the north (within the taper), the lane is at least 12' wide. This is notable as often motorists do not utilize acceleration lanes properly and end up stopping or slowing at the end of the lanes waiting for a larger gap in the adjacent through lane prior to entry into the adjacent through lane. This additional length of 12'+ width would be beneficial in this situation.

LSC recommends installation of yellow raised plastic delineator posts with yellow reflectors be placed within the buffer area as shown on the plans. These would emphasize the end of the acceleration lanes for motorists that would be using the lanes from each direction. Motorists using the left-turn acceleration lanes in the opposing directions would essentially be using the common center painted median area (between the through lanes).

CDOT Access Code RA Highway standards prescribe an acceleration lane length of 738 feet plus a 222-foot transition taper for a posted speed limit of 55mph.

220 ft transition taper and 875 ft acceleration lane is shown on the CD's. Coordinate with the civil engineer so that the deviation, TIS and CD's are consistent.

These recommendations do not match the TIS recommendations on page 10. Revise the deviation and/or TIS accordingly.

#### LIMITS OF CONSIDERATION

(At least one of the conditions listed below must be met for this deviation request to be considered.)

- ☐ The ECM standard is inapplicable to the particular situation.
- ☒ Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
- ☐ A change to a standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.

#### Provide justification:

There is about 2,100 feet between Mesa Ridge Parkway and the Peaceful Valley intersections (not centerline spacing, rather space between the intersections). Back-to-back left-turn acceleration lanes, tapers, and the required 50'-buffer zone need to be configured to fit within this available fixed length. This deviation proposes dimensions that would, in our judgement, provide the optimum balance for these lanes, given the site-specific conditions.

#### CRITERIA FOR APPROVAL

Per ECM section 5.8.7 the request for a deviation may be considered if the request is **not based exclusively on financial considerations**. The deviation must not be detrimental to public safety or surrounding property. The applicant must include supporting information demonstrating compliance with **all of the following criteria**:

The deviation will achieve the intended result with a comparable or superior design and quality of improvement.

The requested auxiliary lane configuration will allow for the intersections of Marksheffel/Mesa Ridge and Marksheffel/Peaceful Valley to maintain a satisfactory level of service as stop-sign-controlled intersections for a longer time period than as standard "T" intersections. This may delay the need to install traffic signals.

The deviation will not adversely affect safety or operations.

The deviation will allow for the needed auxiliary lanes to maintain an acceptable level of service.

The deviation would result in better level of service for the westbound left-turning movement at the Marksheffel/Peaceful Valley intersection. At Mesa Ridge/Marksheffel, the interim channelized-T striping would be clearer to motorists that a two-stage left-turn for eastbound-to-northbound left-turning vehicles is allowed and clearly defined. The two-stage left allows eastbound left-turning motorists to 1) select an acceptable gap in the southbound traffic stream and the northbound left-turn movement, then 2) turn left into the left-turn acceleration lane, accelerate, and merge into the northbound traffic stream. The two-stage movement reduces the complexity of the movement and movement delay. The proposed striping is more appropriate than the current TWLTL.

Although the lane lengths proposed would be shorter than ECM standards, the lane length of the northbound left-turn acceleration lane would meet CDOT Access Code criteria for acceleration lanes RA (Regional Arterial) highways. The southbound left-turn acceleration lane would be within 38 feet of meeting this same CDOT criteria. The southbound lane was shortened to allow for a longer northbound left-turn acceleration lane from Mesa Ridge due to 1) the slight upgrade and 2) higher volume of this turning movement and 3) the movement is an “arterial to arterial” left-turn movement. Also, the southbound left-turn acceleration lane proposed would end near the end of the straight section of Marksheffel (prior to the horizontal curve).

The deviation will not adversely affect maintenance and its associated cost.

The proposed restriping will not require any additional pavement width and will therefore not affect maintenance and its associated cost. The plans show proposed plastic delineator posts with reflectors within the painted median “buffer” area between the ends of the back-to-back left-turn acceleration lanes. These are suggested by LSC to supplement dual yellow and yellow hatch pavement markings, but the County could elect to not install due to required maintenance.

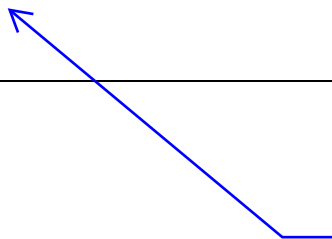
The deviation will not adversely affect aesthetic appearance.

The deviation will not adversely affect the aesthetic appearance as this is only a restriping plan.

The deviation meets the design intent and purpose of the ECM standards.

The deviation will allow for the needed auxiliary lanes to maintain an acceptable level of service

The deviation meets the control measure requirements of Part I.E.3 and Part I.E.4 of the County’s MS4 permit, as applicable.



Please address. You may state that the MS4 permit is not applicable to this deviation but please give your reason (i.e. no disturbance involved with the deviation request as the deviation request only calls for restriping of the roadway)

Provide an exhibit of the request

**REVIEW AND RECOMMENDATION:**

**Approved by the ECM Administrator**

This request has been determined to have met the criteria for approval. A deviation from Section \_\_\_\_\_ of the ECM is hereby granted based on the justification provided.

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**Denied by the ECM Administrator**

This request has been determined not to have met criteria for approval. A deviation from Section \_\_\_\_\_ of the ECM is hereby denied.

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**ECM ADMINISTRATOR COMMENTS/CONDITIONS:**

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### **1.1. PURPOSE**

The purpose of this resource is to provide a form for documenting the findings and decision by the ECM Administrator concerning a deviation request. The form is used to document the review and decision concerning a requested deviation. The request and decision concerning each deviation from a specific section of the ECM shall be recorded on a separate form.

### **1.2. BACKGROUND**

A deviation is a critical aspect of the review process and needs to be documented to ensure that the deviations granted are applied to a specific development application in conformance with the criteria for approval and that the action is documented as such requests can point to potential needed revisions to the ECM.

### **1.3. APPLICABLE STATUTES AND REGULATIONS**

Section 5.8 of the ECM establishes a mechanism whereby an engineering design standard can be modified when if strictly adhered to, would cause unnecessary hardship or unsafe design because of topographical or other conditions particular to the site, and that a departure may be made without destroying the intent of such provision.

### **1.4. APPLICABILITY**

All provisions of the ECM are subject to deviation by the ECM Administrator provided that one of the following conditions is met:

- The ECM standard is inapplicable to a particular situation.
- Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship on the applicant, and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
- A change to a standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.

### **1.5. TECHNICAL GUIDANCE**

The review shall ensure all criteria for approval are adequately considered and that justification for the deviation is properly documented.

### **1.6. LIMITS OF APPROVAL**

Whether a request for deviation is approved as proposed or with conditions, the approval is for project-specific use and shall not constitute a precedent or general deviation from these Standards.

### **1.7. REVIEW FEES**

A Deviation Review Fee shall be paid in full at the time of submission of a request for deviation. The fee for Deviation Review shall be as determined by resolution of the BoCC.



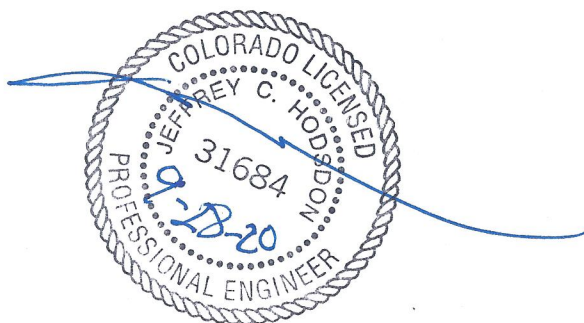


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The Glen at Widefield Filing No. 10  
Transportation Memorandum  
(LSC #194800)  
PCD File No.: SF1921  
September 24, 2020

**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.

  
\_\_\_\_\_

Sept 28<sup>th</sup> 2020  
\_\_\_\_\_  
Date



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September 24, 2020

Mr. J. Ryan Watson  
Widefield Investment Group  
3 Widefield Boulevard  
Colorado Springs, CO 80911

RE: The Glen at Widefield Filing No. 10  
Updated Transportation Memorandum  
El Paso County, Colorado  
LSC #194800

Dear Mr. Watson:

In response to your request, LSC Transportation Consultants, Inc. has prepared this transportation memorandum for The Glen at Widefield Filing No. 10. As shown in Figure 1, the site is located west of the Marksheffel Road/Peaceful Valley Road intersection in El Paso County, Colorado. Filing 10 is planned to contain 40 lots for single-family homes. This memorandum is a supplement to the overall Glen at Widefield East Preliminary Plan traffic report dated January 18, 2016.

LSC Recently prepared a TIS for Filings 10 & 11 combined (dated March 11, 2020). LSC is in the process of addressing staff comments on that combined report for both filings combined. This includes working with staff on potential short-term/interim improvements and/or intersection configurations prior to traffic-signal installation(s) at intersections along Marksheffel Road.

Copies of the plat for Filing No. 10 are attached for reference. The lot and street layout for this filing matches the Preliminary Plan.

## REPORT CONTENTS

This report is being prepared as part of a submittal to El Paso County. It identifies the traffic impacts of this development. The report contains the following:

- Updated traffic count data;
- Projections of short-term (2022) baseline/background traffic volumes at the key area intersections;
- The projected average weekday and peak-hour vehicle trips to be generated by Filing No. 10;
- The assignment of the Filing No. 10 projected trips to the key area intersections;



- The short-term level of service at these intersections;
- The short-term level of service and queuing analysis at the intersection of Powers Boulevard/Mesa Ridge Parkway;
- Findings and recommendations; and
- Signal escrow analysis tables.

## LAND USE AND ACCESS

Since completion of the 2016 Glen at Widefield East Preliminary Plan Traffic Report, 356 of the 578 proposed lots for single-family homes within the preliminary plan area have been platted as The Glen at Widefield Filing Nos. 7, 8, and 9. At the time traffic counts were conducted in September 2019, about 144 homes had been constructed in The Glen at Widefield Filing 7 and about 32 homes had been constructed in Filing 8. Note: There is currently significant home construction activity within Filing No. 8, so these figures will change rapidly. None of the homes in Filing 9 had been constructed at the time of the counts. Access for these filings is via the intersection of Spring Glen Drive/Mesa Ridge Parkway and via the recently-completed west leg of the intersection of Marksheffel/Peaceful Valley Road.

The currently-proposed Glen at Widefield Filing No. 10 is planned to contain 40 lots for single-family homes. Figure 2 shows the location of The Glen at Widefield Filing Nos. 7 through 10 and the anticipated future filings. No new access points are proposed as part of Filing No. 10. However, the west leg of the intersection of Marksheffel/Peaceful Valley is planned to be restricted to right-in/right-out only. This restriction should remain in place until a traffic signal is warranted and installed. This will not likely happen until further development occurs east of Marksheffel Road.

## 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.

**Powers Boulevard** is a four-lane Expressway extending north from Mesa Ridge Parkway. In the future, Powers Boulevard is planned to be extended south to connect to Interstate 25 (I-25), potentially at Exit 122. In the vicinity of the site, Powers Boulevard has two through lanes in each direction and a posted speed limit of 55 miles per hour (mph). The Colorado Department of Transportation has been collecting escrow funds from the previous Glen at Widefield filings as participation toward the recently-installed traffic signal at the intersection of Mesa Ridge/Powers.

**Marksheffel Road** extends north from the Link Road/C&S Road intersection in Fountain, Colorado to north of Woodmen Road. Marksheffel has recently been upgraded to an interim three-lane facility between Mesa Ridge Parkway and Bradley Road as part of a PPRTA project. Marksheffel Road is shown as a future four-lane Expressway on the El Paso County *Major*

*Transportation Corridors Plan (MTCP)*. The posted speed limit on Marksheffel Road is 55 mph north of Mesa Ridge Parkway and 45 mph south of Mesa Ridge Parkway.

**Mesa Ridge Parkway** is a four-lane median-divided Principal Arterial extending east from I-25 to Powers Boulevard. A half-section of Mesa Ridge Parkway with one through lane in each direction has been constructed east from Powers Boulevard to Marksheffel Road. It is our understanding that the construction of the other half-section is not the applicant's responsibility. LSC estimates that Mesa Ridge Parkway will likely need to be widened to provide two lanes in each direction once the average weekday traffic volumes reach 14,000 to 18,000 vehicles per day. Mesa Ridge Parkway improvements are listed as an "A-List" PPRTA project. The posted speed limit in the vicinity of the site is 45 mph.

**Peaceful Valley Road** is a two-lane City of Fountain street that extends east from Marksheffel Road about two-and-a-half miles to the location of a future extension of Meridian Road. The posted speed limit on Peaceful Valley Road is 30 mph. Most of Peaceful Valley Road is located within the City of Fountain.

**Poa Annua Street** is a two-lane City of Fountain street that extends east from Marksheffel about 850 feet, ending in a cul-de-sac. The posted speed limit on Poa Annua is 25 mph.

#### **Notable Recent Area Roadway-System Improvements**

The Marksheffel South project has been completed, a traffic signal has been installed at the intersection of Mesa Ridge Parkway and Powers, and it is our understanding that this signal has only been fully operational since early January 2018. The temporary Roanfield Drive street connection to Powers Boulevard has been closed. Also, the southbound left-turn lane at the Mesa Ridge/Powers intersection was lengthened as required with The Glen at Widefield Filing No. 7. The Marksheffel painted center median at the intersection of Peaceful Valley Road/Marksheffel Road was originally striped (and currently remains striped) as a channelized-T configuration (with southbound left-turn deceleration and left-turn acceleration lanes).

#### **EXISTING TRAFFIC VOLUMES**

Figure 3a shows the existing peak-hour traffic volumes and Figure 3b shows the existing lane geometries and traffic controls. The traffic volumes are based on traffic counts conducted by LSC in September 2019 and February 2020. The traffic count reports are attached.

#### **EXISTING LEVEL OF SERVICE**

Level of service (LOS) is a quantitative measure of the level of 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)	Average Control Delay (seconds per vehicle) <sup>(1)</sup>
A	10.0 sec or less	10.0 sec or less
B	10.1-20.0 sec	10.1-15.0 sec
C	20.1-35.0 sec	15.1-25.0 sec
D	35.1-55.0 sec	25.1-35.0 sec
E	55.1-80.0 sec	35.1-50.0 sec
F	80.1 sec or more	50.1 sec or more
(1) 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 intersections of Powers/Mesa Ridge, Marksheffel/Mesa Ridge, Marksheffel/Peaceful Valley and Marksheffel/Poa Annua were analyzed to determine the existing levels of service. The intersection of Powers/Mesa Ridge was analyzed using Synchro. The intersections of Marksheffel/Mesa Ridge, Marksheffel/Peaceful Valley, and Marksheffel/Poa Annua were analyzed using the unsignalized method of analysis procedures outlined in the *Highway Capacity Manual, 6th Edition* by the Transportation Research Board. The results of the analysis are shown in Figure 3b.

The intersection of Powers/Mesa Ridge currently operates at an overall LOS B or better during the peak hours. The westbound left-turn movement at this intersection is operating at LOS D during the peak hours.

The eastbound approach at the stop sign-controlled intersection of Marksheffel/Peaceful Valley is currently operating at LOS D during the morning peak hour and LOS E during the afternoon peak hour. The westbound approach is currently operating at LOS C or better during the peak hours.

All movements at the stop sign-controlled intersections of Marksheffel/Mesa Ridge and Marksheffel/Poa Annua are currently operating at LOS C or better during the peak hours.

#### **SHORT-TERM (YEAR 2022) BACKGROUND TRAFFIC**

Figure 4a shows the short-term (Year 2022) background traffic volumes at the key area intersections. Background traffic is the traffic estimated to be on the roadways without the Glen at Widefield Filing No. 10 traffic.

Background traffic includes the existing traffic volume (from Figure 3) plus increases in through traffic, due to regional growth, plus traffic estimated to be generated by buildout of existing and

currently-proposed subdivisions in the vicinity of the site. The existing northbound left-turn and eastbound left-turn movements at the intersection of Marksheffel/Peaceful Valley were rerouted with the restriction of the west leg to right-in/right-out only. These estimates also include traffic projected to be generated by the development of the 180 single-family homes within The Glen at Widefield Filing Nos. 7, 8, and 9 that were unoccupied when traffic counts were conducted in September 2019 and traffic projected to be generated by buildout of all the existing and currently-proposed developments within the Lorson Ranch development located east of the intersection of Marksheffel/Fontaine.

Increases in the through traffic volumes on Powers Boulevard were estimated, based on the growth rate calculated from the Colorado Department of Transportation 20-year growth factor for this section of Powers Boulevard.

Figure 4b shows the lane geometry, traffic control, and level of service at the key area intersections, based on the short-term background volumes.

#### **TRIP GENERATION**

The Filing No. 10 site-generated vehicle trips have been estimated using the nationally published trip-generation rates from *Trip Generation, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE). Table 2 shows the trip-generation estimates for these filings. Table 2 also shows estimates of the additional traffic expected to be generated due to buildout of the approved Filings 7, 8, and 9 and future filings within the Glen at Widefield East Preliminary Plan area.

Filing 10 is expected to generate 378 vehicle trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 7 vehicles would enter and 22 vehicles would exit the site. During the afternoon peak hour, which generally occurs for one hour between 4:15 and 6:15 p.m., about 25 vehicles would enter, and 15 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 an important factor in determining the site's traffic impacts. Figure 5 shows the short-term distribution estimates. The directional distribution estimates have been based on the following factors: the location of the site with respect to the regional employment, commercial, and activity centers; the land use proposed for the site; the proposed access system for the site; and the roadway system serving the site. The short-term distribution assumes the existing street network.

When the estimated site trips (from Table 2) are directionally distributed according to the LSC-estimated percentages shown in Figure 5 and assigned/routed on the internal and area street

network (according to LSC estimates), the resulting projected site-generated traffic volumes can be determined.

Figure 6 shows the projected short-term site-generated traffic volumes at the site access points and at key area intersections due to the currently-proposed Glen at Widefield Filing No. 10 only. The short-term site-generated traffic volumes assume the internal street network through the future development area just north of Filing 10 has not been constructed.

#### **SHORT-TERM TOTAL TRAFFIC**

Filing 10 only as stated in the paragraph above

Figure 7a shows the projected short-term total traffic volumes at the key areas. The short-term total traffic volumes are the sum of the short-term background traffic volumes (from Figure 4a) plus the Filing Nos. 10 ~~and 11~~ short-term site-generated traffic volumes (from Figure 6).

Figure 7b shows the lane geometry, traffic control, and level of service at the key area intersections, based on the short-term total volumes.

#### **LONG-TERM TOTAL TRAFFIC**

Please refer to the master traffic report (the January 18, 2016 *Glen at Widefield East Preliminary Plan Traffic Report*) for the long-term peak-hour traffic volume projections and level of service analysis. The original report is for the entire Glen at Widefield East preliminary plan area. No significant changes are projected to the results of this study.

#### **SHORT-TERM LEVEL OF SERVICE**

Marksheffel/Poa Annua are not part of the provided analysis. Please remove

The intersections of Marksheffel/Mesa Ridge, Marksheffel/Peaceful Valley, and Marksheffel/Poa Annua were analyzed to determine the projected levels of service, based on the short-term background and total traffic volumes, using the unsignalized method of analysis procedures outlined in the *Highway Capacity Manual, 6th Edition* by the Transportation Research Board. The signalized intersection of Powers/Mesa Ridge was analyzed using Synchro. The results of the analysis are shown in Figures 4b and 7b.

#### **Powers Boulevard/Mesa Ridge Parkway**

All movements at the intersection of Powers/Mesa Ridge are projected to continue to operate at LOS D or better during the peak hours, based on the projected short-term background and total peak-hour traffic volumes. The short-term analysis assumes Mesa Ridge Parkway has been widened approaching Powers Boulevard to provide dual westbound left-turn lanes.

As discussed in the Preliminary Plan traffic report, the 2040 analysis indicates an overall LOS C during the peak hours. Individual southbound and westbound left-turn movements are projected to operate at LOS E during the afternoon peak hour, based on the projected 2040 background



and total traffic volumes. LOS E does not necessarily indicate failure of the movement or the intersection or a traffic safety problem. Given a longer cycle length and the prioritization by CDOT of north/south through traffic on Powers, some left-turn and minor street movements, especially with protected-only phasing, may experience delays in the LOS E range as priority is given to the major street for traffic progression and for serving high volumes of through traffic.

### **Spring Glen Drive/Mesa Ridge Parkway**

All movements at the stop sign-controlled intersection of Springs Glen/Mesa Ridge are projected to operate at LOS C or better during the peak hours, based on the projected short-term total traffic volumes.

### **Marksheffel Road/Mesa Ridge Parkway**

The eastbound left-turn movement at the stop sign-controlled intersection of Marksheffel/Mesa Ridge is projected to operate at LOS E during the morning peak hour, based on the projected short-term background and total traffic volumes. If this intersection were restriped to provide a northbound left-turn acceleration lane, the eastbound left-turn movement is projected to operate at LOS D or better during the peak hours.

In the previous pages it indicates that the west leg would be restricted. Please revise accordingly.

### **Marksheffel Road/Peaceful Valley Road**

If the east leg of the intersection of Marksheffel/Peaceful Valley is restricted to right-in/right-out only, all movements are projected to operate at LOS C or better during the peak hours, based on the short-term total traffic volumes following development of the Glen at Widefield Filing No. 10.

## **QUEUING ANALYSIS**

A queuing analysis has been performed for the southbound and westbound left turn at Powers/Mesa Ridge. The analysis has been completed, based on dual left-turn lanes with existing length for the westbound Mesa Ridge left-turn lane, the recently extended southbound left-turn lane, and projected short-term total traffic.

The maximum southbound left-turn queue on Powers Boulevard approaching Mesa Ridge Parkway is projected to be about 181 feet long, based on the projected short-term total traffic volumes. The southbound left-turn lane has recently been lengthened to 1,108 feet plus a 222-foot taper.

The maximum westbound left-turn queue on Mesa Ridge Parkway approaching Powers Boulevard is projected to be about 370 feet long, based on the projected short-term total traffic volumes, assuming dual westbound left-turn lanes. An additional queuing analysis was performed, based on the 2040 morning peak-hour traffic volumes shown in the overall Glen at Widefield East Preliminary Plan traffic report, dated January 18, 2016. The projected maximum westbound left-turn queue, based on the 2040 traffic volumes, is 469 feet.

## **TRAFFIC SIGNAL WARRANT ANALYSIS**

The intersection of Marksheffel/Mesa Ridge was analyzed to determine if either an Eight-Hour Vehicular-Volume Traffic-Signal Warrant or a Four-Hour Vehicular-Volume Traffic-Signal Warrant would be met or be close to being met, based on the projected existing and/or short-term total traffic volume.

Table 3 shows the results of the analysis for Marksheffel/Mesa Ridge. As shown in the table, the existing traffic volumes during five of the eight hours studied currently meet the thresholds for both the Eight-Hour Vehicular-Volume Traffic-Signal Warrant and the Four-Hour Vehicular-Volume Traffic-Signal Warrant. An additional two of the hours analyzed are projected to meet the threshold for an Eight-Hour Vehicular Volume Warrant, based on the short-term total traffic volumes. 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 County. As discussed in the Level of Service section above, this intersection could potentially continue to operate at a satisfactory level of service as a stop sign-controlled intersection in the short term, with minor modifications to the existing traffic-lane striping.

## **CONCLUSIONS AND RECOMMENDATIONS**

### **Trip Generation**

- Filing 10 is expected to generate 378 vehicle trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak hour, about 7 vehicles would enter and 22 vehicles would exit the site. During the afternoon peak hour, about 25 vehicles would enter and 15 vehicles would exit the site.

### **Level of Service**

- The signalized intersection of Mesa Ridge Parkway/Powers Boulevard is projected to continue to operate at a satisfactory level of service based on the projected short-term background and total peak-hour traffic volumes.
- The eastbound left-turn movement at the stop sign-controlled intersection of Marksheffel/Mesa Ridge is projected to operate at LOS E during the afternoon peak hour, based on the projected short-term background and total traffic volumes. If this intersection were restriped to provide a northbound left-turn acceleration lane, the eastbound left-turn movement is projected to operate at LOS D or better during the peak hours.
- The intersection of Mesa Ridge Parkway/Spring Glen Drive would operate at satisfactory levels of service, as a stop sign-controlled intersection, based on the projected short-term background and total peak-hour traffic volumes.

Mr. J. Ryan Watson  
The Glen at Widefield Filing No. 10

The previous pages indicate that the west leg would be restricted to a right-in/right-out only. Please revise accordingly. 24, 2020  
Transportation Memorandum

- If the east leg of the intersection of Marksheffel/Peaceful Valley is restricted to right-in/right-out only, all movements are projected to operate at LOS C or better during the peak hours, based on the short-term total traffic volumes following development of the Glen at Widefield Filing No. 10. This restriction should remain in place until a traffic signal is warranted and installed. This will not likely occur until further development occurs east of Marksheffel Road.

Please provide an Autoturn exhibit for the RIRO. The construction documents did not indicate a radius or provide a consistent shoulder from the right turn lane striping and edge of asphalt

### Intersection Lane Configurations

- Table 4 shows a summary of the recommended short-term improvements in the vicinity of the site.
- A 475-foot left-turn lane approaching Spring Glen Drive has been installed with the construction of Mesa Ridge Parkway.
- Mesa Ridge Parkway has been constructed and striped with 10-foot paved shoulders in the vicinity of Spring Glen Drive. Once the full four-lane Principal Arterial section is completed, it is anticipated that the acceleration lane will be implemented at that time. The width for a future westbound right-turn acceleration lane on Mesa Ridge Parkway will become available, as the half-section to be built with the initial Mesa Ridge construction will be sufficiently wide. This has been shown on the Mesa Ridge Parkway design plans.
- A westbound right-turn deceleration lane will be required on Mesa Ridge Parkway at Spring Glen Drive when the east leg of the intersection of Marksheffel/Peaceful Valley is restricted to right-in/right-out only. Based on a design speed of 50 mph, the prescribed lane length for this lane is 235 feet plus a 200-foot taper.
- The painted center median on Marksheffel Road at the Peaceful Valley Road intersection is currently striped for a dedicated southbound left-turn lane and a dedicated southbound left-turn acceleration lane. The west leg of this intersection was recently completed to provide a second access to the Glen at Widefield East. If the west leg is restricted to right-in/right-out only, **as recommended with this subdivision filing**, the existing left-turn acceleration lane could remain. The right-turn restriction could be accomplished by installing a right-turn “island”, pavement markings and signs on the west leg. **Note:** If the west leg were to remain a full-movement intersection (or with future signalization and conversion back to a full-movement intersection), the painted center median should be restriped as an exclusive northbound left-turn lane. Based on a design speed of 50 mph, the prescribed lane length for this lane is 285 feet plus a 200-foot taper.
- The painted center median on Marksheffel Road at Mesa Ridge Parkway is currently striped as a two-way left-turn lane. LSC recommended (in the Filings 10 TIS) that this painted center median be restriped to create an interim “channelized-T”-type intersection. This would include a dedicated northbound left-turn lane and a dedicated northbound

please indicate the turn lane lengths for this left turn lane.

left-turn acceleration lane similar to the existing striping at the intersection of Marksheffel/Peaceful Valley.

- Based on a design speed of 60 mph, the prescribed lane length for this lane would be 1,170 feet plus a 300-foot taper.
- There is about 2,060 feet between Mesa Ridge Parkway and the Peaceful Valley intersections (not centerline spacing, rather space between the intersections). There is currently about 875 feet available for a northbound left-turn acceleration lane (assuming no change to the current Peaceful Valley southbound left-turn acceleration lane and taper) between the Mesa Ridge Parkway intersection and the current end of the lane transition taper for the southbound left-turn acceleration lane at Peaceful Valley Road (which is about 965 feet long plus a 220-foot taper).
- LSC recommends shortening the left-turn lane by about 100 feet (to 865 feet) and adding a new taper stripe for this southbound left turn acceleration lane. The left-turn acceleration lane from Mesa Ridge Parkway would then be the 875 feet and the taper currently striped for the Peaceful Valley acceleration lane would be used for this new northbound left-turn acceleration lane. Restriping in this manner would create 100 feet of separation between the tapers at the ends of the acceleration lanes, which would result in a “buffer” area between the ends of the opposing direction acceleration lanes. This following summarizes the resulting lane and taper lengths:
  - 865’ southbound left-turn acceleration lane from Peaceful Valley
  - 220’ lane transition taper
  - 100’ “buffer zone”
  - 220’ lane transition (with 120’ overlap with the southbound taper)
  - 875’ northbound left-turn acceleration lane from Marksheffel
- LSC recommends installation of yellow raised plastic delineator posts with yellow reflectors be placed within the 100-foot buffer area and in series parallel to the transition taper stripes. These would emphasize the end of the lane for motorists that would be using the lanes from each direction. Motorists using the left-turn acceleration lanes in the opposing directions would essentially be using the common center painted median area (between the through lanes).
- Based on the projected short-term total traffic volumes and the volumes projected in the Preliminary Plan TIS report for 2040, and the criteria contained in the El Paso County Engineering Criteria Manual (ECM) for Minor (or Principal) Arterials, a southbound right-turn deceleration lane is not projected to be warranted on Marksheffel Road approaching Peaceful Valley Road (provided the planned street connections through Filing Nos. 11 and 12 are in place at such time that the turning volumes exceed the turning-volume threshold requiring a turn lane). Should the planned street connections

through Filing Nos. 11 and 12 become necessary prior to the Filing 11 or Filing 12 subdivisions being constructed, the developer would install a temporary road connection for purposes of reducing the southbound right-turn volume at Marksheffel/Peaceful Valley Road.

In the future, if and when Marksheffel is further upgraded and expanded to an Expressway-type roadway (as classified in the 2016 MTCP 2040 Roadway Plan), the turn lane could potentially be incorporated into the upgraded roadway cross section at that time, if necessary.

- Based on the projected short-term total traffic volumes, the classification of Marksheffel Road as an Expressway, and the criteria contained in the El Paso County Engineering Criteria Manual (ECM), a southbound right-turn acceleration lane is projected to be warranted on Marksheffel Road at Peaceful Valley Road. Although Marksheffel Road is classified as an Expressway, it has recently been upgraded from a two-lane roadway to a Rural Minor Arterial cross section instead of an Expressway cross section. Based on a Rural Minor Arterial classification, a right-turn acceleration lane would not be required. LSC recommends right-of-way be reserved for this lane, should Marksheffel be upgraded to an Expressway cross section in the future.
- The southbound left-turn lane on Powers Boulevard approaching Mesa Ridge Parkway was lengthened as part of the Glen at Widefield Filing 7 access permit. The level of service analysis and queueing analysis for the short-term total traffic volumes indicates acceptable operations with the current single-lane configuration.
- Based on the projected short-term and total traffic volumes, Mesa Ridge Parkway should be widened approaching Powers Boulevard to provide dual westbound left-turn lanes. Based on the queueing analysis, dual 475-foot left-turn lanes (plus transition taper) would be adequate to accommodate the projected queues. Deceleration distance would not be necessary, as Powers/Mesa Ridge is a T-intersection. New redirect tapers would be required east of the dual left-turn lanes to transition to the existing cross section. The taper ratio should be 45:1.

#### **Proposed Subdivision Street Classifications**

- Figure 8 shows the recommended street classifications for the proposed street sections within Filing No. 10.

#### **Mesa Ridge Parkway/Powers Boulevard Intersection**

- CDOT has agreed to a signal escrow amount of \$107,018 for all of Glen at Widefield East. The number of total lots in the Preliminary Plan has been reduced to 578 and, therefore, the corresponding escrow amount would be \$103,960 for all of Glen at Widefield East.



For purposes of the Filing 10 access permit, the amount would be \$7,222. Table 5 presents the signal escrow analysis including the previously-identified amount for Filings 7, 8, and 9 and the remaining amount for future filings.

- Access permit applications will be submitted to CDOT for these filings, for purposes of processing the signal escrow and for work in the CDOT right-of-way to construct the westbound dual left-turn lanes and any associated traffic-signal modifications. A new access permit and associated Notice-to-Proceed will be required.

#### **Mesa Ridge Parkway/Spring Glen Drive Signal Escrow**

- The Glen East Preliminary Plan traffic report contains an estimated signal escrow amount for the entire Preliminary Plan and states that the developer's percentage contribution toward this signal will be calculated and a proportional contribution made toward the signal construction with each filing. The estimated proportional contribution is \$2,276 for Filing No. 10. Table 6 presents the signal escrow analysis for this intersection, including the previously-identified amounts for Filings 7, 8, and 9 and the remaining amount for future filings.

#### **Marksheffel Road/Peaceful Valley Road**

- The Glen at Widefield East Preliminary Plan traffic report contains an estimated escrow amount for the Preliminary Plan and states that the developer's percentage contribution toward this signal will be calculated and a proportional contribution made toward the signal construction with each filing. The estimated proportional contribution is \$2,521 for Filing No. 10. Table 7 presents the signal escrow analysis for this intersection, including the previously-identified amounts for Filings 7, 8, and 9 and the remaining amounts for future filings.

#### **Roadway Improvement Fee Program**

- This project will be required to participate in the El Paso County Road Improvement Fee Program. The Glen at Widefield Filing No. 10 will join the ten-mil PID. The ten-mil PID building permit fee portion associated with this option is \$1,221 per single-family dwelling unit. The total building permit fee would be \$48,840 for the 40 lots within Filing No. 10.

\* \* \* \* \*

Please contact me if you have any questions regarding this report.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

By: Jeffrey C. Hodsdon, P.E.  
Principal

JCH:KDF:jas

Enclosures: Tables 2-7  
Figures 1-8  
Traffic Count Reports  
Level of Service Reports  
Queuing Reports

# Tables

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**Table 2**  
**Trip Generation Estimate**  
**The Glen at Widefield Filing 10**

Filing	Land Use Code	Land Use Description	Trip Generation Units				Trip Generation Rates <sup>(1)</sup>					Future Total Trips Generated				
							Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour	
			Existing	Future	Total			In	Out	In	Out		In	Out	In	Out
Approved Filings																
7	210	Single-Family Detached Housing	144	4	148	DU <sup>(2)</sup>	9.44	0.19	0.56	0.62	0.37	38	1	2	2	1
8	210	Single-Family Detached Housing	32	69	101	DU	9.44	0.19	0.56	0.62	0.37	651	13	38	43	25
9	210	Single-Family Detached Housing	0	107	107	DU <sup>(2)</sup>	9.44	0.19	0.56	0.62	0.37	1,010	20	59	67	39
Total Filings 7-9			176	180	356	DU						1,699	34	99	112	65
Currently Proposed Filing																
10	210	Single-Family Detached Housing	0	40	40	DU <sup>(2)</sup>	9.44	0.19	0.56	0.62	0.37	378	7	22	25	15
Total Filings 7-10			176	220	396	DU						2,077	41	121	137	80
Future Filings																
11	210	Single-Family Detached Housing	0	103	103	DU	9.44	0.19	0.56	0.62	0.37	972	19	57	64	38
12	210	Single-Family Detached Housing	0	79	79	DU	9.44	0.19	0.56	0.62	0.37	746	15	44	49	29
Total Filings 7-12			176	402	578	DU						3,795	75	222	250	147

Notes:

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

(2) DU = dwelling unit

Source: LSC Transportation Consultants, Inc.

**Table 3**  
**The Glen at Widefield Filing 10**  
**Traffic Signal Warrant Analysis of Mesa Ridge Pkwy/Marksheffel Rd**

Hour	Traffic Volumes		Warrant Analysis <sup>(1)</sup>							
			Warrant 1, Eight Hour Vehicular Volume Evaluation						Warrant 2, Four Hour Vehicular Volume Evaluation	
			Warrant Thresholds				Warrant Threshold Met?			Warrant Threshold Met?
			Condition A (70%)		Condition B (70%)		West Leg		70% Warrant Threshold Minor Minimum	West Leg
	Major <sup>(2)</sup>	Minor <sup>(3)</sup>	Major	Minor	Major	Minor	A	B		
<b>Existing</b>										
6:30 AM	831	153	420	105	630	53	Yes	Yes	75	Yes
7:30 AM	627	153	420	105	630	53	Yes	No	122	Yes
11:30 AM	389	176	420	105	630	53	No	No	221	No
12:30 PM	367	129	420	105	630	53	No	No	232	No
1:30 PM	321	170	420	105	630	53	No	No	255	No
2:30 PM	446	221	420	105	630	53	Yes	No	192	Yes
4:00 PM	696	296	420	105	630	53	Yes	Yes	101	Yes
5:00 PM	674	248	420	105	630	53	Yes	Yes	108	Yes
							5	3		5
<b>Short-Term Total</b>										
6:30 AM	925	197	420	105	630	53	Yes	Yes	64	Yes
7:30 AM	698	197	420	105	630	53	Yes	Yes	101	Yes
11:30 AM	449	204	420	105	630	53	Yes	No	191	Yes
12:30 PM	423	149	420	105	630	53	Yes	No	204	No
1:30 PM	370	197	420	105	630	53	No	No	230	No
2:30 PM	515	256	420	105	630	53	Yes	No	160	Yes
4:00 PM	803	343	420	105	630	53	Yes	Yes	80	Yes
5:00 PM	778	287	420	105	630	53	Yes	Yes	84	Yes
							7	4		6

**Notes:**

(1) Thresholds are based on 2 or more lanes on the major approach and 1 lane on the minor approach with the 70% factor used as the posted speed limit on Marksheffel Rd exceeds 40 mph.

(2) The major street traffic includes all northbound and southbound movements (left, through and right) on Marksheffel Rd.

(3) The minor street traffic includes the eastbound left-turn traffic only on Mesa Ridge Pkwy

Source: LSC Transportation Consultants, Inc.



**Table 4**  
**Recommended Short-Term Improvements**  
**The Glen at Widefield Filing No. 10**

Description	Trigger	Timing
Westbound right-turn deceleration Lane on Mesa Ridge Parkway approaching Spring Glen Drive	Eastbound right-turn volume of 25 vehicles per hour	With The Glen at Widefield Filing No. 10
Westbound right-turn acceleration lane on Mesa Ridge Parkway at Spring Glen Drive	Southbound right-turn volume of 50 vehicles per hour (Existing southbound right-turn volume is 68 vehicles per hour)	Once the full four-lane Principal Arterial section is completed, it is anticipated that the acceleration lane will be implemented at that time. The width for a future westbound right-turn acceleration lane on Mesa Ridge Parkway will become available as the half-section to be built with the initial Mesa Ridge construction will be sufficiently wide. This has been shown on the Mesa Ridge Parkway design plans
Restrict the west leg of Marksheffel/Peaceful Valley to right-in/right-out only. The right-turn restriction could be accomplished by installing a right-turn "island", pavement markings and signs on the west leg.	When the level of service for the eastbound left-turn movement at the intersection of Marksheffel/Peaceful Valley drops below an acceptable level (LOS D)	With The Glen at Widefield Filing No. 10
Restripe the painted center median on Marksheffel Road in the vicinity of Mesa Ridge Parkway to create an interim "Channelized Tee" type intersection. This would include a dedicated northbound left-turn lane and a dedicated northbound left-turn acceleration lane similar to the existing striping at the intersection of Marksheffel/Peaceful Valley. Please refer to the report text for lane dimensions and other details.	With The Glen at Widefield Filing No. 10 or when the level of service for the eastbound left-turn movement at the intersection of Marksheffel/Mesa Ridge drops below an acceptable level (LOS D)	With The Glen at Widefield Filing No. 10; this item remains under discussion and evaluation by county staff. This recommendation would need concurrence from County staff, and staff may elect to leave the intersection as currently striped. Please refer to the text of the report for details. Note: The Filing 10 impact is anticipated to be low at this intersection and this improvement is primarily needed for background traffic.
Southbound right-turn deceleration lane on Marksheffel Road approaching Poa Annua Street. Based on a design speed of 60 mph, the prescribed lane length for this deceleration lane is 290 feet plus a 240-foot taper.	Based on Expressway Classification: Southbound right-turn volume of 10 vehicles per hour  Based on Minor Arterial Classification: Southbound right-turn volume of 50 vehicles per hour	Future (With The Glen at Widefield Filing No. 11)
Southbound right-turn deceleration lane on Marksheffel Road approaching Peaceful Valley Road.	Not projected to be required based on Minor (or Principal) Arterial roadway criteria (provided the planned street connection through Filing 12 is in place at such time that the turning volumes exceed the turning volume threshold requiring a turn lane).  In the future, if and when Marksheffel is further upgraded and expanded to an Expressway-type roadway (as classified in the 2016 MTCP 2040 Roadway Plan), the turn lane could potentially be incorporated into the upgraded roadway cross section at that time, if necessary.	Future (if necessary)
Southbound right-turn acceleration lane on Marksheffel Road at Peaceful Valley Road	Based on Expressway Classification: Eastbound right-turn volume of 10 vehicles per hour  Based on Minor Arterial Classification: Generally not required	LSC recommends right-of-way be reserved for this improvement to be constructed if/when Marksheffel Road is upgraded to an Expressway cross section
Mesa Ridge Parkway should be widened approaching Powers Boulevard to provide dual westbound left-turn lanes. Based on the queueing analysis, dual 475foot left turn lanes (plus transition taper) would be adequate to accommodate the projected queues. Deceleration distance would not be necessary, as Powers/Mesa Ridge is a T-intersection. New redirect tapers would be required east of the dual left turn lanes to transition to the existing cross section. The taper ratio should be 45:1.	Once the westbound left-turn queue regularly exceeds the length of the existing single left-turn lane	With The Glen at Widefield Filing No. 10

**Table 5**  
**Glen East Preliminar Plan CDOT Access Permit and Escrow Analysis**  
**Mesa Ridge & Powers (SH 21)**  
**The Glen at Widefield Filing 10**

Subdivisions Currently Proposed			Currently Proposed Separate Access Permits and Escrow Amounts per Access Permit			
Subdivision Name	Number of Lots	Status	Portion of total Escrow of \$103,960	Access Permits	Access Permit Escrow Amt.	Escrow to be deposited in Account with CDOT
Filing 7	148	Recorded	\$26,648	Permit No. 216057	\$26,648	Completed
Filing 8	101	Recorded	\$18,166	Permit No. 218055	\$18,166	Completed
Filing 9	107	Plat Approved - not recorded	\$19,065	Permit No. 218056	\$19,065	Completed
Filing 10	40	Pending	\$7,222	Application to be submitted soon	\$7,222	Prior to issuance of NTP
Filing 11	103	Future	\$18,596	Application to be submitted soon	\$18,596	Prior to issuance of NTP
Remaining Filings	79	Future	\$14,263	Application(s) not submitted	TBD	

Source: LSC Transportation Consultants, Inc.

**Table 6**  
**Glen East Preliminary Plan County Intersection Escrow Analysis**  
**Mesa Ridge Parkway & Spring Glen Drive Intersection**  
**The Glen at Widefield Filing 10**

Subdivisions Currently Proposed			Signal Escrow Amounts
Subdivision Name	Number of Lots	Status	Portion of Total Escrow of \$33,750
Filing 7	148	Platted	\$8,875
Filing 8	101	Platted	\$6,057
Filing 9	107	Plat Approved - not recorded	\$6,189
Filing 10	40	Pending	\$2,276
Filing 11	103	Future	\$5,859
Remaining Filings	79	Future	\$4,494
			<b>\$33,750</b>
<i>Source: LSC Transportation Consultants, Inc. August 24, 2016</i>			

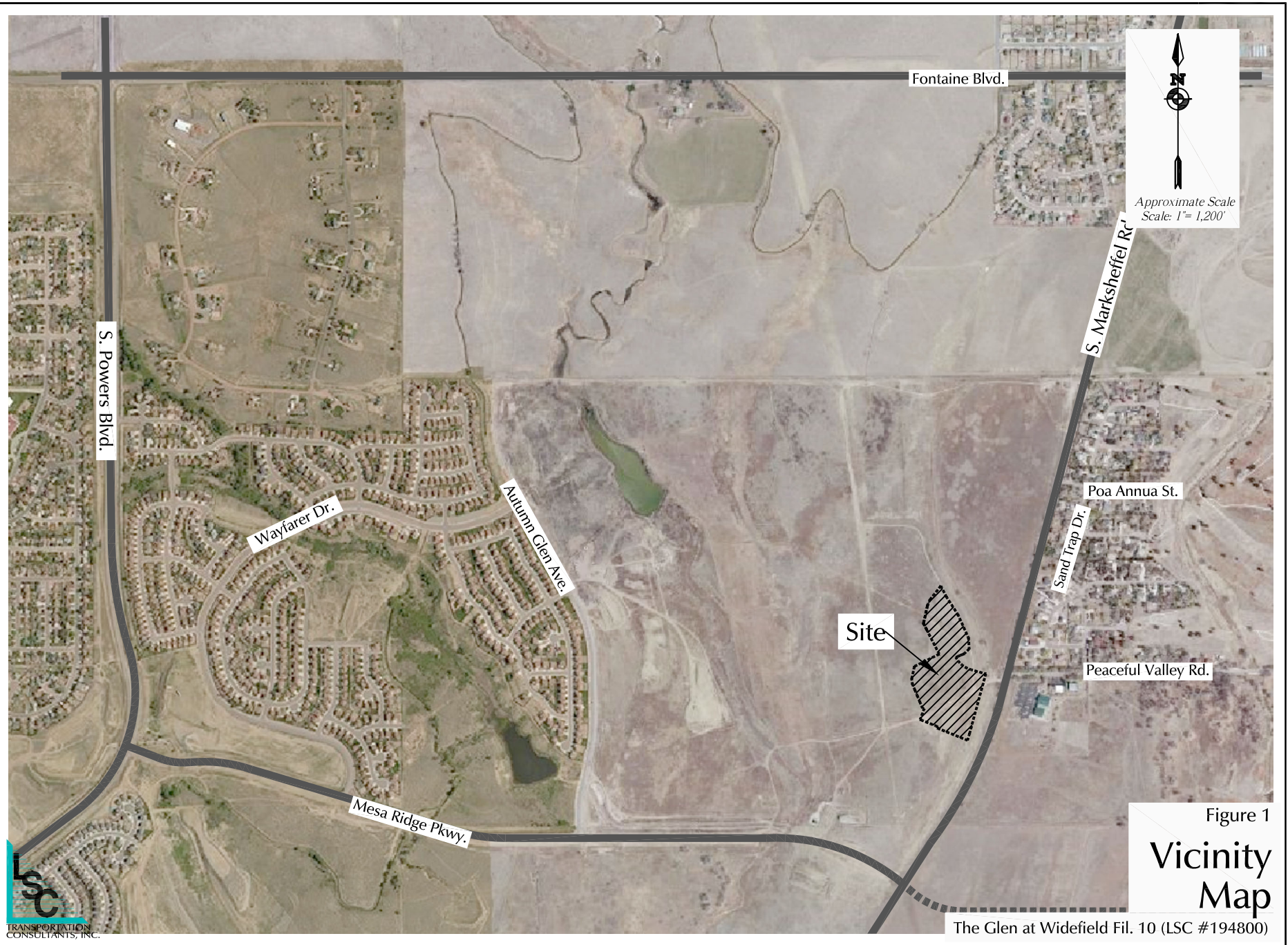
**Table 7**  
**Glen East Preliminary Plan County Intersection Escrow Analysis**  
**Peaceful Valley Road & Marksheffel Road Intersection**  
**The Glen at Widefield Filing 10**

Subdivisions Currently Proposed			Signal Escrow Amounts
Subdivision Name	Number of Lots	Status	Portion of Total Escrow of \$36,250
Filing 7	148	Platted	Deferred to Fil 8
Filing 8	101	Platted	\$15,615
Filing 9	107	Plat Approved - not recorded	\$6,648
Filing 10	40	Pending	\$2,521
Filing 11	103	Future	\$6,489
Remaining Filings	79	Future	\$4,977
			<b>\$36,250</b>
Note: The escrow amount for Filing 8 includes the deferred amount for Filing 7			
Source: LSC Transportation Consultants, Inc. August 24, 2016			

# Figures

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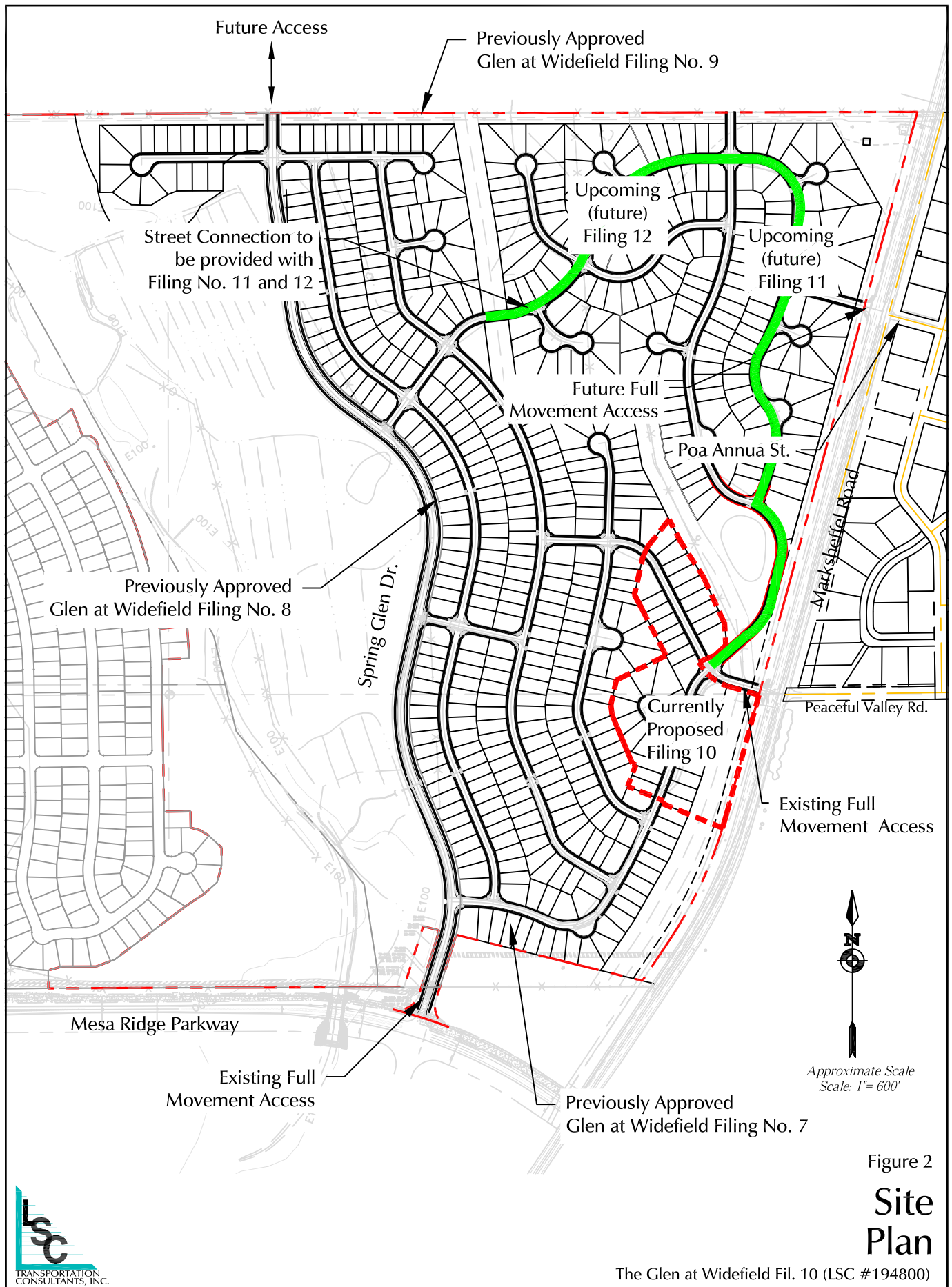


Figure 2

# Site Plan

The Glen at Widefield Fil. 10 (LSC #194800)



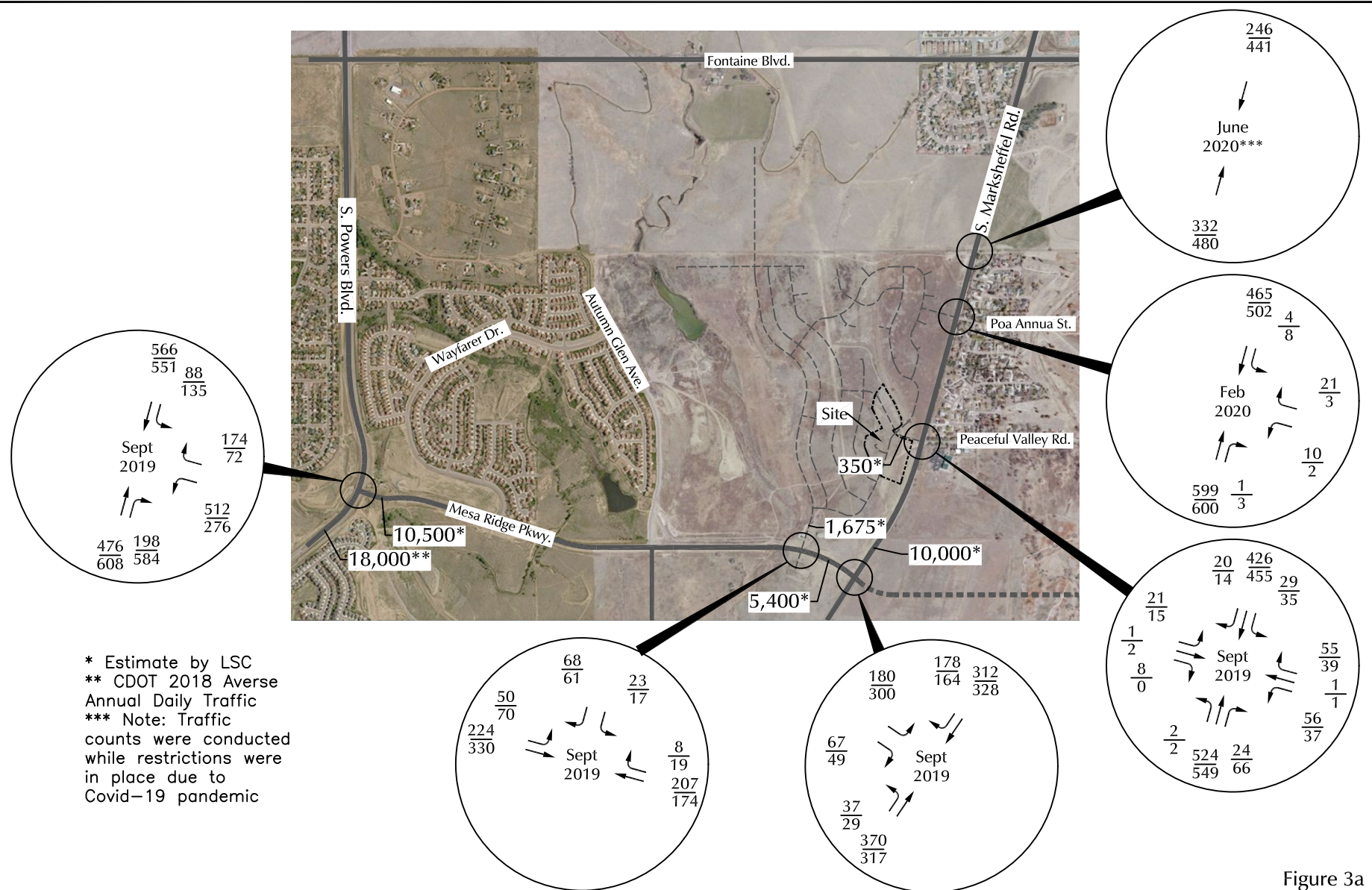
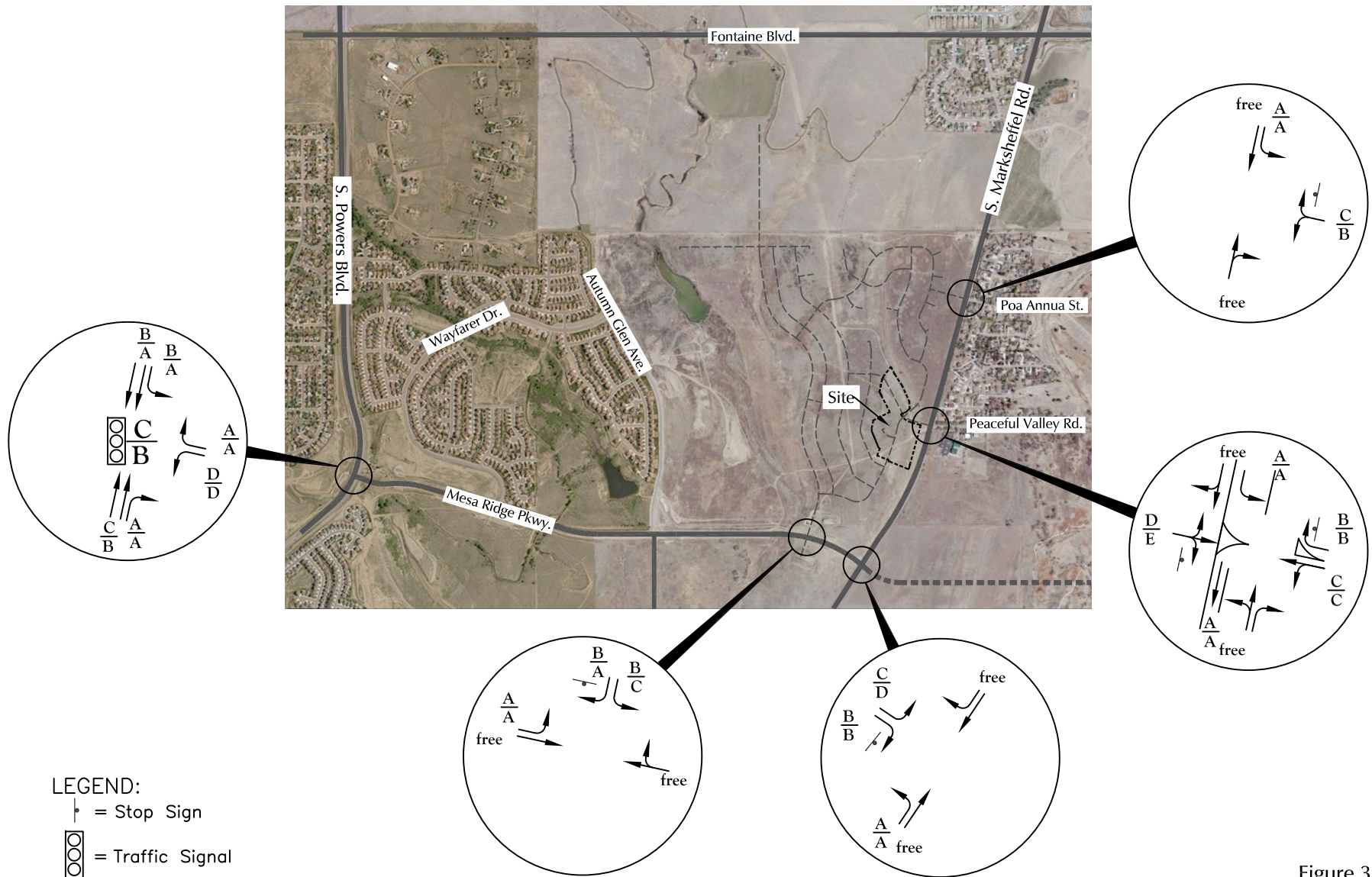


Figure 3a

## Existing Traffic

The Glen at Widefield Fil. 10 (LSC #194800)



LEGEND:

= Stop Sign

= Traffic Signal

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

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

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

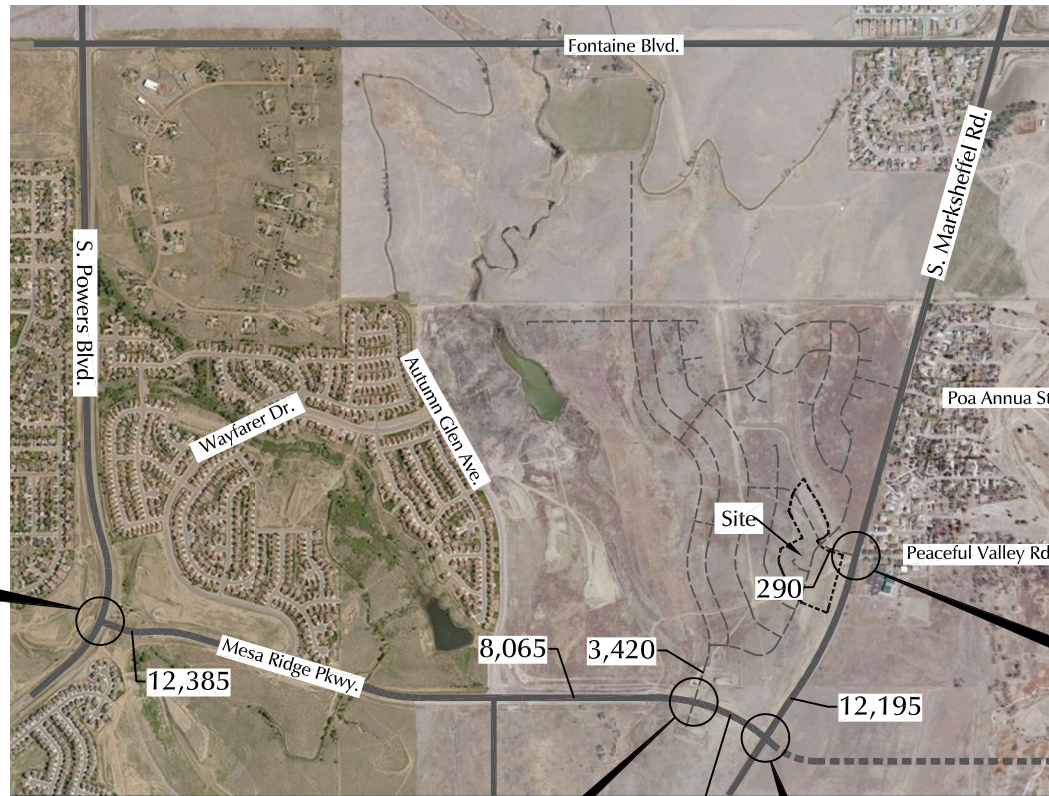
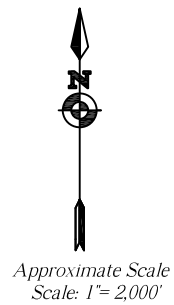
$\frac{D}{C}$  = PM Entire Intersection Peak-Hour Level of Service

Figure 3b

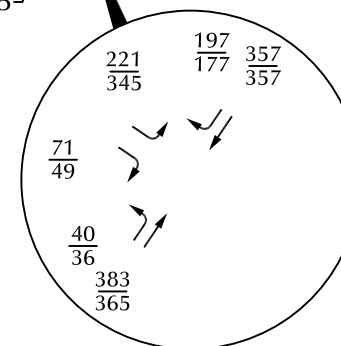
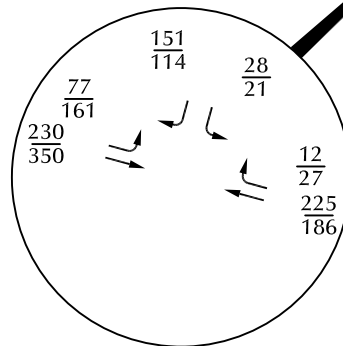
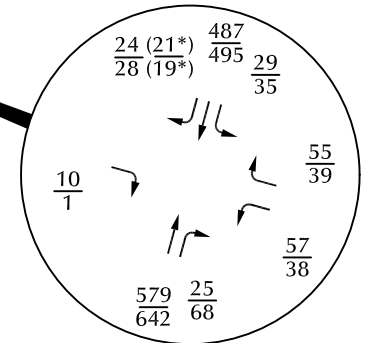
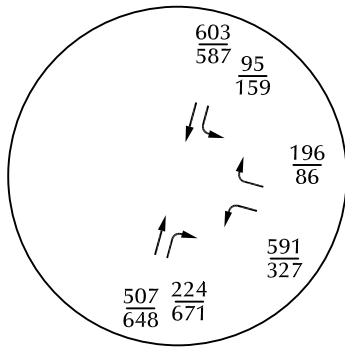
## Existing Lane Geometry, Traffic Control and Level of Service

The Glen at Widefield Fil. 10 (LSC #194800)





\*Volumes with Filing  
Nos 10 and 11 street  
connections.



#### LEGEND:

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

XXX = Average Weekday Traffic (vehicles per day)

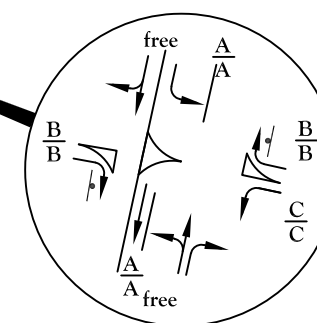
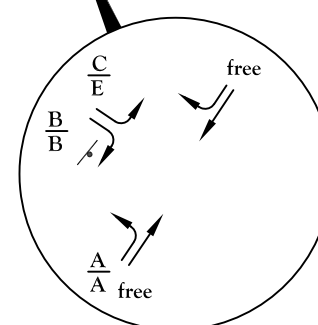
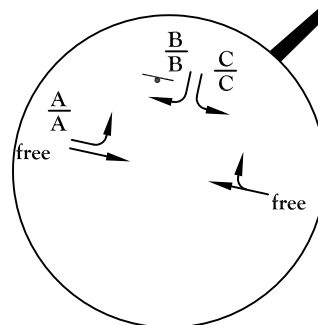
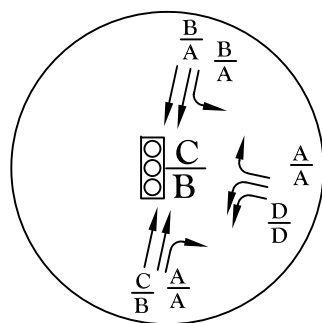
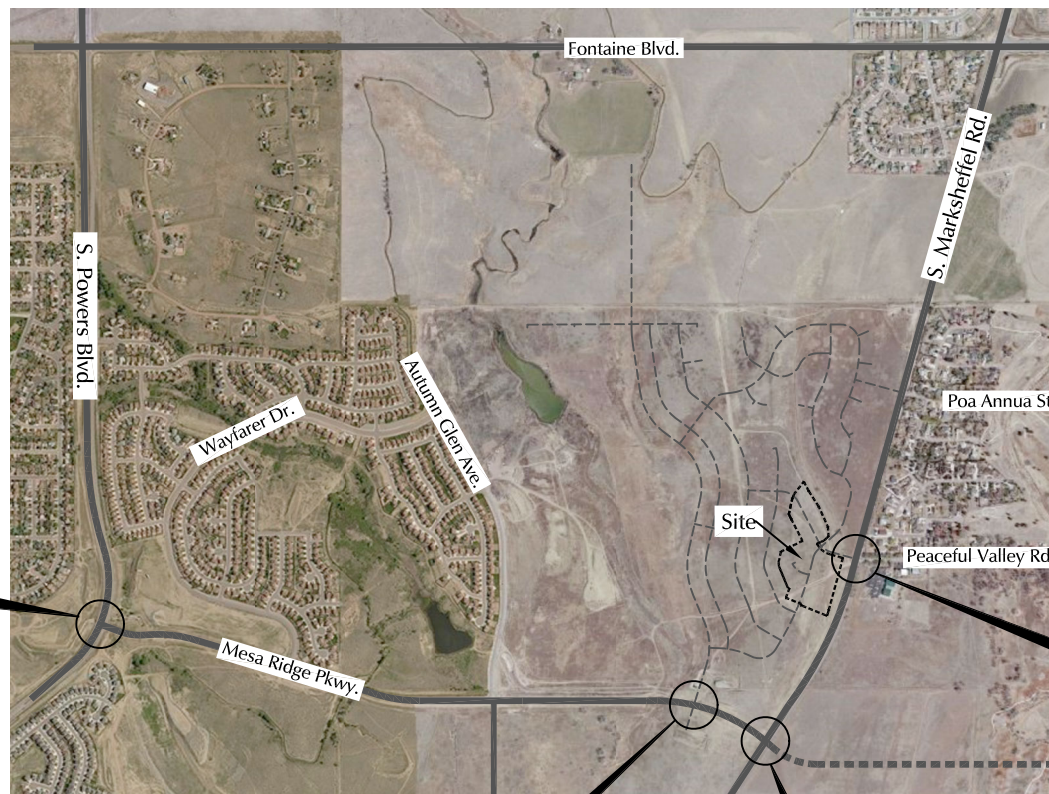
Figure 4a

## Short-Term Background Traffic

The Glen at Widefield Fil. 10 (LSC #194800)



Approximate Scale  
Scale: 1"= 2,000'



LEGEND:

= Stop Sign

= Traffic Signal

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

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

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

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

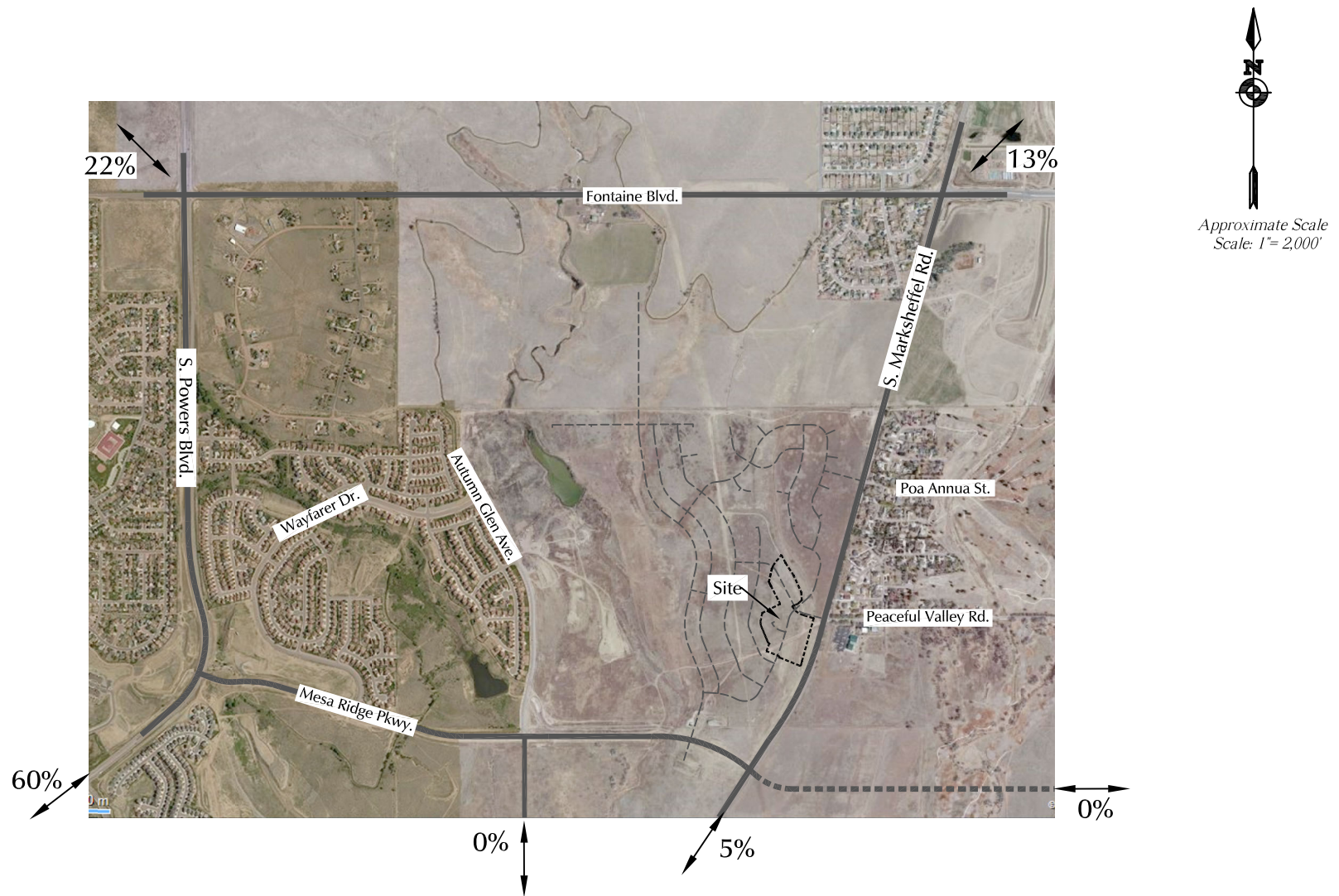


# Short-Term Background Lane Geometry, Traffic Control and Level of Service


Figure 4b


The Glen at Widefield Fil. 10 (LSC #194800)





LEGEND:

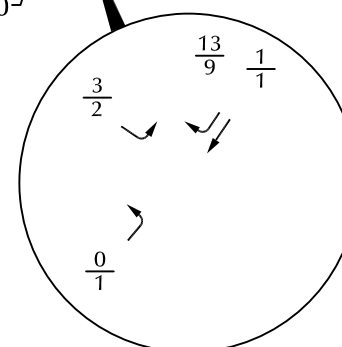
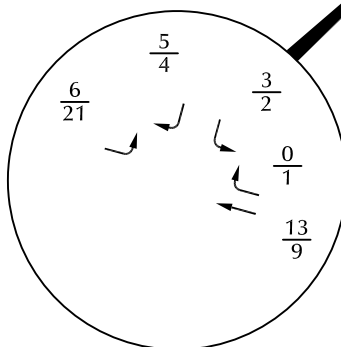
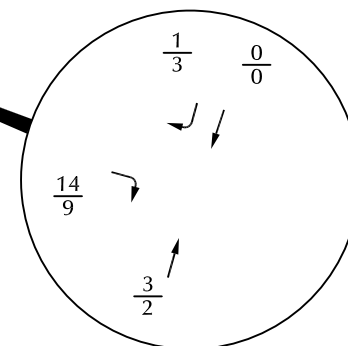
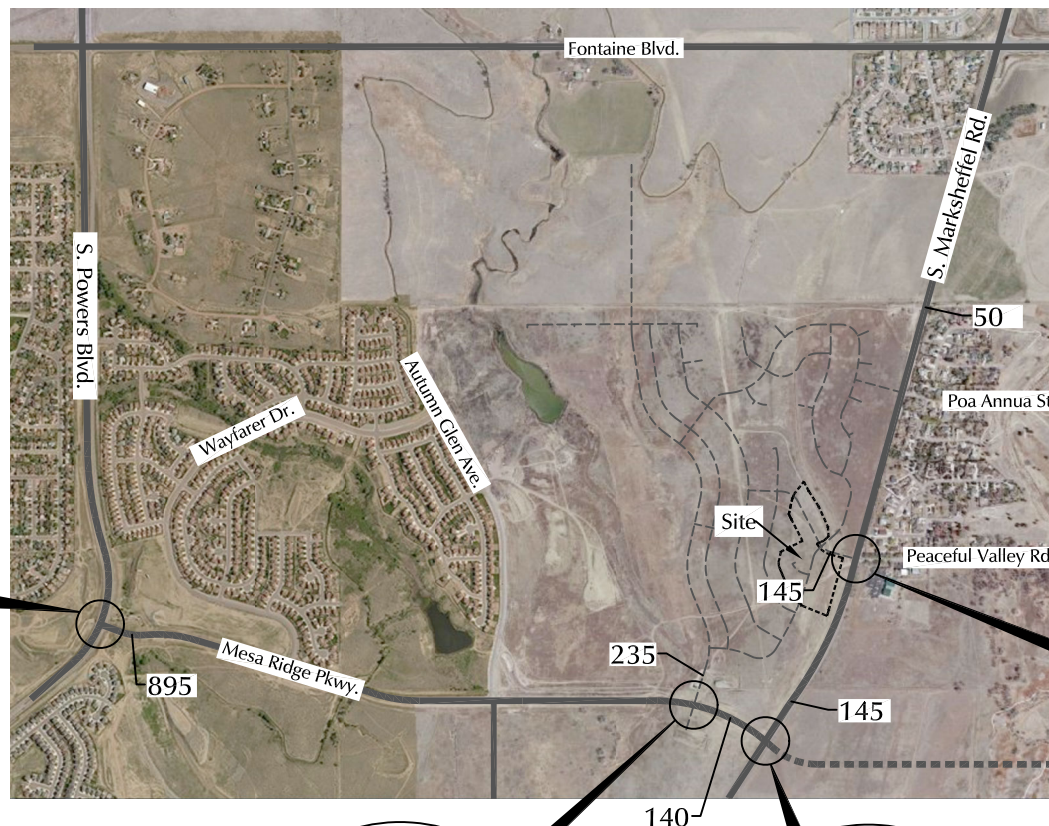
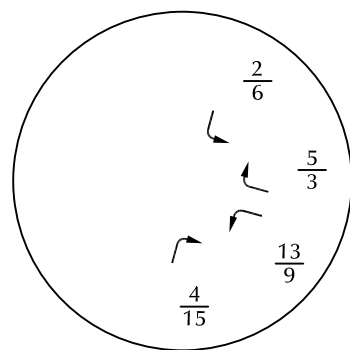
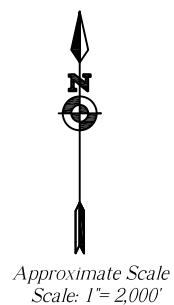

 XX% = Short-Term Percent Directional Distribution


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## Estimated Directional Distribution of Site-Generated Traffic

The Glen at Widefield Fil. 10 (LSC #194800)

Figure 5



LEGEND:

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

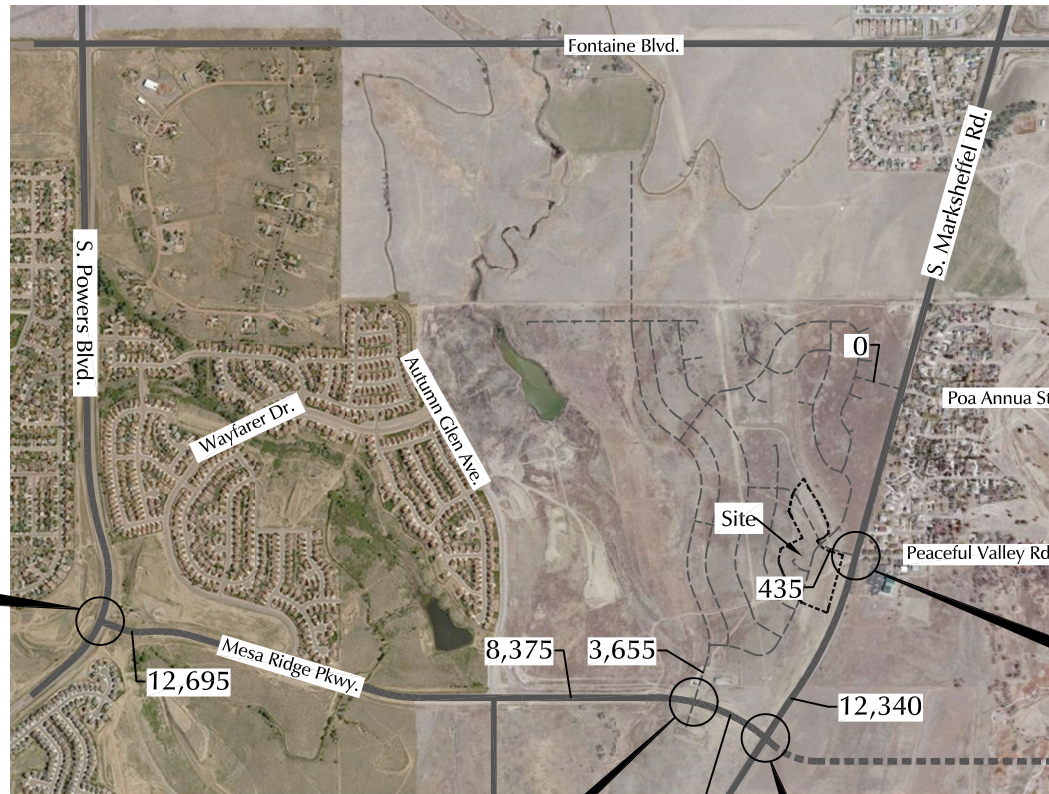
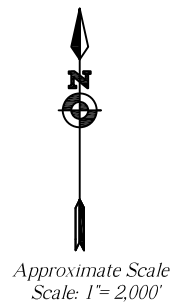
XXX = Average Weekday Traffic (vehicles per day)

Figure 6

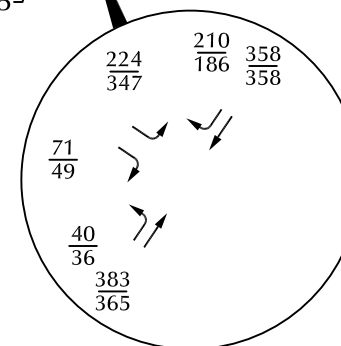
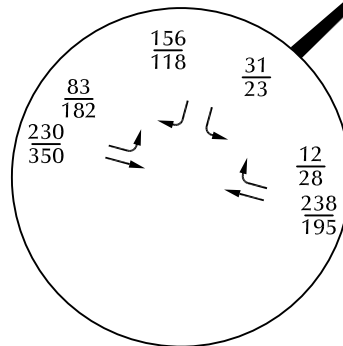
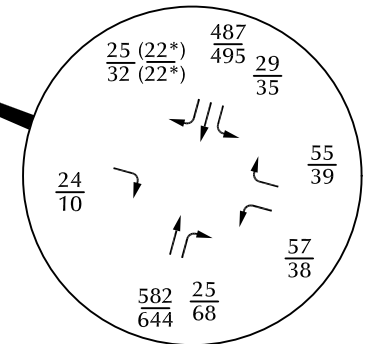
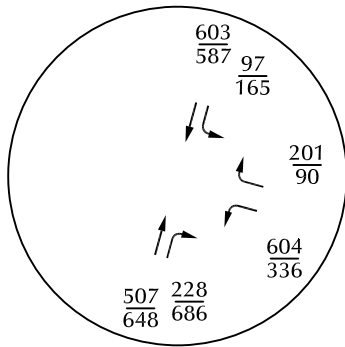
# Assignment of Site-Generated Traffic

The Glen at Widefield Fil. 10 (LSC #194800)





\*Volumes with Filing  
Nos 10 and 11 street  
connections.



#### LEGEND:

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

XXX = Average Weekday Traffic (vehicles per day)

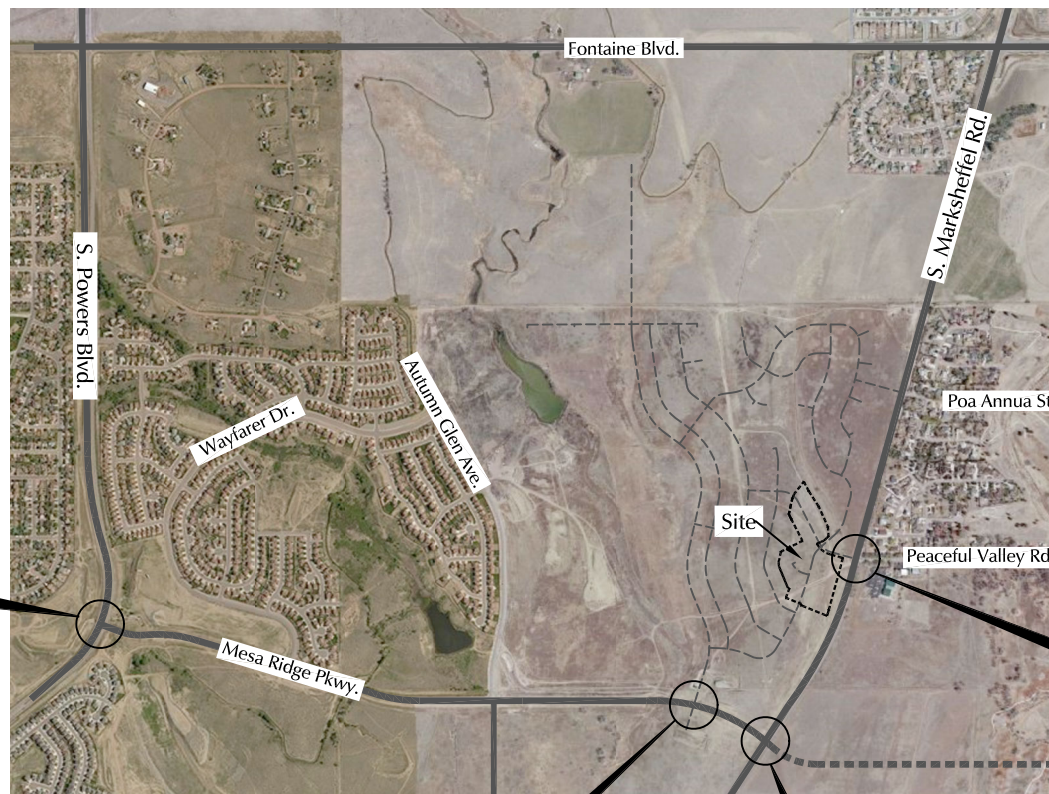
Figure 7a

## Short-Term Total Traffic

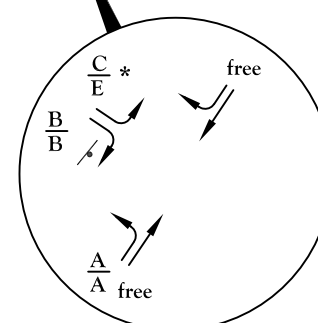
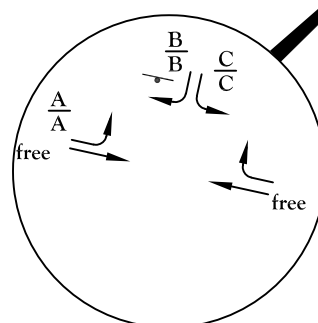
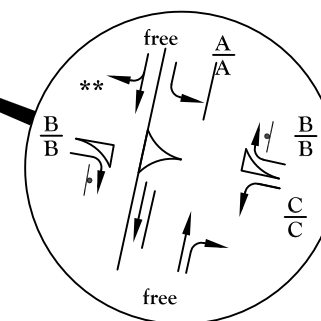
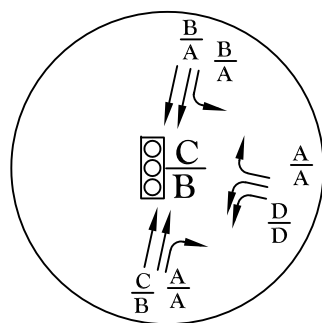
The Glen at Widefield Fil. 10 (LSC #194800)



Approximate Scale  
Scale: 1"= 2,000'



\*\* Note: Southbound right-turn lane not required if Filing Numbers 11 and 12 street network in place (shown in Figure 2).



# LEGEND:

⊥ = Stop Sign

⊞ = Traffic Signal

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

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

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

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



\*Projected to operate at LOS D if Marksheffel is restriped with a northbound acceleration lane.

Figure 7b

## Short-Term Total Lane Geometry, Traffic Control and Level of Service

The Glen at Widefield Fil. 10 (LSC #194800)

# Traffic Counts

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545 E Pikes Peak Ave, Suite 210  
Colorado Springs, CO 80905  
719-633-2868

File Name : Powers Blvd - Mesa Ridge Parkway AM 9-19

Site Code : 00194800

Start Date : 9/25/2019

Page No : 1

## Groups Printed- Unshifted

	Powers Blvd Southbound					Mesa Ridge Pkwy Westbound					Powers Blvd Northbound					Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
06:30 AM	9	137	0	0	146	114	0	32	0	146	0	109	29	0	138	0	0	0	0	0	430
06:45 AM	21	170	0	0	191	171	0	34	0	205	0	109	43	0	152	0	0	0	0	0	548
Total	30	307	0	0	337	285	0	66	0	351	0	218	72	0	290	0	0	0	0	0	978
07:00 AM	24	159	0	0	183	143	0	56	0	199	0	130	38	0	168	0	0	0	0	0	550
07:15 AM	18	115	0	0	133	112	0	48	0	160	0	119	65	0	184	0	0	0	0	0	477
07:30 AM	25	122	0	0	147	86	0	36	0	122	0	118	52	0	170	0	0	0	0	0	439
07:45 AM	14	118	0	0	132	94	0	41	0	135	0	96	46	0	142	0	0	0	0	0	409
Total	81	514	0	0	595	435	0	181	0	616	0	463	201	0	664	0	0	0	0	0	1875
08:00 AM	21	144	0	0	165	82	0	29	0	111	0	99	59	0	158	0	0	0	0	0	434
08:15 AM	14	151	0	0	165	105	0	23	0	128	0	70	43	0	113	0	0	0	0	0	406
Grand Total	146	1116	0	0	1262	907	0	299	0	1206	0	850	375	0	1225	0	0	0	0	0	3693
Apprch %	11.6	88.4	0	0		75.2	0	24.8	0		0	69.4	30.6	0		0	0	0	0		
Total %	4	30.2	0	0	34.2	24.6	0	8.1	0	32.7	0	23	10.2	0	33.2	0	0	0	0	0	



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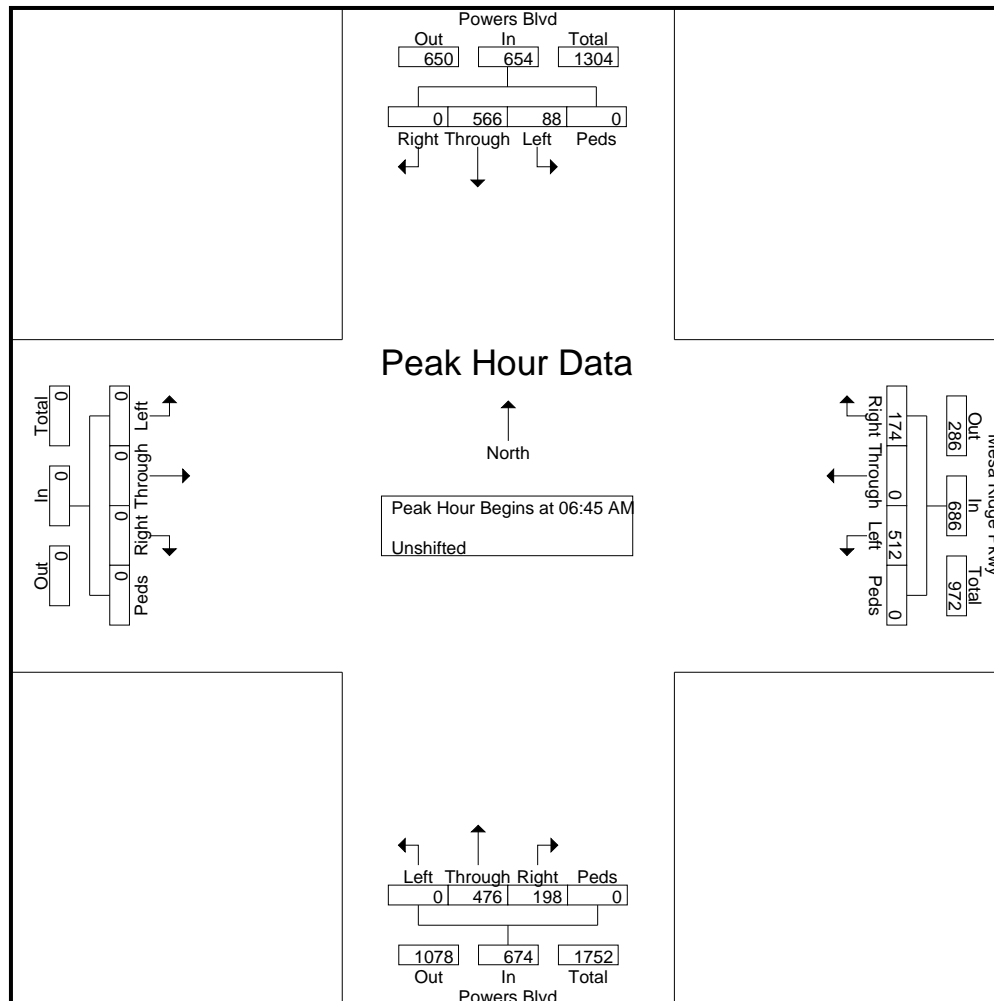
File Name : Powers Blvd - Mesa Ridge Parkway AM 9-19

Site Code : 00194800

Start Date : 9/25/2019

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	Powers Blvd Southbound					Mesa Ridge Pkwy Westbound					Powers Blvd Northbound					Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
<b>Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1</b>																					
Peak Hour for Entire Intersection Begins at 06:45 AM																					
06:45 AM	21	170	0	0	191	171	0	34	0	205	0	109	43	0	152	0	0	0	0	0	548
07:00 AM	24	159	0	0	183	143	0	56	0	199	0	130	38	0	168	0	0	0	0	0	550
07:15 AM	18	115	0	0	133	112	0	48	0	160	0	119	65	0	184	0	0	0	0	0	477
07:30 AM	25	122	0	0	147	86	0	36	0	122	0	118	52	0	170	0	0	0	0	0	439
Total Volume	88	566	0	0	654	512	0	174	0	686	0	476	198	0	674	0	0	0	0	0	2014
% App. Total	13.5	86.5	0	0		74.6	0	25.4	0		0	70.6	29.4	0		0	0	0	0	0	
PHF	.880	.832	.000	.000	.856	.749	.000	.777	.000	.837	.000	.915	.762	.000	.916	.000	.000	.000	.000	.000	.915





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## Groups Printed- Unshifted

	Powers Blvd Southbound					Mesa Ridge Pkwy Westbound					Powers Blvd Northbound					Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
04:00 PM	35	109	0	0	144	70	0	19	0	89	0	152	137	0	289	0	0	0	0	0	522
04:15 PM	37	137	0	0	174	61	0	24	0	85	0	146	145	0	291	0	0	0	0	0	550
04:30 PM	37	140	0	0	177	62	0	23	0	85	0	171	141	0	312	0	0	0	0	0	574
04:45 PM	29	138	0	0	167	77	0	14	0	91	0	147	140	0	287	0	0	0	0	0	545
Total	138	524	0	0	662	270	0	80	0	350	0	616	563	0	1179	0	0	0	0	0	2191
05:00 PM	30	112	0	0	142	78	0	18	0	96	0	160	137	0	297	0	0	0	0	0	535
05:15 PM	39	161	0	0	200	59	0	17	0	76	0	130	166	0	296	0	0	0	0	0	572
05:30 PM	33	147	0	0	180	61	0	17	0	78	0	161	128	0	289	0	0	0	0	0	547
05:45 PM	20	89	0	0	109	75	0	17	0	92	0	148	150	0	298	0	0	0	0	0	499
Total	122	509	0	0	631	273	0	69	0	342	0	599	581	0	1180	0	0	0	0	0	2153
Grand Total	260	1033	0	0	1293	543	0	149	0	692	0	1215	1144	0	2359	0	0	0	0	0	4344
Apprch %	20.1	79.9	0	0		78.5	0	21.5	0		0	51.5	48.5	0		0	0	0	0	0	
Total %	6	23.8	0	0	29.8	12.5	0	3.4	0	15.9	0	28	26.3	0	54.3	0	0	0	0	0	





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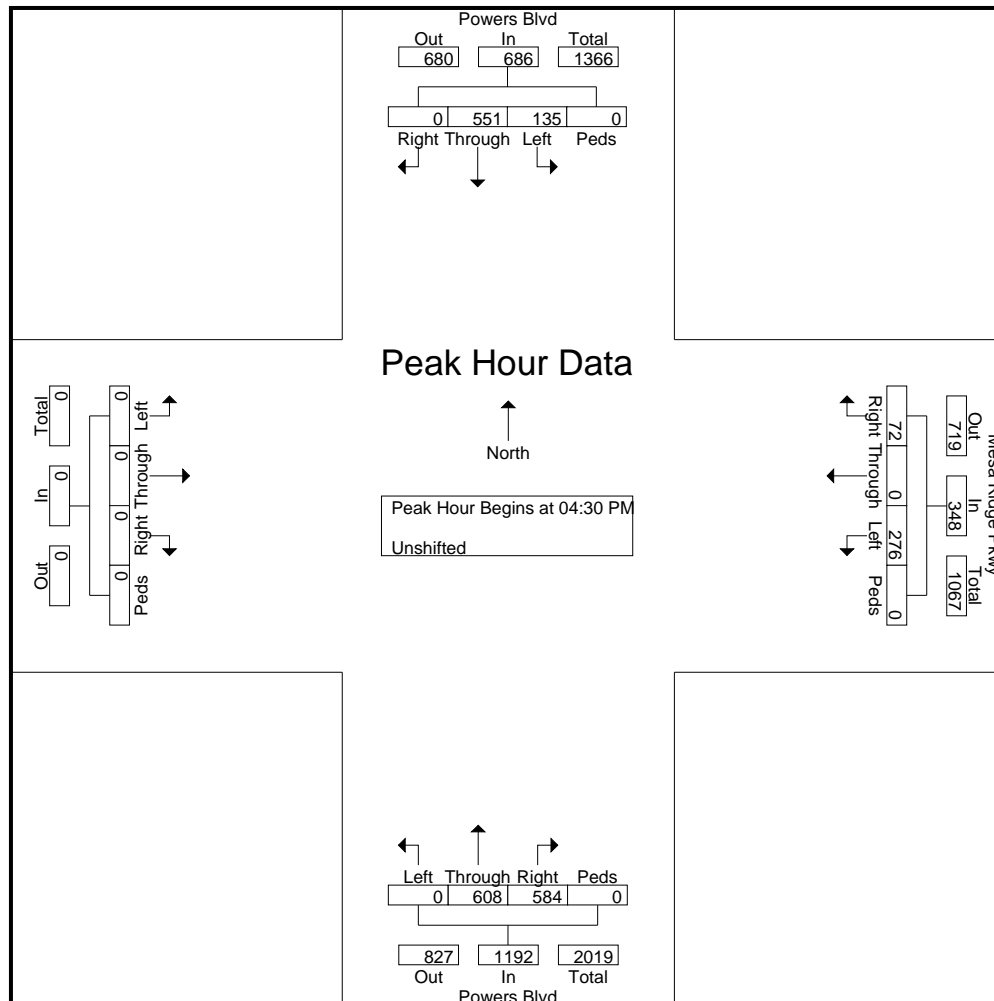
File Name : Powers Blvd - Mesa Ridge Parkway PM 9-19

Site Code : 00194800

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	Powers Blvd Southbound					Mesa Ridge Pkwy Westbound					Powers Blvd Northbound					Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
<b>Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1</b>																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	37	140	0	0	177	62	0	23	0	85	0	171	141	0	312	0	0	0	0	0	574
04:45 PM	29	138	0	0	167	77	0	14	0	91	0	147	140	0	287	0	0	0	0	0	545
05:00 PM	30	112	0	0	142	78	0	18	0	96	0	160	137	0	297	0	0	0	0	0	535
05:15 PM	39	161	0	0	200	59	0	17	0	76	0	130	166	0	296	0	0	0	0	0	572
Total Volume	135	551	0	0	686	276	0	72	0	348	0	608	584	0	1192	0	0	0	0	0	2226
% App. Total	19.7	80.3	0	0		79.3	0	20.7	0		0	51	49	0		0	0	0	0		
PHF	.865	.856	.000	.000	.858	.885	.000	.783	.000	.906	.000	.889	.880	.000	.955	.000	.000	.000	.000	.000	.970





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File Name : Spring Glen Dr - Mesa Ridge Pkwy AM

Site Code : 00194800

Start Date : 9/18/2019

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## Groups Printed- Unshifted

Start Time	Spring Glen Dr Southbound					Mesa Ridge Pkwy Westbound					Northbound					Mesa Ridge Pkwy Eastbound					Int. Total
	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	
06:30 AM	6	0	15	0	21	0	51	1	0	52	0	0	0	0	0	9	38	0	0	47	120
06:45 AM	4	0	21	0	25	0	47	4	0	51	0	0	0	0	0	10	58	0	0	68	144
Total	10	0	36	0	46	0	98	5	0	103	0	0	0	0	0	19	96	0	0	115	264
07:00 AM	7	0	21	0	28	0	58	1	0	59	0	0	0	0	0	12	52	0	0	64	151
07:15 AM	4	0	16	0	20	0	39	3	0	42	0	0	0	0	0	13	67	0	0	80	142
07:30 AM	8	0	11	0	19	0	38	1	0	39	0	0	0	0	0	7	52	0	0	59	117
07:45 AM	4	0	20	0	24	0	50	3	0	53	0	0	0	0	0	18	53	0	0	71	148
Total	23	0	68	0	91	0	185	8	0	193	0	0	0	0	0	50	224	0	0	274	558
08:00 AM	4	0	16	0	20	0	53	1	0	54	0	0	0	0	0	17	50	0	0	67	141
08:15 AM	0	0	13	0	13	0	38	1	0	39	0	0	0	0	0	14	53	0	0	67	119
Grand Total	37	0	133	0	170	0	374	15	0	389	0	0	0	0	0	100	423	0	0	523	1082
Apprch %	21.8	0	78.2	0		0	96.1	3.9	0		0	0	0	0		19.1	80.9	0	0		
Total %	3.4	0	12.3	0	15.7	0	34.6	1.4	0	36	0	0	0	0	0	9.2	39.1	0	0	48.3	





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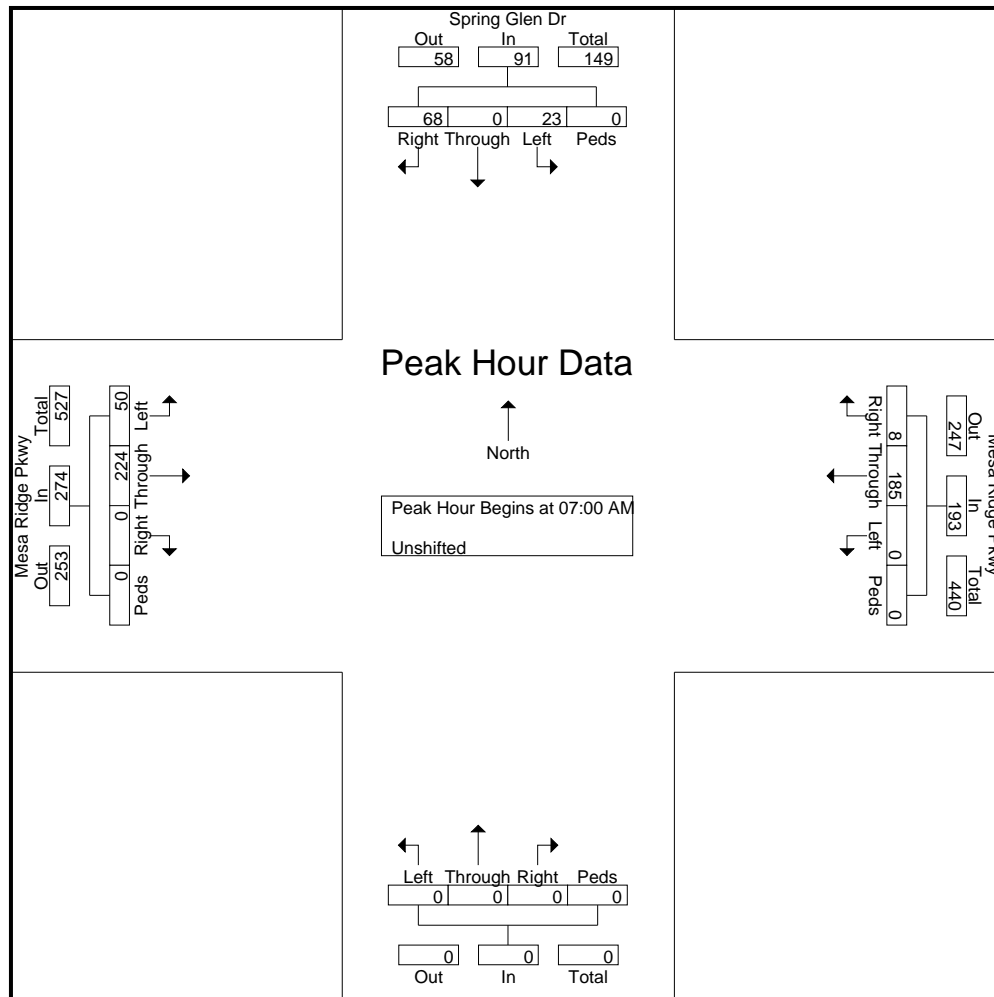
File Name : Spring Glen Dr - Mesa Ridge Pkwy AM

Site Code : 00194800

Start Date : 9/18/2019

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	Spring Glen Dr Southbound					Mesa Ridge Pkwy Westbound					Northbound					Mesa Ridge Pkwy Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
<b>Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1</b>																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	7	0	21	0	28	0	58	1	0	59	0	0	0	0	0	12	52	0	0	64	151
07:15 AM	4	0	16	0	20	0	39	3	0	42	0	0	0	0	0	13	67	0	0	80	142
07:30 AM	8	0	11	0	19	0	38	1	0	39	0	0	0	0	0	7	52	0	0	59	117
07:45 AM	4	0	20	0	24	0	50	3	0	53	0	0	0	0	0	18	53	0	0	71	148
Total Volume	23	0	68	0	91	0	185	8	0	193	0	0	0	0	0	50	224	0	0	274	558
% App. Total	25.3	0	74.7	0		0	95.9	4.1	0		0	0	0	0		18.2	81.8	0	0		
PHF	.719	.000	.810	.000	.813	.000	.797	.667	.000	.818	.000	.000	.000	.000	.000	.694	.836	.000	.000	.856	.924





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545 E Pikes Peak Ave, Suite 210

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719-633-2868

File Name : Spring Glen Dr - Mesa Ridge Pkwy PM

Site Code : 00194800

Start Date : 9/18/2019

Page No : 1

## Groups Printed- Unshifted

	Spring Glen Dr Southbound					Mesa Ridge Pkwy Westbound					Northbound					Mesa Ridge Pkwy Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
04:00 PM	5	0	10	0	15	0	41	1	0	42	0	0	0	0	0	22	67	0	0	89	146
04:15 PM	2	0	10	0	12	0	25	3	0	28	0	0	0	0	0	18	59	0	0	77	117
04:30 PM	1	0	16	0	17	0	32	5	0	37	0	0	0	0	0	20	77	0	0	97	151
04:45 PM	4	0	13	0	17	0	48	3	0	51	0	0	0	0	0	14	83	0	0	97	165
Total	12	0	49	0	61	0	146	12	0	158	0	0	0	0	0	74	286	0	0	360	579
05:00 PM	4	0	18	0	22	0	41	2	0	43	0	0	0	0	0	19	80	0	0	99	164
05:15 PM	5	0	16	0	21	0	38	8	0	46	0	0	0	0	0	13	85	0	0	98	165
05:30 PM	4	0	14	0	18	0	30	6	0	36	0	0	0	0	0	24	82	0	0	106	160
05:45 PM	2	0	13	0	15	0	52	5	0	57	0	0	0	0	0	20	67	0	0	87	159
Total	15	0	61	0	76	0	161	21	0	182	0	0	0	0	0	76	314	0	0	390	648
Grand Total	27	0	110	0	137	0	307	33	0	340	0	0	0	0	0	150	600	0	0	750	1227
Apprch %	19.7	0	80.3	0		0	90.3	9.7	0		0	0	0	0		20	80	0	0		
Total %	2.2	0	9	0	11.2	0	25	2.7	0	27.7	0	0	0	0		12.2	48.9	0	0	61.1	



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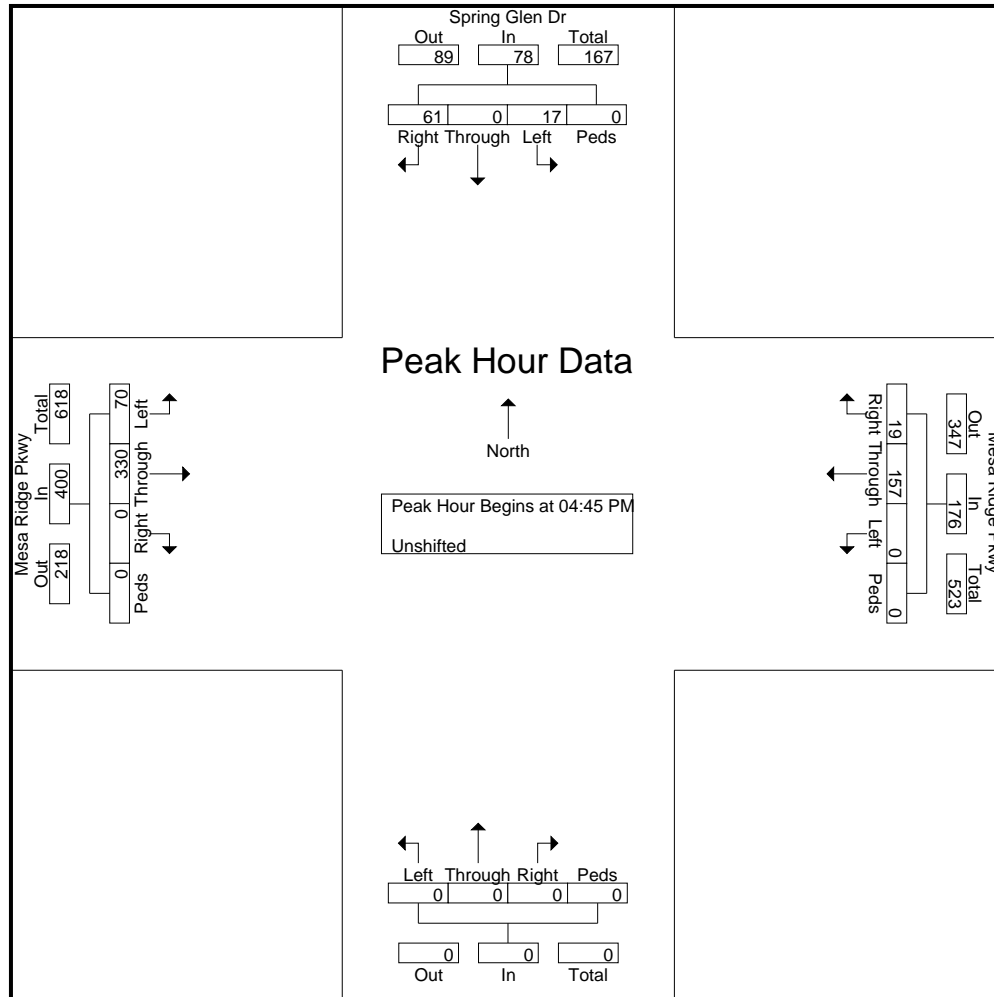
File Name : Spring Glen Dr - Mesa Ridge Pkwy PM

Site Code : 00194800

Start Date : 9/18/2019

Page No : 2

	Spring Glen Dr Southbound					Mesa Ridge Pkwy Westbound					Northbound					Mesa Ridge Pkwy Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
<b>Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1</b>																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	4	0	13	0	17	0	<b>48</b>	3	0	<b>51</b>	0	0	0	0	0	14	83	0	0	97	<b>165</b>
05:00 PM	4	0	<b>18</b>	0	<b>22</b>	0	41	2	0	43	0	0	0	0	0	19	80	0	0	99	164
05:15 PM	<b>5</b>	0	16	0	21	0	38	<b>8</b>	0	46	0	0	0	0	0	13	<b>85</b>	0	0	98	165
05:30 PM	4	0	14	0	18	0	30	6	0	36	0	0	0	0	0	<b>24</b>	82	0	0	<b>106</b>	160
Total Volume	17	0	61	0	78	0	157	19	0	176	0	0	0	0	0	70	330	0	0	400	654
% App. Total	21.8	0	78.2	0		0	89.2	10.8	0		0	0	0	0		17.5	82.5	0	0		
PHF	.850	.000	.847	.000	.886	.000	.818	.594	.000	.863	.000	.000	.000	.000	.000	.729	.971	.000	.000	.943	.991





File Name : marksheffel rd - mesa ridge pkwy am 9-19

Site Code : 00194800

Start Date : 9/25/2019

Page No : 1

Groups Printed- Unshifted

	Marksheffel Rd Southbound					Westbound					Marksheffel Rd Northbound					Mesa Ridge Pkwy Eastbound					
06:30 AM	0	63	55	1	119	0	0	0	0	0	4	71	0	0	75	27	0	7	0	34	228
06:45 AM	0	64	53	0	117	0	0	0	0	0	9	93	0	0	102	43	0	13	0	56	275
Total	0	127	108	1	236	0	0	0	0	0	13	164	0	0	177	70	0	20	0	90	503
07:00 AM	0	66	52	0	118	0	0	0	0	0	7	97	0	0	104	35	0	20	0	55	277
07:15 AM	0	60	38	0	98	0	0	0	0	0	13	86	0	0	99	48	0	18	0	66	263
07:30 AM	0	53	35	0	88	0	0	0	0	0	8	81	0	0	89	43	0	16	0	59	236
07:45 AM	0	53	36	0	89	0	0	0	0	0	6	61	0	0	67	37	0	12	0	49	205
Total	0	232	161	0	393	0	0	0	0	0	34	325	0	0	359	163	0	66	0	229	981
08:00 AM	0	32	48	0	80	0	0	0	0	0	10	68	0	0	78	37	0	8	0	45	203
08:15 AM	0	34	54	0	88	0	0	0	0	0	4	44	0	0	48	36	0	3	0	39	175
	0	425	371	1	797	0	0	0	0	0	61	601	0	0	662	306	0	97	0	403	1862
Apprch %	0			0.1		0	0	0	0	0	9.2		0	0			0		0		
Total %	0			0.1	42.8	0	0	0	0	0	3.3		0	0	35.6		0	5.2	0	21.6	



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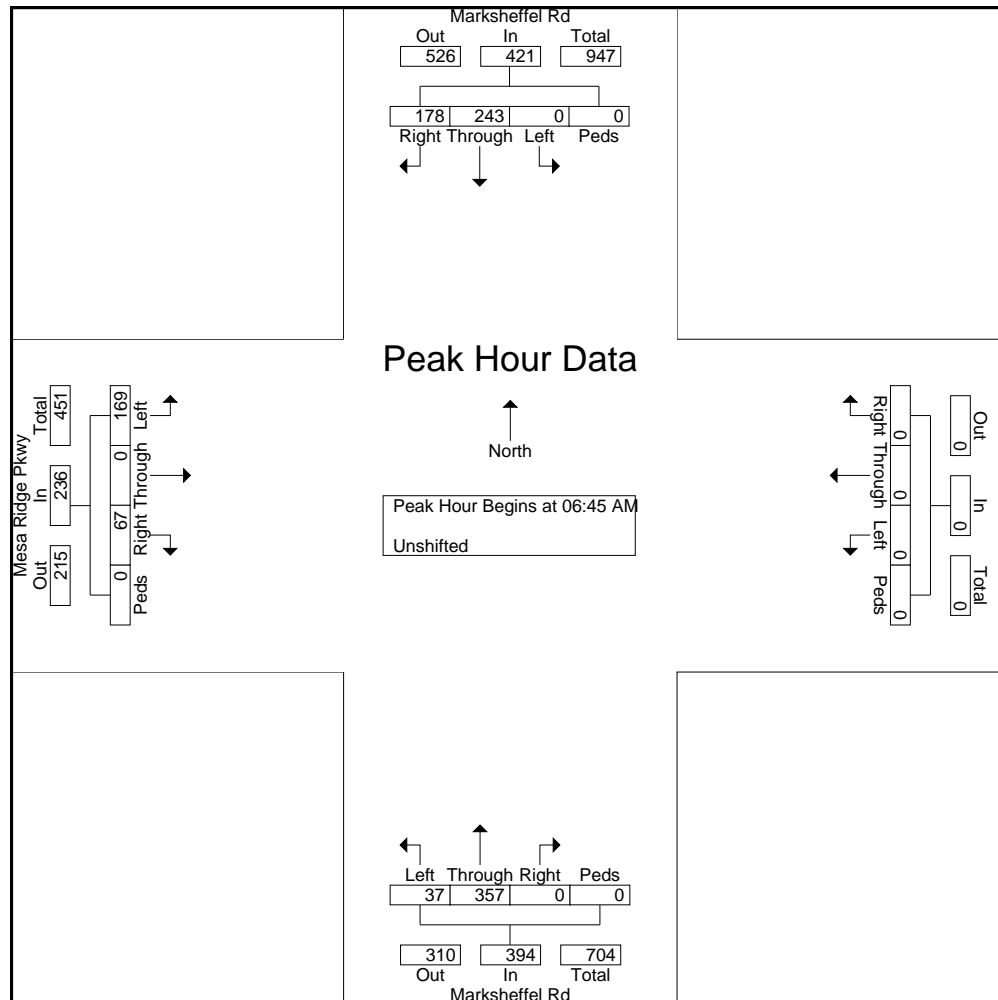
File Name : marksheffel rd - mesa ridge pkwy am 9-19

Site Code : 00194800

Start Date : 9/25/2019

Page No : 2

	Marksheffel Rd Southbound					Westbound					Marksheffel Rd Northbound					Mesa Ridge Pkwy Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
<b>Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1</b>																					
Peak Hour for Entire Intersection Begins at 06:45 AM																					
06:45 AM	0	64	53	0	117	0	0	0	0	0	9	93	0	0	102	43	0	13	0	56	275
07:00 AM	0	66	52	0	118	0	0	0	0	0	7	97	0	0	104	35	0	20	0	55	277
07:15 AM	0	60	38	0	98	0	0	0	0	0	13	86	0	0	99	48	0	18	0	66	263
07:30 AM	0	53	35	0	88	0	0	0	0	0	8	81	0	0	89	43	0	16	0	59	236
Total Volume	0	243	178	0	421	0	0	0	0	0	37	357	0	0	394	169	0	67	0	236	1051
% App. Total	0	57.7	42.3	0		0	0	0	0		9.4	90.6	0	0		71.6	0	28.4	0		
PHF	.000	.920	.840	.000	.892	.000	.000	.000	.000	.000	.712	.920	.000	.000	.947	.880	.000	.838	.000	.894	.949





# LSC Transportation Consultants, Inc.

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File Name : Marksheffel Rd - Mesa Ridge Pkwy PM 9-19

Site Code : 00194800

Start Date : 9/25/2019

Page No : 1

## Groups Printed- Unshifted

Start Time	Marksheffel Rd Southbound					Westbound					Marksheffel Rd Northbound					Mesa Ridge Pkwy Eastbound					Int. Total
	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	
04:00 PM	0	56	39	0	95	0	0	0	0	0	5	76	0	0	81	67	0	11	0	78	254
04:15 PM	0	76	43	0	119	0	0	0	0	0	8	37	0	0	45	70	0	11	0	81	245
04:30 PM	0	66	41	0	107	0	0	0	0	0	12	51	0	0	63	76	0	12	0	88	258
04:45 PM	0	77	51	0	128	0	0	0	0	0	5	53	0	0	58	83	0	5	0	88	274
Total	0	275	174	0	449	0	0	0	0	0	30	217	0	0	247	296	0	39	0	335	1031
05:00 PM	0	70	39	0	109	0	0	0	0	0	8	52	0	0	60	60	0	7	0	67	236
05:15 PM	0	85	33	0	118	0	0	0	0	0	4	73	0	0	77	66	0	8	0	74	269
05:30 PM	0	57	45	0	102	0	0	0	0	0	10	52	0	0	62	62	0	9	0	71	235
05:45 PM	0	60	36	0	96	0	0	0	0	0	9	41	0	0	50	60	0	14	0	74	220
Total	0	272	153	0	425	0	0	0	0	0	31	218	0	0	249	248	0	38	0	286	960
Grand Total	0	547	327	0	874	0	0	0	0	0	61	435	0	0	496	544	0	77	0	621	1991
Apprch %	0	62.6	37.4	0		0	0	0	0		12.3	87.7	0	0		87.6	0	12.4	0		
Total %	0	27.5	16.4	0	43.9	0	0	0	0	0	3.1	21.8	0	0	24.9	27.3	0	3.9	0	31.2	



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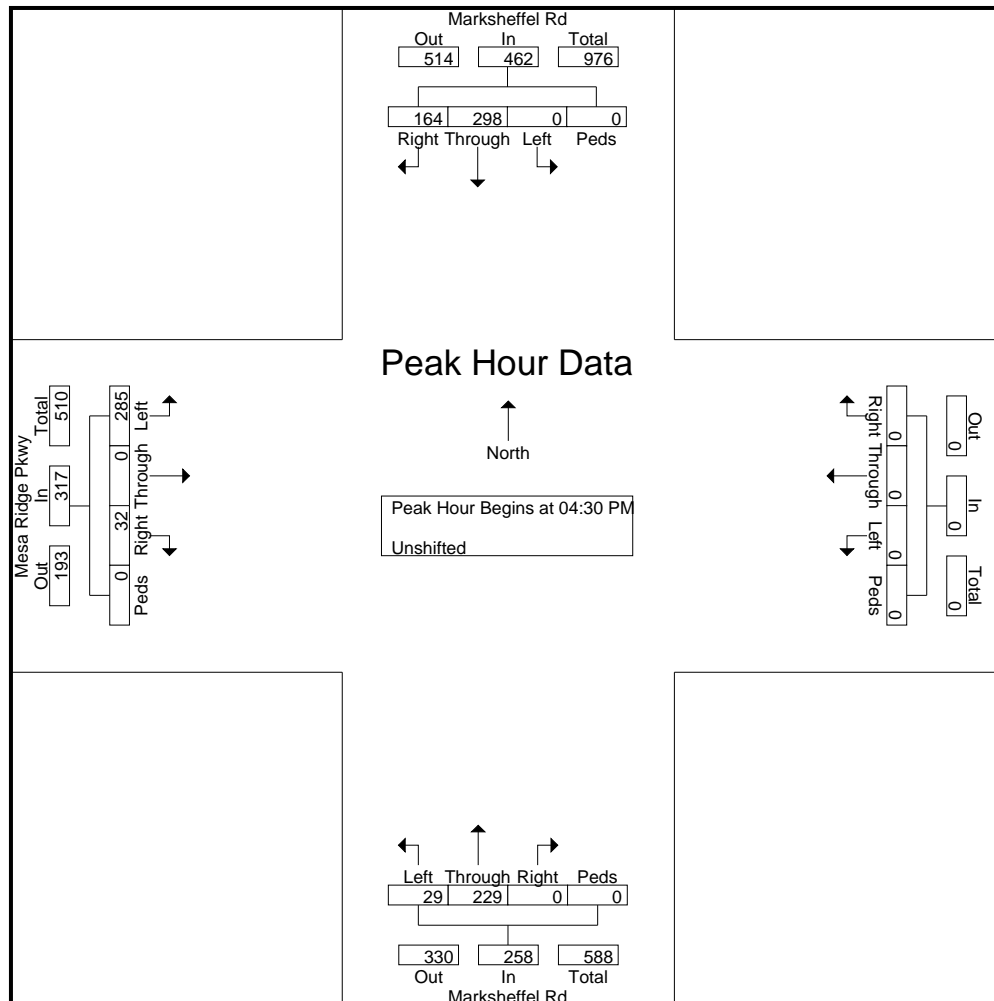
File Name : Marksheffel Rd - Mesa Ridge Pkwy PM 9-19

Site Code : 00194800

Start Date : 9/25/2019

Page No : 2

	Marksheffel Rd Southbound					Westbound					Marksheffel Rd Northbound					Mesa Ridge Pkwy Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
<b>Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1</b>																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	66	41	0	107	0	0	0	0	0	12	51	0	0	63	76	0	12	0	88	258
04:45 PM	0	77	51	0	128	0	0	0	0	0	5	53	0	0	58	83	0	5	0	88	274
05:00 PM	0	70	39	0	109	0	0	0	0	0	8	52	0	0	60	60	0	7	0	67	236
05:15 PM	0	85	33	0	118	0	0	0	0	0	4	73	0	0	77	66	0	8	0	74	269
Total Volume	0	298	164	0	462	0	0	0	0	0	29	229	0	0	258	285	0	32	0	317	1037
% App. Total	0	64.5	35.5	0		0	0	0	0		11.2	88.8	0	0		89.9	0	10.1	0		
PHF	.000	.876	.804	.000	.902	.000	.000	.000	.000	.000	.604	.784	.000	.000	.838	.858	.000	.667	.000	.901	.946





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File Name : Marksheffel Rd - Peaceful Valley Rd AM 9-19

Site Code : 194800

Start Date : 9/12/2019

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## Groups Printed- Unshifted

	Marksheffel Rd Southbound					Peaceful Valley Rd Westbound					Marksheffel Rd Northbound					Peaceful Valley Rd Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
06:30 AM	3	72	4	0	79	8	0	7	0	15	0	94	3	0	97	7	0	1	0	8	199
06:45 AM	5	110	5	0	120	13	1	12	0	26	0	107	6	0	113	4	0	2	0	6	265
Total	8	182	9	0	199	21	1	19	0	41	0	201	9	0	210	11	0	3	0	14	464
07:00 AM	6	112	2	0	120	25	0	12	0	37	0	139	2	0	141	1	0	2	0	3	301
07:15 AM	7	92	5	0	104	12	0	12	0	24	2	147	9	0	158	13	1	3	0	17	303
07:30 AM	11	108	8	0	127	6	0	19	0	25	0	131	7	0	138	3	0	1	0	4	294
07:45 AM	13	77	3	0	93	6	0	6	0	12	0	98	12	0	110	3	0	1	0	4	219
Total	37	389	18	0	444	49	0	49	0	98	2	515	30	0	547	20	1	7	0	28	1117
08:00 AM	15	68	12	0	95	17	0	10	0	27	0	93	16	0	109	1	1	0	0	2	233
08:15 AM	23	69	2	0	94	24	0	16	0	40	0	45	25	0	70	1	0	0	0	1	205
Grand Total	83	708	41	0	832	111	1	94	0	206	2	854	80	0	936	33	2	10	0	45	2019
Apprch %	10	85.1	4.9	0		53.9	0.5	45.6	0		0.2	91.2	8.5	0		73.3	4.4	22.2	0		
Total %	4.1	35.1	2	0	41.2	5.5	0	4.7	0	10.2	0.1	42.3	4	0	46.4	1.6	0.1	0.5	0	2.2	





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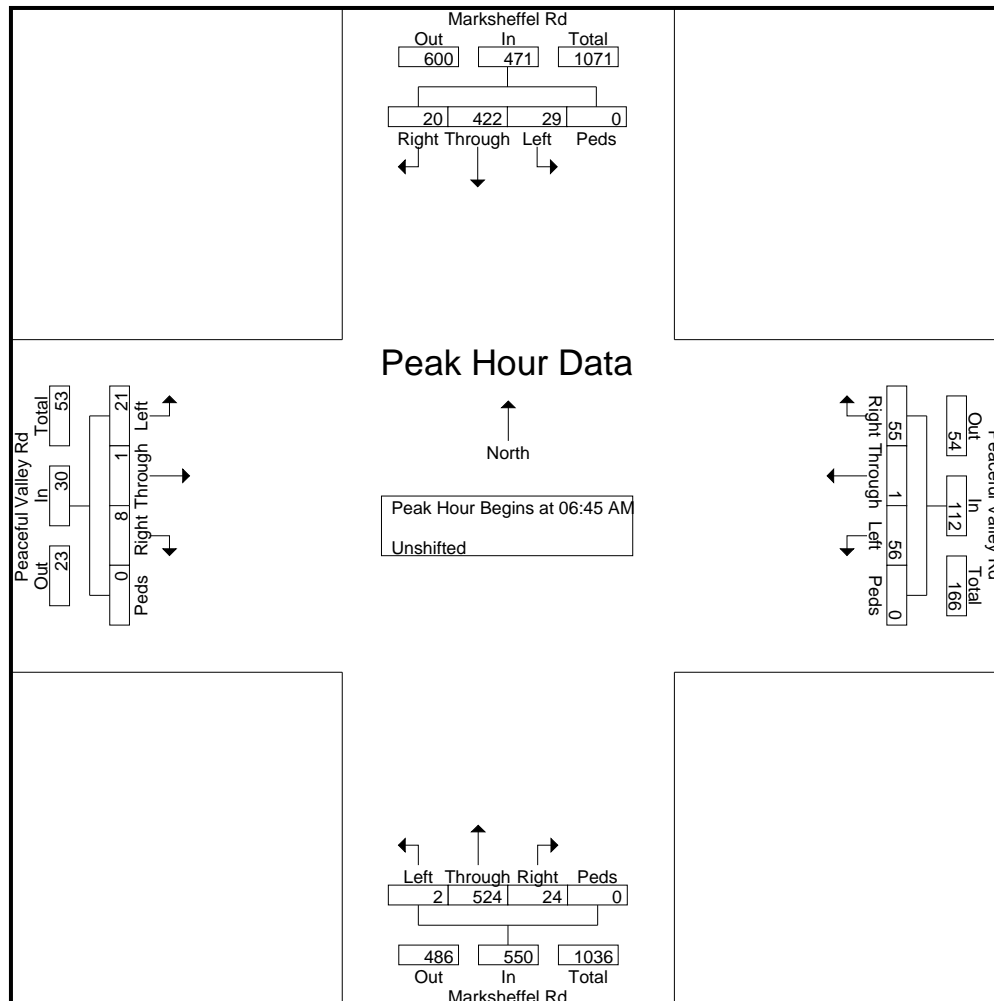
File Name : Marksheffel Rd - Peaceful Valley Rd AM 9-19

Site Code : 194800

Start Date : 9/12/2019

Page No : 2

	Marksheffel Rd Southbound					Peaceful Valley Rd Westbound					Marksheffel Rd Northbound					Peaceful Valley Rd Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
<b>Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1</b>																					
Peak Hour for Entire Intersection Begins at 06:45 AM																					
06:45 AM	5	110	5	0	120	13	1	12	0	26	0	107	6	0	113	4	0	2	0	6	265
07:00 AM	6	112	2	0	120	25	0	12	0	37	0	139	2	0	141	1	0	2	0	3	301
07:15 AM	7	92	5	0	104	12	0	12	0	24	2	147	9	0	158	13	1	3	0	17	303
07:30 AM	11	108	8	0	127	6	0	19	0	25	0	131	7	0	138	3	0	1	0	4	294
Total Volume	29	422	20	0	471	56	1	55	0	112	2	524	24	0	550	21	1	8	0	30	1163
% App. Total	6.2	89.6	4.2	0		50	0.9	49.1	0		0.4	95.3	4.4	0		70	3.3	26.7	0		
PHF	.659	.942	.625	.000	.927	.560	.250	.724	.000	.757	.250	.891	.667	.000	.870	.404	.250	.667	.000	.441	.960





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File Name : Marksheffel Rd - Peaceful Valley Rd PM 9-19

Site Code : 00194800

Start Date : 9/12/2019

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## Groups Printed- Unshifted

	Marksheffel Rd Southbound					Peaceful Valley Rd Westbound					Marksheffel Rd Northbound					Peaceful Valley Rd Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
04:00 PM	9	94	2	0	105	5	0	6	0	11	1	107	9	0	117	1	0	0	0	1	234
04:15 PM	19	120	3	0	142	5	0	7	0	12	0	118	14	0	132	5	1	0	0	6	292
04:30 PM	7	91	2	0	100	10	1	13	0	24	1	130	15	0	146	3	1	0	0	4	274
04:45 PM	3	110	6	0	119	11	0	8	0	19	1	109	20	0	130	3	0	0	0	3	271
Total	38	415	13	0	466	31	1	34	0	66	3	464	58	0	525	12	2	0	0	14	1071
05:00 PM	6	105	3	0	114	11	0	11	0	22	0	104	17	0	121	4	0	0	0	4	261
05:15 PM	7	94	4	0	105	9	0	8	0	17	0	121	22	0	143	1	0	0	0	1	266
05:30 PM	8	98	2	0	108	7	0	7	0	14	0	97	9	0	106	0	0	0	0	0	228
05:45 PM	6	98	1	0	105	6	0	9	0	15	1	100	11	0	112	3	1	1	0	5	237
Total	27	395	10	0	432	33	0	35	0	68	1	422	59	0	482	8	1	1	0	10	992
Grand Total	65	810	23	0	898	64	1	69	0	134	4	886	117	0	1007	20	3	1	0	24	2063
Apprch %	7.2	90.2	2.6	0		47.8	0.7	51.5	0		0.4	88	11.6	0		83.3	12.5	4.2	0		
Total %	3.2	39.3	1.1	0	43.5	3.1	0	3.3	0	6.5	0.2	42.9	5.7	0	48.8	1	0.1	0	0	1.2	



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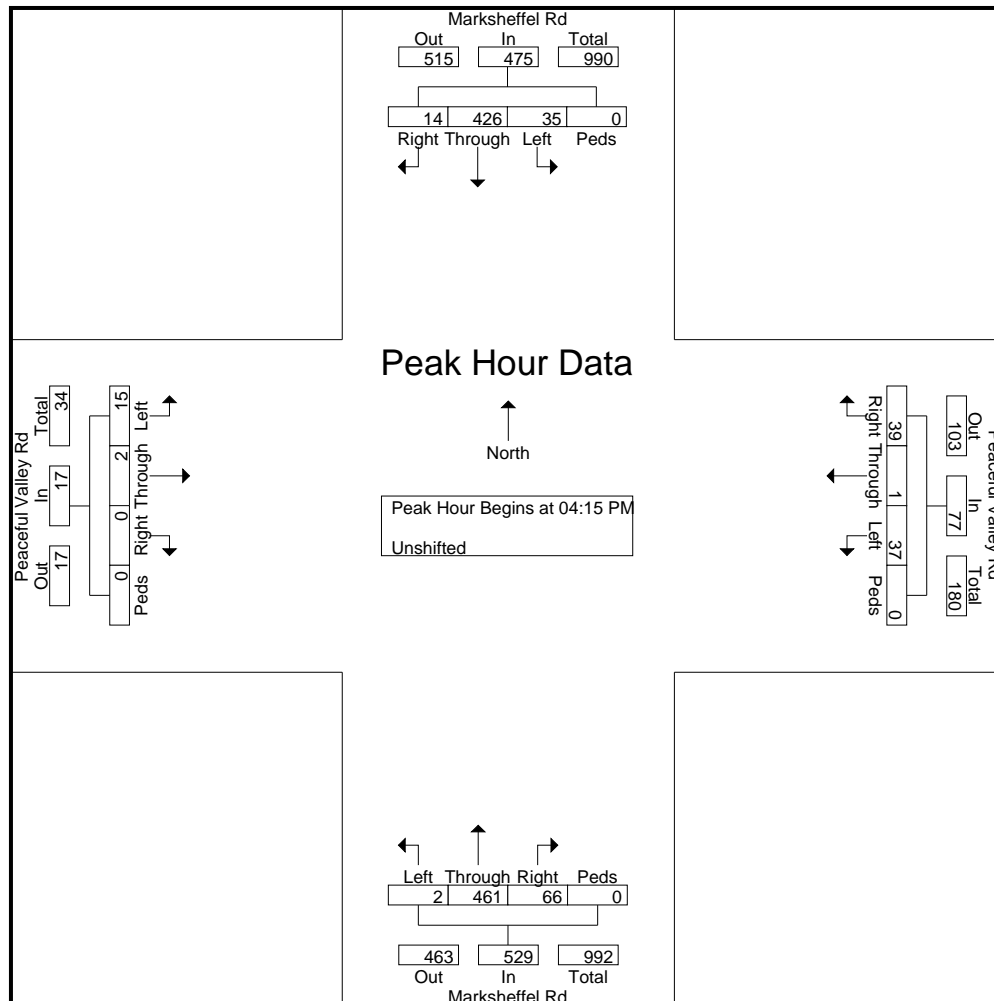
File Name : Marksheffel Rd - Peaceful Valley Rd PM 9-19

Site Code : 00194800

Start Date : 9/12/2019

Page No : 2

	Marksheffel Rd Southbound					Peaceful Valley Rd Westbound					Marksheffel Rd Northbound					Peaceful Valley Rd Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
<b>Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1</b>																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	19	120	3	0	142	5	0	7	0	12	0	118	14	0	132	5	1	0	0	6	292
04:30 PM	7	91	2	0	100	10	1	13	0	24	1	130	15	0	146	3	1	0	0	4	274
04:45 PM	3	110	6	0	119	11	0	8	0	19	1	109	20	0	130	3	0	0	0	3	271
05:00 PM	6	105	3	0	114	11	0	11	0	22	0	104	17	0	121	4	0	0	0	4	261
Total Volume	35	426	14	0	475	37	1	39	0	77	2	461	66	0	529	15	2	0	0	17	1098
% App. Total	7.4	89.7	2.9	0		48.1	1.3	50.6	0		0.4	87.1	12.5	0		88.2	11.8	0	0		
PHF	.461	.888	.583	.000	.836	.841	.250	.750	.000	.802	.500	.887	.825	.000	.906	.750	.500	.000	.000	.708	.940



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File Name : Marksheffel Rd - Poa Annua St AM

Site Code : 00194800

Start Date : 2/27/2020

Page No : 1

## Groups Printed- Unshifted

Start Time	Marksheffel Rd Southbound					Poa Annua St Westbound					Marksheffel Rd Northbound					Eastbound					Int. Total
	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	
06:30 AM	0	96	0	0	96	1	0	1	0	2	0	111	0	0	111	0	0	0	0	0	209
06:45 AM	0	129	0	0	129	3	0	4	0	7	0	130	0	0	130	0	0	0	0	0	266
Total	0	225	0	0	225	4	0	5	0	9	0	241	0	0	241	0	0	0	0	0	475
07:00 AM	0	118	0	0	118	3	0	5	0	8	0	174	0	0	174	0	0	0	0	0	300
07:15 AM	2	110	0	0	112	1	0	7	0	8	0	150	1	0	151	0	0	0	0	0	271
07:30 AM	2	108	0	0	110	3	0	5	0	8	0	125	0	0	125	0	0	0	0	0	243
07:45 AM	2	104	0	0	106	1	0	5	0	6	0	107	0	0	107	0	0	0	0	0	219
Total	6	440	0	0	446	8	0	22	0	30	0	556	1	0	557	0	0	0	0	0	1033
08:00 AM	3	107	0	0	110	2	0	1	0	3	0	90	0	0	90	0	0	0	0	0	203
08:15 AM	0	92	0	0	92	0	0	2	0	2	0	85	0	0	85	0	0	0	0	0	179
Grand Total	9	864	0	0	873	14	0	30	0	44	0	972	1	0	973	0	0	0	0	0	1890
Apprch %	1	99	0	0		31.8	0	68.2	0		0	99.9	0.1	0		0	0	0	0		
Total %	0.5	45.7	0	0	46.2	0.7	0	1.6	0	2.3	0	51.4	0.1	0	51.5	0	0	0	0	0	

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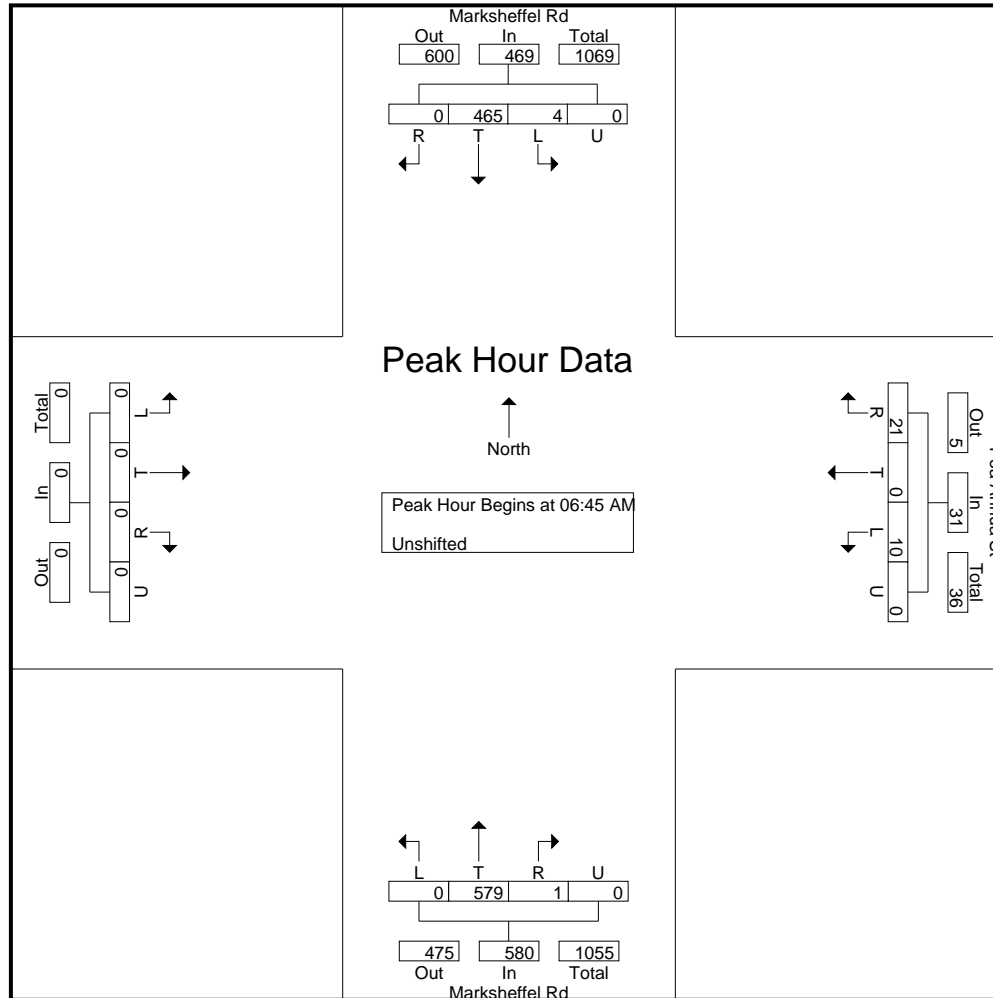
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File Name : Marksheffel Rd - Poa Annua St AM

Site Code : 00194800

Start Date : 2/27/2020

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719-633-2868

File Name : Marksheffel Rd - Poa Annua St PM  
Site Code : 00194800  
Start Date : 2/27/2020  
Page No : 1

## Groups Printed- Unshifted

	Marksheffel Rd Southbound					Poa Annua St Westbound					Marksheffel Rd Northbound					Eastbound					
Start Time	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	Int. Total
04:00 PM	4	123	0	0	127	0	0	3	0	3	0	135	2	0	137	0	0	0	0	0	267
04:15 PM	5	134	0	0	139	0	0	0	0	0	0	141	0	0	141	0	0	0	0	0	280
04:30 PM	4	117	0	0	121	0	0	0	0	0	0	165	0	0	165	0	0	0	0	0	286
04:45 PM	2	125	0	0	127	1	0	0	0	1	0	152	1	0	153	0	0	0	0	0	281
Total	15	499	0	0	514	1	0	3	0	4	0	593	3	0	596	0	0	0	0	0	1114
05:00 PM	1	118	0	0	119	0	0	2	0	2	0	145	0	0	145	0	0	0	0	0	266
05:15 PM	1	142	0	0	143	1	0	1	0	2	0	138	2	0	140	0	0	0	0	0	285
05:30 PM	3	112	0	0	115	0	0	2	0	2	0	136	0	0	136	0	0	0	0	0	253
05:45 PM	2	105	0	0	107	1	0	1	0	2	0	127	1	0	128	0	0	0	0	0	237
Total	7	477	0	0	484	2	0	6	0	8	0	546	3	0	549	0	0	0	0	0	1041
Grand Total	22	976	0	0	998	3	0	9	0	12	0	1139	6	0	1145	0	0	0	0	0	2155
Apprch %	2.2	97.8	0	0		25	0	75	0		0	99.5	0.5	0		0	0	0	0		
Total %	1	45.3	0	0	46.3	0.1	0	0.4	0	0.6	0	52.9	0.3	0	53.1	0	0	0	0	0	

# LSC Transportation Consultants, Inc.

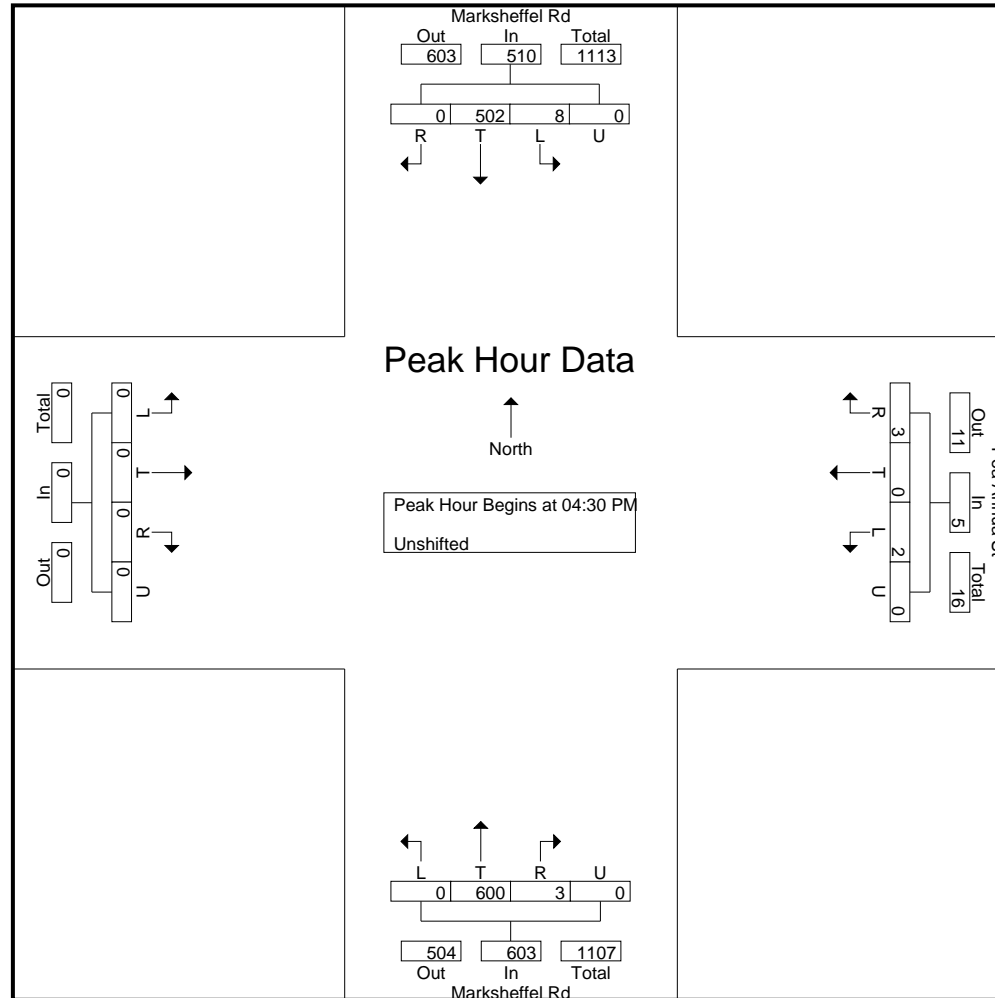
545 E Pikes Peak Ave, Suite 210  
Colorado Springs, CO 80905  
719-633-2868

File Name : Marksheffel Rd - Poa Annua St PM

Site Code : 00194800

Start Date : 2/27/2020

Page No : 3



# LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210  
Colorado Springs, CO 80905  
719-633-2868

File Name : Marksheffel Rd - Lorson Blvd AM  
Site Code : 00204050  
Start Date : 5/28/2020  
Page No : 1

## Groups Printed- Unshifted

Start Time	Marksheffel Rd Southbound					Lorson Blvd Westbound					Marksheffel Rd Northbound					Eastbound					Int. Total
	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	
06:30 AM	1	32	0	0	33	7	0	7	0	14	0	74	6	0	80	0	0	0	0	0	127
06:45 AM	2	33	0	0	35	18	0	4	0	22	0	63	4	0	67	0	0	0	0	0	124
Total	3	65	0	0	68	25	0	11	0	36	0	137	10	0	147	0	0	0	0	0	251
07:00 AM	0	54	0	0	54	15	0	3	0	18	0	64	10	0	74	0	0	0	0	0	146
07:15 AM	0	52	0	0	52	15	0	4	0	19	0	80	4	0	84	0	0	0	0	0	155
07:30 AM	1	46	0	0	47	22	0	7	0	29	0	91	12	0	103	0	0	0	0	0	179
07:45 AM	0	56	0	0	56	17	0	5	0	22	0	74	8	0	82	0	0	0	0	0	160
Total	1	208	0	0	209	69	0	19	0	88	0	309	34	0	343	0	0	0	0	0	640
08:00 AM	1	66	0	0	67	22	0	4	0	26	0	55	8	0	63	0	0	0	0	0	156
08:15 AM	1	63	0	0	64	12	0	5	0	17	0	58	10	0	68	0	0	0	0	0	149
Grand Total	6	402	0	0	408	128	0	39	0	167	0	559	62	0	621	0	0	0	0	0	1196
Apprch %	1.5	98.5	0	0		76.6	0	23.4	0		0	90	10	0		0	0	0	0		
Total %	0.5	33.6	0	0	34.1	10.7	0	3.3	0	14	0	46.7	5.2	0	51.9	0	0	0	0	0	



# LSC Transportation Consultants, Inc.

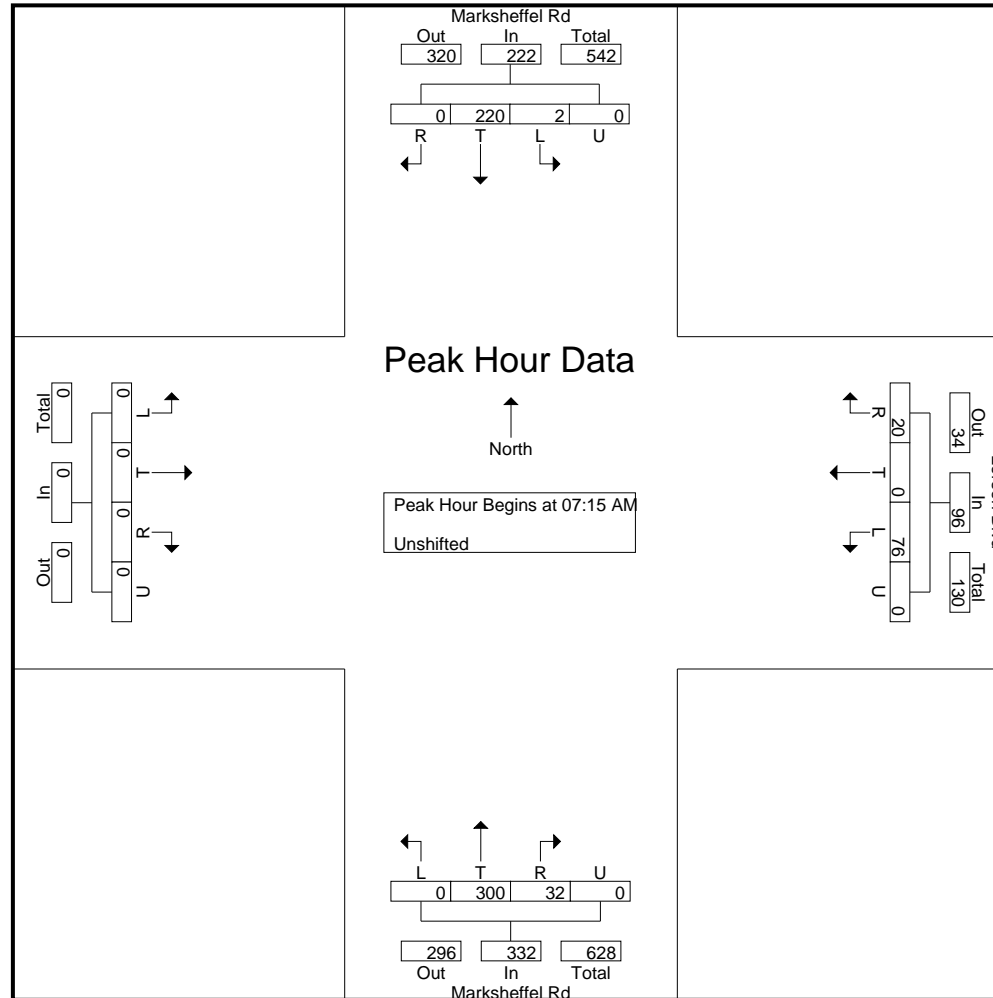
545 E Pikes Peak Ave, Suite 210  
Colorado Springs, CO 80905  
719-633-2868

File Name : Marksheffel Rd - Lorson Blvd AM

Site Code : 00204050

Start Date : 5/28/2020

Page No : 3



# LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210  
Colorado Springs, CO 80905  
719-633-2868

File Name : Marksheffel Rd - Lorson Blvd PM  
Site Code : 00204050  
Start Date : 5/28/2020  
Page No : 1

## Groups Printed- Unshifted

	Marksheffel Rd Southbound					Lorson Blvd Westbound					Marksheffel Rd Northbound					Eastbound					
Start Time	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	Int. Total
04:00 PM	3	71	0	0	74	12	0	2	0	14	0	98	23	0	121	0	0	0	0	0	209
04:15 PM	5	94	0	0	99	14	0	6	0	20	0	98	31	0	129	0	0	0	0	0	248
04:30 PM	4	95	0	0	99	9	0	3	0	12	0	98	27	0	125	0	0	0	0	0	236
04:45 PM	2	91	0	0	93	15	0	4	0	19	0	83	29	0	112	0	0	0	0	0	224
Total	14	351	0	0	365	50	0	15	0	65	0	377	110	0	487	0	0	0	0	0	917
05:00 PM	2	94	0	0	96	20	0	4	0	24	0	94	28	0	122	0	0	0	0	0	242
05:15 PM	6	88	0	0	94	13	0	4	0	17	0	97	25	0	122	0	0	0	0	0	233
05:30 PM	6	97	0	0	103	12	0	4	0	16	0	92	41	0	133	0	0	0	0	0	252
05:45 PM	4	98	0	0	102	19	0	4	0	23	0	69	34	0	103	0	0	0	0	0	228
Total	18	377	0	0	395	64	0	16	0	80	0	352	128	0	480	0	0	0	0	0	955
Grand Total	32	728	0	0	760	114	0	31	0	145	0	729	238	0	967	0	0	0	0	0	1872
Apprch %	4.2	95.8	0	0		78.6	0	21.4	0		0	75.4	24.6	0		0	0	0	0		
Total %	1.7	38.9	0	0	40.6	6.1	0	1.7	0	7.7	0	38.9	12.7	0	51.7	0	0	0	0	0	

# LSC Transportation Consultants, Inc.

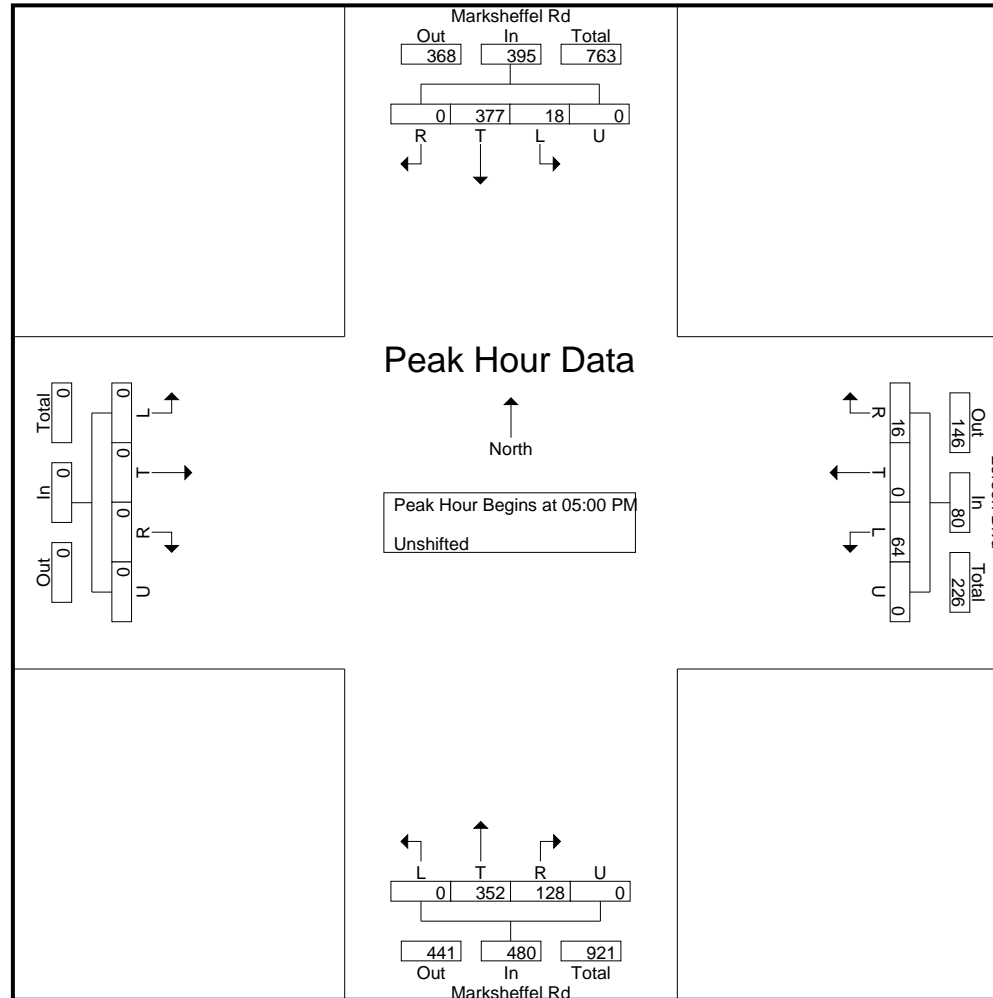
545 E Pikes Peak Ave, Suite 210  
Colorado Springs, CO 80905  
719-633-2868

File Name : Marksheffel Rd - Lorson Blvd PM

Site Code : 00204050

Start Date : 5/28/2020

Page No : 3







# Levels of Service

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HCM 6th TWSC  
4: Marksheffel Rd & Poa Annua St

Existing Traffic  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	21	579	1	4	465
Future Vol, veh/h	10	21	579	1	4	465
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	-	-	-	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	78	78	83	83	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	27	698	1	4	505
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1212	699	0	0	699	0
Stage 1	699	-	-	-	-	-
Stage 2	513	-	-	-	-	-
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	201	440	-	-	898	-
Stage 1	493	-	-	-	-	-
Stage 2	601	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	200	440	-	-	898	-
Mov Cap-2 Maneuver	336	-	-	-	-	-
Stage 1	491	-	-	-	-	-
Stage 2	601	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	15	0	0.1			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	400	898	-	
HCM Lane V/C Ratio	-	-	0.099	0.005	-	
HCM Control Delay (s)	-	-	15	9	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	0.3	0	-	

HCM 6th TWSC  
5: Marksheffel Rd & Peaceful Valley Rd

Existing Traffic  
AM Peak Hour

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔	↔	↔	↔	
Traffic Vol, veh/h	21	1	8	56	1	55	2	524	24	29	426	20
Future Vol, veh/h	21	1	8	56	1	55	2	524	24	29	426	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	290	340	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	83	83	83	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	1	10	67	1	66	2	602	28	33	490	23







Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1189	1202	502	1179	1185	602	513	0	0	630	0	0
Stage 1	568	568	-	606	606	-	-	-	-	-	-	-
Stage 2	621	634	-	573	579	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	165	185	569	167	189	500	1052	-	-	952	-	-
Stage 1	508	506	-	484	487	-	-	-	-	-	-	-
Stage 2	475	473	-	505	501	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	139	178	569	158	182	500	1052	-	-	952	-	-
Mov Cap-2 Maneuver	139	178	-	291	304	-	-	-	-	-	-	-
Stage 1	506	488	-	483	486	-	-	-	-	-	-	-
Stage 2	410	472	-	477	483	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	31.1		17.3		0		0.5	
HCM LOS	D		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1052	-	-	176 291 500	952	-	-
HCM Lane V/C Ratio	0.002	-	-	0.219 0.236 0.133	0.035	-	-
HCM Control Delay (s)	8.4	0	-	31.1 21.2 13.3	8.9	-	-
HCM Lane LOS	A	A	-	D C B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8 0.9 0.5	0.1	-	-






HCM 6th TWSC  
6: Marksheffel Rd & Mesa Ridge Pkwy

Existing Traffic  
AM Peak Hour

Intersection						
Int Delay, s/veh	3.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	180	67	37	370	312	178
Future Vol, veh/h	180	67	37	370	312	178
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	500	-	-	290
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	95	95	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	180	67	39	389	351	200
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	818	351	551	0	-	0
Stage 1	351	-	-	-	-	-
Stage 2	467	-	-	-	-	-
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	346	692	1019	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	631	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	333	692	1019	-	-	-
Mov Cap-2 Maneuver	440	-	-	-	-	-
Stage 1	686	-	-	-	-	-
Stage 2	631	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	16.6	0.8		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1019	-	440	692	-	-
HCM Lane V/C Ratio	0.038	-	0.409	0.097	-	-
HCM Control Delay (s)	8.7	-	18.7	10.8	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	2	0.3	-	-

HCM 6th TWSC  
7: Mesa Ridge Pkwy & Spring Glen Dr








Existing Traffic  
AM Peak Hour

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	50	224	207	8	23	68
Future Vol, veh/h	50	224	207	8	23	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	390	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	82	82	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	57	257	252	10	28	84
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	262	0	-	0	628	257
Stage 1	-	-	-	-	257	-
Stage 2	-	-	-	-	371	-
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	1302	-	-	-	447	782
Stage 1	-	-	-	-	786	-
Stage 2	-	-	-	-	698	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1302	-	-	-	427	782
Mov Cap-2 Maneuver	-	-	-	-	427	-
Stage 1	-	-	-	-	751	-
Stage 2	-	-	-	-	698	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.4	0		11.2		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1302	-	-	-	427	782
HCM Lane V/C Ratio	0.044	-	-	-	0.066	0.107
HCM Control Delay (s)	7.9	-	-	-	14	10.2
HCM Lane LOS	A	-	-	-	B	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	0.4



Timings  
10: Mesa Ridge Pkwy/Powers Blvd & Mesa Ridge Pkwy

Existing Traffic  
AM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	512	174	476	198	88	566
Future Volume (vph)	512	174	476	198	88	566
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	30.0	30.0	6.0	30.0
Minimum Split (s)	11.0	11.0	37.0	37.0	11.0	37.0
Total Split (s)	56.0	56.0	44.0	44.0	20.0	64.0
Total Split (%)	46.7%	46.7%	36.7%	36.7%	16.7%	53.3%
Yellow Time (s)	3.0	3.0	5.0	5.0	3.0	5.0
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	7.0	7.0	5.0	7.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	46.6	46.6	45.4	45.4	63.4	61.4
Actuated g/C Ratio	0.39	0.39	0.38	0.38	0.53	0.51
v/c Ratio	0.87	0.28	0.39	0.29	0.22	0.35
Control Delay	47.4	4.3	29.6	5.0	16.7	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.4	4.3	29.6	5.0	16.7	18.9
LOS	D	A	C	A	B	B
Approach Delay	36.5		22.4			18.6
Approach LOS	D		C			B

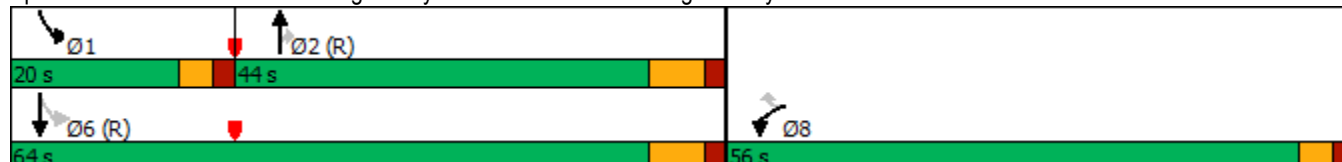
Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.87  
 Intersection Signal Delay: 26.1  
 Intersection Capacity Utilization 72.5%  
 Analysis Period (min) 15

Intersection LOS: C





ICU Level of Service C

Splits and Phases: 10: Mesa Ridge Pkwy/Powers Blvd & Mesa Ridge Pkwy



HCM 6th TWSC  
4: Marksheffel Rd & Poa Annua St

Existing Traffic  
PM Peak Hour

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	3	600	3	8	502
Future Vol, veh/h	2	3	600	3	8	502
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	-	-	-	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	78	78	91	91	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	4	659	3	9	546

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1225	661	0
Stage 1	661	-	-
Stage 2	564	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	198	462	-
Stage 1	514	-	-
Stage 2	569	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	196	462	-
Mov Cap-2 Maneuver	333	-	-
Stage 1	509	-	-
Stage 2	569	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.1	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	400	927
HCM Lane V/C Ratio	-	-	0.016	0.009
HCM Control Delay (s)	-	-	14.1	8.9
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

HCM 6th TWSC  
5: Marksheffel Rd & Peaceful Valley Rd

Existing Traffic  
PM Peak Hour

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕	↕	↕	↕	
Traffic Vol, veh/h	15	2	0	37	1	39	2	549	66	35	455	14
Future Vol, veh/h	15	2	0	37	1	39	2	549	66	35	455	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	290	340	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	78	78	78	92	92	92	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	3	0	47	1	50	2	597	72	42	542	17







Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1273	1308	551	1237	1244	597	559	0	0	669	0	0
Stage 1	635	635	-	601	601	-	-	-	-	-	-	-
Stage 2	638	673	-	636	643	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	144	159	534	153	174	503	1012	-	-	921	-	-
Stage 1	467	472	-	487	489	-	-	-	-	-	-	-
Stage 2	465	454	-	466	468	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	124	151	534	145	165	503	1012	-	-	921	-	-
Mov Cap-2 Maneuver	124	151	-	277	287	-	-	-	-	-	-	-
Stage 1	466	450	-	486	488	-	-	-	-	-	-	-
Stage 2	416	453	-	442	446	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	39.8		16.8		0		0.6	
HCM LOS	E		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1012	-	-	127 277 503	921	-	-
HCM Lane V/C Ratio	0.002	-	-	0.189 0.176 0.099	0.045	-	-
HCM Control Delay (s)	8.6	0	-	39.8 20.8 12.9	9.1	-	-
HCM Lane LOS	A	A	-	E C B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7 0.6 0.3	0.1	-	-

HCM 6th TWSC  
6: Marksheffel Rd & Mesa Ridge Pkwy

Existing Traffic  
PM Peak Hour






Intersection						
Int Delay, s/veh	7.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	300	47	29	317	328	164
Future Vol, veh/h	300	47	29	317	328	164
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	500	-	-	290
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	100	100	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	333	52	29	317	364	182
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	739	364	546	0	-	0
Stage 1	364	-	-	-	-	-
Stage 2	375	-	-	-	-	-
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	385	681	1023	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	695	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	374	681	1023	-	-	-
Mov Cap-2 Maneuver	479	-	-	-	-	-
Stage 1	683	-	-	-	-	-
Stage 2	695	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	25.7	0.7		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1023	-	479	681	-	-
HCM Lane V/C Ratio	0.028	-	0.696	0.077	-	-
HCM Control Delay (s)	8.6	-	28	10.7	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	5.3	0.2	-	-

HCM 6th TWSC  
7: Mesa Ridge Pkwy & Spring Glen Dr

Existing Traffic  
PM Peak Hour

Intersection

Int Delay, s/veh 2.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	70	330	174	19	17	61
Future Vol, veh/h	70	330	174	19	17	61
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	390	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	86	86	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	80	379	202	22	22	78









Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	224	0	0 752 213
Stage 1	-	-	- - 213 -
Stage 2	-	-	- - 539 -
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	1345	-	- - 378 827
Stage 1	-	-	- - 823 -
Stage 2	-	-	- - 585 -
Platoon blocked, %		-	- -
Mov Cap-1 Maneuver	1345	-	- - 356 827
Mov Cap-2 Maneuver	-	-	- - 356 -
Stage 1	-	-	- - 774 -
Stage 2	-	-	- - 585 -

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1345	-	-	-	356	827
HCM Lane V/C Ratio	0.06	-	-	-	0.061	0.095
HCM Control Delay (s)	7.8	-	-	-	15.8	9.8
HCM Lane LOS	A	-	-	-	C	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.2	0.3

# Timings 10: Mesa Ridge Pkwy/Powers Blvd & Mesa Ridge Pkwy

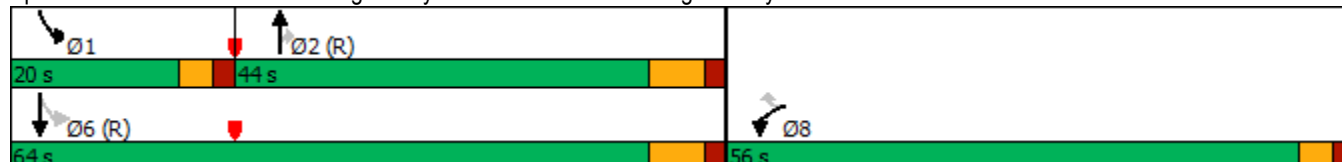
Existing Traffic  
PM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			
Traffic Volume (vph)	276	72	608	584	135	551
Future Volume (vph)	276	72	608	584	135	551
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	30.0	30.0	6.0	30.0
Minimum Split (s)	11.0	11.0	37.0	37.0	11.0	37.0
Total Split (s)	56.0	56.0	44.0	44.0	20.0	64.0
Total Split (%)	46.7%	46.7%	36.7%	36.7%	16.7%	53.3%
Yellow Time (s)	3.0	3.0	5.0	5.0	3.0	5.0
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	7.0	7.0	5.0	7.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	29.4	29.4	62.5	62.5	80.6	78.6
Actuated g/C Ratio	0.24	0.24	0.52	0.52	0.67	0.66
v/c Ratio	0.73	0.18	0.34	0.56	0.26	0.25
Control Delay	51.1	7.3	19.0	5.0	9.5	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.1	7.3	19.0	5.0	9.5	9.7
LOS	D	A	B	A	A	A
Approach Delay	42.0		12.1			9.6
Approach LOS	D		B			A

## Intersection Summary








Cycle Length: 120  
Actuated Cycle Length: 120  
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
Natural Cycle: 65  
Control Type: Actuated-Coordinated  
Maximum v/c Ratio: 0.73  
Intersection Signal Delay: 16.5  
Intersection LOS: B  
Intersection Capacity Utilization 61.9%  
ICU Level of Service B  
Analysis Period (min) 15

## Splits and Phases: 10: Mesa Ridge Pkwy/Powers Blvd & Mesa Ridge Pkwy









HCM 6th TWSC  
5: Marksheffel Rd & Peaceful Valley Rd

Short-Term Background Traffic  
AM Peak Hour

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	10	57	0	55	0	579	25	29	487	24
Future Vol, veh/h	0	0	10	57	0	55	0	579	25	29	487	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	0	0	-	0	-	-	290	340	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	83	83	83	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	13	69	0	66	0	666	29	33	560	28
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	574	1313	-	666	-	0	0	695	0	0
Stage 1	-	-	-	666	-	-	-	-	-	-	-	-
Stage 2	-	-	-	647	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	7.12	-	6.22	-	-	-	4.12	-	-
Critical Hdwy Stg 1	-	-	-	6.12	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.12	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	3.518	-	3.318	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	0	0	518	135	0	459	0	-	-	901	-	-
Stage 1	0	0	-	449	0	-	0	-	-	-	-	-
Stage 2	0	0	-	460	0	-	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	518	128	-	459	-	-	-	901	-	-
Mov Cap-2 Maneuver	-	-	-	259	-	-	-	-	-	-	-	-
Stage 1	-	-	-	449	-	-	-	-	-	-	-	-
Stage 2	-	-	-	432	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	12.1		19.1		0		0.5					
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBT		NBR		EBLn1WBLn1WBLn2		SBL	SBT	SBR			
Capacity (veh/h)	-		-		518 259 459		901	-	-			
HCM Lane V/C Ratio	-		-		0.025 0.265 0.144		0.037	-	-			
HCM Control Delay (s)	-		-		12.1 23.8 14.2		9.1	-	-			
HCM Lane LOS	-		-		B C B		A	-	-			
HCM 95th %tile Q(veh)	-		-		0.1 1 0.5		0.1	-	-			

HCM 6th TWSC  
6: Marksheffel Rd & Mesa Ridge Pkwy

Short-Term Background Traffic  
AM Peak Hour






Intersection						
Int Delay, s/veh	4.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	221	71	40	383	357	197
Future Vol, veh/h	221	71	40	383	357	197
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	500	-	-	290
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	95	95	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	221	71	42	403	401	221

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	888	401	622	0	-	0
Stage 1	401	-	-	-	-	-
Stage 2	487	-	-	-	-	-
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	314	649	959	-	-	-
Stage 1	676	-	-	-	-	-
Stage 2	618	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	300	649	959	-	-	-
Mov Cap-2 Maneuver	425	-	-	-	-	-
Stage 1	646	-	-	-	-	-
Stage 2	618	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.6	0.8	0
HCM LOS	C		








Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	959	-	425	649	-	-
HCM Lane V/C Ratio	0.044	-	0.52	0.109	-	-
HCM Control Delay (s)	8.9	-	22.3	11.2	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	2.9	0.4	-	-



Intersection						
Int Delay, s/veh	3.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	77	230	225	12	28	151
Future Vol, veh/h	77	230	225	12	28	151
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	390	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	82	82	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	89	264	274	15	35	186
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	289	0	-	0	724	282
Stage 1	-	-	-	-	282	-
Stage 2	-	-	-	-	442	-
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	1273	-	-	-	393	757
Stage 1	-	-	-	-	766	-
Stage 2	-	-	-	-	648	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1273	-	-	-	365	757
Mov Cap-2 Maneuver	-	-	-	-	365	-
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	648	-
Approach	EB	WB		SB		
HCM Control Delay, s	2	0		12		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1273	-	-	-	365	757
HCM Lane V/C Ratio	0.07	-	-	-	0.095	0.246
HCM Control Delay (s)	8	-	-	-	15.9	11.3
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3	1

# Timings 10: Mesa Ridge Pkwy/Powers Blvd & Mesa Ridge Pkwy

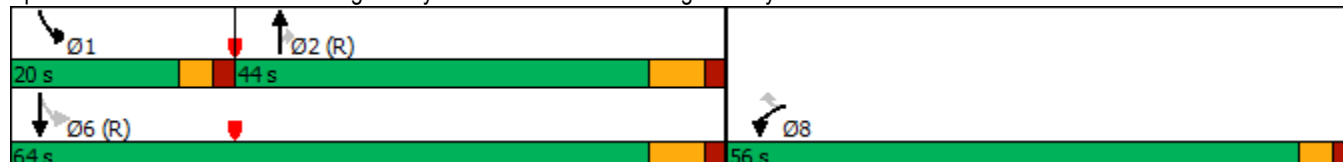
Short-Term Background Traffic  
AM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	591	196	507	224	95	603
Future Volume (vph)	591	196	507	224	95	603
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	30.0	30.0	6.0	30.0
Minimum Split (s)	11.0	11.0	37.0	37.0	11.0	37.0
Total Split (s)	56.0	56.0	44.0	44.0	20.0	64.0
Total Split (%)	46.7%	46.7%	36.7%	36.7%	16.7%	53.3%
Yellow Time (s)	3.0	3.0	5.0	5.0	3.0	5.0
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	7.0	7.0	5.0	7.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	34.6	34.6	57.9	57.9	75.4	73.4
Actuated g/C Ratio	0.29	0.29	0.48	0.48	0.63	0.61
v/c Ratio	0.69	0.37	0.32	0.27	0.20	0.31
Control Delay	41.4	5.3	21.1	3.7	11.1	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.4	5.3	21.1	3.7	11.1	12.5
LOS	D	A	C	A	B	B
Approach Delay	32.4		15.8			12.3
Approach LOS	C		B			B

## Intersection Summary








Cycle Length: 120  
Actuated Cycle Length: 120  
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
Natural Cycle: 65  
Control Type: Actuated-Coordinated  
Maximum v/c Ratio: 0.69  
Intersection Signal Delay: 20.8  
Intersection LOS: C  
Intersection Capacity Utilization 61.3%  
ICU Level of Service B  
Analysis Period (min) 15

Splits and Phases: 10: Mesa Ridge Pkwy/Powers Blvd & Mesa Ridge Pkwy



HCM 6th TWSC  
5: Marksheffel Rd & Peaceful Valley Rd

Short-Term Background Traffic  
PM Peak Hour

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	1	38	0	39	0	642	68	35	495	28
Future Vol, veh/h	0	0	1	38	0	39	0	642	68	35	495	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	0	0	-	0	-	-	290	340	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	78	78	78	92	92	92	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	1	49	0	50	0	698	74	42	589	33

Major/Minor	Minor2		Minor1		Major1		Major2	
Conflicting Flow All	-	-	606	1388	-	698	-	0
Stage 1	-	-	-	698	-	-	-	-
Stage 2	-	-	-	690	-	-	-	-
Critical Hdwy	-	-	6.22	7.12	-	6.22	-	4.12
Critical Hdwy Stg 1	-	-	-	6.12	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.12	-	-	-	-
Follow-up Hdwy	-	-	3.318	3.518	-	3.318	-	2.218
Pot Cap-1 Maneuver	0	0	497	120	0	440	0	843
Stage 1	0	0	-	431	0	-	-	-
Stage 2	0	0	-	435	0	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	497	115	-	440	-	843
Mov Cap-2 Maneuver	-	-	-	245	-	-	-	-
Stage 1	-	-	-	431	-	-	-	-
Stage 2	-	-	-	412	-	-	-	-







Approach	EB	WB	NB	SB
HCM Control Delay, s	12.3	18.7	0	0.6
HCM LOS	B	C		







  

Minor Lane/Major Mvmt	NBT	NBR	EBLn1WBLn1WBLn2	SBL	SBT	SBR
Capacity (veh/h)	-	-	497 245 440	843	-	-
HCM Lane V/C Ratio	-	-	0.003 0.199 0.114	0.049	-	-
HCM Control Delay (s)	-	-	12.3 23.3 14.2	9.5	-	-
HCM Lane LOS	-	-	B C B	A	-	-
HCM 95th %tile Q(veh)	-	-	0 0.7 0.4	0.2	-	-

HCM 6th TWSC  
6: Marksheffel Rd & Mesa Ridge Pkwy












Short-Term Background Traffic  
PM Peak Hour

Intersection						
Int Delay, s/veh	12.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	345	49	36	365	357	177
Future Vol, veh/h	345	49	36	365	357	177
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	500	-	-	290
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	100	100	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	383	54	36	365	397	197
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	834	397	594	0	-	0
Stage 1	397	-	-	-	-	-
Stage 2	437	-	-	-	-	-
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	~ 338	652	982	-	-	-
Stage 1	679	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 325	652	982	-	-	-
Mov Cap-2 Maneuver	446	-	-	-	-	-
Stage 1	654	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	41.4	0.8		0		
HCM LOS	E					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	982	-	446	652	-	-
HCM Lane V/C Ratio	0.037	-	0.859	0.084	-	-
HCM Control Delay (s)	8.8	-	45.7	11	-	-
HCM Lane LOS	A	-	E	B	-	-
HCM 95th %tile Q(veh)	0.1	-	8.7	0.3	-	-
Notes						
~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon						

Intersection						
Int Delay, s/veh	3.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	161	350	186	27	21	114
Future Vol, veh/h	161	350	186	27	21	114
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	390	-	-	290	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	86	86	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	185	402	216	31	27	146
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	247	0	-	0	988	216
Stage 1	-	-	-	-	216	-
Stage 2	-	-	-	-	772	-
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	1319	-	-	-	274	824
Stage 1	-	-	-	-	820	-
Stage 2	-	-	-	-	456	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1319	-	-	-	236	824
Mov Cap-2 Maneuver	-	-	-	-	236	-
Stage 1	-	-	-	-	705	-
Stage 2	-	-	-	-	456	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.6	0		12.2		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1319	-	-	-	236	824
HCM Lane V/C Ratio	0.14	-	-	-	0.114	0.177
HCM Control Delay (s)	8.2	-	-	-	22.2	10.3
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.5	-	-	-	0.4	0.6

# Timings 10: Mesa Ridge Pkwy/Powers Blvd & Mesa Ridge Pkwy

Short-Term Background Traffic  
PM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	327	86	648	671	159	587
Future Volume (vph)	327	86	648	671	159	587
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	30.0	30.0	6.0	30.0
Minimum Split (s)	11.0	11.0	37.0	37.0	11.0	37.0
Total Split (s)	56.0	56.0	44.0	44.0	20.0	64.0
Total Split (%)	46.7%	46.7%	36.7%	36.7%	16.7%	53.3%
Yellow Time (s)	3.0	3.0	5.0	5.0	3.0	5.0
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	7.0	7.0	5.0	7.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	21.2	21.2	70.9	70.9	88.8	86.8
Actuated g/C Ratio	0.18	0.18	0.59	0.59	0.74	0.72
v/c Ratio	0.62	0.27	0.32	0.59	0.29	0.24
Control Delay	49.8	9.5	13.8	4.9	6.3	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.8	9.5	13.8	4.9	6.3	6.2
LOS	D	A	B	A	A	A
Approach Delay	41.4		9.3			6.2
Approach LOS	D		A			A

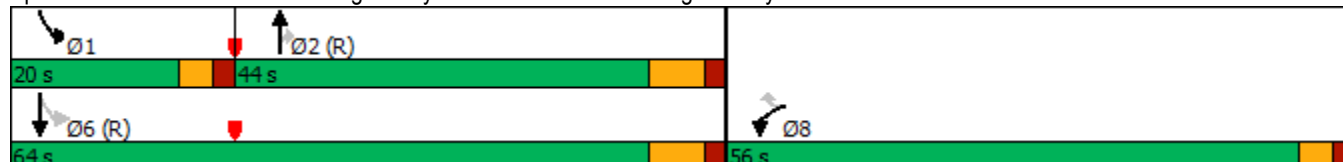
## Intersection Summary








Cycle Length: 120  
Actuated Cycle Length: 120  
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
Natural Cycle: 60  
Control Type: Actuated-Coordinated  
Maximum v/c Ratio: 0.62  
Intersection Signal Delay: 14.2  
Intersection Capacity Utilization 60.4%  
Analysis Period (min) 15

Intersection LOS: B

ICU Level of Service B

## Splits and Phases: 10: Mesa Ridge Pkwy/Powers Blvd & Mesa Ridge Pkwy









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	0	0	24	57	0	55	0	582	25	29	487	25
Future Vol, veh/h	0	0	24	57	0	55	0	582	25	29	487	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	0	0	-	0	-	-	290	340	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	83	83	83	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	31	69	0	66	0	669	29	33	560	29







Major/Minor	Minor2		Minor1		Major1		Major2	
Conflicting Flow All	-	-	575	1325	-	669	-	0
Stage 1	-	-	-	669	-	-	-	-
Stage 2	-	-	-	656	-	-	-	-
Critical Hdwy	-	-	6.22	7.12	-	6.22	-	4.12
Critical Hdwy Stg 1	-	-	-	6.12	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.12	-	-	-	-
Follow-up Hdwy	-	-	3.318	3.518	-	3.318	-	2.218
Pot Cap-1 Maneuver	0	0	518	133	0	458	0	898
Stage 1	0	0	-	447	0	-	-	-
Stage 2	0	0	-	454	0	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	518	122	-	458	-	898
Mov Cap-2 Maneuver	-	-	-	251	-	-	-	-
Stage 1	-	-	-	447	-	-	-	-
Stage 2	-	-	-	411	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.4	19.5	0	0.5
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1WBLn1WBLn2	SBL	SBT	SBR
Capacity (veh/h)	-	-	518 251 458	898	-	-
HCM Lane V/C Ratio	-	-	0.059 0.274 0.145	0.037	-	-
HCM Control Delay (s)	-	-	12.4 24.7 14.2	9.2	-	-
HCM Lane LOS	-	-	B C B	A	-	-
HCM 95th %tile Q(veh)	-	-	0.2 1.1 0.5	0.1	-	-

Intersection						
Int Delay, s/veh	4.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	224	71	40	383	358	210
Future Vol, veh/h	224	71	40	383	358	210
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	500	-	-	290
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	95	95	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	224	71	42	403	402	236
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	889	402	638	0	-	0
Stage 1	402	-	-	-	-	-
Stage 2	487	-	-	-	-	-
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	314	648	946	-	-	-
Stage 1	676	-	-	-	-	-
Stage 2	618	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	300	648	946	-	-	-
Mov Cap-2 Maneuver	425	-	-	-	-	-
Stage 1	646	-	-	-	-	-
Stage 2	618	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	19.8	0.8	0			
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	946	-	425	648	-	-
HCM Lane V/C Ratio	0.045	-	0.527	0.11	-	-
HCM Control Delay (s)	9	-	22.5	11.2	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	3	0.4	-	-



Intersection						
Int Delay, s/veh	4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	83	230	238	12	31	156
Future Vol, veh/h	83	230	238	12	31	156
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	390	-	-	290	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	82	82	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	95	264	290	15	38	193
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	305	0	-	0	744	290
Stage 1	-	-	-	-	290	-
Stage 2	-	-	-	-	454	-
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	1256	-	-	-	382	749
Stage 1	-	-	-	-	759	-
Stage 2	-	-	-	-	640	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1256	-	-	-	353	749
Mov Cap-2 Maneuver	-	-	-	-	353	-
Stage 1	-	-	-	-	701	-
Stage 2	-	-	-	-	640	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.1	0		12.3		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1256	-	-	-	353	749
HCM Lane V/C Ratio	0.076	-	-	-	0.108	0.257
HCM Control Delay (s)	8.1	-	-	-	16.4	11.5
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4	1

# Timings

Fil 10 Generated + Short-Term Background Traffic

## 10: Mesa Ridge Pkwy/Powers Blvd & Mesa Ridge Pkwy

AM Peak Hour

	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖↗	↖	↖↖	↖	↖	↖↖
Traffic Volume (vph)	604	201	507	228	97	603
Future Volume (vph)	604	201	507	228	97	603
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	30.0	30.0	6.0	30.0
Minimum Split (s)	11.0	11.0	37.0	37.0	11.0	37.0
Total Split (s)	56.0	56.0	44.0	44.0	20.0	64.0
Total Split (%)	46.7%	46.7%	36.7%	36.7%	16.7%	53.3%
Yellow Time (s)	3.0	3.0	5.0	5.0	3.0	5.0
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	7.0	7.0	5.0	7.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	35.3	35.3	57.1	57.1	74.7	72.7
Actuated g/C Ratio	0.29	0.29	0.48	0.48	0.62	0.61
v/c Ratio	0.70	0.37	0.33	0.28	0.21	0.32
Control Delay	41.0	5.2	21.6	3.7	11.3	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	5.2	21.6	3.7	11.3	12.8
LOS	D	A	C	A	B	B
Approach Delay	32.0		16.1			12.6
Approach LOS	C		B			B

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 20.9

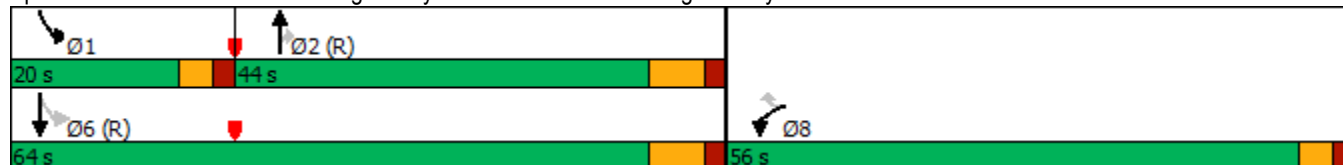
Intersection LOS: C









Intersection Capacity Utilization 61.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 10: Mesa Ridge Pkwy/Powers Blvd & Mesa Ridge Pkwy















Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	10	38	0	39	0	644	68	35	495	32
Future Vol, veh/h	0	0	10	38	0	39	0	644	68	35	495	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	0	0	-	0	-	-	290	340	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	78	78	78	92	92	92	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	14	49	0	50	0	700	74	42	589	38







Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	608	1399	-	700	-	0	0	774	0	0
Stage 1	-	-	-	700	-	-	-	-	-	-	-	-
Stage 2	-	-	-	699	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	7.12	-	6.22	-	-	-	4.12	-	-
Critical Hdwy Stg 1	-	-	-	6.12	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.12	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	3.518	-	3.318	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	0	0	496	118	0	439	0	-	-	842	-	-
Stage 1	0	0	-	430	0	-	0	-	-	-	-	-
Stage 2	0	0	-	430	0	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	496	110	-	439	-	-	-	842	-	-
Mov Cap-2 Maneuver	-	-	-	239	-	-	-	-	-	-	-	-
Stage 1	-	-	-	430	-	-	-	-	-	-	-	-
Stage 2	-	-	-	397	-	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.5		19		0		0.6	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBT	NBR	EBLn1WBLn1WBLn2	SBL	SBT	SBR
Capacity (veh/h)	-	-	496 239 439	842	-	-
HCM Lane V/C Ratio	-	-	0.028 0.204 0.114	0.049	-	-
HCM Control Delay (s)	-	-	12.5 23.9 14.3	9.5	-	-
HCM Lane LOS	-	-	B C B	A	-	-
HCM 95th %tile Q(veh)	-	-	0.1 0.7 0.4	0.2	-	-

Intersection						
Int Delay, s/veh	13					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	347	49	36	365	358	186
Future Vol, veh/h	347	49	36	365	358	186
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	500	-	-	290
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	100	100	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	386	54	36	365	398	207
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	835	398	605	0	-	0
Stage 1	398	-	-	-	-	-
Stage 2	437	-	-	-	-	-
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	~ 338	652	973	-	-	-
Stage 1	678	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 325	652	973	-	-	-
Mov Cap-2 Maneuver	446	-	-	-	-	-
Stage 1	653	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	42	0.8		0		
HCM LOS	E					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	973	-	446	652	-	-
HCM Lane V/C Ratio	0.037	-	0.864	0.084	-	-
HCM Control Delay (s)	8.8	-	46.4	11	-	-
HCM Lane LOS	A	-	E	B	-	-
HCM 95th %tile Q(veh)	0.1	-	8.8	0.3	-	-
Notes						
~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon						

Intersection						
Int Delay, s/veh	8.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	347	49	36	365	358	186
Future Vol, veh/h	347	49	36	365	358	186
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	500	-	-	290
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	100	100	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	386	54	36	365	398	207
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	835	398	605	0	-	0
Stage 1	398	-	-	-	-	-
Stage 2	437	-	-	-	-	-
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	~ 338	652	973	-	-	-
Stage 1	678	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 325	652	973	-	-	-
Mov Cap-2 Maneuver	515	-	-	-	-	-
Stage 1	653	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	27.6	0.8		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	973	-	515	652	-	-
HCM Lane V/C Ratio	0.037	-	0.749	0.084	-	-
HCM Control Delay (s)	8.8	-	30	11	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	6.4	0.3	-	-
Notes						
~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon						

Intersection						
Int Delay, s/veh	3.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	182	350	195	28	23	118
Future Vol, veh/h	182	350	195	28	23	118
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	390	-	-	290	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	86	86	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	209	402	227	33	29	151
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	260	0	-	0	1047	227
Stage 1	-	-	-	-	227	-
Stage 2	-	-	-	-	820	-
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	1304	-	-	-	253	812
Stage 1	-	-	-	-	811	-
Stage 2	-	-	-	-	433	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1304	-	-	-	213	812
Mov Cap-2 Maneuver	-	-	-	-	213	-
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	433	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.8	0		12.7		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1304	-	-	-	213	812
HCM Lane V/C Ratio	0.16	-	-	-	0.138	0.186
HCM Control Delay (s)	8.3	-	-	-	24.6	10.4
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.6	-	-	-	0.5	0.7

# Timings

Fil 10 Generated + Short-Term Background Traffic

## 10: Mesa Ridge Pkwy/Powers Blvd & Mesa Ridge Pkwy

PM Peak Hour

	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖↗	↖	↖↖	↖	↖	↖↖
Traffic Volume (vph)	336	90	648	686	165	587
Future Volume (vph)	336	90	648	686	165	587
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	30.0	30.0	6.0	30.0
Minimum Split (s)	11.0	11.0	37.0	37.0	11.0	37.0
Total Split (s)	56.0	56.0	44.0	44.0	20.0	64.0
Total Split (%)	46.7%	46.7%	36.7%	36.7%	16.7%	53.3%
Yellow Time (s)	3.0	3.0	5.0	5.0	3.0	5.0
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	7.0	7.0	5.0	7.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	21.6	21.6	70.4	70.4	88.4	86.4
Actuated g/C Ratio	0.18	0.18	0.59	0.59	0.74	0.72
v/c Ratio	0.63	0.28	0.33	0.61	0.30	0.24
Control Delay	49.7	9.3	14.1	5.1	6.5	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.7	9.3	14.1	5.1	6.5	6.3
LOS	D	A	B	A	A	A
Approach Delay	41.1		9.4			6.4
Approach LOS	D		A			A

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 14.4

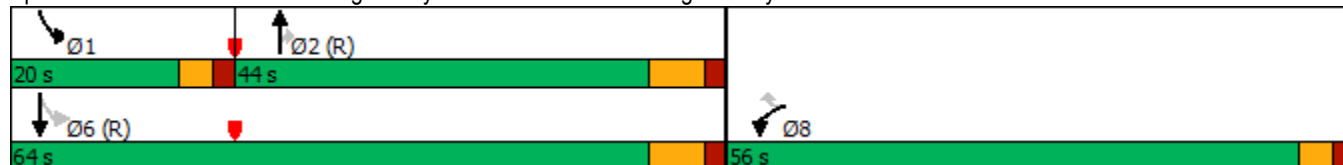
Intersection LOS: B

Intersection Capacity Utilization 61.6%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 10: Mesa Ridge Pkwy/Powers Blvd & Mesa Ridge Pkwy



# Queuing Reports

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# Queuing and Blocking Report

## Intersection: 10: Mesa Ridge Pkwy/Powers Blvd & Mesa Ridge Pkwy

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	R	L	T	T
Maximum Queue (ft)	313	370	105	264	228	98	124	246	219
Average Queue (ft)	162	213	41	154	99	44	52	126	82
95th Queue (ft)	269	311	78	241	210	75	101	207	172
Link Distance (ft)			824	517	517			1087	1087
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	350	350				150	750		
Storage Blk Time (%)	0	0			1				
Queuing Penalty (veh)	0	1			2				

# Queuing and Blocking Report

## Intersection: 10: Mesa Ridge Pkwy/Powers Blvd & Mesa Ridge Pkwy

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	R	L	T	T
Maximum Queue (ft)	193	248	65	331	375	248	181	177	123
Average Queue (ft)	96	152	22	170	129	151	81	80	47
95th Queue (ft)	199	222	47	279	312	259	137	140	100
Link Distance (ft)			824	517	517			1087	1087
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	350	350				150	750		
Storage Blk Time (%)					2	12			
Queuing Penalty (veh)					11	38			