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April 21, 2017

Mr. Troy Kirschman
 Hover Architecture, PC
 8089 So. Lincoln Street, Suite 201
 Littleton, CO 80122

Re: Monument Hill Business Park
 El Paso County, CO
 (DBE #170030)

Dear Mr. Kirschman:

I am pleased to submit my revised Traffic Impact Analysis for the proposed Monument Hill Business Park commercial development in El Paso County, Colorado. This revision has been prepared to respond to comments from El Paso County. The site is located near the intersection of Monument Hill Road and Deer Creek Road.

This study first provides a summary of the existing roadways and traffic volumes in the vicinity of the proposed commercial development and a summary of planned improvements to the roadway system. Next, estimates are made of the amount and directional distribution of vehicular traffic likely to be generated. This information is then combined with projected future traffic volumes in the vicinity to evaluate the impact of the new development on the future roadway system and, where appropriate, to make recommendations for the required roadway improvements.

I trust that my findings and recommendations will assist in the planning for the proposed Monument Hill Business Park commercial development. Please call me if I can be of further assistance.

Traffic Engineer's Statement

The attached 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.

David L. Ruble
 Name, P.E. # 13428



4-21-17
 Date

Developer's Statement

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

Name, Title
Business Name
Address

Date

DLR/bar

Monument Hill Business Park
Commercial Development
Traffic Impact Analysis Report
April 21, 2017

Prepared by
Dave L. Ruble, Jr., P.E.
DB Enterprise LLC



TABLE OF CONTENTS

Section	Description	Page
A	Executive Summary	1
B	Introduction/Background	3
C	Existing Traffic Condition	7
D	Future Traffic Conditions	9
E	Trip Generation	12
F	Trip Distribution	14
G	Trip Assignment and Traffic Volumes	16
H	Impacts	20
I	Recommendations/Conclusion	27
Attachment No. 1 - Existing Traffic		
Attachment No. 2 - Level of Service Analyses		
Attachment No. 3 - Queue Length Analyses		

LIST OF ILLUSTRATIONS

Figure	Description	Page
1	Vicinity Map	5
2	Site Plan	6
3	Existing Traffic Volume, Lane Geometry and Traffic Control	8
4	Year 2018 Background Peak-Hour Traffic Volumes	10
5	Year 2023 Background Peak-Hour Traffic Volumes	11
6	Trip Distribution of Site-Generated Traffic	15
7	Assignment of Site-Generated Traffic	17
8	Year 2018 Total Peak-Hour Traffic Volumes	18
9	Year 2023 Total Peak-Hour Traffic Volumes	19
10	Year 2023 Daily Traffic Impacts	23
11	Year 2023 Total Traffic Queue Lengths	25

Table	Description	Page
1	Estimated Vehicle Trip Generation	13
2	Intersection Level of Service Analysis Results	21

Section A – Executive Summary

An executive summary of the analysis presented in this report is as follows:

1. The proposed Monument Hill Business Park commercial development is located in El Paso County. It is located near the intersection of Monument Hill Road and Deer Creek Road. The site is bounded by Monument Hill Road on the west, Deer Creek Road on the north, commercial land on the south, and vacant land on the east.
2. The proposed commercial development will be served by two unsignalized accesses, Access A and Access B. Access A will have access along Monument Hill Road. Access B will have access along Deer Creek Road. Both accesses are proposed to be unsignalized accesses with stop-controlled on Access A and Access B.
3. When completed, the proposed 3.625-acre commercial development will contain 31,500 square feet of office and warehouse space. The owner of the property estimates that 30 percent of the space will be for general office use and the other 70 percent will be for warehouse space. Based on this information at full build out, the site is expected to generate approximately 91 vehicle trips entering and 91 vehicle trips leaving the site on a typical weekday. Of these, approximately 21 vehicle trips will occur during the AM peak-hour, with 18 vehicles trips entering and three vehicle trips exiting the site and approximately 21 vehicle trips will occur during the PM peak-hour, with four vehicles entering and 17 vehicle trips exiting the site.
4. The directional distribution of site-generated traffic is expected to be 50 percent from the north with 30 percent using Monument Hill Road and 20 percent using Woodmoor Drive; five percent from the east using Deer Creek Road; and the remaining 45 percent from the south with 35 percent using Monument Hill Road and 10 percent using Woodmoor Drive.

5. A total of four intersections are analyzed in this report, three along Deer Creek Road at Monument Hill Road, Access B, and Woodmoor Drive and one along Monument Hill Road at Access A. All of the traffic movements at the four unsignalized intersections are expected to operate at a very good Level of Service (LOS "B" or better) in the Years 2018 and 2023 either with or without the traffic from the proposed Monument Hill Business Park commercial development.
6. The queue lengths for the one intersection along Monument Hill Road and three along Deer Creek Road are not considered to be excessive during the AM and PM peak-hours through the Year 2023.
7. Traffic impacts associated with the proposed Monument Hill Business Park commercial development are considered minor and can be accommodated by the existing roadway system.

Section B – Introduction/Background

The proposed Monument Hill Business Park commercial development is to be located near the intersection of Monument Hill Road and Deer Creek Road in El Paso County, Colorado. The proposed commercial development will contain 31,500 square feet of office and warehouse space on approximately 3.625 acres of land. Two full movement accesses (Access A and Access B) will serve the site, one along Monument Hill Road and one along Deer Creek Road. These two intersections are proposed to be unsignalized.

DB Enterprise, LLC has been retained by Hover Architecture to assess the traffic impacts to the existing and proposed roadway network from the traffic generated by the proposed commercial development. This report summarizes the following analysis procedures which were utilized in the evaluation:

- A review and analysis of present roadway and traffic conditions in the vicinity of the site and a review of planned and proposed roadway improvements in the general vicinity.
- A determination of the peak-hour and daily vehicle-trip generation for the proposed commercial development.
- An analysis of the estimated directional distribution of site-generated traffic and an assignment of that traffic to the adjacent street network.
- A determination of the future traffic volumes in the vicinity of the site.
- An evaluation of the impacts of site-generated traffic expressed in terms of the development's traffic as an increment of total projected traffic on the surrounding roadway system and the resulting Levels of Service on the adjacent major roadways and intersections.

- A determination of appropriate roadway standards and improvements which will ensure optimum traffic operation for traffic entering and exiting the site.

The location of the proposed Monument Hill Business Park commercial development is shown in Figure 1. As shown in this figure, the site is located southeast of the intersection of Monument Hill Road and Deer Creek Road in El Paso County, Colorado. The site is bounded on the west by Monument Hill Road, on the south by commercial development, Deer Creek Road on the north, and vacant land on the east.

Figure 1 also depicts the preliminary location for the accesses that are expected to serve the site. The one access along Monument Hill Road (Access B) and one access along Deer Creek Road (Access A) are expected to be a full movement accesses. The intersection of Monument Hill Road and Deer Creek Road is unsignalized and has stop control on Deer Creek Road. The intersection of Woodmoor Drive and Deer Creek Road is unsignalized and has stop control on Deer Creek Road. Figure 2 depicts the preliminary site plan for the proposed Monument Hill Business Park commercial development.



Approximate Scale
Scale 1" = 130'



Figure 1
Vicinity Map

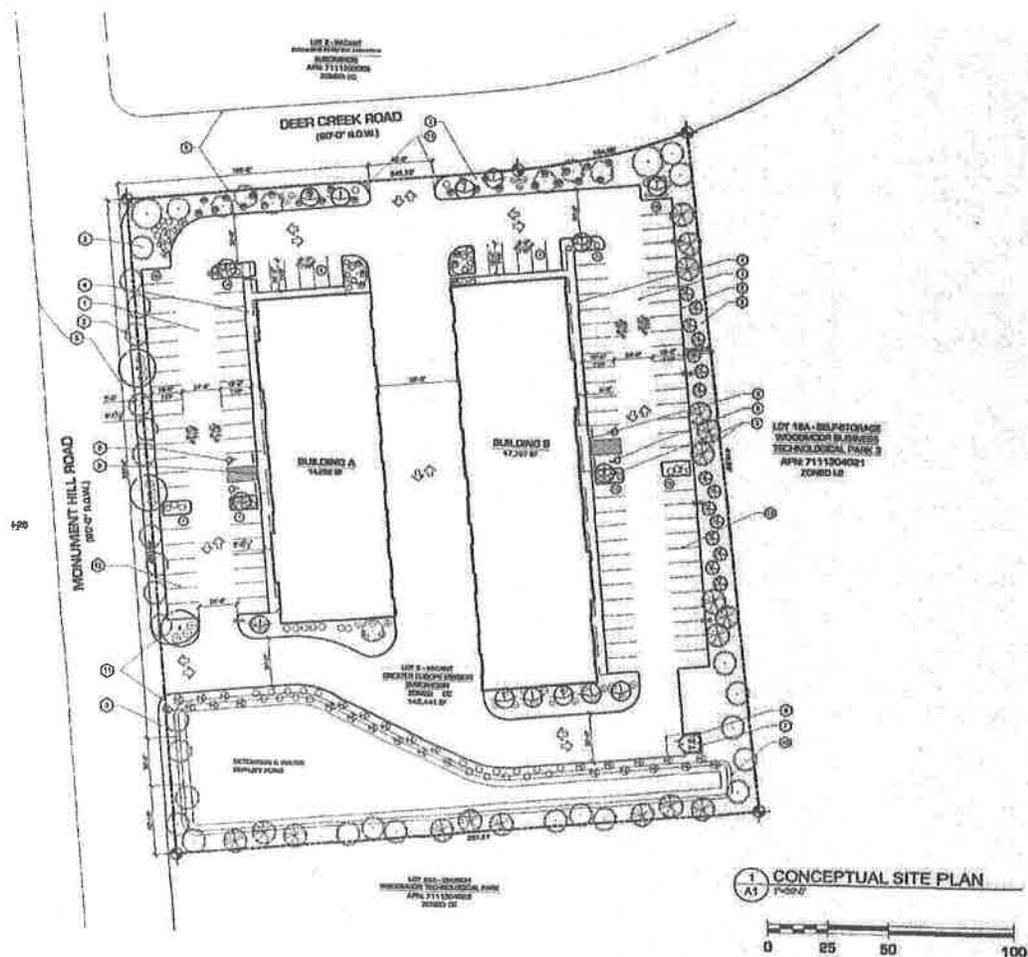


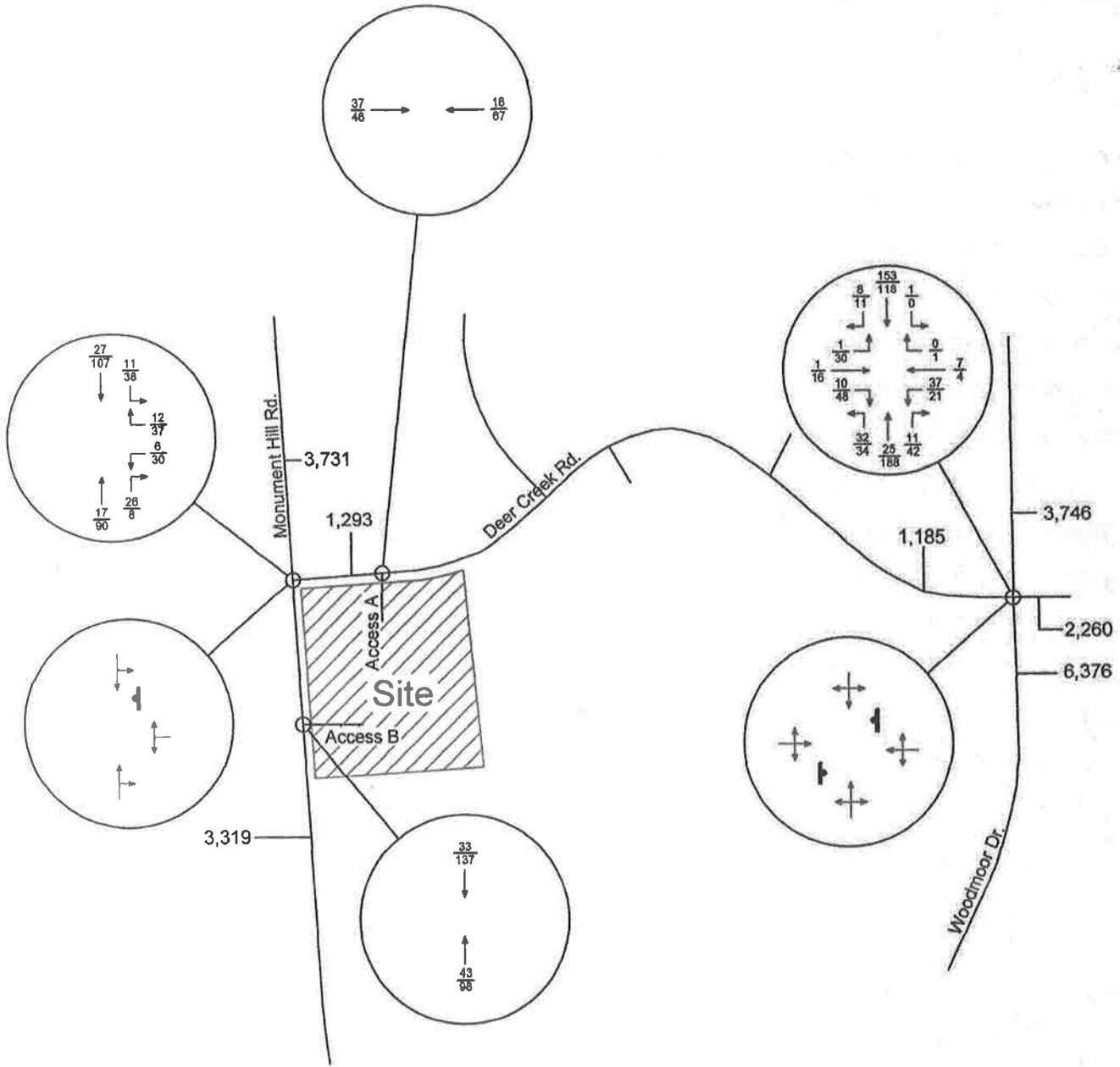
Figure 2
Site Plan

Section C – Existing Traffic Condition

Roadway Network

Major roadways in the vicinity of the site are illustrated in Figure 3 and described with a brief discussion of anticipated future roadway improvements. Monument Hill Road is classified as a collector roadway. It currently has two lanes, one lane in each direction. There are no plans to widen this roadway. This roadway begins on the south at Woodmoor Drive and ends on the north at East Palmer Divide Avenue. Woodmoor Drive is classified as a collector roadway. It runs in a north-south direction from State Highway 105 on the south to Fallen Leaf Way on the north. At Fallen Leaf Way, this roadway then goes in an east-west direction to Furrow Road. It currently has two lanes, one lane in each direction in the vicinity of the proposed commercial development. There are no plans to widen this roadway. Deer Creek Road is a two-lane local roadway that begins on the east at Monument Hill Road and ends on the west at Woodmoor Drive. There are no plans to widen this roadway. El Paso County has asked for a traffic signal warrant analysis of the intersection of Monument Hill Road and Deer Creek Road.

Figure 3 shows existing traffic volumes, traffic control, and lane geometry for the two existing intersections along Deer Creek Road and two planned access points serving the proposed commercial development. Turning movement traffic counts were taken at the two existing intersections and along Deer Creek Road. These traffic counts were taken by Counter Measures, Inc. in April 2017. Daily traffic counts were taken on the three approaches of the intersection of Monument Hill Road and Deer Creek Road and the four approaches of the intersection of Woodmoor Drive and Deer Creek Road. These counts are also shown in Figure 3. A summary of the raw count data is provided in Attachment No. 1.



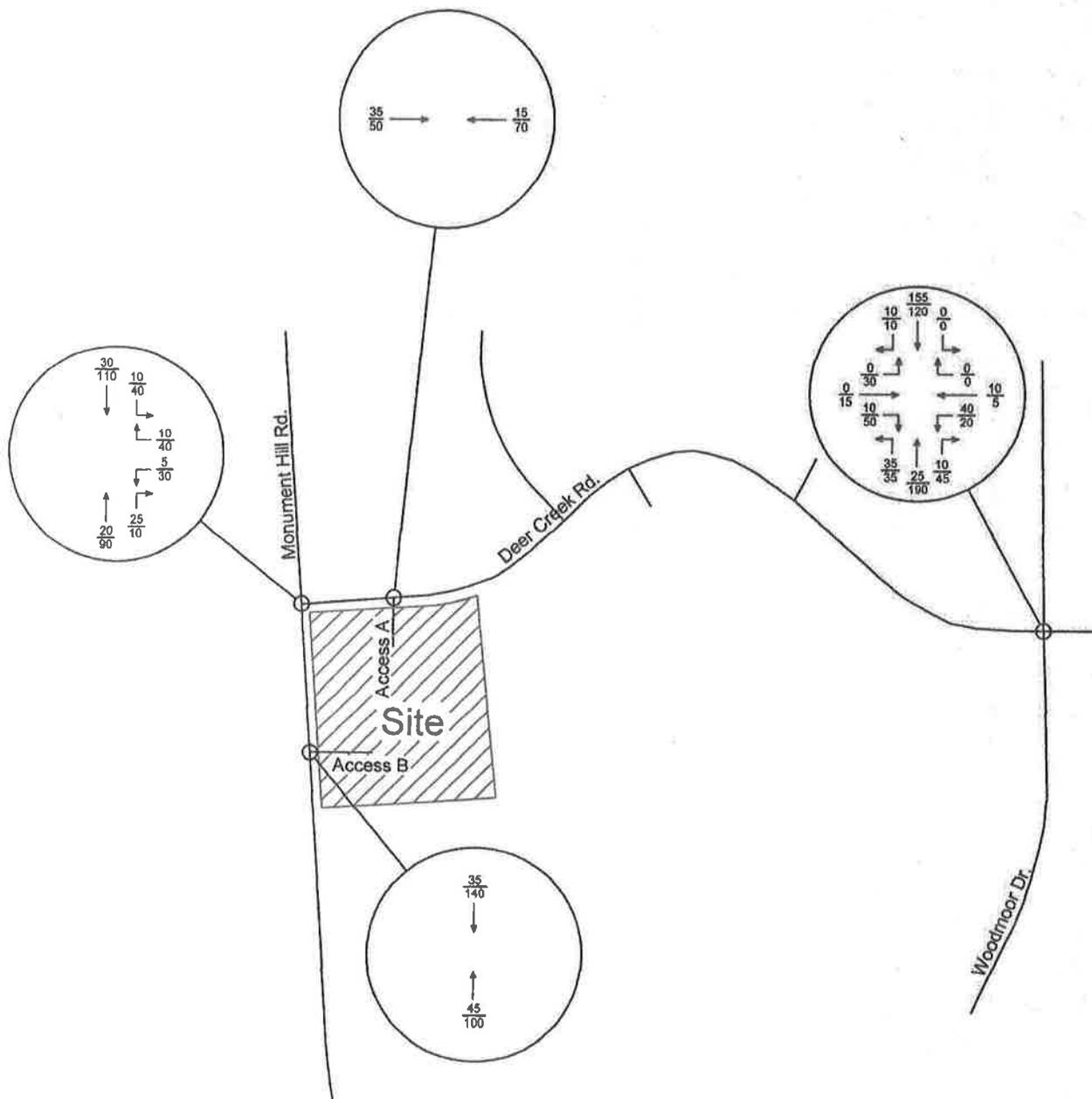
Legend

-  = Stop Sign
- $\frac{15}{15}$ = AM Peak-Hour Traffic Volumes
- $\frac{15}{15}$ = PM Peak-Hour Traffic Volumes
- 1,525 = Daily Traffic Volume

Figure 3
Existing Lane Geometry, Traffic Control and Traffic Volumes

Section D – Future Traffic Conditions

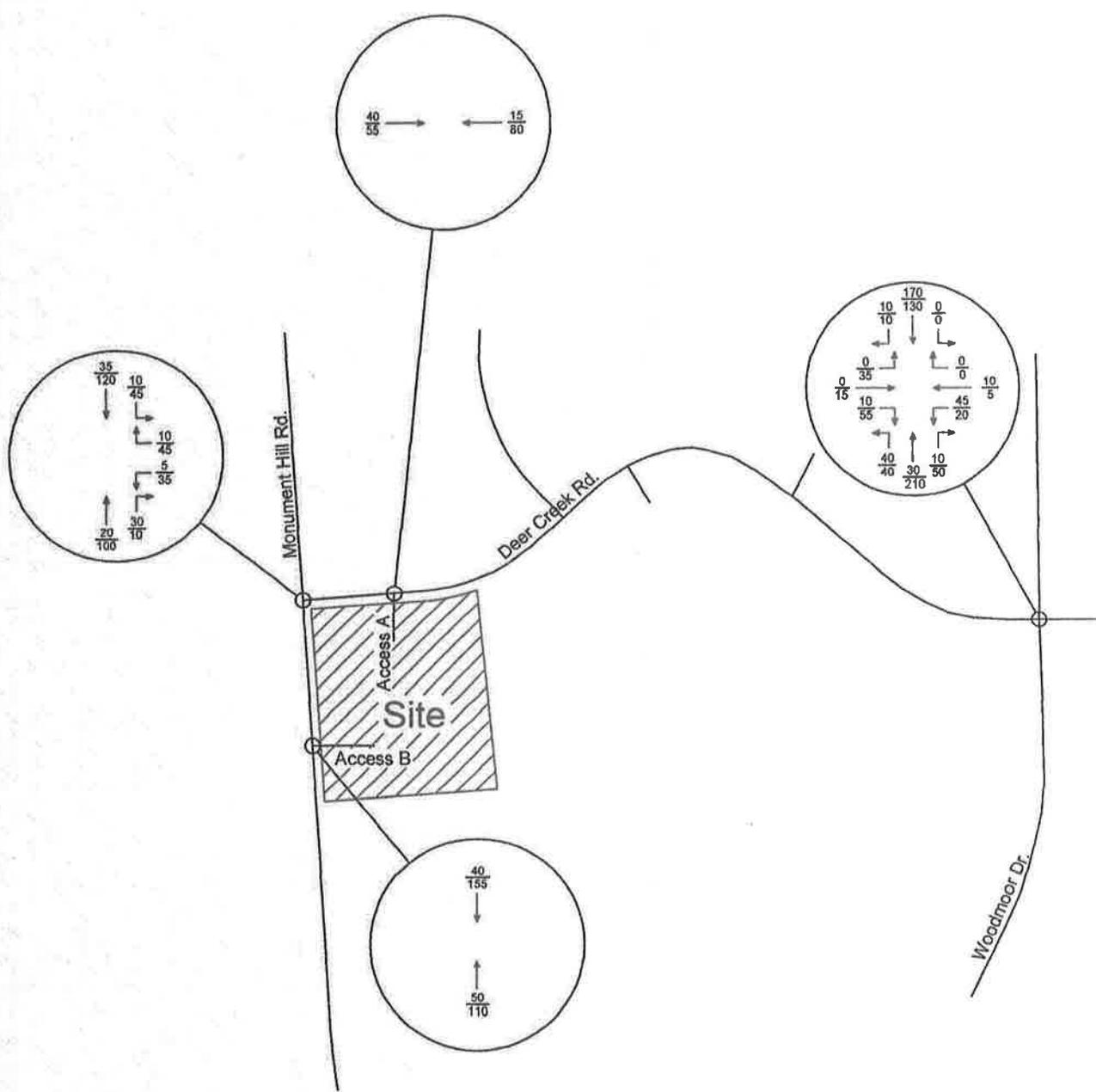
El Paso County does not have long-range traffic forecasts for either Monument Hill Road, Woodmoor Drive, or Deer Creek Road. In the absence of no official long-range forecast, a two percent annual growth rate was used for all three roadways. A growth factor of 1.02 was applied to the existing peak-hour traffic volumes depicted in Figure 3 to arrive at an estimate for the Year 2018. These peak-hour volumes are depicted in Figure 4. A growth factor of 1.10 was applied to the Year 2018 background peak-hour traffic volumes depicted in Figure 4 to arrive at an estimate for the Year 2023. These peak-hour volumes are depicted in Figure 5.



Legend

- $\frac{15}{15}$ = AM Peak-Hour Traffic Volumes
PM Peak-Hour Traffic Volumes
- 1,500 = Daily Traffic Volume

Figure 4
Year 2018 Background
Peak-Hour Traffic Volumes



Legend

$$\frac{15}{15} = \frac{\text{AM Peak-Hour Traffic Volumes}}{\text{PM Peak-Hour Traffic Volumes}}$$

Figure 5
Year 2023 Background
Peak-Hour Traffic Volumes

Section E – Trip Generation

The proposed 3.625-acre Monument Hill Business Park commercial development will contain 31,500 square feet of office and warehouse space. The owner of the property estimates that 30 percent of the space will be for general office use and the other 70 percent will be for warehouse space. The amount of traffic that will be generated by the proposed commercial development has been estimated based upon trip generation rates published by the Institute of Transportation Engineers (ITE) in the 9th Edition, 2014, of *Trip Generation*. The results of the analysis are shown in Table 1, giving the average number of weekday daily and morning and evening peak-hour trips expected to be generated by the proposed commercial development.

As illustrated in Table 1, on an average weekday the proposed commercial development at full build out will generate approximately 182 daily vehicle trips with 91 entering and 91 leaving the site on a typical weekday. Of these, approximately 21 trips will occur during the AM peak-hour, with 18 vehicles entering and three exiting the site and approximately 21 trips will occur during the PM peak-hour, with four vehicles entering and 17 exiting the site.

Table 1
 Estimated Vehicle Trip Generation
 Monument Hill Business Park
 El Paso County, Colorado
 (DBE #170030; April, 2017)

ITTE Category	Quantity	Trip Generation Rates (1)				Total Vehicle Trips Generated						
		Average Weekday	AM Peak-Hour In	AM Peak-Hour Out	PM Peak-Hour In	PM Peak-Hour Out	Average Weekday	AM Peak-Hour In	AM Peak-Hour Out	PM Peak-Hour In	PM Peak-Hour Out	
150 Warehousing	22.05 KSF (2)	3.56	0.24	0.06	0.08	0.24	78	5	1	2	5	
710 General Office Building	9.45 KSF (2)	11.03	1.37	0.19	0.25	1.24	104	13	2	2	12	
							Total	182	18	3	4	17

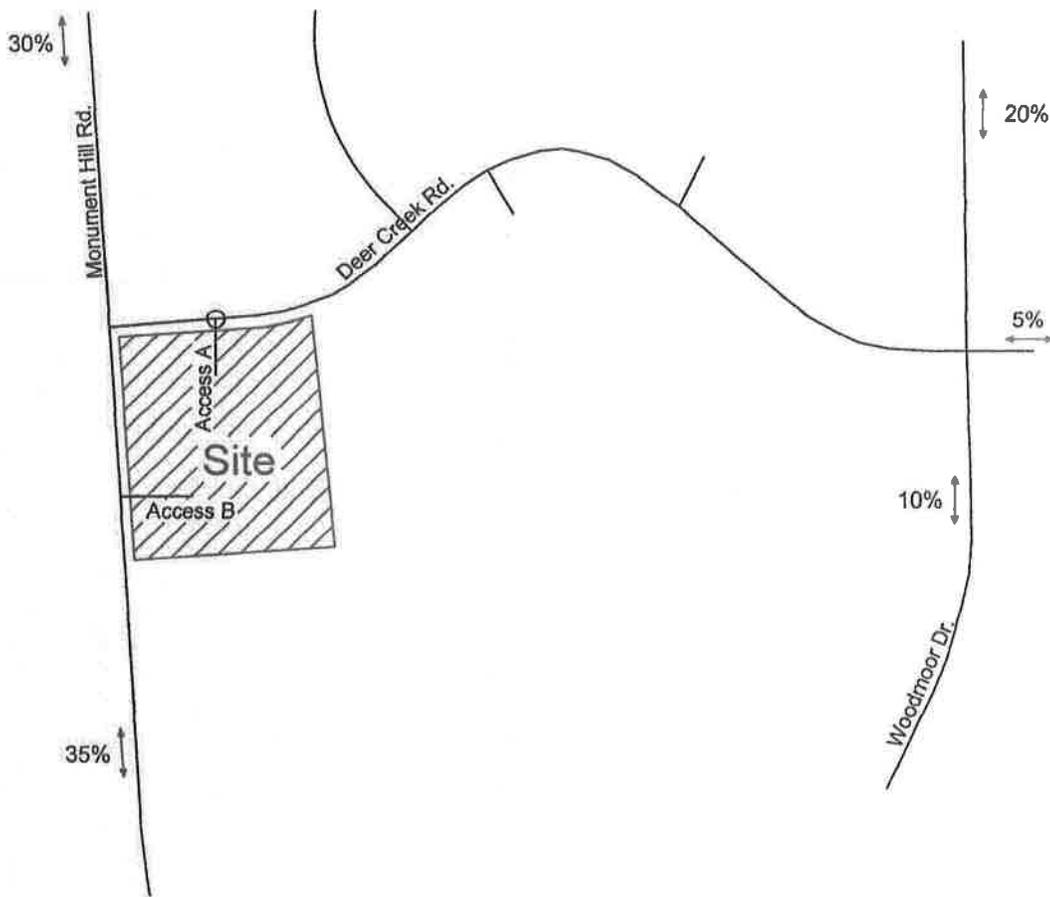
Notes:
 (1) Source: "Trip Generation", Institute of Transportation Engineers, 9th Edition, 2014.
 (2) KSF = 1,000 Square Feet

Section F – Trip Distribution

The directional distribution of site-generated traffic onto adjacent roadways, which provide access to and from the proposed Monument Hill Business Park commercial development, is one of the most important components in the assessment of the proposed commercial development's traffic impacts. Major factors which influence the traffic distribution assumptions include the location of the site relative to the surrounding roadway network, the level of access serving the site, and the type of land use proposed within the development.

The directional distribution of site-generated traffic is expected to be 50 percent from the north with 30 percent using Monument Hill Road and the other 20 percent using Woodmoor Drive; 45 percent from the south with 35 percent using Monument Hill Road and the other 10 percent using Woodmoor Drive; and the remaining five percent from the east using Deer Creek Road.

Figure 6 depicts the directional distribution of site-generated traffic that is being used in this analysis.



Legend

60% = Directional Distribution
of Site-Generated Traffic

Figure 6
Trip Distribution of
Site-Generated Traffic

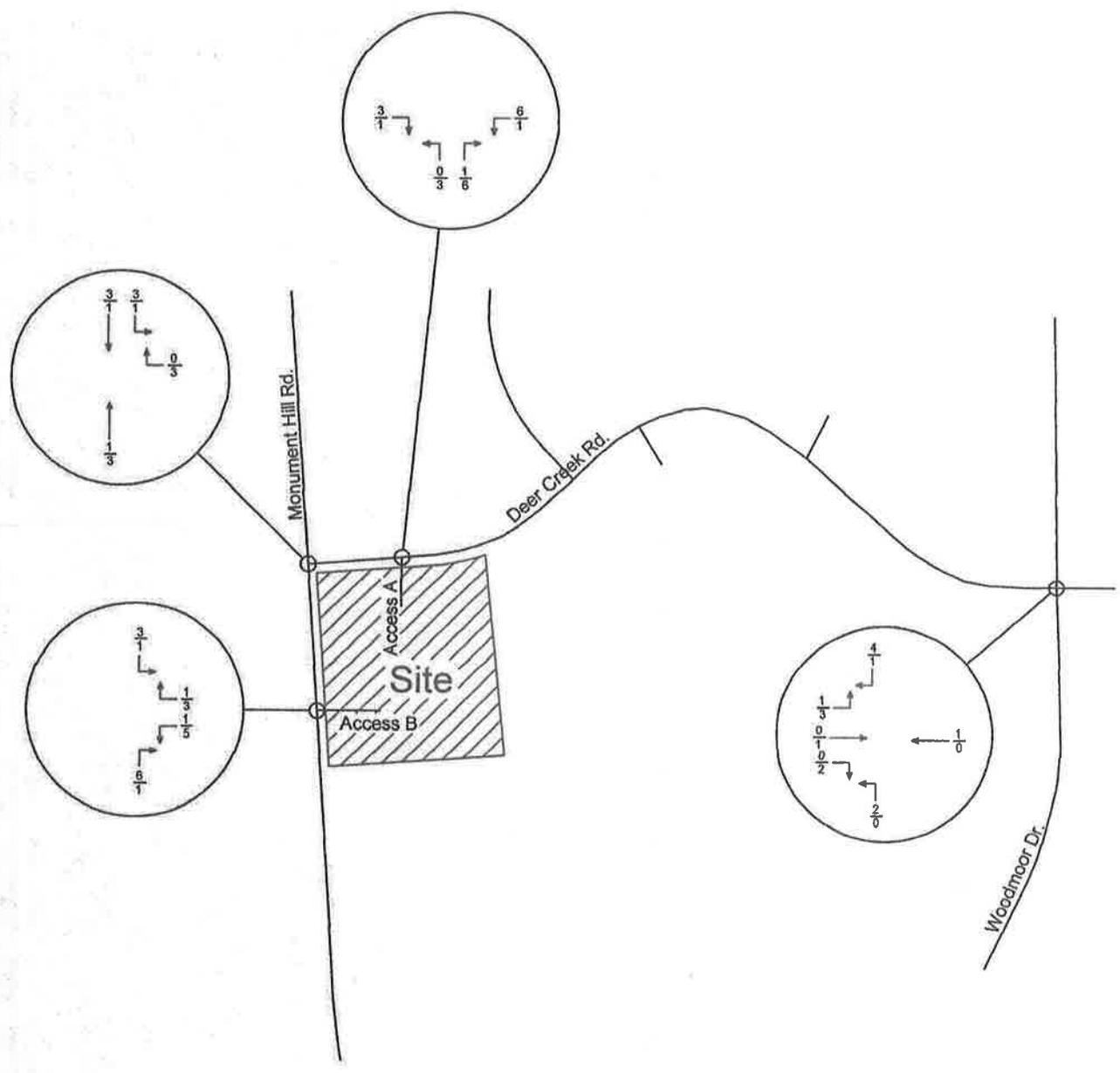
Section G – Trip Assignment and Traffic Volumes

Site-Generated Traffic

Figure 7 illustrates the assignment of site-generated peak-hour traffic on the adjacent street system for the proposed site accesses and intersections along Deer Creek Road for the Years 2018 and 2023. The assignment of site-generated traffic is based upon the traffic distribution percentages shown in Figure 6 and the vehicle-trip generation estimates of Table 1.

Total Traffic

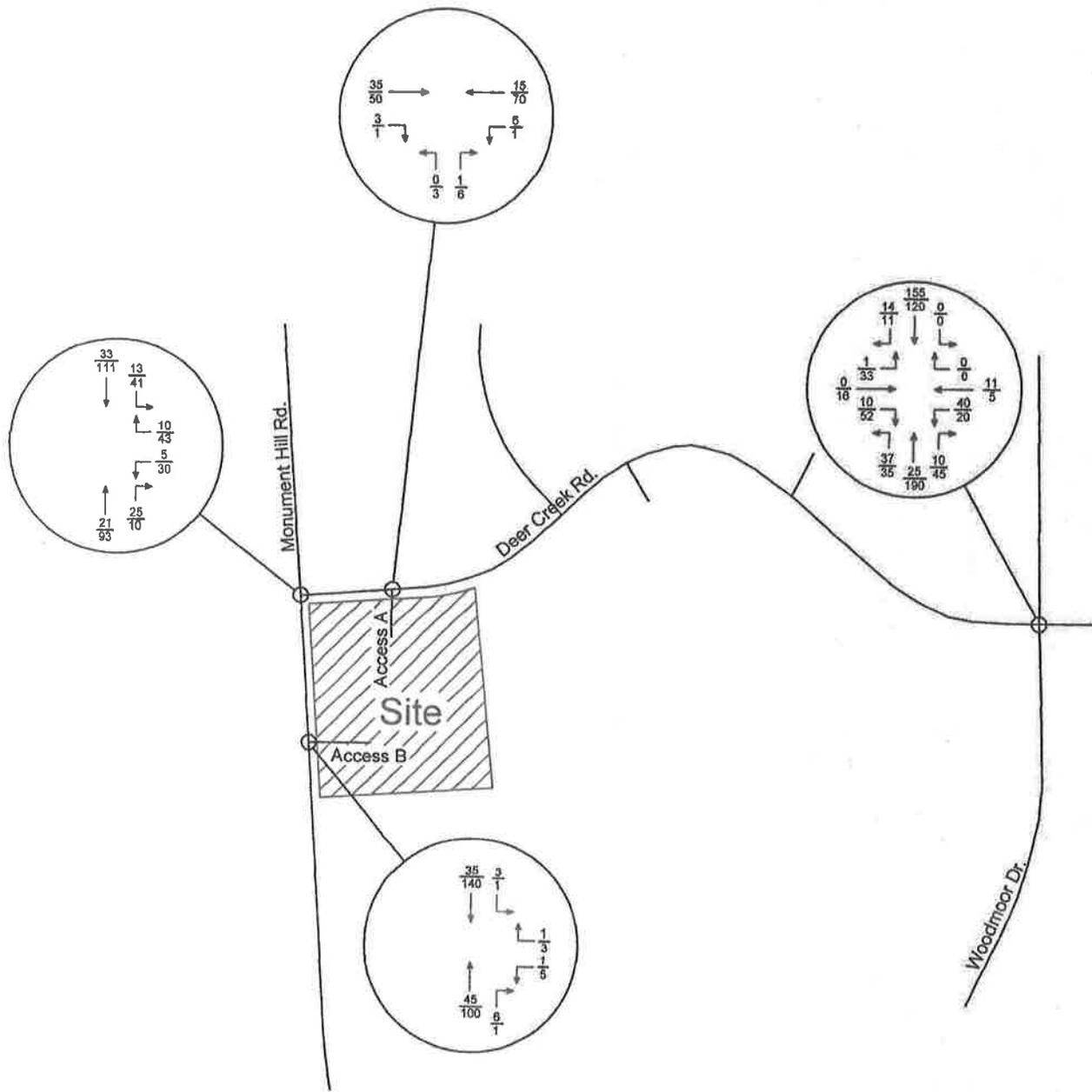
The Years 2018 and 2023 total AM and PM peak-hour traffic volumes along Monument Hill Road and Deer Creek Road are illustrated in Figures 8 and 9, respectively. For the Year 2018, these volumes were derived by adding the site-generated traffic from Figure 7 to the Year 2018 background peak-hour traffic volumes in Figure 4. For the Year 2023, these volumes were derived by adding the site-generated traffic from Figure 7 to the Year 2023 background peak-hour traffic volumes in Figure 5, respectively.



Legend

$$\frac{15}{15} = \frac{\text{AM Peak-Hour Traffic Volumes}}{\text{PM Peak-Hour Traffic Volumes}}$$

Figure 7
Assignment of
Site-Generated Traffic



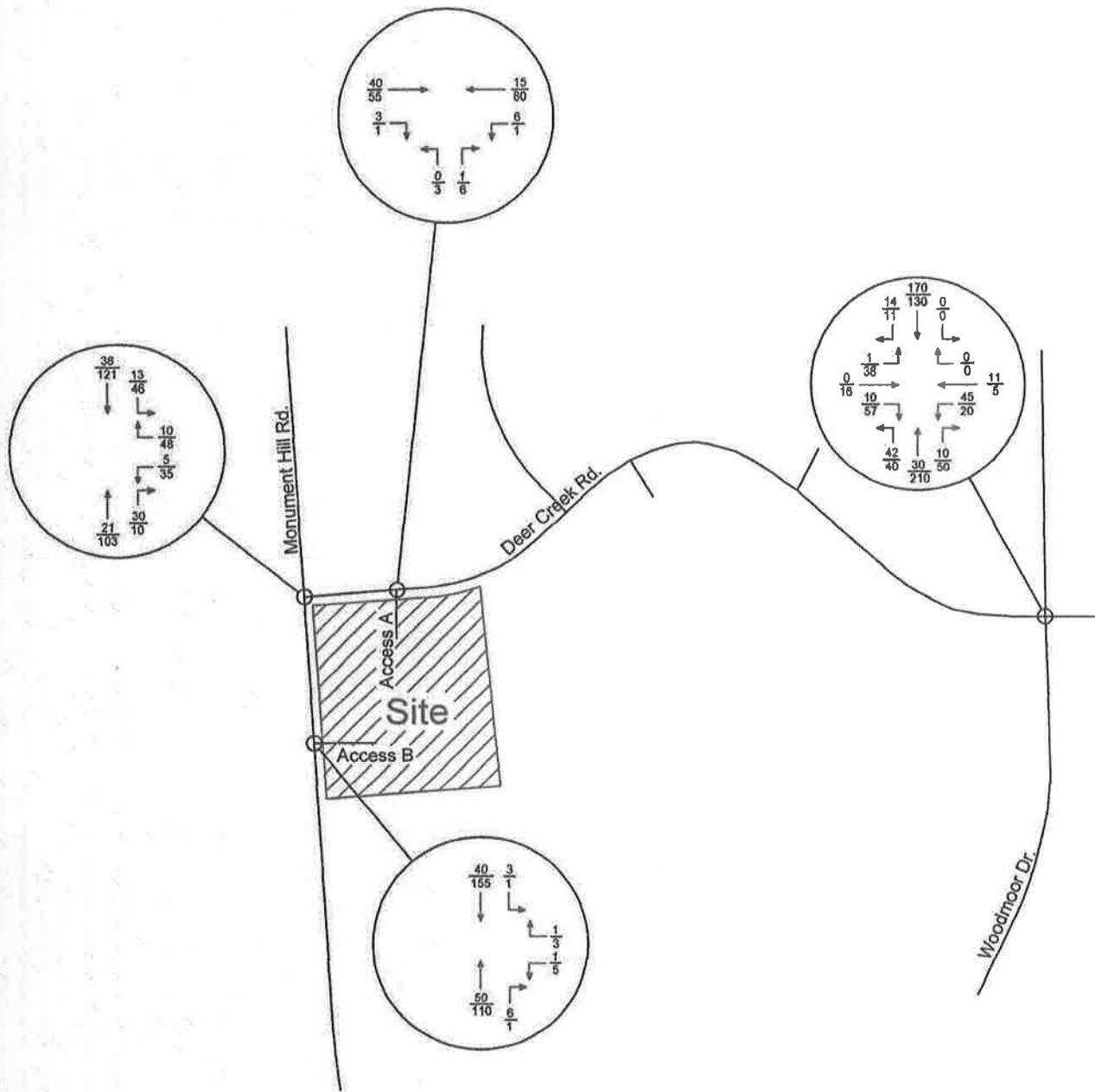
Legend

$$\frac{15}{15} = \frac{\text{AM Peak-Hour Traffic Volumes}}{\text{PM Peak-Hour Traffic Volumes}}$$

Figure 8
Year 2018 Total
Peak-Hour Traffic Volumes



Approximate Scale
Scale: 1" = 120'



Legend

$$\frac{15}{15} = \frac{\text{AM Peak-Hour Traffic Volumes}}{\text{PM Peak-Hour Traffic Volumes}}$$

Figure 9
Year 2023 Total
Peak-Hour Traffic Volumes

Section H - Impacts

Traffic impacts associated with a development such as the proposed Monument Hill Business Park commercial development are best described in terms of the resulting effects they have on the major intersections that serve the proposed commercial development. In this particular case, the expected impacts are concentrated at two intersections along Monument Hill Road – Deer Creek Road and Access B, and two intersections along Deer Creek at Access A and Woodmoor Drive.

Based upon the peak-hour traffic volumes shown in Figures 3, 4, 5, 8, and 9, “Signalized and Unsignalized Intersection Capacity” analyses have been performed using procedures set forth in the 2010 *Highway Capacity Manual*. The concept of Level of Service (LOS) is used as a basis for computing combinations of roadway operating conditions. By definition, six different Levels of Service are used (A, B, C, D, E, and F) with “A” being a free-flow condition and “E” representing the “capacity” of a given intersection or traffic movement. Analyses have been performed for the Year 2017 existing traffic, Year 2018 background and total traffic conditions, and the Year 2023 background and total traffic conditions.

The lane geometry and traffic control depicted in Figure 3 were used for this analysis. The results of these capacity analyses are found in Attachment No. 2 and are summarized in Table 2.

Monument Hill Road/Deer Creek Road: All of the traffic movement at this unsignalized intersection currently operates at a very good Level of Service (LOS “B” or better) during the AM and PM peak-hours. By the Year 2023, all of the traffic movements at this intersection are expected to continue to operate at a very good Level of Service (LOS “B or better) during the AM and PM peak-hours either with or without the traffic from the proposed commercial development.

Table 2
 Intersection Level of Service Analysis Results
 Monument Hill Business Park
 El Paso County, Colorado
 (DBE #170030; April, 2017)

Intersection Location	Control	Year 2017		Year 2018		Year 2018		Year 2023		Year 2023	
		Existing Traffic Level of Service AM	Existing Traffic Level of Service PM	Background Traffic Level of Service AM	Background Traffic Level of Service PM	Background plus Site-Generated Traffic Level of Service AM	Background plus Site-Generated Traffic Level of Service PM	Background Traffic Level of Service AM	Background Traffic Level of Service PM	Background plus Site-Generated Traffic Level of Service AM	Background plus Site-Generated Traffic Level of Service PM
Monument Hill Rd. & Deer Creek Rd.	Unsignalized	A	A	A	A	A	A	A	A	A	A
Southbound Approach Level of Service		A	A	A	A	A	A	A	A	A	A
Westbound Approach Level of Service		A	A	A	B	A	B	A	B	A	B
Critical Movement Delay (sec/veh)		8.7	9.9	8.7	10.0	8.7	10.0	8.7	10.2	8.8	10.3
Deer Creek Rd. & Access A	Unsignalized	-	-	-	-	A	A	-	-	A	A
Southbound Approach Level of Service		-	-	-	-	A	A	-	-	A	A
Westbound Approach Level of Service		-	-	-	-	A	A	-	-	A	A
Critical Movement Delay (sec/veh)		-	-	-	-	8.5	8.8	-	-	8.5	8.9
Monument Hill Rd. & Access B	Unsignalized	-	-	-	-	A	A	-	-	A	A
Westbound Approach Level of Service		-	-	-	-	A	A	-	-	A	A
Northbound Approach Level of Service		-	-	-	-	A	A	-	-	A	A
Critical Movement Delay (sec/veh)		-	-	-	-	8.8	9.6	-	-	8.8	9.7
Woodmoor Dr. & Deer Creek Rd.	Unsignalized	A	A	A	A	A	A	A	A	A	A
Northbound Approach Level of Service		A	A	A	A	A	A	A	A	A	A
Southbound Approach Level of Service		A	A	A	A	A	A	A	A	A	A
Westbound Approach Level of Service		B	B	B	B	B	B	B	B	B	B
Eastbound Approach Level of Service		A	A	A	A	A	A	A	A	A	A
Critical Movement Delay (sec/veh)		11.1	13.2	11.2	13.5	11.3	13.5	11.6	14.2	11.7	14.3

Notes:
 Level of Service is based the methodology contained in the Highway Capacity Manual.

Monument Hill Road/Access B: All of the traffic movements at this unsignalized intersection are expected to operate at an excellent Level of Service (LOS "A") during the AM and PM peak-hours through the Year 2023.

Deer Creek Road/Access A: All of the traffic movements at this unsignalized intersection are expected to operate at an excellent Level of Service (LOS "A") during the AM and PM peak-hours through the Year 2023.

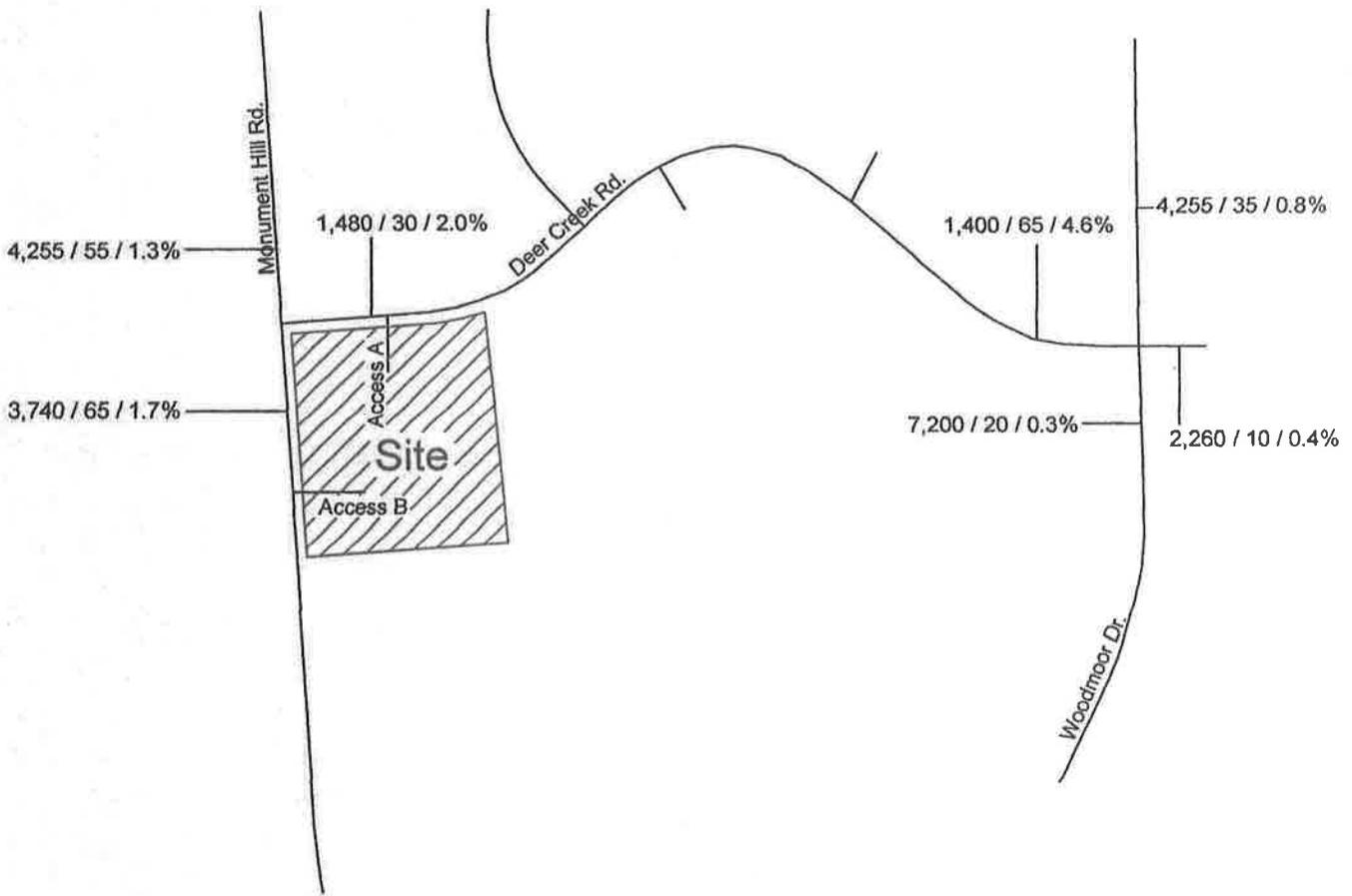
Woodmoor Drive/Deer Creek: All of the traffic movements at this unsignalized intersection currently operates at a very good Level of Service (LOS "B" or better) during the AM and PM peak-hours. By the Year 2023, all of the traffic movements at this intersection are expected to continue to operate at a very good Level of Service (LOS "B or better) during the AM and PM peak-hours either with or without the traffic from the proposed commercial development.

Average Daily Traffic

The average daily traffic impacts of the proposed commercial development can be expressed in terms of average daily traffic (ADT) volumes, in which site-generated traffic is shown as an increment of the Year 2023 total weekday traffic. This analysis was done for Monument Hill Road, Woodmoor Drive, and Deer Creek Road. A growth factor of 1.126 was applied to the existing daily traffic volumes depicted in Figure 3 to arrive at an estimated Year 2023. Site-generated traffic is less than two percent of the daily traffic on Monument Hill Road; less than one percent of the daily traffic on Woodmoor Drive; and less than five percent of the daily traffic on Deer Creek Road. Figure 10 depicts the daily traffic impacts of the proposed commercial development.

Traffic Signal Warrant Analysis

Initially, a peak-hour traffic signal warrant analyses were performed on the intersection of Monument Hill Road and Deer Creek Road and Woodmoor Drive and Deer Creek Road for the Year 2023 total traffic condition. If either of these two intersections meet



Legend

1,500 / 25 / 1.2% = Total Year 2023 Daily Traffic / Site-Generated Traffic / Percent of Daily Traffic

Figure 10
Year 2023 Daily
Traffic Impacts

the MUTCD peak-hour warrant, a four-hour and eight-hour warrant analysis will be performed. Neither of the two intersections meet the MUTCD peak-hour warrant for either the AM and PM peak-hours. Therefore, a four-hour and eight-hour warrant analysis is needed.

Queue Length Analysis

A queue length analysis was performed for the four intersections analyzed in this report for the Year 2023 total AM and PM peak-hour traffic conditions. The software program *SimTraffic* was used to estimate these queue lengths. The queue lengths being reported for this analysis represent an average of five simulations with each simulation lasting 60 minutes. None of the queue lengths appear to be excessive. Figure 11 depicts the expected queue lengths for these four intersections for the AM and PM peak-hours. Attachment No. 3 contains the *SimTraffic* printouts.

Access Locations

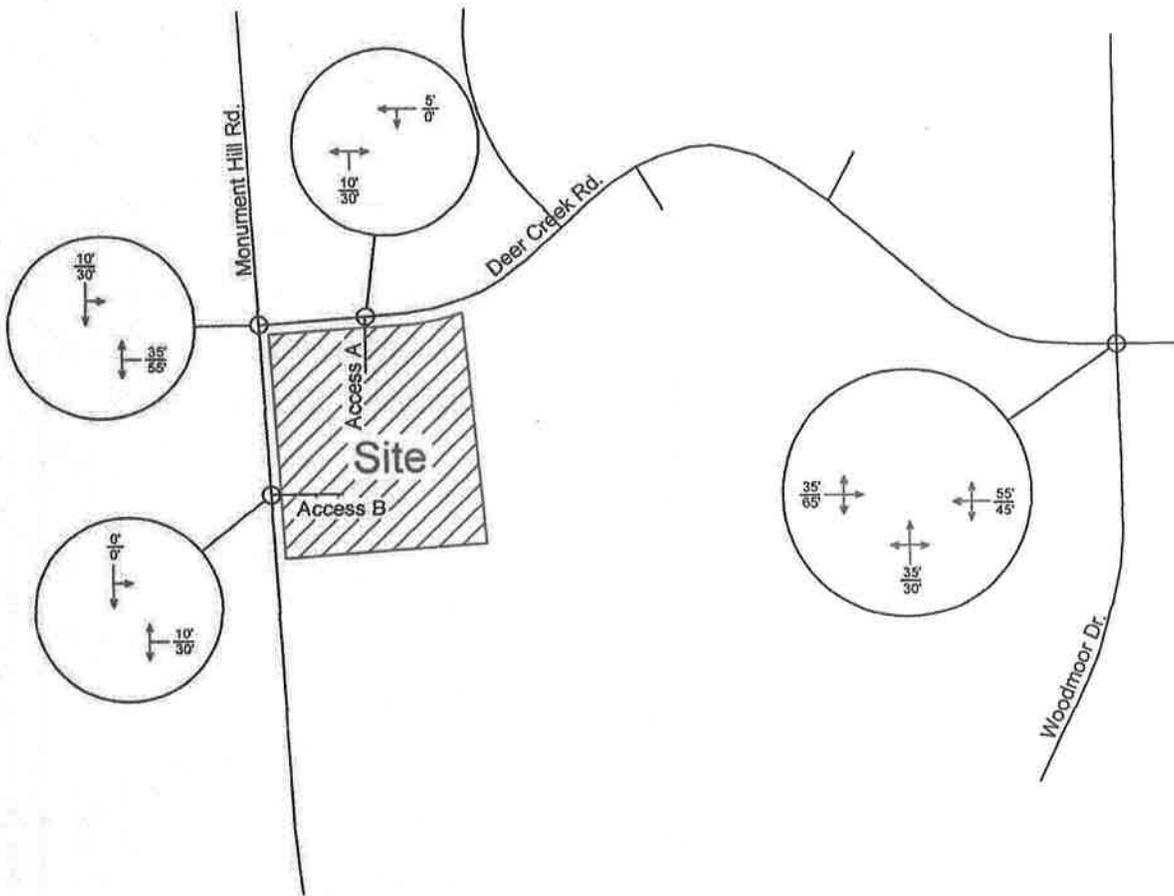
Access A is located approximately 155.5 feet west of Monument Hill Road, and Access B is located approximately 287 feet south of Deer Creek Road. For a local or collector roadway, an access needs to be at least 50 feet from the intersection. These two accesses exceed the minimum distance for an access from an existing intersection.

Auxiliary Lane Requirements

No separate auxiliary traffic lanes are being recommended as a result of the traffic from the proposed commercial development.

Sight Distance Evaluation

El Paso County requires an entering sight distance of 595 feet for Monument Hill Road and 455 feet for Deer Creek Road. Based on a visual inspection of both access points, the available sight distance is in excess of these two requirements.



Legend

$\frac{15'}{15'}$ = AM Peak-Hour Queue Lengths, in Feet
 PM Peak-Hour Queue Length, in Feet

Figure 11
Year 2023 Total Traffic
Queue Lengths

Pedestrian and Bicycle Facilities

Monument Hill Road and Deer Creek Road do not have designated bicycle lanes or sidewalks in the vicinity of the proposed commercial development, therefore, no continuity of these facilities is required.

Existing Signing and Striping

Since no changes are being recommended to either Monument Hill Road and Deer Creek Road as a result of the proposed commercial development, the existing signing and striping is adequate.

Access Deviation Request

El Paso County design standards do not permit direct access onto a major collector roadway. The proposed site plan is showing an access approximately 287 feet south of Deer Creek Road. An access deviation request is being requested. The supporting justification for this request is included in Attachment No. 4.

Section I - Recommendations/Conclusions

The traffic impacts from the proposed Monument Hill Business Park commercial development are considered to be minor and the existing roadway system and traffic control depicted in Figure 3 is able to accommodate the traffic from the proposed Monument Hill Business Park commercial development. No additional roadway improvements are needed.

**Attachment No. 1
Existing Traffic Counts
Turning Movement Counts
And Daily Traffic Counts**

COUNTER MEASURES INC.

1889 YORK STREET
DENVER, COLORADO
303-333-7409

N/S STREET: WOODMOOR DR
E/W STREET: DEER CREEK RD
CITY: MONUMENT
COUNTY: EL PASO

File Name : WOODDEER
Site Code : 00000016
Start Date : 4/5/2017
Page No : 1

Groups Printed- VEHICLES

Start Time	WOODMOOR DR Southbound				DEER CREEK RD Westbound				WOODMOOR DR Northbound				DEER CREEK RD Eastbound				Int. Total	
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds		
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	0	18	2	0	4	1	0	0	3	3	2	0	0	0	0	0	0	33
06:45 AM	0	27	3	0	9	2	0	0	10	1	0	0	0	0	2	0	0	54
Total	0	45	5	0	13	3	0	0	13	4	2	0	0	0	2	0	0	87
07:00 AM	0	30	1	0	12	3	0	0	5	7	3	0	0	0	3	0	0	64
07:15 AM	0	25	1	0	10	2	0	0	7	5	4	0	0	0	2	0	0	56
07:30 AM	1	43	1	0	8	1	0	0	9	4	4	0	0	1	3	0	0	75
07:45 AM	0	37	5	0	7	1	0	0	11	9	0	0	1	0	2	0	0	73
Total	1	135	8	0	37	7	0	0	32	25	11	0	1	1	10	0	0	268
08:00 AM	0	21	1	1	10	0	0	0	8	8	0	0	0	1	4	0	0	54
08:15 AM	0	36	0	0	7	0	0	0	8	6	0	0	0	0	2	0	0	59
Total	0	57	1	1	17	0	0	0	16	14	0	0	0	1	6	0	0	113
04:00 PM	0	28	1	0	8	1	0	25	8	45	7	1	2	1	24	5	0	156
04:15 PM	0	33	3	1	3	1	0	3	4	32	6	0	3	1	12	11	0	113
04:30 PM	0	30	3	0	7	1	0	40	11	35	11	0	4	1	19	0	0	162
04:45 PM	0	29	0	0	2	1	0	10	9	51	7	0	6	3	7	2	0	127
Total	0	120	7	1	20	4	0	78	32	163	31	1	15	6	62	18	0	558
05:00 PM	0	33	3	0	6	0	0	0	9	50	11	0	10	2	14	0	0	138
05:15 PM	0	26	5	0	6	2	1	0	5	52	13	0	10	10	8	0	0	138
05:30 PM	0	30	1	0	7	1	2	0	6	38	12	0	11	6	10	0	0	124
05:45 PM	0	20	4	0	8	1	3	0	1	34	17	0	3	1	4	0	0	96
Total	0	109	13	0	27	4	6	0	21	174	53	0	34	19	36	0	0	496
Grand Total	1	466	34	2	114	18	6	78	114	380	97	1	50	27	116	18	0	1522
Apprch %	0.2	92.6	6.8	0.4	52.8	8.3	2.8	36.1	19.3	64.2	16.4	0.2	23.7	12.8	55.0	8.5	0	
Total %	0.1	30.6	2.2	0.1	7.5	1.2	0.4	5.1	7.5	25.0	6.4	0.1	3.3	1.8	7.6	1.2	0	

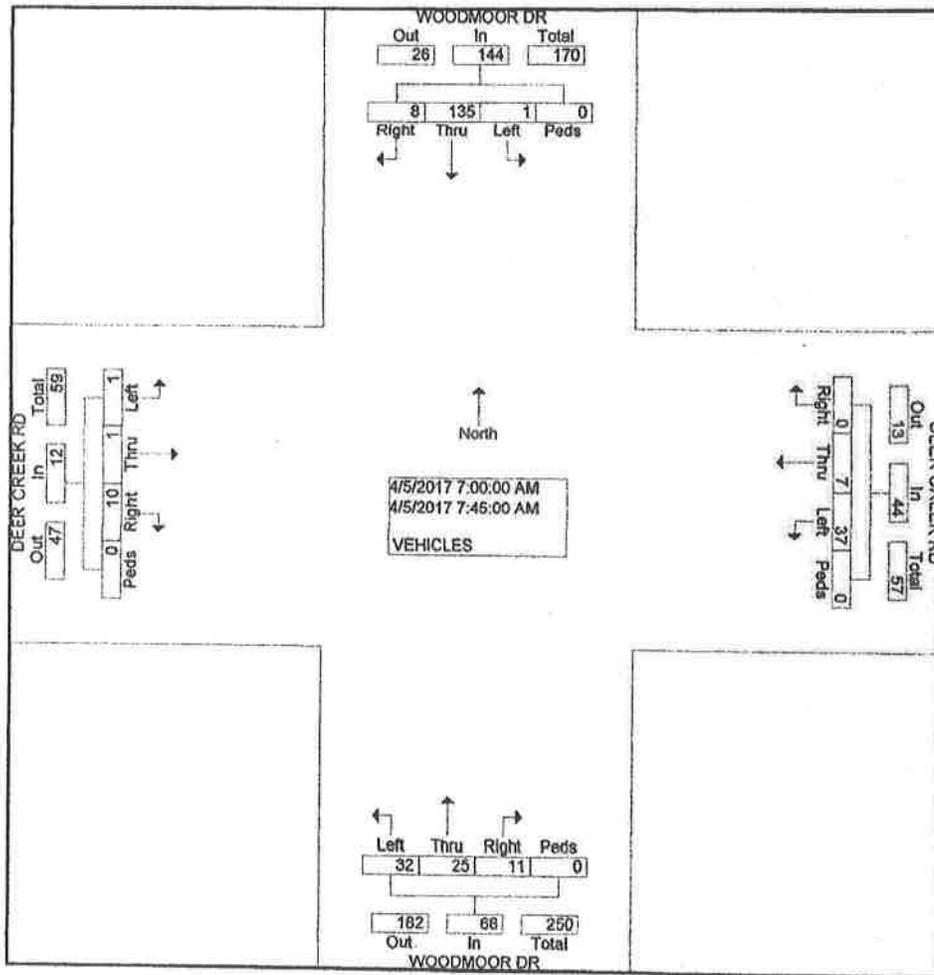
COUNTER MEASURES INC.

1889 YORK STREET
DENVER, COLORADO
303-333-7409

N/S STREET: WOODMOOR DR
E/W STREET: DEER CREEK RD
CITY: MONUMENT
COUNTY: EL PASO

File Name : WOODDEER
Site Code : 00000016
Start Date : 4/5/2017
Page No : 2

Start Time	WOODMOOR DR Southbound					DEER CREEK RD Westbound					WOODMOOR DR Northbound					DEER CREEK RD Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour From 06:30 AM to 08:30 AM - Peak 1 of 1																					
Intersection	07:00 AM																				
Volume	1	135	8	0	144	37	7	0	0	44	32	25	11	0	68	1	1	10	0	12	268
Percent	0.7	93.8	5.6	0.0		84.1	15.9	0.0	0.0		47.1	36.8	16.2	0.0		8.3	8.3	83.3	0.0		
07:30 Peak Factor	0.893																				
High Int. Volume	07:30 AM					07:00 AM					07:45 AM					07:30 AM					
Peak Factor	1	43	1	0	45	12	3	0	0	15	11	9	0	0	20	0	1	3	0	4	4
					0.80					0.73					0.85					0.75	
					0					3					0					0	



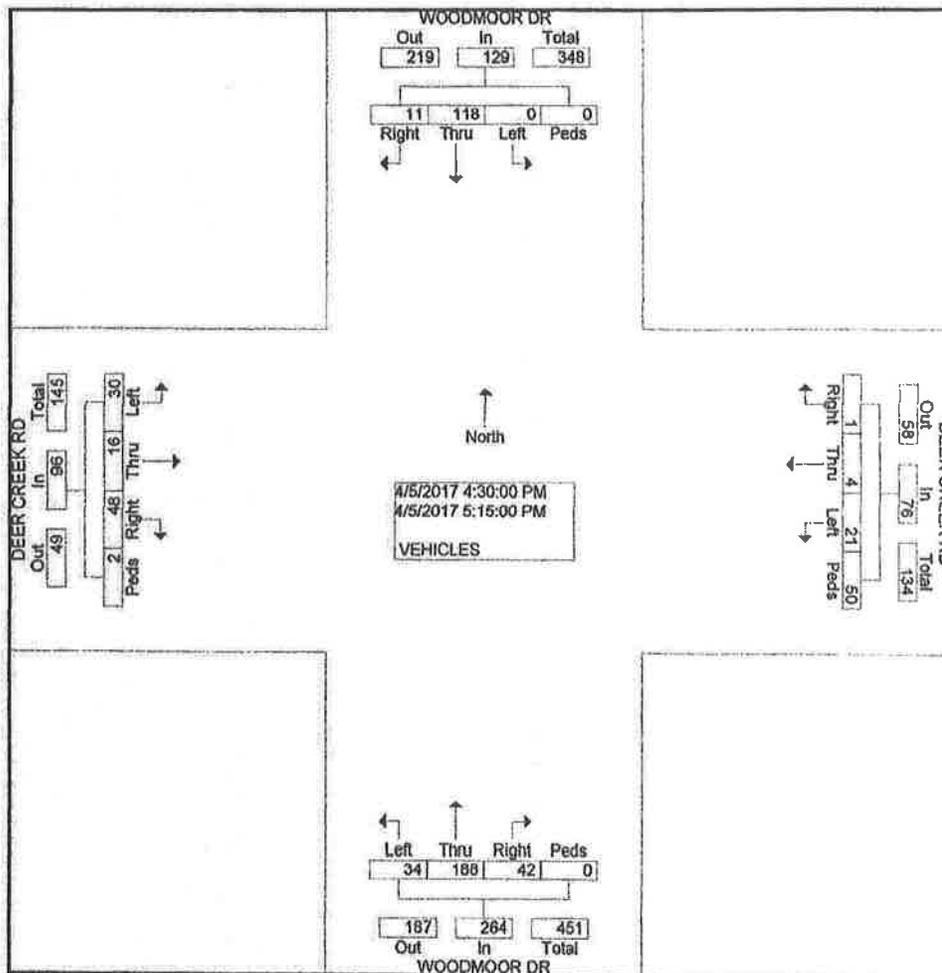
COUNTER MEASURES INC.

1889 YORK STREET
DENVER, COLORADO
303-333-7409

N/S STREET: WOODMOOR DR
EW STREET: DEER CREEK RD
CITY: MONUMENT
COUNTY: EL PASO

File Name : WOODDEER
Site Code : 00000016
Start Date : 4/5/2017
Page No : 2

Start Time	WOODMOOR DR Southbound					DEER CREEK RD Westbound					WOODMOOR DR Northbound					DEER CREEK RD Eastbound					Int. Total
	Left	Thru	Rig	Ped	App. Total	Left	Thru	Rig	Ped	App. Total	Left	Thru	Rig	Ped	App. Total	Left	Thru	Rig	Ped	App. Total	
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:30 PM																				
Volume	0	118	11	0	129	21	4	1	50	76	34	188	42	0	264	30	16	48	2	96	565
Percent	0.0	91.5	8.5	0.0		27.6	5.3	1.3	65.8		12.9	71.2	15.9	0.0		31.3	16.7	50.0	2.1		
04:30 Volume	0	30	3	0	33	7	1	0	40	48	11	35	11	0	57	4	1	19	0	24	162
Peak Factor	0.872																				
High Int. Volume	05:00 PM					04:30 PM					05:00 PM					05:15 PM					
Peak Factor	0.89					0.39					0.94					0.85					7



COUNTER MEASURES INC.

1889 YORK STREET
DENVER, COLORADO
303-333-7409

File Name : MONUDEER
Site Code : 00000005
Start Date : 4/5/2017
Page No : 1

N/S STREET: MONUMENT HILL RD
E/W STREET: DEER CREEK RD
CITY: MONUMENT
COUNTY: EL PASO

Groups Printed- VEHICLES

Start Time	Southbound				Westbound				Northbound				Eastbound				Int. Total	
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds		
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	3	6	0	0	1	0	3	0	0	5	5	0	0	0	0	0	0	23
06:45 AM	2	2	0	0	0	0	4	0	0	9	5	0	0	0	0	0	0	22
Total	5	8	0	0	1	0	7	0	0	14	10	0	0	0	0	0	0	45
07:00 AM	4	7	0	0	2	0	4	0	0	6	4	0	0	0	0	0	0	27
07:15 AM	2	9	0	0	1	0	3	0	0	3	8	0	0	0	0	0	0	26
07:30 AM	4	2	0	0	2	0	3	0	0	2	5	0	0	0	0	0	0	18
07:45 AM	1	9	0	0	1	0	2	0	0	6	9	0	0	0	0	0	0	28
Total	11	27	0	0	6	0	12	0	0	17	26	0	0	0	0	0	0	99
08:00 AM	4	12	0	0	1	0	2	0	0	6	7	0	0	0	0	0	0	32
08:15 AM	2	9	0	0	5	0	1	0	0	14	5	0	0	0	0	0	0	36
Total	6	21	0	0	6	0	3	0	0	20	12	0	0	0	0	0	0	68
04:00 PM	4	1	0	0	7	0	9	0	0	17	4	1	0	0	0	0	0	43
04:15 PM	6	21	0	0	3	0	5	0	0	11	2	2	0	0	0	0	0	50
04:30 PM	5	12	0	0	10	0	10	0	0	19	2	0	0	0	0	0	0	58
04:45 PM	8	18	0	0	8	0	11	0	0	18	1	0	0	0	0	0	0	64
Total	23	52	0	0	28	0	35	0	0	65	9	3	0	0	0	0	0	215
05:00 PM	9	47	0	0	3	0	11	0	0	26	2	0	0	0	0	0	0	98
05:15 PM	16	30	0	0	9	0	5	0	0	27	3	0	0	0	0	0	0	90
05:30 PM	19	46	0	0	4	0	7	0	0	37	2	0	0	0	0	0	0	115
05:45 PM	5	26	0	0	0	0	5	0	0	24	1	0	0	0	0	0	0	61
Total	49	149	0	0	16	0	28	0	0	114	8	0	0	0	0	0	0	364
Grand Total	94	257	0	0	57	0	85	0	0	230	65	3	0	0	0	0	0	791
Apprch %	26.8	73.2	0.0	0.0	40.1	0.0	59.9	0.0	0.0	77.2	21.8	1.0	0.0	0.0	0.0	0.0	0.0	
Total %	11.9	32.5	0.0	0.0	7.2	0.0	10.7	0.0	0.0	29.1	8.2	0.4	0.0	0.0	0.0	0.0	0.0	

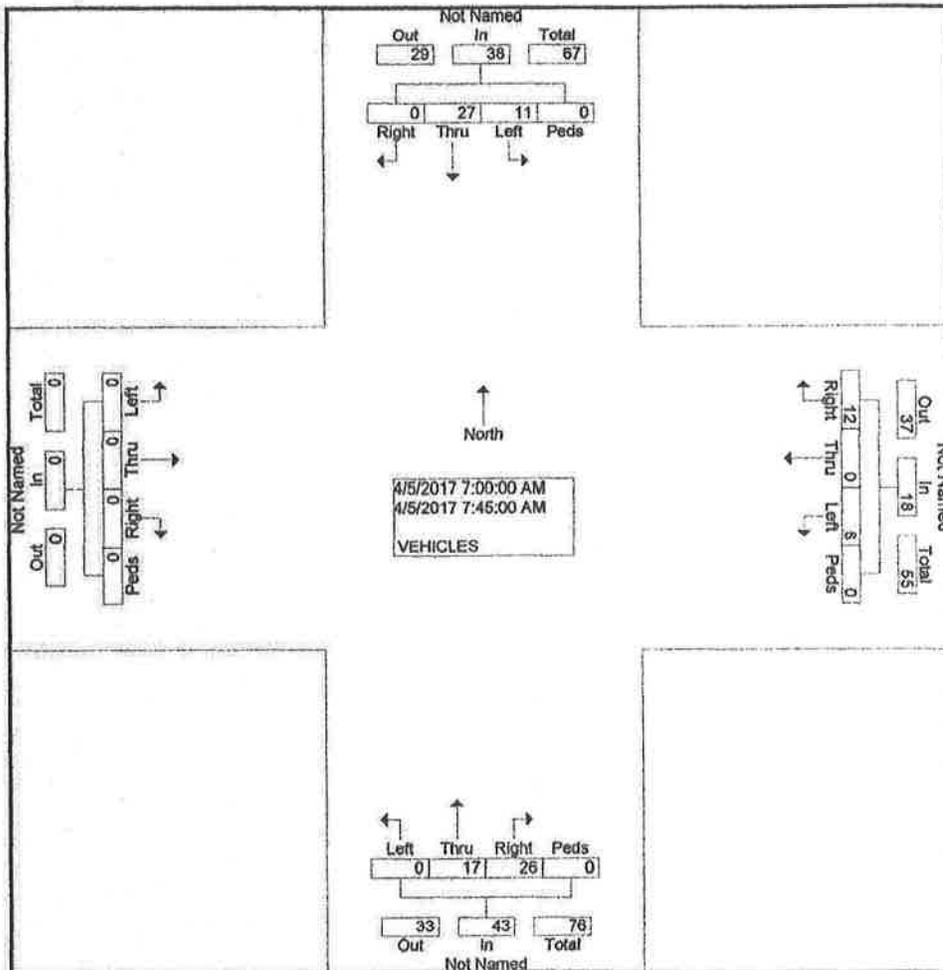
COUNTER MEASURES INC.

1889 YORK STREET
DENVER, COLORADO
303-333-7409

N/S STREET: MONUMENT HILL RD
E/W STREET: DEER CREEK RD
CITY: MONUMENT
COUNTY: EL PASO

File Name : MONUDEER
Site Code : 00000005
Start Date : 4/5/2017
Page No : 2

Start Time	Southbound					Westbound					Northbound					Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour From 07:00 AM to 07:45 AM - Peak 1 of 1																					
Intersect on	07:00 AM																				
Volume	11	27	0	0	38	6	0	12	0	18	0	17	26	0	43	0	0	0	0	0	99
Percent	28.9	71.1	0.0	0.0		33.3	0.0	66.7	0.0		0.0	39.5	60.5	0.0		0.0	0.0	0.0	0.0		
07:45																					
Volume	1	9	0	0	10	1	0	2	0	3	0	6	9	0	15	0	0	0	0	0	28
Peak Factor	0.884																				
High Int. Volume	07:00 AM					07:00 AM					07:45 AM										
Peak Factor	0.864					0.750					0.717										



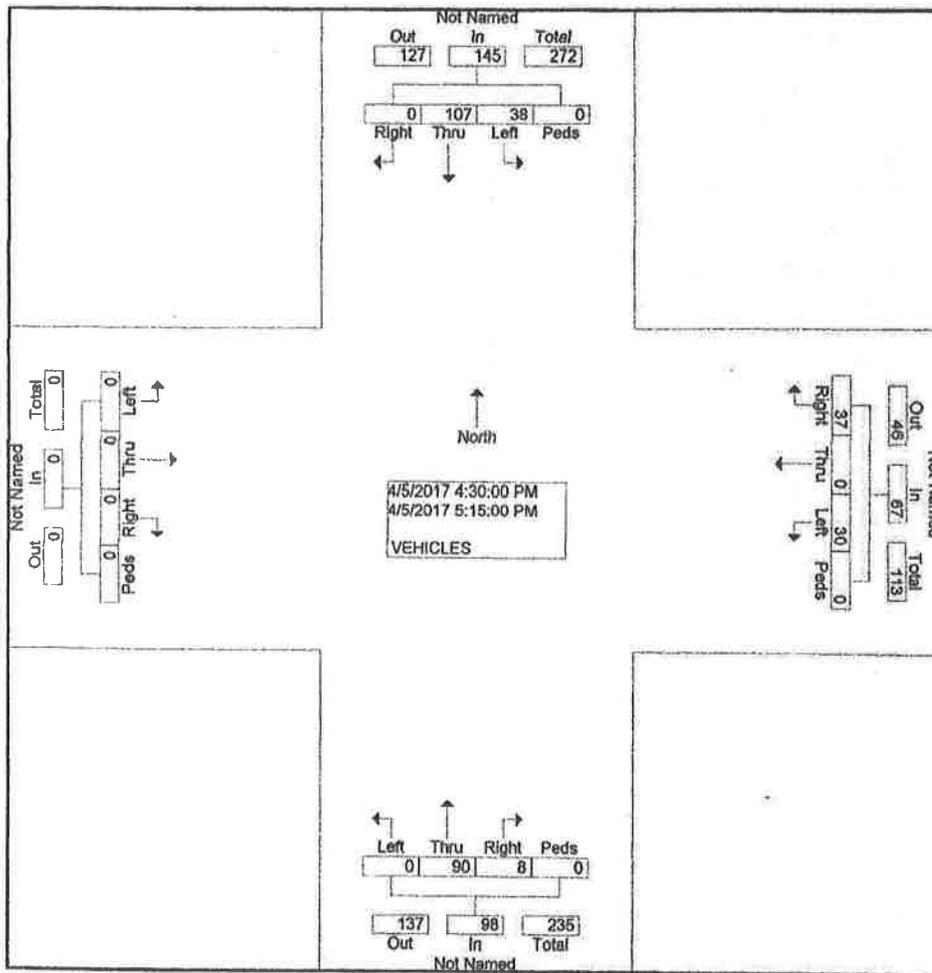
COUNTER MEASURES INC.

1889 YORK STREET
DENVER, COLORADO
303-333-7409

N/S STREET: MONUMENT HILL RD
E/W STREET: DEER CREEK RD
CITY: MONUMENT
COUNTY: EL PASO

File Name : MONUDEER
Site Code : 00000005
Start Date : 4/5/2017
Page No : 2

Start Time	Southbound					Westbound					Northbound					Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Intersect on	04:30 PM																				
Volume	38	107	0	0	145	30	0	37	0	67	0	90	8	0	98	0	0	0	0	0	310
Percent	26.2	73.8	0.0	0.0		44.8	0.0	55.2	0.0		0.0	91.8	8.2	0.0		0.0	0.0	0.0	0.0		
05:00 Volume	9	47	0	0	56	3	0	11	0	14	0	26	2	0	28	0	0	0	0	0	98
Peak Factor																					
High Int. Volume	05:00 PM					04:30 PM					05:15 PM										
Peak Factor	0.64					0.83					0.81					0.791					



COUNTER MEASURES INC.

Location: MONUMENT HILL RD S/O DEER CREEK RD **1889 YORK STREET**
 City: MONUMENT **DENVER, COLORADO 80206**
 County: EL PASO **303-333-7409**
 Direction: NORTHBOUND-SOUTHBOUND

Site Code: 040510
 Station ID: 040510

Start Time	06-Apr-17 Thu	NB	SB	Total
12:00 AM		0	0	0
01:00		0	0	0
02:00		0	2	2
03:00		0	5	5
04:00		12	13	25
05:00		70	35	105
06:00		190	153	343
07:00		94	102	196
08:00		78	59	137
09:00		63	78	141
10:00		62	71	133
11:00		104	93	197
12:00 PM		91	120	211
01:00		178	140	318
02:00		210	200	410
03:00		146	135	281
04:00		161	154	315
05:00		88	149	237
06:00		71	57	128
07:00		36	20	56
08:00		31	14	45
09:00		16	3	19
10:00		3	9	12
11:00		2	1	3
Total		1706	1613	3319
Percent		51.4%	48.6%	
AM Peak	-	06:00	06:00	06:00
Vol.	-	190	153	343
PM Peak	-	14:00	14:00	14:00
Vol.	-	210	200	410
Grand Total		1706	1613	3319
Percent		51.4%	48.6%	
ADT	ADT 3,319		AADT 3,319	

COUNTER MEASURES INC.

Location: DEER CREEK RD E/O MONUMENT HILL RD 1889 YORK STREET
 City: MONUMENT DENVER, COLORADO 80206
 County: EL PASO 303-333-7409
 Direction: EASTBOUND-WESTBOUND

Site Code: 414
 Station ID: 414

Start Time	06-Apr-17 Thu	EB	WB	Total						
12:00 AM		1	0	1						
01:00		0	0	0						
02:00		0	0	0						
03:00		0	1	1						
04:00		2	5	7						
05:00		7	5	12						
06:00		43	21	64						
07:00		105	56	161						
08:00		50	34	84						
09:00		31	26	57						
10:00		31	24	55						
11:00		26	27	53						
12:00 PM		34	39	73						
01:00		38	35	73						
02:00		76	77	153						
03:00		44	74	118						
04:00		48	73	121						
05:00		62	49	111						
06:00		39	24	63						
07:00		23	16	39						
08:00		8	13	21						
09:00		10	4	14						
10:00		4	1	5						
11:00		5	2	7						
Total		687	606	1293						
Percent		53.1%	46.9%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	105	56	-	-	-	-	-	-	161
PM Peak	-	14:00	14:00	-	-	-	-	-	-	14:00
Vol.	-	76	77	-	-	-	-	-	-	153
Grand Total		687	606							1293
Percent		53.1%	46.9%							
ADT		ADT 1,293	AADT 1,293							

COUNTER MEASURES INC.

Location: WOODMOOR DR N/O DEER CREEK RD
 City: MONUMENT
 County: EL PASO
 Direction: NORTHBOUND-SOUTHBOUND

1889 YORK STREET
 DENVER, COLORADO 80206
 303-333-7409

Site Code: 040506
 Station ID: 040506

Start Time	06-Apr-17 Thu	NB	SB	Total
12:00 AM		2	3	5
01:00		8	2	10
02:00		0	0	0
03:00		0	2	2
04:00		6	18	24
05:00		4	30	34
06:00		16	102	118
07:00		70	264	334
08:00		68	165	233
09:00		78	134	212
10:00		82	106	188
11:00		84	117	201
12:00 PM		84	112	196
01:00		106	116	222
02:00		150	140	290
03:00		138	142	280
04:00		188	142	330
05:00		221	122	343
06:00		168	109	277
07:00		136	72	208
08:00		77	33	110
09:00		58	26	84
10:00		16	14	30
11:00		8	7	15
Total		1768	1978	3746
Percent		47.2%	52.8%	
AM Peak	-	11:00	07:00	07:00
Vol.	-	84	264	334
PM Peak	-	17:00	15:00	17:00
Vol.	-	221	142	343
Grand Total		1768	1978	3746
Percent		47.2%	52.8%	
ADT	ADT 3,746		AADT 3,746	

COUNTER MEASURES INC.

Location: WOODMOOR DR S/O DEER CREEK RD
 City: MONUMENT
 County: EL PASO
 Direction: SOUTHBOUND-NORTHBOUND

1889 YORK STREET
 DENVER, COLORADO 80206
 303-333-7409

Site Code: 040504
 Station ID: 040504

Start Time	06-Apr-17 Thu	SB	NB	Total					
12:00 AM		4	2	6					
01:00		2	10	12					
02:00		1	2	3					
03:00		1	0	1					
04:00		15	6	21					
05:00		35	8	43					
06:00		134	42	176					
07:00		384	232	616					
08:00		213	122	335					
09:00		154	120	274					
10:00		160	114	274					
11:00		168	120	288					
12:00 PM		151	128	277					
01:00		162	150	312					
02:00		229	256	485					
03:00		262	271	533					
04:00		390	386	776					
05:00		369	249	618					
06:00		296	160	456					
07:00		252	106	358					
08:00		157	94	251					
09:00		94	67	161					
10:00		36	30	66					
11:00		20	14	34					
Total		3689	2687	6376					
Percent		57.9%	42.1%						
AM Peak	-	07:00	07:00	-	-	-	-	-	07:00
Vol.	-	384	232	-	-	-	-	-	616
PM Peak	-	16:00	16:00	-	-	-	-	-	16:00
Vol.	-	390	386	-	-	-	-	-	776
Grand Total		3689	2687						6376
Percent		57.9%	42.1%						
ADT		ADT 6,376	AADT 6,376						

COUNTER MEASURES INC.

Location: DEER CREEK RD E/O WOODMOOR DR
 City: MONUMENT
 County: EL PASO
 Direction: EASTBOUND-WESTBOUND

1889 YORK STREET
 DENVER, COLORADO 80206
 303-333-7409

Site Code: 040513
 Station ID: 040513

Start Time	06-Apr-17 Thu	EB	WB	Total
12:00 AM		1	1	2
01:00		1	1	2
02:00		4	1	5
03:00		0	0	0
04:00		1	1	2
05:00		2	10	12
06:00		10	30	40
07:00		26	64	90
08:00		20	57	77
09:00		18	30	48
10:00		23	25	48
11:00		28	34	62
12:00 PM		31	36	67
01:00		24	32	56
02:00		30	40	70
03:00		56	45	101
04:00		66	46	112
05:00		75	46	121
06:00		44	50	94
07:00		40	32	72
08:00		23	20	43
09:00		21	12	33
10:00		10	12	22
11:00		4	2	6
Total		558	627	1185
Percent		47.1%	52.9%	
AM Peak	-	11:00	07:00	07:00
Vol.	-	28	64	90
PM Peak	-	17:00	18:00	17:00
Vol.	-	75	50	121
Grand Total		558	627	1185
Percent		47.1%	52.9%	
ADT		ADT 1,185	AADT 1,185	

COUNTER MEASURES INC.

Location: DEER CREEK RD W/O WOODMOOR DR
 City: MONUMENT
 County: EL PASO
 Direction: WESTBOUND-EASTBOUND

1889 YORK STREET
 DENVER, COLORADO 80206
 303-333-7409

Site Code: 040507
 Station ID: 040507

Start Time	06-Apr-17 Thu	WB	EB	Total
12:00 AM		2	2	4
01:00		0	1	1
02:00		0	0	0
03:00		1	0	1
04:00		6	1	7
05:00		12	2	14
06:00		41	18	59
07:00		156	94	250
08:00		74	32	106
09:00		78	50	128
10:00		64	50	114
11:00		72	60	132
12:00 PM		66	44	110
01:00		78	52	130
02:00		108	80	188
03:00		124	78	202
04:00		126	102	228
05:00		126	102	228
06:00		71	62	133
07:00		54	49	103
08:00		38	31	69
09:00		14	15	29
10:00		8	7	15
11:00		5	4	9
Total		1324	936	2260
Percent		58.6%	41.4%	
AM Peak	-	07:00	07:00	07:00
Vol.	-	156	94	250
PM Peak	-	16:00	16:00	16:00
Vol.	-	126	102	228
Grand Total		1324	936	2260
Percent		58.6%	41.4%	
ADT		ADT 2,260	AADT 2,260	

Attachment No. 2
Capacity Analysis
Existing, Opening Day (2018) and Five Years after Opening Day (2023)

**Year 2017 Existing Traffic Volumes
Weekday Conditions
AM and PM Peak-Hours
(Synchro Printouts)**

HCM 2010 TWSC

1: Monument Hill Rd. & Deer Creek Rd.

04/07/2017

Intersection

Int Delay, s/veh 2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑			↓
Traffic Vol, veh/h	6	12	17	26	11	27
Future Vol, veh/h	6	12	17	26	11	27
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	13	18	28	12	29

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	86	33	0	0	47	0
Stage 1	33	-	-	-	-	-
Stage 2	53	-	-	-	-	-
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	915	1041	-	-	1560	-
Stage 1	989	-	-	-	-	-
Stage 2	970	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	908	1041	-	-	1560	-
Mov Cap-2 Maneuver	908	-	-	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	962	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	8.7		0		2.1
HCM LOS	A				

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	993	1560	-
HCM Lane V/C Ratio	-	-	0.02	0.008	-
HCM Control Delay (s)	-	-	8.7	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection

Int Delay, s/veh 3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Vol, veh/h	1	1	10	37	7	0	32	25	11	1	153	8
Future Vol, veh/h	1	1	10	37	7	0	32	25	11	1	153	8
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									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	11	40	8	0	35	27	12	1	166	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	280	282	171	282	280	33	175	0	0	39	0	0
Stage 1	173	173	-	103	103	-	-	-	-	-	-	-
Stage 2	107	109	-	179	177	-	-	-	-	-	-	-
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	672	627	873	670	628	1041	1401	-	-	1571	-	-
Stage 1	829	756	-	903	810	-	-	-	-	-	-	-
Stage 2	898	805	-	823	753	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	652	610	873	647	611	1041	1401	-	-	1571	-	-
Mov Cap-2 Maneuver	652	610	-	647	611	-	-	-	-	-	-	-
Stage 1	807	755	-	880	789	-	-	-	-	-	-	-
Stage 2	866	784	-	811	752	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	11.1	3.6	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1401	-	-	820	641	1571	-	-
HCM Lane V/C Ratio	0.025	-	-	0.016	0.075	0.001	-	-
HCM Control Delay (s)	7.6	0	-	9.5	11.1	7.3	0	-
HCM Lane LOS	A	A	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	0.2	0	-	-

Intersection

Int Delay, s/veh 3.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		P			4
Traffic Vol, veh/h	30	37	90	8	38	107
Future Vol, veh/h	30	37	90	8	38	107
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	40	98	9	41	116

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	301	102	0	0	107	0
Stage 1	102	-	-	-	-	-
Stage 2	199	-	-	-	-	-
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	691	953	-	-	1484	-
Stage 1	922	-	-	-	-	-
Stage 2	835	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	670	953	-	-	1484	-
Mov Cap-2 Maneuver	670	-	-	-	-	-
Stage 1	922	-	-	-	-	-
Stage 2	810	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	9.9		0		2
HCM LOS	A				

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	801	1484	-
HCM Lane V/C Ratio	-	-	0.091	0.028	-
HCM Control Delay (s)	-	-	9.9	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection

Int Delay, s/veh 3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	16	48	21	4	1	34	188	42	0	118	11
Future Vol, veh/h	30	16	48	21	4	1	34	188	42	0	118	11
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									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	17	52	23	4	1	37	204	46	0	128	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	438	458	134	470	441	227	140	0	0	250	0	0
Stage 1	134	134	-	301	301	-	-	-	-	-	-	-
Stage 2	304	324	-	169	140	-	-	-	-	-	-	-
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	529	499	915	504	510	812	1443	-	-	1316	-	-
Stage 1	869	785	-	708	665	-	-	-	-	-	-	-
Stage 2	705	650	-	833	781	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	513	484	915	452	495	812	1443	-	-	1316	-	-
Mov Cap-2 Maneuver	513	484	-	452	495	-	-	-	-	-	-	-
Stage 1	843	785	-	687	645	-	-	-	-	-	-	-
Stage 2	678	631	-	768	781	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.5	13.2	1	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1443	-	-	653	466	1316	-	-
HCM Lane V/C Ratio	0.026	-	-	0.156	0.061	-	-	-
HCM Control Delay (s)	7.6	0	-	11.5	13.2	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.2	0	-	-

**Year 2018 Background and Total Traffic Volumes
Weekday Conditions
AM and PM Peak-Hours
(Synchro Printouts)**

Intersection

Int Delay, s/veh 2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Vol, veh/h	5	10	20	25	10	30
Future Vol, veh/h	5	10	20	25	10	30
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	11	22	27	11	33

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	89	35	0	0	49	0
Stage 1	35	-	-	-	-	-
Stage 2	54	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	912	1038	-	-	1558	-
Stage 1	987	-	-	-	-	-
Stage 2	969	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	906	1038	-	-	1558	-
Mov Cap-2 Maneuver	906	-	-	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	962	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	8.7		0		1.8
HCM LOS	A				

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	990	1558	-
HCM Lane V/C Ratio	-	-	0.016	0.007	-
HCM Control Delay (s)	-	-	8.7	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection

Int Delay, s/veh 3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Vol, veh/h	0	0	10	40	10	0	35	25	10	0	155	10
Future Vol, veh/h	0	0	10	40	10	0	35	25	10	0	155	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	11	43	11	0	38	27	11	0	168	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	288	288	174	288	288	33	179	0	0	38	0	0
Stage 1	174	174	-	109	109	-	-	-	-	-	-	-
Stage 2	114	114	-	179	179	-	-	-	-	-	-	-
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	664	622	869	664	622	1041	1397	-	-	1572	-	-
Stage 1	828	755	-	896	805	-	-	-	-	-	-	-
Stage 2	891	801	-	823	751	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	641	605	869	642	605	1041	1397	-	-	1572	-	-
Mov Cap-2 Maneuver	641	605	-	642	605	-	-	-	-	-	-	-
Stage 1	805	755	-	871	782	-	-	-	-	-	-	-
Stage 2	854	779	-	813	751	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.2	11.2	3.8	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1397	-	-	869	634	1572	-	-
HCM Lane V/C Ratio	0.027	-	-	0.013	0.086	-	-	-
HCM Control Delay (s)	7.6	0	-	9.2	11.2	0	-	-
HCM Lane LOS	A	A	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0	0.3	0	-	-

Intersection

Int Delay, s/veh 3.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑			↓
Traffic Vol, veh/h	30	40	90	10	40	110
Future Vol, veh/h	30	40	90	10	40	110
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	43	98	11	43	120

Major/Minor	Minor1	Minor2	Major1	Major2	Major3	Major4
Conflicting Flow All	310	103	0	0	109	0
Stage 1	103	-	-	-	-	-
Stage 2	207	-	-	-	-	-
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	682	952	-	-	1481	-
Stage 1	921	-	-	-	-	-
Stage 2	828	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	661	952	-	-	1481	-
Mov Cap-2 Maneuver	661	-	-	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	802	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	801	1481	-
HCM Lane V/C Ratio	-	-	0.095	0.029	-
HCM Control Delay (s)	-	-	10	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection												
Int Delay, s/veh	3.3											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕			↕				↕	
Traffic Vol, veh/h	30	15	50	20	5	0	35	190	45	0	120	10	
Future Vol, veh/h	30	15	50	20	5	0	35	190	45	0	120	10	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None										
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	33	16	54	22	5	0	38	207	49	0	130	11	

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	446	468	136	478	448	231	141	0	0	255	0	0
Stage 1	136	136	-	307	307	-	-	-	-	-	-	-
Stage 2	310	332	-	171	141	-	-	-	-	-	-	-
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	523	493	913	498	506	808	1442	-	-	1310	-	-
Stage 1	867	784	-	703	661	-	-	-	-	-	-	-
Stage 2	700	644	-	831	780	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	506	478	913	445	490	808	1442	-	-	1310	-	-
Mov Cap-2 Maneuver	506	478	-	445	490	-	-	-	-	-	-	-
Stage 1	840	784	-	681	641	-	-	-	-	-	-	-
Stage 2	673	624	-	765	780	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.5	13.5	1	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1442	-	-	653	453	1310	-	-
HCM Lane V/C Ratio	0.026	-	-	0.158	0.06	-	-	-
HCM Control Delay (s)	7.6	0	-	11.5	13.5	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.2	0	-	-

HCM 2010 TWSC

1: Monument Hill Rd. & Deer Creek Rd.

04/07/2017

Intersection

Int Delay, s/veh 2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	TT		↑			↓
Traffic Vol, veh/h	5	10	21	25	13	33
Future Vol, veh/h	5	10	21	25	13	33
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	11	23	27	14	36

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	100	36	0
Stage 1	36	-	-
Stage 2	64	-	-
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	899	1037	1557
Stage 1	986	-	-
Stage 2	959	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	891	1037	1557
Mov Cap-2 Maneuver	891	-	-
Stage 1	986	-	-
Stage 2	950	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	2.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	983	1557
HCM Lane V/C Ratio	-	-	0.017	0.009
HCM Control Delay (s)	-	-	8.7	7.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection

Int Delay, s/veh 0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↓	↑	
Traffic Vol, veh/h	35	3	6	15	0	1
Future Vol, veh/h	35	3	6	15	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	3	7	16	0	1

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	69
Stage 1	-	-	40
Stage 2	-	-	29
Critical Hdwy	-	4.12	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	-	2.218	3.518
Pot Cap-1 Maneuver	-	1568	936
Stage 1	-	-	982
Stage 2	-	-	994
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1568	931
Mov Cap-2 Maneuver	-	-	931
Stage 1	-	-	982
Stage 2	-	-	989

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1031	-	-	1568	-
HCM Lane V/C Ratio	0.001	-	-	0.004	-
HCM Control Delay (s)	8.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

HCM 2010 TWSC
7: Monument Hill Rd. & Access B

04/07/2017

Intersection

Int Delay, s/veh 0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑			↑
Traffic Vol, veh/h	1	1	45	6	3	35
Future Vol, veh/h	1	1	45	6	3	35
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	1	49	7	3	38

Major/Minor	Minor1	Minor2	Major1	Major2
Conflicting Flow All	97	52	0	0
Stage 1	52	-	-	-
Stage 2	45	-	-	-
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	902	1016	-	1550
Stage 1	970	-	-	-
Stage 2	977	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	900	1016	-	1550
Mov Cap-2 Maneuver	900	-	-	-
Stage 1	970	-	-	-
Stage 2	975	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	954	1550	-
HCM Lane V/C Ratio	-	-	0.002	0.002	-
HCM Control Delay (s)	-	-	8.8	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection												
Int Delay, s/veh	3.2											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Vol, veh/h	1	0	10	40	11	0	37	25	10	0	155	14
Future Vol, veh/h	1	0	10	40	11	0	37	25	10	0	155	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									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	11	43	12	0	40	27	11	0	168	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	295	294	176	295	297	33	184	0	0	38	0	0
Stage 1	176	176	-	113	113	-	-	-	-	-	-	-
Stage 2	119	118	-	182	184	-	-	-	-	-	-	-
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	657	617	867	657	615	1041	1391	-	-	1572	-	-
Stage 1	826	753	-	892	802	-	-	-	-	-	-	-
Stage 2	885	798	-	820	747	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	633	599	867	634	597	1041	1391	-	-	1572	-	-
Mov Cap-2 Maneuver	633	599	-	634	597	-	-	-	-	-	-	-
Stage 1	802	753	-	866	779	-	-	-	-	-	-	-
Stage 2	846	775	-	810	747	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.4	11.3	3.9	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1391	-	-	839	626	1572	-	-
HCM Lane V/C Ratio	0.029	-	-	0.014	0.089	-	-	-
HCM Control Delay (s)	7.7	0	-	9.4	11.3	0	-	-
HCM Lane LOS	A	A	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0	0.3	0	-	-

HCM 2010 TWSC

1: Monument Hill Rd. & Deer Creek Rd.

04/21/2017

Intersection

Int Delay, s/veh 3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T			↑
Traffic Vol, veh/h	30	43	93	10	41	111
Future Vol, veh/h	30	43	93	10	41	111
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	47	101	11	45	121

Major/Minor	Minor1	Minor2	Major1	Major2	Major3	Major4
Conflicting Flow All	317	107	0	0	112	0
Stage 1	107	-	-	-	-	-
Stage 2	210	-	-	-	-	-
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	676	947	-	-	1478	-
Stage 1	917	-	-	-	-	-
Stage 2	825	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	654	947	-	-	1478	-
Mov Cap-2 Maneuver	654	-	-	-	-	-
Stage 1	917	-	-	-	-	-
Stage 2	798	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	800	1478	-
HCM Lane V/C Ratio	-	-	0.099	0.03	-
HCM Control Delay (s)	-	-	10	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

HCM 2010 TWSC

5: Access A & Deer Creek Rd.

04/21/2017

Intersection

Int Delay, s/veh 0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↗	↘	
Traffic Vol, veh/h	50	1	1	70	3	6
Future Vol, veh/h	50	1	1	70	3	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	1	1	76	3	7

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	55
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1550
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1550
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	956	-	-	1550	-
HCM Lane V/C Ratio	0.01	-	-	0.001	-
HCM Control Delay (s)	8.8	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection

Int Delay, s/veh 0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑			↑
Traffic Vol, veh/h	5	3	100	1	1	140
Future Vol, veh/h	5	3	100	1	1	140
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	3	109	1	1	152

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	263	109	0	0	110	0
Stage 1	109	-	-	-	-	-
Stage 2	154	-	-	-	-	-
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	726	945	-	-	1480	-
Stage 1	916	-	-	-	-	-
Stage 2	874	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	725	945	-	-	1480	-
Mov Cap-2 Maneuver	725	-	-	-	-	-
Stage 1	916	-	-	-	-	-
Stage 2	873	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	9.6		0		0.1
HCM LOS	A				

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	794	1480	-
HCM Lane V/C Ratio	-	-	0.011	0.001	-
HCM Control Delay (s)	-	-	9.6	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	33	16	52	20	5	0	35	190	45	0	120	11
Future Vol, veh/h	33	16	52	20	5	0	35	190	45	0	120	11
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									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	36	17	57	22	5	0	38	207	49	0	130	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	446	468	136	480	449	231	142	0	0	255	0	0
Stage 1	136	136	-	307	307	-	-	-	-	-	-	-
Stage 2	310	332	-	173	142	-	-	-	-	-	-	-
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	523	493	913	496	505	808	1441	-	-	1310	-	-
Stage 1	867	784	-	703	661	-	-	-	-	-	-	-
Stage 2	700	644	-	829	779	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	506	478	913	442	489	808	1441	-	-	1310	-	-
Mov Cap-2 Maneuver	506	478	-	442	489	-	-	-	-	-	-	-
Stage 1	840	784	-	681	641	-	-	-	-	-	-	-
Stage 2	673	624	-	760	779	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.7	13.5	1	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1441	-	-	649	451	1310	-	-
HCM Lane V/C Ratio	0.026	-	-	0.169	0.06	-	-	-
HCM Control Delay (s)	7.6	0	-	11.7	13.5	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.2	0	-	-

**Year 2023 Background and Total Traffic Volumes
Weekday Conditions
AM and PM Peak-Hours
(Synchro Printouts)**

HCM 2010 TWSC

1: Monument Hill Rd. & Deer Creek Rd.

04/07/2017

Intersection

Int Delay, s/veh 1.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑			↑
Traffic Vol, veh/h	5	10	20	30	10	35
Future Vol, veh/h	5	10	20	30	10	35
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	11	22	33	11	38

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	98	38	0
Stage 1	38	-	-
Stage 2	60	-	-
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	901	1034	1551
Stage 1	984	-	-
Stage 2	963	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	895	1034	1551
Mov Cap-2 Maneuver	895	-	-
Stage 1	984	-	-
Stage 2	956	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	1.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	983	1551
HCM Lane V/C Ratio	-	-	0.017	0.007
HCM Control Delay (s)	-	-	8.7	7.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection

Int Delay, s/veh 3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	10	45	10	0	40	30	10	0	170	10
Future Vol, veh/h	0	0	10	45	10	0	40	30	10	0	170	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	11	49	11	0	43	33	11	0	185	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	320	320	190	321	321	38	196	0	0	43	0	0
Stage 1	190	190	-	125	125	-	-	-	-	-	-	-
Stage 2	130	130	-	196	196	-	-	-	-	-	-	-
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	633	597	852	632	596	1034	1377	-	-	1566	-	-
Stage 1	812	743	-	879	792	-	-	-	-	-	-	-
Stage 2	874	789	-	806	739	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	609	578	852	609	577	1034	1377	-	-	1566	-	-
Mov Cap-2 Maneuver	609	578	-	609	577	-	-	-	-	-	-	-
Stage 1	786	743	-	851	767	-	-	-	-	-	-	-
Stage 2	834	764	-	796	739	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.3	11.6	3.9	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1377	-	-	852	603	1566	-	-
HCM Lane V/C Ratio	0.032	-	-	0.013	0.099	-	-	-
HCM Control Delay (s)	7.7	0	-	9.3	11.6	0	-	-
HCM Lane LOS	A	A	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0	0.3	0	-	-

HCM 2010 TWSC

1: Monument Hill Rd. & Deer Creek Rd.

04/07/2017

Intersection

Int Delay, s/veh 3.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y			Y
Traffic Vol, veh/h	35	45	100	10	45	120
Future Vol, veh/h	35	45	100	10	45	120
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	49	109	11	49	130

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	342	114	0	0	120	0
Stage 1	114	-	-	-	-	-
Stage 2	228	-	-	-	-	-
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	654	939	-	-	1468	-
Stage 1	911	-	-	-	-	-
Stage 2	810	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	630	939	-	-	1468	-
Mov Cap-2 Maneuver	630	-	-	-	-	-
Stage 1	911	-	-	-	-	-
Stage 2	781	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	10.2		0		2.1
HCM LOS	B				

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	773	1468
HCM Lane V/C Ratio	-	-	0.112	0.033
HCM Control Delay (s)	-	-	10.2	7.5
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1

HCM 2010 TWSC

9: Woodmoor Dr. & Deer Creek Rd.

04/07/2017

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	35	15	55	20	5	0	40	210	50	0	130	10
Future Vol, veh/h	35	15	55	20	5	0	40	210	50	0	130	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	16	60	22	5	0	43	228	54	0	141	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	492	517	147	527	494	255	152	0	0	283	0	0
Stage 1	147	147	-	342	342	-	-	-	-	-	-	-
Stage 2	345	370	-	185	152	-	-	-	-	-	-	-
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	487	462	900	462	476	784	1429	-	-	1279	-	-
Stage 1	856	775	-	673	638	-	-	-	-	-	-	-
Stage 2	671	620	-	817	772	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	469	445	900	408	459	784	1429	-	-	1279	-	-
Mov Cap-2 Maneuver	469	445	-	408	459	-	-	-	-	-	-	-
Stage 1	825	775	-	649	615	-	-	-	-	-	-	-
Stage 2	641	598	-	747	772	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.1	14.2	1	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1429	-	-	620	417	1279	-	-
HCM Lane V/C Ratio	0.03	-	-	0.184	0.065	-	-	-
HCM Control Delay (s)	7.6	0	-	12.1	14.2	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	0.2	0	-	-

HCM 2010 TWSC

1: Monument Hill Rd. & Deer Creek Rd.

04/07/2017

Intersection

Int Delay, s/veh 2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T			T
Traffic Vol, veh/h	5	10	21	30	13	38
Future Vol, veh/h	5	10	21	30	13	38
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	11	23	33	14	41

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	109	39	0	0	55	0
Stage 1	39	-	-	-	-	-
Stage 2	70	-	-	-	-	-
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	888	1033	-	-	1550	-
Stage 1	983	-	-	-	-	-
Stage 2	953	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	880	1033	-	-	1550	-
Mov Cap-2 Maneuver	880	-	-	-	-	-
Stage 1	983	-	-	-	-	-
Stage 2	944	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	8.8		0		1.9
HCM LOS	A				

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 976	1550	-
HCM Lane V/C Ratio	-	- 0.017	0.009	-
HCM Control Delay (s)	-	- 8.8	7.3	0
HCM Lane LOS	-	- A	A	A
HCM 95th %tile Q(veh)	-	- 0.1	0	-

Intersection

Int Delay, s/veh 0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	Y	
Traffic Vol, veh/h	40	3	6	15	0	1
Future Vol, veh/h	40	3	6	15	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	3	7	16	0	1

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	47
Stage 1	-	-	45
Stage 2	-	-	29
Critical Hdwy	-	4.12	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	-	2.218	3.518
Pot Cap-1 Maneuver	-	1560	930
Stage 1	-	-	977
Stage 2	-	-	994
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1560	925
Mov Cap-2 Maneuver	-	-	925
Stage 1	-	-	977
Stage 2	-	-	989

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1025	-	-	1560	-
HCM Lane V/C Ratio	0.001	-	-	0.004	-
HCM Control Delay (s)	8.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection

Int Delay, s/veh 0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑			↑
Traffic Vol, veh/h	1	1	50	6	3	40
Future Vol, veh/h	1	1	50	6	3	40
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	1	54	7	3	43

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	108	58	0
Stage 1	58	-	-
Stage 2	50	-	-
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	889	1008	1542
Stage 1	965	-	-
Stage 2	972	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	887	1008	1542
Mov Cap-2 Maneuver	887	-	-
Stage 1	965	-	-
Stage 2	970	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 944	1542	-
HCM Lane V/C Ratio	-	- 0.002	0.002	-
HCM Control Delay (s)	-	- 8.8	7.3	0
HCM Lane LOS	-	- A	A	A
HCM 95th %tile Q(veh)	-	- 0	0	-

HCM 2010 TWSC

9: Woodmoor Dr. & Deer Creek Rd.

04/07/2017

Intersection

Int Delay, s/veh 3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	0	10	45	11	0	42	30	10	0	170	14
Future Vol, veh/h	1	0	10	45	11	0	42	30	10	0	170	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									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	11	49	12	0	46	33	11	0	185	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	327	327	192	327	329	38	200	0	0	43	0	0
Stage 1	192	192	-	129	129	-	-	-	-	-	-	-
Stage 2	135	135	-	198	200	-	-	-	-	-	-	-
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	626	591	850	626	590	1034	1372	-	-	1566	-	-
Stage 1	810	742	-	875	789	-	-	-	-	-	-	-
Stage 2	868	785	-	804	736	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	600	571	850	602	570	1034	1372	-	-	1566	-	-
Mov Cap-2 Maneuver	600	571	-	602	570	-	-	-	-	-	-	-
Stage 1	782	742	-	845	762	-	-	-	-	-	-	-
Stage 2	825	758	-	794	736	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	11.7	4	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1372	-	-	819	595	1566	-	-
HCM Lane V/C Ratio	0.033	-	-	0.015	0.102	-	-	-
HCM Control Delay (s)	7.7	0	-	9.5	11.7	0	-	-
HCM Lane LOS	A	A	-	A	B	A	-	-
HCM 95th %ile Q(veh)	0.1	-	-	0	0.3	0	-	-

HCM 2010 TWSC

1: Monument Hill Rd. & Deer Creek Rd.

04/21/2017

Intersection

Int Delay, s/veh 3.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T			U
Traffic Vol, veh/h	35	48	103	10	46	121
Future Vol, veh/h	35	48	103	10	46	121
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	52	112	11	50	132

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	349	117	0
Stage 1	117	-	-
Stage 2	232	-	-
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	648	935	1464
Stage 1	908	-	-
Stage 2	807	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	624	935	1464
Mov Cap-2 Maneuver	624	-	-
Stage 1	908	-	-
Stage 2	777	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	2.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	773	1464	-
HCM Lane V/C Ratio	-	-	0.117	0.034	-
HCM Control Delay (s)	-	-	10.3	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

5: Access A & Deer Creek Rd.

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↘	
Traffic Vol, veh/h	55	1	1	80	3	6
Future Vol, veh/h	55	1	1	80	3	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	60	1	1	87	3	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	61	0	149	60
Stage 1	-	-	-	-	60	-
Stage 2	-	-	-	-	89	-
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	-	-	1542	-	843	1005
Stage 1	-	-	-	-	963	-
Stage 2	-	-	-	-	934	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1542	-	842	1005
Mov Cap-2 Maneuver	-	-	-	-	842	-
Stage 1	-	-	-	-	963	-
Stage 2	-	-	-	-	933	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	944	-	-	1542	-
HCM Lane V/C Ratio	0.01	-	-	0.001	-
HCM Control Delay (s)	8.9	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

HCM 2010 TWSC
7: Monument Hill Rd. & Access B

04/21/2017

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		P			4
Traffic Vol, veh/h	5	3	110	1	1	155
Future Vol, veh/h	5	3	110	1	1	155
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	3	120	1	1	168

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	291	120	0	0	121	0
Stage 1	120	-	-	-	-	-
Stage 2	171	-	-	-	-	-
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	700	931	-	-	1467	-
Stage 1	905	-	-	-	-	-
Stage 2	859	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	699	931	-	-	1467	-
Mov Cap-2 Maneuver	699	-	-	-	-	-
Stage 1	905	-	-	-	-	-
Stage 2	858	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	9.7		0		0
HCM LOS	A				

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	771	1467	-
HCM Lane V/C Ratio	-	-	0.011	0.001	-
HCM Control Delay (s)	-	-	9.7	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

HCM 2010 TWSC

9: Woodmoor Dr. & Deer Creek Rd.

04/21/2017

Intersection

Int Delay, s/veh 3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	38	16	57	20	5	0	40	210	50	0	130	11
Future Vol, veh/h	38	16	57	20	5	0	40	210	50	0	130	11
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									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	17	62	22	5	0	43	228	54	0	141	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	492	517	147	529	495	255	153	0	0	283	0	0
Stage 1	147	147	-	342	342	-	-	-	-	-	-	-
Stage 2	345	370	-	187	153	-	-	-	-	-	-	-
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	487	462	900	460	476	784	1428	-	-	1279	-	-
Stage 1	856	775	-	673	638	-	-	-	-	-	-	-
Stage 2	671	620	-	815	771	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	469	445	900	404	459	784	1428	-	-	1279	-	-
Mov Cap-2 Maneuver	469	445	-	404	459	-	-	-	-	-	-	-
Stage 1	825	775	-	649	615	-	-	-	-	-	-	-
Stage 2	641	598	-	742	771	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.3	14.3	1	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1428	-	-	616	414	1279	-	-
HCM Lane V/C Ratio	0.03	-	-	0.196	0.066	-	-	-
HCM Control Delay (s)	7.6	0	-	12.3	14.3	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	0.2	0	-	-

Attachment No. 3
Years 2023 Weekday Peak-Hour Queue Lengths
(SimTraffic Printouts)

Queuing and Blocking Report
 2023 AM Peak-Hour Total Traffic Volumes

04/07/2017

Intersection: 1: Monument Hill Rd. & Deer Creek Rd.

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	31	19
Average Queue (ft)	12	1
95th Queue (ft)	36	10
Link Distance (ft)	485	471
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Access A & Deer Creek Rd.

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	6	24
Average Queue (ft)	0	1
95th Queue (ft)	4	10
Link Distance (ft)	2026	352
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Monument Hill Rd. & Access B

Movement	WB
Directions Served	LR
Maximum Queue (ft)	25
Average Queue (ft)	1
95th Queue (ft)	11
Link Distance (ft)	472
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
2023 AM Peak-Hour Total Traffic Volumes

04/07/2017

Intersection: 9: Woodmoor Dr. & Deer Creek Rd.

Movement	EB	WB	NB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	31	64	48
Average Queue (ft)	10	29	8
95th Queue (ft)	34	53	34
Link Distance (ft)	2026	314	642
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report
2023 PM Peak-Hour Total Traffic Volumes

04/21/2017

Intersection: 1: Monument Hill Rd. & Deer Creek Rd.

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	66	42
Average Queue (ft)	35	6
95th Queue (ft)	56	28
Link Distance (ft)	485	471
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Access A & Deer Creek Rd.

Movement	NB
Directions Served	LR
Maximum Queue (ft)	36
Average Queue (ft)	9
95th Queue (ft)	32
Link Distance (ft)	352
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Monument Hill Rd. & Access B

Movement	WB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	8
95th Queue (ft)	29
Link Distance (ft)	472
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
2023 PM Peak-Hour Total Traffic Volumes

04/21/2017

Intersection: 9: Woodmoor Dr. & Deer Creek Rd.

Movement	EB	WB	NB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	71	40	45
Average Queue (ft)	40	20	6
95th Queue (ft)	64	45	29
Link Distance (ft)	2026	314	642
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

Attachment No. 4
Access Deviation Request

**Access Deviation Request
Site Access Along Monument Hill Road**

A request is being made to allow for a site access along Monument Hill Road from the proposed Monument Hill Business Park. This deviation from El Paso County's design standards will:

- Achieve the intended result with a comparable or superior design and quality of improvement.
- Not adversely affect safety or operations of the proposed access along Monument Hill Road. All of the traffic movements at this proposed access are expected to operate at an excellent Level of Service (LOS "A") during the AM and PM peak-hours.
- Not adversely affect maintenance and its associated cost. The plowing of this access will be handled by the owner of the commercial development.
- Not adversely affect aesthetic appearance.
- Meet the design intent and purpose of these Standards.