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Ponderosa at Lorson Ranch
PUDSP1910
Updated Transportation Memorandum
(LSC #194890)
April 15, 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.

COLORADO LICENSED
JEFFREY C. HODSDON
31684
4-15-20
PROFESSIONAL ENGINEER

Developer's Statement

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

4/15/20
Date

Add PCD File No: SF2016 1

LSC Responses to EPC PCD Comments on - Ponderosa at Lorson Ranch TIA April 2020

Page: 1

Number: 1 Author: dsdlaforce Subject: Text Box Date: 7/29/2020 13:11:40

Add PCD File No: SF2016

Author: jeff Subject: Sticky Note Date: 9/2/2020 12:04:08

LSC Response: Added

1

Referenced table is incorrect. Table 2-35 is for driveway access design. Winter Gem Grove is a roadway therefore the appropriate sight distance is Table 2-21 for intersection sight distance (445' for Design Speed of 40 mph). Update the analysis.

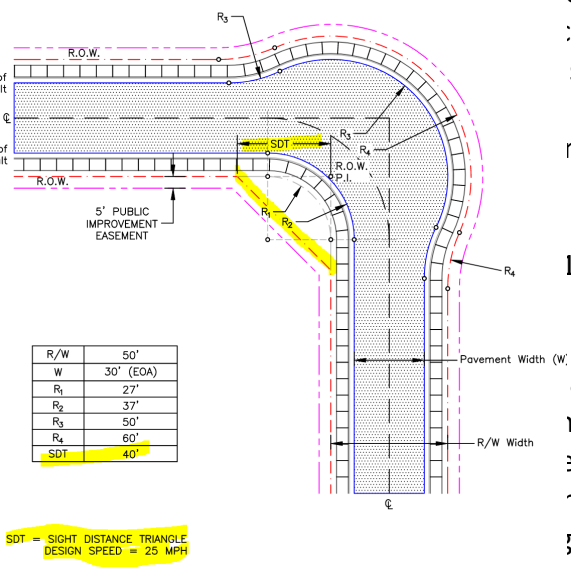
Access Locations and Spacing

Two full-movement access points are proposed to Old Glory Drive aligning with Bearcat Loop and Little Dogie Drive. Bearcat Loop is located about 525 feet north of the southwest intersection of Old Glory Drive/Roundup Butte Street and about 665 feet south of Journey Drive. Little Dogie Drive is located about 330 feet east of Journey Drive and 330 feet west of the northeast intersection of Old Glory Drive/Roundup Butte Street. Based on Table 2-7 in the *El Paso County Engineering Criteria Manual* (ECM), the minimum spacing of local roadways along an Urban Collector is 330 feet. The proposed access point locations would meet or exceed this criterion.

Sight Distance Analysis

Figure 3 shows a sight distance analysis at the two proposed access points to Old Glory Drive. Based on a design speed of 40 miles per hour (mph) on Old Glory Drive and the criteria contained in Table 2-35 of the ECM, the required sight distance for passenger cars at the two proposed site access points is 350 feet. The required stopping sight distance is also shown in the figure. The require distance can be met at both intersections if the area curb line have low-level landscaping and are kept fre signs and parking areas) that would restrict the driv — about 18 inches or lower in height — to the east n.

2



R/W	50'
W	30' (EOA)
R_1	27'
R_2	37'
R_3	50'
R_4	60'
SDT	40'

Figures for key driveway locations on Winter Gem Grove. 17 of the ECM, the required stopping sight distance miles per hour is 155 feet. There would be sufficier 25 mph approaching all of the proposed drivewa 81. Figures 6 and 7 show the analysis of the sight di northeast side of the site. Lots 80 and 81 are located e southeast-bound traffic to slow to a speed lower tl he curve radius, the estimated design speed of this ght distance based on a design speed of 17 mph, a break reaction distance predicted on a time of 2.5 seconds and a vehicle deceleration rate of 11.2 feet/second squared (consistent with Table 2-17) is 90 feet. As shown in Figures 6 and 7, the calculated stopping sight distance of 90 feet could be met for both Lots 80 and 81.

3

Deviation request is required if ECM criteria for SSD is not met. Include the calculation in the appendix.

See detail SD_2-77 which shows the lot line following the sight distance triangle. Include a recommended sight distance triangle on the deviation request at the two knuckle locations. Plat will need to be updated accordingly.

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. Copies of Map 14 2040 Roadway Plan (Classification and Lanes) and Map 17 2060 Corridor Preservation Plan from the *El Paso County 2016 Major*

Page: 3

Number: 1 Author: dsdlaforce Subject: Callout Date: 8/3/2020 16:03:54

Referenced table is incorrect. Table 2-35 is for driveway access design. Winter Gem Grove is a roadway therefore the appropriate sight distance is Table 2-21 for intersection sight distance (445' for Design Speed of 40 mph). Update the analysis.

Author: jeff Subject: Sticky Note Date: 9/2/2020 12:05:37

LSC Response: Per discussions with staff, please refer to the deviation request form included with this submittal.

Number: 2 Author: dsdlaforce Subject: Image Date: 8/3/2020 14:00:11

Number: 3 Author: dsdlaforce Subject: Callout Date: 8/3/2020 14:00:39

Deviation request is required if ECM criteria for SSD is not met. Include the calculation in the appendix.See detail SD_2-77 which shows the lot line following the sight distance triangle. Include a recommended sight distance triangle on the deviation request at the two knuckle locations. Plat will need to be updated accordingly.

Author: jeff Subject: Sticky Note Date: 9/2/2020 13:08:49

LSC Response: Per discussion with staff, a figure has been added to the TIS report showing a "composite" easement to maintain sight distance lines of sight.

Transportation Corridors Plan Update (2016 MTCP) with the site location identified are included in the appendix.

- **Marksheffel Road** extends north from the Link Road/C&S Road intersection in Fountain, Colorado to north of Woodmen Road. Marksheffel Road is shown as a future four-lane Expressway on the County *Major Transportation Corridors Plan (MTCP)*. The posted speed limit on Marksheffel Road is 55 miles per hour (mph). The PPRTA has completed the Marksheffel Road upgrade between Mesa Ridge Parkway and Bradley Road. This included intersection improvements at the Fontaine Boulevard intersection.
- **Fontaine Boulevard** is designated as a four-lane Urban Principal Arterial east of Marksheffel Road and it exists as such from Marksheffel Road east to Old Glory Drive/Stingray Lane. An Urban Non-Residential Collector Street has been constructed east of Stingray Lane. The posted speed limit on Fontaine Boulevard is 35 mph just east of (and a short distance west of) Marksheffel Road. The speed limit increases to 45 mph just east of the bridge over Jimmy Camp Creek.
- **Old Glory Drive** is an Urban Residential Collector which extends north from Lorson Boulevard across Fontaine Boulevard and then loops towards the east, intersecting Fontaine Boulevard again about one-half mile to the east. Old Glory Drive has one through lane in each direction plus a center two-way left-turn lane adjacent to the site. The Old Glory/Fontaine intersection is currently being evaluated by LSC for level of service (this report shows preliminary analysis of existing and existing plus site level of service), traffic control, signing/striping and pedestrian/bike accommodation, and evaluation of existing conditions and as part of a route to the school. The report will be completed shortly and will include traffic projected to be generated by this development, expanding on the analysis shown in Figures 6 and 9 of this report.

Pending. Include with the re-submittal. 1

Existing Traffic Volumes

Figure 8 shows the existing traffic volumes at the intersection of Fontaine Boulevard and Old Glory Drive. These volumes are based on manual intersection turning-movement counts conducted by LSC in October 2019. The count data sheets are attached for reference. Please note: as of the date of this report, the Lorson Boulevard bridges have been opened to traffic. Therefore, Lorson Ranch traffic patterns are in the process of changing. The volumes shown in the figure were conducted prior to the bridge openings. It is likely that these 2019 volumes are now conservative, given that a second access to Lorson Ranch and an alternative to Fontaine Boulevard at Marksheffel is now in place. Figure 8 also shows the existing traffic volumes at the intersections of Old Glory/Bearcat Loop and Old Glory/Little Dogie Drive. These volumes are estimates by LSC based on traffic estimated to be generated by existing residential developments west and north of the site and the existing traffic volumes at Old Glory/Fontaine.

Page: 4

Number: 1 Author: dsdlaforce Subject: Callout Date: 7/29/2020 13:55:22

Pending. Include with the re-submittal.

Author: jeff Subject: Sticky Note Date: 9/2/2020 13:21:33

LSC Response: This has been attached to the report and this paragraph has been revised as well.

Existing Levels 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. Table 1 shows the level of service delay ranges.

Table 1
Intersection Levels of Service Delay Ranges

Level of Service	Unsignalized Intersections Average Control Delay (seconds per vehicle)(1)
A	10.0 sec or less
B	10.1-15.0 sec
C	15.1-25.0 sec
D	25.1-35.0 sec
E	35.1-50.0 sec
F	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.

Figure 8 presents the results of the existing intersection level of service analysis. Levels of service are based on the unsignalized method of analysis procedures from the *Highway Capacity Manual, 6th Edition* by the Transportation Research Board. The peak-hour factors used for each approach are based on the traffic volumes for the peak fifteen minutes of the entire intersection. 1 If the peak fifteen minutes of an approach did not coincide with the peak fifteen minutes of the intersection, the peak-hour factor for that approach was instead taken from Synchro Studio 10 User Guide Table 9-1 Suggested Peak Hour Volumes. The peak-hour factor calculations are included in Appendix Table 1. The level of service reports are attached.

The northbound and southbound left-turn and through movements at the intersection of Fontaine/Old Glory are currently operating at LOS E or F during both the morning and afternoon peak hours.

TRIP GENERATION

Estimates of the traffic volumes expected to be generated by the site have been made using the nationally published trip generation rates found in *Trip Generation,10th Edition, 2017* by the Institute of Transportation Engineers (ITE). Table 2 shows the results of the trip generation

2 Explain why. Does going with the the User Guide Table 9-1 provide the conservative result?

Page: 5

Number: 1 Author: dsdlaforce Subject: Highlight Date: 7/29/2020 14:10:35

n. If the peak fifteen minutes of an approach did not coincide with the peak fifteen minutes of the intersection, the peak-hour factor for that approach was instead taken from Synchro Studio 10 User Guide Table 9-1 Suggested Peak Hour Volumes.

Number: 2 Author: dsdlaforce Subject: Callout Date: 7/29/2020 14:11:59

Explain why. Does going with the the User Guide Table 9-1 provide the conservative result?

Author: jeff Subject: Sticky Note Date: 9/2/2020 14:55:20

LSC Response: Notes have been added to the table indicating where the PHF used is more conservative than the ECM value and the methodology used in the calculation of the peak-hour factors is attached as an appendix item. This paragraph has been changed to reference this detailed methodology.

The intersection of Old Glory/Fontaine is currently two-way, stop sign-controlled. The northbound and southbound left-turn and through movements are currently operating at LOS E or LOS F during the peak hours. If this intersection were converted to all-way, stop sign control all movements are projected to operate at LOS C or better during the peak hours. The HCM procedure for all-way stop sign-controlled intersections is limited to three approach lanes. As Fontaine Boulevard has four eastbound and westbound approach lanes at Old Glory Drive, this intersection was analyzed using Synchro/SimTraffic. The simulation was run five times and the average stop delay per vehicle for each lane was averaged over the five runs and compared to the control delay listed in Table 1.

The proposed access points to Old Glory Drive are projected to operate at LOS B or better for all movements during the peak hours as two-way stop sign-controlled intersections.

ROADWAY CLASSIFICATIONS

Figure 12 shows the recommended roadway classifications for all streets within and adjacent to Ponderosa at Lorson Ranch.

RECOMMENDED AUXILIARY LANES

Based on the short-term total traffic volumes shown in Figure 11, the criteria contained in the *El Paso County Engineering Criteria Manual,* and the classification of Old Glory Drive as an Urban Collector, northeast-bound right-turn deceleration lanes are not projected to be required on Old Glory Drive approaching the site access points. Although a southwest-bound left-turn lane would also not be required, there is an existing two-way left-turn lane on Old Glory Drive adjacent to the site.

RECOMMENDED SIGNAGE

LSC recommends “SPEED LIMIT 15” signs (MUTCD R2-1) be posted on Winter Gem Grove as shown in Figure 13.

Based on the sight distance analysis, parking should be restricted on Old Glory Drive. Regardless, on street parking is not permitted along Urban Collector streets per ECM criteria. Given the existing striping, it seems clear that there is no room for on-street parking on Old Glory. However, if it is a policy of EPC Public Works to post “NO PARKING” signs along Urban Collectors in this situation, then these can be added.

FONTAINE/OLD GLORY INTERSECTION

The Old Glory/ Fontaine intersection is currently being evaluated by LSC for level of service, traffic control, signing/striping and pedestrian/bike accommodation, and evaluation of existing conditions and as part of a route to the school. This report includes a preliminary analysis of

Finalize with the resubmittal. 1

Page: 7

Number: 1 Author: dsdlaforce Subject: Callout Date: 7/29/2020 14:29:34

Finalize with the resubmittal.

Author: jeff Subject: Sticky Note Date: 9/2/2020 13:20:49

LSC Response: This has been attached to the report and this paragraph has been revised as well.

Appendix Table 1
Peak Hour Factor Calculations
Old Glory Dr and Fontaine Blvd
Ponderosa at Lorson Ranch

Existing Traffic Volumes[1]
(vehicles per hour)

AM Peak Hour

Time	Southbound					Westbound					Northbound					Eastbound					Total
	SBL	SBT	SBR	SBU	SB Total	WBL	WBT	WBR	WBU	WB Total	NBL	NBT	NBR	NBU	NB Total	EBL	EBT	EBR	EBU	EB Total	
6:50 AM	1	0	73	0	74	0	66	0	0	66	33	1	1	0	35	13	75	5	25	118	**293**
7:05 AM	4	0	52	0	56	0	87	0	0	87	29	0	1	0	30	18	63	2	19	102	**293**
7:20 AM	37	1	54	0	92	10	97	4	1	112	19	0	4	0	23	17	166	6	8	197	**430**
7:35 AM	4	0	43	0	47	16	129	15	0	160	16	0	5	0	21	24	57	13	12	106	**335**
TOTAL	**46**	**1**	**222**	**0**	**269**	**26**	**379**	**19**	**1**	**425**	**97**	**1**	**11**	**0**	**109**	**72**	**361**	**26**	**64**	**523**	**1351**
Peak-15	92					112					23					197					430
4x Peak-15	368					448					92					788					1720
60 Total	269					425					109					523					1351
PHF	**0.73**					**0.95**					**1.18**					**0.66**					0.79
Approach	**SB**					**WB**					**NB**					**EB**					
PHF -- USE[2]	**0.73**					**0.87**					**0.83**					**0.66**					

PM Peak Hour

Time	Southbound					Westbound					Northbound					Eastbound					Total
	SBL	SBT	SBR	SBU	SB Total	WBL	WBT	WBR	WBU	WB Total	NBL	NBT	NBR	NBU	NB Total	EBL	EBT	EBR	EBU	EB Total	
4:45 AM	2	1	27	0	30	2	35	1	0	38	13	0	4	0	17	69	77	26	4	176	**261**
5:00 AM	3	0	25	0	28	7	86	6	0	99	19	1	3	0	23	59	87	34	9	189	**339**
5:15 AM	1	0	27	0	28	1	52	1	0	54	21	0	0	0	21	54	39	26	14	133	**236**
5:30 AM	2	1	25	0	28	1	39	1	0	41	12	0	0	0	12	59	60	24	15	158	**239**
TOTAL	**8**	**2**	**104**	**0**	**114**	**11**	**212**	**9**	**0**	**232**	**65**	**1**	**7**	**0**	**73**	**241**	**263**	**110**	**42**	**656**	**1075**
Peak-15	28					99					23					189					339
4x Peak-15	112					396					92					756					1356
60 Total	114					232					73					656					1075
PHF	**1.02**					**0.59**					**0.79**					**0.87**					0.79
Approach	**SB**					**WB**					**NB**					**EB**					
PHF -- USE	**0.83**					**0.59**					**0.79**					**0.87**					

Notes:
(1) Based on manual turning movement counts by LSC in October 2019
(2) If the peak 15 minutes of the approach did not coincide with the peak 15 minutes of the intersection the peak hour factor for that approach was instead taken from Synchro Studio 10 User Guide Table 9-1 Suggested Peak Hour Volumes

Source: LSC Transportation Consultants, Inc.

Explain why ECM Appendix I Section B.3.1.B.1 is not being adhered to. See the snippet to the right.

2

B. Intersection LOS

A.M. and P.M. peak hour intersection LOS shall be determined for the existing collector and arterial signalized and unsignalized intersections within the

transportation network to be studied. The analysis shall use procedures described in the Highway Capacity Manual. Factors for intersections will be by approach and those used for roadways will be by facility unless otherwise directed by the ECM Administrator.

1. **Existing and Short-Range Horizon**
   Use calculated peak hour factors or 0.85, whichever is higher, and

2. **Long-Range Horizon**
   A peak hour factor of 0.95 may be used for the Long-Range Horizon. Greater values may be used if approved by the ECM Administrator.

1

Page: 11

Number: 1 Author: dsdlaforce Subject: Image Date: 7/29/2020 14:15:35

Number: 2 Author: dsdlaforce Subject: Text Box Date: 7/29/2020 14:15:52

Explain why ECM Appendix I Section B.3.1.B.1 is not being adhered to. See the snippet to the right.

Author: jeff Subject: Sticky Note Date: 9/2/2020 13:12:12

LSC Response: Notes have been added to the table and the methodology used in the calculation of the peak hour factors is attached.

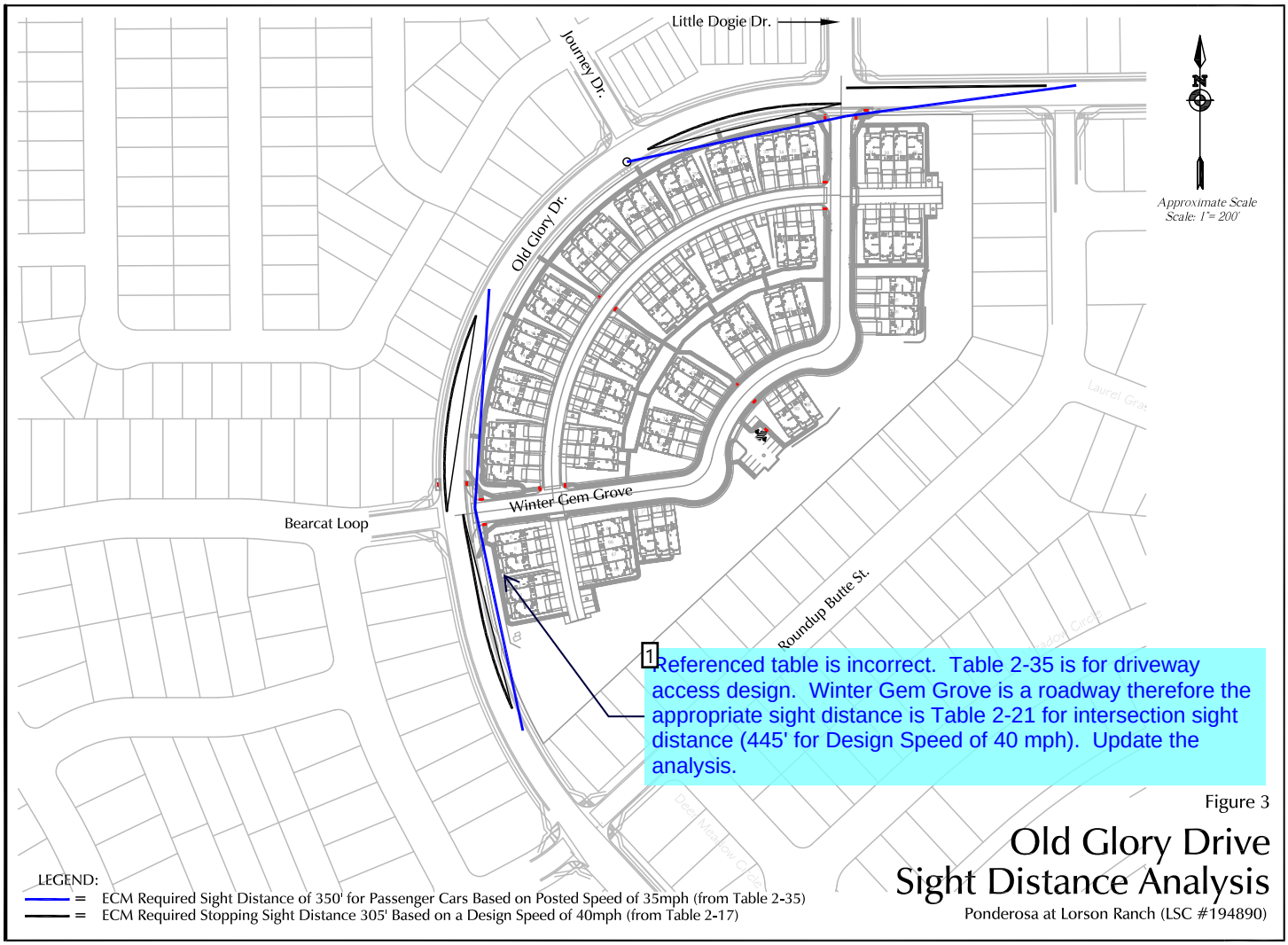


Figure 3

Old Glory Drive Sight Distance Analysis

Ponderosa at Lorson Ranch (LSC #194890)

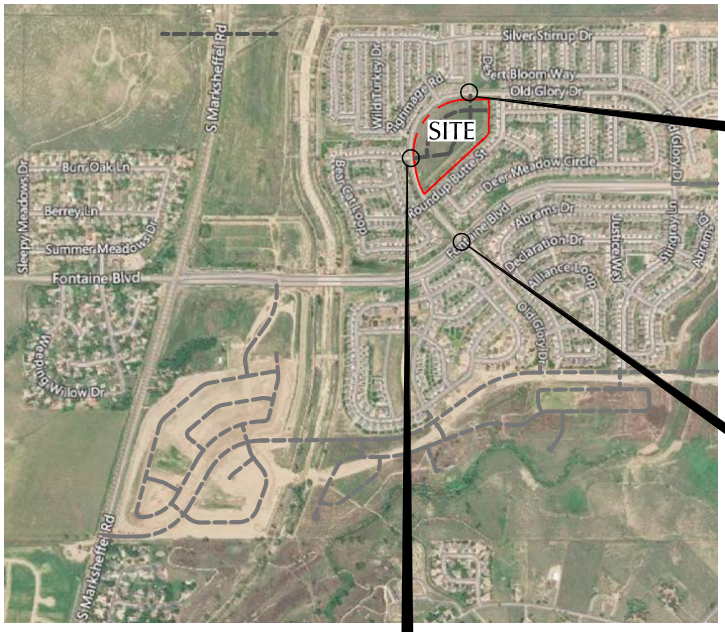
Page: 15

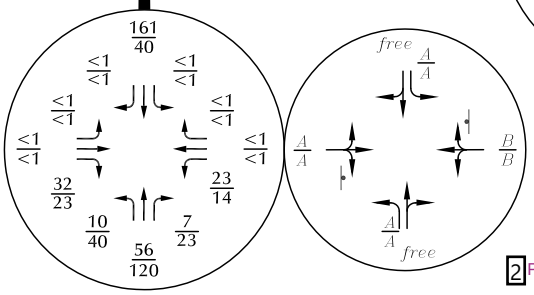
Number: 1 Author: dsdlaforce Subject: Callout Date: 8/3/2020 15:38:30

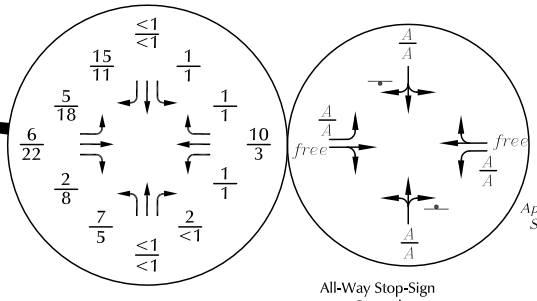
Referenced table is incorrect. Table 2-35 is for driveway access design. Winter Gem Grove is a roadway therefore the appropriate sight distance is Table 2-21 for intersection sight distance (445' for Design Speed of 40 mph). Update the analysis.

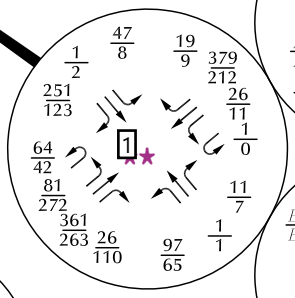
Author: jeff Subject: Sticky Note Date: 9/2/2020 13:10:03

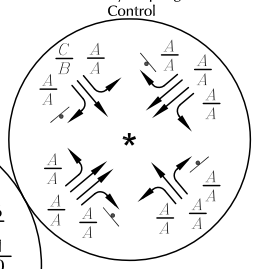
LSC Response: Per discussions with staff, please refer to the deviation request form included with this submittal.

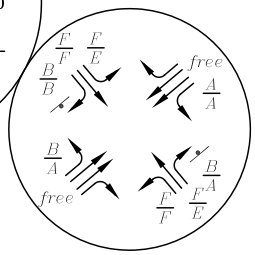












Approximate Scale
Scale: 1" = 1,500'

All-Way Stop-Sign Control

Two-Way Stop-Sign Control

* Based on SimTraffic simulation stopped vehicle delay.

2 Please refer to report narrative regarding these volumes.

LEGEND:

= Stop Sign

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

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

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

Figure 11

Existing plus Site-Generated Traffic, Lane Geometry, Traffic Control and Level of Service

Ponderosa at Lorson Ranch (LSC #194890)

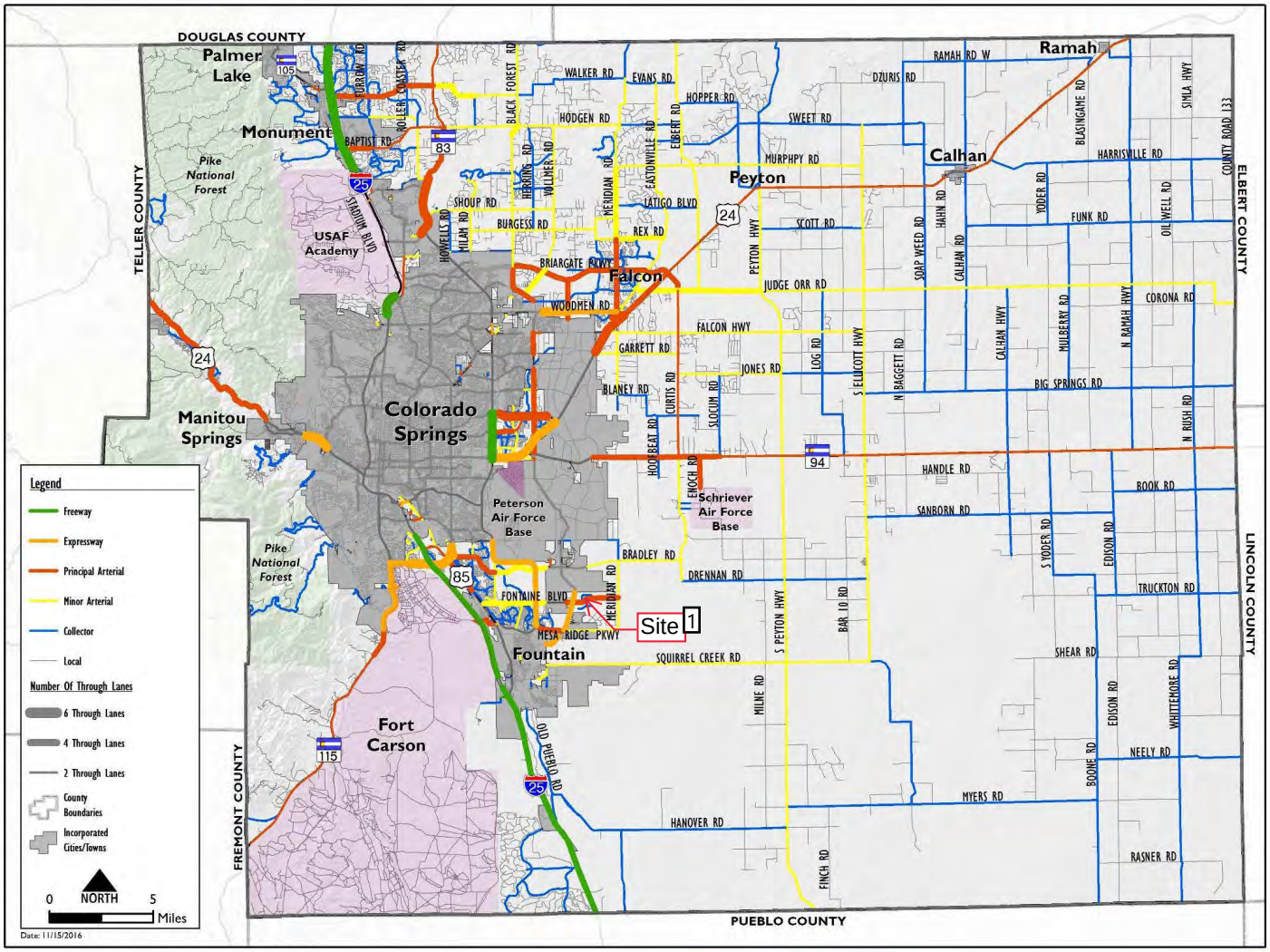
Page: 23

Number: 1 Author: jchodsdon Subject: Typewritten Text Date: 2/27/2020 08:15:26 -07'00'

**

Number: 2 Author: jchodsdon Subject: Typewritten Text Date: 2/27/2020 08:20:02 -07'00'

** Please refer to report narrative regarding these volumes.



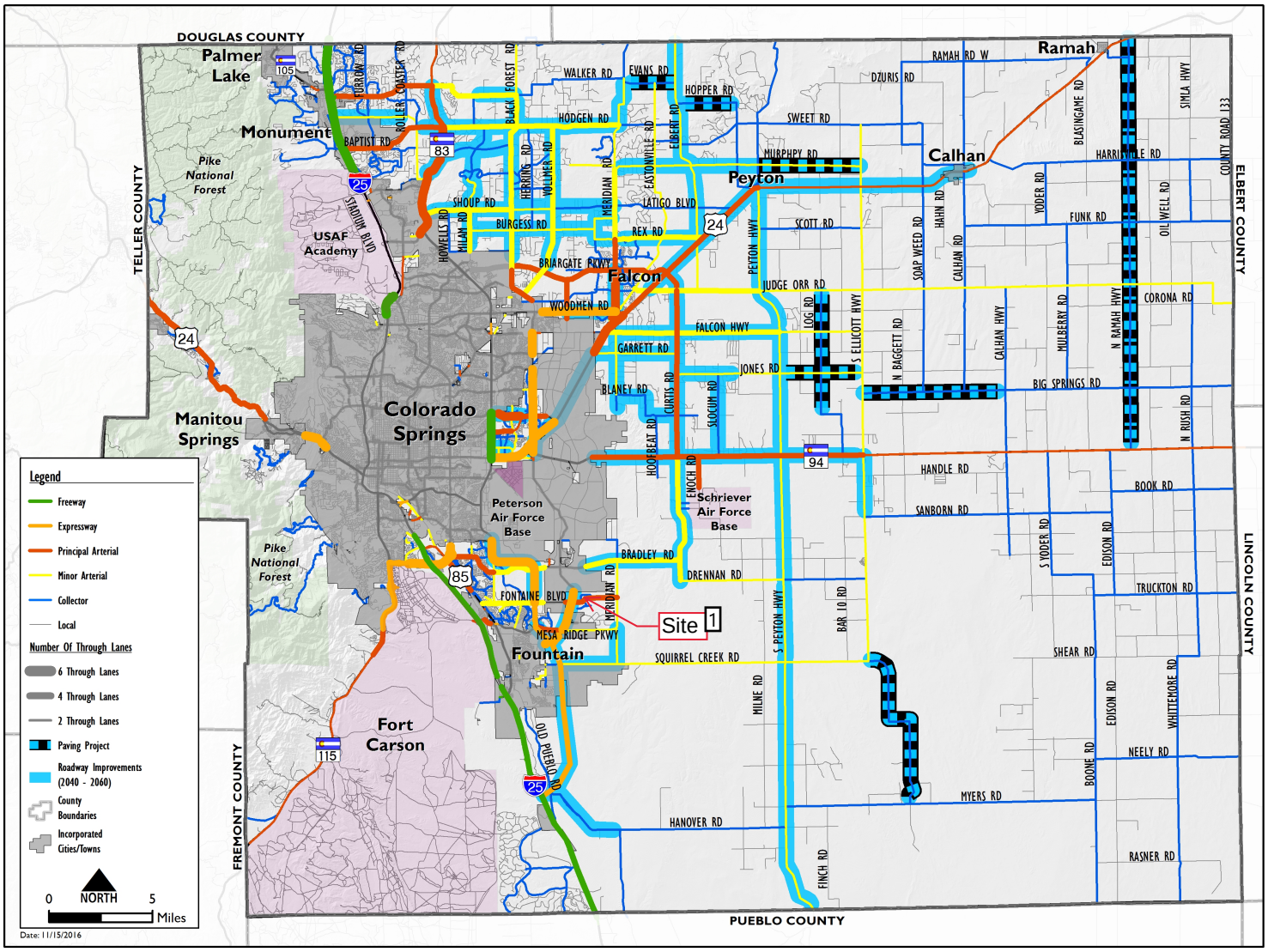
Map 14: 2040 Roadway Plan (Classification and Lanes)

Page: 49

Number: 1 Author: Kirstin Subject: Callout Date: 11/15/2019 13:43:18 -07'00'

Site

Map 17: 2060 Corridor Preservation



Page: 50

Number: 1 Author: Kirstin Subject: Callout Date: 11/15/2019 13:41:50 -07'00'

Site