

LSC Responses to TIS Redline Comments



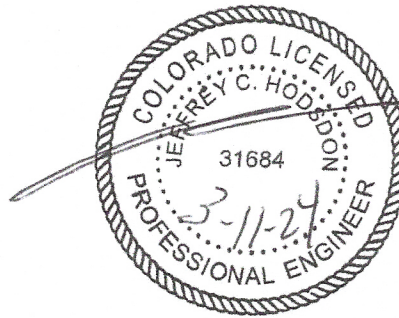
LSC TRANSPORTATION CONSULTANTS, INC.
2504 East Pikes Peak Avenue, Suite 304
Colorado Springs, CO 80909
(719) 633-2868
FAX (719) 633-5430
E-mail: lsc@lsctrans.com
Website: <http://www.lsctrans.com>

Monument Ridge East Traffic Impact Study (LSC #S234450) March 11, 2024

Add PCD File No. P245

Traffic Engineer's Statement

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



Developer's Statement

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

Maria Larsen


3/12/2024
Date

LSC Responses to TIS Redline Comments

Page: 1

 Number: 1 Author: Daniel Torres Subject: Text Box Date: 4/15/2024 8:12:40 AM

[Add PCD File No. P245](#)

 Author: Jeff Date: 8/7/2024 1:44:54 PM
LSC RESPONSE: Added as requested.

- Estimated average daily traffic (ADT) volumes adjacent to the proposed development on the following roadway segments: County Line Road, Monument Hill Road, Misty Acres Boulevard, and Old Antlers Way.
- Projections of 20-year background traffic volumes on the following roadways adjacent to the site: County Line Road, Monument Hill Road, Misty Acres Boulevard, Old Antlers Way;
- The proposed site land use and access plan;
- Estimates of average weekday and weekday peak-hour trip generation for the proposed development and the estimated directional distribution of site-generated vehicle trips on roadways and intersections adjacent to and in the vicinity of the site;
- Projected site-generated and resulting total peak-hour intersection traffic volumes at the following study-area intersections:
 - I-25 southbound ramps/County Line Road
 - I-25 northbound ramps/County Line Road
 - County Line Road/Monument Hill Road (future Misty Acres Boulevard)
 - Monument Hill Road/Misty Acres Boulevard (north)
 - Monument Hill Road/Misty Acres Boulevard (south)
 - Misty Acres Boulevard/Old Antlers Way
- Intersection level of service (LOS) analysis at the study-area intersections;
- Evaluation of short- and long-term projected intersection volumes to determine potential requirements for any auxiliary right-/left-turn lanes at the proposed site access points, based on the criteria in El Paso County's Engineering Criteria Manual (ECM). Also included are potential long-term lane requirements;
- Pedestrian facilities; and
- Findings and recommendations for submittal to El Paso County.

LIST OF OTHER TRAFFIC REPORTS USED IN THE PREPARATION OF THIS REPORT

The following traffic report was completed for this site within the past five years and has been used for reference and background information:

- Monument Ridge Development – by WSB, June 5, 2022

Please include PCD
No. ANX236.

1

LAND USE AND ACCESS


Proposed Land Uses

Figure 1 shows the site location relative to the adjacent and nearby roadways. The proposed Monument Ridge East residential development site is located south of County Line Road and east of Monument Hill Road (Interstate 25 frontage road).

Approximately 342 total dwelling units are planned for the site, including 36 single-family lots on the east side of the planned extension of Misty Acres Boulevard and duplex, tri-plex, and four-plex dwelling units on the west side of the planned extension of Misty Acres Boulevard. Figure 2 shows the site plan.

Number: 1 Author: HaoVo Subject: Callout Date: 4/11/2024 10:34:06 AM

Please include PCD No. ANX236.

 Author: Jeff Date: 8/7/2024 5:25:47 PM
LSC RESPONSE: Added as requested

Access and Circulation

Figure 2 also shows the proposed roadways, roadway realignments, and access points.

Figure 3 highlights the details of the proposed extension of Misty Acres Boulevard north to County Line Road, the realignment of the north portion of Monument Hill Road to the south to tie into the proposed extension of Misty Acres Boulevard, and the segments of existing roadway to be removed.

Access points are proposed at the following locations.

- Access C – 383 feet south of the future County Line Road/Misty Acres Boulevard intersection.
- Access A – 720 feet south of the future County Line Road/Misty Acres Boulevard intersection.
- Access B – 280 feet west of the future Misty Acres Boulevard/Monument Hill Road intersection.
- New west leg at the existing Misty Acres Boulevard/Old Antlers Way T-intersection

SIGHT DISTANCE

FYI: Sight distance and stopping sight distance ¹
that are applicable to the studied intersections will
required when the site is subdivided.

Intersection sight distance at all proposed public road/site-access intersection locations on Misty Acres Boulevard and Monument Hill Road must meet intersection sight-distance requirements in *ECM* Table 2-21. Sight distance lines of sight for all public road intersections/access points will need to be kept clear of any sight-distance obstructions, including landscaping, signage, structures, fencing, parking areas, etc.

ROAD AND TRAFFIC CONDITIONS AND MTCP CLASSIFICATION

Figure 1 shows the roads adjacent to and in the vicinity of the site. Adjacent roads serving the site are identified below followed by a brief description of each:

Interstate Highway 25 (I-25) runs north-to-south throughout the entire state of Colorado and is classified as a four-lane F-W – Interstate System, Freeway. The nearest on/off ramps are located approximately 700 to 1,100 feet west of the site at mile marker 163. Adjacent to the site, the posted speed limit on I-25 is 75 miles per hour (mph). Auxiliary left-turn lanes exist on both the eastbound and westbound approaches at the I-25 on-ramps on County Line Road.

County Line Road is classified by El Paso County as a two-lane, Rural Minor Arterial and extends east and west from Interstate 25. The posted speed limit on County Line Road is generally 45 mph, but it decreases to 30 mph near the I-25 interchange between Beacon Lite Road and Doewood Drive. No auxiliary turn lanes currently exist at its intersection with Monument Hill Road.

Number: 1 Author: HaoVo Subject: Callout Date: 4/15/2024 2:49:38 PM

FYI: Sight distance and stopping sight distance that are applicable to the studied intersections will required when the site is subdivided.

Author: Jeff Date: 8/7/2024 1:50:11 PM

LSC RESPONSE: Comment noted. Preliminary sight distance analysis with horizontal lines of sight have been included in the TIS report.

It appears that Monument Hill Road classified as a rural major collector. Please revise.

11

Monument Hill Road (I-25 Frontage Road) is a two-lane paved Frontage Road that extends north from Woodmoor Drive to County Line Road. The posted speed limit on Monument Hill Road in the vicinity of the site is 45 mph. No auxiliary turn lanes currently exist at its intersection with County Line Road. The current alignment of the north portion of Monument Hill Road will be shifted to the south as part of this development (please refer to Figure 3).

Misty Acres Boulevard is a two-lane Major Collector that extends north from Monument Hill Road to about 800 feet north of Old Antlers Way. At this point, a temporary road extends west to Monument Hill Road. Misty Acres Boulevard is planned to be extended north to County Line Road and a new intersection would be created basically at the location of the existing Monument Hill Road/County Line Road intersection. The existing Misty Acres Boulevard is one through lane in each direction plus a raised center median. The proposed extension would be constructed as a two-lane, Urban Major Collector with a center left turn median (Non-Residential Collector cross section).


Existing Traffic Volumes

Vehicular turning-movement counts were conducted for the following dates and times at the following intersections, as shown in Figure 4. Raw count data is attached:

- I-25 southbound ramps/County Line Road
 - Thursday, January 18, 2024 from 6:30 – 8:30 a.m.
 - Wednesday, January 17, 2024 from 4:00 – 6:00 p.m.
- I-25 southbound ramps/County Line Road
 - Thursday, January 18, 2024 from 6:30 – 8:30 a.m.
 - Wednesday, January 17, 2024 from 4:00 – 6:00 p.m.
- County Line Road/Monument Hill Road
 - Wednesday, January 10, 2024 from 6:30 – 8:30 a.m.
 - Tuesday, January 9, 2024 from 4:00 – 6:00 p.m.
- Monument Hill Road/Misty Acres Boulevard (north)
 - Tuesday, December 12, 2023 from 6:30 – 8:30 a.m.
 - Tuesday, December 12, 2023 from 3:45 – 5:45 p.m.
- Monument Hill Road/Misty Acres Boulevard (south)
 - Wednesday, January 10, 2024 from 6:30 – 8:30 a.m.
 - Tuesday, January 9, 2024 from 4:00 – 6:00 p.m.
- Misty Acres Boulevard/Old Antlers Way (from the WSB TIS report)
 - Wednesday, April 27, 2022 from 6:30 – 8:30 a.m.
 - Wednesday, April 27, 2022 from 4:00 – 6:00 p.m.

Number: 1 Author: HaoVo Subject: Callout Date: 4/15/2024 2:55:33 PM

It appears that Monument Hill Road classified as a rural major collector. Please revise.

 Author: Jeff Date: 8/7/2024 1:50:49 PM
LSC RESPONSE: Revised as requested.

Please include the
year of projection for
the short range.

1

SHORT TERM BASELINE TRAFFIC VOLUMES

Figure 5 shows the estimated short-term baseline volumes. These volumes account for projected shifts in **existing** traffic volumes following the extension of Misty Acres Boulevard to the north, realignment of Monument Hill Road, and associated closure of some segments of roadway (as depicted in Figure 3). No additional background traffic growth was applied when estimating these volumes. The intent was to show shift/adjustment to existing traffic volumes assuming the roadway changes.

PEDESTRIAN AND BICYCLE FACILITIES

The proposed extension of Misty Acres through the site is proposed as an Urban Non-Residential Collector cross section. This standard cross section to be constructed will include sidewalks and paved outside shoulders, which will accommodate bicycles.

The existing west side of Misty Acres Boulevard on the south end near the high school is striped for an outside paved shoulder, but along most of the roadway, there is no shoulder striping. The roadway has sufficient width to accommodate bicycles. Monument Hill Road and County Line Road do not currently have paved outside shoulders.

TRIP GENERATION

Estimates of the vehicle trips projected to be generated by the proposed Monument Ridge East residential development have been made using the nationally published trip-generation rates from *Trip Generation, 11th Edition, 2021* by the Institute of Transportation Engineers (ITE). Corresponding trip-generation rates from the following ITE Land Use categories have been used to develop trip-generation estimates for the proposed 342 dwelling units:


- “210 – Single-Family (Detached) Housing”
- “215 – Single-Family (Attached) Housing”
- “220 – Multi-Family Housing (Low-Rise)”

did you mean
Conceptual site plan?


2

Table 1 below presents a summary of the estimated site trip generation. A detailed trip-generation estimate for the site, including ITE rates land uses, is presented Table 2 (attached). The proposed **sketch plan** is attached for reference.

The site plan land uses are projected to generate about 2,525 total vehicle trips on the average weekday during a 24-hour period, with approximately half entering and half exiting the site. During the morning peak hour, approximately 51 entering vehicles and 121 exiting vehicles are estimated to be generated. Approximately 122 entering and 86 exiting vehicles are estimated to be generated by the site during the afternoon peak hour.


 Number: 1 Author: HaoVo Subject: Callout Date: 4/11/2024 11:20:33 AM

Please include the year of projection for the short range.

 Author: Jeff Date: 8/7/2024 1:51:10 PM
LSC RESPONSE: Added as requested.

 Number: 2 Author: Daniel Torres Subject: Callout Date: 4/15/2024 3:03:41 PM

did you mean Conceptual site plan?

 Author: Jeff Date: 8/7/2024 5:27:22 PM
LSC RESPONSE: Yes, and the TIS is also for the Preliminary Plan.

 Number: 3 Author: Daniel Torres Subject: Highlight Date: 4/15/2024 11:56:33 AM

Table 1: Summary of Estimated Site Vehicle-Trip Generation

Analysis Period	Trips Generated		
	Entering	Exiting	Total
Morning Peak Hour (veh./hour)	51	121	172
Afternoon Peak Hour (veh./hour)	122	86	208
Daily/24-hour (veh./day)	1,263	1,263	2,525

TRIP DISTRIBUTION AND ASSIGNMENT

Trip Directional Distribution

The directional-distribution estimate of site-generated vehicle trips to the study-area roads and intersections is a necessary component in determining the site’s traffic impacts. Figure 6 shows the percentages of the site-generated vehicle trips projected to be oriented to and from the site’s major approaches. Estimates have been based on the following factors: LCS’s previous traffic impact studies in the vicinity, the proposed new land uses, the area roadway system serving the site, and the site’s geographic location relative to the overall greater El Paso County/Colorado Springs area and the Denver metro area. Figure 6 shows the estimated distribution splits.

Site-Generated Traffic

Site-generated volumes have been calculated by applying the directional-distribution percentages estimated by LSC (from Figure 6) to the trip-generation estimates (from Table 4). Figure 7 shows the projected site-generated traffic volumes for the weekday morning and afternoon peak hours.

Short-Term Total Traffic Volumes


Figure 8 shows the projected short-term total traffic, which is the sum of the short-term baseline (adjusted existing) traffic volumes (from Figure 5) and site-generated traffic volumes (from Figure 7). Laneage and traffic control at the study-area intersections are shown in Figure 8.

Note: as indicated in the “Short-Term Baseline Traffic Volumes” section and as shown in Figure 5, short-term baseline traffic volumes assume that existing traffic patterns would change following the realignment of Monument Hill Boulevard and extension of Misty Acres Boulevard (as depicted in Figure 3).

The TIS by WSB identified the development to the west of I-25 at County Line/Beacon Lite as part of the short term traffic. Please indicate why that development is not considered for the short term background and only in the long term background analysis.

Number: 1 Author: Daniel Torres Subject: Callout Date: 4/15/2024 1:11:47 PM

The TIS by WSB identified the development to the west of I-25 at County Line/Beacon Lite as part of the short term traffic. Please indicate why that development is not considered for the short term background and only in the long term background analysis.

 Author: Jeff Date: 8/7/2024 1:55:17 PM
LSC RESPONSE: Added to the short term analysis. These "background" land uses and trip generation have been revised.

please give your basis for this two percent growth rate

2044 Background Traffic Volumes

Figure 9 shows estimated long-term background volumes. Projected 20-year background traffic volumes do **not** include projected traffic to be generated by the proposed site. Long-term background traffic volumes are estimates by LSC, which assume a two-percent annual growth rate on County Line Road. With site-generated traffic, the total growth rate is about 3.3 percent west of Misty Acres Boulevard and about 2.3 percent east of Misty Acres Boulevard (growth over the short-term baseline/adjusted existing volume).

Traffic generated by planned adjacent and nearby developments, including projected commercial traffic from WSB's traffic study west of I-25, has been included in 2044 background traffic volumes. Additionally, long-term background traffic volumes assume that existing traffic patterns would change following the realignment of Monument Hill Boulevard and extension of Misty Acres Boulevard.

2044 Total Traffic Volumes

Figure 10 shows the sum of 2044 background traffic volumes (from Figure 9) plus site-generated traffic volumes (from Figure 7).

LEVEL OF SERVICE ANALYSIS

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection and is indicated on a scale from "A" to "F." LOS A is indicative of little congestion or delay. LOS F indicates a high level of congestion or delay. Table 3 shows the level of service delay ranges for signalized and unsignalized intersections.


Table 3: Intersection Levels of Service Delay Ranges

Level of Service	Signalized Intersections	Unsignalized Intersections
	Average Control Delay (seconds per vehicle)	Average Control Delay (seconds per vehicle) ¹
A	10.0 sec or less	10.0 sec or less
B	10.1-20.0 sec	10.1-15.0 sec
C	20.1-35.0 sec	15.1-25.0 sec
D	35.1-55.0 sec	25.1-35.0 sec
E	55.1-80.0 sec	35.1-50.0 sec
F	80.1 sec or more	50.1 sec or more

¹ For unsignalized intersections, if V/C ratio is greater than 1.0 the level of service is LOS F, regardless of the projected average control delay per vehicle.

Number: 1 Author: Daniel Torres Subject: Callout Date: 4/15/2024 12:10:37 PM

[please give your basis for this two percent growth rate](#)

 Author: Jeff Date: 8/7/2024 1:56:31 PM

LSC RESPONSE: This paragraph has been revised.

Detailed Synchro reports are attached. A summary of LOS during the weekday morning and evening peak hours for the study-area intersections is shown in the following figures:

- Figure 4: 2024 Existing Traffic, Lane Geometry, Traffic Control, and LOS
- Figure 5: Adjusted Existing Traffic, Lane Geometry, Traffic Control, and LOS
- Figure 8: Short-Term Total Traffic, Lane Geometry, Traffic Control, and LOS
- Figure 9: 2044 Background Traffic, Lane Geometry, Traffic Control, and LOS
- Figure 10: 2044 Background + Site Traffic, Lane Geometry, Traffic Control, and LOS

I-25 Southbound Ramps/County Line Road

Short Term

figure 10 indicates
LOS F

1

All individual turning movements and approaches are projected to operate at LOS D or better during the short term, with or without the addition of site-generated traffic.

Long Term

The single-lane southbound approach is projected to operate at LOS E or worse during at least one peak hour, with or without the addition of site-generated traffic. This single-lane approach is projected to have a volume-to-capacity (v/c) ratio of 1.03 during the PM peak hour with the addition of site-generated traffic. All other individual turning movements and approaches are projected to operate at LOS D or better during all long-term scenarios. Assuming future all-way, stop-sign traffic control (AWSC) the level of service would improve to acceptable levels for all approaches.

I-25 Northbound Ramps/County Line Road

All individual turning movements and approaches are projected to operate at LOS D or better through the long term, with or without the addition of site-generated traffic.

County Line Road/Misty Acres Boulevard

Short Term


All individual turning movements and approaches are projected to operate at LOS D or better based on the short-term total traffic volumes.

Long Term

The northbound-left turning movement would operate at LOS E or worse during both **long-term** peak hours if the intersection were to remain two-way, stop-sign controlled. This intersection will likely need to be signalized in the future based on the **long-term analysis**. Signalizing this

Number: 1 Author: Daniel Torres Subject: Callout Date: 4/15/2024 12:14:06 PM

figure 10 indicates LOS F

 Author: Jeff Date: 8/7/2024 5:28:04 PM
LSC RESPONSE: This paragraph has been updated

intersection would result in all individual turning movements operating at LOS D or better during the long-term scenarios.

Misty Acres Boulevard/Access A

All individual turning movements and approaches are projected to operate at LOS B or better through the long term with the addition of site-generated traffic.

Misty Acres Boulevard/Access B

All individual turning movements and approaches are projected to operate at LOS A through the long term with the addition of site-generated traffic.

Misty Acres Boulevard/Access C

All individual turning movements and approaches are projected to operate at LOS B or better through the long term with the addition of site-generated traffic.

Misty Acres Boulevard/Monument Hill Road

LSC has accounted for changes to existing traffic patterns that would likely change following the realignment of Monument Hill Boulevard and extension of Misty Acres Boulevard. All individual turning movements and approaches are projected to operate at LOS B or better through the long term.

Misty Acres Boulevard/Old Antlers Way

All individual turning movements and approaches are projected to operate at LOS B or better through the long term, with or without the addition of site-generated traffic.

ROADWAY IMPROVEMENTS

Auxiliary Turn-Lane Thresholds and Design Parameters

Section 2.3.7.D of the *ECM* lists ingress/egress volume thresholds in which exclusive right- or left-turn lanes would be required, by classification. Prescribed auxiliary turn lanes would be required to meet design criteria outlined in Section 2.3.7.E of the *ECM*.

At the intersection of Misty Acres Boulevard/County Line Road, the **Colorado State Highway Access Code** criteria (Section 4.8) would apply.

Based on the classification, the **design speed** of Misty Acres Boulevard is 40 mph. LSC has based

Provide reasoning/justification for the future speed as criteria for a minor arterial is 60/55 mph and 30mph is identified above as the existing posted speed, and 45mph is listed beyond to the east.

future **posted speed** of 40 mph on County Line Road

also indicate the design speed used for the Aux. lane analysis

☰ Number: 1 Author: Daniel Torres Subject: Callout Date: 4/15/2024 3:11:26 PM

Provide reasoning/justification for the future speed as criteria for a minor arterial is 60/55 mph and 30mph is identified above as the existing posted speed, and 45mph is listed beyond to the east.

↶ Author: Jeff Date: 8/7/2024 1:59:20 PM
LSC RESPONSE: Added as requested.

☰ Number: 2 Author: Daniel Torres Subject: Callout Date: 4/15/2024 1:40:13 PM

also indicate the design speed used for the Aux. lane analysis

↶ Author: Jeff Date: 8/7/2024 2:00:52 PM
LSC RESPONSE: This paragraph has been revised to clarify.

ge and the I-25 Interchange (i.e., through the Misty Acres Boulevard
in and the I-25 Interchange (i.e., through the Misty Acres Boulevard
for speed at the Monument Hill Road study-area intersections are noted

1
please identify if this
is downgrade or
upgrade and indicate
the factor used.

Auxiliary Turn-Lane Needs Analysis

Please refer to Figure 11 and Figure 12 for preliminary recommendations for auxiliary turn lanes at the study-area intersections.

2
Please identify the ECM criteria and identify if it has been met.
Also northbound left turn lane is meeting thresholds per the volumes provided. Please include.

County Line Road/Misty Acres Boulevard

The following auxiliary turn lanes would be required at the future County Line Road/Misty Acres Boulevard intersection. The turn lanes on County Line Road are based on County Line Road grades of between five and seven percent. Please refer to the site plan, which depicts the following laneage at this intersection. LSC provided the laneage recommendations for inclusion on the site plan.


- Northbound Right Turn Deceleration Lane
 - 175 feet of full-width lane (including storage) + 80-foot bay taper = 255 feet total
- Westbound-Left Turn Deceleration Lane
 - 176 feet of full-width lane + 50 feet of storage + 162-foot taper = 388 feet total
- Eastbound-Right-Turn Deceleration Lane
 - 140 feet of full-width lane + 75-foot taper = 215 feet total
 - Will require a design waiver from CDOT, as based on SHAC criteria, a 356-foot lane plus 144-foot taper is prescribed for a total of 500 feet. This waiver would be requested due to the challenging topography to the west of the intersection. The plans show a larger corner radius on the southwest corner as mitigation for the shorter lane which would allow for right turns at a higher speed, thus reducing the speed differential between eastbound through traffic and right-turning traffic.

An eastbound-left-turn deceleration lane would not be required based on projected turning volumes and the threshold requirement for a turn lane. However, in this situation LSC recommends a short eastbound-left-turn bay for vehicle storage. The space will be available to stripe this lane between the eastbound and westbound through lanes on the west leg of this intersection.

- Eastbound-left-Turn-Storage-Bay
 - 75 feet of full-width lane for vehicle storage + 120-foot taper = 195 feet total
 - Not required based on projected volumes but recommended by LSC.


 Number: 1 Author: Daniel Torres Subject: Callout Date: 4/15/2024 1:36:08 PM

please identify if this is downgrade or upgrade and indicate the factor used.

 Author: Jeff Date: 8/7/2024 5:28:24 PM
LSC RESPONSE: Added as requested

 Number: 2 Author: Daniel Torres Subject: Text Box Date: 4/15/2024 2:31:09 PM

Please identify the ECM criteria and identify if it has been met. Also northbound left turn lane is meeting thresholds per the volumes provided. Please include.

 Author: Jeff Date: 8/7/2024 5:28:38 PM
LSC RESPONSE: Added as requested. The northbound left has also been addressed in the report.

Misty Acres Boulevard/Access C

Based on projected total volumes, auxiliary turn lanes would **not** be required on any approach at the intersection of Monument Hill Road/Access C.

Although the projected left-turn volume does not exceed the *ECM* threshold requiring a northbound-left-turn lane on Misty Acres Boulevard, the proposed major collector cross section of Misty Acres Boulevard includes a striped median for left-turning movements at intersections/access points.

Misty Acres Boulevard/Access A

Based on projected total volumes, auxiliary turn lanes would **not** be **required** on any approach at the intersection of Misty Acres Boulevard/Access A.

Although the projected left-turn volume does not exceed the *ECM* threshold requiring a northbound-left-turn lane on Misty Acres Boulevard, the proposed major collector cross section of Misty Acres Boulevard includes a striped median for left-turning movements at intersections/access points.

Misty Acres Boulevard/Old Antlers Way/South Site Access

Based on projected total volumes, auxiliary turn lanes would **not** be required on any approach at the intersection of Misty Acres Boulevard/Old Antlers Way.

Although the projected left-turn volume does not exceed the *ECM* threshold requiring a northbound-left-turn lane on Misty Acres Boulevard, the proposed major collector cross section of Misty Acres Boulevard includes a striped median for left-turning movements at intersections/access points.

Monument Hill Road (Realigned) /Misty Acres Boulevard/Site Access (New proposed Intersection)


A 315-foot southbound-right-turn lane would be required on Misty Acres Boulevard approaching Monument Hill Road. This 315-foot turn lane would consist of 155 feet of deceleration length plus a 160-foot taper. Based on projected total volumes, other auxiliary turn lanes would **not** be required at the intersection of Misty Acres Boulevard/Monument Hill Road. The width that would otherwise be six-foot paved shoulder in the southbound direction (as part of the overall Misty Acres Boulevard cross section) could be utilized as part of the 12-foot right-turn lane width.

Although the projected left-turn volume does not exceed the *ECM* threshold requiring a northbound-left-turn lane on Misty Acres Boulevard, the proposed major collector cross section

it appears that a eastbound left turn is meeting thresholds also. Please provide recommendations.

Number: 1 Author: Daniel Torres Subject: Text Box Date: 4/15/2024 2:33:29 PM

it appears that a eastbound left turn is meeting thresholds also. Please provide recommendations.

 Author: Jeff Date: 8/7/2024 2:06:27 PM

LSC RESPONSE: The eastbound left has also been addressed in the report.

- Projected volumes are higher on County Line Road than Misty Acres approach. Balanced volumes are ideal for roundabouts.

Pros:

- Generally, roundabouts are self-regulating and offer safety advantages over conventional intersections.
- The LOS would potentially be better than the conventional intersection for the northbound approach before a signal warrant is met, and potentially after signalization as well.

Conventional Intersection

Pros:

- The intersection would be similar to the existing intersection, will little modification needed on the north leg.
- A signal would not likely need to be installed in the short term – could remain TWSC.
- The LOS is shown to be D or better, based on the short-term scenario.
- There are likely more precedent cases for signal installation at intersections with grades over 4 percent than with roundabout grades over 4 percent.

Cons:

- Installation of a signal at an intersection with approach grades over 4 percent is not ideal, and would require a deviation (county intersection maximum intersection grade is 4 percent)
- Generally, El Paso County staff has indicated that an intersection cannot be signalized until warrants are met. The LOS would potentially be worse with the conventional intersection for the northbound approach before a signal warrant is met. The short term shows LOS D for the northbound approach.
- The conventional intersection would require auxiliary turn lanes on the intersection legs as shown on Figure 11,

The intersection of Misty Acres Boulevard/County Line Road will likely need to be signalized in the future. Based on projected volumes the volumes for the AM and PM peak hours would meet the Warrant No. 2 (Four-Hour Volume) threshold. The volume threshold would need to be met for two other hours of the day, such as the afternoon “school” peak hour and two hours during the late afternoon/evening peak hour.

Please indicate whether crash warrants would be met.

1

☰ Number: 1 Author: Daniel Torres Subject: Text Box Date: 4/15/2024 3:28:03 PM

Please indicate whether crash warrants would be met.

↩ Author: jeff Date: 8/7/2024 5:29:00 PM

LSC RESPONSE: A traffic signal warrant has been added to the updated report.

Other Recommendations

LSC recommends MUTCD horizontal curve warning signage be installed on Monument Hill Road for traffic on the northbound approach to the proposed curve to the east adjacent to the site. The specific signs and sign placement can be included for review as part of the construction plans.

ROADWAY CLASSIFICATIONS

indicate whether these are based on 2044 or short term volumes ¹

Based on the projected traffic volumes, roadway continuity, length, the *MTCP*, and other factors, LSC recommends roadway classifications for the study-area roadways. These are presented in Table 4 below and are shown on a roadway map in Figure 13.

Table 4: Roadway Classifications at Proposed Site Access Points

Roadway	Direction from Intersecting Road	Intersecting Road	Projected ADT	Recommended Classification
County Line Rd	West	Misty Acres Blvd	10,972	Rural Minor Arterial (but under CDOT Access Control)
County Line Rd	East	Misty Acres Blvd	8,378	Rural Minor Arterial
Misty Acres Blvd	South	County Line Rd	4,000	Major Collector (Urban Non-Residential Collector)
Misty Acres Blvd	South	Old Antlers Way*	4,000	Major Collector (Hybrid Cross Section)
Access A	East	Misty Acres Blvd	298	Urban Local
Access A	West	Misty Acres Blvd	510	Local (Private Street)
Monument Hill Rd	East (for 1,000 feet)	Misty Acres Blvd	119	Urban Local
Monument Hill Rd	South	725 feet west of Access B	119	Rural Major Collector
Access B	South	Monument Hill Rd	404	Local (Private Street)
Old Antlers Way	West	Misty Acres Blvd	947	Local (Private Street)

*More precisely, south of the south site boundary on the east side of Misty Acres, which is 175' north of Old Antlers Way

use County nomenclature (i.e. urban local) ²

☰ Number: 1 Author: Daniel Torres Subject: Callout Date: 4/15/2024 2:41:17 PM

[indicate whether these are based on 2044 or short term volumes](#)

🔄 Author: Jeff Date: 8/7/2024 5:29:17 PM
LSC RESPONSE: Added as requested.

☰ Number: 2 Author: Daniel Torres Subject: Callout Date: 4/15/2024 2:42:31 PM

[use County nomenclature \(i.e. urban local\)](#)

🔄 Author: Jeff Date: 8/7/2024 5:29:40 PM
LSC RESPONSE: Revised as requested.

1
revise to deviations
that may be required
since no actual plan
has been submitted
nor is it required with
a rezone

CDOT will require a new access permit for Monument Hill Road, County Line Road/Misty Acres Boulevard. The permit application will be submitted with the design waiver request. The final permit, once issued, will identify the resolution of the above design waivers and will identify the requirements of this development at this intersection. CDOT will not require an access permit for the current intersection adjacent to the site on Monument Hill Road, as jurisdictional control of Monument Hill Road has been transferred to El Paso County.

DEVIATIONS, DESIGN WAIVERS, AND LDC WAIVERS

2

Deviations to EPC ECM Criteria

- **Major Collector Intersection Centerline Spacing:** A deviation may be required for the intersection of Misty Acres Boulevard/Access C for intersection spacing less than 660' along an Urban Non-Residential Collector.
- **Intersection Grades:** The approach grades on County Line Road approaching the proposed Misty Acres Boulevard intersection would exceed *ECM* criteria. Although this is an existing condition, a deviation may be required.

CDOT Design Waivers

- Right Turn Deceleration Lane Length (CDOT Design Waiver – to be submitted as part of the access permit process)

EPC Land Development Code (LDC) Waivers

- Local (Private) Streets shown on the site plan areas west of Misty Acres Boulevard connecting to Access points C, A, B and the Misty Acres/Old Antlers Way intersection would likely need waivers to the LDC to allow for private streets.

POTENTIAL ESCROW FOR FUTURE INTERSECTION SIGNALIZATION

- Following the realignment of Monument Hill Road, County Line Road/Misty Acres Boulevard has the potential to warrant signalization in the future. El Paso County may require a fair-share escrow amount toward this future traffic signal, unless this intersection is determined to be an “eligible” intersection under the El Paso County Roadway Impact Fee program.


3
FYI: Please submit the deviation at the subdivision state. Deviation file may be submitted separately for review.


 Number: 1 Author: Daniel Torres Subject: Callout Date: 4/15/2024 3:34:13 PM

[revise to deviations that may be required since no actual plan has been submitted nor is it required with a rezone](#)


 Author: Jeff Date: 8/7/2024 2:17:38 PM

LSC RESPONSE: Deviations are listed as the report has been prepared for submittal with the Preliminary Plan, too.

 Number: 2 Author: HaoVo Subject: Cloud Date: 4/11/2024 1:13:12 PM

 Number: 3 Author: HaoVo Subject: Callout Date: 4/15/2024 3:36:21 PM

[FYI: Please submit the deviation at the subdivision state. Deviation file may be submitted separately for review.](#)

 Author: Jeff Date: 8/7/2024 2:19:58 PM

LSC RESPONSE: Deviations are listed as the report has been prepared for submittal with the Preliminary Plan, too.

FINDINGS AND CONCLUSIONS

- The site is projected to generate about 2,525 new driveway vehicle-trips on the average weekday.
- During the weekday morning peak hour of adjacent street traffic, 51 vehicles would enter the site while 121 vehicles would exit.
- During the weekday afternoon peak hour of adjacent street traffic, 122 vehicles would enter the site while 86 vehicles would exit.
- Please refer to the “Level of Service” section above for detailed LOS results and discussion regarding all study-area intersections.
- Please refer to the “Auxiliary Turn-Lane Analysis” section for evaluation of turn-lane needs at the study-area intersections.
- A list of potential deviations, CDOT design waivers and/or LDC waivers is included above.

* * * * *

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

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

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

JCH/JAB:jas


Enclosures: Table 2
Figure 1 - Figure 13
Traffic Count Reports
Synchro LOS Reports

FYI: Please discuss any traffic improvements with trigger points for the construction at the subdivision stage.



Number: 1 Author: HaoVo Subject: Callout Date: 4/15/2024 3:40:31 PM

FYI: Please discuss any traffic improvements with trigger points for the construction at the subdivision stage.

 Author: Jeff Date: 8/7/2024 2:20:30 PM
LSC RESPONSE: Added as requested.



Approximate Scale
1" = 500'

860' 825'

Existing Monument Hill Rd Alignment (to be removed)

County Line Rd

Access C

Access A

Monument Hill Rd

Access B

270'

718'

383'

325'

Doewood Dr

FYI: this does not meet intersection spacing per ECM table 2-7. Access location are not approved at this rezone stage and would need to be in compliance once the development plan is submitted at the subdivision stage.

Note: Please refer to Figure 3 for an exhibit showing road realignments and changes.

Interstate 25

Monument Hill Rd

Misty Acres Blvd

Old Antlers Way




Figure 2
Site Plan

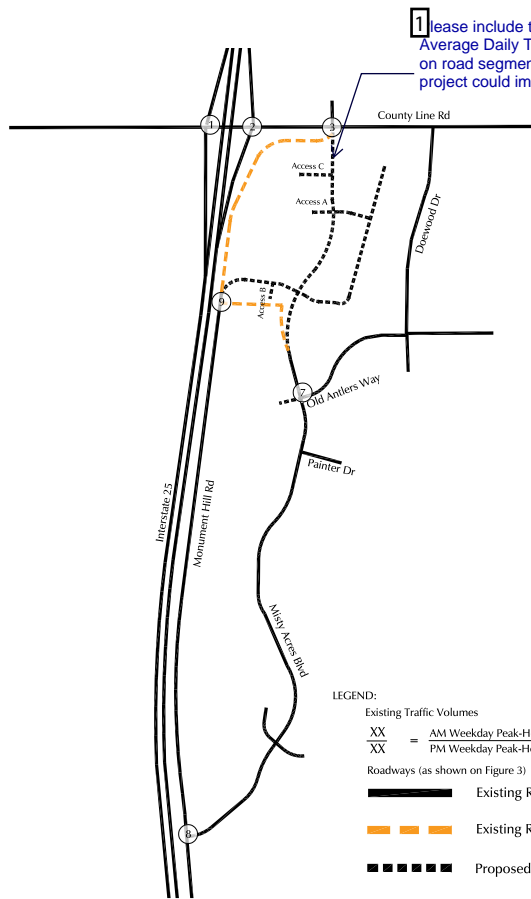
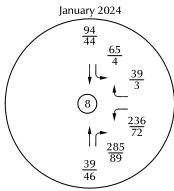
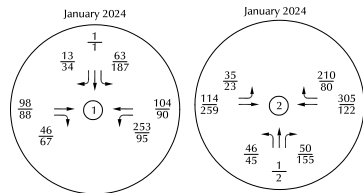
Monument Ridge East (LSC# S234450)

Number: 1 Author: Daniel Torres Subject: Callout Date: 8/7/2024 2:21:46 PM

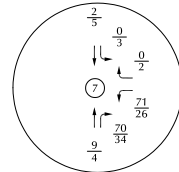
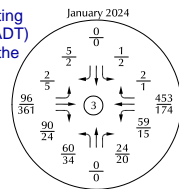
FYI: this does not meet intersection spacing per ECM table 2-7. Access location are not approved at this rezone stage and would need to be in compliance once the development plan is submitted at the subdivision stage.

 Author: Jeff Date: 8/7/2024 2:25:41 PM

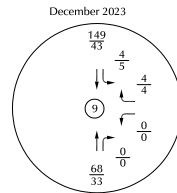
LSC RESPONSE: This figure has been revised. Also, a deviation has been prepared as this report is for submittal with the Preliminary Plan, too.



1 Please include the existing Average Daily Traffic (ADT) on road segments that the project could impact.



April 2022
(From WSB's 2022 Monument Ridge Development study)



LEGEND:

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

Roadways (as shown on Figure 3)

Existing Roadway segments (to remain)

Existing Roadway Segments (to be removed)


Proposed New Roadway Segments

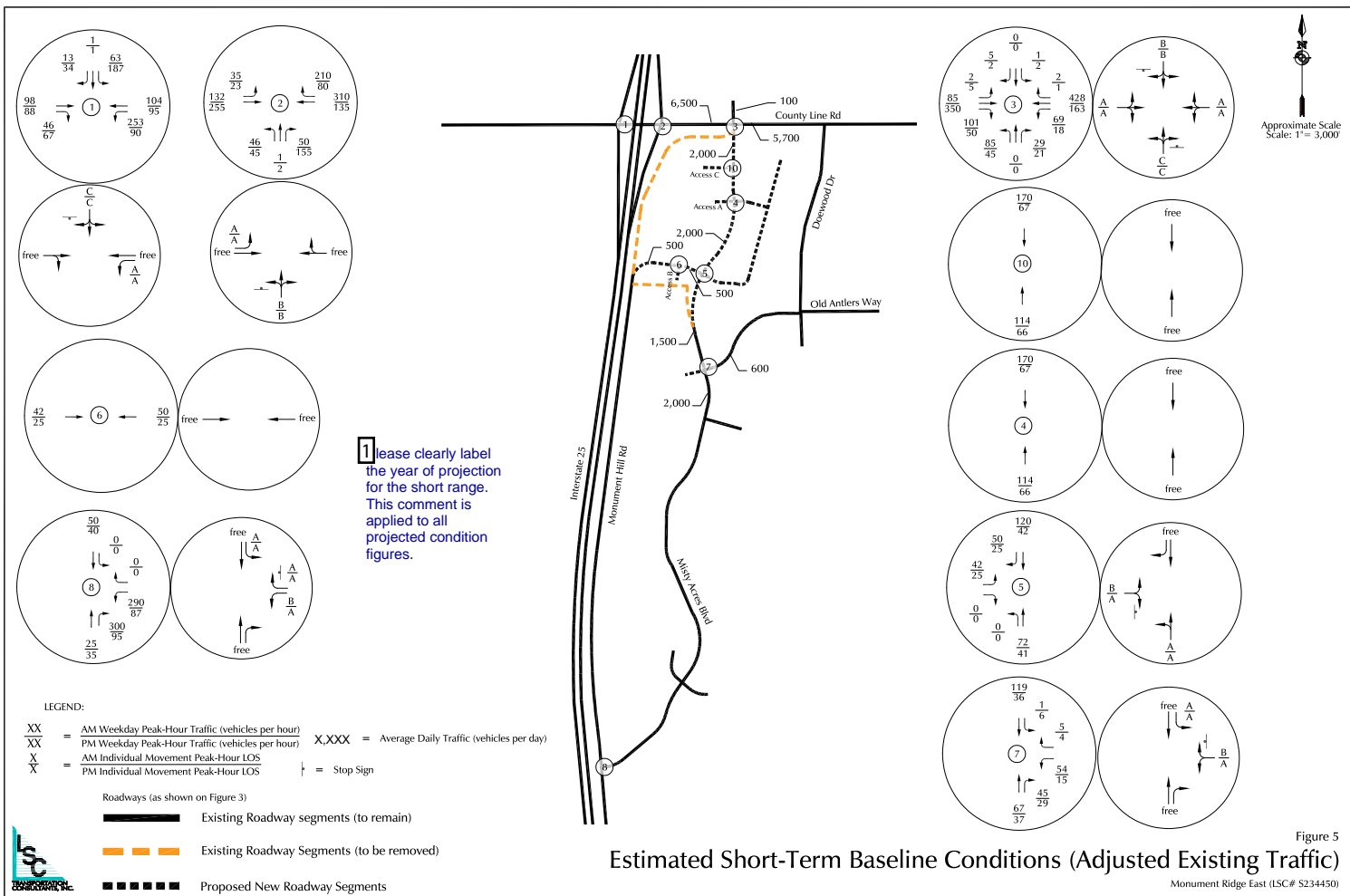
Figure 4
Existing Traffic Counts
Monument Ridge East (LSC # S234450)



Number: 1 Author: HaoVo Subject: Callout Date: 4/11/2024 11:34:57 AM

Please include the existing Average Daily Traffic (ADT) on road segments that the project could impact.

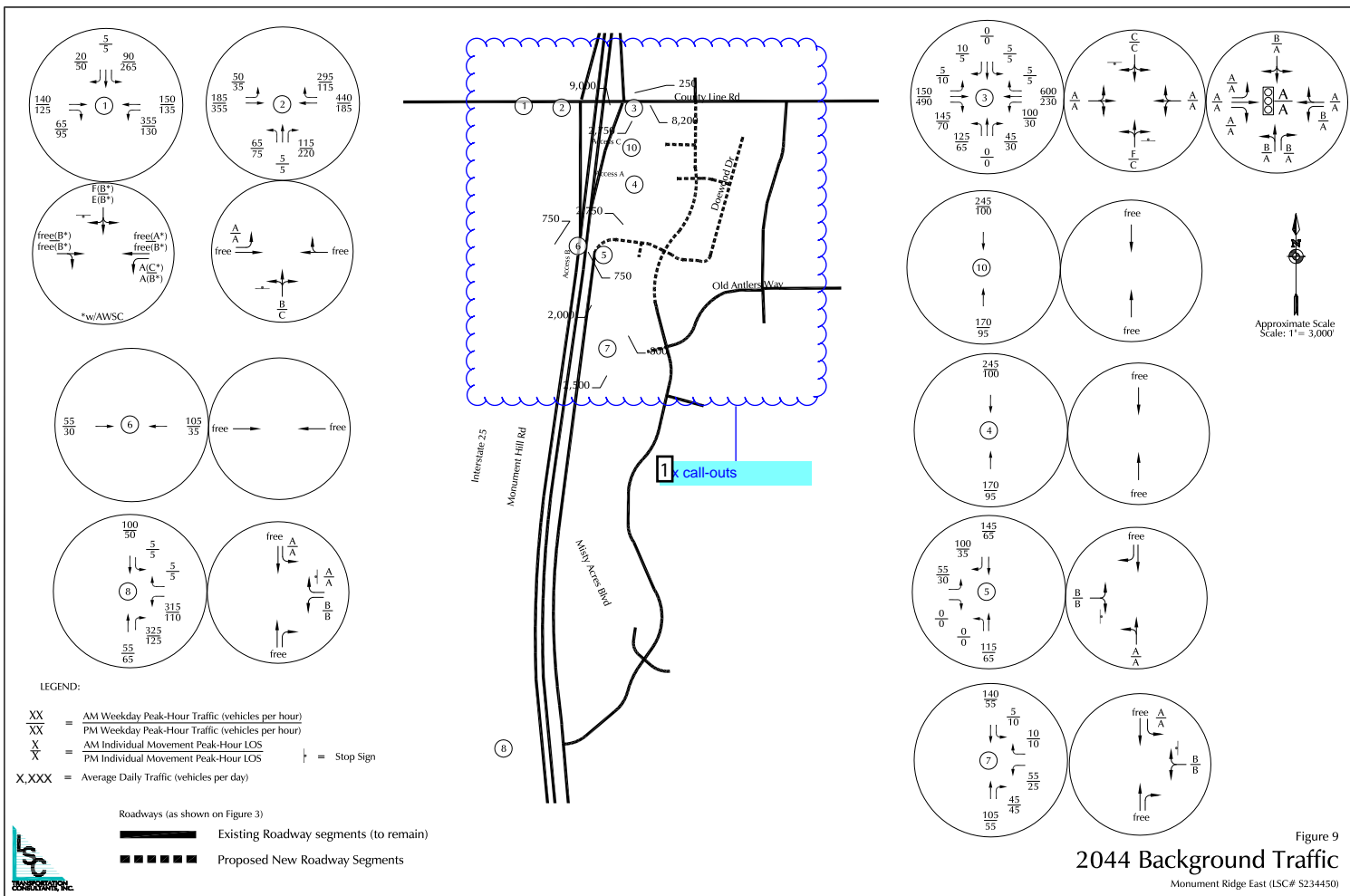
 Author: Jack Date: 8/7/2024 5:46:31 PM
LSC RESPONSE: Revised in report, as requested



☰ Number: 1 Author: HaoVo Subject: Callout Date: 4/11/2024 11:35:30 AM


Please clearly label the year of projection for the short range. This comment is applied to all projected condition figures.

↩ Author: Jack Date: 8/7/2024 5:45:48 PM
LSC RESPONSE: Added to figure, as requested



Number: 1 Author: Daniel Torres Subject: Cloud+ Date: 4/15/2024 1:51:08 PM

[fix call-outs](#)

 Author: Jeff Date: 8/7/2024 5:30:57 PM
LSC RESPONSE: Fixed as requested.
