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Peaceful Ridge at Fountain Valley
Traffic Impact Analysis
(LSC #S214530)
December 10, 2021

Please add "PCD File No. CDR-22-015". ¹

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.


Date

LSC Responses to TIS Comments

Page: 1

 Number: 1 Author: Carlos Subject: Text Box Date: 9/13/2022 15:21:51

[Please add "PCD File No. CDR-22-015".](#)

 Author: jchodsdon Subject: Sticky Note Date: 5/5/2023 15:10:18
LSC Response: Added as requested.

COVID-19 pandemic;

- Review of previously-completed traffic studies in the vicinity of this site for information and findings relative to this development. Other recent studies completed in the area and any applicable data/transferrable information/analysis etc. from previous LSC studies adjacent to the site were also utilized;
- Evaluation of intersection/access sight distance at the proposed access-point intersections on Marksheffel Road and Fontaine Boulevard, based on current criteria in the County's *Engineering Criteria Manual*.
- Estimates of average weekday and peak-hour trip generation for the proposed development;
- Estimation of directional distribution of site-generated vehicle trips on the area street system, at the study-area intersections, and at the proposed site access points;
- Projections of site-generated turning-movement traffic volumes at the following "study-area" intersections:
 - Marksheffel Road/Fontaine Boulevard
 - Fontaine Boulevard/Sleepy Meadows Drive
 - Marksheffel Road/proposed north site access (RIRO)
 - Marksheffel Road/Fontaine Boulevard
 - Fontaine Boulevard/Sleepy Meadows Drive
 - Marksheffel Road/proposed north site access (RIRO)
- Estimates of short- and long-term background traffic volumes at the study-area intersections and access points;
- Total traffic (site traffic-plus-background traffic) projections at the study-area intersections for the short and long term;
- Level of service (LOS) analysis at the study-area intersections;
- Evaluation of existing, short-term, and long-term projected intersection volumes to determine the potential need for any new auxiliary right-/left-turn lanes based on the criteria in the County's *Engineering Criteria Manual*;
- Other recommended improvements/modifications to the study-area streets and intersections; and
- Summary of compiled data, analysis, findings, and recommendations.

Remove duplicate "Marksheffel Road/proposed north site access". Revise to Marksheffel Road and Peaceful Ridge Drive.

Revise study area intersections to include the planned intersection of Marksheffel Road and Bradley Ridge per Bradley Ridge Filling No. 1. Or identify why the intersection was omitted from the study area.

☰ Number: 1 Author: Carlos Subject: Text Box Date: 9/29/2022 13:35:11

Remove duplicate "Marksheffel Road/proposed north site access". Revise to Marksheffel Road and Peaceful Ridge Drive.

👤 Author: jchodsdon Subject: Sticky Note Date: 5/10/2023 12:57:12

LSC Response: Revised as requested. Also note: Marksheffel Road/Fontaine Boulevard has been removed as a study-area intersection. The updated TIS includes an appendix item with percent relative impact calculations per ECM Appendix B.

☰ Number: 2 Author: Carlos Subject: Text Box Date: 9/29/2022 13:34:52

Revise study area intersections to include the planned intersection of Marksheffel Road and Bradley Ridge per Bradley Ridge Filling No. 1. Or identify why the intersection was omitted from the study area.

👤 Author: jchodsdon Subject: Sticky Note Date: 5/5/2023 15:16:44

LSC Response: Revised as requested.

PRIOR AREA TRAFFIC REPORTS

Reference Bradley Ridge Filling 1 Traffic Impact Study by Matrix Design Group, March 4, 2022.

LSC utilized the following previous traffic reports to assist in the production of this report:

- Lorson Ranch (December 2018)
- Grand Mountain School (July 21, 2021)
- Bradley Heights, Filing 1 (May 19, 2021)
- Glen at Widefield, Filings 10 and 11 (July 9, 2021)
- The Hills at Lorson Ranch (July 2021)
- Peaceful Ridge at Fountain Valley (May 2006)

LAND USE AND ACCESS

Proposed Land Use

Figure 1 shows the site location relative to the adjacent and nearby streets. The site is located west of Marksheffel Road and north of Fontaine Boulevard in El Paso County, Colorado. Approximately 253 single-family (detached) dwelling units are proposed. A copy of the site plan is shown in Figure 2.

Proposed Site Access

Access points proposed for the property include:

- Right-in/right-out (RIRO) access to Marksheffel Road – 0.5 miles north of Fontaine Boulevard/Marksheffel Road. This access would align with Cider Mill Place on the east side of Marksheffel Road (although left-turn and east/west through traffic would be prohibited).
- Fontaine Boulevard via existing Sleepy Meadows Drive
- A future connection to Bradley Heights approximately 900 feet west of Marksheffel Road/Cider Mill Place (long-term only).

There is no connection from Bradley Heights to Peaceful Ridge Drive. Do you mean through Bridgegate Place?

ROAD AND TRAFFIC CONDITIONS

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

Marksheffel Road extends north from the Link Road/C&S Road intersection in Fountain, Colorado to north of Woodmen Road. Marksheffel Road is shown as a future four-lane Expressway on the County's *Major Transportation Corridors Plan (MTCP)*. The posted speed limit on Marksheffel Road at Fontaine Boulevard is 55 miles per hour (mph). Auxiliary left- and right-turn lanes exist on all approaches at the signalized intersection of Marksheffel/Fontaine.

Fontaine Boulevard is designated as a four-lane Principal Arterial west of Marksheffel Road in the vicinity of the site. The posted speed limit on Fontaine Boulevard is generally 35 mph just west of Marksheffel and 45 mph west of Sleepy Meadows Drive. Auxiliary right-turn deceleration

☰ Number: 1 Author: Carlos Subject: Text Box Date: 9/29/2022 10:05:40

[Reference Bradley Ridge Filling 1 Traffic Impact Study by Matrix Design Group, March 4, 2022.](#)

👤 Author: jchodsdon Subject: Sticky Note Date: 5/5/2023 15:17:35

LSC Response: Revised as requested.

☰ Number: 2 Author: Carlos Subject: Text Box Date: 9/29/2022 13:44:20

[There is no connection from Bradley Heights to Peaceful Ridge Drive. Do you mean through Bridgagate Place?](#)

👤 Author: jchodsdon Subject: Sticky Note Date: 5/5/2023 15:20:31

LSC Response: Yes. That was our intent. This has been updated. "Bradley Heights" was the older name of the overall development to the north, not a reference to a specific street name.

lanes exist on all approaches at the stop-sign-controlled intersections of Fontaine Boulevard/Sleepy Meadows Drive and Fontaine Boulevard/Cottonwood Grove Drive. Additionally, southbound-to-westbound right-turn acceleration lanes exist for both of the previously-mentioned intersections on Fontaine Boulevard.

Cottonwood Grove Drive is a two-lane local street extending north-to-south for 0.3 miles between Summer Meadows Drive and Weeping Willow Drive. The Fontaine/Cottonwood Grove intersection is a four-leg, full-movement intersection with stop-sign control on the minor-street approaches. The posted speed limit on Cottonwood Grove Drive is 25 mph.

Sleepy Meadows Drive is a two-lane local street extending north from Fontaine Boulevard for about a quarter-mile. The Fontaine/Sleepy Meadows intersection is currently a full-movement T-intersection with stop-sign control on the southbound approach. The posted speed limit on Sleepy Meadows Drive is 25 mph.

Short-Term Baseline Traffic Volumes

Figure 4 shows estimated “short term baseline” traffic volumes on the study-area streets and at the study-area intersections (short-term peak-hour turning-movement volumes). Short-term analysis assumes that no modifications would be made to the existing lane geometry or traffic control at the study-area intersections. These estimates are consistent with short-term background traffic volumes shown in recent LSC traffic studies conducted in the vicinity of this site, as described in the “Prior Area Traffic Reports” section above.

CRASH/ACCIDENT HISTORY


Identify what years the crash-history data was obtained from.

Three years of crash-history data were obtained from the Colorado State Patrol Central Records Unit. During the three-year period, two crashes were reported at the intersection of Fontaine Boulevard/Sleepy Meadows Drive, neither of which involved personal injury. Zero crashes were reported at the intersection of Fontaine Boulevard/Cottonwood Grove Drive adjacent to the site.


SIGHT DISTANCE

El Paso County Requirements

Access points (planned public-roadway intersections) must meet *Engineering Criteria Manual* standards for sight distance. The north site-access point is anticipated to be a stop-controlled, RIRO intersection with Marksheffel. All sight-distance field measurements utilized a driver’s eye height of 3.5 feet and a height of 3.5 feet for an eastbound vehicle approaching from the west.

 Number: 1 Author: Carlos Subject: Text Box Date: 9/29/2022 13:45:04

[Identify what years the crash-history data was obtained from.](#)

 Author: jchodsdon Subject: Sticky Note Date: 5/5/2023 15:21:13
LSC Response: Added to the report as requested.

Mr. J. Ryan Watson
Peaceful Ridge

1 Identify the grade of Marksheffel Road approaching Peaceful Ridge Drive from the north. Per ECM Chapter 2.3.6.B Table 2-18 identifies stopping sight distances for roads with grades in excess of 3%; use Table 2-18 to determine stopping sight distance. Note: Posted speed limit along Marksheffel Road is 55mph.

Stopping Sight Distance

The “sight distance along the roadway” for the proposed (existing) site-access driveway would exceed the required 425 feet approaching the RIRO access from both directions along Marksheffel Road (per Table 2-17 of the County’s *Engineering Criteria Manual*).

2 Revise entering sight distance requirements since 555 feet per Table 2-21 is for a design speed of 50mph. The posted speed limit for Marksheffel Road is 55mph.

Entering Sight Distance

With a 55-mph posted speed limit and minimal vertical curvature on Marksheffel, the minimum sight distance for both approaches at the proposed site-access location is ³555 feet for passenger vehicles (per Table 2-21 of the County’s *Engineering Criteria Manual*). Sight distances for both approaches at the proposed site-access location to Marksheffel Road exceed the ⁴550-foot requirement for passenger vehicles.

TRIP GENERATION

5 Add an exhibit to the appendix showing the line of sight distances for design vehicles at access points (Marksheffel Road and Peaceful Ridge Drive).


Estimates of the existing and projected vehicle trips to be generated by the site have been made using nationally-published average trip-generation rates for land-use code “210 – Single-Family (Detached) Housing” in *Trip Generation, 11th Edition, 2021* by the Institute of Transportation Engineers (ITE).

Table 1 below presents a summary of the estimated site trip generation. A detailed trip-generation estimate for the development, including ITE rates for the proposed land uses, is presented in Table 3 (attached).


Table 1: Estimated External Site Vehicle-Trip Generation

Analysis Period	Weekday		
	In	Out	Total
Morning Peak Hour	45	128	173
Evening Peak Hour	150	88	238
Daily/24-hour	1,193	1,193	2,386


Based on the ITE estimate for the proposed residential development, the site would generate about 2,386 external vehicle trips on the average weekday. During the weekday morning peak hour, approximately 45 vehicles would enter and 128 vehicles would exit the site. Approximately 150 entering vehicles and 88 exiting vehicles are projected for the weekday afternoon peak hour.

 Number: 1 Author: Carlos Subject: Callout Date: 9/29/2022 13:47:04

Identify the grade of Marksheffel Road approaching Peaceful Ridge Drive from the north. Per ECM Chapter 2.3.6.B Table 2-18 identifies stopping sight distances for roads with grades in excess of 3%; use Table 2-18 to determine stopping sight distance. Note: Posted speed limit along Marksheffel Road is 55mph.

 Author: jchodsdon Subject: Sticky Note Date: 5/11/2023 09:04:14


LSC Response: The grade of Marksheffel north of Peaceful Valley Drive has been included in the report (and has been used in the decel.-lane-length calculation). However, instead of using Table 2-18 for entering sight distance at this intersection, Table 2-21 has been referenced. As 2-21 does not include intersection sight-distance criteria for a 60-mph design speed, AASHTO SD criteria has been used and referenced. Regarding reference to Table 2-18, per previous direction from staff on another project, the stopping sight distance paragraph has been removed. Note: Stopping sight distance in Table 2-18 is met on the approach to the intersection.


 Number: 2 Author: Carlos Subject: Callout Date: 9/29/2022 13:32:49

Revise entering sight distance requirements since 555 feet per Table 2-21 is for a design speed of 50mph. The posted speed limit for Marksheffel Road is 55mph.

 Author: jchodsdon Subject: Sticky Note Date: 5/10/2023 12:58:28

LSC Response: Revised in the updated TIS. Note: Table 2-21 has been referenced. As Table 2-21 does not include intersection sight-distance criteria for a 60-mph design speed, AASHTO SD criteria has been used and referenced.

 Number: 3 Author: Daniel Torres Subject: Highlight Date: 9/29/2022 13:33:25
555

 Number: 4 Author: Daniel Torres Subject: Highlight Date: 9/29/2022 13:33:30
550

 Number: 5 Author: Carlos Subject: Text Box Date: 9/29/2022 13:52:07

Add an exhibit to the appendix showing the line of sight distances for design vehicles at access points (Marksheffel Road and Peaceful Ridge Drive).

 Author: jchodsdon Subject: Sticky Note Date: 5/11/2023 09:08:03

LSC Response: This has been added. Please see Figure 12 of the updated TIS (rather than an appendix exhibit).

TRIP DISTRIBUTION AND ASSIGNMENT

Trip Directional Distribution

Estimating the directional distribution of site-generated vehicle trips to the study-area roads and intersections is a necessary component in determining the site's traffic impacts. Figure 5 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: the proposed new land uses, the area street and road system serving the site, previously-conducted traffic studies for the site, and the site's geographic location relative to the City of Colorado Springs metro area and the Pikes Peak region.

Provide further clarification on whether Bradley Ridge Filling 1 Traffic Impact Analysis was used for your analysis.

Site-Generated Traffic

Short Term

Figure 6 shows the projected short-term site-generated traffic volumes for the weekday morning and evening peak hours. Site-generated traffic volumes at the study-area intersections have been calculated by applying the directional-distribution percentages estimated by LSC (from Figure 5) to the trip-generation estimates (from Table 3).

Long Term


Figure 7 shows the projected long-term site-generated traffic volumes for the weekday morning and evening peak hours. Site-generated traffic volumes at the study-area intersections have been calculated by applying the directional-distribution percentages estimated by LSC (from Figure 5) to the trip-generation estimates (from Table 3).

Short-Term Baseline-Plus-Site-Generated Traffic Volumes

Figure 8 shows the sum of the short-term baseline traffic volumes (from Figure 4) and site-generated peak-hour traffic volumes (shown in Figure 6). These volumes are based on the projected short-term total traffic presented in the Ridge at Lorson Ranch TIS report.

Estimated Future 2040 Background Traffic Volumes

Figure 9 shows the projected 20-year background traffic volumes for the year 2040. Estimated 2040 background through-traffic volumes on Fontaine Boulevard and Marksheffel Road account for projected background traffic growth on these roadways and align with long-term traffic projections from recent LSC traffic studies in the vicinity of the site. Projected 20-year background traffic volumes do **not** include projected traffic to be generated by the proposed Peaceful Ridge development.

 Number: 1 Author: Carlos Subject: Text Box Date: 9/29/2022 14:25:10

[Provide further clarification on whether Bradley Ridge Filling 1 Traffic Impact Analysis was used for your analysis.](#)

 Author: jchodsdon Subject: Sticky Note Date: 5/5/2023 15:40:39

LSC Response: The report has been revised based on our review of the Bradley Ridge Filing 1 TIS. The updated report clearly references that TIS.

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

- Figure 3: Existing Traffic, Lane Geometry, Traffic Control, and LOS
- Figure 4: Short-Term Baseline Traffic, Lane Geometry, Traffic Control, and LOS
- Figure 8: Short-Term Total Traffic, Lane Geometry, Traffic Control, and LOS
- Figure 9: 2040 Background Traffic, Lane Geometry, Traffic Control, and LOS
- Figure 10: 2040 Background + Site Traffic, Lane Geometry, Traffic Control, and LOS

Marksheffel Road/Fontaine Boulevard

Short Term

All individual turning movements at the intersection of Marksheffel Road/Fontaine Boulevard currently operate at and are projected to remain at LOS D or better during all short-term scenarios, with or without the addition of site-generated traffic.

Long Term

Overall, the signalized intersection of Marksheffel Road/Fontaine Boulevard is projected to operate at LOS D or better during both long-term peak hours, with or without the addition of site-generated traffic. The following turning movements are projected to operate at LOS E during the short term, with or without the addition of site-generated traffic:

- Eastbound-through, westbound-left, northbound-through, and southbound-left

All other turning movements are projected to remain at LOS D or better during the short term during both peak hours, with or without the addition of site-generated traffic.

Fontaine Boulevard/Sleepy Meadows Drive

Update labeling, appears to be Peaceful Ridge Drive. ¹

All individual turning movements and single-lane approaches are projected to operate at LOS C or better during both short-term peak hours through the 20-year horizon, with or without the addition of site-generated traffic.

Marksheffel Road/Proposed North Site Access (RIRO)

All approaches and individual turning movements at the proposed RIRO site access on Marksheffel Road are projected to operate at LOS C or better during both peak hours through the 20-year horizon.

AUXILIARY TURN-LANE ANALYSIS

The *Engineering Criteria Manual* contains turning volume thresholds which require auxiliary left- or right-turn lanes by roadway classifications. Roadway classifications for key thoroughfares

Bradley Ridge Filling 1 Traffic Impact Analysis March 4, 2022 identified the Peaceful Ridge Drive and Marksheffel Road LOS as F. Discuss discrepancies between both analyses and explain why they are different in this report. ²

Number: 1 Author: Carlos Subject: Callout Date: 9/29/2022 11:59:56

[Update labeling, appears to be Peaceful Ridge Drive.](#)

Author: jchodsdon Subject: Sticky Note Date: 5/5/2023 15:41:24

LSC Response: This has been revised in our updated report .

Number: 2 Author: Carlos Subject: Callout Date: 9/29/2022 14:35:15

[Bradley Ridge Filling 1 Traffic Impact Analysis March 4, 2022 identified the Peaceful Ridge Drive and Marksheffel Road LOS as F. Discuss discrepancies between both analyses and explain why they are different in this report.](#)

Author: jchodsdon Subject: Sticky Note Date: 5/11/2023 09:48:14

LSC Response: Although Marksheffel is currently one through lane in each direction, our 2045 analysis assumes Marksheffel widened to a four-lane facility by 2045.

in the vicinity of the site are based on the El Paso County *Major Transportation Corridors Plan (MTCP)*. Marksheffel Road is classified as an Expressway, while Fontaine Boulevard is classified as a Principal Arterial Street.

Marksheffel Road/Proposed North Site Access (RIRO)

Left-Turn Deceleration Lane

The proposed north site-access intersection to Marksheffel Road is planned to be a right-in/right-out intersection. As such, a northbound left-turn deceleration lane would **not** apply.

Right-Turn Deceleration Lane

Right-turn deceleration auxiliary turn lanes are required for an Expressway access with a projected peak-hour right-ingress turning volume of 10 vph or greater. The southbound right-turn volume is projected to exceed this 10-vph threshold during both peak hours following the completion of the Peaceful Ridge residential development.

The posted speed limit on Marksheffel Road is 55 mph. Per the *Engineering Criteria Manual*, the required total lane length on Marksheffel Road is 530 feet, consisting of 290 feet of full-width lane length and a 240-foot approach taper.

Right-Turn Acceleration Lane

Right-turn acceleration auxiliary lanes are required for an Expressway access with a projected peak-hour right-exiting turning volume of 10 vph or greater. However, the current character and cross section of the current Marksheffel Road is an arterial rather than an Expressway. Based on Principal Arterial standards for acceleration lanes, a right-turn acceleration lane is not required until the right-turn volume entering the major roadway exceeds 50 vehicles per hour. LSC recommends that a right-turn acceleration lane be added later when Marksheffel is upgraded to the Expressway cross-section. The eastbound right-turn volume is not projected to exceed 50 right turns per hour during either peak hour following the completion of the Peaceful Ridge residential development.

Fontaine Boulevard/Sleepy Meadows Drive Intersection

Left-Turn Deceleration Lane

Left-turn deceleration auxiliary turn lanes are required for a Principal Arterial access with a projected peak-hour right-ingress turning volume of 10 vph or greater. The eastbound left-turn volume currently exceeds and is projected to remain above this 10-vph threshold during both peak hours following the completion of the Peaceful Ridge residential development.

1 Identify the section of the ECM used.

2 Identify grade of Marksheffel Road at section approaching Peaceful Ridge Drive. Per ECM Section 2.3.7.2 deceleration lane lengths shall be adjusted for grade. Use Table 2-25 to determine deceleration lane grade adjustment factors for determined grade.

Number: 1 Author: Carlos Subject: Callout Date: 9/29/2022 14:40:08

Identify the section of the ECM used.

Author: jchodsdon Subject: Sticky Note Date: 5/11/2023 08:42:57

LSC Response: The *City Traffic Criteria Manual* was used for this updated recommendation. The City of Colorado Springs Traffic Criteria Manual has been used instead of the ECM (as Marksheffel is now under City jurisdiction).

Number: 2 Author: Carlos Subject: Text Box Date: 9/29/2022 11:55:52

Identify grade of Marksheffel Road at section approaching Peaceful Ridge Drive. Per ECM Section 2.3.7.2 deceleration lane lengths shall be adjusted for grade. Use Table 2-25 to determine deceleration lane grade adjustment factors for determined grade.

Author: jchodsdon Subject: Sticky Note Date: 5/11/2023 08:42:48

LSC Response: The grade of Marksheffel north of Peaceful Valley Drive has been included in the report and has been used in the decel-lane-length calculation. Note: The City of Colorado Springs Traffic Criteria Manual has been used instead of the ECM (as Marksheffel is now under City jurisdiction). Note: the city adjustment factor for grade is basically the same as the ECM. Also, 60 mph was used as the speed - same as what would be applicable using the ECM.

1
Identify the section of the ECM used.

The posted speed limit on Fontaine Boulevard is 45 mph. Per the *Engineering Criteria Manual*, the required total lane length on Fontaine Boulevard is 535 feet, consisting of 235 feet of full-width lane length, a 200-foot approach taper, and 100 feet of storage length. Redirect tapers west of the turn lane and east of Sleepy Meadows would be required.

Regarding the redirect tapers east of Sleepy Meadows, Fontaine Boulevard transitions from a 45-mph zone to a 35-mph zone between the limits of the proposed turn-lane improvements. Based on the higher of the two speed limits within this zone (45 mph), the redirect taper for the proposed left-turn deceleration lane on Fontaine Boulevard should be 540 feet (45:1 ratio). This assumes widening to the south only for the left-turn lane.

Two options would limit the extent of the redirect taper on the section of Fontaine Boulevard between Sleepy Meadows and Weeping Willow intersections:

- Shift the existing 35-mph zone west such that this entire section of Fontaine Boulevard has a posted speed limit of 35 mph. This would be feasible by moving the eastbound approach's 35-mph speed-limit sign to a new location upstream of Sleepy Meadows.
- Widen Fontaine symmetrically on the north and south sides. Note: the ability to widen Fontaine Boulevard symmetrically may be constrained due to the presence of existing power poles on the north side of Fontaine Boulevard.

Please refer to Figure 11 for more detail regarding proposed striping modifications adjacent to the intersection of Fontaine Boulevard/Sleepy Meadows Drive.

2
Identify which option you are recommending. Coordinate with the City of Colorado Springs to determine the best solution.

Right-Turn Deceleration Lane


Currently, the westbound right-turn deceleration lane is 300 feet long, consisting of 215 feet of lane length and an 85-foot approach taper. Per the *Engineering Criteria Manual*, the required turn-lane length on this Principal Arterial is 315 feet, consisting of 155 feet of lane length and a 160-foot transition taper (based on an assumed 40-mph design speed).

The combined lane-plus-taper length is short of *ECM* criteria by 15 feet (based on a 40-mph design speed). Although 15 feet short of the *ECM*-required length, the existing full-width lane length (215 feet) exceeds the *ECM* requirement for full-width lane length (155 feet). The taper could be lengthened by 15 feet with the project to construct the redirect tapers for the left-turn lane, or a deviation request could be submitted to allow use of the existing lane dimensions.


3
Identify which option you are proposing. If you are considering a deviation request, please submit one for consideration.

Right-Turn Acceleration Lane


Currently, the westbound right-turn acceleration lane (for southbound-to-westbound right turns) is 275 feet long, consisting of 150 feet of lane length and a 125-foot approach taper. Per the *Engineering Criteria Manual*, and assuming a posted speed of 45 mph east of Sleepy Meadow, the required acceleration-lane length on this Principal Arterial is 550 feet, consisting of 550 feet

 Number: 1 Author: Carlos Subject: Callout Date: 9/29/2022 14:43:46


Identify the section of the ECM used.

 Author: jchodsdon Subject: Sticky Note Date: 5/10/2023 13:00:18


LSC Response: The *City Traffic Criteria Manual* was used for this updated recommendation.

 Number: 2 Author: Carlos Subject: Cloud+ Date: 9/29/2022 14:57:29


Identify which option you are recommending. Coordinate with the City of Colorado Springs to determine the best solution.

 Author: jchodsdon Subject: Sticky Note Date: 5/5/2023 15:55:23

LSC Response: This has been updated and clarified in the revised report. We will send our updated report to City Traffic Engineering for their review.

 Number: 3 Author: Carlos Subject: Text Box Date: 9/29/2022 15:17:04

Identify which option you are proposing. If you are considering a deviation request, please submit one for consideration.

 Author: jchodsdon Subject: Sticky Note Date: 5/8/2023 12:52:43

LSC Response: A deviation request has been prepared and is included with this submittal.

of lane length and a 162-foot transition taper (13.5:1 ratio). Because this acceleration lane does not meet *ECM* criteria, LSC recommends lengthening the existing acceleration lane to the *ECM*-required length for a 45 mph (posted speed).

Marksheffel Road/Fontaine Boulevard

Identify the sections of the *ECM* referenced below.¹

Southbound Right-Turn Deceleration Lane

The posted speed limit on Marksheffel Road is 55 mph. Per the *Engineering Criteria Manual*, the required total lane length on Marksheffel Road is 530 feet, consisting of full-width 290 feet of lane length and a 240-foot approach taper. No modifications would be required to the existing southbound right-turn deceleration lane at Marksheffel/Fontaine, as this current 680-foot turn lane meets the *Engineering Criteria Manual's* criteria.

Northbound Left-Turn Deceleration Lane

Currently, the northbound left-turn lane on Marksheffel Road approaching Fontaine Boulevard is 366 feet. The posted speed limit on Marksheffel Road is 55 mph. Per the *Engineering Criteria Manual*, the required total lane length on Marksheffel Road is 680 feet, consisting of full-width 290 feet of lane length, a 240-foot approach taper, and 150 feet of storage length. The existing northbound left-turn deceleration lane at Marksheffel/Fontaine would need to be 680 feet to meet the prescribed length in the *Engineering Criteria Manual*.

Eastbound Left-Turn Deceleration Lane

Per the *Engineering Criteria Manual*, the required total eastbound left-turn deceleration lane length on Marksheffel Road is 415 feet, consisting of full-width 155 feet of lane length and a 160-foot approach taper, plus 100 feet of additional storage for left-turning vehicles. The existing eastbound left-turn deceleration lane at Marksheffel/Fontaine would need to be 415 feet to meet the prescribed length in the *Engineering Criteria Manual*. The current length is 335 feet (235 feet plus a 100-foot taper).

This project is expected to add about 13 left turns during the morning peak hour (27 percent of the total) and 9 trips during the afternoon peak hour (14 percent of the total). Site-generated traffic is estimated to be 9 percent and 3 percent of the total eastbound approach volume during the morning and afternoon peak hours, respectively.

Eastbound Through/Right-Turn Laneage

The eastbound approach widens on the intersection approach to provide two through lanes at the intersection. Also, the corner is striped for a flared approach allowing a short distance for separate right-turn movements.

- Provide a table listing all the identified improvements and identify the improvements that will be constructed by Peaceful Ridge.- In a separate column identify which jurisdiction the improvements lie in.²

☰ Number: 1 Author: Carlos Subject: Text Box Date: 9/29/2022 15:07:49

Identify the sections of the ECM referenced below.

🔄 Author: jchodsdon Subject: Sticky Note Date: 5/10/2023 13:00:47

LSC Response: The Marksheffel/ Fontaine intersection has been removed as a study-area intersection. The updated TIS includes an appendix item with percent relative impact calculations per *ECM* Appendix B.

☰ Number: 2 Author: Carlos Subject: Text Box Date: 5/11/2023 08:45:04

- Provide a table listing all the identified improvements and identify the improvements that will be constructed by Peaceful Ridge.- In a separate column identify which jurisdiction the improvements lie in.

🔄 Author: jchodsdon Subject: Sticky Note Date: 5/5/2023 16:02:47

LSC Response: Added as requested.

SUBDIVISION STREET CLASSIFICATIONS

All streets within this subdivision are classified as Urban Local.

MTCP CONFORMANCE

Roadway Classifications

The following study-area roadway improvements are shown on Map 13 of El Paso County's 2016 *MTCP*. The County will require these roadways to be constructed to County standards (*ECM* Table 2-5 presents a summary of roadways design standards):

- Marksheffel Road – 4-lane Rural Expressway
- Fontaine Boulevard – 4-lane Urban Minor Arterial
- Internal roadways within the proposed residential development – Urban Local

Reimbursable Improvements

The following roadway improvement projects have been identified as being needed by the year 2040 per Map 13 and Table 4 of El Paso County's 2016 *MTCP*:

- C4 – Marksheffel Road from 0.5 miles north of Fontaine to Link Road (\$20,816,000)
 - Existing conditions – 2-lane Rural Minor Arterial
 - Future conditions – 4-lane Rural Expressway
- C5 – Fontaine Boulevard from Marksheffel Road to Easy Street (\$42,449,000)
 - Existing conditions – 2-lane Urban Minor Arterial
 - Future conditions – 4-lane Urban Minor Arterial

See the attached *MTCP* maps for reference.

MULTI-MODAL TRANSPORTATION AND TDM OPPORTUNITIES

The following multi-modal improvement project has been identified as being needed by the year 2040 per Map 15 and Table 5 of El Paso County's 2016 *MTCP*:

- Crews Gulch Trail – proposed bicycle route and roadway upgrades/widenings


DEVIATION REQUESTS

A deviation request could be submitted to allow use of the existing lane dimensions for the westbound right-turn lane at Fontaine Boulevard/Sleepy Meadows. See comment on page 10.¹


COUNTY TRANSPORTATION IMPROVEMENT FEE PROGRAM

This project will be required to participate in the El Paso County Road Improvement Fee Program. Peaceful Ridge will join the ten-mil PID. The ten-mil PID building permit fee portion associated

Deviation requests will be required for proposed knuckle designs not meeting radius requirements per ECM Appendix F Standard Drawing SD_2-77.²

 Number: 1 Author: Carlos Subject: Text Box Date: 9/29/2022 15:16:39


[See comment on page 10.](#)

 Author: jchodsdon Subject: Sticky Note Date: 5/8/2023 12:54:25

LSC Response: A deviation request has been prepared and is included with this submittal.

 Number: 2 Author: Carlos Subject: Text Box Date: 9/29/2022 15:14:30

[Deviation requests will be required for proposed knuckle designs not meeting radius requirements per ECM Appendix F Standard Drawing SD_2-77.](#)

 Author: jchodsdon Subject: Sticky Note Date: 5/8/2023 12:55:20

LSC Response: A deviation has been prepared for the knuckle designs - by HR Green.

with this option is \$1,221 per single-family dwelling unit. The total building permit fee would be \$308,913 for the 253 dwelling units.

Note: This is based on the current rate, which is subject to change. El Paso County updates this rate periodically.

CONCLUSIONS

- The site is projected to generate about 2,386 new driveway vehicle trips on the average weekday.
- During the weekday morning peak hour of adjacent street traffic, 45 vehicles would enter the site while 128 vehicles would exit.
- During the weekday evening peak hour of adjacent street traffic, 150 vehicles would enter the site while 88 vehicles would exit.
- Please refer to the “Level of Service” section above for detailed LOS analysis results for individual turning movements and approaches at all studied intersections, during both peak hours through the 2040 horizon year.
- Please refer to the “Auxiliary Turn-Lane Analysis” section for required auxiliary turn lanes at the study-area intersections.

* * * * *

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 3
Figure 1 - Figure 10
Traffic Count Reports
Synchro LOS Reports
MTCP Maps

Please contact the City of Colorado Springs for input on road access to Marksheffel Road and Fontaine Boulevard west of Sleepy Meadows Drive. It is our understanding that ownership of Marksheffel Road has been conveyed to the City of Colorado Springs therefore City design criteria should be followed for areas in city boundaries.

1

 Number: 1 Author: Carlos Subject: Text Box Date: 9/29/2022 16:10:29

Please contact the City of Colorado Springs for input on road access to Marksheffel Road and Fontaine Boulevard west of Sleepy Meadows Drive. It is our understanding that ownership of Marksheffel Road has been conveyed to the City of Colorado Springs therefore City design criteria should be followed for areas in city boundaries.

 Author: jchodsdon Subject: Sticky Note Date: 5/5/2023 16:07:22

LSC Response: This has been updated and clarified in the revised report. We will send our updated report to City Traffic Engineering for their review.

Revise header to "Total Trips Generated"¹

Table 3: Detailed Trip Generation Estimate


ITE		Value	Units ¹	Trip Generation Rates ²					Driveway Trips				
Code	Description			Average Weekday	A.M.		P.M.		Average Weekday	A.M.		P.M.	
				In	Out	In	Out		In	Out	In	Out	
210	Single-Family (Detached) Housing	253	DU	9.43	0.18	0.51	0.59	0.35	2386	45	128	150	88

¹ DU = dwelling units

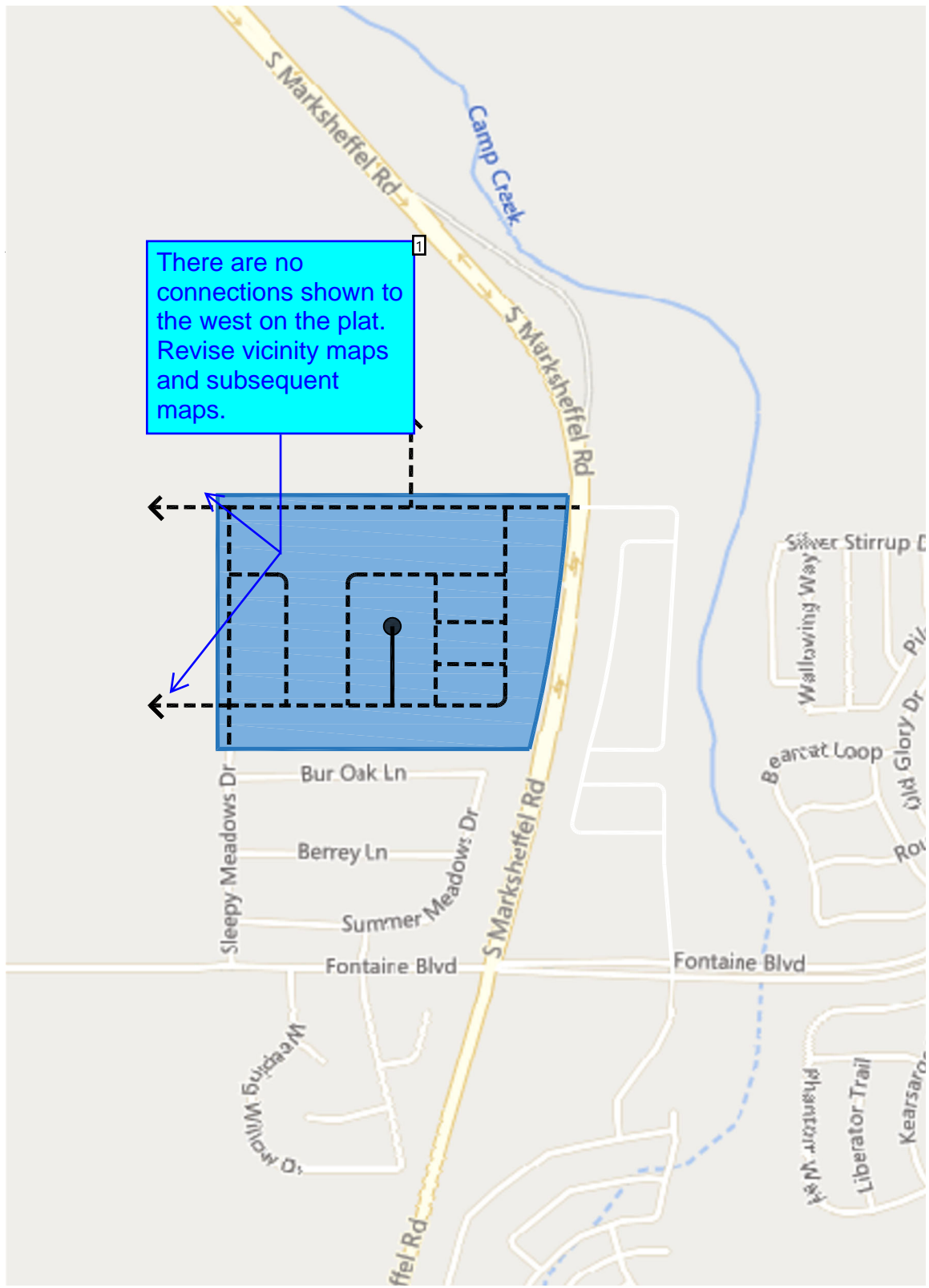
² Source: *Trip Generation*, 11th Edition (2021) by the Institute of Transportation Engineers (ITE)

Number: 1 Author: Carlos Subject: Text Box Date: 9/29/2022 14:12:05

Revise header to "Total Trips Generated".

 Author: jchodsdon Subject: Sticky Note Date: 5/5/2023 16:20:22

LSC Response: This heading is technically correct, in the context of ITE terminology. However, to simplify and avoid any unnecessary confusion, we have updated the heading to "Trips Generated."




There are no connections shown to the west on the plat. Revise vicinity maps and subsequent maps.


1

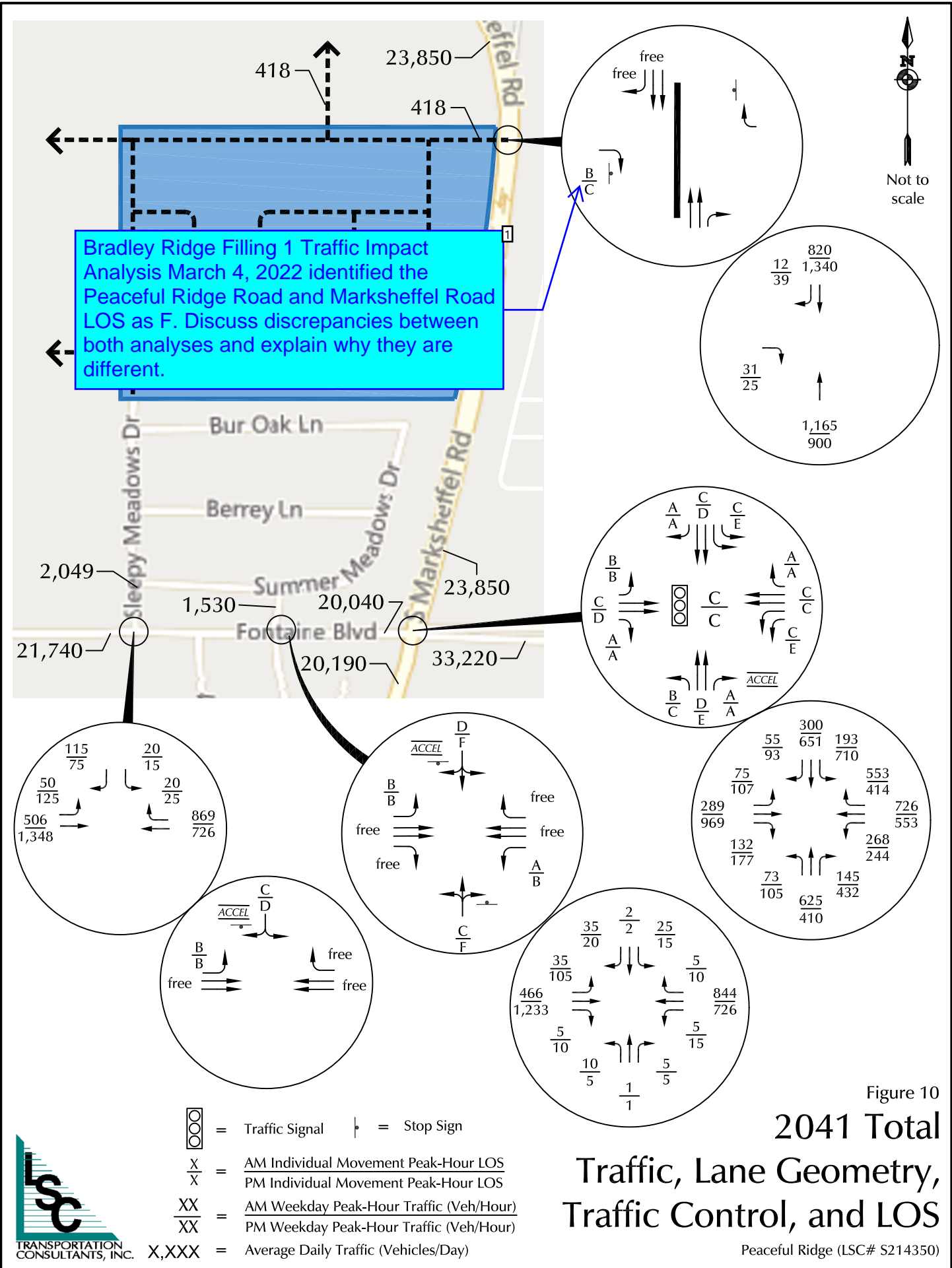



Figure 1
Vicinity Map
Peaceful Ridge (LSC# S214350)

 Number: 1 Author: Carlos Subject: Callout Date: 9/29/2022 15:19:02


There are no connections shown to the west on the plat. Revise vicinity maps and subsequent maps.

 Author: jchodsdon Subject: Sticky Note Date: 5/5/2023 16:21:02
LSC Response: Revised as requested.



 Number: 1 Author: Carlos Subject: Callout Date: 9/29/2022 11:43:25

[Bradley Ridge Filling 1 Traffic Impact Analysis March 4, 2022 identified the Peaceful Ridge Road and Marksheffel Road LOS as F. Discuss discrepancies between both analyses and explain why they are different.](#)

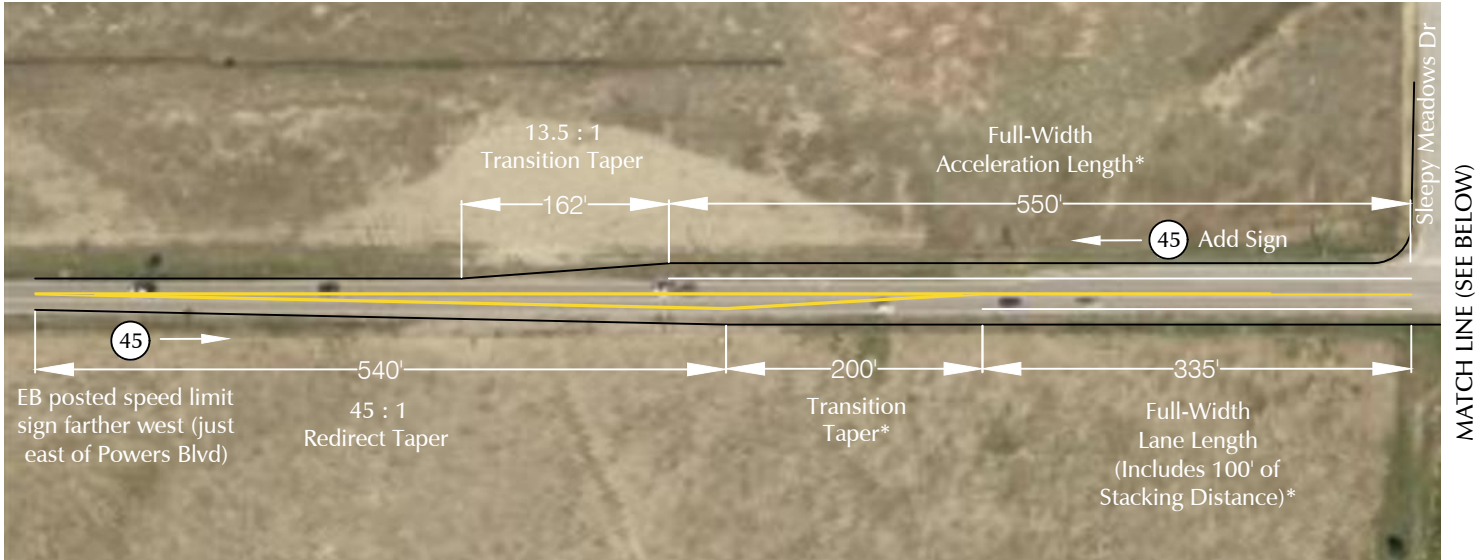
 Author: jchodsdon Subject: Sticky Note Date: 5/11/2023 09:47:15

LSC Response: Although Marksheffel is currently one through lane in each direction, our 2045 analysis assumes Marksheffel widened to a four-lane facility by 2045.



1" = 150'
scale

Note: this concept shows the WB through lane alignment unchanged, but shifts the EB thru lane south to accommodate the proposed EB left turn lane at Sleepy Meadows. This is due to existing overhead utility poles along the north side of Fontaine west of Sleepy Meadows.



* Adjusted for grade, if needed

(XX) Posted speed limit sign location (mph)

Please refer to report text for discussion regarding westbound-right turn lane at Fontaine Blvd/Sleepy Meadows Dr



Potential alternatives to limit extent of redirect taper to the section between Sleepy Meadows and Weeping Willow intersections

1. Shift 35-mph zone west such that this section is 35 mph (i.e., move EB 35 speed limit sign to a new location upstream of Sleepy Meadows)
2. Widen Fontaine Blvd symmetrically on north and south sides for the EBL turn lane approaching Sleepy Meadows Drive


Include propose improvements for Marksheffel Road and Peaceful Ridge Drive intersection and Marksheffel Road and Fontaine Boulevard.




Proposed Laneage Improvements

Figure 11

Peaceful Ridge (LSC# S214350)

 Number: 1 Author: Carlos Subject: Text Box Date: 9/29/2022 15:20:43

[Include propose improvements for Marksheffel Road and Peaceful Ridge Drive intersection and Marksheffel Road and Fontaine Boulevard.](#)

 Author: jchodsdon Subject: Sticky Note Date: 5/10/2023 13:03:19

LSC Response: Marksheffel/Peaceful Ridge Drive improvements included on a separate, new figure.

Regarding the Marksheffel/Fontaine intersection, it has been removed as a study area intersection. The updated TIS includes an appendix item with percent relative impact calculations per *ECM* Appendix B.