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Meridian Ranch Fieldhouse Traffic Impact Study (LSC #S234410) February 8, 2024

Traffic Engineer's Statement

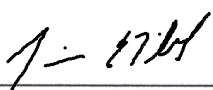
Please add PCD File No. PPR246

¹ 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.



Jim Nikkel, General Manager
Meridian Service Metropolitan District

02/09/2024


Date

LSC Responses to Meridian Ranch Fieldhouse TIS Redlines 3-14-24

Page: 1

 Number: 1 Author: Daniel Torres Subject: Text Box Date: 3/12/2024 22:02:03

[Please add PCD File No. PPR246](#)

 Author: jchodsdon Subject: Sticky Note Date: 5/6/2024 21:26:16

LSC Response: Added as requested.

- The assignment of these trips to the area streets, roadways, and intersections; projections of long-term background traffic volumes;
- Resulting total traffic volumes on the area roadways;
- The projected levels of service at the key area intersections, following buildout; and
- The recommended transportation system, including functional classification of streets and roadways, number of lanes, intersection lane geometry/auxiliary turn lanes, and intersection traffic control.

PREVIOUS TRAFFIC REPORTS COMPLETED IN THE AREA

LSC completed the *Meridian Ranch Sketch Plan 2017 Amendment Traffic Impact Study* (TIS) ([SKP-171](#)) October 3, 2017 and the *Meridian Ranch Sketch Plan 2021 Amendment Traffic Impact Study* ([SKP-213](#)) June 25, 2021. Both sketch plan studies assumed this site developed as a community park with four soccer fields and access to Rainbow Bridge Drive.

A list of other traffic studies in the area of study completed within the past five years (that LSC is aware of) is attached for reference. This study accounts for the land use, trip generation, and the roadway network included in these studies.

A traffic report, entitled Eastonville Road Project Conceptual Design Report, was also recently completed for Eastonville Road by Wilson & Company (for El Paso County).


LAND USE AND ACCESS

Land Use [Add discussion of school sites within 2 miles](#) ¹


Figure 1 shows the site location. The site for the fieldhouse building, parking areas, and fields is part of a district-owned 19-acre parcel (EPC parcel no. 4220303093).

Figure 2 shows the proposed site plan for the Meridian Ranch Fieldhouse. The fieldhouse will provide space for recreational sports and exercise as an extension of the Meridian Ranch Recreation Center located on the northeast of the intersection of Londonderry Drive and Angels Road. The site is planned to include a 53,965-square-foot building that will include an indoor soccer field, a basketball/volleyball court, an exercise studio, a cardio/weights floor, a walking track, a childcare area, offices, and locker rooms. The site plan also includes a future 2,488-square-foot office building and a future outdoor soccer field.

The facility will not be open to the general-public use as a for-profit business, but rather for use by Meridian Ranch residents.

 Number: 1 Author: Bret Subject: Engineer Date: 3/4/2024 16:34:03 -07'00'

[Add discussion of school sites within 2 miles](#)

 Author: kdfer Subject: Sticky Note Date: 5/8/2024 14:48:46

LSC Response: Per ECM Section B.2.3.B analysis of pedestrian routes within 2 miles of a school is only required for residential land uses.

We have added labels to our Figure 2 showing the area schools.

Please provide excerpts as staff could not find this on the 2017 Sketch Plan

1

Access

Two full-movement access points are proposed to Rainbow Bridge Drive. The first access will be located about 397 feet southeast of Culebra Peak Drive and the second access will be located about 340 feet southeast of the first access.

The locations of these access points are generally consistent with those shown on the 2017 Sketch Plan TIA.

Pedestrian Facilities

Figure 3 shows the location of existing bicycle lanes, marked pedestrian crossings, and trail connections in the vicinity of the site. There are currently detached sidewalks along both sides of all the streets in the vicinity of the site. As shown in Figure 2, an existing trail that currently goes through the site to the Rolling Hills Ranch subdivision to the west is planned to be rerouted through the parking areas along new sidewalks.

There are existing pedestrian crosswalk markings on the intersection of Londonderry Drive/Rainbow Bridge Drive. The posted speed limit at this intersection during school arrival and dismissal times is 25 mph.

Per table 2-21 the sight distance shall be based on design speed. Revise accordingly.

2


Sight Distance

Figure 4 shows an analysis of the required sight-distance at the proposed access points to Rainbow Bridge Drive. Based on the posted speed limit of 25 miles per hour (mph) on Rainbow Bridge Drive and the information contained in Table 2-21 of the *Engineering Criteria Manual (ECM)*, the required intersection sight distance at these intersections is 280 feet. Based on the criteria contained in Table 2-17 of the *ECM*, the required stopping sight distance approaching these intersections is 155 feet. As shown in Figure 3, these criteria can be met at both intersections.

The available sight distance at the access points was measured in the field. The available sight distance at the north access is about 444 feet to the north and 533 feet to the south. The available sight distance at the south access is about 675 feet to the north and 635 feet to the south. The available sight distance exceeds the required sight distance at both access points.

 Number: 1 Author: Daniel Torres Subject: Callout Date: 3/12/2024 22:12:23


Please provide excerpts as staff could not find this on the 2017 Sketch Plan

 Author: kdfer Subject: Sticky Note Date: 4/1/2024 11:19:06

LSC Response: The text has been revised to indicate that although the Sketch Plan does not show access points for the "Community Park & Possible Recreation Center" the access points are generally consistent with the location assumed in the Sketch Plan TIS analysis .

 Number: 2 Author: Daniel Torres Subject: Callout Date: 3/12/2024 22:19:22

Per table 2-21 the sight distance shall be based on design speed. Revise accordingly.

 Author: kdfer Subject: Sticky Note Date: 4/1/2024 11:25:53

LSC Response: As Rainbow Bridge Drive is classified as Urban Local adjacent to the site the posted speed and design speed are both 25 mph. The text has been revised to indicate that the analysis is based on the design speed .

Existing Traffic Volumes

Figure 5 shows the existing morning, mid-afternoon (3:00-4:00 p.m.), and late-afternoon peak-hour traffic volumes at the key intersections from the attached traffic counts conducted by LSC in December 2023.

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 and more than 80 seconds for signalized intersections. Table 1 shows the level of service delay ranges.

Table 1: Level 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.		

Figure 5 presents the results of the existing intersection level of service analysis. The levels of service on Rex Road are based on the unsignalized method of analysis procedures from the *Highway Capacity Manual, 6th Edition* by the Transportation Research Board. The level of service reports are attached.

Londonderry Drive/Rainbow Bridge Drive

The intersection of Londonderry/Rainbow Bridge Drive approaches are currently operating at LOS C or better during the peak hours.

Rex Road/Pyramid Peak Drive

The intersection of Rex Road/Pyramid Peak Drive is currently two-way, stop-sign controlled. All approaches at this intersection are currently operating at LOS B or better during the peak hours.


Identify why Londonderry/Lambert intersection was not included in the analysis. Also Sunrise Ridge and Rex Road as this intersection appears to be the quickest route for Sanctuary & Rolling hills Ranch North subdivisions. Be sure to include their traffic in your analysis and update the distribution of traffic accordingly.

11

All

Number: 1 Author: Daniel Torres Subject: Text Box Date: 3/12/2024 23:31:58

Identify why Londonderry/Lambert intersection was not included in the analysis. Also Sunrise Ridge and Rex Road as this intersection appears to be the quickest route for Sanctuary & Rolling hills Ranch North subdivisions. Be sure to include their traffic in your analysis and update the distribution of traffic accordingly.

 Author: kdfer Subject: Sticky Note Date: 5/8/2024 22:24:33

LSC Response: Londonderry/Lambert has already been addressed as part of the residential subdivisions served by Lambert, the side street. Including additional trips from this site as "site-generated traffic" for the fieldhouse would result in double counting trip ends. Trip ends between the residential and this facility are already included in the intersection volumes as the trips are paired with the residential. Past traffic reports reasonably account for trips traveling by car to/from this facility and passing through the Londonderry/Lambert intersection (or south of this intersection). Showing site-generated traffic for this project turning to and from Lambert would "double count" site-generated trips from two different project TIS reports.

Note: While side street impacts are associated with the development along Lambert to the north and south, rather than this project as explained above, LSC did complete a count and check of the signal warrant threshold status to provide staff with current data. Please refer to the updated report for details.

With respect to the Sunrise Ridge/Rex Road intersection, LSC assumed mainly use of Rex Road to Pyramid Peak Drive rather than use of Sunrise Ridge Drive south of Rex (to Pyramid Peak) because of use of Rex Road is faster with significantly less interference than use of Sunrise Ridge with many homes fronting that street directly. Trips paired between these residential subdivisions and this facility are included in the through traffic on Rex Road in previous traffic reports.

Please be sure to include Sanctuary and Rolling Hills Ranch North in your background traffic. Sanctuary is already approved and Rolling Ranch PUDSP will be going to hearing soon.

2043 BACKGROUND TRAFFIC

Background traffic is the traffic estimated to be on the study-area streets without consideration of the proposed fieldhouse. It includes through traffic and traffic generated by adjacent/nearby developments.

Figure 6 shows the projected 20-year background traffic volumes for the year 2043. These volumes assume that Rex Road has been extended east to US Highway 24. The 2043 background traffic volumes were based on previous work completed by LSC in the area, including the *Meridian Ranch Sketch Plan 2021 Amendment Traffic Impact Study* ([SKP-213](#)), dated June 25, 2021.

TRIP GENERATION

The site-generated vehicle trips were estimated using nationally-published trip-generation rates for Land Use 495: Recreational Community Center from *Trip Generation, 11th Edition, 2021* by the Institute of Transportation Engineers (ITE). Note that the data for this land use are based on public facilities, but membership at the proposed fieldhouse is planned to be restricted to residents of Meridian Ranch. The ITE estimates may be conservative.


The ITE trip-generation estimates for land use No. 495 are for vehicle trips. Limited/no ITE data is available for trips by alternate transportation modes. To be conservative, no reductions to the trip-generation estimate were made due to mode split. However, due to the location of the proposed site within a residential area and the availability of existing pedestrian and bicycle facilities as shown on Figure 3, it is likely that some visitors will choose to walk or ride their bicycle to and from the site. Table 2 shows the results of the trip-generation estimate. Table 2 also shows the trip-generation estimate from the Sketch Plan report completed by LSC in October 2017.

The proposed fieldhouse, based on ITE trip-generation rates for land use No.495, is estimated to generate about 1,662 vehicle trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. This is about 1,377 more weekdays trips than was assumed for this same parcel in the 2017 *Sketch Plan Update TIS*.

During the morning peak hour, which generally occurs for one hour between 6:30 a.m. and 8:30 a.m., about nine vehicles would enter and four vehicles would exit the site. During the mid-afternoon school peak hour (3:00 – 4:00 p.m.), about 45 vehicles would enter and 54 vehicles would exit the site. During the afternoon peak hour, which generally occurs for one hour between 4:15 p.m. and 6:15 p.m., about 76 vehicles would enter and 80 vehicles would exit.

 Number: 1 Author: Daniel Torres Subject: Callout Date: 3/12/2024 23:29:17

Please be sure to include [Sanctuary and Rolling Hills Ranch North](#) in your background traffic. [Sanctuary](#) is already approved and [Rolling Ranch PUDSP](#) will be going to hearing soon.

 Author: kdfer Subject: Sticky Note Date: 5/8/2024 22:28:01

Adding additional background traffic from [Sanctuary and Rolling Hills Ranch North](#) were accounted for in the background through traffic on Rex Road traffic.

The background volumes already include some additional traffic between these subdivisions and the elementary school.

This study was based on the existing traffic. Please provide analysis and conclusions with the added traffic of this development.

Provide excerpts of this study in this report.

used full-movement access points to Rainbow Bridge Drive are projected to operate at a satisfactory level of service as two-way, stop-sign-controlled intersections through 2043.

- Based on the **existing** traffic volumes shown in Figure 4 and the criteria contained in the *ECM*, the following auxiliary lanes would be required at the intersection of Londonderry Drive/Rainbow Bridge Drive:

- An eastbound right-turn lane on Londonderry Drive approaching Rainbow Bridge Drive
- A northbound left-turn lane on Rainbow Bridge Drive approaching Londonderry Drive.
- A southbound right-turn lane on Rainbow Bridge Drive approaching Londonderry Drive.

figure 3 is the pedestrian and bicycle facilities figure. revise accordingly

Please identify whether any changes to the existing left turn lanes at this intersection are needed.

However, auxiliary turn lanes for the purposes of mitigating “speed-change differential” between through traffic and turning traffic are not necessary at this intersection as it is all-way, stop-sign controlled and all vehicles approaching the intersection decelerate to a stop. Additionally, LSC completed a Pedestrian Operation and Safety Study for this intersection dated February 8, 2017. All the improvements recommended in that study have since been implemented. That study did not recommend additional auxiliary lanes, likely because this would result in longer crossing distances for pedestrians. For these reasons, LSC does not recommend any improvements at this intersection.

- At the intersection of Rex Road/Pyramid Peak Road, the **existing** traffic volume during the school peak hour (shown in Figure 3) currently exceeds the 50-vph threshold in the *ECM* above which an eastbound right-turn deceleration lane is prescribed. The threshold is not currently exceeded during the morning and evening peak hours. Regarding the projected traffic impact of this project: This project is anticipated to add less than one vehicle per hour to that turning movement during the peak hours and, further, the diverted-trip component during the afternoon peak may actually reduce the net increase in right-turning trips.
- The minimal additional site-generated eastbound right-turning volume during the school peak hour would represent less than a one-percent increase over the existing turning volume during the school peak hour, which is the time period during which the 50 vph is exceeded.
- Also note: although the existing right-turning volume during the school peak hour currently exceeds the 50 vph threshold, the road has been built and infrastructure is in-place - including sidewalk and storm-sewer inlet.
- Based on the above reasons, LSC does not recommend a requirement of this project to add an eastbound right-turn deceleration lane at the intersection of Rex Road/Pyramid Peak Road.
- At the intersection of Rex Road/Pyramid Peak Road, the **existing** traffic volumes during the morning, school and evening peak hours (shown in Figure 3) currently exceed the 25-vph threshold in the *ECM* above which a northbound left-turn deceleration lane is prescribed. However, LSC recommends the existing

The addition of a southbound right turn along Rainbow Bridge approaching Londonderry would result in a crossing less than the north/south crossing of Londonderry. Provide justification for not providing a right turn due to this developments traffic impacts.

Number: 1 Author: Daniel Torres Subject: Callout Date: 3/12/2024 23:12:09

This study was based on the existing traffic. Please provide analysis and conclusions with the added traffic of this development.

Author: kdfer Subject: Sticky Note Date: 5/7/2024 14:49:59

LSC Response: The analysis and recommendations have been based on the current study - including existing and projected volumes and analysis. We have modified this paragraph to clarify and have expanded the rationale for our recommendations.

Number: 2 Author: Daniel Torres Subject: Callout Date: 3/12/2024 23:12:01

5

Author: kdfer Subject: Sticky Note Date: 4/1/2024 11:29:31

LSC Response: Revised as requested

Number: 3 Author: Daniel Torres Subject: Callout Date: 3/12/2024 23:11:39

Provide excerpts of this study in this report.

Author: kdfer Subject: Sticky Note Date: 5/8/2024 15:01:19

LSC Response: References to this study have been struck from the updated TIA

Number: 4 Author: Daniel Torres Subject: Text Box Date: 3/12/2024 23:10:46

Please identify whether any changes to the existing left turn lanes at this intersection are needed.

Author: kdfer Subject: Sticky Note Date: 5/8/2024 21:34:11

LSC Response: This comment has been addressed in the updated TIS. As part of this, a queuing analysis has been added to the updated TIS report.

Number: 5 Author: Daniel Torres Subject: Callout Date: 3/12/2024 22:59:44

figure 3 is the pedestrian and bicycle facilities figure. revise accordingly

Author: kdfer Subject: Sticky Note Date: 4/1/2024 11:31:15

LSC Response: Revised as requested

Number: 6 Author: Daniel Torres Subject: Callout Date: 3/12/2024 23:32:37

The addition of a southbound right turn along Rainbow Bridge approaching Londonderry would result in a crossing less than the north/south crossing of Londonderry. Provide justification for not providing a right turn due to this developments traffic impacts.

Author: kdfer Subject: Sticky Note Date: 5/8/2024 21:34:57

LSC Response: Expanded discussion and justification has been added to the updated report as requested

single-lane northbound approach be allowed to remain as currently configured/built for the following reasons:

- Pyramid Peak Drive is classified as an Urban Local and the typical cross section for that classification does not have turn lanes.
 - Auxiliary turn lanes for the purposes of mitigating “speed-change differential” between through traffic and turning traffic are not necessary as the northbound approach is **Stop-sign controlled** and all vehicles approaching the intersection decelerate to a stop prior to proceeding to enter the intersection.
 - The opposing volumes are less than 20 vehicles per hour. The Colorado Highway Access code allows for a left-turn lane to be dropped if the opposing volume is predicted to be below 100 vehicles per hour.
 - The northbound approach is projected to operate at a satisfactory level of service with a single-lane approach.
 - The minimal site-generated northbound left-turning volume during the peak hours would represent less than a five-percent increase over the corresponding existing northbound left-turning volumes.
 - Based on the above reasons, LSC does not recommend any modifications to the northbound approach at the intersection of Rex Road/Pyramid Peak Road.
- Based on the projected 2043 total traffic volumes shown in Figure 9 and the criteria contained in the *ECM*, no auxiliary turn lanes are required on Rainbow Bridge Drive approaching the site-access points.
 - No offsite improvements are recommended.

* * * * *

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

1
see comments regarding
analyzing the two other
intersections along Londonderry
and Rex Rd and provide auxiliary
lane analysis accordingly.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.


By Jeffrey C. Hodsdon, P.E.
Principal

JCH/KDF:jas

Enclosures: Table 2
Figures 1-11
Traffic Counts
Level of Service Reports
MTCP Maps
Appendix 1

 Number: 1 Author: Daniel Torres Subject: Text Box Date: 3/12/2024 23:34:06

see comments regarding analyzing the two other intersections along Londonderry and Rex Rd and provide auxiliary lane analysis accordingly.

 Author: kdfer Subject: Sticky Note Date: 5/8/2024 22:31:31

LSC Response: See responses above. Also, trips between residential areas and the Field House, which will turn to and from Londonderry/Lambert intersection should be considered trip ends "tagged to" or "site-generated" traffic associated with those residential subdivisions which have already been studied in TIS reports for those projects. Thus, evaluation and findings of any intersection or other improvements required as a result of those turning movements have already been identified as the responsibility of those developments. Conversely, Field House trips paired with these prior developments' "site generated traffic," have be called out and analyzed in this report as site-generated traffic at Londonderry/Rainbow Bridge.

Table 2
Trip Generation Estimate
Meridian Ranch Field House

Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾								Average Weekday Traffic	Total Trips Generated							
			Average Weekday Traffic	Morning Peak-Hour		Midday Peak-Hour		Afternoon Peak-Hour		Morning Peak-Hour		Midday Peak-Hour		Afternoon Peak-Hour					
				In	Out	In	Out	In	Out	In		Out	In	Out	In	Out			
Trip Generation Estimate Based on the Currently Proposed Plan																			
495	Recreational Community Center	53.965 KSF ⁽³⁾	28.82	326	535	0.76	0.92	1.18	1.33	1,555	7	3	41	50	63	72			
488	Soccer Complex	1 field	71.33	0.60	0.39	1.88	2.27	10.84	5.59	71	1	0	2	2	11	5			
712	Small Office Building	2.468 KSF	14.39	1.37	0.30	0.74	0.82	0.73	1.43	36	3	1	2	2	2	3			
Total										1,662	9	4	45	54	76	80			
Trip Generation Estimate For the Same Parcel From the Meridian Ranch Sketch Plan 2017 Amendment Traffic Impact Analysis , October 3, 2017 (SKP171)																			
488	Soccer Complex	4 fields	71.33	0.70	0.70	---	---	14.26	6.41	285	3	3	---	---	57	26			
Change (increase) in Trip Generation Estimate										1,377	6	1	---	---	19	54			
Notes: (1) Source: <i>Trip Generation</i> , 11th Edition, 2021 by the Institute of Transportation Engineers (ITE) (2) KSF = 1,000 square feet Source: LSC Transportation Consultants, Inc.																			
Dec-23																			

Number: 1

Author: Bret

Subject: Engineer

Date: 3/4/2024 11:47:52 -07'00'

Morning Peak-Hour Rates and Trips Generated do not match, please revise

Author: kdfer

Subject: Sticky Note

Date: 4/1/2024 11:39:51

LSC Response: The table has been revised as requested

T

Number: 2

Author: Bret

Subject: Engineer

Date: 3/4/2024 11:48:30 -07'00'

1.26

0.65

T

Number: 3

Author: Bret

Subject: Engineer

Date: 3/4/2024 11:48:10 -07'00'

1.26

0.65

T

Number: 4

Author: Bret

Subject: Engineer

Date: 3/4/2024 11:48:25 -07'00'

0

T

Number: 5

Author: Bret

Subject: Engineer

Date: 3/4/2024 11:48:14 -07'00'

0

T

Number: 6

Author: Bret

Subject: Engineer

Date: 3/4/2024 11:48:45 -07'00'

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3

T

Number: 7

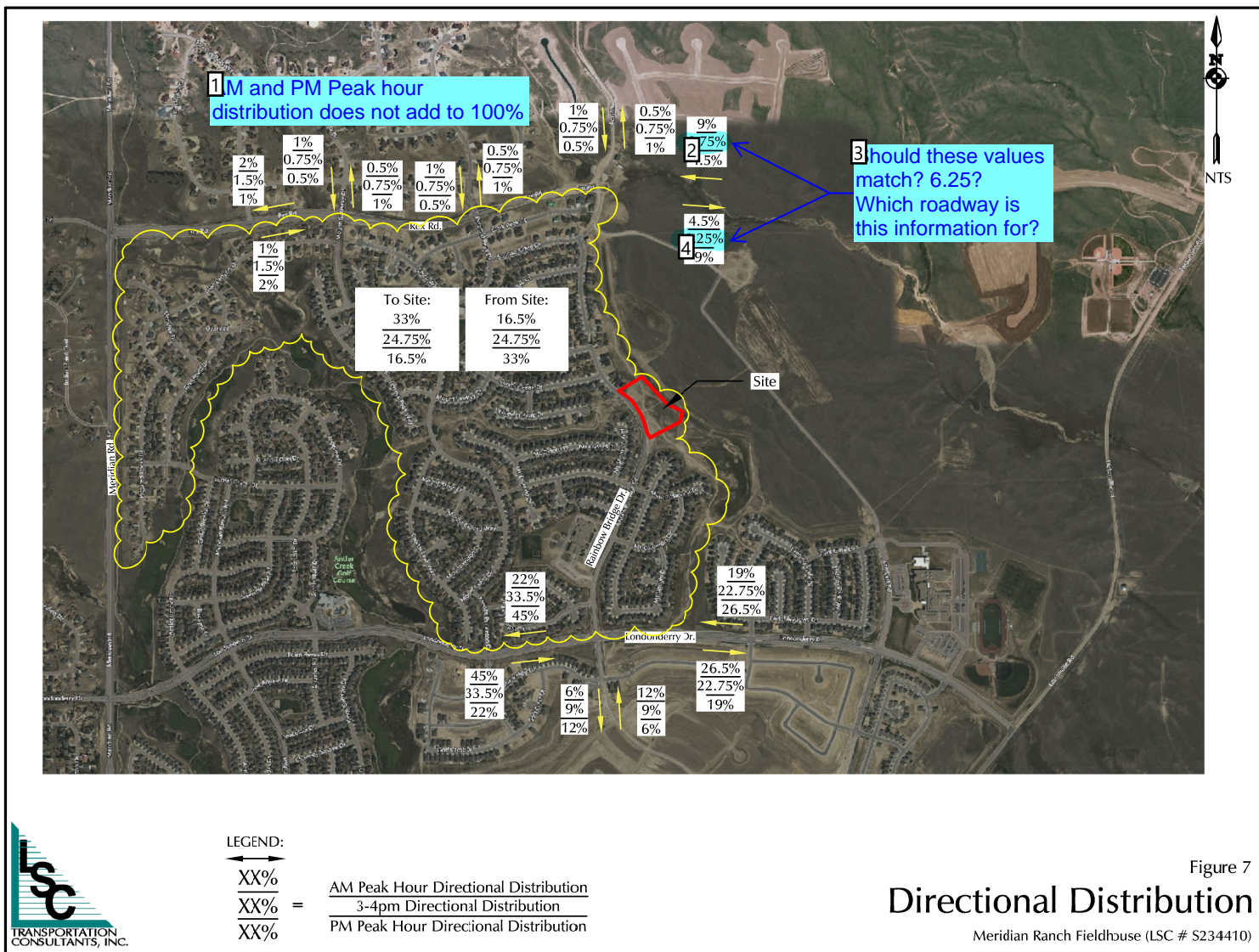
Author: Bret


Subject: Engineer

Date: 3/4/2024 11:48:13 -07'00'


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3





 Number: 1 Author: Bret Subject: Engineer Date: 3/4/2024 17:33:09 -07'00'

AM and PM Peak hour distribution does not add to 100%


 Author: kdfer Subject: Sticky Note Date: 4/1/2024 11:40:18

LSC Response: Typographical errors on the figure have been corrected.

 Number: 2 Author: Bret Subject: Engineer Date: 3/4/2024 16:53:39 -07'00'

 Number: 3 Author: Bret Subject: Engineer Date: 3/4/2024 17:20:10 -07'00'

Should these values match? 6.25? Which roadway is this information for?

 Author: kdfer Subject: Sticky Note Date: 4/1/2024 11:40:30

LSC Response: Typographical errors on the figure have been corrected.

 Number: 4 Author: Bret Subject: Engineer Date: 3/4/2024 16:53:41 -07'00'
