



ACCEPTED for FILE
Engineering Review
04/26/2023 4:53:40 PM
Jeff Rice - EPC Engineering
EPC Department of Public Works

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>

Foursquare at Sterling Ranch East
Traffic Technical Memorandum
PCD No. PUDSP227
(LSC #S224590)
April 20, 2023

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.

[Handwritten Signature]

4/20/23
Date

Foursquare at Sterling Ranch East

Traffic Technical Memorandum

Prepared for:

Loren J. Moreland
Vice President/ Project Manager
Classic SRJ
2138 Flying Horse Club Drive
Colorado Springs, CO 80921

APRIL 20, 2023

LSC Transportation Consultants
Prepared by: Kirstin D. Ferrin, P.E.
Reviewed by: Jeffrey C. Hodsdon, P.E.

LSC #S224590
PUDSP227



CONTENTS

| | |
|---|---|
| REPORT CONTENTS | 1 |
| RECENT TRAFFIC REPORTS | 2 |
| LAND USE AND ACCESS | 2 |
| Intersection Sight Distance..... | 3 |
| Pedestrian and Bicycle Analysis..... | 4 |
| Safety Analysis | 4 |
| TRIP GENERATION..... | 4 |
| TOTAL TRAFFIC VOLUMES AND LEVELS OF SERVICE | 5 |
| SIGNAL WARRANT THRESHOLD ANALYSIS – AM AND PM PEAK HOURS | 5 |
| Marksheffel/Vollmer..... | 6 |
| Marksheffel/Sterling Ranch..... | 6 |
| Briargate/Vollmer | 6 |
| SUBDIVISION STREET CLASSIFICATIONS | 7 |
| DEVIATION REQUESTS..... | 7 |
| ROADWAY IMPROVEMENTS | 7 |
| ROADWAY IMPROVEMENT FEE PROGRAM..... | 7 |
| Enclosures:..... | 8 |
| Tables 1-4 | |
| Figures 1-6 | |
| Appendix Table 1 | |
| Tables 5 and 6 from <i>Sterling Ranch East Rezoning and Preliminary Plan TIS</i> with notes by LSC | |



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>

April 20, 2023

Mr. Loren J. Moreland
Vice President/ Project Manager
Classic SRJ
2138 Flying Horse Club Drive
Colorado Springs, CO 80921

RE: Foursquare at Sterling Ranch East
El Paso County, CO
Traffic Technical Memorandum
PUDSP227
LSC #S224590

Dear Mr. Moreland:

LSC Transportation Consultants, Inc. has prepared this traffic technical memorandum for the Foursquare at Sterling Ranch East residential development. As shown in Figure 1, the site is located north of the future extension of Briargate Parkway and west of the future extension of Sterling Ranch Road in El Paso County, Colorado. LSC recently prepared a traffic impact study (TIS) for the Sterling Ranch East Rezoning and Preliminary Plan ([SP224](#)) that included trips by the currently-proposed filing. This memorandum is intended as a site-specific, final plat traffic report for Foursquare at Sterling Ranch East.

REPORT CONTENTS

This report presents:

- A summary of the proposed land use and access plan;
- The projected average weekday and peak-hour vehicle trips to be generated by the currently-proposed filing;
- The assignment of the site-generated traffic volumes to the area roadways;
- The recommended street classifications for the internal streets within the currently-proposed filing;
- Improvements needed with the currently-proposed filing; and
- The project's obligation to the County roadway improvement fee program.

RECENT TRAFFIC REPORTS

- LSC completed an updated master traffic study (MTIS) for the entire Sterling Ranch development, dated February 10, 2023. Appendix Table 1 includes a link to the El Paso County Electronic Development Application Review Program (EDARP) page where a copy of the latest version of that MTIS can be obtained.
- LSC prepared a TIS for the Sterling Ranch East Rezoning and Preliminary Plan, February 10, 2023. The currently proposed filing was accounted for within that recent report. Appendix Table 1 includes a link to the El Paso County Electronic Development Application Review Program (EDARP) page where a copy of the latest version of that TIS can be obtained.
- A list of other traffic studies within Sterling Ranch and in the vicinity of area of study completed within the past five years (that LSC is aware of) is attached for reference (Appendix Table 1).
- El Paso County is currently studying the Briargate Stapleton Corridor as part of a Pikes Peak Rural Transportation Authority (PPRTA) study. A draft version of the Briargate-Stapleton Corridor Study by Wilson & Company was published December 9, 2021.

LAND USE AND ACCESS

Foursquare at Sterling Ranch East is planned to include 158 small lots for single-family homes. The proposed development includes higher density single-family detached units arranged in “packs” of four (referred to as “Foursquare”) with two units adjacent to the public street and two units behind. Figure 2 shows the proposed site plan.

The proposed development is most similar to patio homes, which the *Trip Generation Manual* includes as a “specialized land use” under ITE Land Use 210: Single-Family Detached Housing. However, the data is limited to only three sites and ITE intends to provide further analysis in future editions of the Trip Generation Manual. Until that further data and analysis are available, LSC has selected **ITE Land Use 210 Single-Family Detached Housing**, which results in a more conservative trip-generation estimate for the proposed Foursquare development.

While ITE Land Use 210 was selected for use in this report, LSC considered ITE Land Uses 215 and 220. The description for ITE Land Use: 215 Single-Family Attached Housing states that the units share a wall with an adjoining dwelling unit and the description for ITE Land Use: 220 Multifamily Housing states that the units are located within the same building with at least three other dwelling units. The proposed homes within Foursquare at Sterling Ranch East are all proposed to be detached units on individual small lots with no shared walls.

Figure 3 shows the roadway connections that are planned to be constructed in the short term. As shown in Figure 3, by 2023 Briargate Parkway is planned to be constructed to its final cross section between Vollmer Road and Wheatland Drive, Marksheffel Road is planned to be completed between Vollmer Road and Woodmen Road, and Sterling Ranch Road is planned to

be constructed from Marksheffel Road to Dines Boulevard. With Sterling Ranch East Filing No. 1, which is planned to be constructed prior to the Villages at Sterling Ranch East, Briargate Parkway is planned to be constructed to its final cross section between Wheatland Drive and Sterling Ranch Road and Sterling Ranch Road is planned to be constructed from Dines Boulevard to Idaho Falls Drive. These connections will need to be constructed with Foursquare at Sterling Ranch East if they are not constructed as part of Sterling Ranch East Filing 1.

Full-movement access is proposed to Sterling Ranch Road via Idaho Falls Drive. The proposed access spacing is shown in Figure 2. As shown in the figure, all of the access points meet the intersection spacing requirements.

An additional three-quarter-movement access (Boulder City Drive) is proposed to Briargate Parkway about 1,245 feet east of Wheatland Drive and 1,375 feet west of Sterling Ranch Road. This access will require a deviation to the criteria contained in the El Paso County *Engineering Criteria Manual (ECM)*. The *Briargate Parkway-Stapleton Road Corridor Study Appendix D: Access Control Plan* shows the access locations and intersection access restrictions along Briargate Parkway between Black Forest Road and Meridian Road. This deviation request is being made as part of the application for Sterling Ranch East Filing No. 1 but will also be required by the currently-proposed Foursquare at Sterling Ranch East as it is our understanding that these projects will need to be developed concurrently. The draft access control plan shows a right-in/right-out access point north and south of Briargate Parkway between Wheatland Drive and Sterling Ranch Road. The Master TIS showed two offset three-quarter movement (left-in/right-in/right-out only) access points in this general location. A future three-quarter movement access to be located 160 feet east of the currently-proposed Boulder City Drive would serve the future planned K-8 school parcel located southwest of the intersection of Briargate/Sterling Ranch.

The currently-proposed filing was included in the Sterling Ranch Master TIS as Traffic Analysis Zone (TAZ) 19. Traffic projected to be generated by land uses within this zone was included as part of the short-term background traffic volumes in the Sterling Ranch East Rezoning and Preliminary Plan TIS. The land use and access currently proposed are consistent with what was assumed in the Master TIS and the Sterling Ranch East Rezoning and Preliminary Plan TIS.

Intersection Sight Distance

Figure 4a shows a sight-distance analysis at the proposed intersection of Idaho Falls/Sterling Ranch. Based on a design speed of 40 miles per hour (mph) and the criteria contained in Table 2-21 of the *Engineering Criteria Manual (ECM)*, the required intersection sight distance at the future intersections is 445 feet. As shown in Figure 4a, the proposed intersections to Sterling Ranch Road and Idaho Falls Drive will meet the criteria.

Figure 4b shows a sight-distance analysis at the proposed three-quarter movement intersection of Boulder City/Briargate. Based on a design speed of 50 miles per hour (mph) and the criteria

contained in Table 2-21 of the *Engineering Criteria Manual (ECM)*, the required intersection sight distance at the future intersection is 55 feet. As shown in Figures 4b, the proposed intersection will meet the criteria.

Please refer to the PUDSP document for sight-distance analysis of the internal local/local intersections.

Pedestrian and Bicycle Analysis

Figure 2 also shows the location of all planned trails and sidewalks in the vicinity of the site. Connections are also proposed to the planned future Sand Creek Regional Trail (west of Dines Boulevard), as shown in the attached map.

A detached sidewalk will be provided along the west side of Sterling Ranch Road. The multi-use paved shoulder on Sterling Ranch Road will accommodate bicycles.

There are no existing schools within two miles of the site, however, a K-8 school is planned southwest of the future intersection of Briargate/Sterling Ranch Road and two elementary schools are planned east of Sterling Ranch Road. A school crossing will likely be needed at the intersection of Sterling Ranch Road/Briargate Parkway. This intersection is planned to be signal controlled in the future. The final intersection design will need to meet the criteria for pedestrian safety contained in *ECM 2.5.2.F.2* and *ECM 2.5.6.G-J*. It is our understanding that the specific elements of this design are currently under discussion by the applicant and County staff. Once a decision has been reached regarding the planning/design elements, the applicable documents will be revised as necessary (which may include this TIS report).

Safety Analysis

Most of the roadways in the vicinity of the site have not yet been constructed. The Colorado State Patrol (CSP) provided LSC with crash history data for Vollmer Road between Tahiti Drive and Burgess Road from September 2019 through September 2022. During the reported time period, there were twelve reported crashes. Of the twelve reports, ten were single-vehicle non-intersection-related crashes on Vollmer Road. One crash involved a southbound vehicle that turned right onto Poco Road and crashed into several cars parked on Poco Road partially in the lane. The only intersection related crash occurred in June 2022. A vehicle heading northbound on Vollmer Road was slowing to turn left at Lochwinnoch Road and the vehicle behind them attempted to pass on the left side. The crash history data has been attached.

TRIP GENERATION

Foursquare at Sterling Ranch East site-generated vehicle trips have been estimated using the nationally-published trip-generation rates from *Trip Generation, 11th Edition, 2021* by the Institute of Transportation Engineers (ITE). Table 1 shows the trip-generation estimate. The

trip-generation estimate is consistent with the estimate assumed in the Sterling Ranch Master TIS and the Sterling Ranch East Rezoning and Preliminary Plan TIS for the same parcels.

The Villages at Sterling Ranch East is expected to generate 1,490 vehicle trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 29 vehicles would enter and 82 vehicles would exit the site. During the afternoon peak hour, which generally occurs for one hour between 4:15 and 6:15 p.m., about 94 vehicles would enter and 55 vehicles would exit the site.

TRIP DISTRIBUTION AND ASSIGNMENT

When the distribution percentages from Figure 8 of the Sterling Ranch East Rezoning and Preliminary Plan TIA are applied to the new, external trip-generation estimates (from Table 1), the resulting site-generated traffic volumes can be determined. Figures 5a and 5b show the short-term residential site-generated traffic volumes. These volumes assume only the street network shown in Figure 3.

TOTAL TRAFFIC VOLUMES AND LEVELS OF SERVICE

Please refer to the short-term and 2042 peak-hour traffic-volume projections and level of service analysis shown in Figures 14c and 15c of the *Sterling Ranch East Rezoning & Preliminary Plan TIS*. The proposed land use and access are in compliance with the Sterling Ranch Master TIS and Sterling Ranch Preliminary Plan TIS. As such, there are no changes to these projected volumes or level of service results.

SIGNAL WARRANT THRESHOLD ANALYSIS – AM AND PM PEAK HOURS

The intersections of Marksheffel/Vollmer, Marksheffel/Sterling Ranch, and Briargate/Vollmer were analyzed to determine if the thresholds for Four-Hour and/or Eight-Hour Vehicular-Volume Traffic-Signal Warrant thresholds would be reached or exceeded, based on the projected short-term traffic volumes.

The volumes shown are based on the following:

- The short-term background traffic volumes which are based on the existing traffic volumes plus estimates of traffic to be generated in the short term by buildout of Homestead at Sterling Ranch, Branding Iron at Sterling Ranch, Sterling Ranch Filings 2-4, Copper Chase at Sterling Ranch, Homestead North at Sterling Ranch Filings 1-3, and the Retreat at TimberRidge Filings 1-3,
- The Sterling Ranch East Filing Nos. 1 and 2 site-generated traffic volumes taken from the traffic memo for that subdivision filing.,
- The Villages at Sterling Ranch East site-generated traffic volumes from our current work for the traffic memo for that subdivision,
- The Foursquare at Sterling Ranch East site-generated traffic volumes shown in Figure 5b of this memorandum.

The off-peak-hour volumes are estimates by LSC based on the peak-hour traffic volumes, 72-hour machine counts conducted by LSC on Vollmer Road in November 2020, and vehicle time-of-day distribution data for single-family homes published by the Institute of Transportation Engineers.

Marksheffel/Vollmer

Table 2 shows the results of the analysis for the intersection of Marksheffel/Vollmer. As shown in Table 2, in the short-term only, five of the hours analyzed are projected to meet the thresholds for an Eight-Hour Vehicular-Volume Traffic-Signal Warrant and none of the hours analyzed are projected to meet the thresholds for a Four-Hour Vehicular Volume Traffic Signal Warrant. This analysis indicates that traffic-signal warrant(s) will likely **not** be met at the intersection of Marksheffel/Vollmer with buildout of Sterling Ranch East Filing Nos. 1 and 2, the Villages at Sterling Ranch East, and Foursquare at Sterling Ranch East.

Marksheffel/Sterling Ranch

Table 3 shows the results of the analysis for the intersection of Marksheffel/Sterling Ranch. As shown in Table 3, in the short-term, five of the hours analyzed are projected to meet the thresholds for an Eight-Hour Vehicular-Volume Traffic-Signal Warrant. The traffic volumes for three additional hours are approaching the thresholds. The minor approach volume for all three of these hours is well over the 150 vehicle per hour (vph) minimum threshold and the major approach volumes are within two to 68 vph of the 600 vph threshold. Four of the hours analyzed are projected to meet the thresholds for a Four-Hour Vehicular-Volume Traffic-Signal Warrant.

This analysis indicates that the Eight-Hour and Four-Hour Vehicular Volume traffic-signal warrant(s) may be met at the intersection of Marksheffel/Sterling Ranch with buildout of Sterling Ranch East Filing 1, the Villages at Sterling Ranch East, and Foursquare at Sterling Ranch East. LSC recommends at least eight hours of traffic count volume data be collected at the intersections Marksheffel/Sterling Ranch following completion of Marksheffel Road between Vollmer Road and Woodmen Road, which is planned to be done in 2023. Once the traffic data is completed, traffic-signal warrant analysis can be reanalyzed based on the existing conditions at that time. The decision to require a signal to be installed rests with the County.

Briargate/Vollmer

Table 4 shows the results of the analysis for the intersection of Briargate/Vollmer. As shown in Table 4, in the short term only, none of the hours analyzed are projected to meet the thresholds for an Eight-Hour Vehicular-Volume Traffic-Signal Warrant or the thresholds for a Four-Hour Vehicular-Volume Traffic-Signal Warrant. This analysis indicates that traffic-signal warrant(s) will likely **not** be met at the intersection of Briargate/Vollmer with buildout of Sterling Ranch East Filing Nos. 1 and 2, the Villages at Sterling Ranch East, and Foursquare at Sterling Ranch East.

SUBDIVISION STREET CLASSIFICATIONS

All of the internal streets within Foursquare at Sterling Ranch East should be classified as Urban Local. Figure 6 shows the recommended street classifications for the internal streets and the streets in the vicinity of the site.

DEVIATON REQUESTS

The Boulder City Drive connection to Briargate Parkway, along with the Briargate Parkway extension to Sterling Ranch Road, are part of a separate Preliminary Plan and Final Plat. However, it is our understanding that both projects will need to develop concurrently because of shared infrastructure.

It is also our understanding that the deviation request for the three-quarter movement access to Briargate Parkway, prepared by JR Engineering, has been revised (by JR Engineering) in response to staff comments.

ROADWAY IMPROVEMENTS

Tables 5 and 6 from the *Sterling Ranch East Rezoning and Preliminary Plan TIS* contained a summary of needed improvements and recommendations for auxiliary turn-lane lengths. Copies of these tables have been attached with the improvements needed either prior to or with Foursquare at Sterling Ranch East highlighted.

ROADWAY IMPROVEMENT FEE PROGRAM

This project will be required to participate in the El Paso County Road Improvement Fee Program. Foursquare at Sterling Ranch East Filing will join the five-mil PID. The 2019 five-mil PID building permit fee portion associated with this option is \$2,527 per single-family dwelling unit. Based on 158 lots, the total building permit fee would be \$399,266. Note: program fees are subject to change.

* * * * *

(this space left blank intentionally)

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/KDF:jas

Enclosures: Tables 1-4
Figures 1-6
Appendix Table 1
Tables 5 and 6 from *Sterling Ranch East Rezoning and Preliminary Plan TIS* with
notes by LSC

Tables 1-4



**Table 1
FourSquare at Sterling Ranch East
Trip Generation**

| Sketch Plan TAZ | ITE Code | ITE Land Use | Quantity | Unit | Trip Generation Rates ⁽¹⁾ | | | | Total Trip Generated | | | | | |
|-----------------------|-------------|--------------------------------|----------|-------------------|--------------------------------------|--------------|------|--------------|----------------------|-------|--------------|-----|--------------|----|
| | | | | | Daily | AM Peak Hour | | PM Peak Hour | | Daily | AM Peak Hour | | PM Peak Hour | |
| | | | | | | In | Out | In | Out | | In | Out | | |
| 19 | 210 | Single-Family Detached Housing | 158 | DU ⁽²⁾ | 9.43 | 0.18 | 0.52 | 0.59 | 0.35 | 1,490 | 29 | 82 | 94 | 55 |

Notes:

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

(2) DU = Dwelling Unit

Source: LSC Transportation Consultants, Inc.

Nov-22

Table 2
Traffic Signal Warrant Analysis
Marksheffel Road/Vollmer Road

| Hour | Short-Term Total Traffic ⁽⁵⁾ | | | | | | | | | | | Warrant Analysis ⁽¹⁾ | | | | | | | | | | |
|--|--|----------------------|---|-------------|-----------------------------------|-------------|-------------------------------------|-------------|--------------------------|-------------|---|---------------------------------|------------------------|-------|--|------------------|-------------------------|---------------------------|-------------------------|---------------------------|------------|----|
| | Short-Term Background Traffic ⁽²⁾ | | SRE Filing Nos. 1 & 2 Generated Traffic | | Villages at SRE Generated Traffic | | Foursquare at SRE Generated Traffic | | Short-Term Total Traffic | | Warrant 1: Eight Hour Vehicular Volume Evaluation | | | | Warrant 2: Four Hour Vehicular Volume Evaluation | | | | | | | |
| | Major ⁽³⁾ | Minor ⁽³⁾ | Major | Minor | Major | Minor | Major | Minor | Major | Minor | Warrant Thresholds | | Warrant Threshold Met? | | Short-Term Background | Short-Term Total | Warrant Threshold Minor | Warrant Threshold Met? WB | Warrant Threshold Minor | Warrant Threshold Met? WB | | |
| | Vollmer | Marksheffel | Vollmer | Marksheffel | Vollmer | Marksheffel | Vollmer | Marksheffel | Vollmer | Marksheffel | Condition A | | Condition B | | Condition A | Condition B | Condition A | Condition B | Minimum | WB | Minimum | WB |
| | | | | | | | | | | | Major | Minor | Major | Minor | Condition A | Condition B | Condition A | Condition B | | | | |
| 12-1 AM | 49 | 3 | 1 | 0 | 1 | 0 | 2 | 0 | 53 | 3 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 1-2 AM | 24 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 25 | 3 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 2-3 AM | 18 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 19 | 0 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 3-4 AM | 26 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 27 | 3 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 4-5 AM | 41 | 13 | 1 | 1 | 2 | 0 | 1 | 0 | 45 | 14 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 5-6 AM | 108 | 34 | 4 | 2 | 5 | 1 | 2 | 0 | 119 | 37 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 6-7 AM | 320 | 99 | 14 | 5 | 15 | 2 | 7 | 0 | 356 | 106 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 7-8 AM | 763 | 171 | 23 | 8 | 26 | 3 | 14 | 0 | 826 | 182 | 600 | 150 | 900 | 75 | Yes | No | Yes | No | 219 | No | 194 | No |
| 8-9 AM | 851 | 144 | 22 | 7 | 24 | 3 | 16 | 0 | 913 | 154 | 600 | 150 | 900 | 75 | No | No | Yes | Yes | 187 | No | 172 | No |
| 9-10 AM | 737 | 91 | 16 | 4 | 18 | 2 | 14 | 0 | 785 | 97 | 600 | 150 | 900 | 75 | No | No | No | No | 232 | No | 208 | No |
| 10-11 AM | 856 | 91 | 19 | 4 | 20 | 2 | 18 | 0 | 913 | 97 | 600 | 150 | 900 | 75 | No | No | No | Yes | 186 | No | 172 | No |
| 11-12 PM | 971 | 86 | 21 | 4 | 23 | 2 | 24 | 0 | 1039 | 92 | 600 | 150 | 900 | 75 | No | Yes | No | Yes | 157 | No | 138 | No |
| 12-1 PM | 685 | 68 | 21 | 4 | 22 | 1 | 24 | 0 | 752 | 73 | 600 | 150 | 900 | 75 | No | No | No | No | 256 | No | 224 | No |
| 1-2 PM | 679 | 72 | 23 | 4 | 23 | 2 | 26 | 0 | 751 | 78 | 600 | 150 | 900 | 75 | No | No | No | No | 258 | No | 225 | No |
| 2-3 PM | 782 | 75 | 25 | 4 | 26 | 2 | 30 | 0 | 863 | 81 | 600 | 150 | 900 | 75 | No | No | No | No | 209 | No | 184 | No |
| 3-4 PM | 835 | 73 | 29 | 4 | 27 | 2 | 36 | 0 | 927 | 79 | 600 | 150 | 900 | 75 | No | No | No | Yes | 191 | No | 168 | No |
| 4-5 PM | 869 | 91 | 36 | 5 | 35 | 2 | 45 | 0 | 985 | 98 | 600 | 150 | 900 | 75 | No | No | No | Yes | 183 | No | 154 | No |
| 5-6 PM | 732 | 90 | 36 | 5 | 35 | 2 | 44 | 0 | 847 | 97 | 600 | 150 | 900 | 75 | No | No | No | No | 234 | No | 188 | No |
| 6-7 PM | 505 | 72 | 29 | 4 | 28 | 2 | 37 | 0 | 599 | 78 | 600 | 150 | 900 | 75 | No | No | No | No | 338 | No | 291 | No |
| 7-8 PM | 320 | 52 | 21 | 3 | 20 | 1 | 27 | 0 | 388 | 56 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 8-9 PM | 260 | 38 | 19 | 2 | 18 | 1 | 27 | 0 | 324 | 41 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 9-10 PM | 168 | 29 | 14 | 2 | 13 | 1 | 19 | 0 | 214 | 32 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 10-11 PM | 95 | 13 | 7 | 1 | 7 | 0 | 9 | 0 | 118 | 14 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 11-12 AM | 50 | 8 | 4 | 0 | 3 | 0 | 6 | 0 | 63 | 8 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| Numbers of Hours the Warrant Thresholds Are Met | | | | | | | | | | | | | | 1 | 1 | 2 | 5 | | | | | |
| Warrant Met? | | | | | | | | | | | | | | No | | No | | | | | | |

Notes:
 (1) Thresholds are based on 2 or more lanes on the major approach and 1 lane on the minor approach (Warrant evaluation assuming the westbound left turn only for the minor street)
 (2) Source: Sterling Ranch East Phase 1 Rezoning and Preliminary Plan Traffic Impact Study, November 14, 2022
 (3) The major street traffic includes all movements (left, through, and right)
 (4) The minor street traffic includes only the left turns from the minor street
 (5) Off peak hour traffic volumes are based on the projected peak hour traffic volumes, 72-hour machine counts conducted on Vollmer Road in November 2020 and vehicle time-of-day distribution data for single-family residential published by the Institute of Transportation Engineers
 Source: LSC Transportation Consultants, Inc.

Table 3
Traffic Signal Warrant Analysis
 Marksheffel Road/Sterling Ranch Road

| Hour | Short-Term Total Traffic ⁽⁵⁾ | | | | | | | | | | Warrant Analysis ⁽¹⁾ | | | | | | | | | | | | |
|---|--|----------------------|---------------------------------------|----------------|-----------------------------------|----------------|-------------------------------------|----------------|--------------------------|----------------|---|-------|-------------|-------|--|-------------|------------------|-------------|---------------------------|---------------------------|---------------------------|---------------------------|----|
| | Short-Term Background Traffic ⁽²⁾ | | SRE Filing Nos. 1&2 Generated Traffic | | Villages at SRE Generated Traffic | | Foursquare at SRE Generated Traffic | | Short-Term Total Traffic | | Warrant 1: Eight Hour Vehicular Volume Evaluation | | | | Warrant 2: Four Hour Vehicular Volume Evaluation | | | | | | | | |
| | Major ⁽³⁾ | Minor ⁽⁴⁾ | Major | Minor | Major | Minor | Major | Minor | Major | Minor | Warrant Thresholds | | | | Short-Term Background | | Short-Term Total | | | | | | |
| | Marksheffel | Sterling Ranch | Marksheffel | Sterling Ranch | Marksheffel | Sterling Ranch | Marksheffel | Sterling Ranch | Marksheffel | Sterling Ranch | Condition A | | Condition B | | Condition A | Condition B | Condition A | Condition B | Warrant Threshold Minimum | Warrant Threshold Met? WB | Warrant Threshold Minimum | Warrant Threshold Met? WB | |
| | | | | | | | | | | | Major | Minor | Major | Minor | A | B | A | B | | | | | |
| 12-1 AM | 40 | 5 | 8 | 3 | 5 | 1 | 2 | 1 | 1 | 55 | 10 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 1-2 AM | 17 | 5 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 23 | 10 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 2-3 AM | 16 | 0 | 3 | 0 | 2 | 0 | 1 | 0 | 0 | 22 | 0 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 3-4 AM | 18 | 5 | 3 | 3 | 2 | 1 | 1 | 1 | 0 | 24 | 10 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 4-5 AM | 27 | 18 | 5 | 11 | 3 | 6 | 1 | 3 | 36 | 38 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No | |
| 5-6 AM | 57 | 45 | 8 | 27 | 5 | 14 | 2 | 7 | 72 | 93 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No | |
| 6-7 AM | 173 | 133 | 27 | 80 | 16 | 42 | 7 | 21 | 223 | 276 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No | |
| 7-8 AM | 374 | 230 | 52 | 138 | 30 | 72 | 13 | 36 | 469 | 476 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | Yes | |
| 8-9 AM | 422 | 194 | 60 | 116 | 35 | 61 | 15 | 30 | 532 | 401 | 600 | 150 | 900 | 75 | No | No | No | No | 379 | No | 324 | Yes | |
| 9-10 AM | 366 | 122 | 52 | 73 | 30 | 38 | 13 | 19 | 461 | 252 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No | |
| 10-11 AM | 451 | 122 | 68 | 73 | 39 | 38 | 17 | 19 | 575 | 252 | 600 | 150 | 900 | 75 | No | No | No | No | 365 | No | 303 | No | |
| 11-12 PM | 548 | 115 | 88 | 69 | 51 | 36 | 22 | 18 | 709 | 238 | 600 | 150 | 900 | 75 | No | No | Yes | No | 316 | No | 246 | No | |
| 12-1 PM | 340 | 102 | 88 | 69 | 42 | 38 | 21 | 18 | 491 | 227 | 600 | 150 | 900 | 75 | No | No | No | No | #N/A | #N/A | 345 | No | |
| 1-2 PM | 350 | 108 | 95 | 72 | 45 | 40 | 23 | 19 | 513 | 239 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | 334 | No | |
| 2-3 PM | 407 | 113 | 111 | 76 | 53 | 42 | 27 | 20 | 598 | 251 | 600 | 150 | 900 | 75 | No | No | No | No | 387 | No | 291 | No | |
| 3-4 PM | 460 | 110 | 135 | 74 | 64 | 41 | 33 | 19 | 692 | 244 | 600 | 150 | 900 | 75 | No | No | Yes | No | 360 | No | 253 | No | |
| 4-5 PM | 522 | 137 | 167 | 92 | 79 | 51 | 41 | 24 | 809 | 304 | 600 | 150 | 900 | 75 | No | No | Yes | No | 329 | No | 198 | Yes | |
| 5-6 PM | 477 | 135 | 164 | 91 | 78 | 50 | 40 | 24 | 759 | 300 | 600 | 150 | 900 | 75 | No | No | Yes | No | 352 | No | 221 | Yes | |
| 6-7 PM | 367 | 108 | 136 | 72 | 64 | 40 | 34 | 19 | 601 | 239 | 600 | 150 | 900 | 75 | No | No | Yes | No | Low Volume | No | 290 | No | |
| 7-8 PM | 251 | 79 | 98 | 53 | 47 | 29 | 24 | 14 | 420 | 175 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No | |
| 8-9 PM | 238 | 57 | 100 | 38 | 48 | 21 | 25 | 10 | 411 | 126 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No | |
| 9-10 PM | 165 | 44 | 72 | 29 | 34 | 16 | 18 | 8 | 289 | 97 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No | |
| 10-11 PM | 84 | 20 | 35 | 13 | 17 | 7 | 9 | 4 | 145 | 44 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No | |
| 11-12 AM | 49 | 13 | 21 | 9 | 9 | 5 | 5 | 2 | 84 | 29 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No | |
| Numbers of Hours the Warrant Thresholds Are Met | | | | | | | | | | | | | | 0 | 0 | 5 | 0 | | | | | | |
| Warrant Met? | | | | | | | | | | | | | | No | No | No | No | No | No | No | No | | |

Notes:
 (1) Thresholds are based on 2 or more lanes on the major approach and 1 lane on the minor approach (Warrant evaluation assuming the southbound left turn only for the minor street)
 (2) Source: Sterling Ranch East Phase 1 Rezoning and Preliminary Plan Traffic Impact Study, February 10, 2023
 (3) The major street traffic includes all movements (left, through, and right)
 (4) The minor street traffic includes only the left turns from the minor street
 (5) Off peak hour traffic volumes are based on the projected peak hour traffic volumes, 72-hour machine counts conducted on Vollmer Road in November 2020 and vehicle time-of-day distribution data for single-family residential published by the Institute of Transportation Engineers
 Source: LSC Transportation Consultants, Inc.

Table 4
Traffic Signal Warrant Analysis
Briargate Parkway/Vollmer Road

| Hour | Short-Term Total Traffic ⁽⁵⁾ | | | | | | | | | | | | Warrant Analysis ⁽³⁾ | | | | | | | | | |
|---|--|----------------------|---|-------------|-----------------------------------|-------------|-------------------------------------|-------------|--------------------------|-------------|---|-------|---------------------------------|-------|--|------------------|-------------------------|---------------------------|-------------------------|---------------------------|------------|----|
| | Short-Term Background Traffic ⁽²⁾ | | SRE Filing Nos. 1 & 2 Generated Traffic | | Villages at SRE Generated Traffic | | Foursquare at SRE Generated Traffic | | Short-Term Total Traffic | | Warrant 1: Eight Hour Vehicular Volume Evaluation | | | | Warrant 2: Four Hour Vehicular Volume Evaluation | | | | | | | |
| | Major ⁽⁴⁾ | Minor ⁽⁴⁾ | Major | Minor | Major | Minor | Major | Minor | Major | Minor | Warrant Thresholds | | Warrant Threshold Met? | | Short-Term Background | Short-Term Total | Warrant Threshold Minor | Warrant Threshold Met? WB | Warrant Threshold Minor | Warrant Threshold Met? WB | | |
| | Vollmer | Marksheffel | Vollmer | Marksheffel | Vollmer | Marksheffel | Vollmer | Marksheffel | Vollmer | Marksheffel | Condition A | | Condition B | | Condition A | Condition B | Condition A | Condition B | Minimum | WB | Minimum | WB |
| | | | | | | | | | | | Major | Minor | Major | Minor | Condition A | Condition B | Condition A | Condition B | | | | |
| 12-1 AM | 19 | 1 | 2 | 0 | 4 | 0 | 2 | 1 | 27 | 2 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 1-2 AM | 11 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 13 | 2 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 2-3 AM | 6 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 3-4 AM | 13 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 15 | 2 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 4-5 AM | 23 | 4 | 0 | 1 | 3 | 1 | 1 | 3 | 27 | 9 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 5-6 AM | 79 | 10 | 2 | 3 | 4 | 4 | 2 | 8 | 87 | 25 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 6-7 AM | 222 | 30 | 6 | 9 | 13 | 10 | 8 | 23 | 249 | 72 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 7-8 AM | 551 | 52 | 10 | 15 | 25 | 18 | 16 | 40 | 602 | 125 | 600 | 150 | 900 | 75 | No | No | No | No | 315 | No | 289 | No |
| 8-9 AM | 603 | 44 | 12 | 13 | 29 | 15 | 18 | 34 | 662 | 106 | 600 | 150 | 900 | 75 | No | No | No | No | 288 | No | 265 | No |
| 9-10 AM | 525 | 28 | 10 | 8 | 25 | 10 | 16 | 21 | 576 | 67 | 600 | 150 | 900 | 75 | No | No | No | No | 328 | No | 302 | No |
| 10-11 AM | 578 | 28 | 14 | 8 | 33 | 10 | 21 | 21 | 646 | 67 | 600 | 150 | 900 | 75 | No | No | No | No | 301 | No | 272 | No |
| 11-12 PM | 625 | 26 | 16 | 8 | 42 | 9 | 27 | 20 | 710 | 63 | 600 | 150 | 900 | 75 | No | No | No | No | 280 | No | 245 | No |
| 12-1 PM | 576 | 25 | 17 | 49 | 14 | 10 | 28 | 20 | 635 | 104 | 600 | 150 | 900 | 75 | No | No | No | No | 302 | No | 276 | No |
| 1-2 PM | 563 | 27 | 19 | 52 | 16 | 10 | 31 | 21 | 629 | 110 | 600 | 150 | 900 | 75 | No | No | No | No | 309 | No | 278 | No |
| 2-3 PM | 646 | 28 | 22 | 55 | 18 | 11 | 35 | 22 | 721 | 116 | 600 | 150 | 900 | 75 | No | No | No | No | 272 | No | 240 | No |
| 3-4 PM | 672 | 27 | 27 | 53 | 21 | 10 | 42 | 22 | 762 | 112 | 600 | 150 | 900 | 75 | No | No | No | No | 261 | No | 219 | No |
| 4-5 PM | 672 | 34 | 33 | 66 | 27 | 13 | 53 | 27 | 785 | 140 | 600 | 150 | 900 | 75 | No | No | No | No | 261 | No | 208 | No |
| 5-6 PM | 542 | 34 | 33 | 65 | 27 | 13 | 52 | 27 | 654 | 139 | 600 | 150 | 900 | 75 | No | No | No | No | 319 | No | 268 | No |
| 6-7 PM | 347 | 27 | 27 | 52 | 23 | 10 | 44 | 21 | 441 | 110 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 7-8 PM | 206 | 19 | 19 | 38 | 16 | 7 | 32 | 15 | 273 | 79 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 8-9 PM | 149 | 14 | 20 | 27 | 16 | 5 | 32 | 11 | 217 | 57 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 9-10 PM | 88 | 11 | 14 | 21 | 11 | 4 | 22 | 9 | 135 | 45 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 10-11 PM | 55 | 5 | 7 | 10 | 6 | 2 | 11 | 4 | 79 | 21 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| 11-12 AM | 26 | 3 | 4 | 6 | 3 | 1 | 7 | 3 | 40 | 13 | 600 | 150 | 900 | 75 | No | No | No | No | Low Volume | No | Low Volume | No |
| Numbers of Hours the Warrant Thresholds Are Met | | | | | | | | | | | | | | 0 | 0 | 0 | 0 | | | | | |
| Warrant Met? | | | | | | | | | | | | | | No | | No | | | | | | |

Notes:
 (1) Thresholds are based on 2 or more lanes on the major approach and 1 lane on the minor approach (Warrant evaluation assuming the westbound left turn only for the minor street)
 (2) Source: Sterling Ranch East Phase 1 Rezoning and Preliminary Plan Traffic Impact Study, February 10, 2023
 (3) The major street traffic includes all movements (left, through, and right)
 (4) The minor street traffic includes only the left turns from the minor street
 (5) Off peak hour traffic volumes are based on the projected peak hour traffic volumes, 72-hour machine counts conducted on Vollmer Road in November 2020 and vehicle time-of-day distribution data for single-family residential published by the Institute of Transportation Engineers
 Source: LSC Transportation Consultants, Inc.

Figures 1-6





Not to scale

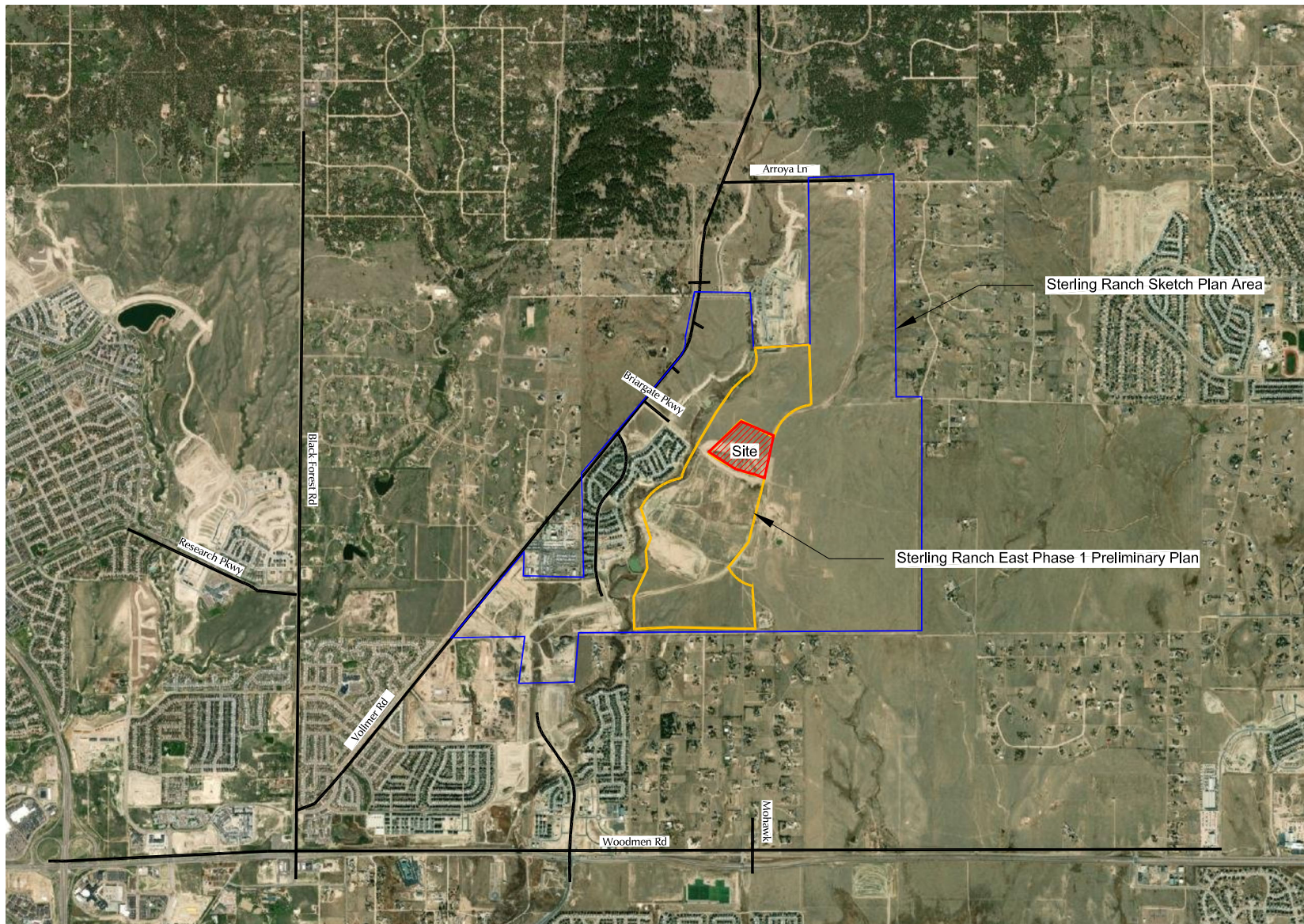
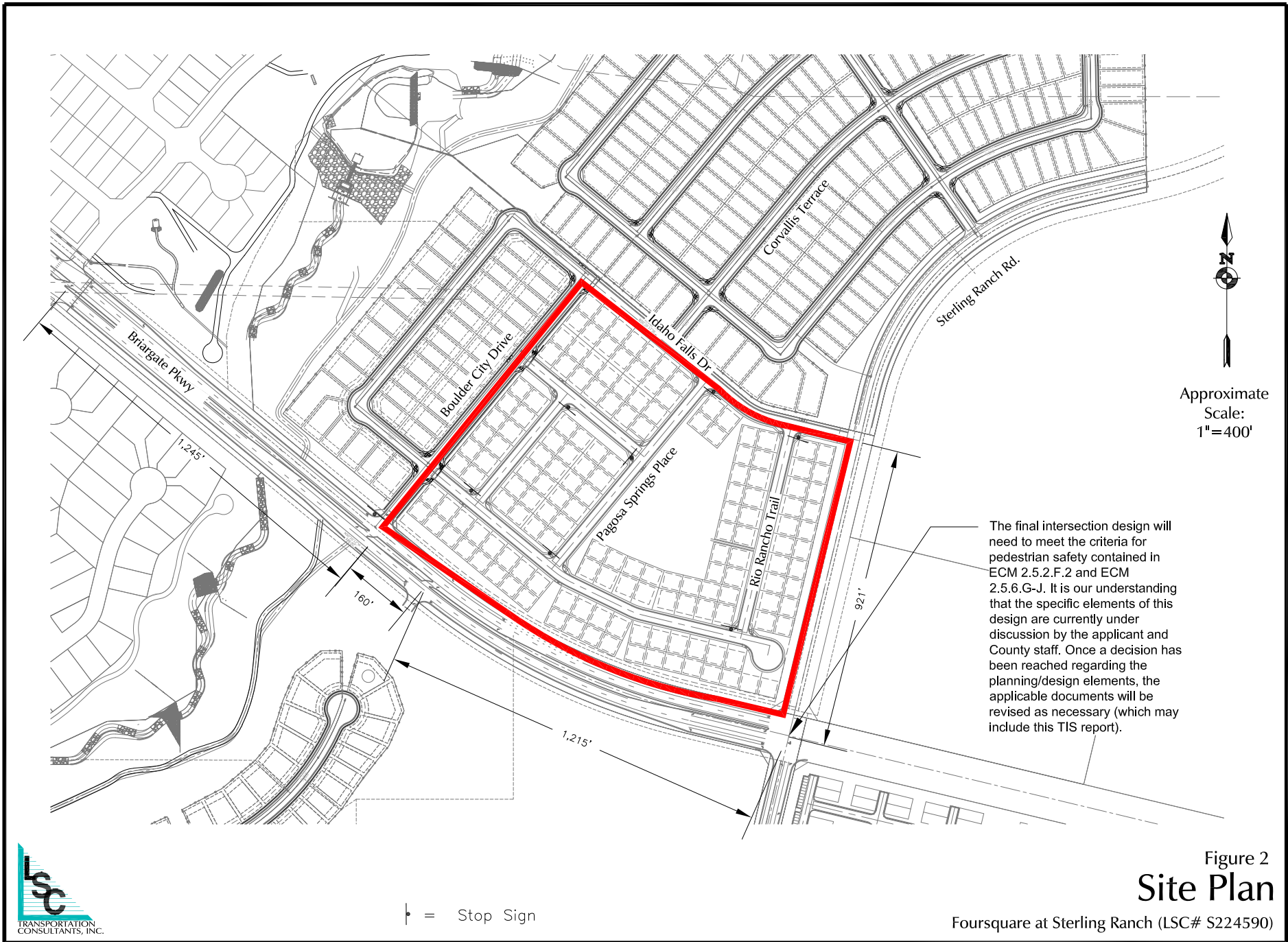


Figure 1

Vicinity Map

Foursquare at Sterling Ranch (LSC# S224590)



Approximate
Scale:
1"=400'

The final intersection design will need to meet the criteria for pedestrian safety contained in ECM 2.5.2.F.2 and ECM 2.5.6.G-J. It is our understanding that the specific elements of this design are currently under discussion by the applicant and County staff. Once a decision has been reached regarding the planning/design elements, the applicable documents will be revised as necessary (which may include this TIS report).

Figure 2
Site Plan

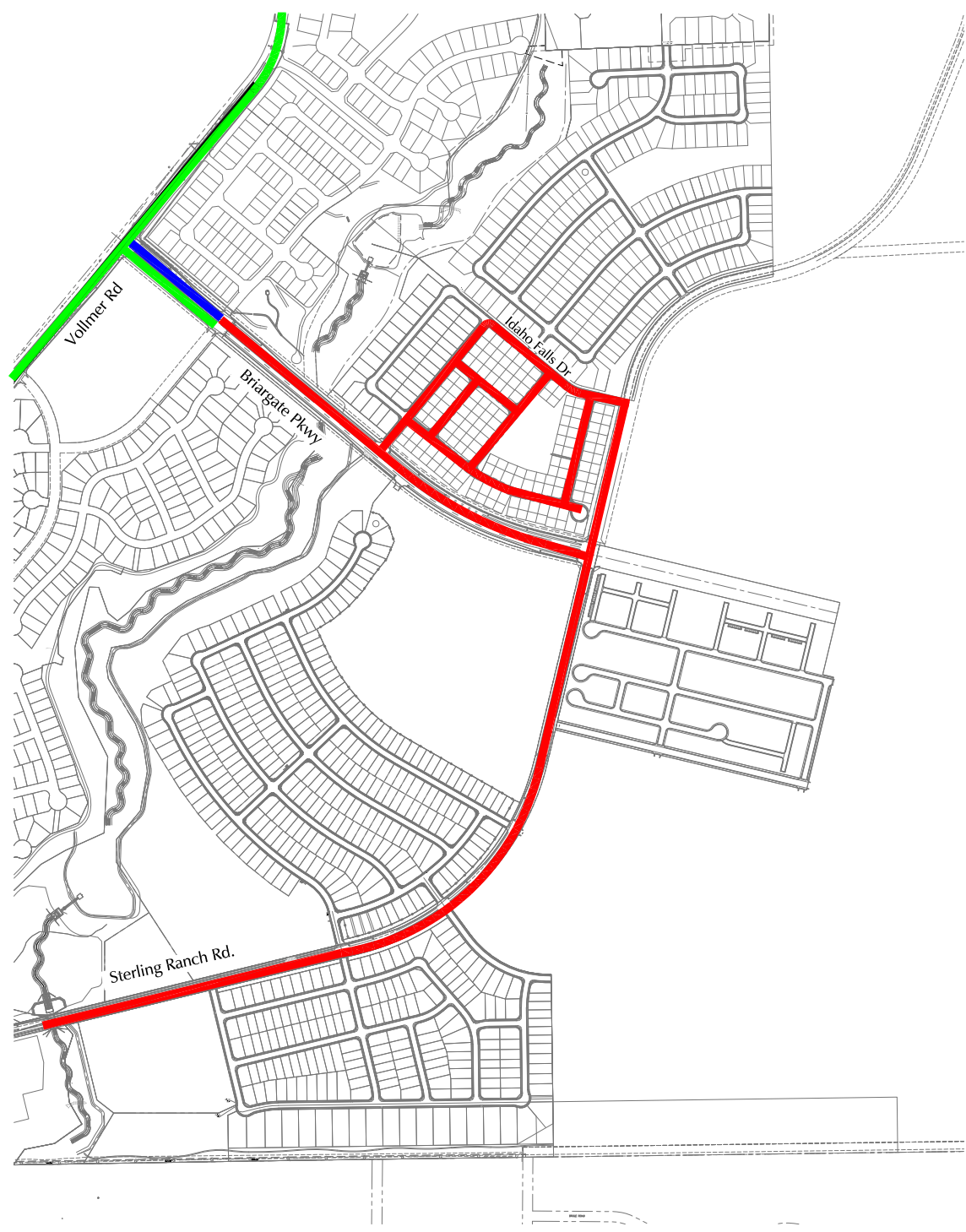
Foursquare at Sterling Ranch (LSC# S224590)



T = Stop Sign



Not to scale



LEGEND:

- Roadway Connection Planned with Foursquare at Sterling Ranch or Earlier Filings
- The north half of the Briargate Pkwy cross-section is planned to be constructed in the short-term
- Existing Roadway

Figure 3

Short-Term Roadway Connections

Foursquare at Sterling Ranch (LSC# S224590)



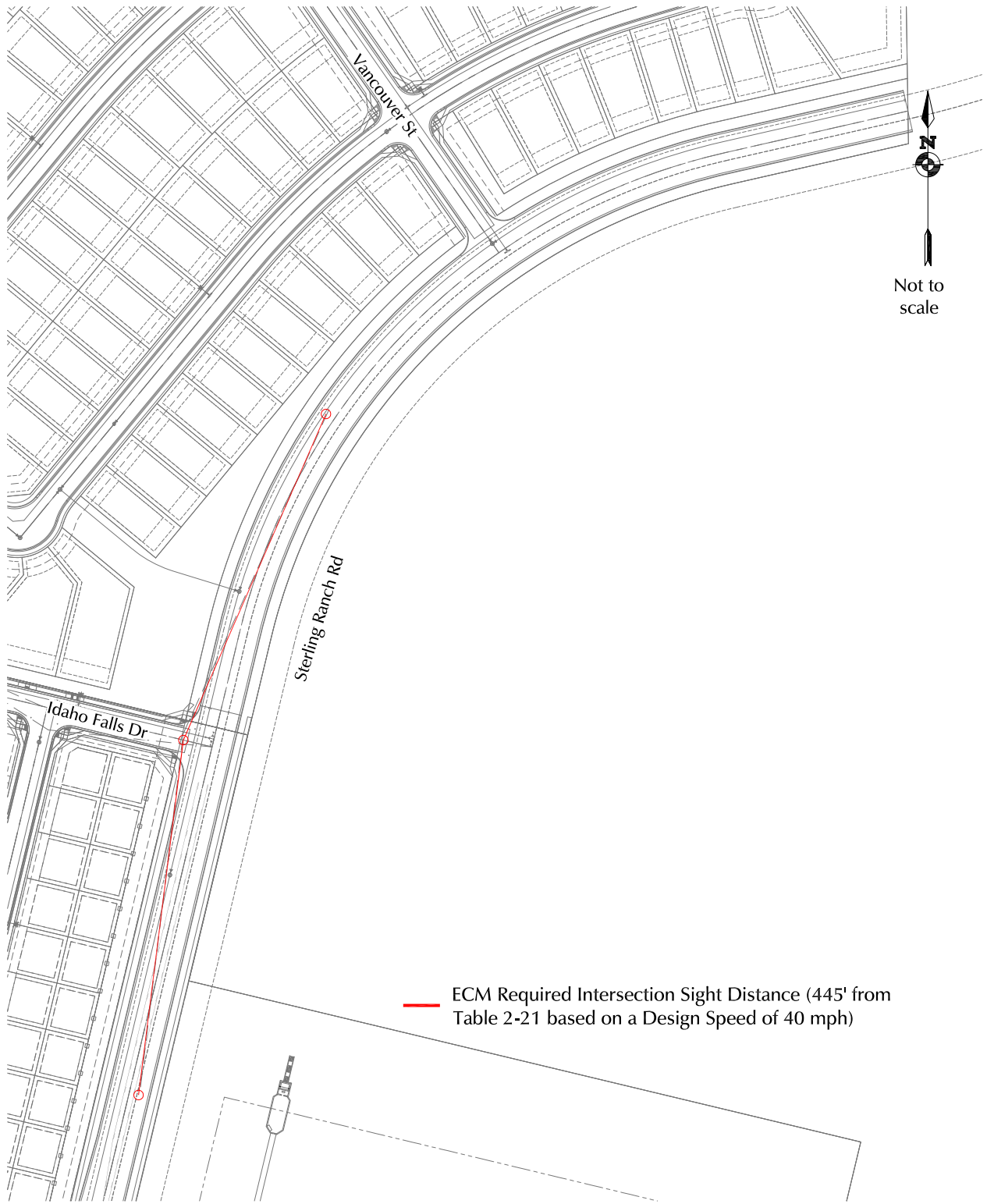


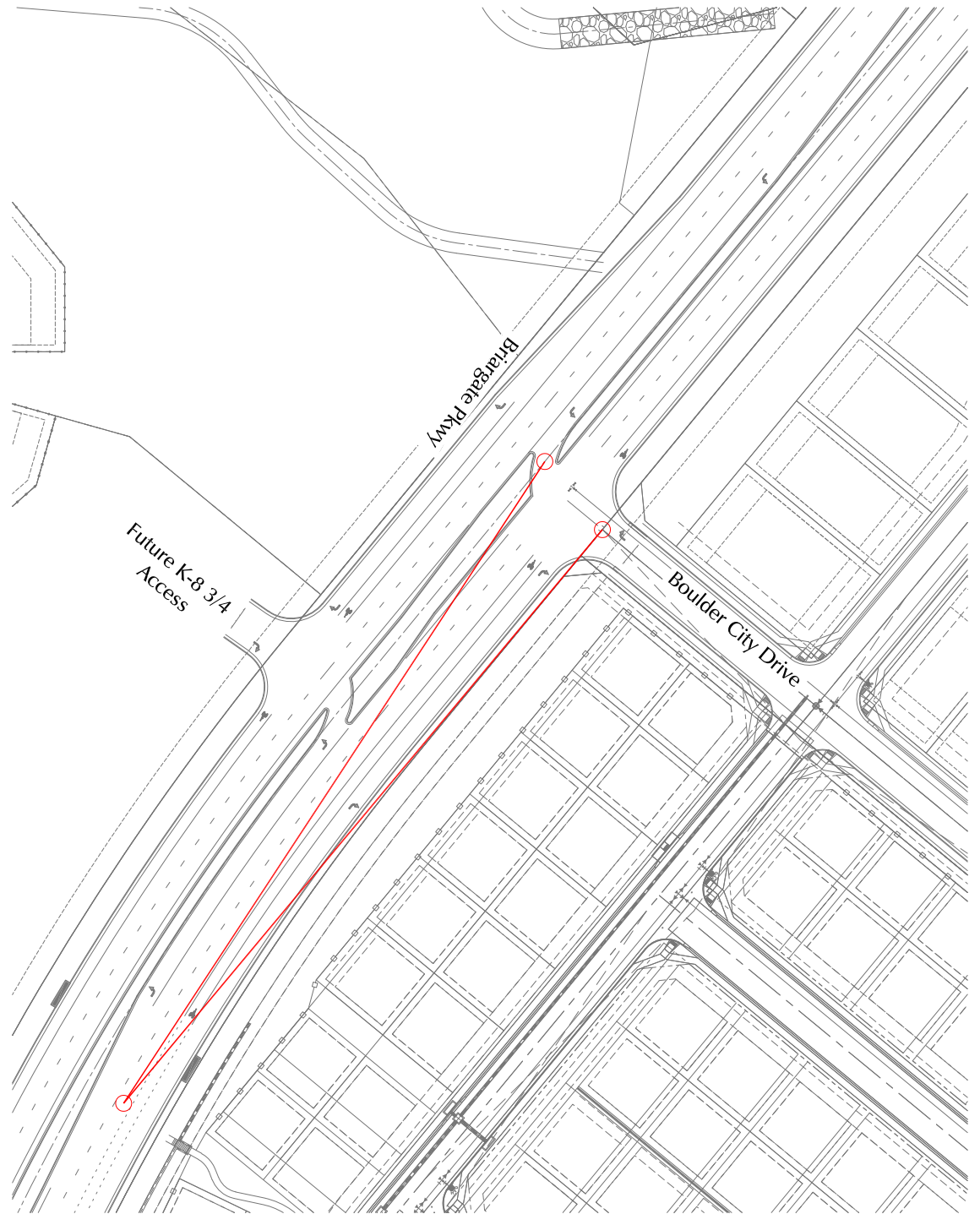
Figure 4a

Sight Distance Analysis - Sterling Ranch Road/Idaho Falls Drive

Foursquare at Sterling Ranch (LSC# S224590)



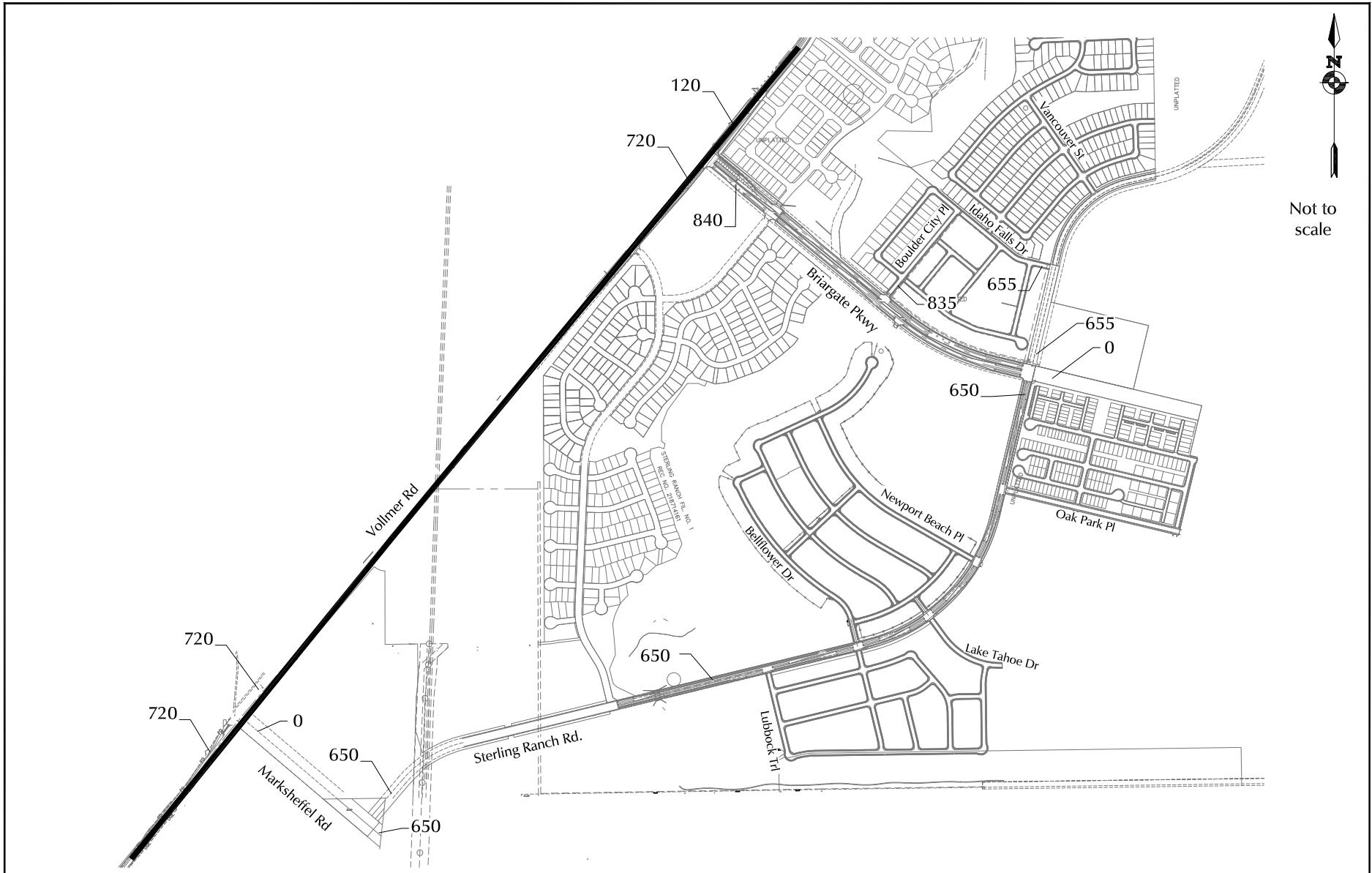
— ECM Required Intersection Sight Distance (555' from Table 2-2.1 based on a Design Speed of 50 mph)



North arrow
Not to scale

Sight Distance Analysis - Briargate Parkway/Boulder City Drive

Figure 4b
Foursquare at Sterling Ranch (LSC# S22.4590)

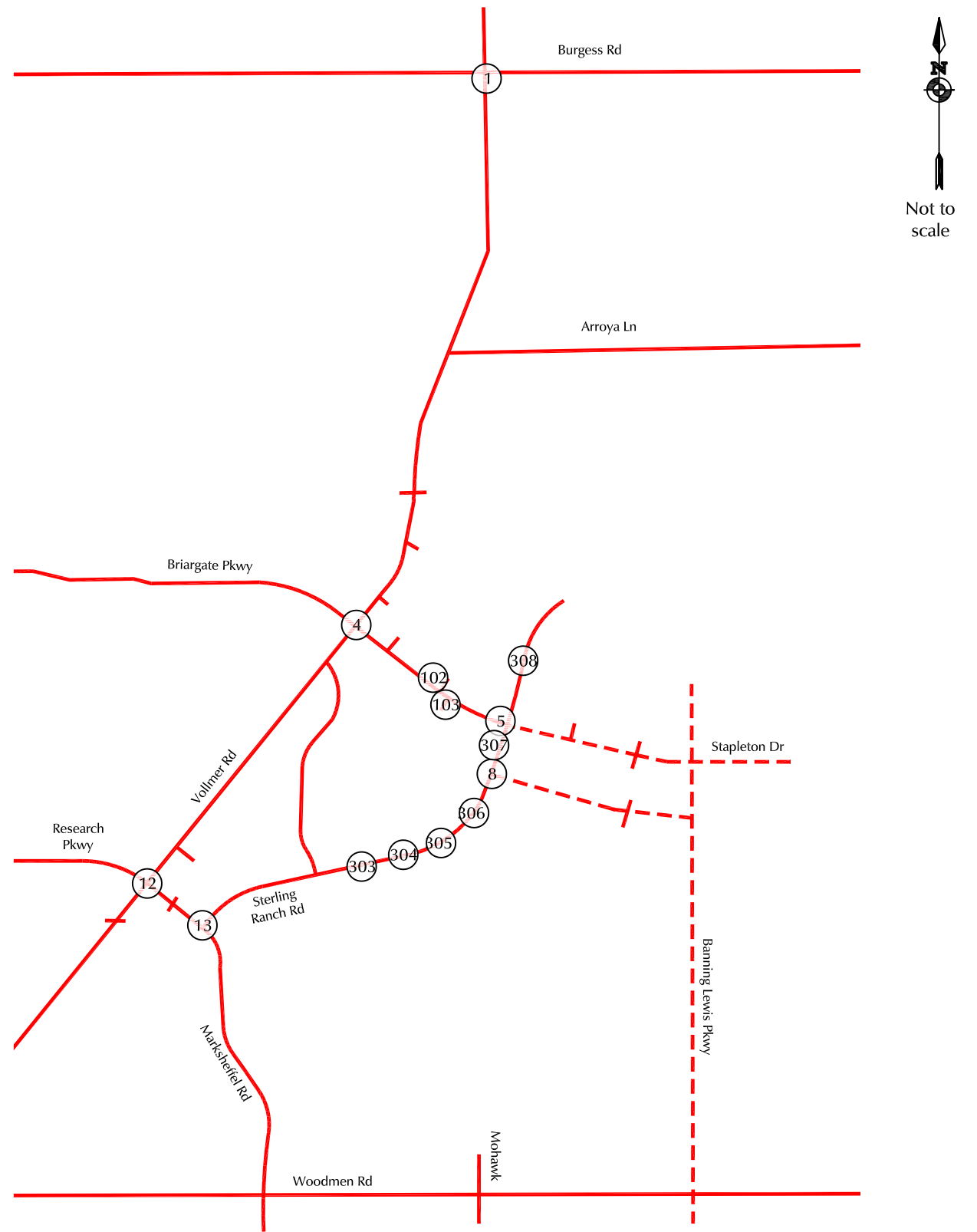
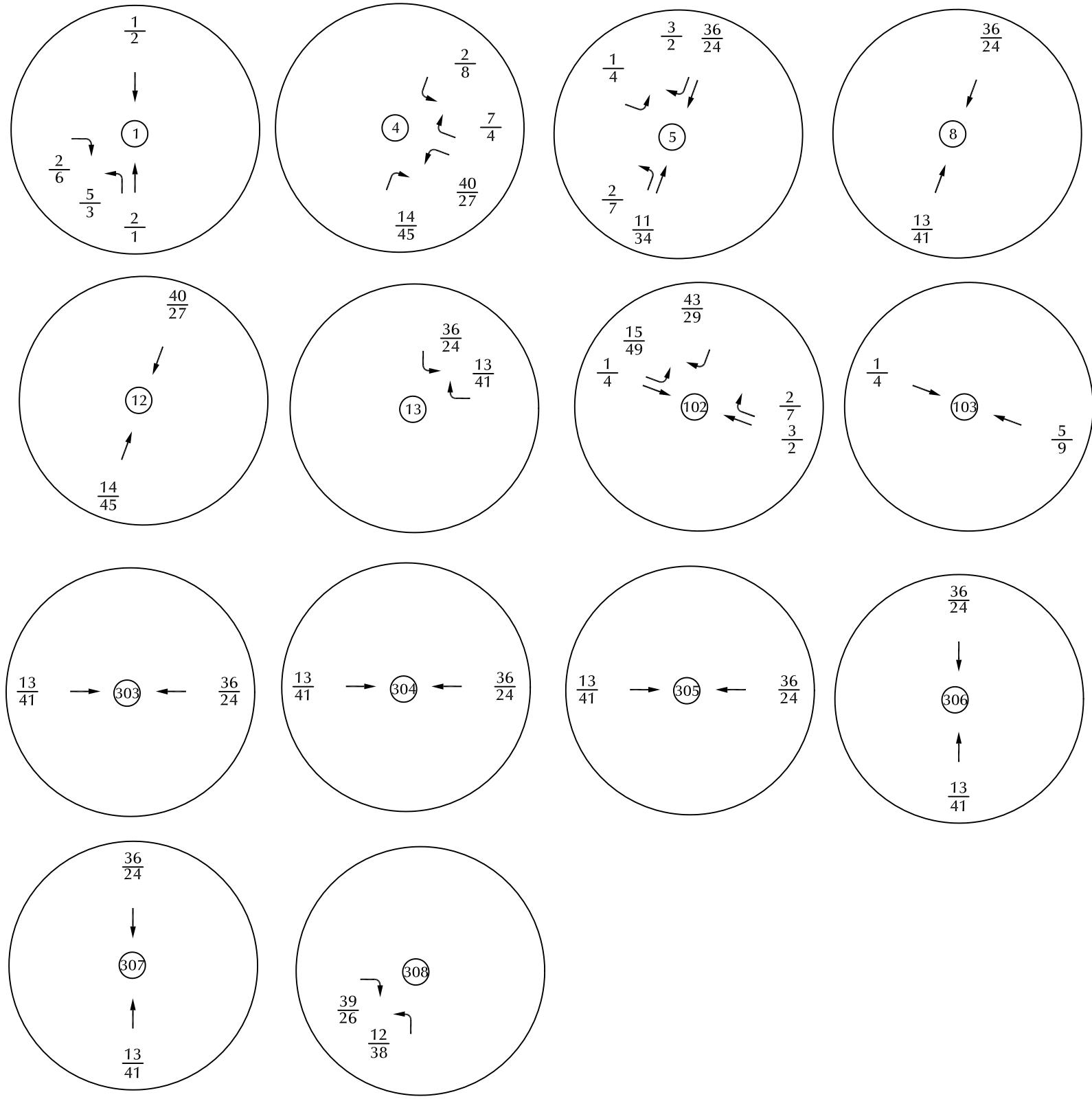


LEGEND: XXX = Average Weekday Traffic (vehicles per day)(AWT)

Short-Term Site-Generated Average Weekday Traffic

Figure 5a

Foursquare at Sterling Ranch (LSC# S224590)

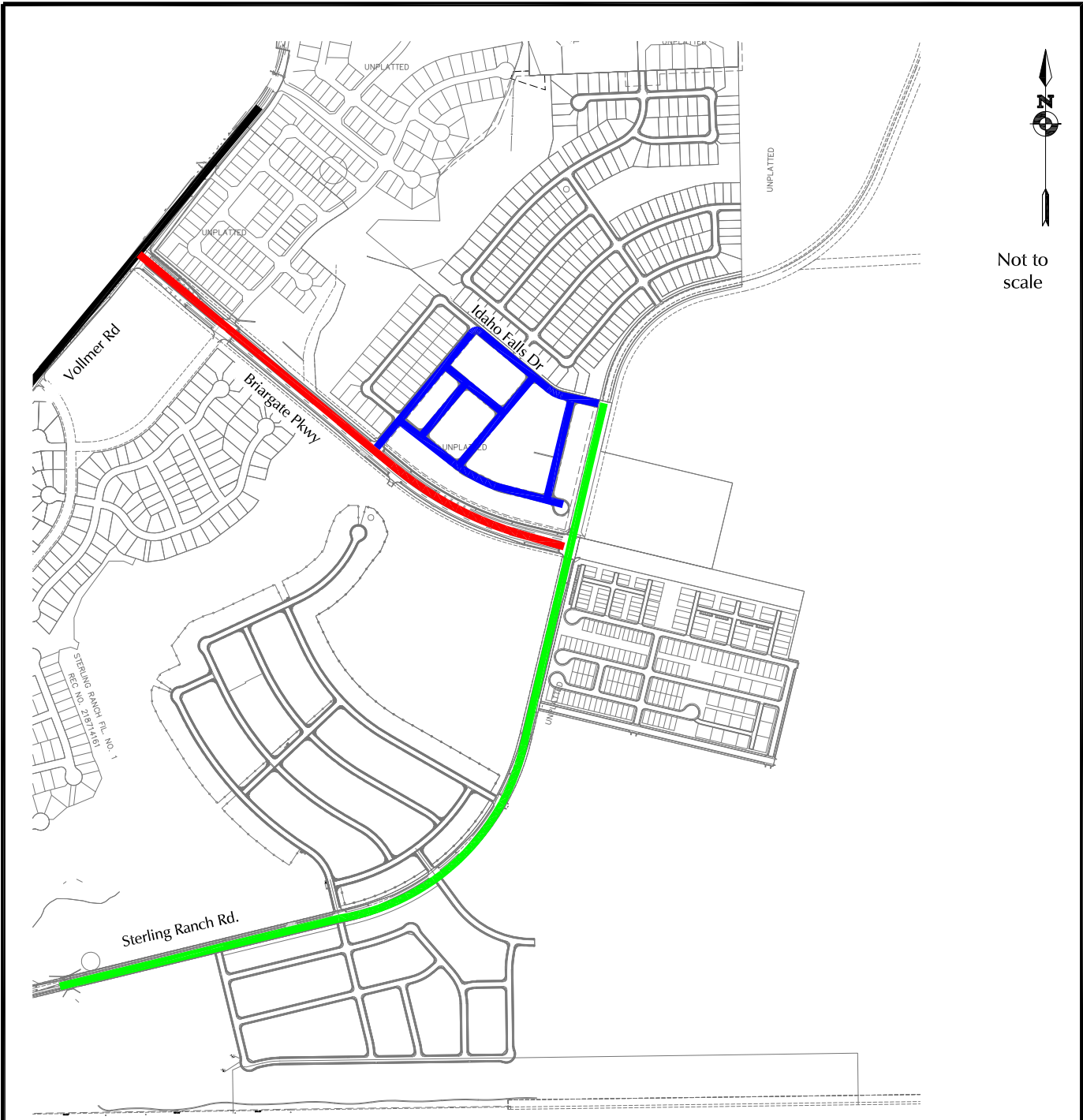


LEGEND: $\frac{XX}{XX} = \frac{\text{AM Peak-Hour Traffic (veh/hr)}}{\text{PM Peak-Hour Traffic (veh/hr)}}$



Figure 5b
Short-Term Site-Generated Traffic

Foursquare at Sterling Ranch (LSC# S224590)



North arrow pointing up.

Not to scale

LEGEND:

- 4-Lane Urban Principal Arterial
- Urban Local
- Urban Non-Residential Collector



Figure 6
Roadway Classifications
 Foursquare at Sterling Ranch (LSC# S224590)

Appendix Table 1



**Appendix Table 1
Area Traffic Impact Studies
Foursquare Sterling Ranch East**

| Study | PCD File No⁽¹⁾ | Consultant | Date |
|--|---|-------------------------------------|-------------------|
| Sterling Ranch Reports | | | |
| Sterling Ranch Updated Traffic Impact Analysis | SKP07007 | LSC Transportation Consultants, Inc | June 5, 2008 |
| Sterling Ranch Phase 1 Traffic Impact Study | P151 | LSC Transportation Consultants, Inc | March 16, 2015 |
| Sterling Ranch Phases 1-3 Transportation Memorandum | SP1415 | LSC Transportation Consultants, Inc | October 2, 2017 |
| Branding Iron at Sterling Ranch Filing No. 1 and Homestead at Sterling Ranch Filing No. 1 Transportation | SF1724 SF1725 | LSC Transportation Consultants, Inc | December 19, 2017 |
| Sterling Ranch Filing No. 2 Transportation Memorandum | SF1820 | LSC Transportation Consultants, Inc | April 3, 2018 |
| Sterling Ranch Phase 2 Preliminary Plan Traffic Impact Study | SP203 | LSC Transportation Consultants, Inc | December 20, 2018 |
| Homestead at Sterling Ranch Filing No. 2 Transportation Memorandum | SF194 | LSC Transportation Consultants, Inc | March 3, 2020 |
| Branding Iron at Sterling Ranch Filing No. 2 Transportation Memorandum | SF1918 | LSC Transportation Consultants, Inc | May 6, 2020 |
| Sterling Ranch Filing No. 2 and Phase 2 Traffic Impact Study | SF2015 SP191 | LSC Transportation Consultants, Inc | June 23, 2021 |
| Sterling Ranch Filing No. 3 Transportation Memorandum | SF2132 | LSC Transportation Consultants, Inc | April 19, 2022 |
| Copper Chase at Sterling Ranch Transportation Memorandum | PUDSP222 | LSC Transportation Consultants, Inc | December 14, 2021 |
| Homestead North Phase 1 Updated Transportation Memorandum | SP208 | LSC Transportation Consultants, Inc | January 11, 2022 |
| Homestead North Filing No. 1 Traffic Technical Memorandum | SF2213 | LSC Transportation Consultants, Inc | February 2, 2022 |
| Homestead North Filing No. 2 Traffic Technical Memorandum | SF2218 | LSC Transportation Consultants, Inc | April 15, 2022 |
| Homestead North Filing 3 Traffic Impact Study | SF2229 | LSC Transportation Consultants, Inc | June 17, 2022 |
| The Villages at Sterling Ranch East Preliminary Plan/Traffic Generation Analysis | PUDSP226 | SM Rocha, LLC | July 1, 2022 |
| Sterling Ranch Sketch Plan Amendment Master Traffic Impact Study | SKP224 | LSC Transportation Consultants, Inc | February 10, 2023 |
| Sterling Ranch East - Rezoning & Preliminary Plan Traffic Impact Study | SP-22-004, P-22-012, P-22-013 | LSC Transportation Consultants, Inc | February 10, 2023 |
| Sterling Ranch East Filing Nos 1 & 2 Traffic Technical Memorandum | SF2235 SF2237 | LSC Transportation Consultants, Inc | February 10, 2023 |
| Sterling Ranch Filing No. 4 Transportation Memorandum | SF2230 | LSC Transportation Consultants, Inc | February 21, 2023 |
| Retreat at TimberRidge Reports | | | |
| The Retreat at TimberRidge Traffic Impact Analysis | PUD173 | LSC Transportation Consultants, Inc | January 25, 2018 |
| The Retreat at TimberRidge Preliminary Plan Traffic Technical Memorandum | SP182 | LSC Transportation Consultants, Inc | June 29, 2018 |
| The Retreat at TimberRidge Filing No. 1 Traffic Technical Memorandum | SF199 | LSC Transportation Consultants, Inc | April 3, 2020 |
| The Retreat at TimberRidge Filing No. 2 Updated Traffic Technical Memorandum | SF2121 | LSC Transportation Consultants, Inc | October 4, 2021 |
| The Retreat at TimberRidge Filing No. 3 Traffic Technical Memorandum | | LSC Transportation Consultants, Inc | July 1, 2022 |
| Other Area Reports | | | |
| Wolf Ranch School Site Traffic Impact Study | OAR1720 | Matrix Design Group, Inc. | 5-May-17 |
| The Ranch Sketch Plan Traffic Impact Analysis | SKP186 | LSC Transportation Consultants, Inc | July 9, 2019 |
| Lodge III Traffic Impact Study | OAR | LSC Transportation Consultants, Inc | December 13, 2019 |
| Continental 613 Traffic Impact Study | OAR2177 | LSC Transportation Consultants, Inc | July 16, 2021 |
| Solace at Black Forest Traffic Impact and Access Analysis | OAR2134 | LSC Transportation Consultants, Inc | August 13, 2021 |
| Traffic Impact Study Addendum for Percheron | OAR2173 | SM Rocha, LLC | October, 2021 |
| Woodmen East Commercial Center Traffic Impact Analysis | OAR2191 | LSC Transportation Consultants, Inc | December 8, 2021 |
| Traffic Impact Study for Jaynes Property | SKP225 | SM Rocha, LLC | May, 2022 |
| Traffic Impact Study for Rhetoric Site | P2216 | SM Rocha, LLC | June, 2022 |
| Briargate-Stapleton Corridor Study (DRAFT) | briargate-stapleton.com | Wilson & Company | December 9, 2021 |

Notes:

(1) Follow the links listed below to obtain the most recent version of each listed study. To obtain a copy of the version of each study used in preparing this report please contact LSC Transportation Consultants, Inc.

Source: LSC Transportation Consultants, Inc.

Feb-23

Additional Attachments

Tables 5 and 6 from *Sterling Ranch East Rezoning and Preliminary Plan TIS* with notes by LSC



| Table 5 Sterling Ranch East Phase 1 Preliminary Plan Intersection Improvements | | | | |
|--|---|--|---|---|
| Item # | Improvement | Trigger | Timing | Responsibility |
| 1) Burgess Road/Vollmer Road | | | | |
| 1 | Reconstruct as a modern one-lane roundabout | When the LOS degrades below LOS F | Existing deficiency | This intersection may be eligible intersection under the fee impact program |
| 12) Marksheffel Road/Vollmer Road | | | | |
| 2 | Signalization of the intersection | Once warrants are met. The decision on timing of traffic signal installation rests with El Paso County Public Works. | Anticipated by buildout of Sterling Ranch East Phase 1 Preliminary Plan | This intersection may be eligible intersection under the fee impact program |
| 14) Marksheffel Road/Sterling Ranch Road | | | | |
| 3 | Signalization of the intersection | Once warrants are met. The decision on timing of traffic signal installation rests with El Paso County Public Works. | Anticipated by buildout of Sterling Ranch East Phase 1 Preliminary Plan | SRMD#3 |
| 102) Briargate Parkway/Boulder City Drive | | | | |
| 4 | Construct an eastbound left-turn lane on Briargate Parkway approaching Boulder City Drive. The lane should be 285' long plus a 200' taper. | eastbound left-turn volume > 10 vph | With Sterling Ranch East Phase 1 Preliminary Plan or Foursquare at Sterling Ranch | Sterling Ranch |
| 5 | Construct a westbound right-turn deceleration lane on Briargate Parkway approaching Boulder City Drive. The lane should be 235' long plus a 200' taper. | westbound right-turn volume > 25 vph | Long Term | Sterling Ranch |
| 103) Briargate Parkway/Future School 3/4 Movement Access | | | | |
| 6 | Construct a westbound left-turn lane on Briargate Parkway approaching the school access. The lane should be 285' long plus a 200' taper. | westbound left-turn volume > 10 vph | Long Term With development of the K-8 School Parcel (Tract M) | Sterling Ranch |
| 7 | Construct an eastbound right-turn deceleration lane on Briargate Parkway approaching the school access. The lane should be 235' long plus a 200' taper. | eastbound right-turn volume > 25 vph | Long Term With development of the K-8 School Parcel (Tract M) | Sterling Ranch |
| 5) Briargate Parkway/Sterling Ranch Road | | | | |
| 8 | Construct an eastbound left-turn lane on Briargate Parkway approaching Sterling Ranch Road. The lane should be 435' long plus a 200' taper. | eastbound left-turn volume > 10 vph | With Sterling Ranch East Phase 1 Preliminary Plan or Foursquare at Sterling Ranch | Sterling Ranch |
| 9 | Construct an eastbound right-turn deceleration lane on Briargate Parkway approaching Sterling Ranch Road. The lane should be 235' long plus a 200' taper. | eastbound right-turn volume > 25 vph | Long Term With development of the K-8 School Parcel (Tract M) | Sterling Ranch |
| 10 | Construct a northbound to eastbound right-turn acceleration lane on Briargate Parkway at Sterling Ranch Road. The lane should be 580' long plus a 180' taper. | northbound right-turn volume > 50 vph | Long Term With development of the K-8 School Parcel (Tract M) | Sterling Ranch |
| 11 | Construct a westbound left-turn lane on Briargate Parkway approaching Sterling Ranch Road. The lane should be 285' long plus a 200' taper. | westbound left-turn volume > 10 vph | Long Term | Sterling Ranch |
| 12 | Construct an eastbound right-turn deceleration lane on Briargate Parkway approaching Sterling Ranch Road. The lane should be 235' long plus a 200' taper. | eastbound right-turn volume > 25 vph | Long Term | Sterling Ranch |
| 13 | Construct a southbound to westbound right-turn acceleration lane on Briargate Parkway at Sterling Ranch Road. The lane should be 580' long plus a 180' taper. | southbound right-turn volume > 50 vph | With Sterling Ranch East Phase 1 Preliminary Plan | Sterling Ranch |
| 303) Sterling Ranch Road/Lubbock Trail | | | | |
| 14 | Construct an northeastbound right-turn deceleration lane on Sterling Ranch Road approaching Lubbock Trail. The lane should be 155' long plus a 160' taper. | northeastbound right-turn volume > 50 vph | Long Term With development of the Elementary School Parcel (Tract F) | Sterling Ranch |
| 15 | Construct a southwestbound left-turn lane on Sterling Ranch Road approaching Lubbock Trail. The lane should be 305' long plus a 200' taper. | southwestbound-turn volume > 25 vph | Long Term With development of the Elementary School Parcel (Tract F) | Sterling Ranch |
| 304) Sterling Ranch Road/Westmont Drive | | | | |
| 16 | Construct an northeastbound left-turn deceleration lane on Sterling Ranch Road approaching Westmont Drive. The lane should be 205' long plus a 160' taper. | northeastbound left-turn volume > 25 vph | With Sterling Ranch East Phase 1 Preliminary Plan | Sterling Ranch |
| 17 | Construct a southwestbound left-turn lane on Sterling Ranch Road approaching Westmont Drive. The lane should be 205' long plus a 200' taper. | southwestbound-turn volume > 25 vph | Long Term (Needed with construction of a northeastbound left-turn lane) | Sterling Ranch |
| 305) Sterling Ranch Road/Lake Tahoe Drive | | | | |
| 18 | Construct an northeastbound left-turn deceleration lane on Sterling Ranch Road approaching Lake Tahoe Drive. The lane should be 225' long plus a 160' taper. | northeastbound left-turn volume > 25 vph | With Sterling Ranch East Phase 1 Preliminary Plan | Sterling Ranch |
| 19 | Construct a southwestbound left-turn lane on Sterling Ranch Road approaching Lake Tahoe Drive. The lane should be 205' long plus a 200' taper. | southwestbound-turn volume > 25 vph | Not Required (Needed with construction of a northeastbound left-turn lane) | Sterling Ranch |
| 20 | Construct an northeastbound right-turn deceleration lane on Sterling Ranch Road approaching Lake Tahoe Drive. The lane should be 155' long plus a 160' taper. | northeastbound right-turn volume > 50 vph | Long Term | Sterling Ranch |
| 306) Sterling Ranch Road/Newport Beach Drive | | | | |
| 21 | Construct a northeastbound left-turn lane on Sterling Ranch Road approaching Newport Beach Drive. The lane should be 205' long plus a 200' taper. | northeastbound left-turn volume > 25 vph | With Sterling Ranch East Phase 1 Preliminary Plan | Sterling Ranch |
| 308) Sterling Ranch Road/Idaho Falls Drive | | | | |
| 22 | Construct a northeastbound left-turn lane on Sterling Ranch Road approaching Idaho Falls Drive. The lane should be 240' long plus a 200' taper. | northeastbound left-turn volume > 25 vph | With Sterling Ranch East Phase 1 Preliminary Plan | Sterling Ranch |
| 309) Sterling Ranch Road/Vancouver Street | | | | |
| 23 | Construct a northeastbound left-turn lane on Sterling Ranch Road approaching Vancouver Street. The lane should be 265' long plus a 200' taper. | northeastbound left-turn volume > 25 vph | With Sterling Ranch East Phase 1 Preliminary Plan | Sterling Ranch |

Notes:
 Source: LSC Transportation Consultants, Inc. (February 2023)

Future SRE Filings

SRE Fil 2

SRE Fil 2

Future SRE Filings

SRE Fil 1

SRE Fil 1

SRE Fil 1

SRE Fil 2 or Foursquare

Future SRE Filings

LSC recommends at least eight hours of traffic count volume data be collected at the intersection of Marksheffel/Sterling Ranch following completion of Marksheffel Road between Vollmer Road and Woodmen Road, which is planned to be done in 2023. Once the traffic data is completed traffic-signal warrant analysis can be reanalyzed based on the existing conditions at that time.
 The decision to require a signal to be installed rests with the County.

Source: Sterling Ranch East Phase 1 Rezoning and Preliminary Plan TIS, February 10, 2023. Improvements needed prior to Sterling Ranch East Filings 1 and 2 and/or Foursquare at Sterling Ranch East have been highlighted in green. Improvements needed with Sterling Ranch East Filings 1 and 2 and/or Foursquare at Sterling Ranch East are highlighted in yellow and noted.

Table 6
(Page 1 of 2)
Sterling Ranch East Rezoning and Preliminary Plan
Roadway Segment Improvements

| Segment ID ⁽¹⁾ (See Figure 12 for map) | Improvement Description | Timing | Design ADT (vpd) | Projected 2042 ADT (vpd) | Responsibility |
|--|--|--|---|--------------------------|---|
| V1 northbound | Per the City of Colorado Springs, an outside paved shoulder will need to be added along the east side of Vollmer Road from Dry Needle Place up to the south end of segment V2 improvements. | With Sterling Ranch Filing No. 4 but potentially complete concurrently with the construction of the right-turn lane at Pioneer Landscape Center access for the Sterling Ranch Recycling Facility (PCD No. PPR2241) | 5,500 (Directional northbound) | 16,275 | Sterling Ranch |
| V1 southbound | | | 10,000 (Directional southbound) | | |
| V1 | Improve Vollmer Road between Dry Needle Place and the Sterling Ranch south boundary to a standard 4-Lane Urban Minor Arterial Cross Section (add a second northbound through lane and painted center median). ⁽²⁾ | The need driven by anticipated traffic from each development impacting this section of Vollmer Road. | 20,000 | | Sterling Ranch, if necessary, prior to construction by others. |
| V2 | Improve Vollmer Road between the Sterling Ranch south boundary to Lochwinnoch Lane/Sterling property boundary to a standard 4-Lane Urban Minor Arterial Cross Section. ⁽²⁾ | Short-Term Future (With Sterling Ranch Fil No. 2 Or Sterling Ranch Phase 2) | 20,000 (Note: Existing Capacity 8,000 ⁽³⁾) | 17,475 | Sterling Ranch |
| V3 | Short Term: Improve Vollmer Road from Lochwinnoch Lane to Sterling Ranch boundary (northeast of Glider Loop) to provide 36' of pavement (existing pavement 1 approx. 23.38') and stripe for one through lane plus a 6' paved, striped outside shoulder in each direction. ⁽²⁾ | Short-Term Future (With Homestead North) | 11,000 (Note: Existing Capacity 8,000) | 17,380 | Sterling Ranch |
| | Long Term: Improve Vollmer Road from Lochwinnoch Lane to Sterling Ranch boundary (northeast of Glider Loop) to a standard 4-Lane Urban Minor Arterial Cross Section. ⁽²⁾ | Long-Term Future | 20,000 | | Sterling Ranch with potential County assistance with ROW acquisition - pursuant to the recent development agreement between Sterling Ranch and EPC. |
| V4 | Improve Vollmer Road from Sterling Ranch boundary (northeast of Glider Loop) to Briargate Parkway to a standard 4-Lane Urban Minor Arterial Cross Section. ⁽²⁾ | Short-Term Future— May 2024 Updated 10/15/2022 - Sections V4, V5, V6 to be constructed by May 2024 (prior note: With Homestead North Filing 1) | 20,000 | 16,445 | Sterling Ranch |
| V5 | Improve Vollmer Road from Briargate Parkway to Jane Kirkham Drive to a standard 4-Lane Urban Minor Arterial Cross Section. ⁽²⁾ | Short-Term Future— May 2024 Updated 10/15/2022 - Sections V4, V5, V6 to be constructed by May 2024 (prior note: prior note: With Homestead North Filing 1) | 20,000 | 11,690 | Sterling Ranch |
| V6 | Improve Vollmer Road from Jane Kirkham Drive to Sam Bass Drive to a standard 4-Lane Urban Minor Arterial Cross Section. ⁽²⁾ | Short-Term Future— May 2024 Updated 10/15/2022 - Sections V4, V5, V6 to be constructed by May 2024 (prior note: prior note: With Homestead North Filing 2) | 20,000 | 11,425 | Sterling Ranch |
| V7 | Improve Vollmer Road between Sam Bass Drive and Poco Road to a 4-lane Urban Minor Arterial but with necessary lane transitions, redirect tapers, etc. south of Poco to adequately transition between the 4-Lane Urban Minor Arterial Cross Section and the 2-Lane Rural Arterial Cross Section north of Poco Road. | Short-Term Future – May 2024 Updated 10/15/2022 - Sections V4, V5, V6 to be constructed by May 2024 (prior note: With Homestead North Filing 3) | 20,000 | 10,030 | Sterling Ranch |
| V8 | Improve Vollmer Road from Poco Road to Shoup Road to a Rural 2-Lane Arterial Cross Section. ⁽²⁾ | Long-Term Future | 10,000 | 11,790 | El Paso County Project ID U-12 |

Part 1/2 of this table (see Part 2 on next page)

Notes:

(1) See Figure 10

(2) Adequate transition/redirect tapers would be needed between the various cross sections on Vollmer Road. Based on the criteria contained in Table 2-29 of the *El Paso Engineering Criteria Manual*, an appropriate taper ratio for a roadway with a design speed of 40 miles per hour is 20:1

(3) Source: Table 20 *Road Impact Fee Study Updated* November 16, 2016

Source: LSC Transportation Consultants, Inc. (February 10, 2023)

Table 6

With either SRE Fil 1, SRE Fil 2 or Foursquare

Sterling Ranch East Phase 1 Preliminary Plan

Roadway Segment Improvements

| Segment ID ⁽¹⁾ (See Figure 12 for map) | Improvement Description | Timing | Design ADT (vpd) | Projected 2042 ADT (vpd) | Responsibility |
|--|--|--|------------------|--------------------------|---|
| SR1 | Construct Sterling Ranch Road as an Urban Non-Residential Collector from Marksheffel Road to Dines Boulevard. | Short Term - with Sterling Ranch Fil No. 2 | 20,000 | 14,840 | Sterling Ranch |
| SR2 | Construct Sterling Ranch Road as an Urban Non-Residential Collector from Dines Boulevard to Briargate Parkway. | Short-Term | 20,000 | 10,275 | Sterling Ranch |
| SR3 | Construct Sterling Ranch Road as an Urban Collector from Briargate Parkway to Vancouver Street. | Short Term | 10,000 | 9,300 | Sterling Ranch |
| SR4 | Construct Sterling Ranch Road from Vancouver Street north to Arroya (or ultimate north terminus). | Long-Term Future | 10,000 | 4,260 | Sterling Ranch |
| M1 | Construct Marksheffel Road as an Urban Principal Arterial to City of Colorado Springs standards in 107' of right-of-way between Vollmer Road and Sterling Ranch Road. | Updated 10/15/2022: to be completed by the end of 2022 (prior note: With Sterling Ranch Fil No. 2) | 40,000 | 23,370 | Sterling Ranch |
| M2 | Construct Marksheffel Road as an Urban Principal Arterial to City of Colorado Springs standards in 107' of right-of-way between Sterling Ranch Road and the south boundary of the Sterling Ranch Master Plan Area. 10/16/2022 NOTE: With the completion of M2 in 2023, the connection between Vollmer and Woodmen Road (via M3) will be completed. | Short Term Updated 10/15/2022: to be completed in 2023 (prior note: With Sterling Ranch Phase 2) | 40,000 | 29,600 | Sterling Ranch |
| M3 | Construct Marksheffel Road between the south boundary of the Sterling Ranch Master Plan Area and Woodmen Road. (Note this segment is located within the City of Colorado Springs). 10/16/2022 NOTE: With the completion of M2 in 2023, the connection between Vollmer and Woodmen Road (via M3) will be completed. | Updated 10/15/2022: Completed (by Others) | 40,000 | 24,525 | Others (Completed) |
| M4 | Construct Marksheffel Road between Black Forest Road and Vollmer Road. | Long-Term Future | 40,000 | 27,910 | Others |
| B1 | Construct the south half section of Briargate Pkwy (4-Lane Principal Arterial) between Vollmer Road and Wheatland Drive [now full section by 2023]. | Short-Term Future Updated 10/15/2022: Full section to be completed in 2023 with Homestead at Sterling Ranch Filing No. 1 (prior note: With Homestead at Sterling Ranch Fil 2) | 20,000 | 24,745 | Sterling Ranch |
| | Construct the north half section of Briargate Pkwy (4-Lane Principal Arterial) between Vollmer Road and Wheatland Drive [now full section by 2023]. | Short-Term Future Updated 10/15/2022: Full section to be completed in 2023 with Homestead at Sterling Ranch Filing No. 1 (prior note: Long-Term Future) | 40,000 | | |
| B2 | Construct Briargate Pkwy (full section) as a 4-Lane Principal Arterial between Wheatland Dr and Sterling Ranch Road. | Short-Term Future Updated 10/15/2022: Full section to be completed in 2023 or Spring 2024 (prior note: Long-Term Future) | 40,000 | 26,375 | Sterling Ranch |
| B3 | Construct Briargate Pkwy as a 4-Lane Principal Arterial between Sterling Ranch Road and Banning Lewis Parkway. | Intermediate Term | 40,000 | 22,365 | Sterling Ranch |
| B4 | Construct Stapleton Road as a 4-Lane Principal Arterial between Banning Lewis Parkway and Meridian Road (including upgrade of existing rural two-lane segment between Towner and Meridian). | Long-Term Future | 40,000 | 17,945 | Others |
| B5 | Construct Briargate Pkwy as a 4-Lane Principal Arterial between Black Forest Road and Vollmer Road. | Long-Term Future | 40,000 | 24,340 | Others; PPRTA A List Project |
| BL1 | Construct Banning Lewis Parkway as a 4-Lane Principal Arterial between the south Sterling Ranch boundary and Briargate Pkwy. | Long-Term Future | 40,000 | 20,320 | Financial assurances for half-section, Sterling Ranch half-section or full-section w/ cost recovery |
| BL2 | Construct Banning Lewis Parkway as a 4-Lane Principal Arterial between Woodmen Road and the south Sterling Ranch boundary. (Note this segment will be located within the City of Colorado Springs) | Long-Term Future | 40,000 | 28,480 | Others |
| W1 | Widen Woodmen Road from 4-lane to 6-lane section from Powers Boulevard to US 24. | Long-Term Future | 72,000 | 66,690 | PPRTA A-List Project; City of Colorado Springs ConnectCOS Index No.476 |
| B1 | Widen Black Forest Road between Woodmen Road to just north of Research Road to two northbound and southbound through lanes. | Black Forest Widening Project | 40,000 | 28,420 | City of Colorado Springs |
| B2 | Widen Black Forest Road from just north of Research Road to Briargate Parkway. | Long-Term Future | 40,000 | 25,145 | Others/City of Colorado Springs |
| B3 | Widen Black Forest Rd from Briargate Pkwy to Old Ranch Rd as a 4-lane Principal Arterial with bike and pedestrian facilities. | Long-Term Future | 40,000 | 19,135 | PPRTA B List Project ConnectCOS Index No. 479 |

Part 2/2 of this table

Notes:

(1) See Figure 10

(2) Adequate transition/redirect tapers would be needed between the various cross sections on Vollmer Road. Based on the criteria contained in Table 2-29 of the *El Paso Engineering Criteria Manual*, an appropriate taper ratio for a roadway with a design speed of 40 miles per hour is 20:1

(3) Source: Table 20 *Road Impact Fee Study Updated* November 16, 2016

Source: LSC Transportation Consultants, Inc. (February 10, 2023)

From Briargate Parkway to Idaho Falls Drive with SRE Fil 2 or Foursquare
From Idaho Falls Drive to Vancouver Street with future filings