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See redlines on SF-17-024
project

Branding Iron at Sterling Ranch Filing No. 1
Homestead at Sterling Ranch Filing No. 1
Updated Traffic Technical Memorandum
(LSC #184280)
April 19, 2018

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.

signature

Developer's Statement

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

Date

SF-17-025



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April 19, 2018

Mr. Jim Morley
Morley-Bentley Investments, LLC
20 Boulder Crescent, 1st Floor
Colorado Springs, CO 80903

RE: Branding Iron at Sterling Ranch Filing No. 1
Homestead at Sterling Ranch Filing No. 1
El Paso County, CO
Updated Traffic Technical Memorandum
LSC #184280

Dear Mr. Morley:

LSC Transportation Consultants, Inc. has prepared this updated traffic technical memorandum for the first two residential filings proposed within the Sterling Ranch development. As shown on Figure 1, Sterling Ranch is located east of Vollmer Road near Lochwinnoch Lane between the future extensions of Marksheffel Road and Stapleton Drive in El Paso County, Colorado. LSC prepared a traffic impact study (TIS) for the entire Sterling Ranch development dated June 5, 2008. LSC also prepared a traffic impact analysis for the first phase of the Sterling Ranch development dated March 16, 2015. Since completion of that report, several transportation memoranda regarding the Sterling Ranch development have been prepared, the latest of which was dated October 2, 2017. The 2015 report and the 2017 memorandum included the parcels currently proposed as Branding Iron at Sterling Ranch Filing No. 1 and Homestead at Sterling Ranch Filing No. 1. This report is intended as a site-specific, final plat traffic report for the two currently proposed filings.

REPORT CONTENTS

This report presents:

- Current traffic volume data.
- Estimates of projected intermediate-term (2025) traffic volumes.
- The recommended street classifications for the internal streets within the proposed development.
- Roadway capacity of the proposed Vollmer Road interim cross section.
- An evaluation of the ability of the short-term roadway improvements to accommodate the projected short-term traffic volumes.
- The project's obligation (if any) to the County roadway improvement fee program.

LAND USE AND ACCESS

The Branding Iron at Sterling Ranch Filing No. 1 is planned to include 51 lots for single-family homes. The Homestead at Sterling Ranch Filing No. 1 is planned to include 72 lots for single-family homes. The site plan for these two filings is shown in Figure 2. This land use is consistent with the land use assumed in the October 2017 transportation memorandum.

Figure 3 shows the new street connections planned to be constructed in the spring of 2018. These street connections are part of the Sterling Ranch Filing No. 1 plat. It is our understanding that Filing 1 has been recorded as of the week of April 9th. As shown on Figure 3, a section of Marksheffel Road is planned to be constructed southeast from Vollmer Road to Sterling Ranch Road, Sterling Ranch Road is planned to be constructed northeast from Marksheffel Road to Dines Boulevard, Dines Boulevard is planned to be constructed between Sterling Ranch Road and Vollmer Road, Wheatland Drive is planned to be constructed between Dines Boulevard and Briargate Parkway, and an interim cross section of Briargate Parkway is planned to be constructed between Vollmer Road and Wheatland Drive. Access for the two currently proposed filings is proposed to Dines Boulevard.

EXISTING TRAFFIC VOLUMES

Figure 4 shows the existing daily and peak-hour traffic volumes on Vollmer Road adjacent to the site. The traffic volumes are from the attached traffic counts conducted adjacent to the site in September 2017. Figure 4 also shows the average weekday traffic volumes on Vollmer Road based on 24-hour machine (tube) counts conducted in September 2017.

2025 BACKGROUND TRAFFIC

May 2018

Figure 5 shows the projected 2025 background traffic volumes. Background traffic is the traffic estimated to be on the roadways without the Branding Iron at Sterling Ranch Filing No. 1 and Homestead at Sterling Ranch Filings No. 1 traffic. Background traffic includes the existing traffic volumes (from Figure 4) plus increases in through traffic due to regional growth plus traffic estimated to be generated by buildout of the proposed Retreat at Timber Ridge development to be located generally northeast of the intersection of Vollmer Road and Poco Road.

TRIP GENERATION

The site-generated vehicle-trips were estimated using the nationally published trip generation rates from *Trip Generation, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE). Table 1 shows the current trip generation estimate.

SHORT-TERM DIRECTIONAL DISTRIBUTION

Figure 6 shows the short-term directional distribution estimates. This figure has been taken from the July 2, 2014 Sterling Ranch traffic report. Note: It is our understanding that the Marksheffel extension northwest across Sand Creek to Vollmer Road is anticipated to occur in the short term, however this analysis assumes this connection not yet completed.

INTERMEDIATE-TERM (2025) SITE-GENERATED TRAFFIC

Figure 7 shows the projected site-generated traffic volume for the Branding Iron at Sterling Ranch Filing No. 1. Figure 8 shows the projected site-generated traffic volume for the Homestead at Sterling Ranch Filing No. 1. The site-generated traffic volumes were calculated by applying the directional distribution percentages (from Figure 6) to the trip generation estimates (from Table 1). Figure 9 shows the total site-generated traffic volumes. These volumes are the sum of the Branding Iron at Sterling Ranch Filing No. 1 site-generated traffic volumes from Figure 7 plus the Homestead at Sterling Ranch Filing No. 1 site-generated traffic volumes from Figure 8.

INTERMEDIATE-TERM (2025) TOTAL TRAFFIC

Figure 10 shows the projected total traffic volumes for the intermediate term. Total traffic volumes include 2025 background through traffic on Vollmer Road (from Figure 5) plus site-generated traffic volumes from these two proposed subdivision filings (from Figure 9).

LONG-TERM TRAFFIC

Please refer to the master traffic report—the June 5, 2008 Sterling Ranch Updated Traffic Impact Analysis by LSC—for the long-term peak-hour traffic volume projections and level of service analysis. The original report is for the entire Sterling Ranch Sketch Plan.

ESTIMATED VOLLMER ROAD IMPROVEMENTS/CAPACITY

THE SIA for this plat does not. Which plat's SIA?

The subdivision improvements agreement (SIA) paragraph 6.d. indicates the following:

6d. Vollmer Road: With respect to the Vollmer Road improvements described in Exhibit A, the parties agree that the addition of two lanes to the existing two lane cross section shall be required completed no later than three years from the date of recording of Filing No. 1. In the event that any portions of the four-lane cross section of Vollmer Road are not completed within the three-year time period, collateral sufficient in the opinion of the County to assure completion of the improvements must be posted by the Subdivider and a deadline by which such road improvements shall be completed shall be established by written agreement.

In the interim, auxiliary turn lanes will be completed on Vollmer Road as shown in the attached exhibit (Sterling Ranch – Vollmer Road (North) Street Improvement Plans) and as per the attached memo by LSC dated October 2, 2017.

Currently the MTCP indicates a capacity of existing Vollmer Road to be about 6,000 vehicles per day. The El Paso County *Engineering Criteria Manual* (ECM) indicates the average daily traffic (ADT) capacity of an ECM-standard rural minor arterial (two lanes) to be 10,000 vehicles per day. However, the proposed interim cross section is a hybrid between urban and rural cross sections and would include auxiliary turn lanes. With the addition of ECM-standard auxiliary right- and left-turn deceleration lanes, LSC estimates the capacity to be about 14,000 vehicles per day through the area of the improved cross section. This is comparable to the fee study estimate of the capacity of Fontaine Boulevard west of Marksheffel, which has a two-lane cross section and auxiliary turn lanes.

The projected intermediate-term total traffic volume as shown in Figure 9 would be 4,920 vehicles per day—well below the estimated capacity of 14,000 vehicles per day for a roadway of this cross section. The projected volume would also be below the estimated existing capacity of 6,000 vehicles per day.

PROJECTED INTERSECTION LEVELS OF SERVICE

The intersections of Marksheffel Road/Vollmer Road and Dines Boulevard/Vollmer Road, were analyzed to determine the projected levels of service for the intermediate-term total traffic volumes based on the unsignalized intersection analysis procedures from the *Highway Capacity Manual 6th Edition*. Figure 10 shows the level of service analysis results. The level of service reports are attached.

All of the intersections analyzed are projected to operate at a level of service B or better for all movements as stop-sign-controlled intersections.

SUBDIVISION STREET CLASSIFICATIONS

Figure 11 shows the recommended street classifications for Sterling Ranch Road, Dines Boulevard, and the internal streets within Branding Iron at Sterling Ranch Filing No. 1 and Homestead at Sterling Ranch Filing No. 1.

ROADWAY IMPROVEMENTS

Based on the criteria contained in the El Paso County *Engineering Criteria Manual* and the classification of Vollmer Road as a Minor Arterial, northbound right-turn deceleration lanes and southbound left-turn lanes would **not** will be required on Vollmer Road approaching Marksheffel Road and Dines Boulevard following development of the Branding Iron at Sterling Ranch Filings No. 1 and the Homestead at Sterling Ranch Filing No. 1. **However, the road improvements required as part of the SIA must be constructed. These include auxiliary turn lanes on Vollmer Road** as discussed in our October 2, 2017 transportation memorandum. The applicant will be constructing an interim cross

Should this be in the SIA?

section for Vollmer Road between Marksheffel Road and Stapleton Drive. The interim road improvement would widen the roadway to the east side. There would continue to be one through lane in each direction, but the interim road improvements would allow for southbound left-turn and northbound right-turn lanes at the Briargate Parkway/Vollmer and Dines/Vollmer intersections.

TRANSPORTATION IMPROVEMENT FEE PROGRAM

These two subdivision filings will be required to participate in the Countywide Transportation Improvement Fee Program. This project will annex into the 10 mil PID. Based on a per-lot upfront building permit fee of \$923 per dwelling unit, the total building permit fee amount for the 123 lots (both filings) would be \$113,529.

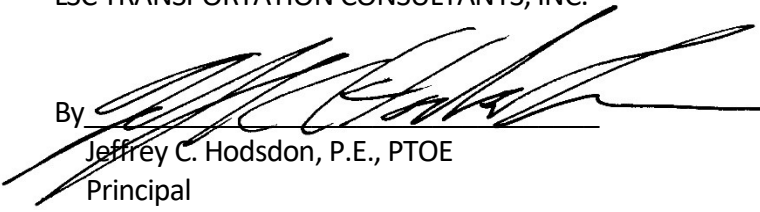
* * * * *

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

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

By


Jeffrey C. Hodsdon, P.E., PTOE
Principal

Add amount for this filing

JCH:KDF:bjwb

Enclosures: Table 1
Figures 1-11
Traffic Count Reports
Level of Service Reports
Sterling Ranch – Vollmer Road (North) Street Improvement Plans
Transportation Memo dated October 2, 2017

18. An escrow agreement, including a financial assurance estimate for the offsite improvements to Vollmer Road, as approved by the Planning and Community Development Department Director and the County Attorney's Office, shall be completed at the time of any subsequent final plat or replat within the Sterling Ranch development. A fair share contribution based on proportional calculated traffic generation shall be deposited for each plat or replat within the Sterling Ranch development.

Table 1
Trip Generation Estimate
Branding Iron at Sterling Ranch Filing No. 1 and
Homestead at Sterling Ranch Filing No. 1

| Filing | Land Use Code | Land Use Description | Trip Generation Units | Trip Generation Rates ⁽¹⁾ | | | | Total External Trips Generated | | | | | |
|--|---------------|--------------------------------|-----------------------|--------------------------------------|-------------------|------|-------------------|--------------------------------|-------------------------|-------------------|-----|-------------------|-----|
| | | | | Average Weekday Traffic | Morning Peak Hour | | Evening Peak Hour | | Average Weekday Traffic | Morning Peak Hour | | Evening Peak Hour | |
| | | | | | In | Out | In | Out | | In | Out | In | Out |
| Branding Iron at Sterling Ranch Filing No. 1 | 210 | Single-Family Detached Housing | 51 DU ⁽²⁾ | 9.44 | 0.19 | 0.56 | 0.62 | 0.37 | 481 | 9 | 28 | 32 | 19 |
| Homestead at Sterling Ranch Filing No. 1 | 210 | Single-Family Detached Housing | 72 DU | 9.44 | 0.19 | 0.56 | 0.62 | 0.37 | 680 | 13 | 40 | 45 | 26 |
| | | | 123 DU | | | | | | 1,161 | 22 | 68 | 77 | 45 |

Notes:

(1) Source: "Trip Generation, 10th Edition, 2017" by the Institute of Transportation Engineers (ITE)

(2) DU = dwelling unit

Source: LSC Transportation Consultants, Inc.

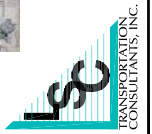


Approximate Scale
Scale: 1" = 3,000'



Figure 1
**Vicinity
Map**

Branding Iron at Sterling Ranch Filing No. 1 and Homestead at Sterling Ranch Filing No. 1 (LSC #184280)



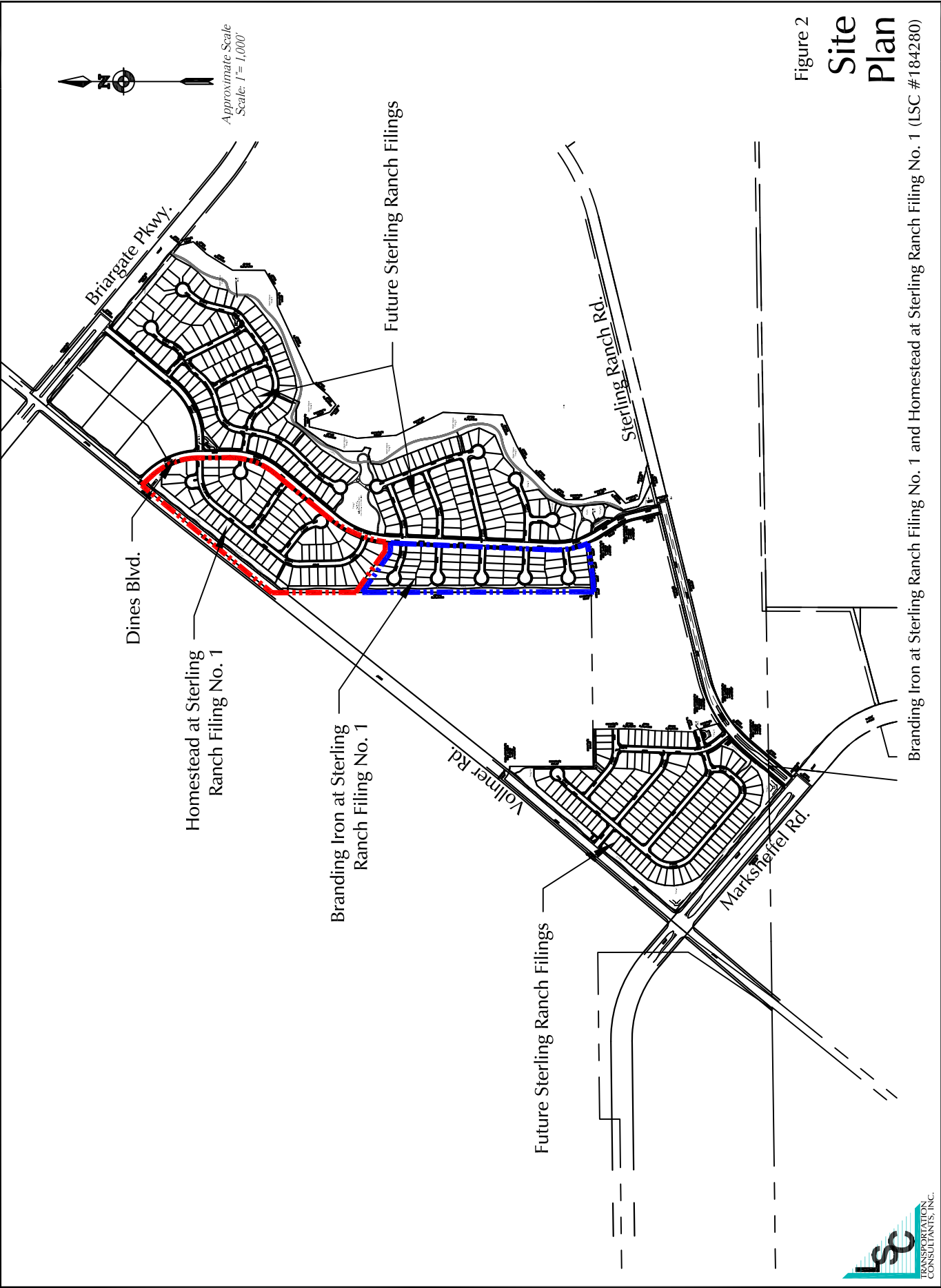


Figure 2
Site Plan

Branding Iron at Sterling Ranch Filing No. 1 and Homestead at Sterling Ranch Filing No. 1 (LSC #184280)



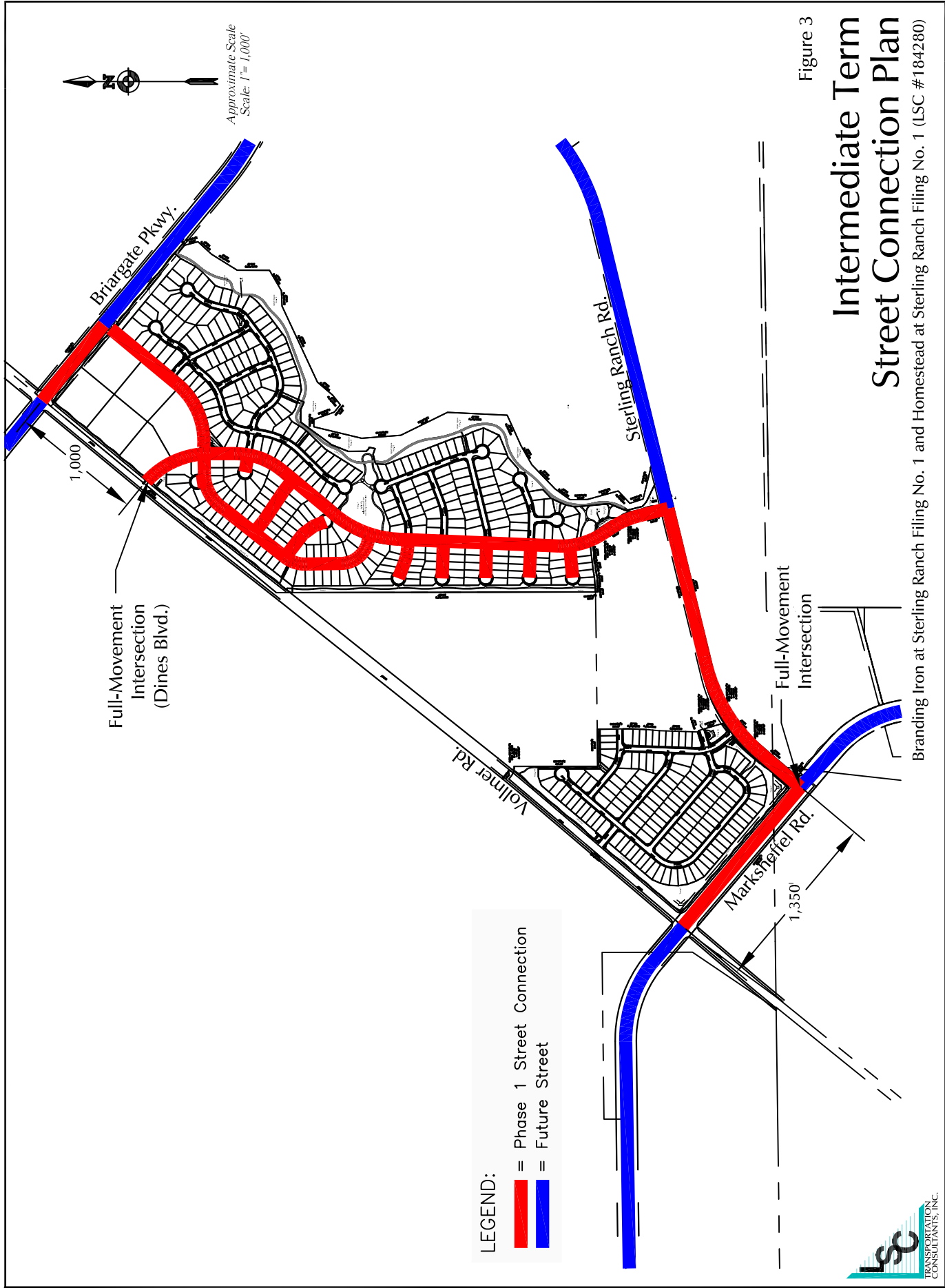


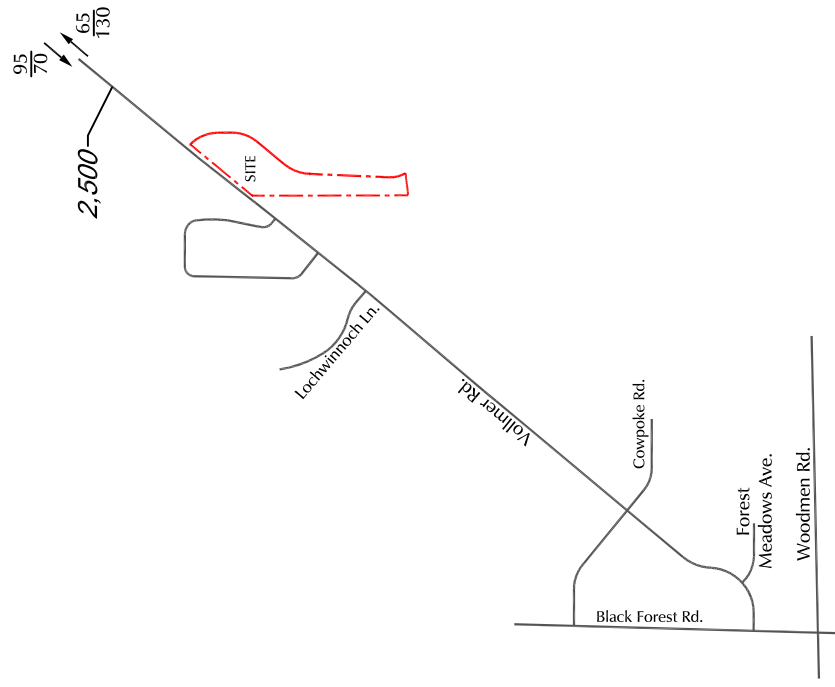
Figure 3

Intermediate Term Street Connection Plan





Approximate Scale
Scale: 1" = 3,000'



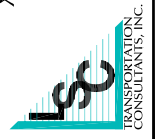
LEGEND:

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
 $\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)

XXX = Average Weekday Traffic (vehicles per day) September 2017

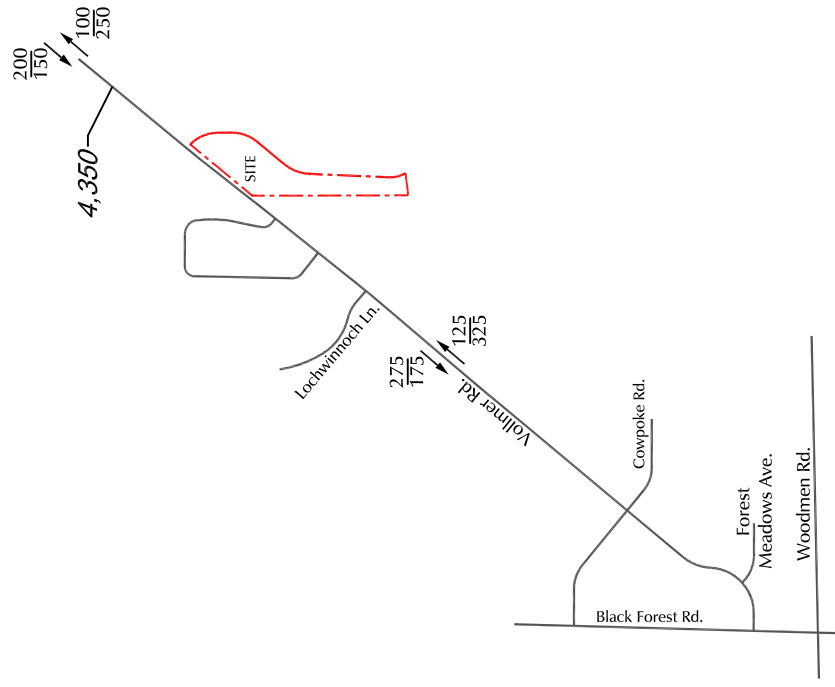
Figure 4
**Existing
Traffic Volumes**

Branding Iron at Sterling Ranch Filing No. 1 and Homestead at Sterling Ranch Filing No. 1 (LSC #184280)





Approximate Scale
Scale: 1" = 3,000'



LEGEND:

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

XXX = Average Weekday Traffic (vehicles per day)

Figure 5

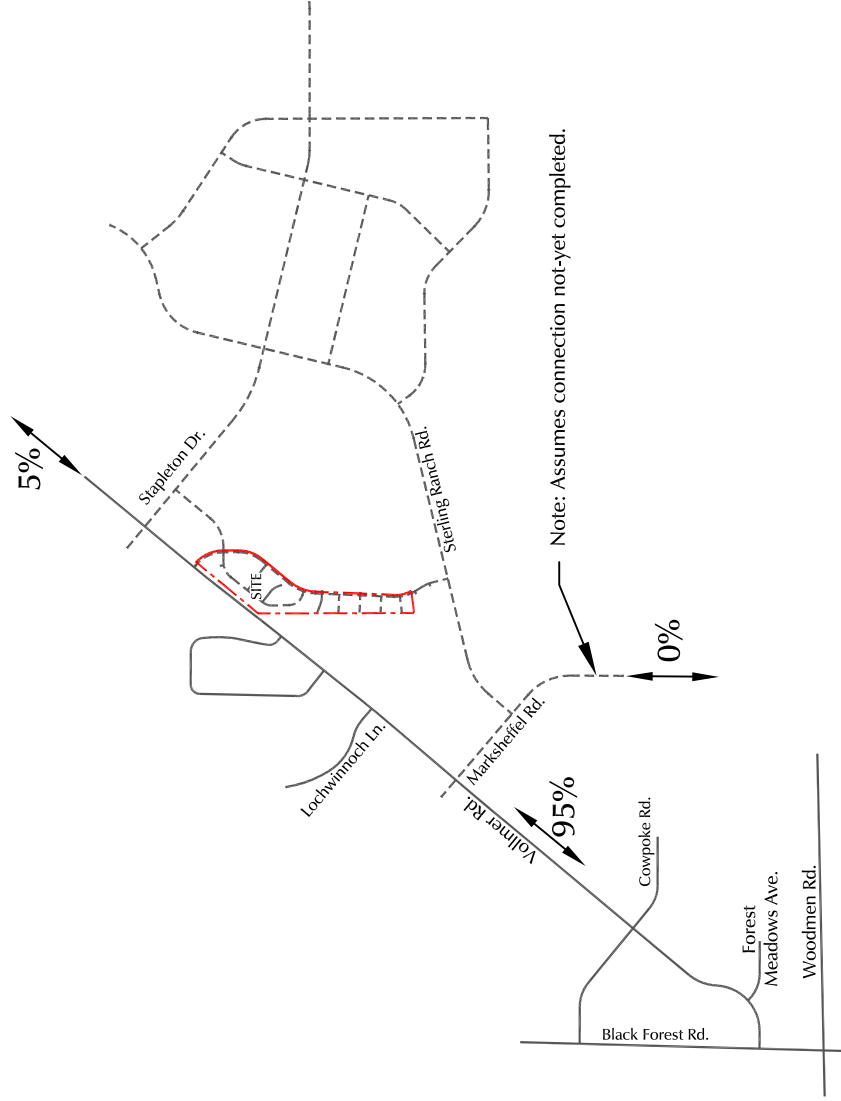
Year 2025 Background Traffic

Branding Iron at Sterling Ranch Filing No. 1 and Homestead at Sterling Ranch Filing No. 1 (LSC #184280)





Approximate Scale
Scale: 1" = 3,000'



LEGEND:
↔ 35% =

Percent Directional Distribution Residential

Branding Iron at Sterling Ranch Filing No. 1 and Homestead at Sterling Ranch Filing No. 1 (LSC #184280)

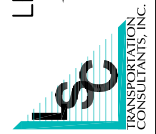


Figure 6

Short-Term Directional Distribution of Site-Generated Traffic

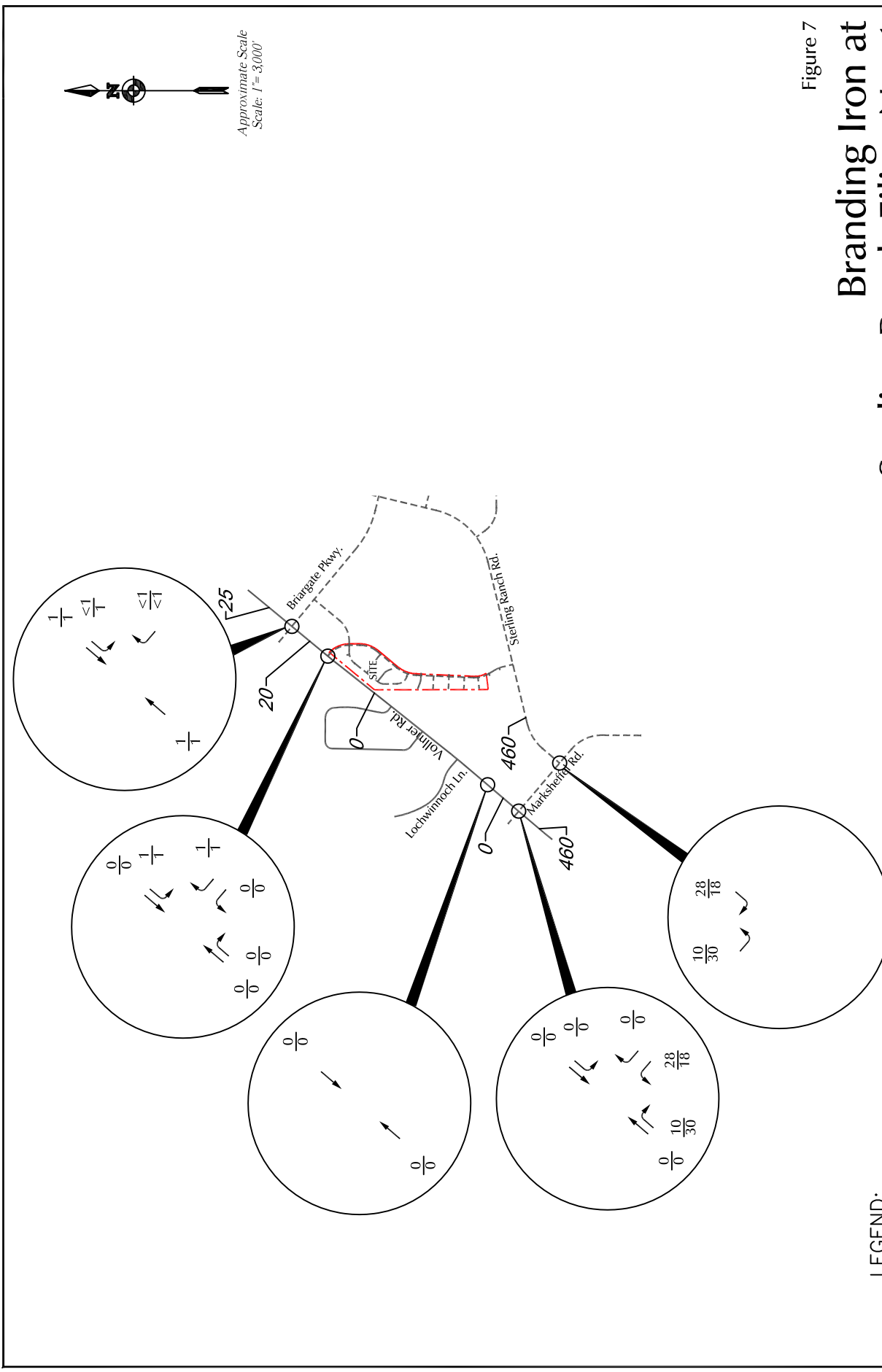
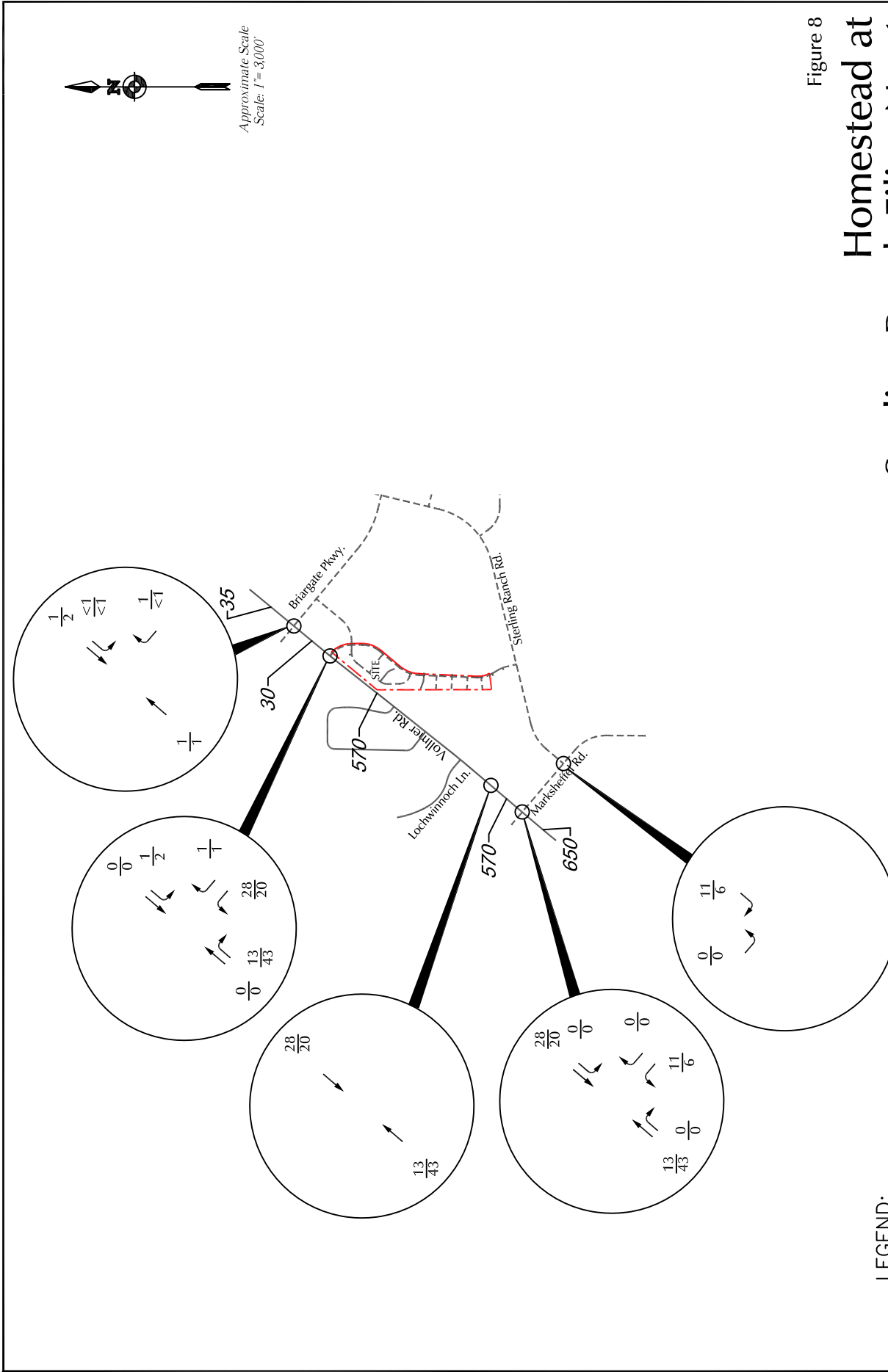


Figure 7
 Branding Iron at
 Sterling Ranch Filing No. 1
 Short-Term Site-Generated Traffic

LEGEND:
 XX = AM Weekday Peak-Hour Traffic (vehicles per hour)
 XX = PM Weekday Peak-Hour Traffic (vehicles per hour)
 XXX = Average Weekday Traffic (vehicles per day)

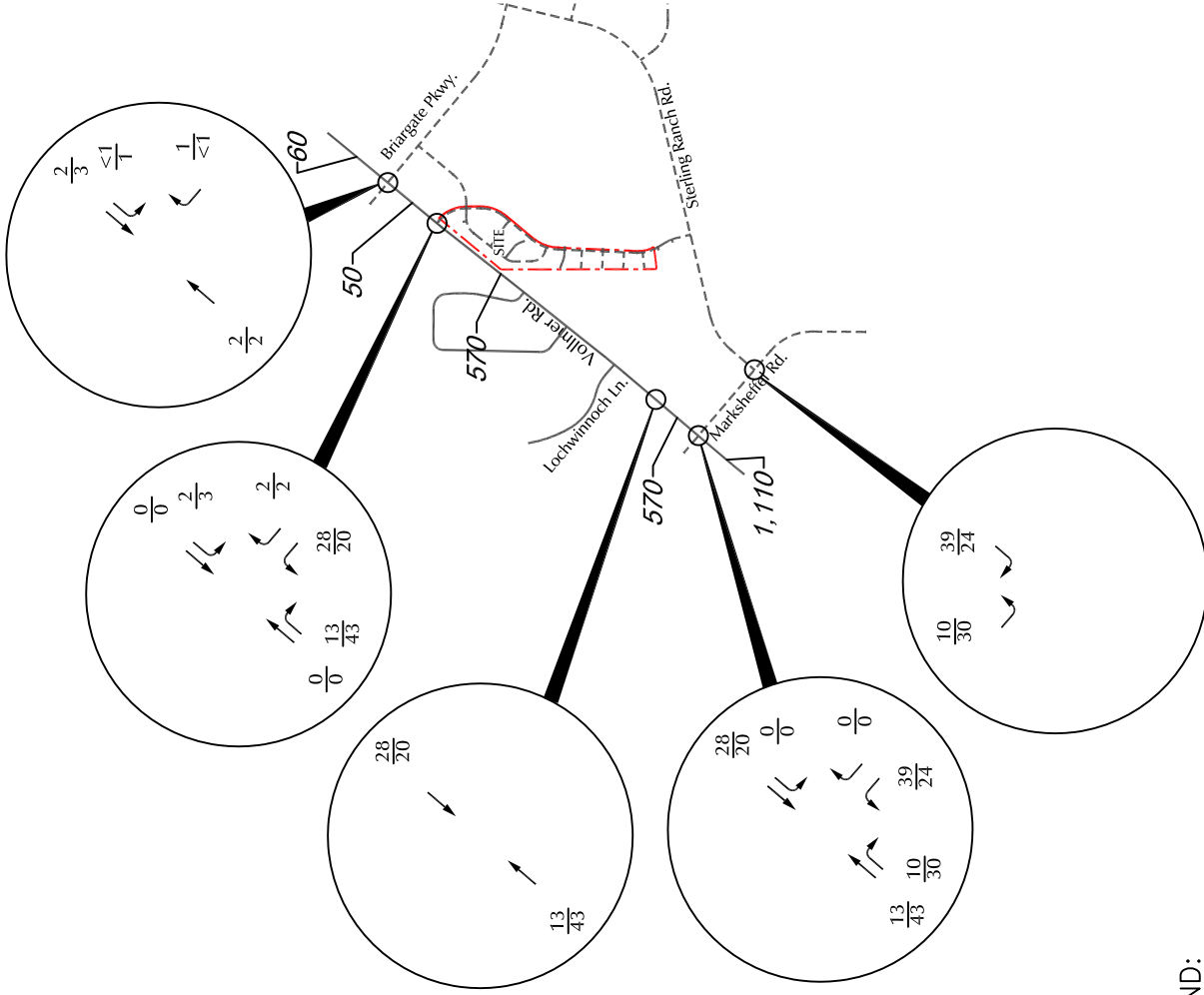
Branding Iron at Sterling Ranch Filing No. 1 and Homestead at Sterling Ranch Filing No. 1 (LSC #184280)







Approximate Scale
Scale: 1" = 3,000'



* Includes Branding Iron at Sterling Ranch Filing No. 1 and Homestead at Sterling Ranch Filing No. 1

Figure 9

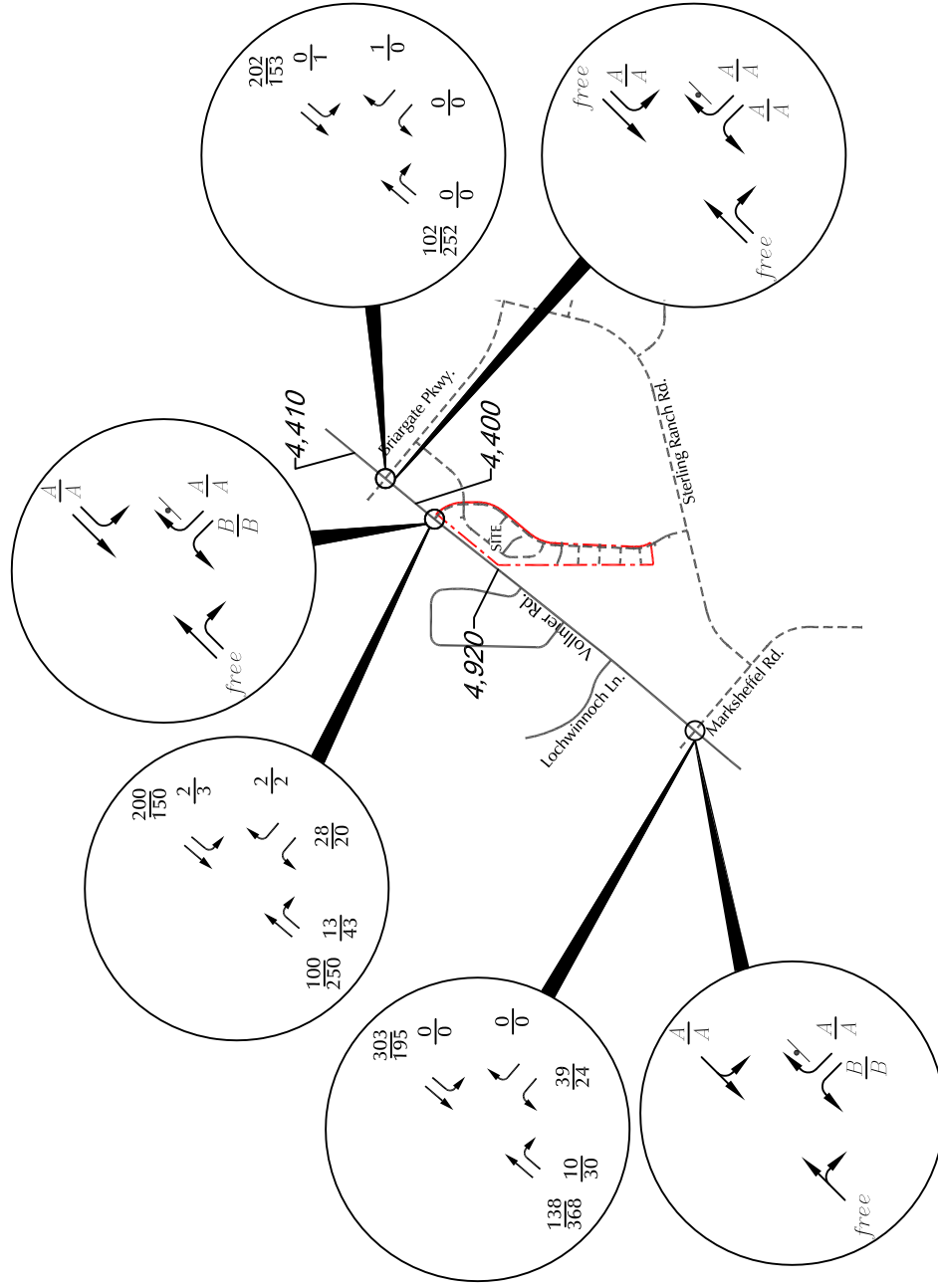
Short-Term* Site-Generated Traffic

LEGEND:
 XX = AM Weekday Peak-Hour Traffic (vehicles per hour)
 XX = PM Weekday Peak-Hour Traffic (vehicles per hour)
 XXX = Average Weekday Traffic (vehicles per day)

Branding Iron at Sterling Ranch Filing No. 1 and Homestead at Sterling Ranch Filing No. 1 (LSC #184280)



Approximate Scale
Scale: 1" = 3,000'



LEGEND:

↑ = Stop Sign

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)

$\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)

$\frac{A}{A}$ = AM Individual Movement Peak-Hour Level of Service

$\frac{B}{B}$ = PM Individual Movement Peak-Hour Level of Service

LSC-XXX = Average Weekday Traffic (vehicles per day)



Figure 10

Year 2025 Background plus Site Traffic

Branding Iron at Sterling Ranch Filing No. 1 and Homestead at Sterling Ranch Filing No. 1 (LSC #184280)

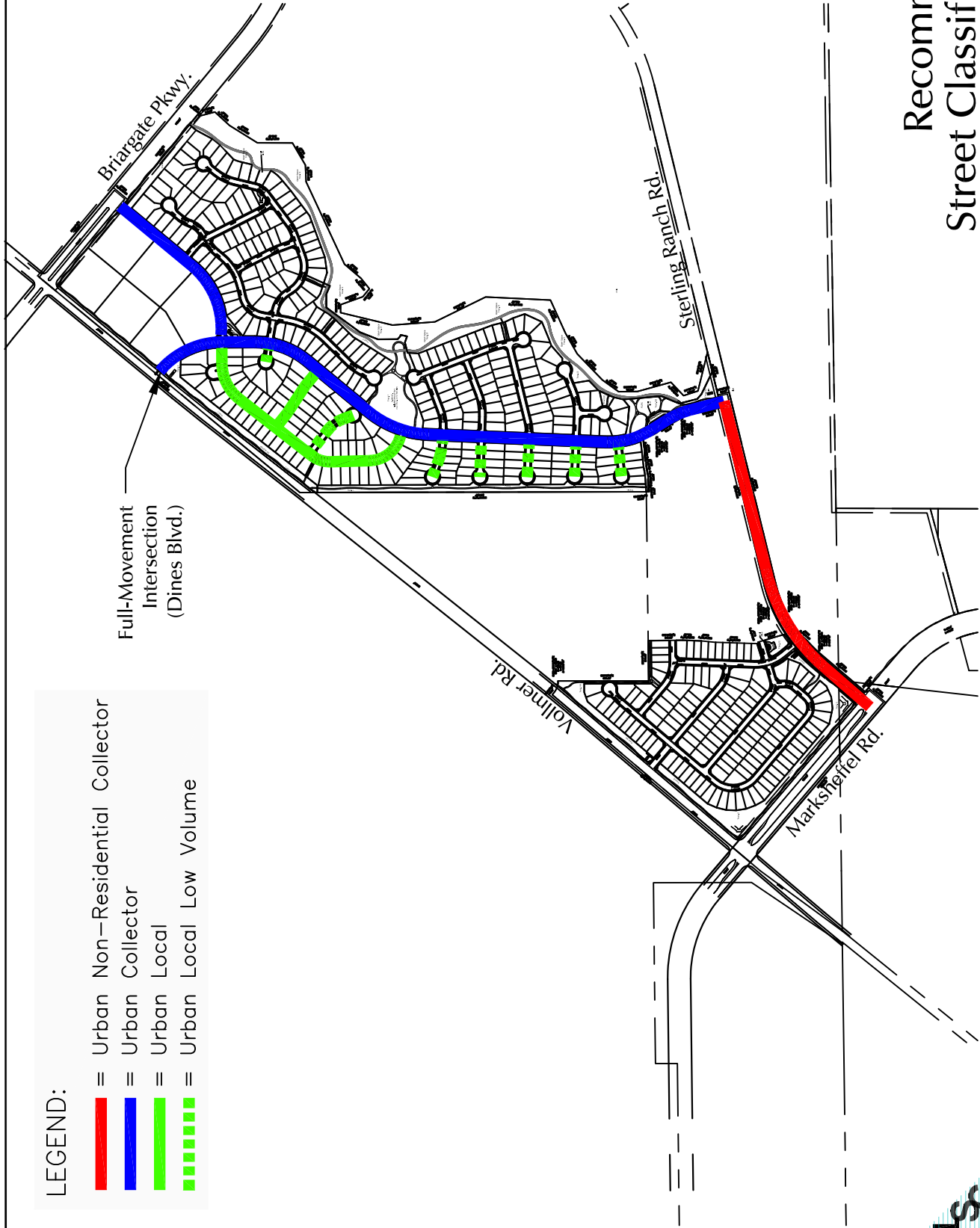
LEGEND:

- █ = Urban Non-Residential Collector
- █ = Urban Collector
- █ = Urban Local
- █ = Urban Local Low Volume

Full-Movement Intersection (Dines Blvd.)



Approximate Scale
Scale: 1" = 1,000'



Branding Iron at Sterling Ranch Filing No. 1 and Homestead at Sterling Ranch Filing No. 1 (LSC #184280)

Figure 11
Recommended
Street Classifications



| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 0.9 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 39 | 0 | 138 | 10 | 0 | 303 |
| Future Vol, veh/h | 39 | 0 | 138 | 10 | 0 | 303 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 81 | 81 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 42 | 0 | 150 | 11 | 0 | 374 |

| Major/Minor | Minor1 | Major1 | Major2 | | |
|----------------------|--------|--------|--------|---|-------|
| Conflicting Flow All | 530 | 156 | 0 | 0 | 161 |
| Stage 1 | 156 | - | - | - | - |
| Stage 2 | 374 | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 |
| Pot Cap-1 Maneuver | 510 | 890 | - | - | 1418 |
| Stage 1 | 872 | - | - | - | - |
| Stage 2 | 696 | - | - | - | - |
| Platoon blocked, % | | | | | |
| Mov Cap-1 Maneuver | 510 | 890 | - | - | 1418 |
| Mov Cap-2 Maneuver | 510 | - | - | - | - |
| Stage 1 | 872 | - | - | - | - |
| Stage 2 | 696 | - | - | - | - |

| Approach | WB | NB | SB |
|----------------------|------|----|----|
| HCM Control Delay, s | 12.7 | 0 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | WBLn2 | SBL | SBT |
|-----------------------|-----|----------|-------|-----|------|
| Capacity (veh/h) | - | - | 510 | - | 1418 |
| HCM Lane V/C Ratio | - | - | 0.083 | - | - |
| HCM Control Delay (s) | - | - | 12.7 | 0 | 0 |
| HCM Lane LOS | - | - | B | A | A |
| HCM 95th %tile Q(veh) | - | - | 0.3 | - | 0 |

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 0.9 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ↘ | ↗ | ↑ | ↗ | ↘ | ↑ |
| Traffic Vol, veh/h | 28 | 2 | 100 | 13 | 2 | 200 |
| Future Vol, veh/h | 28 | 2 | 100 | 13 | 2 | 200 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | 235 | 285 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 81 | 81 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 30 | 2 | 109 | 14 | 2 | 247 |

| Major/Minor | Minor1 | Major1 | Major2 | | | |
|----------------------|--------|--------|--------|---|-------|---|
| Conflicting Flow All | 360 | 109 | 0 | 0 | 123 | 0 |
| Stage 1 | 109 | - | - | - | - | - |
| Stage 2 | 251 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver | 639 | 945 | - | - | 1464 | - |
| Stage 1 | 916 | - | - | - | - | - |
| Stage 2 | 791 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | - | - |
| Mov Cap-1 Maneuver | 638 | 945 | - | - | 1464 | - |
| Mov Cap-2 Maneuver | 638 | - | - | - | - | - |
| Stage 1 | 915 | - | - | - | - | - |
| Stage 2 | 791 | - | - | - | - | - |

| Approach | WB | NB | SB |
|----------------------|------|----|-----|
| HCM Control Delay, s | 10.8 | 0 | 0.1 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | WBLn2 | SBL | SBT |
|-----------------------|-----|-----|-------|-------|-------|-----|
| Capacity (veh/h) | - | - | 638 | 945 | 1464 | - |
| HCM Lane V/C Ratio | - | - | 0.048 | 0.002 | 0.002 | - |
| HCM Control Delay (s) | - | - | 10.9 | 8.8 | 7.5 | - |
| HCM Lane LOS | - | - | B | A | A | - |
| HCM 95th %tile Q(veh) | - | - | 0.1 | 0 | 0 | - |

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 0 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ↘ | ↗ | ↑ | ↗ | ↘ | ↑ |
| Traffic Vol, veh/h | 0 | 1 | 102 | 0 | 0 | 202 |
| Future Vol, veh/h | 0 | 1 | 102 | 0 | 0 | 202 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | 235 | 285 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 81 | 81 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 1 | 111 | 0 | 0 | 249 |

| Major/Minor | Minor1 | Major1 | Major2 | | | |
|----------------------|--------|--------|--------|---|-------|---|
| Conflicting Flow All | 360 | 111 | 0 | 0 | 111 | 0 |
| Stage 1 | 111 | - | - | - | - | - |
| Stage 2 | 249 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver | 639 | 942 | - | - | 1479 | - |
| Stage 1 | 914 | - | - | - | - | - |
| Stage 2 | 792 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | |
| Mov Cap-1 Maneuver | 639 | 942 | - | - | 1479 | - |
| Mov Cap-2 Maneuver | 639 | - | - | - | - | - |
| Stage 1 | 914 | - | - | - | - | - |
| Stage 2 | 792 | - | - | - | - | - |

| Approach | WB | NB | SB |
|----------------------|-----|----|----|
| HCM Control Delay, s | 8.8 | 0 | 0 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | WBLn2 | SBL | SBT |
|-----------------------|-----|----------|-------|-------|------|
| Capacity (veh/h) | - | - | - | 942 | 1479 |
| HCM Lane V/C Ratio | - | - | - | 0.001 | - |
| HCM Control Delay (s) | - | - | 0 | 8.8 | 0 |
| HCM Lane LOS | - | - | A | A | A |
| HCM 95th %tile Q(veh) | - | - | - | 0 | 0 |

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 0.5 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 24 | 0 | 368 | 30 | 0 | 195 |
| Future Vol, veh/h | 24 | 0 | 368 | 30 | 0 | 195 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 93 | 93 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 26 | 0 | 396 | 32 | 0 | 203 |

| Major/Minor | Minor1 | Major1 | Major2 | | |
|----------------------|--------|--------|--------|---|-------|
| Conflicting Flow All | 615 | 412 | 0 | 0 | 428 |
| Stage 1 | 412 | - | - | - | - |
| Stage 2 | 203 | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 |
| Pot Cap-1 Maneuver | 455 | 640 | - | - | 1131 |
| Stage 1 | 669 | - | - | - | - |
| Stage 2 | 831 | - | - | - | - |
| Platoon blocked, % | | | | | |
| Mov Cap-1 Maneuver | 455 | 640 | - | - | 1131 |
| Mov Cap-2 Maneuver | 455 | - | - | - | - |
| Stage 1 | 669 | - | - | - | - |
| Stage 2 | 831 | - | - | - | - |

| Approach | WB | NB | SB |
|----------------------|------|----|----|
| HCM Control Delay, s | 13.4 | 0 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | WBLn2 | SBL | SBT |
|-----------------------|-----|----------|-------|-----|------|
| Capacity (veh/h) | - | - | 455 | - | 1131 |
| HCM Lane V/C Ratio | - | - | 0.057 | - | - |
| HCM Control Delay (s) | - | - | 13.4 | 0 | 0 |
| HCM Lane LOS | - | - | B | A | A |
| HCM 95th %tile Q(veh) | - | - | 0.2 | - | 0 |

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 0.6 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ↘ | ↗ | ↑ | ↗ | ↘ | ↑ |
| Traffic Vol, veh/h | 20 | 2 | 250 | 43 | 3 | 150 |
| Future Vol, veh/h | 20 | 2 | 250 | 43 | 3 | 150 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | 235 | 285 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 93 | 93 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 22 | 2 | 269 | 46 | 3 | 156 |

| Major/Minor | Minor1 | Major1 | Major2 | | |
|----------------------|--------|--------|--------|---|-------|
| Conflicting Flow All | 431 | 269 | 0 | 0 | 315 |
| Stage 1 | 269 | - | - | - | - |
| Stage 2 | 162 | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 |
| Pot Cap-1 Maneuver | 581 | 770 | - | - | 1245 |
| Stage 1 | 776 | - | - | - | - |
| Stage 2 | 867 | - | - | - | - |
| Platoon blocked, % | | | - | - | - |
| Mov Cap-1 Maneuver | 580 | 770 | - | - | 1245 |
| Mov Cap-2 Maneuver | 580 | - | - | - | - |
| Stage 1 | 774 | - | - | - | - |
| Stage 2 | 867 | - | - | - | - |

| Approach | WB | NB | SB |
|----------------------|------|----|-----|
| HCM Control Delay, s | 11.2 | 0 | 0.2 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | WBLn2 | SBL | SBT |
|-----------------------|-----|----------|-------|-------|-------|
| Capacity (veh/h) | - | - | 580 | 770 | 1245 |
| HCM Lane V/C Ratio | - | - | 0.037 | 0.003 | 0.003 |
| HCM Control Delay (s) | - | - | 11.4 | 9.7 | 7.9 |
| HCM Lane LOS | - | - | B | A | A |
| HCM 95th %tile Q(veh) | - | - | 0.1 | 0 | 0 |

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 0 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ↘ | ↗ | ↑ | ↗ | ↘ | ↑ |
| Traffic Vol, veh/h | 0 | 0 | 252 | 0 | 1 | 153 |
| Future Vol, veh/h | 0 | 0 | 252 | 0 | 1 | 153 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | 235 | 285 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 93 | 93 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 271 | 0 | 1 | 159 |

| Major/Minor | Minor1 | Major1 | Major2 | | |
|----------------------|--------|--------|--------|---|-------|
| Conflicting Flow All | 432 | 271 | 0 | 0 | 271 |
| Stage 1 | 271 | - | - | - | - |
| Stage 2 | 161 | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 |
| Pot Cap-1 Maneuver | 581 | 768 | - | - | 1292 |
| Stage 1 | 775 | - | - | - | - |
| Stage 2 | 868 | - | - | - | - |
| Platoon blocked, % | | | - | - | - |
| Mov Cap-1 Maneuver | 580 | 768 | - | - | 1292 |
| Mov Cap-2 Maneuver | 580 | - | - | - | - |
| Stage 1 | 774 | - | - | - | - |
| Stage 2 | 868 | - | - | - | - |

| Approach | WB | NB | SB |
|----------------------|----|----|-----|
| HCM Control Delay, s | 0 | 0 | 0.1 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1WBLn2 | SBL | SBT |
|-----------------------|-----|---------------|-----|-------|
| Capacity (veh/h) | - | - | - | 1292 |
| HCM Lane V/C Ratio | - | - | - | 0.001 |
| HCM Control Delay (s) | - | - | 0 | 7.8 |
| HCM Lane LOS | - | - | A | A |
| HCM 95th %tile Q(veh) | - | - | - | 0 |



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October 2, 2017

Mr. Jim Morley
Morley-Bentley Investments, LLC
20 Boulder Crescent, 1st Floor
Colorado Springs, CO 80903

RE: Sterling Ranch Phases 1-3
El Paso County, CO
Traffic Technical Memorandum
LSC #144010

Dear Mr. Morley:

LSC Transportation Consultants, Inc. has prepared this traffic technical memorandum for Phases 1-3 of the Sterling Ranch development. As shown on Figure 1, the site is located east of Vollmer Road near Lochwinnoch Lane between the future extensions of Marksheffel Road and Stapleton Drive in El Paso County, Colorado.

This memorandum has been prepared to address the proposed interim cross section of Vollmer Road (please refer to attached exhibits). Due to current constraints on the west side of Vollmer Road, the applicant is proposing an interim cross section along the frontage of Sterling Ranch Phase 1. This interim cross section and proposed laneage is attached. The proposed interim road improvement would widen the roadway to the east side. There would continue to be one through lane in each direction but the interim road improvements would allow for southbound left-turn and northbound right-turn lanes at the Briargate Parkway/Vollmer and Dines/Vollmer intersections (both access points to Sterling Ranch Phase 1).

REPORT CONTENTS

This report presents:

- Current traffic volume data
- Estimates of projected “intermediate-term” (2025) traffic volumes
- Roadway capacity of this interim cross section
- An evaluation of the ability of the short-term roadway improvements to accommodate the projected short-term traffic volumes.

LAND USE AND ACCESS

The site plan figure from the July 2, 2014 traffic report for Sterling Ranch is attached for reference. That traffic report assumed 672 lots in the area shown but no commercial development in the short term at the southeast corner of Vollmer/Briargate Parkway. The analysis in this memo assumes buildout of 719 lots, reflecting a minor increase over the previously anticipated 672-lot count.

EXISTING TRAFFIC VOLUMES

Figure 2 shows the existing daily and peak-hour traffic volumes on Vollmer Road adjacent to the site. The traffic volumes are from the attached traffic counts conducted adjacent to the site in September 2017. Figure 2 also shows the average weekday traffic volumes on Vollmer Road based on 24-hour machine (tube) counts conducted in September 2017.

2025 BACKGROUND TRAFFIC

Volumes in Figure 3 represent eight years of growth in current Vollmer Road traffic volumes (out to 2025) at 5.4 percent per year. This is the growth rate of volumes projected in the 2016 *Major Transportation Corridors Plan (MTCP) Update*. Note: It is our understanding that the Marksheffel extension southeast across Sand Creek will occur in the short term, however no timing is available from the City of Colorado Springs.

TRIP GENERATION

The site-generated vehicle-trips were estimated using the nationally published trip generation rates from *Trip Generation, 9th Edition, 2012* by the Institute of Transportation Engineers (ITE). Table 1 shows the current trip generation estimate.

SHORT-TERM DIRECTIONAL DISTRIBUTION

Figure 4 shows the short-term directional distribution estimates. This figure has been taken from the July 2, 2014 Sterling Ranch traffic report. Note: It is our understanding that the Marksheffel extension northwest across Sand Creek to Vollmer Road is anticipated to occur in the short term, however no timing of this connection is available from the City of Colorado Springs.

INTERMEDIATE-TERM (2025) SITE-GENERATED TRAFFIC

Figure 5 shows the projected site-generated traffic volume for 719 lots. The site-generated traffic volumes were calculated by applying the directional distribution percentages (from Figure 4) to the trip generation estimates (from Table 1).

INTERMEDIATE-TERM (2025) TOTAL TRAFFIC

Figure 6 shows the projected total traffic volumes for the intermediate term. Total traffic volumes include 2025 background through traffic on Vollmer Road (from Figure 3) plus Phase 1 site-generated traffic volumes (from Figure 5).

ESTIMATED VOLLMER ROAD CAPACITY

Currently the MTCP indicates a capacity of existing Vollmer Road to be about 6,000 vehicles per day. The ECM indicates the ADT capacity of an ECM-standard rural minor arterial (two lanes) to be 10,000 vehicles per day. However, the proposed interim cross section is a hybrid between urban and rural cross sections and would include auxiliary turn lanes. With the addition of ECM-standard auxiliary right- and left-turn deceleration lanes, LSC estimates the capacity to be about 14,000 vehicles per day through the area of the improved cross section. This is comparable to the fee study estimate of the capacity of Fontaine Boulevard west of Marksheffel, which has a two-lane cross section and auxiliary turn lanes.

The projected intermediate-term total traffic volume as shown in Figure 6 would be 5,300 vehicles per day—well below the estimated capacity of 14,000 vehicles per day for a roadway of this cross section. The projected volume would also be below the estimated existing capacity of 6,000 vehicles per day.

PROJECTED INTERSECTION LEVELS OF SERVICE

The intersections of Marksheffel Road/Vollmer Road and Stapleton Drive/Vollmer Road, and the two full-movement site access intersections to Vollmer Road were analyzed to determine the projected levels of service for the intermediate-term total traffic volumes based on the unsignalized intersection analysis procedures from the *Highway Capacity Manual*. Figure 6 shows the level of service analysis results. The level of service reports are attached.

As shown on the figures, all the intersections analyzed are projected to operate at a level of service B as stop-sign-controlled intersections.

* * * * *

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

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

By _____
Jeffrey C. Hodsdon, P.E., PTOE
Principal



JCH:bjwb

Enclosures: Table 1
Figures 1-6
Cross Section and Laneage Exhibits
Site Plan Exhibit from July 2, 2014 Report
Traffic Count Reports
Level of Service Reports

**Table 1
Trip Generation Estimate
Sterling Ranch Phases 1-3**

| TAZ ⁽²⁾ | Parcel | Land Use Code | Land Use Description | Trip Generation Units | Trip Generation Rates ⁽¹⁾ | | | | Total External Trips Generated | | | | | | |
|--|--------------|---------------|--------------------------------|------------------------------------|--------------------------------------|-------------------|------|-------------------|--------------------------------|-------------------------|-------------------|------|-------------------|------|--|
| | | | | | Average Weekday Traffic | Morning Peak Hour | | Evening Peak Hour | | Average Weekday Traffic | Morning Peak Hour | | Evening Peak Hour | | |
| | | | | | | In | Out | In | Out | | In | Out | In | Out | |
| October 2017 Currently Anticipated Sterling Ranch Phases 1-3 (Residential Trip Generation Only) | | | | | | | | | | | | | | | |
| 2, 4, 5, 6, & 7 | A1-A4; B1-B3 | 210 | Single-Family Detached Housing | 719 DU ⁽³⁾ | 9.52 | 0.19 | 0.56 | 0.63 | 0.37 | 6,845 | 135 | 404 | 453 | 266 | |
| Sterling Ranch Phases 1-3 Traffic Impact Analysis July 2, 2014 | | | | | | | | | | | | | | | |
| Phase 1 | | | | | | | | | | | | | | | |
| 7 | A1 | 210 | Single-Family Detached Housing | 100 DU | 9.52 | 0.19 | 0.56 | 0.63 | 0.37 | 952 | 19 | 56 | 63 | 37 | |
| 2 | A2 | 210 | Single-Family Detached Housing | 100 DU | 9.52 | 0.19 | 0.56 | 0.63 | 0.37 | 952 | 19 | 56 | 63 | 37 | |
| 4 | A3 | --- | Sanitary Lift Station | ----- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| | | | | Total Phase 2 | 200 DU | | | | | 1,904 | 38 | 112 | 126 | 74 | |
| Phase 2 | | | | | | | | | | | | | | | |
| 7 | A1 | 210 | Single-Family Detached Housing | 60 DU | 9.52 | 0.19 | 0.56 | 0.63 | 0.37 | 571 | 11 | 34 | 38 | 22 | |
| 2 | A2 | 210 | Single-Family Detached Housing | 92 DU | 9.52 | 0.19 | 0.56 | 0.63 | 0.37 | 876 | 17 | 52 | 58 | 34 | |
| 6 | A4 | 210 | Single-Family Detached Housing | 7 DU | 9.52 | 0.19 | 0.56 | 0.63 | 0.37 | 67 | 1 | 4 | 4 | 3 | |
| | | | | Total Phase 2 | 159 DU | | | | | 1,514 | 29 | 90 | 100 | 59 | |
| 2, 4, 5, 6, & 7 | | | | Total Phases 1 & 2 | 359 DU | | | | | 3,418 | 67 | 202 | 226 | 133 | |
| Phase 3 | | | | | | | | | | | | | | | |
| 7 | B1 | 210 | Single-Family Detached Housing | 34 DU | 9.52 | 0.19 | 0.56 | 0.63 | 0.37 | 324 | 6 | 19 | 21 | 13 | |
| | B2 | 210 | Single-Family Detached Housing | 133 DU | 9.52 | 0.19 | 0.56 | 0.63 | 0.37 | 1,266 | 25 | 75 | 84 | 49 | |
| 5 & 6 | B3 | 210 | Single-Family Detached Housing | 146 DU | 9.52 | 0.19 | 0.56 | 0.63 | 0.37 | 1,390 | 27 | 82 | 92 | 54 | |
| | | | | Total Phase 3 | 313 DU | | | | | 2,980 | 58 | 176 | 197 | 116 | |
| 2, 4, 5, 6, & 7 | | | | Total Phases 1, 2, & 3 | 672 DU | | | | | 6,398 | 125 | 378 | 423 | 249 | |
| Sterling Ranch Updated Traffic Impact Analysis June 5, 2008 | | | | | | | | | | | | | | | |
| 4 | --- | 220 | Apartment | 89 DU | 6.72 | 0.10 | 0.41 | 0.40 | 0.22 | 598 | 9 | 36 | 36 | 19 | |
| 2 | --- | 210 | Single-Family Detached Housing | 234 DU | 9.57 | 0.19 | 0.56 | 0.64 | 0.37 | 2,239 | 44 | 132 | 149 | 87 | |
| 5 | --- | 210 | Single-Family Detached Housing | 82 DU | 9.52 | 0.19 | 0.56 | 0.63 | 0.37 | 781 | 15 | 46 | 52 | 30 | |
| 6 | --- | 210 | Single-Family Detached Housing | 103 DU | 9.52 | 0.19 | 0.56 | 0.63 | 0.37 | 981 | 19 | 58 | 65 | 38 | |
| 7 | --- | 210 | Single-Family Detached Housing | 611 DU | 9.52 | 0.19 | 0.56 | 0.63 | 0.37 | 5,817 | 115 | 344 | 385 | 226 | |
| | | | | Total TAZs 2, 5, 6, & 7 | 1,030 DU | | | | | 9,818 | 193 | 580 | 651 | 381 | |
| Difference in Estimated Trip Generation TAZs 2, 5, 6 & 7 | | | | -311 DU | | | | | | -2,973 | -58 | -176 | -198 | -115 | |

Notes:

- (1) Source: "Trip Generation, 9th Edition, 2012" by the Institute of Transportation Engineers (ITE)
- (2) TAZ = Traffic Analysis Zone from Sterling Ranch Updated Traffic Impact Analysis by LSC June 5, 2008
- (3) DU = dwelling unit

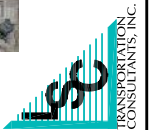


Approximate Scale
Scale: 1" = 3,000'



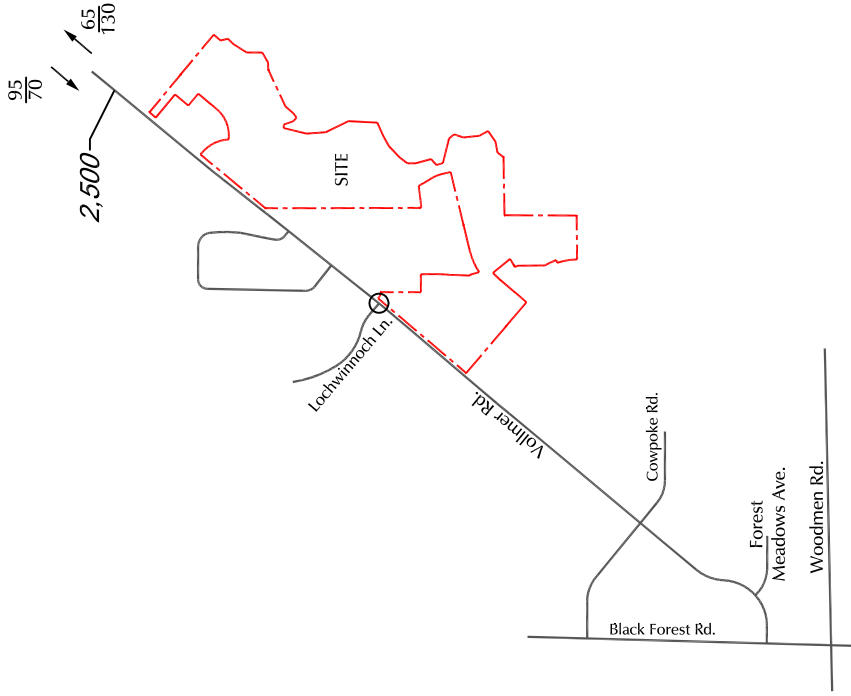
Figure 1
Vicinity
Map

Sterling Ranch (LSC #144010)





Approximate Scale
Scale: 1" = 3,000'



LEGEND:

┆ = Stop Sign

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)

$\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)

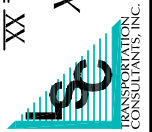
X,XXX = Average Weekday Traffic (vehicles per day) September 2017

*Based on counts conducted September 2017

Figure 2

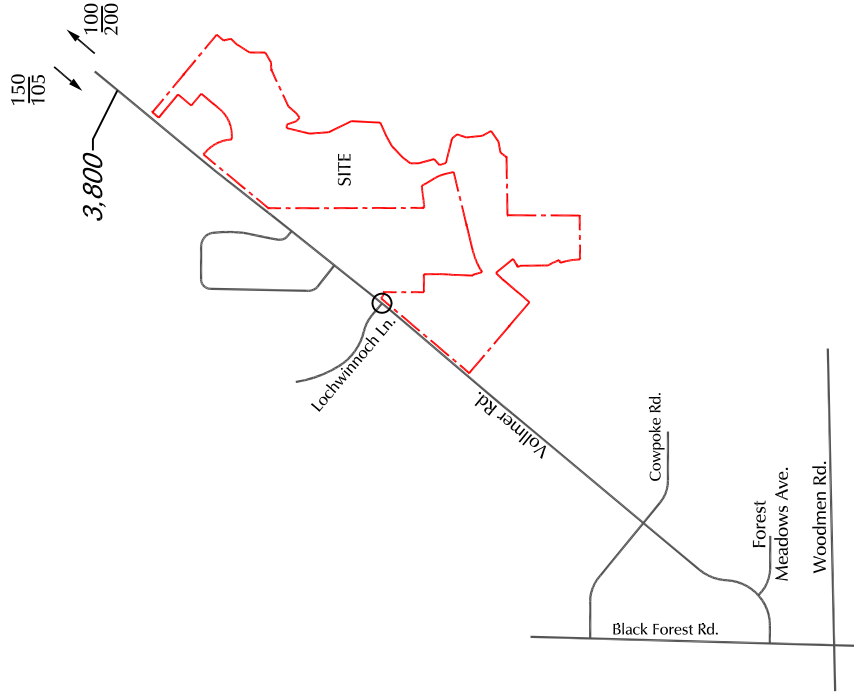
Existing Traffic Volumes

Sterling Ranch (LSC #144010)





Approximate Scale
Scale: 1" = 3,000'



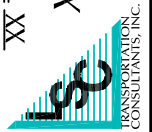
LEGEND:

- $\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
- $\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)
- X,XXX = Average Weekday Traffic (vehicles per day)

Figure 3

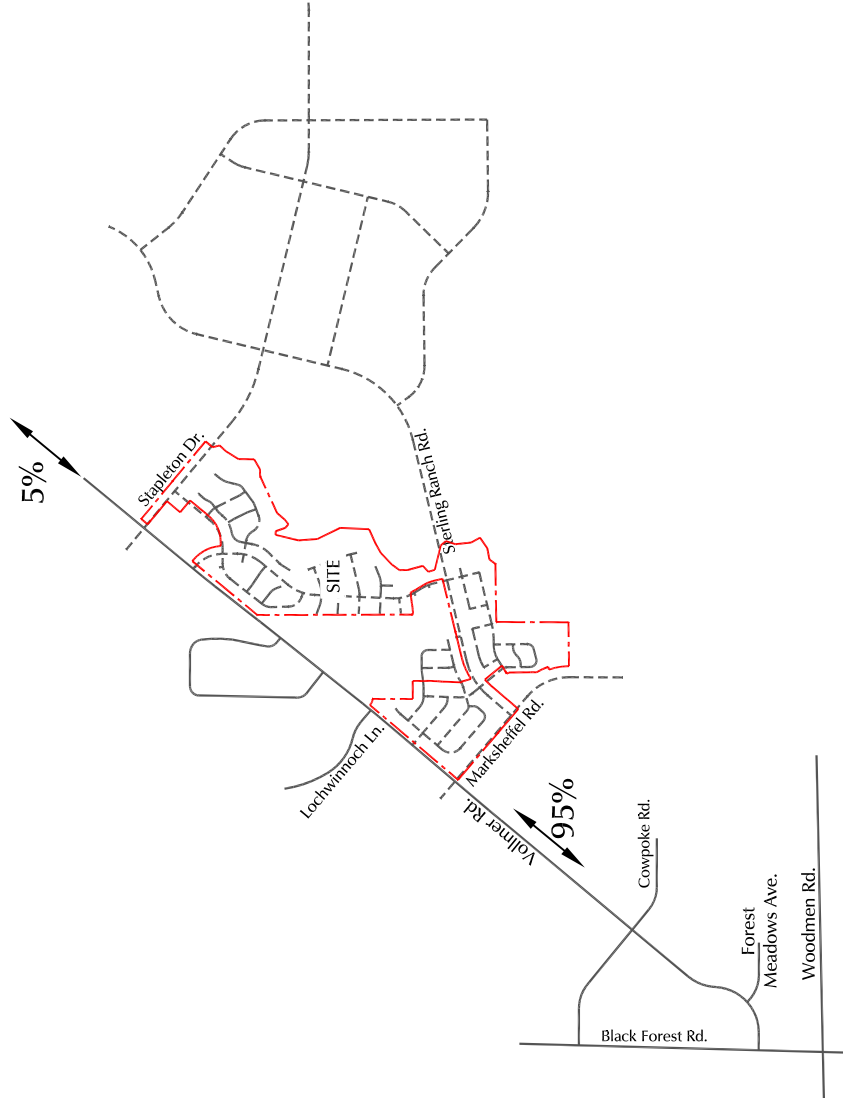
2025 Background Traffic

Sterling Ranch (LSC #144010)





Approximate Scale
Scale: 1" = 3,000'



LEGEND:

↔ 35%

= Percent Directional Distribution

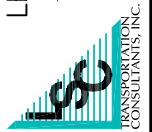


Figure 4

Short-Term Directional Distribution of Site-Generated Traffic

Sterling Ranch (LSC #144010)

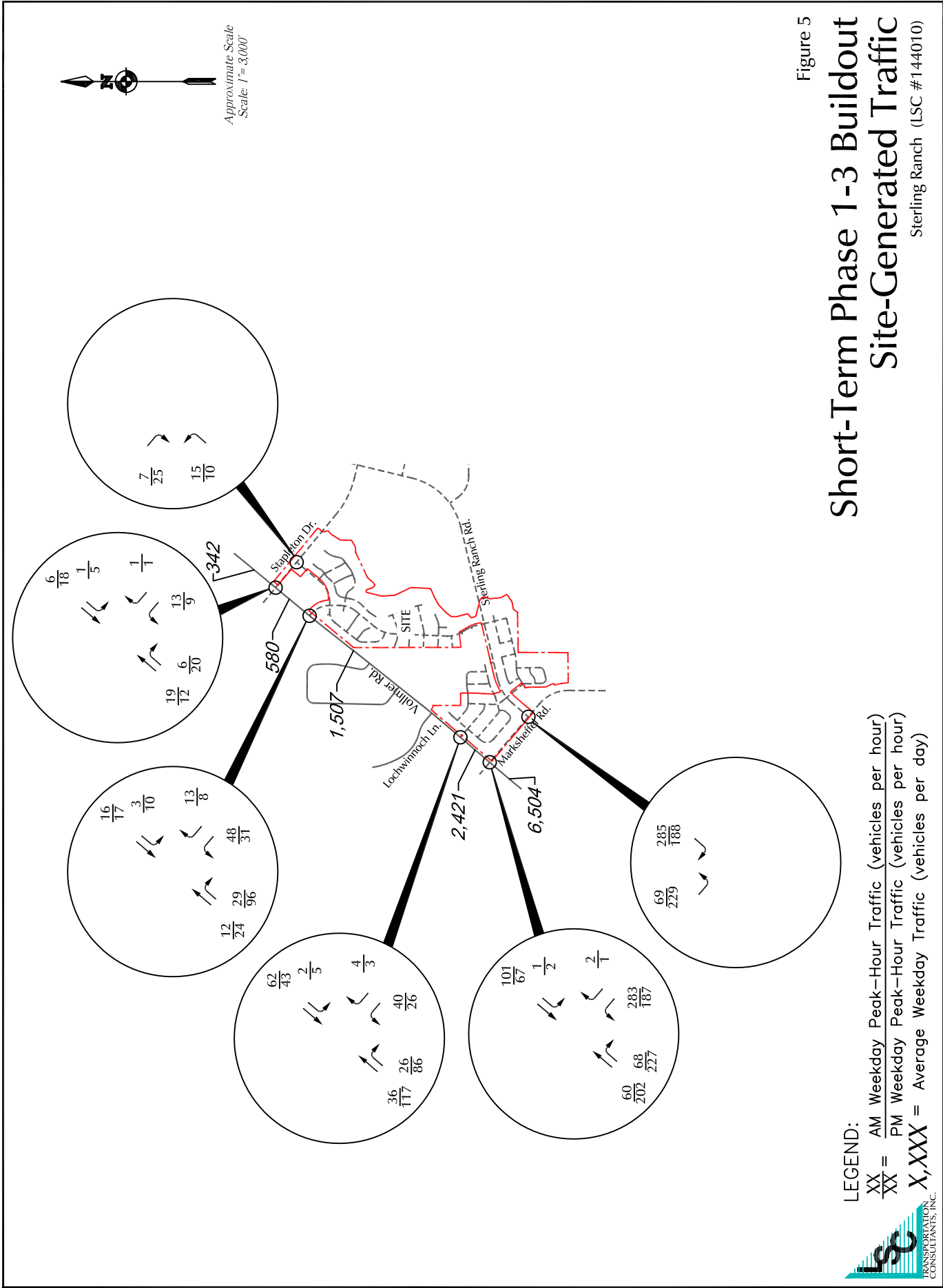
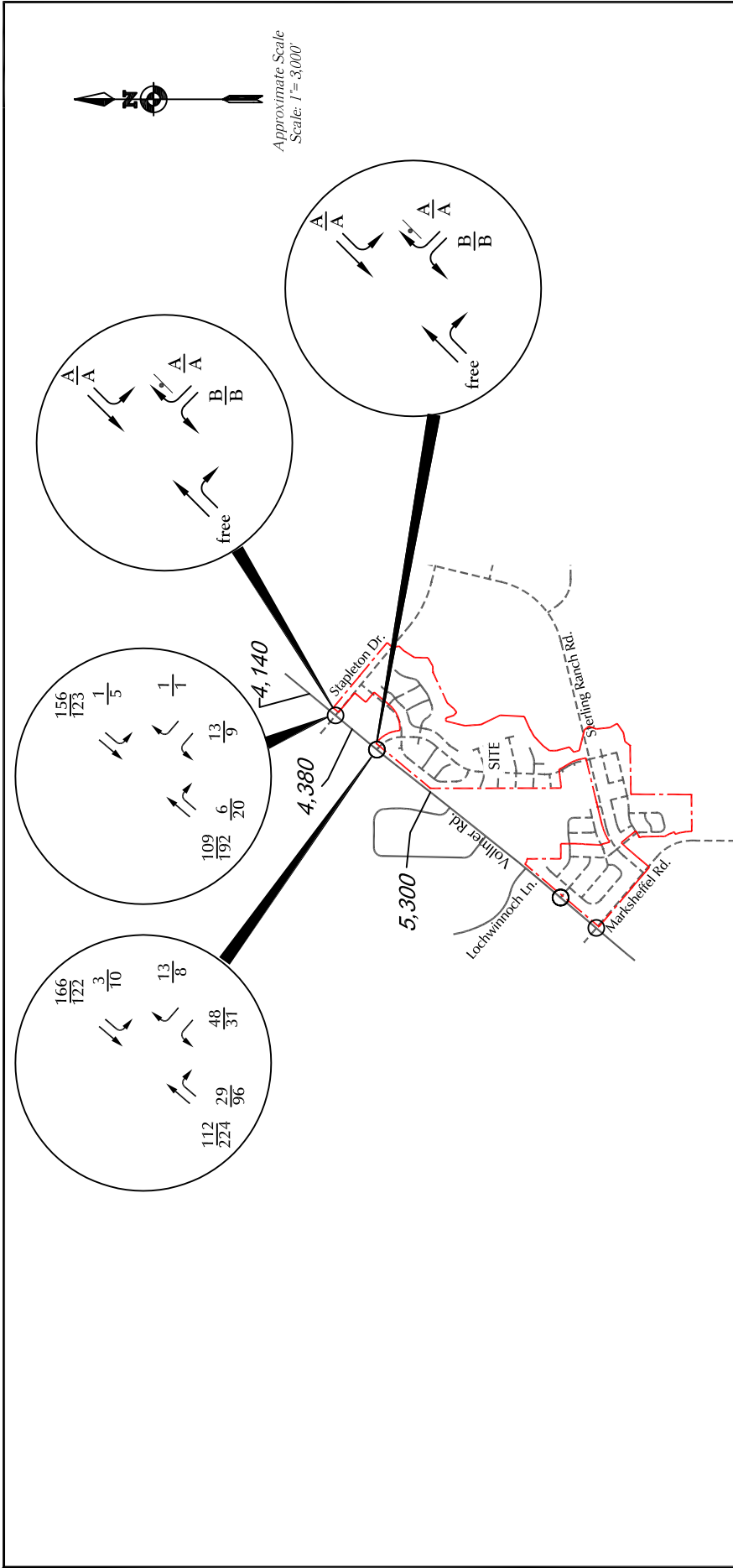


Figure 5
Short-Term Phase 1-3 Buildout
Site-Generated Traffic
 Sterling Ranch (LSC #144010)



LEGEND:

↑ = Stop Sign

$\frac{26}{31}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)

$\frac{109}{192}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)

$\frac{A}{B}$ = AM Individual Movement Peak-Hour Level of Service

$\frac{48}{31}$ = PM Individual Movement Peak-Hour Level of Service

LSC 500 = Average Weekday Traffic (vehicles per day)

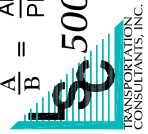
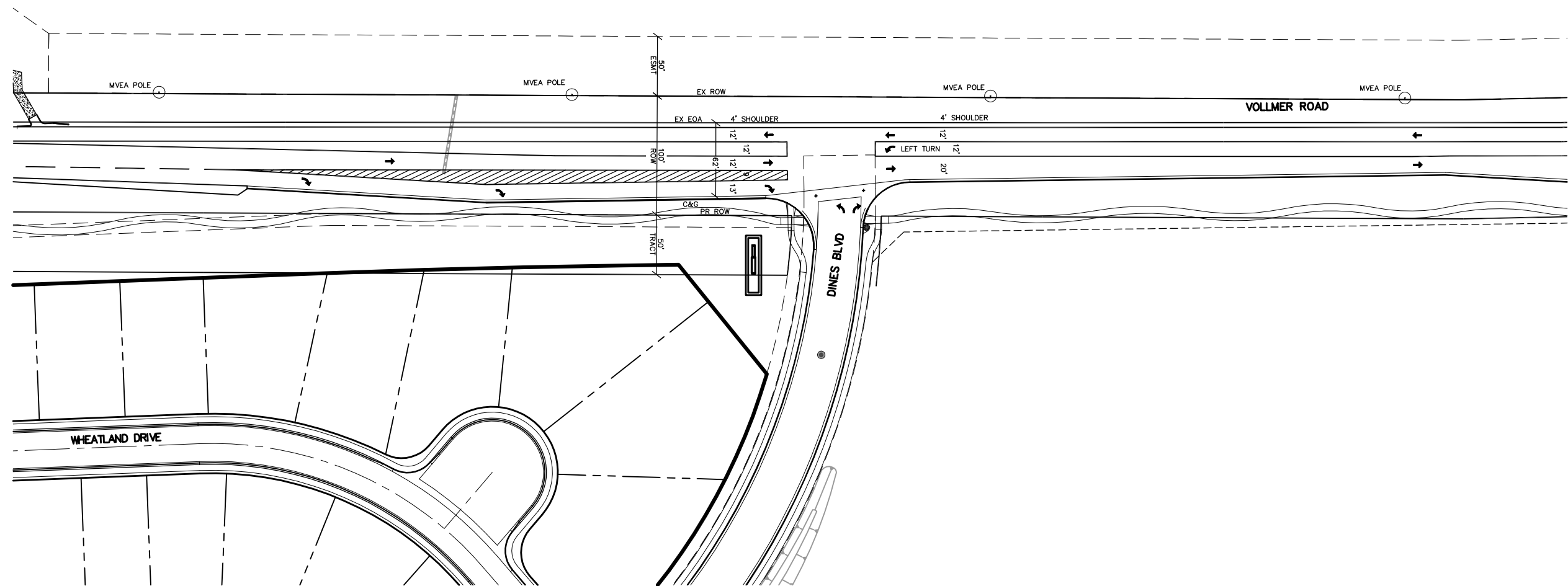
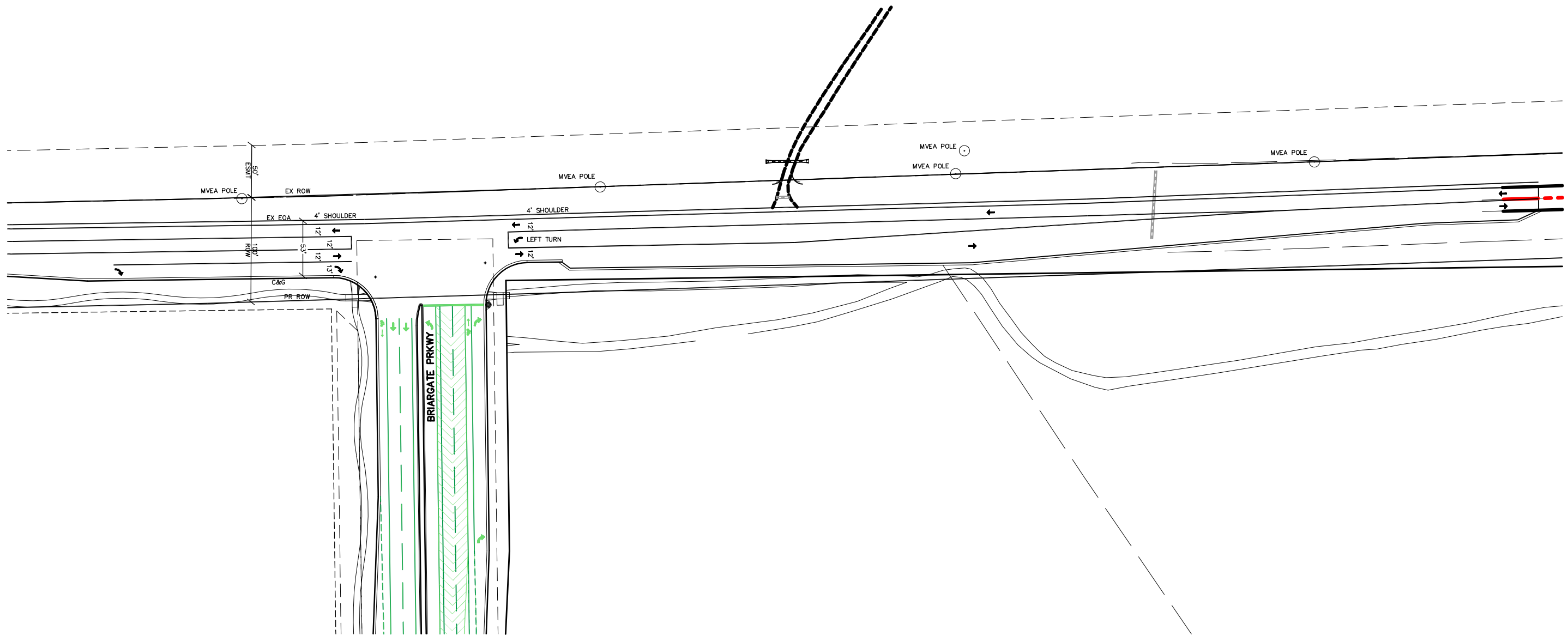


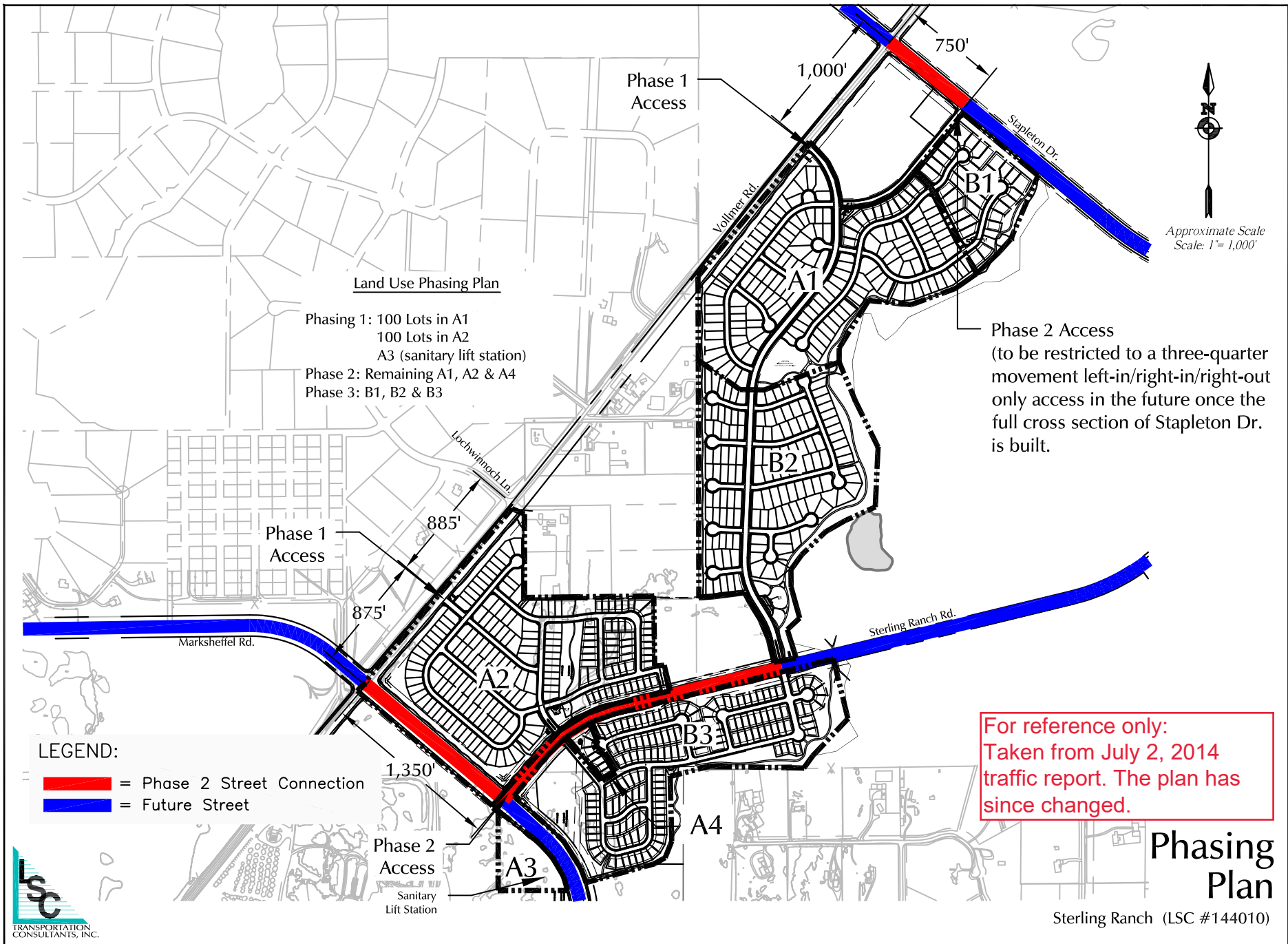
Figure 6

Year 2025 Total Traffic & Intersection Analysis

Sterling Ranch (LSC #144010)







| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 1.7 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ↘ | ↗ | ↑ | ↗ | ↘ | ↑ |
| Traffic Vol, veh/h | 48 | 13 | 112 | 29 | 3 | 166 |
| Future Vol, veh/h | 48 | 13 | 112 | 29 | 3 | 166 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | 235 | 285 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 81 | 81 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 52 | 14 | 122 | 32 | 4 | 205 |

| Major/Minor | Minor1 | Major1 | Major2 | | |
|----------------------|--------|--------|--------|---|-------|
| Conflicting Flow All | 335 | 122 | 0 | 0 | 154 |
| Stage 1 | 122 | - | - | - | - |
| Stage 2 | 213 | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 |
| Pot Cap-1 Maneuver | 660 | 929 | - | - | 1426 |
| Stage 1 | 903 | - | - | - | - |
| Stage 2 | 823 | - | - | - | - |
| Platoon blocked, % | | | | | |
| Mov Cap-1 Maneuver | 658 | 929 | - | - | 1426 |
| Mov Cap-2 Maneuver | 658 | - | - | - | - |
| Stage 1 | 900 | - | - | - | - |
| Stage 2 | 823 | - | - | - | - |

| Approach | WB | NB | SB |
|----------------------|------|----|-----|
| HCM Control Delay, s | 10.5 | 0 | 0.1 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | WBLn2 | SBL | SBT |
|-----------------------|-----|----------|-------|-------|-------|
| Capacity (veh/h) | - | - | 658 | 929 | 1426 |
| HCM Lane V/C Ratio | - | - | 0.079 | 0.015 | 0.003 |
| HCM Control Delay (s) | - | - | 10.9 | 8.9 | 7.5 |
| HCM Lane LOS | - | - | B | A | A |
| HCM 95th %tile Q(veh) | - | - | 0.3 | 0 | 0 |

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 0.5 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ↘ | ↗ | ↑ | ↗ | ↘ | ↑ |
| Traffic Vol, veh/h | 13 | 1 | 119 | 6 | 1 | 156 |
| Future Vol, veh/h | 13 | 1 | 119 | 6 | 1 | 156 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | 235 | 285 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 81 | 81 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 14 | 1 | 129 | 7 | 1 | 193 |

| Major/Minor | Minor1 | Major1 | Major2 | | | |
|----------------------|--------|--------|--------|---|-------|---|
| Conflicting Flow All | 324 | 129 | 0 | 0 | 136 | 0 |
| Stage 1 | 129 | - | - | - | - | - |
| Stage 2 | 195 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver | 670 | 921 | - | - | 1448 | - |
| Stage 1 | 897 | - | - | - | - | - |
| Stage 2 | 838 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | - | - |
| Mov Cap-1 Maneuver | 669 | 921 | - | - | 1448 | - |
| Mov Cap-2 Maneuver | 669 | - | - | - | - | - |
| Stage 1 | 896 | - | - | - | - | - |
| Stage 2 | 838 | - | - | - | - | - |

| Approach | WB | NB | SB |
|----------------------|------|----|----|
| HCM Control Delay, s | 10.4 | 0 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | WBLn2 | SBL | SBT |
|-----------------------|-----|----------|-------|-------|-------|
| Capacity (veh/h) | - | - | 669 | 921 | 1448 |
| HCM Lane V/C Ratio | - | - | 0.021 | 0.001 | 0.001 |
| HCM Control Delay (s) | - | - | 10.5 | 8.9 | 7.5 |
| HCM Lane LOS | - | - | B | A | A |
| HCM 95th %tile Q(veh) | - | - | 0.1 | 0 | 0 |

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 1 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ↘ | ↗ | ↑ | ↗ | ↘ | ↑ |
| Traffic Vol, veh/h | 31 | 8 | 224 | 96 | 10 | 122 |
| Future Vol, veh/h | 31 | 8 | 224 | 96 | 10 | 122 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | 235 | 285 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 93 | 93 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 34 | 9 | 241 | 103 | 10 | 127 |

| Major/Minor | Minor1 | Major1 | Major2 | | |
|----------------------|--------|--------|--------|---|-------|
| Conflicting Flow All | 388 | 241 | 0 | 0 | 344 |
| Stage 1 | 241 | - | - | - | - |
| Stage 2 | 147 | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 |
| Pot Cap-1 Maneuver | 616 | 798 | - | - | 1215 |
| Stage 1 | 799 | - | - | - | - |
| Stage 2 | 880 | - | - | - | - |
| Platoon blocked, % | | | | | |
| Mov Cap-1 Maneuver | 611 | 798 | - | - | 1215 |
| Mov Cap-2 Maneuver | 611 | - | - | - | - |
| Stage 1 | 793 | - | - | - | - |
| Stage 2 | 880 | - | - | - | - |

| Approach | WB | NB | SB |
|----------------------|------|----|-----|
| HCM Control Delay, s | 10.9 | 0 | 0.6 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | WBLn2 | SBL | SBT |
|-----------------------|-----|----------|-------|-------|-------|
| Capacity (veh/h) | - | - | 611 | 798 | 1215 |
| HCM Lane V/C Ratio | - | - | 0.055 | 0.011 | 0.009 |
| HCM Control Delay (s) | - | - | 11.2 | 9.6 | 8 |
| HCM Lane LOS | - | - | B | A | A |
| HCM 95th %tile Q(veh) | - | - | 0.2 | 0 | 0 |

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 0.4 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ↘ | ↗ | ↑ | ↗ | ↘ | ↑ |
| Traffic Vol, veh/h | 9 | 1 | 212 | 20 | 5 | 123 |
| Future Vol, veh/h | 9 | 1 | 212 | 20 | 5 | 123 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | 235 | 285 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 93 | 93 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 10 | 1 | 228 | 22 | 5 | 128 |

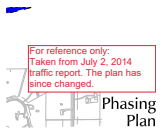
| Major/Minor | Minor1 | Major1 | Major2 | | | |
|----------------------|--------|--------|--------|---|-------|---|
| Conflicting Flow All | 366 | 228 | 0 | 0 | 250 | 0 |
| Stage 1 | 228 | - | - | - | - | - |
| Stage 2 | 138 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver | 634 | 811 | - | - | 1316 | - |
| Stage 1 | 810 | - | - | - | - | - |
| Stage 2 | 889 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | |
| Mov Cap-1 Maneuver | 631 | 811 | - | - | 1316 | - |
| Mov Cap-2 Maneuver | 631 | - | - | - | - | - |
| Stage 1 | 807 | - | - | - | - | - |
| Stage 2 | 889 | - | - | - | - | - |

| Approach | WB | NB | SB |
|----------------------|------|----|-----|
| HCM Control Delay, s | 10.7 | 0 | 0.3 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | WBLn2 | SBL | SBT |
|-----------------------|-----|----------|-------|-------|-------|
| Capacity (veh/h) | - | - | 631 | 811 | 1316 |
| HCM Lane V/C Ratio | - | - | 0.016 | 0.001 | 0.004 |
| HCM Control Delay (s) | - | - | 10.8 | 9.4 | 7.7 |
| HCM Lane LOS | - | - | B | A | A |
| HCM 95th %tile Q(veh) | - | - | 0 | 0 | 0 |

Markup Summary

jchodsdon (1)



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Author: jchodsdon
Date: 10/2/2017 6:50:53 AM
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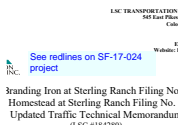
For reference only:
Taken from July 2, 2014 traffic report. The plan has since changed.

dsdrice (2)



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SF-17-025



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Author: dsdrice
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See redlines on SF-17-024 project

dsdparsons (6)



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May 2018



Subject: Callout
Page Label: 4
Author: dsdparsons
Date: 7/24/2018 8:33:39 AM
Color: ■

THE SIA for this plat does not. Which plat's SIA?

Page 1
April 24, 2018
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Author: dsdparsons
Date: 7/24/2018 8:34:10 AM
Color: [Redacted]

Subject: Callout
Page Label: 6
Author: dsdparsons
Date: 7/24/2018 8:34:10 AM
Color: [Redacted]

Should this be in the SIA?