

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

Homestead North Filing No. 3 Traffic Impact Study (LSC #S224250) June 17, 2022

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.

Include Traffic Engineer's signature & date

Developer's Statement

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

4M +

22

Add County Project # "P-22-015"

LSC Responses to TIS Redline Comments

Page: 1

Number: 1 Author: CDurham Subject: Text Box Date: 8/29/2022 16:52:16
Include Traffic Engineer's signature & date
Author: kdferrin Subject: Sticky Note Date: 10/12/2022 12:03:09 LSC Reponse: Revised as requested
LSC Reponse: Revised as requested
Number: 2 Author: CDurham Subject: Text Box Date: 8/29/2022 16:54:18
Add County Project # "P-22-015"
Ruthor: kdferrin Subject: Sticky Note Date: 10/12/2022 12:21:26
LSC Reponse: Revised as requested
Add County Project # "P-22-015"

1

Study-Area Access Plan

The access plan for the current study area is generally consistent with the access plan shown in the master traffic report. The following summarizes the changes: Indicate project # this deviation was approved with

- The Sterling Ranch access to Briargate Parkway just east of Vollmer Road (Wheat and Drive) was previously shown as a right-in/right-out-only intersection in the Sketch Plan. The south leg is now proposed as a three-quarter-movement (left-in/right-in/right-out-only) access. A deviation request for this access point was submitted and approved. The north leg that will serve Homestead North Phase 1 is still proposed to be restricted to right-in/right-out only.
- An additional right-in-only access (Jane Kirkham Drive) is planned from northbound Vollmer Road between Briargate Parkway and the first full-movement site access. The access was part of the Filing 1 application and prior LSC TIS report.

These changes to the plan will result in some localized shifts in intersection turning movements shown in the master traffic study long-term traffic projections, but nothing significant requiring an update to the master study.

CURRENTLY PROPOSED LAND USE AND ACCESS

Land Use and Vehicle Access

Homestead North Fil 3 is planned to include 77 lots for single-family homes. Filing 3 will have access to Vollmer Road and Briargate Parkwayvia the Homestead North Phase 1 street system to the access points approved as part of the Homestead North Filing 1. These access points include a full-movement site access (Sam Bass Drive) to Vollmer Road about 1,410 feet north of Briargate Parkway and 1,370 feet south of Poco Road and an additional right-in-only access (Jane Kirkham Drive) to Vollmer Road 704 feet north of Briargate Parkway and about 704 feet south of Sam Bass Drive.

An access is also planned to Briargate Parkway 750 feet east of Vollmer Road aligning with Wheatland Drive. In the short term, full-movement access will be allowed at this intersection, as only a half section of Briargate Parkway is planned to be constructed between Vollmer Road and Wheatland Drive. Once Briargate Parkway is widened to the full Principal Arterial cross-section **and** the roadway is extended east of Wheatland, the north leg serving Homestead North will be restricted to right-in/right-out only and the south leg will be restricted to three-quarter movements (left-in/right-out only).

The plan shows an "internal" full-movement access to Poco Road about 675 east of Vollmer Road as part of the currently proposed Homestead North Filing 3.

Number: 1 Author: CDurham Subject: Callout Date: 8/30/2022 16:39:27 Indicate project # this deviation was approved with Date: 10/12/2022 13:04:05

Author: kdferrin Subject: Sticky Note Date: 10/12/2022 LSC Response: The additional information has been provided as requested

Sight Distance Analysis

Figure 3 shows a sight distance analysis at the future access to Poco Road. Based on a design speed of 25 miles per hour (mph) and the criteria contained in Table 2-21 of the *El Paso County Engineering Criteria Manual (ECM)*, the required intersection sight distance at the future intersections is 280 feet. Based on the criteria contained in Table 2-17 of the *ECM*, the required stopping sight distance approaching this intersection is 155 feet. As shown in Figure 4, the future intersection analyzed will meet the criteria.

Pedestrian and Bicycle Access

There are no existing schools within two miles of the site. However, there are planned future school sites within the Sterling Ranch Master Plan area south of Briargate Parkway. There are planned sidewalks along the subdivision streets, Vollmer Road, adjacent to the site, and Briargate Parkway. School crossings will be needed at the intersection of Briargate Parkway/Vollmer Road. School crossings should not be allowed at the intersection of Briargate Parkway/Wheatland Drive.

EXISTING ROAD AND TRAFFIC CONDITIONS

Study Area Roadways and Streets

The adjacent streets are shown in Figure 1 and are described below. Copies of the 2016 El Paso County Major Transportation Corridors Plan (MTCP), 2040 Roadway Plan, and 2016 MTCP 2060 Corridor Preservation Plan with the site location identified on each of them have been attached to this report.

Vollmer Road is currently a five-lane urban street within the City of Colorado Springs limits between Black Forest Road and Cowpoke Road; and a two-lane, rural, paved roadway north of Cowpoke Road extending to north of Hodgen Road. In the southbound direction, Vollmer Road has a posted speed limit of 45 miles per hour (mph). South of Cowpoke Road, Vollmer Road has a 40-mph posted speed limit. The *2040 El Paso County Major Transportation Corridors Plan (MTCP)* and the Sterling Ranch master traffic study show Vollmer Road as a four-lane Urban Minor Arterial adjacent to the site. Vollmer Road is planned to transition to a 2-lane Rural Minor Arterial north of Poco Road. In the interim, auxiliary turn lanes will be completed on Vollmer Road at Briargate Parkway as part of the Homestead at Sterling Ranch Filing No. 2 development.

Marksheffel Road is a Principal Arterial extending north from the City of Fountain to Woodmen Road. Marksheffel Road is planned to ultimately be widened to six lanes and extended north and west from Woodmen Road to connect to Research Parkway at Black Forest Road. Marksheffel Road is shown as a six-lane Principal Arterial through the Sterling Ranch Master Plan area on the El Paso County *MTCP*.

Marksheffel Road is not shown on Figure ¹ 1 as stated in first paragraph.

Number: 1Author: CDurhamSubject: Text BoxDate: 9/1/2022 08:15:42Marksheffel Road is not shown on Figure 1 as stated in first paragraph.

Author: kdferrinSubject: Sticky NoteDate: 10/12/2022 13:06:11LSC Response: Figure 1 has been revised to show Marksheffel Road

The intersection of Poco/Vollmer has been analyzed to determine the existing intersection levels of service. The analysis was based on the unsignalized intersection analysis procedures from the *Highway Capacity Manual, 6th Edition*. Figure 4 shows the level of service analysis results. The level of service reports are attached.

All movements at the intersection of Poco/Vollmer are currently operating at LOS B or better during the peak hours.

BACKGROUND (BASELINE) CONDITIONS (SHORT- AND LONG-TERM FUTURE)

Background traffic is the traffic estimated to be on the adjacent roadways and at adjacent intersections without the proposed development's trip generation of site-generated traffic volumes. Background traffic includes the through traffic and the traffic generated by nearby developments but assumes zero traffic generated by Homestead North Phase 1.

Figure 5 shows the projected short-term background traffic volumes at the key area intersections. The short-term background volumes assume a half section of Briargate Parkway has been constructed between Vollmer Road and Wheatland Drive and that full-movement access is permitted at the intersection of Briargate/Wheatland. The short-term background traffic includes the existing traffic volumes (from Figure 3 with the traffic on the east leg of the intersection of Vollmer/Poco removed as most of it was observed to be construction related) plus increases in through traffic due to regional growth, plus traffic estimated to be generated by buildout of the Homestead at Sterling Ranch Filing 2, Branding Iron at Sterling Ranch Filing 2, Sterling Ranch Filing No. 2, Sterling Ranch Phase 2, the Retreat at TimberRidge Filing Nos. 1 and 2 to be located generally northeast of Exhibit shows 2042. Revise to correct year between text and exhibits.

Figure 6 shows the projected 2040 background traffic volumes at the key area intersections. 2040 background traffic volume estimates were based on 2040 volume projections in the *El Paso County Major Transportation Corridors Plan (MTCP)* and previous work completed in the area by LSC, including the *Sterling Ranch Updated Traffic Impact Analysis* by LSC (dated June 5, 2008) and the *Retreat at TimberRidge Updated Traffic Impact Analysis* by LSC (dated January 25, 2018). The 2040 background traffic volumes assume buildout of the Sterling Ranch development, including future phases of Homestead North, and buildout of the Retreat at TimberRidge. The 2040 background traffic assumes Briargate Parkway/Stapleton Road has been constructed between Black Forest Road and Towner Avenue and that the intersection of Briargate/Wheatland is restricted to a three-quarter movement (left-in/right-in/right-out only) for the south leg and right-in/right-out only for the north leg.

 Number: 1
 Author: CDurham
 Subject: Callout
 Date: 9/1/2022 13:56:47

 Exhibit shows 2042. Revise to correct year between text and exhibits.
 Date: 9/1/2022 13:56:47

Author: kdferrinSubject: Sticky NoteDate: 10/12/2022 13:06:25LSC Response: The text has been revised to 2042

TRIP GENERATION

The site-generated vehicle trips were 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 estimates.

Homestead North Filing 3 is projected to generate about 727 new external 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 14 vehicles would enter and 43 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 48 vehicles would enter and 28 vehicles would exit the site.

Make note of difference in traffic from previous reports.

TRIP DISTRIBUTION AND ASSIGNMENT

The directional distribution of the site-generated traffic volumes on the street and roadway system serving the site is one of the most important factors in determining the site's traffic impacts. The specific short-term and long-term distribution estimates are shown in Figure 7. The directional distribution estimates are based on the following factors: the location of the site with respect to the Colorado Springs metropolitan area, the planned access system for the site, the street and roadway system serving the site, the land uses proposed for the site, and the distribution of existing traffic volumes. The short-term distribution estimate assumes only the short section of Briargate Parkway between Vollmer Road and Wheatland Drive has been constructed in the vicinity of the site and the long-term distribution estimate assumes full buildout of the future roadway network in the vicinity of the site.

When the distribution percentages (from Figure 7) are applied to the trip-generation estimates (from Table 1), the resulting site-generated traffic volumes can be determined. Figures 8 and 9 show the short-term and 2040 site-generated traffic volume estimate for Homestead Filing 3. The short-term site-generated traffic volumes assume the intersection of Briargate/Wheatland as an interim full-movement intersection. The long-term site-generated traffic volumes assume the north leg of this intersection has been restricted to right-in/right-out only.

TOTAL TRAFFIC

Short-Term Total Traffic Volumes

Figure 10 shows the projected short-term total traffic volumes at the intersection of Briargate/Vollmer and the site access points. The short-term total traffic volumes are the sum of the short-term background traffic volumes (from Figure 5) and the short-term site-generated traffic volumes (from Figure 8).

 Number: 1
 Author: CDurham
 Subject: Text Box
 Date: 9/1/2022 14:50:42

 Make note of difference in traffic from previous reports.

Author: kdferrin Subject: Sticky Note Date: 10/12/2022 13:06:42 LSC Response: The additional information has been provided as requested

AUXILIARY TURN LANES

- Based on the projected short-term background traffic volumes and the criteria contained in the *El Paso County Engineering Criteria Manual (ECM)*, a northbound right-turn deceleration lane is projected to be warranted on Vollmer Road approaching Sam Bass Drive. This lane, which was required with Homestead North Filing 1, should be 155 feet long plus a 160-foot taper.
- Based on the projected short-term total traffic volumes and the criteria contained in the *El Paso County Engineering Criteria Manual (ECM)*, a northbound right-turn deceleration lane is projected to be warranted on Vollmer Road approaching Poco Road. This lane should be 155 feet long plus a 160-foot taper. State which filing or development will warrant the decel lane.
- Based on the projected short-term and 2040 total traffic volumes and the criteria contained in the *El Paso County Engineering Criteria Manual (ECM)*, a southbound left-turn lanes are **not** projected to be warranted on Vollmer Road approaching Poco Road and Sam Bass Drive. Vollmer Road is planned to be improved to a Minor Arterial cross section south of Poco Road. As left-turn lanes are included in the standard cross section for a Minor Arterial, LSC recommends a southbound left-turn turn lane approaching Sam Bass Drive be included in the design for the Vollmer Road improvements adjacent to the site. The recommended length for this lane is 205 feet plus a 160-foot taper. A left-turn lane is not needed on Vollmer approaching Poco Road as Vollmer is planned to remain a Rural Minor Arterial north of Poco Road.
- Based on the projected 2040 total traffic volumes and the criteria contained in the *El Paso County Engineering Criteria Manual (ECM)*, a westbound right-turn deceleration lane is projected to be warranted on Briargate Parkway approaching Wheatland Drive. This lane should be 235 feet long plus a 200-foot taper.

TRANSPORTATION IMPROVEMENT FEE PROGRAM

The applicant will be required to participate in the Countywide Transportation Improvement Fee Program. These projects will annex into the 10 mil PID, which has a per-lot upfront building permit fee of \$1,221 per dwelling unit. The total building permit fee amount for the 77 lots within Homestead Filing 3 would be \$94,017.

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

Homestead North Filing 3 is projected to generate about 727 new external 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 14 vehicles would enter and 43 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 48 vehicles would enter and 28 vehicles would exit the site.

Number: 1Author: CDurhamSubject: Text BoxDate: 9/1/2022 15:12:30State which filing or development will warrant the decel lane.

 Author: kdferrin
 Subject: Sticky Note
 Date: 10/12/2022 13:17:27

 LSC Response: The additional information has been provided as requested
 Date: 10/12/2022 13:17:27

Level of Service

- In the short term, the intersection of Briargate/Vollmer is projected to operate at a satisfactory level of service as a stop-sign-controlled "T" intersection. By 2040, it was assumed that Briargate Road/Stapleton Road would be extended west to Black Forest Road and east to connect to its current terminus. It was also assumed that the intersection of Briargate/Vollmer would be signal controlled by 2040. This intersection is projected to operate at an overall satisfactory level of service (LOS D or better) as a signalized intersection.
- The proposed site-access points to Vollmer Road and Briargate Parkway are projected to operate at a satisfactory level of service as stop-sign-controlled intersections, based on the short-term and 2040 total traffic volumes and lane geometry shown in Figures 10 and 11.

Recommended Improvements

- A list of all roadway segment improvements in the vicinity of the The location of each roadway segment is identified in Figure 13.
 Figure 13 is missing in appendix.
 Please provide
- Please refer to the Auxiliary Turn Lanes section above for auxiliary turn-lane recommendations. Figures 10 and 11 also show turn lanes as part of the intersection laneage graphics.

* * * * *

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

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

By Jeffrey C. Hodsdon, P.E. Principal

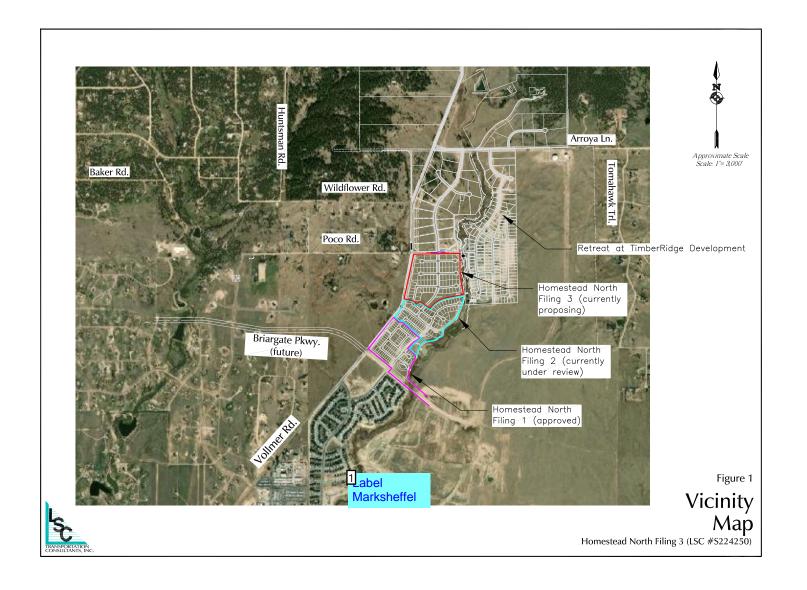
JCH/KDF:jas

Enclosures: Tables 1 and 3 Figures 1-13 TAZ Map MTCP Maps Traffic Count Reports Level of Service Reports

Number: 1 Author: CDurham Subject: Text Box Date: 9/1/2022 15:15:48

Figure 13 is missing in appendix. Please provide

Author: kdferrin Subject: Sticky Note Date: 10/12/2022 13:27:45 LSC Response: Figure 13 has been included with the updated TIS

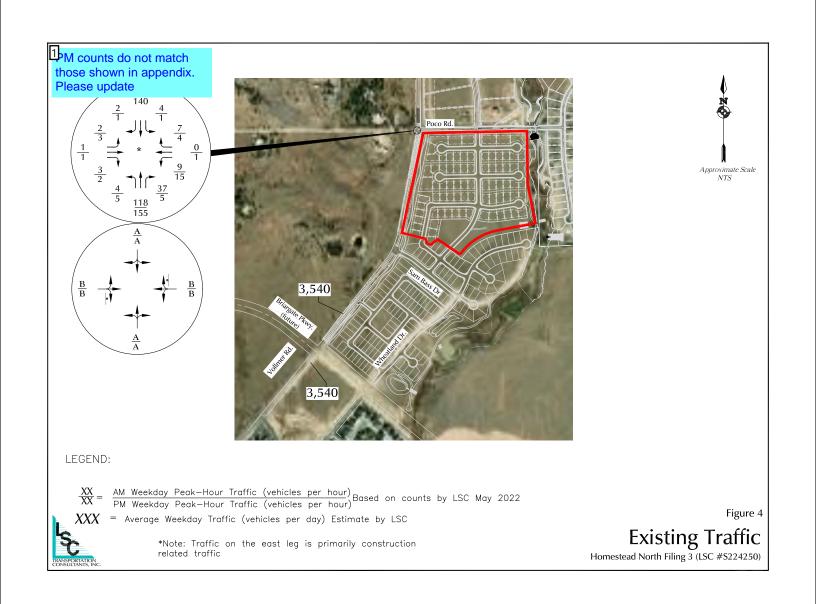


Number: 1 Author: CDurham Subject: Text Box Date: 9/1/2022 15:16:26

Label Marksheffel

Subject: Sticky Note Date: 10/12/2022 13:27:55

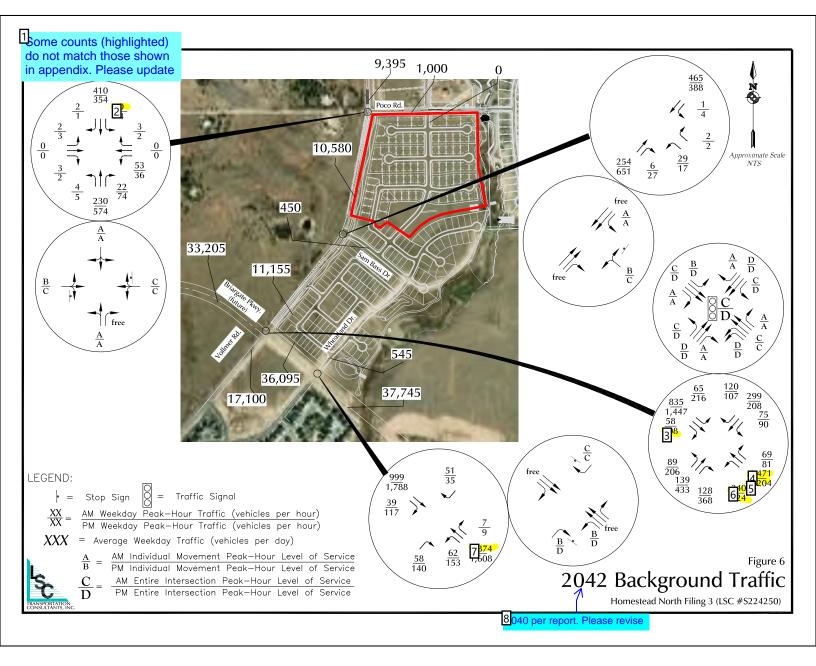
Author: kdferrin Subject: Sticky Note LSC Response: Revised as requested



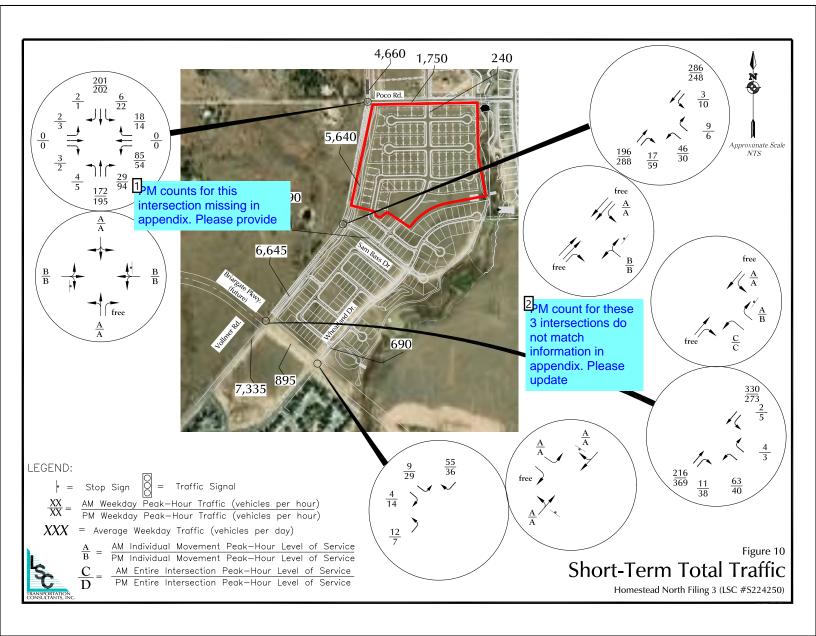
Number: 1 Author: CDurham Subject: Text Box Date: 9/1/2022 15:16:50 PM counts do not match those shown in appendix. Please update

 Author: kdferrin
 Subject: Sticky Note
 Date: 10/21/2022 07:37:51

 LSC Response: The volumes shown on this figure are correct. An incorrect Peak Hour Analysis technical report was inadvertently included in the appendix.
 This page has been replaced with a correct Peak Hour Analysis in the appendix of the revised TIS.



Number: 1	Author: CDurham Subject: Text Box Date: 9/1/2022 15:17:30
Some counts	(highlighted) do not match those shown in appendix. Please update
-Author: k	ferrin Subject: Sticky Note Date: 10/12/2022 13:31:55
LSC Respo	ferrin Subject: Sticky Note Date: 10/12/2022 13:31:55 se: The volumes shown on Figure 6 have been revised and are now consistent with the LOS reports. Second State St
<mark>∕∕</mark> Number: 2	Author: CDurham Subject: Highlight Date: 9/1/2022 15:17:35
A Number 2	Authors Churcham Subjects Highlight Dates 0/1/2022 15:17:54
<u>/ Number: 3</u>	Author: CDurham Subject: Highlight Date: 9/1/2022 15:17:54
🕖 Number: 4	Author: CDurham Subject: Highlight Date: 9/1/2022 15:17:48
🥕 Number: 5	Author: CDurham Subject: Highlight Date: 9/1/2022 15:17:50
Number: 6	Author: CDurham Subject: Highlight Date: 9/1/2022 15:17:46
Number: 7	Author: CDurham Subject: Highlight Date: 9/1/2022 15:17:40
Number: 8	Author: CDurham Subject: Callout Date: 9/1/2022 15:19:44
2040 per report.	Please revise
Author: k	
– LSC Respo	se: The text has been revised to indicate the long term year studies is 2042



Number: 1Author: CDurhamSubject: Text BoxDate: 9/1/2022 15:18:44PM counts for this intersection missing in appendix. Please provide

 Author: kdferrin
 Subject: Sticky Note
 Date: 10/12/2022 13:33:13

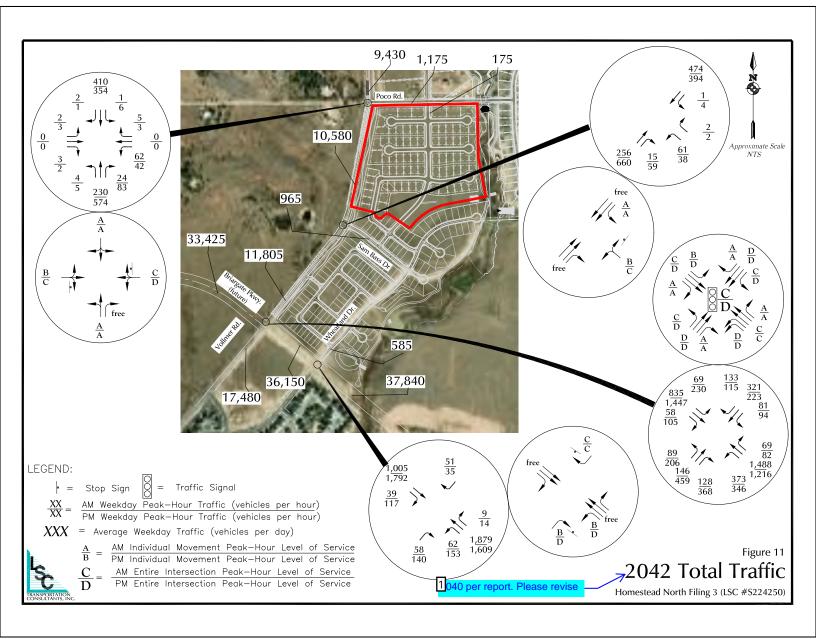
 LSC Response: The Short-Term Total PM Peak Hour LOS report has been included in the updated TIS

Number: 2 Author: CDurham Subject: Text Box Date: 9/1/2022 15:19:26

PM count for these 3 intersections do not match information in appendix. Please update

Author: kdferrin Subject: Sticky Note Date: 10/12/2022 13:33:45

LSC Response: Updated Short-Term LOS reports have been included in the updated TIS that are consistent with the volumes shown in Figure 10



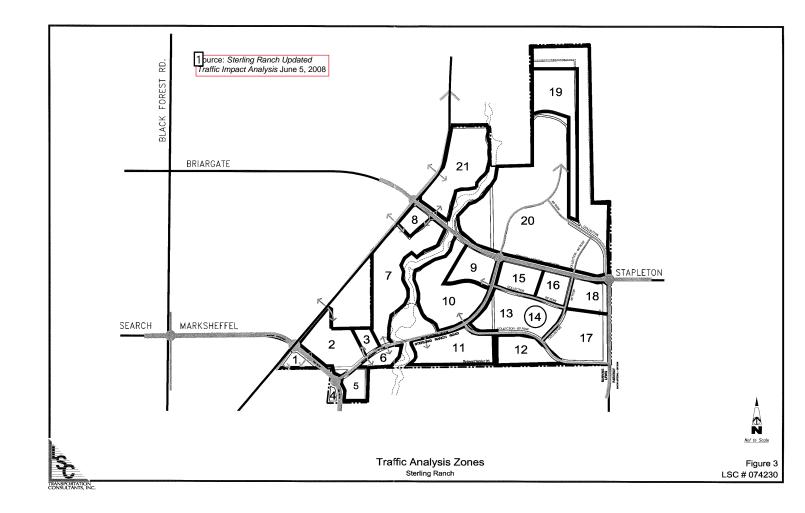
Number: 1 Author: CDurham Subject: Callout Date: 9/1/2022 15:20:07

2040 per report. Please revise

It Date: 5/ 1/2022 15:20:07

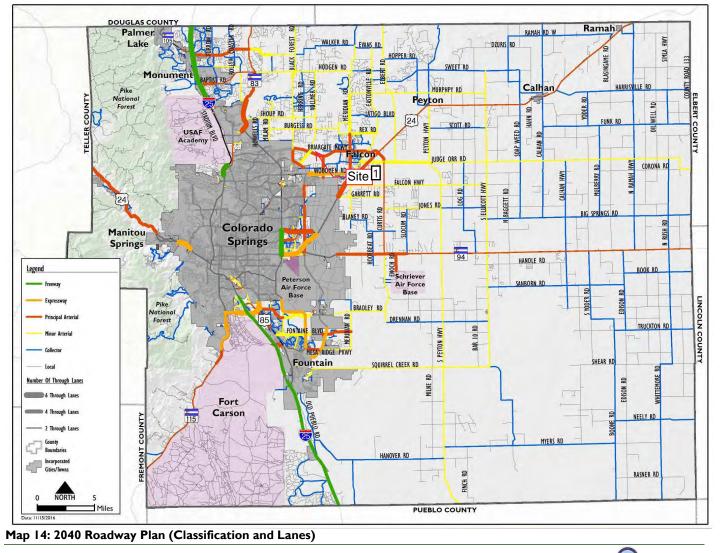
 Author: kdferrin
 Subject: Sticky Note
 Date: 10/12/2022 13:34:22

 LSC Response: The text has been revised to indicate the long term year studies is 2042
 Date: 20/12/2022 13:34:22



 Number: 1
 Author: Kirstin
 Subject: Text Box
 Date: 6/10/2020 09:26:58

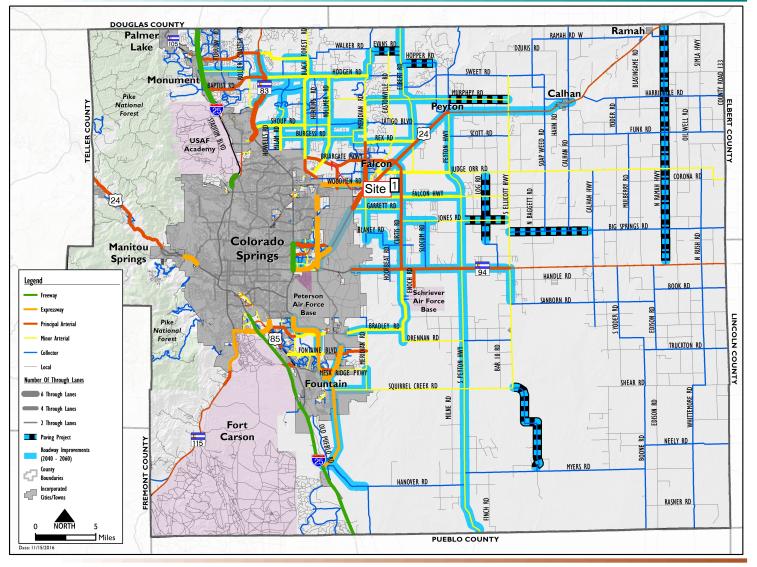
 Source: Sterling Ranch Updated Traffic Impact Analysis June 5, 2008



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EL PASO COUNTY

Number: 1 Author: Kirstin Subject: Callout Date: 7/20/2020 09:11:56



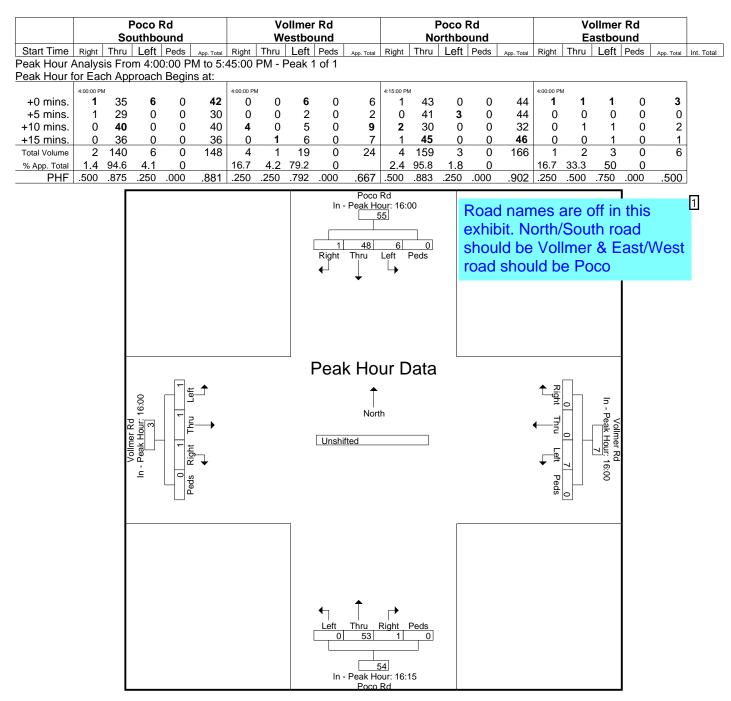
Map 17: 2060 Corridor Preservation

Number: 1 Author: Kirstin Subject: Callout Date: 7/20/2020 09:12:15

LSC Transportation Consultants, Inc.

2504 E. Pikes Peak Ave, Suite 304 Colorado Springs, CO 80909 719-633-2868

> File Name : Vollmer Rd - Poco Rd PM Construction Site Code : S224250 Start Date : 5/11/2022 Page No : 3



 Number: 1
 Author: CDurham
 Subject: Text Box
 Date: 9/1/2022 09:21:56

 Road names are off in this exhibit. North/South road should be Vollmer & East/West road should be Poco

 Author: kdferrin
 Subject: Sticky Note
 Date: 10/21/2022 07:40:47

 LSC Response: This page has been removed and replaced with the correct Peak Hour Analysis (see our response to the comment on page 25).

1

Intersection

Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		1	1	٦	^
Traffic Vol, veh/h	11	6	358	27	10	291
Future Vol, veh/h	11	6	358	27	10	291
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	-	-	155	205	-
Veh in Median Storage	,# 0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	7	421	32	12	342

Major/Minor	Minor1	Ν	lajor1	Ν	/lajor2	
Conflicting Flow All	616	211	0	0	453	0
Stage 1	421	-	-	-	-	-
Stage 2	195	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	422	794	-	-	1104	-
Stage 1	630	-	-	-	-	-
Stage 2	819	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuve		794	-	-	1104	-
Mov Cap-2 Maneuve	r 417	-	-	-	-	-
Stage 1	630	-	-	-	-	-
Stage 2	810	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.5	0	0.3
HCM LOS	В		

Minor Lane/Major Mvmt	NBT	NBRW	/BLn1	SBL	SBT	
Capacity (veh/h)	-	-	501	1104	-	
HCM Lane V/C Ratio	-	-	0.04	0.011	-	
HCM Control Delay (s)	-	-	12.5	8.3	-	
HCM Lane LOS	-	-	В	А	-	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

 Number: 1
 Author: CDurham
 Subject: Text Box
 Date: 9/1/2022 09:34:42

 Missing PM Short-Term Total for Vollmer & Poco. Please provide

Author: kdferrin Subject: Sticky Note Date: 10/12/2022 13:38:43 LSC Response: Included as requested