



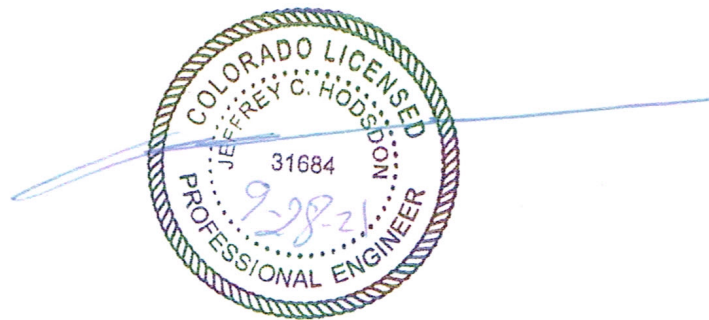
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Waterbury Filing Nos. 1 and 2  
Traffic Impact Analysis  
(LSC #204220)  
September 28, 2021

LSC Responses to  
EPC TIS Redline  
Comments<sup>1</sup>

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.

Pat R. Warr


9/29/21  
Date

# LSC Responses to TIS Redline Comments

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Page: 1

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 Number: 1      Author: jchodsdon    Subject: Text Box    Date: 3/11/2022 16:09:24

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LSC Responses to EPC TIS Redline Comments

- *Waterbury Filing No. 1 Updated Traffic Impact Study*, January 6, 2014
- *Waterbury Phase 1 Filing Nos. 2 and 3 Updated Traffic Impact Analysis*, October 16, 2017
- *Waterbury Phase 2 Preliminary Plan Traffic Impact Analysis*, August 3, 2017

This report is an update to the Preliminary Plan Phase 1 reports.

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

## LAND USE AND ACCESS

(Table 1 in  
Appendix)

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### Site Plan

Figure 2 shows the location of the entire Waterbury PUD development as well as the location of the currently proposed Filing Nos. 1 and 2. The currently proposed filings are planned to include 201 lots for single-family homes. This is five more lots than was assumed in the 2013 traffic study for the same area (the Phase 1 Preliminary Plan area). Access for these filings will be to a new full-movement intersection (Saybrook Road) on Stapleton Road 1,150 east of Bandanero Drive. Copies of approved deviations to the *El Paso County Engineering Criteria Manual (ECM)* have been attached. In the future, Filing Nos. 1 and 2 will have additional access through the remaining Waterbury PUD development area to Eastonville Road and the future Dumont Drive.

### Sight Distance Analysis

Figure 3 shows sight-distance analysis at the proposed public street intersection to Stapleton Drive (Saybrook Road). Per the *El Paso County Engineering Criteria Manual ECM* Table 2-21, the required intersection sight distance at Saybrook Road is 555 feet, based on a design speed of 50 mph for Stapleton Drive. As shown in Figure 3, this requirement is met in both directions.


The required stopping sight distance from *ECM* Table 2-17 is 445 feet. As shown in Figure 3 this requirement is met in both directions.

### Pedestrian and Bicycle Accommodations

There are two existing schools located within two miles of the site, Falcon High School and Meridian Ranch Elementary. A future K-8 school site is located just north of Falcon High School. These schools are located north of Londonderry Drive and west of Eastonville Road. There is also a regional park located northwest of the site.


Figure 4 shows the school pedestrian routes. There are currently no sidewalks on Stapleton Drive and on Eastonville Road.

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 Number: 1      Author: dsdrice      Subject: Callout      Date: 11/17/2021 09:52:53

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[\(Table 1 in Appendix\)](#)

 Author: jchodsdon      Subject: Sticky Note      Date: 3/11/2022 16:10:18

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LSC Response: Corrected/clarified in the updated TIS.

## **TOTAL TRAFFIC**

Figure 11 shows the projected short-term (Year 2021) total traffic volumes. The short-term total traffic volumes are the sum of the short-term background traffic volumes (from Figure 6) plus the short-term site-generated traffic volumes (from Figure 9).

Figure 12 shows the projected 2040 total traffic volumes. The 2040 total traffic volumes are the sum of the 2040 background traffic volumes (from Figure 7) plus the long-term site-generated traffic volumes (from Figure 10).

## **PROJECTED LEVELS OF SERVICE**

The key area intersections have been analyzed to determine the projected future levels of service based on the unsignalized method of analysis procedures from the *Highway Capacity Manual, 6<sup>th</sup> Edition* by the Transportation Research Board and Synchro signalized intersection procedures. Based on the criteria contained in the *ECM*, a peak hour factor of 0.85 was used for the short-term (Year 2021) analysis except for those intersections whose existing peak hour factor calculated from traffic counts conducted by LSC was higher than 0.85. In those cases, the existing peak hour factor was used. A peak hour factor of 0.95 was used for the long-term (Year 2040) analysis, except for the southbound through traffic on US Hwy 24 during the morning peak hour and the northbound through traffic on US Hwy 24 in the afternoon peak hour. Based on the existing peak hour factor and high traffic volumes projected for these movements, a future peak hour factor of 0.98 was used. The results of the analysis are contained in Figures 6, 7, 11, and 12. The level of service reports are attached.

### **Stapleton/Saybrook**


The full-movement site access to Stapleton Drive (Saybrook Road) is projected to operate at a LOS C or better for all movements during the peak hours as a stop-sign controlled "T" intersection based on the projected short-term total traffic volumes. By 2040 it was assumed that Stapleton Drive would be constructed to its full cross section, a south leg would be added to the Stapleton/Saybrook Road to serve a future commercial development. Based on the 2040 total traffic volumes and the lane geometry shown in Figure 12 the minor approach movements are projected to operate at LOS F during the afternoon peak hour if this intersection remains stop-sign controlled. If this intersection is converted to traffic signal control all movements at this intersection are projected to operate at LOS D or better during the peak hours.

(It might not be likely that a full-movement intersection is allowed here if Dumont to the east is constructed.)

### **Stapleton/Eastonville**


The eastbound approach at the intersection of Stapleton/Eastonville is currently operating at LOS F during the morning peak hour. A PPRTA project is currently planned to improve Eastonville Road in the vicinity of the site. However, the timing of this project is unknown. The eastbound and westbound approaches at this intersection are projected to operate at LOS F

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 Number: 1      Author: dsdrice      Subject: Text Box      Date: 11/17/2021 11:43:19

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(It might not be likely that a full-movement intersection is allowed here if Dumont to the east is constructed.)

 Author: jchodsdon      Subject: Sticky Note      Date: 3/11/2022 16:12:54

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LSC Response: A deviation for a full movement was previously approved. As per the comment below, the deviation is being resubmitted on the current deviation form.

adjacent to the site. However, by 2040, it may be necessary to provide two northbound and southbound through lanes to achieve an acceptable level of service.

**1**  
Provide preliminary roundabout design for Saybrook/Sunken Meadow in this or a separate report

### **Rex/Eastonville**

In the short term, it was assumed that a new section of Rex Road would be constructed from Eastonville Road through the Grandview Reserve sketch plan area to US Hwy 24. It was assumed that the section of Rex Road just west of Eastonville Road through the Meridian Ranch development was not yet constructed. The intersection of Rex/Eastonville is projected to operate at LOS B or better for all movements during the peak hours as a stop sign-controlled "T" intersection, based on the projected short-term total traffic volumes.

By 2040, it was assumed that Rex Road would be completed between Meridian Road and US Hwy 24. Based on the projected 2040 total traffic volumes, the intersection of Rex/Meridian is projected to operate at LOS F for some of the minor approach volumes, if it is stop-sign-controlled. If this intersection is constructed as a one-lane modern roundabout or if it is traffic-signal-controlled, all movements are projected to operate at LOS D or better during the peak hours.

### **TRAFFIC SIGNAL WARRANT ANALYSIS**

The intersections of Stapleton/Eastonville and Stapleton/US Hwy 24 were analyzed to determine when Four-Hour Vehicular Volume Traffic-Signal Warrant thresholds would be reached or exceeded, based on the projected short-term peak-hour traffic volumes. The satisfaction of warrants does not indicate that a signal must be installed. The decision to require a signal to be installed rests with the County (or CDOT in the case of US Highway 24/Stapleton).


### **Stapleton/Eastonville**

Table 3 shows the results of the analysis for the intersection of Stapleton/Eastonville. The minor approach volumes were assumed to include either the eastbound left-turn, through, and right-turn movements or the westbound left-turn and through movements (the right-turn movements were excluded, as there is an exclusive right-turn lane). Even if the threshold is met, based on both the eastbound and westbound approaches, it would only be considered to be met once for that hour. As shown in the Table 3, the thresholds for a Four-Hour Vehicular Volume Traffic-Signal Warrant are **not** projected to be met, based on the projected short-term (Year 2021) total traffic volumes.

### **Stapleton/US Hwy 24**

Table 4 shows the signal warrant analysis for the intersection of Stapleton/US Hwy 24, based on the existing (2019) traffic volumes. The analysis assumes the minor approach includes the higher of either the southbound (Stapleton Drive) left-turn and through movements or northbound

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 Number: 1 Author: CDurham Subject: Text Box Date: 11/1/2021 11:05:11 -06'00'

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[Provide preliminary roundabout design for Saybrook/Sunken Meadow in this or a separate report](#)

 Author: jchodsdon Subject: Sticky Note Date: 3/11/2022 16:14:05

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LSC Response: This is included in the updated TIS as requested. Also, please refer to LSC response to the comment letter comment.



Improvements at Stapleton Drive/Dumont Drive will be completed later—either with 4 Way Ranch commercial development or future Waterbury subdivision filings—showing the completion of Dumont north of Stapleton and the connection to Stapleton on the north side.

**g. Stapleton Drive: Design, construction, contribution, and/or escrow of funds for the second two lanes of Stapleton Drive from Eastonville Road to Highway 24.**

Stapleton Drive expansion to four lanes would not be necessary with the currently proposed filings or overall PUD site-generated traffic alone. The expansion to four lanes would be needed with significant additional background traffic. There is an intergovernmental agreement in place which documents the responsibility of the 4 Way Ranch Metro District for the second two lanes of Stapleton Drive. This IGA essentially functions like a SIA. Table 5 presents the calculated percentage contribution for Filings 1 and 2 toward the future Stapleton improvements.

## **DEVIATION REQUESTS**

A deviation request to the criteria for the typical Urban Residential Collector Cross Section contained in the *El Paso County Engineering Criteria Manual (ECM)* criteria will be submitted for Saybrook Road as part of this application. The deviation request is to allow partial turn movement direct access for lots adjacent to Saybrook Road. The proposed modified cross section will allow for needed access while preserving operation of through movements.

## **CONCLUSIONS AND RECOMMENDATIONS**

### **Trip Generation**

- Waterbury Filing Nos. 1 and 2 is expected to generate about 1,897 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, about 37 vehicles would enter and 112 vehicles would exit the site. During the afternoon peak hour, about 125 vehicles would enter and 74 vehicles would exit the site.


### **Level of Service**

The intersection of Saybrook/Stapleton is projected to operate at an acceptable level of service in the short-term as a stop-sign controlled “T” intersection. By 2040 it was assumed that Stapleton Drive would be constructed to its full cross section, a south leg would be added to the Stapleton/Saybrook Road to serve a future commercial development. Based on the 2040 total traffic volumes and the lane geometry shown in Figure 12 the minor approach movements are projected to operate at LOS F during the afternoon peak hour if this intersection remains stop-sign controlled. If this intersection is converted to traffic signal control all movements at this intersection are projected to operate at LOS D or better during the peak hours.

two additional  
deviation requests?


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 Number: 1    Author: dsdrice    Subject: Callout    Date: 11/17/2021 11:23:16

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[two additional deviation requests?](#)

 Author: jchodsdon    Subject: Sticky Note    Date: 3/11/2022 16:14:33

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LSC Response: Included with the resubmittal as requested.

Table 6 Waterbury Filing Nos. 1 and 2 Roadway Improvements				
Item #	Improvement	Trigger	Timing	Responsibility
Roadway Segment Improvements				
1	Eastonville - Stapleton to Latigo final grading and paving	dependent on PPRTA funding priorities	TBD by EPC; PPRTA "A-List" Project	PPRTA
2	Eastonville - Stapleton to Londonderry upgrade to Rural Minor Arterial (per MUTCD)	average daily traffic > 6,000 vehicles per day	dependent on PPRTA funding priorities	PPRTA
3	Eastonville - Londonderry to future Waterbury access upgrade from unimproved roadway to Rural Minor Arterial (per MUTCD)	average daily traffic > 300 vehicles per day	With future Waterbury filings or Initial Grandview Reserve filings or Construction of Rex to Eastonville	PPRTA or developers with free reimbursement
4	Eastonville - Stapleton to Grandview Reserve south boundary upgrade to Rural Minor Arterial (per MUTCD)	average daily traffic > 20,000 vehicles per day	dependent on PPRTA funding priorities	PPRTA Grandview and other area developments if/when
5	Stapleton Drive - US Hwy 24 to Eastonville Road complete southern (eastbound) half	average daily traffic > 18,000 vehicles per day	Shown in 2040 MTCP	El Paso County west of Eastonville Road; 4 Way Ranch Metro District east of Eastonville Road.
6	Widen US Hwy 24 to provide two lanes in each direction	dependent on CDOT funding priorities	Shown in US Highway 24 PEL Study; 2040 MTCP	CDOT
Stapleton/US Hwy 24 Intersection				
7	Convert from Two-Way, Stop-Sign Control to Signal Control	When Traffic Signal Warrant(s) are met. The decision on timing of traffic signal installation rests with the Colorado Department of Transportation	anticipated in the short-term	CDOT; along with any available escrow collected from area developments through the access permitting process.
8	Add dual left-turn lanes	As needed with future developments (Will require Items 5, 6, and 7 to be completed)	Future	Area developments as required
9	Potential long-term capacity upgrades (jughandle, a Jr Interchange, etc.)	When level of service degrades below acceptable levels	Shown in US Highway 24 PEL Study;	CDOT; along with any available escrow collected from area developments, including this project, through the access permitting process.
Eastonville/Stapleton				
10	Construct northbound and southbound left-turn lanes on Eastonville Rd. approaching Stapleton Dr.	- - -	Short-Term	PPRTA/El Paso County <sup>(1)</sup>
11	Signalization of the intersection of Stapleton/Eastonville.	Once warrants are met. The decision on timing of traffic signal installation rests with El Paso County Public Works.	anticipated in the short-term	eligible intersection under the fee impact program
Stapleton/Saybrook Intersection				
12	Constructed an eastbound left-turn lane on Stapleton Dr approaching Saybrook. This lane should be 335 feet long plus a 200-foot taper.	eastbound left-turn volume > 10 vph	With Waterbury Filing Nos. 1 and 2	Waterbury
13	Constructed a westbound right-turn deceleration lane on Stapleton Dr approaching Saybrook. This lane should be 235 feet long plus a 200-foot taper.	westbound right-turn volume > 25 vph	With Waterbury Filing Nos. 1 and 2	Waterbury
14	Constructed a westbound right-turn acceleration lane on Stapleton Dr at Saybrook. This lane should be 760 feet long plus a 180-foot taper.	southbound right-turn volume > 50 vph	With Future Waterbury Filings	Waterbury
15	Convert from Two-Way, Stop-Sign Control to Signal Control	When Traffic Signal Warrant(s) are met. The decision on timing of traffic signal installation rests with El Paso County	Future (Likely with commercial development on the south side of Stapleton)	Waterbury and/or other area developments
Notes:				
(1) The design of Eastonville Road will be performed by the Meridian Ranch developer. LSC anticipates that these turn lanes will be included in the project design. The project will be constructed by El Paso County as PPRTA project.				
Source: LSC Transportation Consultants, Inc. (September 2021)				

Fee


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 Number: 1      Author: CDurham    Subject: Callout    Date: 11/1/2021 10:38:46 -06'00'

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Fee

 Author: jchodsdon    Subject: Sticky Note    Date: 3/11/2022 16:14:50

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LSC Response: Corrected in the updated TIS.

**Applicant and Engineer Declaration:**

I, of my knowledge, the information on this application and all additional or supplemental documentation is true and complete. I am fully aware that any misrepresentation of any information on this application may be cause for denial. I have familiarized myself with the rules, regulations and procedures with respect to preparing and submitting this application. I also understand that an incorrect submittal will be cause to have the project removed from the agenda of the Planning Commission, Board of County Commissioners and/or Board of Adjustment or delay review, and that my approval of this application is based on the representations made in the application and may be revoked at any time for each of representation or condition(s) of approval.

\_\_\_\_\_  
Signature of owner (or authorized representative)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of applicant (if different from owner)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Engineer

\_\_\_\_\_  
Date

\_\_\_\_\_  
Seal



**1 All deviations need to be resubmitted for review on the updated forms as this is a new project.**

**ECM Recommendation:**

**Recommended by the ECM Administrator**

\_\_\_\_\_  
Date

It has been determined to have met the criteria for approval. A deviation from Section \_\_\_\_\_ of ECM is hereby granted based on the justification provided. Comments:

\_\_\_\_\_  
Additional comments or information are attached.

**Not Recommended by the ECM Administrator**

\_\_\_\_\_  
Date

It has been determined not to have met criteria for approval. A deviation from Section \_\_\_\_\_ of ECM is hereby denied. Comments:

\_\_\_\_\_  
Additional comments or information are attached.

County Procedures Manual

Form # R-FM-051-07

Effective Date: 12/31/07

Issued: 00/00/00


No. \_\_\_\_\_

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 Number: 1      Author: dsdrice      Subject: Text Box      Date: 11/17/2021 11:33:08

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All deviations need to be resubmitted for review on the updated forms as this is a new project.

 Author: jchodsdon      Subject: Sticky Note      Date: 3/11/2022 16:15:34

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LSC Response: Included with the resubmittal as requested.