

LSC Responses to EPC Traffic Impact Study_V2 comments

P.J. Anderson
Falcon Field

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December 15, 2021
Traffic Impact Study

- Projected site-generated and resulting total peak-hour intersection traffic volumes at the study-area intersections;
- Projected total daily (AWT) volumes on the study-area streets;
- Intersection level of service analysis at the study-area intersections;
- Vehicle queuing and sight distance analysis at the proposed site access points;
- Recommended street classifications; and
- Findings and recommendations.

LIST OF OTHER TRAFFIC REPORTS USED IN THE PREPARATION OF THIS REPORT

A master TIS report for the original/prior Falcon Field rezone - is dated February 24, 2020. Additionally, a report for the previously submitted preliminary plan is dated November 5, 2020.

The most recent versions of the following traffic reports were utilized in preparing this report: *Falcon Marketplace, Meadowlake Ranch (LSC), The Ranch (LSC)*, and the School District 49 Transportation Facility study (LSC) *US Hwy 24 Planning and Linkage Study (CDOT)*. This report is generally consistent with these reports. Minor adjustments to background traffic volumes have been made to account for newer traffic counts, and traffic projections in the CDOT PEL study.

December 2021 Update: The site-generated traffic for the residential parcels in this report is slightly higher than the prior version. This was in response to the staff comment regarding the maximum potential number of units within the residential zones. The commercial site-generated traffic was not modified. Offsite intersections were added in response to the comments. New traffic counts were conducted at these added intersections. As a result of those newer counts, further background traffic adjustments were also made. The findings and recommendations remain unchanged.

LAND USE AND ACCESS

Figure 1 shows the site location relative to the adjacent and nearby roadways. The development is planned to have commercial and residential land uses. The site is directly southeast of the intersection of Woodmen Road/US Hwy 24 in Parcels 4307000001 and 4307200015. The site plan/land use map is shown in Figure 2.

As shown on the site plan, the primary access will be a new southeast leg of the Woodmen Road/US Hwy 24 intersection (currently a T-intersection). This entry/access street will be classified as an Urban Non-Residential Collector. The proposed series of new street connections between this entry drive and existing Rio Lane to the east would be classified as Urban Non-Residential Collectors or Urban Local streets. Recommended street classifications are presented near the end of this report. The intersection of the entry street and other primary internal street (southwest to northeast orientation) is proposed as a modern roundabout.

Please also compare the original commercial zoned TIS to this proposed residential/commercial zoned site. The intent of my comment is for you to show that the proposed residential/commercial site is generating less trips than the strictly commercial zoned site that was originally approved. ¹

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Number: 1 Author: Daniel Torres Subject: Callout Date: 1/12/2022 11:02:02 AM

Please also compare the original commercial zoned TIS to this proposed residential/commercial zoned site. The intent of my comment is for you to show that the proposed residential/commercial site is generating less trips than the strictly commercial zoned site that was originally approved.

 Author: JCH Subject: Sticky Note Date: 1/21/2022 9:48:09 AM

LSC response: This section has been revised to include the comparison to the original commercial zone TIS.

Capacity Manual, 6th Edition by the Transportation Research Board. The level of service reports are attached.

The southwest-bound through/left at the stop-sign-controlled intersection of US Hwy 24/Rio Lane currently operates at LOS B or better during the peak hours. The shared northwest-bound left-/right-turning movement on Rio Lane operates at LOS F during the peak hours. The levels of service F for this movement are due both to the volume of left-turning vehicles and the high volume of through vehicles on US Hwy 24.

The intersection of US Hwy 24/Woodmen Road currently operates at LOS B during both peak hours, with all movements operating at LOS C or better.

TRIP GENERATION

Estimates of the vehicle trips projected to be generated by the proposed development have been made using the nationally-published trip-generation rates from *Trip Generation, 11th Edition, 2021* by the Institute of Transportation Engineers (ITE). Table 2 below presents a summary of the estimated site trip generation. The detailed trip-generation estimate for the development, including ITE rates for the proposed land use, is presented in Table 3.

Table 2: Estimated External Falcon Field Weekday Vehicle-Trip Generation

Analysis Period	Total External Trips			Pass-By Trips			Diverted Trips		
	In	Out	Total	In	Out	Total	In	Out	Total
A.M. Peak Hour	112	142	254	23	23	46	18	18	36
P.M. Peak Hour	286	252	538	69	69	138	53	53	106
Daily/24-Hour	3,522	3,522	7,045	925	925	1,851	708	708	1,416

Approximately 7,045 total external daily trips are projected to enter and exit the site at the access point (“driveway trips”) on the average weekday. During the morning peak hour, approximately 112 vehicles would enter, and 142 vehicles would exit the site. During the evening peak, approximately 286 vehicles would enter, and 252 vehicles would exit. The proposed development is projected to generate approximately 1,851 (new/non-pass-by or diverted) vehicle trips on the average weekday during a 24-hour period.

A detailed trip-generation estimate for the Falcon Field development, including ITE rates for the proposed land use, is presented in Table 3 (attached).

I believe this should be the total new external trips generated per table 3 minus the diverted trips. Please revise.

Internal Trips

Internal trips are trips that occur within the site and do not impact the external roadways. Because the site is planned to have multiple retail pads and housing, some of the generated trips

Number: 1 Author: Daniel Torres Subject: Callout Date: 1/12/2022 8:33:37 AM

I believe this should be the total new external trips generated per table 3 minus the diverted trips. Please revise.

 Author: JCH Subject: Sticky Note Date: 1/21/2022 9:51:26 AM

LSC response: This sentence has been modified to call out "non-passby" trips. This change was made to be consistent with prior reports.

QUEUING ANALYSIS

The 95th percentile queues at the intersection of US Hwy 24/Woodmen Road along with the queues at the intersection of the proposed Collector and Rio Lane were analyzed to develop laneage on the Collector. Figure 11 provides the 95th percentile queue lengths for the study intersections.

The El Paso County *Engineering Criteria Manual (ECM)* standards were followed to develop turn-lane recommendations at the intersections. Figure 10 provides the turn-lane conceptual design for the roadway between US Hwy 24 and Rio Lane. As shown, it is recommended that the outbound left turn be 270 feet in length and the outbound right turn should be at least 275 feet. Table 4 provides the proposed recommended turn-lane lengths along with the relevant standards and 95th percentile queues. Queuing reports are attached.

Right-In-Only Access Points

The assumption is that the site will be designed such that traffic entering the businesses via the proposed right-in-only access points will have a “free movement” into internal private-access drives, parking bays etc., such that queues will not form and back onto the right-in access points or onto the main entry street. This would likely be accomplished with a sufficient entry “throat” and other site-design elements that would give priority to entering traffic. The on-site/internal design and operation of these right-in access points would need to be verified with the Preliminary Plan and/or Site Development Plan stages of development.

SIGHT DISTANCE ANALYSIS

Sight distance will be addressed at the Preliminary Plan and Site Development Plan stages of development.

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

- Falcon Field is expected to generate about 7,045 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 122 vehicles would enter and 152 vehicles would exit the site. During the afternoon peak hour, approximately 317 vehicles would enter and 283 vehicles would exit the site.

Traffic Operations Analysis

- The signalized intersection of US Hwy 24/Woodmen Road is projected to operate at LOS C or better during both peak hours for the short-term and year-2040 scenarios. The El Paso County

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does not match the
table above. Please
revise

Number: 1 Author: Daniel Torres Subject: Callout Date: 1/12/2022 10:32:37 AM

does not match the table above. Please revise

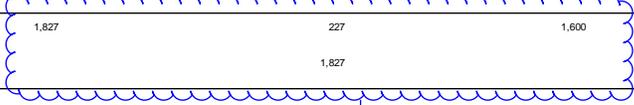
 Author: JCH Subject: Sticky Note Date: 1/21/2022 9:52:10 AM

LSC response: The numbers in this paragraph have been corrected to match the table.

Table 3: Detailed Trip Generation Estimate

Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾				Total Trips Generated					Daily Internal Trip %	Internal Trips Generated					External Trips Generated				Pass-By Trips ⁽²⁾	New External Trips Generated Average Weekday Traffic			
			Average Weekday Traffic	Morning Peak Hour In	Morning Peak Hour Out	Afternoon Peak Hour In	Afternoon Peak Hour Out	Average Weekday Traffic	Morning Peak Hour In	Morning Peak Hour Out	Afternoon Peak Hour In		Afternoon Peak Hour Out	Average Weekday Traffic	Morning Peak Hour In	Morning Peak Hour Out	Afternoon Peak Hour In	Afternoon Peak Hour Out	Average Weekday Traffic	Morning Peak Hour In	Morning Peak Hour Out			Afternoon Peak Hour In	Afternoon Peak Hour Out	
821	Shopping Plaza (40-150k)	84 KSF ⁽³⁾	67.52	1.07	0.65	2.55	2.64	5,672	90	55	214	222	4%	227	6	4	15	16	5,445	84	51	199	206	34%	3,594	
210	Single Family Detached Housing	80 DU	10.28	0.20	0.56	0.64	0.38	822	16	45	51	30	12%	227	4	6	16	15	720	14	42	43	23	0%	720	
220	Multi Family Housing (Low Rise)	145 DU	6.93	0.11	0.36	0.36	0.21	1,005	16	52	52	31						880	14	49	44	23				
Total Trip Generation Estimate								7,499	122	152	317	283			454	10	10	31	31	7,045	112	142	286	252		4,314

Notes:
 (1) Source: "Trip Generation, 11th Edition, 2021" by the Institute of Transportation Engineers (ITE)
 (2) Source: "Trip Generation Handbook - An ITE Proposed Recommended Practice, Third Edition September 2017" by ITE
 (3) KSF = one thousand square feet of floor space
 Source: LSC Transportation Consultants, Inc. (REV. 12/8/2021 JCH)



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2
 missing the multi family ADT. Please update the analysis accordingly.

Number: 1 Author: Daniel Torres Subject: Line Date: 1/11/2022 6:45:58 PM

Number: 2 Author: Daniel Torres Subject: Cloud+ Date: 1/12/2022 10:00:00 AM

[missing the multi family ADT. Please update the analysis accordingly.](#)

Author: JCH Subject: Sticky Note Date: 1/21/2022 9:53:12 AM

LSC response: The missing ADT values have been added and the totals have been updated.

Number: 3 Author: Daniel Torres Subject: Cloud+ Date: 1/12/2022 8:11:24 AM

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Author: jchodsdon Subject: Sticky Note Date: 1/21/2022 9:53:43 AM

LSC Response: Stray numbers have been deleted.

Table 4: Auxiliary Lane Analysis

Turning Movement	Recommended Length (feet)	ECM/CDOT Standard (feet)	95th Percentile Queue (feet)
Northbound Left	270 Decel + Storage 120 Bay Taper	115 Decel 270 Storage 120 Bay Taper	43
Northbound Through	270 (second through lane)		78
Northbound Right	320 Decel	115 Decel	25
Northbound Right (Accel)	960 Accel	225 Taper	N/A
Eastbound Right	600 Decel 225 Taper	600 Decel 225 Taper	37
Westbound Left	600 Decel 100 Storage 225 Taper	600 Decel 100 Storage 225 Taper	51
Eastbound Left	135 Decel + Storage 160 Bay Taper	155 Decel 50 Storage 160 Bay Taper	25
Westbound Left	190 Decel + Storage 75 Bay Taper	115 Decel 100 Storage 120 Bay Taper	25
Eastbound Left	120 Decel + Storage 75 Bay Taper	115 Decel 250 Storage 120 Bay Taper	25
Eastbound Left	130 Decel + Storage 75 Bay Taper	155 Decel 100 Storage 160 Bay Taper	25

(1) In calculating queue lengths, Synchro does not assume the use of a free or yielding right turn. As a result, these queue lengths represent the worst case scenario. These turns are proposed to be channelized with yielding or free right turn operations, which will result in lower queues.

Please identify the intersection as done before.

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Number: 1 Author: Daniel Torres Subject: Cloud+ Date: 1/12/2022 9:50:33 AM

Please identify the intersection as done before.

Author: JCH Subject: Sticky Note Date: 1/21/2022 10:19:40 AM

LSC response: The intersection column has been added back into the table. Also note: additional revisions to the table were made.