

# LSC Responses to TIS Redline Comments

**US Highway 24 (US Hwy 24)** extends locally from the City of Colorado Springs to Peyton in a northeasterly direction and then continues east. US Hwy 24 is classified as EX- Expressway, Major Bypass by the Colorado Department of Transportation (CDOT) in the vicinity of the site and is shown as an Expressway on the *El Paso County Major Transportation Corridors Plan (MTCP)*. The 2040 *MTCP* shows US Hwy 24 as a **six-lane** Expressway. Based on the US Hwy 24 PEL study, US Hwy 24 is planned to be widened to a six-lane roadway in the future. The timing of this improvement is not known. This improvement has not been included in the long-term analysis.

**El Jefe Heights** is a proposed private, local street planned to extend north-south through the site between the north access to Meadowbrook Parkway and Gary Watson Point to the south.

**Gary Watson Point** is a private, local street extending east about 350 feet from Meadowbrook Parkway to a cul-de-sac.

## Existing Traffic Volumes

New vehicular turning-movement traffic counts were conducted at the intersection of Marksheffel Road/Meadowbrook Parkway from 6:30-8:30 a.m. and from 4:00-6:00 p.m. in the summer of 2023. New counts were also completed at Meadowbrook Parkway/Gary Watson Point, the full-movement intersection with Meadowbrook Parkway 500 feet west of Marksheffel Road, and US Highway 24/Marksheffel Road. Figure 4 shows these turning-movement volumes, as well as the average weekday traffic volumes (estimated based on factored peak-hour count data) on the study-area roadways, including at the commercial access points north of the site. Raw count data is attached.

Include crash history back into report. 1

## PEDESTRIAN AND BICYCLE FACILITIES

Meadowbrook Parkway has sidewalks along developed parcels, and the street width is sufficient to accommodate bicycles. There is a 12-foot paved concrete trail along the west side of Marksheffel Road extending north from just south of the bridge just north of Meadowbrook.

## TRIP GENERATION

Estimates of the vehicle-trips projected to be generated by the 5-acre site (as described in the land-use section, Claremont Business Park 2 Filing No. 2 Lots 1, 2A, 2B, and 3) have been made using the nationally published trip-generation rates from *Trip Generation, 11<sup>th</sup> Edition, 2021* by the Institute of Transportation Engineers (ITE). Corresponding trip-generation rates from the following ITE Land Use Categories have been used to develop the trip-generation estimates for site buildout:


- Automated Car Wash
- Fast Food with Drive Through Window
- Mini-Storage

# LSC Responses to TIS Redline Comments

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Page: 9

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 Number: 1    Author: CDurham    Subject: Text Box    Date: 9/7/2023 4:22:12 PM

[Include crash history back into report.](#)

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 Author: jchodsdon    Subject: Sticky Note    Date: 10/5/2023 3:33:39 PM

LSC Response: The crash history section has been added back into the report, as requested. Current three-year crash history has been is included.

Table 1 below presents a summary of the estimated site trip generation. A detailed trip-generation estimate, including ITE rates, is presented in Table 5 (attached). Figure 2 shows the layout within the proposed industrial park.

**Table 1: Summary of Estimated Site Vehicle-Trip Generation**

Analysis Period	Weekday		
	In	Out	Total
Morning Peak Hour	124	120	244
Afternoon Peak Hour	118	112	230
Daily/24-hour	1,448	1,448	2,895

The site is projected to generate about 2,895 total vehicle-trips on the average weekday during a 24-hour period, with approximately half entering and half exiting the site. During the morning peak hour, approximately 124 entering vehicles and 120 exiting vehicles would be generated. Approximately 118 entering and 112 exiting vehicles would be generated by the site during the afternoon peak hour.

Compared to trip-generation estimates in the previously-submitted traffic impact study for Claremont Business Park 2 Filing No. 1 Preliminary Plan, the site would generate approximately:

- Average weekday 24-hour period – 16 fewer daily trips
- Morning peak hour – 49 fewer additional trip and 85 additional exiting trips
- Afternoon peak hour – 4 fewer entering trips and 36 fewer exiting trips


#### Pass-By and Diverted Trips


more <sup>2</sup>

The total number of trips to be generated by the site has also been aggregated by trip type to account for pass-by and diverted trips. A pass-by trip is one made by a motorist who would already be on an adjacent road regardless of the proposed development, but who stops in at the site while passing by. That pass-by motorist would then continue on his or her way to a final destination in the original direction. Table 5 (attached) shows the percent of the trips generated that were assumed to be pass-by trips. Non-primary trip percentage has been based on data from the *Trip Generation Handbook - An ITE Proposed Recommended Practice, 3rd Edition, 2014* by ITE and adjustments by LSC for site-specific conditions.


LSC has adjusted the average ITE percentage as pass-by trips for this site to only include trips from adjacent Meadowbrook Parkway. Diverted trips from adjacent US Highway 24 and Marksheffel Road are considered non-pass-by trips. These trips would be added to Meadowbrook Parkway and would result in altered turning movements at the nearby major intersections, but generally would not add “new impact” trips to US Hwy 24 or Marksheffel Road. ITE-average percent of non-pass-by trips estimated for the land proposed uses for this study are summarized in Table 5. The resulting pass-by and non-pass-by trips are shown in Table 5.


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 Number: 1 Author: CDurham Subject: Highlight Date: 9/8/2023 1:44:10 PM  
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 Author: jchodsdon Subject: Sticky Note Date: 10/5/2023 3:34:04 PM  
LSC Response: Corrected in the updated TIS.

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 Number: 2 Author: CDurham Subject: Callout Date: 9/8/2023 1:44:05 PM  
[more](#)

 Author: jchodsdon Subject: Sticky Note Date: 10/5/2023 3:34:11 PM  
LSC Response: Corrected in the updated TIS.

2602 (per table 5 in appendix) <sup>1</sup>

ITE *Trip Generation* estimated that the proposed Claremont Business Park development is projected to generate about 2,666 total, non-pass-by vehicle-trips on the average weekday during a 24-hour period, with about half entering the site and half exiting the site during the afternoon peak hour. Compared to the previously-submitted traffic impact study, this represents an increase of 31 daily non-pass-by trips generated by the site.

decrease of 33 (per Table 5 in appendix) <sup>2</sup>

## TRIP DISTRIBUTION AND ASSIGNMENT

### Trip Directional Distribution

The directional-distribution estimate of site-generated vehicle-trips to the study-area roads and intersections is a necessary component in determining the site's traffic impacts. Figure 5 shows the percentages of the site-generated vehicle trips projected to be oriented to and from the site's major approaches. Estimates have been based on the following factors: the proposed new land use, the area roadway system serving the site, and the site's geographic location relative to the overall greater El Paso County/Colorado Springs area. Directional-distribution splits from LSC's previously-conducted Claremont Business Park traffic study (dated July 6, 2018) were used to estimate trip distributions and background volumes within the vicinity of the site.

### Site-Generated Traffic

Site-generated traffic volumes have been estimated at the following intersections:


- Marksheffel Road/Meadowbrook Parkway
- Meadowbrook Parkway/El Jefe Heights (proposed north full-movement site access)
- Meadowbrook Parkway/Gary Watson Point (proposed south full-movement site access)
- US Highway 24/Marksheffel Road

These volumes have been calculated by applying the directional-distribution percentages estimated by LSC (from Figure 5) to the trip-generation estimates (from Table 5). Figure 6 shows the projected site-generated traffic volumes for the weekday morning and afternoon peak hours. The figure also shows the estimated average daily traffic volumes (ADTs).

## BASELINE/BACKGROUND TRAFFIC VOLUMES

The report includes traffic count data for morning and afternoon peak hours at the intersection of Meadowbrook Parkway/Gary Watson Point. The current ADT on Gary Watson Point has been estimated based on factored peak-hour counts and shown in the report. Additionally, the current traffic turning to/from the east leg of this intersection (Gary Watson Point) provides a one-day "snapshot" of the peak-hour (AM and PM) trip generation of Lots 8-10. The trips are considered "baseline/background trips" in this report. The background turning volumes associated with the warehousing lots to the south are assumed at least as high as the previous TIS report estimates. For turning movements higher than the estimates in the TIS report, the actual count has been


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 Number: 1 Author: CDurham Subject: Callout Date: 9/8/2023 1:46:29 PM  
[2602 \(per table 5 in appendix\)](#)


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 Author: jchodsdon Subject: Sticky Note Date: 10/5/2023 3:34:16 PM  
LSC Response: Corrected in the updated TIS.

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 Number: 2 Author: CDurham Subject: Callout Date: 9/8/2023 1:46:48 PM  
[decrease of 33 \(per Table 5 in appendix\)](#)

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 Author: jchodsdon Subject: Sticky Note Date: 10/5/2023 3:34:23 PM  
LSC Response: Corrected in the updated TIS.

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## Marksheffel Road/US Highway 24

### Short Term

The intersection of Marksheffel Road/US Hwy 24 is projected to operate at LOS D overall during the morning and evening short-term peak hours, respectively, with or without the addition of short-term site-generated traffic. All left-turning movements are projected to operate at LOS E or worse before and after considering site-generated traffic during the morning and afternoon peak hour, respectively. All other turning movements at this intersection are projected to operate at LOS D or better during the short term upon site buildout.

### Long Term

The intersection of Marksheffel Road/US Hwy 24 is projected to operate at LOS E overall during both the 2043 morning and afternoon peak hours, with and without considering site-generated traffic. High through volumes on US Hwy 24 and a high northeast-bound to north-bound left-turn volume (background traffic) are projected to result in LOS F overall operational performance during the 2043 evening peak hour.

## VEHICLE QUEUING

### Marksheffel Road/Meadowbrook Parkway

This section contains the projected 95th-percentile queues for the eastbound approach at the intersection of Meadowbrook Parkway/Marksheffel Road and for the westbound left turn at El Jefe Heights. Projected queue lengths have also been shown for other key turning movements at this intersection. Table 3 and Table 4 present the 95th-percentile queues reported on the Synchro analysis reports.


Both tables show the existing back-to-back left-turn vehicle storage lengths and the available stacking distance between the two intersections for the eastbound through/right lane. The latter distance is a function of the intersection spacing. The 95th-percentile queues for the projected short-term background plus site-generated and 2040 background plus site-generated scenarios are shown in the tables.

### Short-Term


Verify all references to long-term are for 2043. <sup>2</sup>

Short-term scenario queue reports indicate that the 95th-percentile eastbound queues would **not** exceed the available stacking length for either of the back-to-back left-turn lanes during either short-term peak hour. SimTraffic queueing reports indicated 95th-percentile queue lengths on Meadowbrook of up to 151 feet for the eastbound dual-left-turn lanes approaching Marksheffel and up to 46 feet for the westbound left-turn lane approaching El Jefe. Please refer to Table 3 for more details.

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 Number: 1 Author: CDurham Subject: Highlight Date: 9/8/2023 1:19:15 PM

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 Number: 2 Author: CDurham Subject: Callout Date: 9/8/2023 1:47:44 PM

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[Verify all references to long-term are for 2043.](#)

 Author: jchodsdon Subject: Sticky Note Date: 10/5/2023 3:35:04 PM

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LSC Response: All references have been updated to 2043.



**Table 4: 95th-Percentile Queues (2043 Background + Site)**

<b>Eastbound-Left at Meadowbrook/Marksheffel</b>		
<b>Queuing Metric</b>	<b>A.M. Peak</b>	<b>P.M. Peak</b>
Storage Length (ft)	220'	220'
Taper Length (ft)	100'	100'
Total Stacking Distance (ft)	320'	320'
95th-percentile Queue (ft)	138'	283'
% Upstream Block Time	0%	0%
% Storage Block Time	0%	8%
<b>Westbound-Left at Meadowbrook/El Jefe</b>		
<b>Queuing Metric</b>	<b>A.M. Peak</b>	<b>P.M. Peak</b>
Storage Length (ft)	75'	75'
Taper Length (ft)	65'	65'
Total Stacking Distance (ft)	140'	140'
95th-percentile Queue (ft)	38'	54'
% Upstream Block Time	0%	0%
% Storage Block Time	0%	0%
Source: 95th-percentile queues from SimTraffic reports		

**AUXILIARY TURN LANE ANALYSIS, INTERSECTION CONFIGURATION, AND TRAFFIC CONTROL**

Turn lanes associated with the north access were previously addressed with a deviation request. The turn lanes on Meadowbrook between El Jefe and Marksheffel cannot meet *ECM* criteria for deceleration plus storage plus taper due to the set intersection spacing. Note: deviation requests for these auxiliary turn lanes were approved by the County in 2018.

**Marksheffel Road/Meadowbrook Parkway**

No modifications/improvements would be required for the auxiliary turn lanes at this intersection as a result of site-generated traffic.:

**Meadowbrook Parkway/El Jefe Heights**


No further improvements will be needed to the turn lanes already in place along Meadowbrook Parkway at El Jefe Heights.

What about the Meadowbrook/Gary Watson intersection, as was included in previous report submittal? Indicated that improvements would be needed.


**ROADWAY CLASSIFICATIONS**

Meadowbrook Parkway is an Urban, Non-Residential Collector Street. El Jefe Way and Gary Watson Point are proposed to be private streets.

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 Number: 1 Author: CDurham Subject: Text Box Date: 9/8/2023 1:23:15 PM

What about the Meadowbrook/Gary Watson intersection, as was included in previous report submittal? Indicated that improvements would be needed.

 Author: jchodsdon Subject: Sticky Note Date: 10/5/2023 3:36:11 PM

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LSC Response: The updated TIS addresses this comment.

### **Reimbursable Improvements**

There are no El Paso County *MTCP* roadway improvement projects in the study identified by the year 2040 per Map 13 and Table 4 of El Paso County's 2016 *MTCP*.


### **MULTI-MODAL TRANSPORTATION AND TDM OPPORTUNITIES**

Meadowbrook Parkway has sidewalks and the street width is sufficient width to accommodate bicycles. Gary Watson Point has a sidewalk on one side of the street and the same is proposed for El Jefe Heights. There is a 12-foot-wide paved concrete trail along the west side of Marksheffel Road extending north from just south of the bridge just north of Meadowbrook. There is connectivity to the future Rock Island Regional Trail through the neighborhood to the north. The US Highway 24 PEL Study shows a proposed multi-use path along the north side of the highway. Mountain Metro Transit does not currently provide service adjacent to this site. However, the nearest route runs along Peterson Road (north of Galley). This is reasonably accessible via bicycle and the transit buses are furnished with bicycle racks. Transit service may expand to the east as growth continues to the east.


### **FINDINGS AND CONCLUSIONS**

- The site is projected to generate about 2,895 new driveway vehicle-trips on the average weekday.
- During the weekday morning peak hour of adjacent street traffic, 124 vehicles would enter the site while 120 vehicles would exit.
- During the weekday afternoon peak hour of adjacent street traffic, 118 vehicles would enter the site while 112 vehicles would exit.
- Please refer to the "Level of Service" section above for detailed LOS results and discussion regarding reported level of service at the study-area intersections.
- Please refer to the "Auxiliary Turn Lane Analysis" section for evaluation of potential turn-lane needs. With the development of the commercial site, LSC recommends consideration of the potential addition of a dedicated, separate northbound right-turn lane on El Jefe approaching Meadowbrook – for traffic exiting the commercial area. This shows improvement to LOS D or better for the northbound turning movement.
- Please refer to the "Auxiliary Turn Lane Analysis, Intersection Configuration, and Traffic Control" section for detailed findings/recommendations regarding turn lanes at the study-area intersections.
- Meadowbrook Parkway is an Urban, Non-Residential Collector Street. El Jefe Way and Gary Watson Point are proposed to be private streets.
- Please refer to the "Queuing Analysis" section above for additional details. Long-term analysis indicated that the westbound 95th percentile left-turn queue at El Jefe/Meadowbrook is not projected to exceed the existing left-turn lane length (75 feet plus a 65-foot taper) during the morning or afternoon peak hour.
- Although the 95th percentile queue lengths from the Synchro reports are not greater than the available stacking lengths, there is the potential for queues to periodically back to the

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 Number: 1    Author: CDurham    Subject: Highlight    Date: 9/8/2023 1:24:09 PM  
2040

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 Author: jchodsdon    Subject: Sticky Note    Date: 10/5/2023 4:35:55 PM  
LSC Response: All references have been updated to 2043.

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**Table 5: Detailed Trip Generation Estimate**

ITE Code	Description	Value	Units <sup>1</sup>	Trip Generation Rates <sup>2</sup>				ITE Trips Generated				%	Driveaway Trips Generated				%	% Non-Pass-By	Non-Passby Trips Generated									
				Average	A.M.		P.M.		Average	A.M.			P.M.		Average	A.M.			P.M.		Average	A.M.		P.M.				
				Weekday	In	Out	In	Out	Weekday	In	Out		In	Out	Internal Trips	Weekday			In	Out	In	Out	Pass-By	Pass-By	Weekday	In	Out	In
<b>Currently Proposed Land Uses</b>																												
948	Automated Car Wash	1	CWT	775.00	19.38	19.38	38.75	38.75	775	20	20	39	39	4%	744	19	19	37	37	10%	90%	667	17	17	34	34		
934	Fast-Food w/ Drive-Through Window	2,300	KSF	467.48	22.75	21.86	17.18	15.85	1075	53	51	40	37	4%	1032	51	49	38	36	10%	90%	925	46	44	34	32		
934	Fast-Food w/ Drive-Through Window	2,300	KSF	467.48	22.75	21.86	17.18	15.85	1075	53	51	40	37	4%	1032	51	49	38	36	10%	90%	925	46	44	34	32		
151	Mini-Warehouse	5,000	SU (100s)	18.04	0.54	0.62	0.72	0.77	90	3	3	4	4	8%	87	3	3	4	4	0%	100%	87	3	3	4	4		
				<b>Total</b>					<b>3016</b>	<b>129</b>	<b>125</b>	<b>129</b>	<b>117</b>		<b>2895</b>	<b>124</b>	<b>120</b>	<b>118</b>	<b>112</b>			<b>2602</b>	<b>111</b>	<b>108</b>	<b>106</b>	<b>101</b>		
<b>For Comparison -- Trip Generation from July 2020 TIS Report</b>																												
820	Shopping Center	33.8	KSF	-	-	-	-	-	-	-	-	-	-	-	<b>2911</b>	<b>75</b>	<b>35</b>	<b>122</b>	<b>148</b>	-	-	<b>2635</b>	<b>70</b>	<b>32</b>	<b>111</b>	<b>136</b>		
<b>Change in Trip Generation from the July 2020 TIS Report</b>																												
				-	-	-	-	-	-	-	-	-	-	-	-	2895	124	120	118	112	-	-	2602	111	108	106	101	
				-	-	-	-	-	-	-	-	-	-	-	-	2911	75	35	122	148	-	-	2635	70	32	111	136	
															<b>Difference</b>	<b>-16</b>	<b>49</b>	<b>85</b>	<b>-4</b>	<b>-36</b>			<b>Difference</b>	<b>-33</b>	<b>41</b>	<b>76</b>	<b>-5</b>	<b>-35</b>

<sup>1</sup> KSF = 1,000 square feet, CWT = car wash tunnel, SU (100s) = 100 storage units


<sup>2</sup> Source: Trip Generation, 11th Edition (2021), by the Institute of Transportation Engineers (ITE)

Date: 08/21/2023

From the previous report, include individual lines for 150-Warehouse and the 820-Shopping Center. Trips shown are total of these two, please label as such. (See below for copy of how information was shown in previous version).


150	Warehousing	66.750	KSF	2.26	0.38	0.11	0.14	0.39	0%	151	26	8	10	26	0%	151	26	8	10	26	
820	Shopping Center	33.800	KSF	85.07	1.53	0.83	3.46	3.75	4%	2760	50	27	112	122	10%	2484	45	24	101	109	
										<b>Total</b>	<b>2911</b>	<b>75</b>	<b>35</b>	<b>122</b>	<b>148</b>	<b>Total</b>	<b>2635</b>	<b>70</b>	<b>32</b>	<b>111</b>	<b>136</b>

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 Number: 1 Author: CDurham Subject: Cloud+ Date: 9/8/2023 1:38:16 PM

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From the previous report, include individual lines for 150-Warehouse and the 820-Shopping Center. Trips shown are total of these two, please label as such. (See below for copy of how information was shown in previous version).

 Author: jchodsdon Subject: Sticky Note Date: 10/5/2023 4:36:15 PM

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LSC Response: This table has been revised as requested.

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 Number: 2 Author: CDurham Subject: Image Date: 9/8/2023 1:38:19 PM

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