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February 15, 2019

Rick Magness
Maverik, Inc.
185 South State Street
Salt Lake City, UT 84111

RE: Maverik
Tejon Street/East Motor Way
Colorado Springs, CO
Traffic Impact Study
LSC #184480

Dear Rick,

LSC Transportation Consultants, Inc. has prepared this updated traffic impact study for the proposed Maverik gas station and convenience store development. The site is located on the southeast corner of the intersection of Tejon Street/ Motor Way in Colorado Springs, Colorado.

EXECUTIVE SUMMARY

The proposed Maverik gas station and convenience store development will consist of a 5,518-square-foot convenience store with 12 vehicle fueling positions. The site is located on the southeast corner of the intersection of Tejon Street and Motor Way in Colorado Springs. The plan shows the relocation of two existing access points—one on Tejon Street and one on Motor Way—to new locations farther from the intersection of Motor Way/Tejon Street. These relocated access points would be 260 feet south of and 310 feet east of Tejon/Motor Way. These are both proposed to remain "full-movement" allowing left and right turns.

The number of vehicles projected to enter and exit the Maverik store at the site driveways is as follows:

- 247 entering and 247 exiting vehicles during the morning peak hour (7:00 am - 8:00 am).
- 191 entering and 191 exiting vehicles during the afternoon peak hour (5:00 pm - 6:00 pm).
- About 2,300 entering and 2,300 exiting vehicles during the average weekday 24-hour period.

These “trip” numbers identify the projected total vehicle counts in and out of Maverik. Most of these trips will consist of customers already traveling on the adjacent and nearby streets and roadways, rather than “new impact” or destination customer trips. Most of the above trips entering and exiting Maverik will consist of motorists traveling en route to home, work, school etc. Given the site location adjacent to Tejon Street and Motor Way, and a short distance (a few hundred feet) from Nevada Avenue, motorists passing by will find this Maverik store conveniently located, with several options for entering, exiting, and rejoining their travel routes to their destinations. For example, motorists using southbound Nevada for travel will find this Maverik store to be a convenient intermediate stop for gas or food via a right turn from southbound Nevada to Motor Way with convenient return to southbound Nevada.

Only about six percent of the total projected Maverik trips will be “new impact” primary trips (e.g., a customer making a “special trip” to the gas station/convenience store. Effectively, only 15 “new impact” in and out trips are projected during the one-hour morning commute time period and 11 “new” in and out trips are projected during the evening commute. This store will draw some customers from Interstate 25, however the proportion of these will be minor compared to the customer draw from the adjacent streets and Nevada Avenue.

Motor Way is a wide street with multiple lanes in each direction and Motor Way is intended to provide access to adjacent businesses and a connection to Motor City Drive. The I-25 Interchange at Nevada and Tejon was designed with an eastbound one-way connector ramp between Tejon and Nevada. The intended purpose of this ramp was, in part, to provide access from the southbound I-25 off-ramp to southbound Nevada. However, many drivers exiting I-25 to travel south on Nevada Avenue use other alternatives to this connector ramp. One of the popular alternatives includes use Motor Way to Nevada Avenue via a right turn from the I-25 southbound off-ramp onto Tejon Street then a left turn onto Motor Way. A portion of the projected total Maverik entering trips includes motorists already using this route. For these customers there will be no net change in traffic at the Motor Way/Tejon intersection.

The City has indicated plans to remove the traffic signal from the intersection of Nevada & Motor Way. Motor Way and Arvada would be restricted to right turns only from Nevada and onto Nevada. This report includes estimates and associated traffic modeling of the traffic pattern changes associated with the Motor Way/Nevada by the City. This change and other anticipated area street network changes/improvements will likely translate to fewer drivers using Motor Way and may result fewer motorists using Motor Way as an alternative route from southbound I-25 to southbound Nevada.

This report contains future traffic forecasts on the adjacent streets, at the adjacent Motor Way intersections, and at the site access points. . These forecasts include Maverik customer traffic as well as future projected traffic associated with the planned new hotel to the south on Tejon Street. The estimates also account for planned additional commercial redevelopment to the south between Tejon and Nevada as well as general growth in traffic on the area streets over the

next 20 years.

This report contains the results of traffic operations analysis using the traffic forecasts. This analysis included intersection "Level of service" analysis (intersection capacity/motorist delay analysis) and vehicle queuing (stacking) and "blocking" analysis. Level of Service (LOS) analysis results are presented using a national rating system (A through F) to indicate an intersection's delay and resultant level of congestion. LOS A represents a low level of delay and little to no congestion. LOS D represents generally expected and tolerable levels of delay and congestion during peak periods in urban/suburban areas, but conditions can be subject to sudden and considerable variations.

The signalized intersection of Tejon/Motor Way currently operates at LOS C. The analysis projects that this intersection would operate at LOS B for the short term "baseline" scenario and LOS C for the short term "baseline" plus site scenario. The baseline scenario doesn't include the Maverik development traffic, but it includes the anticipated future removal of the signal at Nevada/Motor Way. The intersection is projected to operate at an overall LOS C based on the future background traffic scenario and the future background plus site scenario. The north and west site access points are projected to operate at LOS C and E, respectively.

The vehicle queuing/stacking analysis modeled the operational effects of queuing and blocking on the adjacent streets. The analysis included projections of peak period vehicle queue lengths for traffic entering Maverik at the west site access from southbound Tejon Street, traffic entering the site at the north access, left turns on all approaches at Motor Way/Tejon, as well as for northbound and westbound through lanes. The analysis model accounted for the short intersection spacings in this area and the effects of through traffic queues at signals periodically blocking access points and "upstream" intersections.

The analysis results indicate that center painted left turn lanes on Tejon and Motor Way could accommodate the traffic projected to turn left into the store. The results also indicate that although northbound queues on Tejon Street periodically back through the proposed Maverik west access, these queues will typically clear each signal cycle and north/south traffic gaps created by the traffic signal at Tejon/Brookside will allow for left turns into the Maverik site.

This report contains recommendations for widening of Tejon Street along the Maverik site to achieve an 11-foot-wide left turn bay at the site access and City-standard bike lanes in both directions. The submitted site plan reflects this recommended widening along the site frontage along Tejon Street. Following a meeting with City staff, it was determined that City staff has a plan for bike lanes in the Tejon Corridor. Also, two through lanes will be maintained at northbound/southbound at the Tejon/Brookside intersection. The northbound/southbound through lane reduction will occur to the south of the Tejon/Brookside intersection.

Minor adjustments to the existing pavement markings on Tejon Street and potentially E. Motor Way adjacent to the site will be needed.

FIGURE 8

REPORT CONTENTS

The report contains the following:

- Existing street and traffic conditions adjacent to and in the vicinity of the site, including the intersection lane geometries, traffic controls, posted speed limits, functional classifications, intersection spacing and alignment, sight distances, etc.
- Existing peak-hour turning movement traffic counts and estimates of future background traffic volumes at the intersections of Tejon Street/Motor Way and Nevada Avenue/Motor Way (located northeast of the site).
- Description of the existing land uses in the vicinity of the site.
- Estimates of short- and long-term baseline/background traffic volumes at the following intersections:
  - -Tejon Street/Motor Way
  - -Nevada Avenue/Motor Way
  - -Proposed north site access/Motor Way
  - -Proposed west site access/Tejon Street
- Assignment of projected peak-hour and daily site-generated traffic volumes at the study area access point intersections.
- Estimates of future "baseline"/background traffic for the short and long term and projections of total traffic including the Maverik traffic.
- Resulting traffic impacts of the proposed development expressed in terms of intersection levels of service and vehicle queuing.
- Findings and recommendations.

LAND USE AND ACCESS

The site is located on the southeast corner of the intersection of Tejon Street/Motor Way in Colorado Springs, CO. The proposed Maverik store development will consist of a 5,518-square-foot convenience store with 12 vehicle fueling positions. Figure 2 shows the site plan with the proposed access points.

<u>Proposed Site Access</u>

Two relocated access points are proposed for the site. The north site access point to Motor Way would be a stop-sign-controlled, T-intersection. Access to Tejon Street would be via a proposed stop-sign-controlled, full-movement T-intersection. These two site access points are located approximately 260 feet south and 310 feet east of the center of the intersection of Tejon Street/ Motor Way, respectively. Figure 1 shows the site location and the adjacent/nearby roadways.

Existing Access Points

The site's proposed land use will replace an existing used car dealership which occupies a portion of the proposed Maverik site. Access to the existing car dealership is located 130 feet south and 190 feet east of the center of the intersection of Tejon Street/Motor Way. Both of these existing access points will be closed and relocated farther from the Tejon Street/Motor Way with the proposed Maverik development.

ROADWAYS AND TRAFFIC CONDITIONS

Area Roadways

The streets adjacent to the site (as well as Nevada Avenue) are identified below, followed by a brief description of each:

Tejon Street is shown as a Minor Arterial on the City of Colorado Springs' *Major Thoroughfare Plan (MTP)*. Tejon Street extends locally north from Cheyenne Boulevard to (and through) downtown. Adjacent to the site, Tejon Street is a five-lane roadway with a two-way-left-turn-lane (TWLTL) and auxiliary left-turn lanes at its signalized intersections with Motor Way and Brookside Street. The posted speed limit in the vicinity of the site is 35 miles per hour (mph). Sidewalks exist on along both sides of Tejon Street. On-street bicycle lanes exist on Tejon Street to the north and south. However, south of Motor Way these lanes are significantly narrower than the City standard or are non-existent due to constraints. Following a meeting with City staff, it was determined that City staff has a plan for bike lanes in the Tejon Corridor. Also, two through lanes will be maintained at northbound/southbound at the Tejon/Brookside intersection. The northbound/southbound through lane reduction will occur to the south of the Tejon/Brookside intersection.

Motor Way is a four-lane, non-arterial street. Motor Way connects to Motor City Drive to the west and E. Arvada Street east of Nevada Avenue. Its posted speed limit in the vicinity of the site is 30 mph. Auxiliary left-turn lanes currently exist on each approach at the signalized intersection of Tejon Street/Motor Way. The City has indicated that the signalized intersection of Nevada Avenue/Motor Way will be converted to an unsignalized, right-in/right-out (RIRO) intersection in the short term.

Brookside Street extends east-to-west between South 8th Street and South Corona Avenue with a posted speed limit in the vicinity of the site of 30 mph. Auxiliary left-turn lanes currently exist on each approach at the signalized intersection of Tejon Street/Brookside Street, while the outer lane on each approach is shared right/through.

Nevada Avenue (State Highway 115 south of Interstate 25) is shown as a six-lane Principal Arterial on the City of Colorado Springs' MTP. Extending 8.3 miles through south/central Colorado Springs

in a north-south orientation, Nevada Avenue has a posted speed limit of 35 mph in the vicinity of the site. Its intersections with the Interstate 25 on-/off-ramps, Motor Way, and Brookside Street are all signalized. Auxiliary left-turn lanes are found at most signalized intersections in the vicinity of the site, with a raised median separating northbound and southbound traffic along Nevada Avenue. South of its intersection with East Cheyenne Road/Southgate Road, Nevada Avenue is referred to as State Highway 115.

Existing Traffic Volumes

Vehicular turning movement counts were conducted at the following locations at the times specified in . Raw count data are attached.

Table 1: Subject Intersection Vehicular Turning Movement Count Data

Intersection		Data Collection			
Major Street	**Minor Street**	**Day**	**Date**	**From**	**To**
Tejon Street	Motor Way	Tuesday	May 22, 2018	6:30 a.m.	8:30 a.m.
				4:00 p.m.	6:00 p.m.
Nevada Avenue	Motor Way	Tuesday	June 19, 2018	6:30 a.m.	8:30 a.m.
				4:00 p.m.	6:00 p.m.
Tejon Street	Brookside Street	Wednesday	January 9, 2019	6:30 a.m.	8:30 a.m.
				4:00 p.m.	6:00 p.m.

Existing morning and evening weekday peak-hour traffic volumes at these three intersections are shown in Figure 3. Count reports are attached.

Current Intersection Level of Service

The current intersection level of service at the intersection of Motor Way/Tejon St. is C for both the morning and afternoon peak hours. Please refer to the level of service section of this report for a complete description of intersection level of service.

Adjusted Existing (Baseline) Traffic Volumes

The City of Colorado Springs plans to convert the currently signalized intersection of Nevada Avenue/E. Motor Way to a right-in/right-out (RI/RO), stop-sign-controlled intersection in the short term. Existing daily traffic volumes (shown in Figure 3) were adjusted by LSC, as shown in Figure 4, to account for shifts in background traffic that will occur with the completion of the RI/RO conversion. Traffic associated with the proposed Maverik development is not included in the these adjusted existing (baseline) traffic volumes.

TRIP GENERATION

Estimates of the vehicle-trips projected to be generated by the Maverik gas station and convenience market have been made using the nationally published trip generation rates from *Trip Generation, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE). Land use code "960 – Super Convenience Market/Gas Station" has been used to estimate the trip generation for the site.

Maverik gas station and super convenience market is expected to generate about 4,623 vehicle-trips on the average weekday (one-half entering and one-half exiting in a 24-hour period). During the morning peak hour, 247 vehicles are projected to enter the site while 247 are projected to exit. Approximately 191 vehicles would enter and 191 vehicles would exit the site during the evening peak hour. The morning peak hour generally occurs for one hour between 6:30 and 8:30 a.m., and the afternoon peak hour occurs for one hour between 4:00 and 6:00 p.m. shows a summary of the results of the trip generation estimate. A detailed trip generation estimate for the development, including ITE rates for the proposed land use is presented in Table 4 (attached).

Table 2: Estimated Site Vehicle-Trip Generation by Trip Type

Trip Type	Avg Weekday ***	A.M. Peak Hour**		P.M. Peak Hour**		Percent of Total Trips		
		In	Out	In	Out	AM	PM	Daily
Primary	277	15	15	11	11	6%	6%	6%
Pass-by	2,981	160	160	122	122	65%	64%	65%
Diverted	1,363	72	72	57	57	29%	30%	30%
Total	**4,622**	**247**	**247**	**191**	**191**	**100%**	**100%**	**100%**

* Please refer to Table 4Table 4 (attached) for detailed trip generation table
** Vehicle-trips/hour
*** Vehicle-trips/day

Pass-By and Diverted Trips

The total number of trips generated by the site has been aggregated by trip type to account for the pass-by phenomenon. A pass-by trip type is one made by a motorist who would already be on an adjacent street 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 4Table 4 (attached) shows the percent of the trips generated by each use that were assumed to be pass-by trips. Pass-by percentage has been based on data from the *Trip Generation Handbook - An ITE Proposed Recommended Practice, 3rd Edition, 2014* by ITE.

The published ITE average percent pass-by trip data for gas station/convenience stores have been adjusted for this site-specific situation and the site's close proximity to Tejon Street, Motor Way and the I-25 on/off ramps. Rather than use the ITE average 56 percent of pass-by trips, this number was adjusted to 65 and 64 percent of morning and evening pass-by trips, respectively.

Analysis also accounts for diverted trips from Nevada Avenue and to a lesser extent, Interstate 25. The published ITE average percent diverted trips (32 percent) was adjusted to 29 and 30 percent, respectively, for the morning and evening peak hours.

The remainder of the trips (6 percent) are estimated to be primary (destination) trips. A breakdown of each trip type percentage used for this site is shown in the last three columns of .

Total Daily Primary Trips

ITE *Trip Generation* estimated that the proposed gas station and convenience market is projected to generate about 277 total primary or "new impact" vehicle-trips on the average weekday during a 24-hour period, with about half entering the site and half exiting the site during the evening peak hour.

Site Trip Distribution

An estimate of the directional distribution of site-generated vehicle-trips to the study area streets and intersections is a necessary component in determining the site's traffic impacts. Figure 5 shows the directional distribution estimate for the site-generated trips by trip type. Estimates have been based on the following factors: traffic counts conducted at nearby intersections, the proposed land use and access plan, the area street system serving the site, the site's geographic location, projected traffic growth in the area, and planned area intersection modifications.

Site-Generated Trip Assignment

Directional distribution percentages estimated by LSC (from Figure 5) were applied to the trip generation estimates (from). Figure 6 shows the projected site-generated traffic volumes for the morning and evening peak hours.

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

-Tejon Street/Motor Way
-Nevada Avenue/Motor Way
-Tejon Street/Brookside Street
-Proposed north site access/Motor Way
-Proposed west site access/Tejon Street

PROJECTED TRAFFIC VOLUMES

Adjusted Existing (Baseline) Plus-Site-Generated Traffic Volumes

Figure 7 shows the sum of the adjusted short-term background traffic volumes (from Figure 4) and site-generated peak-hour traffic volumes (shown in Figure 6). These volumes represent the projected

short-term total traffic following the development of the Maverik store.

Estimated Future 2038 Background Traffic Volumes

Figure 8 shows the projected 20-year background traffic volumes for the year 2038. The estimated 2038 background/baseline traffic volumes in the study area on Nevada Avenue (State Highway 85/87) are generally based on an area 20-year growth factor of 1.05. For northbound and southbound through traffic on Nevada Avenue, the CDOT 20-year growth factor of 1.15 was applied. Additionally, LSC has included estimates of future traffic to be generated by planned redevelopment projects to the south along the west side of Nevada Avenue and the hotel project at the southeast corner of Navajo and Tejon Streets. Traffic from the proposed Maverik development is not included in the **background** traffic volume estimates.

Future 2038 Total Traffic Volumes

Figure 9 shows the sum of 2038 background traffic volumes (from Figure 8) plus the Maverik site-generated traffic volumes (from Figure 6).

LEVEL OF SERVICE ANALYSIS

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection and is indicated on a scale from "A" to "F." LOS A is indicative of little congestion or delay. LOS F indicates a high level of congestion or delay. shows the level of service delay ranges for signalized and unsignalized intersections.

Table 3: Intersection Levels of Service Delay Ranges

	Signalized Intersections		Unsignalized Intersections
Level of Service	Average Control Delay (seconds per vehicle)	V/C[1]	Average Control Delay (seconds per vehicle)[2]
A	10.0 sec or less	less than 0.60	10.0 sec or less
B	10.1-20.0 sec	0.60-0.69	10.1-15.0 sec
C	20.1-35.0 sec	0.70-0.79	15.1-25.0 sec
D	35.1-55.0 sec	0.80-0.89	25.1-35.0 sec
E	55.1-80.0 sec	0.90-0.99	35.1-50.0 sec
F	80.1 sec or more	1.00 and greater	50.1 sec or more

(1) Source: Transportation Research Circular 212
(2) For unsignalized intersections if V/C ratio is greater than 1.0 the level of service is LOS F regardless of the projected average control delay per vehicle.

The following intersections have been analyzed to determine the projected levels of service for the key intersection turning movements:

-Tejon Street/E. Motor Way

FIGURE 8

-Nevada Avenue/E. Motor Way
-Tejon Street/Brookside Street
-Proposed north site access/E. Motor Way
-Proposed west site access/Tejon Street

Tejon/Motor Way

The following is a summary of the level of service analysis at the intersection of Tejon/Motor Way during the weekday morning and evening peak hours. The detailed Synchro reports are attached.

- Overall, the signalized intersection of Tejon Street/E. Motor Way is projected to operate at LOS C or better during all short- and long-term traffic scenarios.
- Some minor street approach and left turning movements (westbound through/right and southbound left) are projected to operate at LOS E or F during peak periods. This is not uncommon, as signal timing favors the movement of through traffic on arterial streets. Despite these E and F individual movement levels of service, analysis results show volume-to-capacity (v/c) ratio below 1.0 through the 2038 horizon year in all traffic scenarios.
- Removing the traffic signal at the intersection of Nevada Avenue/E. Motor Way and converting the intersection to a right-in/right-out intersection will result in changes to the current turning movement volumes at the intersection of Tejon Street/E. Motor Way.
- Note: LSC has modeled the following potential modifications to the intersection of Tejon Street/E. Motor Way:
  -Restriping of the eastbound approach to add a second eastbound left-turn lane.
  -Restriping of the westbound approach for a reduction in the number of westbound through lanes on the westbound approach from two to one.
  -Adjusted existing signal timings along the Tejon Street corridor to account for the change at Nevada/Motor Way (the projected shift/rerouted left turning traffic and re-routed through traffic).

Tejon/Brookside

The following is a summary of the level of service analysis at the intersection of Tejon/Brookside Detailed Synchro reports are attached for reference.

- Overall, the signalized intersection of Tejon Street/Brookside is projected to operate at LOS C or better during all short- and long-term traffic scenarios.
- Some minor street approach and left turning movements (eastbound left and westbound through/right) are projected to operate at LOS E or F during peak periods. This is not uncommon, as signal timing favors the movement of through traffic on arterial streets.
- Despite these E and F individual movement levels of service, analysis results show a v/c ratio below 1.0 for all turning movements besides the eastbound left-turn through the 2038 horizon year in all traffic scenarios. The eastbound left-turn movement is projected to have a

v/c above 1.0 by 2038, with or without the Maverik development (based on the existing signal timing plan).

- Removing the traffic signal at the intersection of Nevada Avenue/E. Motor Way and converting the intersection to a right-in/right-out intersection will result in changes to the current turning movement volumes at this intersection. These altered volumes are reflected in the difference between volumes shown at this intersection in Figure 3 and Figure 4.

Unsignalized Intersection Level of Service (LOS) Analysis Results:

- The north and west site access points are projected to operate at LOS D and E, respectively, for long-term traffic scenario.
- After being converted to a RI/RO intersection, Synchro/HCM procedures reported an eastbound right-turn movement LOS F at the intersection of E. Motor Way/Nevada Avenue for all traffic scenarios. However, traffic signals along Nevada Avenue are coordinated and generated significant traffic gaps. Eastbound right-turning vehicles utilize these gaps to turn right onto southbound Nevada Avenue. SimTraffic simulations replicated gaps formed due to proper coordination of signals on Nevada Avenue, indicating LOS A for the eastbound right turn movement.

QUEUING ANALYSIS

A queuing analysis was performed for the access points and at the adjacent intersection of Motor Way/Tejon Street.

The analysis sheets are attached for reference. The analysis modeled the anticipated available stacking distance between the two intersections for the back-to-back left turn lanes on Tejon Street between Motor Way and the west site access. The analysis model also reflects assumptions for/estimates of vehicle stacking lengths

Replacing the full-movement, signalized intersection of Nevada Avenue/E. Motor Way with a RI/RO access will result in changes in the current turning movement volumes at the intersection of Tejon Street/E. Motor Way. LSC has modeled the following modifications to the intersection of Tejon Street/E. Motor Way:

- Addition of a second eastbound left-turn lane (dual lefts). This analysis assumed protected-permissive phasing for this dual left.
- Reduction in the number of westbound through lanes on the westbound approach from two to one.

Queuing analyses have been run for the projected short-term baseline condition, 2038 background only, short-term baseline plus site-generated, and 2038 background plus site-generated traffic volumes.

“Upstream block time” represents the percent of time during the peak hour in which the entry

point for a turn lane upstream of the subject intersection is blocked by a queue in the adjacent through lane. "Storage block time" is the proportion of time in which the turn lane's queue exceeds the available storage length and left turning vehicles overspill the turn lane in the model and into the adjacent through lane.

The reported queue length in SimTraffic is generally limited by the turn lane length. SimTraffic simply reports the maximum observed queue length during simulations. Any spillover from a left-turn lane is reported in the adjacent lane queue length.

Tejon Street between E. Motor Way and the West Site Access

Approximately 170 feet of combined back-to-back stacking distance is available for southbound left-turning vehicles at the west site access and the northbound left-turn lane at E. Motor Way. With a southbound left-turn bay at the site access, a shared lane transition taper and the existing exclusive northbound left-turn lane approaching Motor Way/Tejon, the following are the recommended striped lane lengths (and approximate allowable stacking distances):

-Southbound left-turn – 50 feet
-Northbound left-turn lane – 80 feet
-A 40' shared transition taper between these two lanes.

With 50 feet of storage, the striped southbound left turn lane at the site access is projected to accommodate projected queues throughout the short- and long-term morning and evening peak hours with the exception of about 1-2 percent "queue blockage" time as reported by the simulation model reports.

With 80 feet of storage, the striped northbound left turn lane at Motor Way/Tejon is projected to accommodate projected queues throughout the short- and long-term morning and evening peak hours with the exception of about 13 percent "queue blockage" time as reported by the simulation model reports.

Note: The northbound through queue on Tejon Street extending south to Brookside Street was observed to prevent northbound left-turning vehicles (onto westbound Motor Way) from entering the northbound left-turn lane at E. Motor Way. This northbound through traffic queue also occasionally blocks southbound left turning vehicles from entering the site access. However, once the northbound queue extending back from E. Motor Way/Tejon Street generally clears each signal cycle.

North Site Access/E. Motor Way

Simulations indicated that the westbound left-turning movement on Motor Way at the north site access could be accommodate the anticipated available left turn stacking distance between the site access and Nevada Avenue during all morning and evening peak hour traffic scenarios. With the

conversion of Nevada/Motor Way intersection to right-in/right-out, the center painted median will no longer be needed for eastbound left turn stacking.

FINDINGS, RECOMMENDATIONS, AND CONCLUSIONS

Trip Generation

Maverik gas station and super convenience market is expected to generate about 4,623 total "driveway" vehicle-trips on the average weekday (one-half entering and one-half exiting in a 24-hour period). During the morning peak hour, 247 vehicles are projected to enter the site while 247 are projected to exit. Approximately 191 vehicles would enter and 191 vehicles would exit the site during the evening peak hour.

Most of these trips generated are not "newly generated" trips, rather passby and diverted trips, or trips by motorists already using the adjacent and nearby major streets en route to a primary destination (such as home, work or school). A detailed trip generation estimate for the development, including ITE rates for the proposed land use is presented in Table 4Table 4 (attached).

Level of Service Analysis

Overall, the signalized intersection of Tejon Street/E. Motor Way is projected to operate at and overall LOS C for the long-term background plus site traffic scenarios. Some minor street approach and left turning movements (eastbound left, westbound through/right, and southbound left) are projected to operate at LOS E or F during peak periods. This is not uncommon as signal timing favors the movement of through traffic on arterial streets. Despite these E and F individual movement levels of service, analysis results show volume-to-capacity (v/c) ratio below 1.0 through the 2038 horizon year in all traffic scenarios.

The north and west site access points are projected to operate at LOS C and E respectively for the long-term traffic scenarios.

After being constructed to a RI/RO access, the eastbound right-turn movement at the intersection of East Motor Way/Nevada Avenue is projected to operate at LOS A for all traffic scenarios because traffic signals along Nevada Avenue are coordinated and generate significant traffic gaps which are utilized by eastbound right-turning vehicles to be able to turn right onto southbound Nevada Avenue.

Queuing Analysis

Please refer to the Queuing Analysis section above and the attached analysis reports for detailed results.

Additional Findings

Tejon/Brookside Intersection

Following a meeting with City staff, it was determined that City staff has a plan for bike lanes in the Tejon Corridor. Also, two through lanes will be maintained at northbound/southbound at the Tejon/Brookside intersection. The northbound/southbound through lane reduction will occur to the south of the Tejon/Brookside intersection.

Tejon/Motor Way Intersection

The primary use of the southbound left-turn lane at Motor Way/Tejon Street is not by motorists traveling to businesses along Motor Way or for travel east of Nevada Avenue on Arvada Street. It is primarily used by motorists to access southbound Nevada Avenue (via Motor Way) after exiting Interstate-25 on the southbound Interstate-25 exit ramp at Tejon Street. This route is used as an alternative to proceeding straight on the split-diamond interchange eastbound ramp and turning right at the Nevada/eastbound split-diamond ramp intersection.

The longest queues within the southbound left-turn lane at Nevada/Motor Way generally occur following the eastbound green signal phase for the I-25 off ramp with motorists wanting to use Motor Way as a connector street to Nevada Avenue. These queues often extend into the through lanes on Tejon, which is generally not problematic, as southbound through traffic is stopped at the red signal at one or both ramp intersections.

Southbound through traffic at the north-side ramp intersection typically remains stopped until the northbound left-turn phase at this intersection ends. This allows for queue clearance at Tejon/Motor Way. The one-way eastbound ramp connecting the off-ramp at Tejon and the on-ramp at Nevada was intended for travel from the southbound Interstate 25 offramp to southbound Nevada Avenue, rather than Motor Way.

Use of Motor Way and the southbound left turn lane from Tejon St. to eastbound Motor Way should, ideally, serve as a connection to Motor City Drive and to serve the adjacent land and businesses (current and future), including this proposed Maverik store. However, for several reasons, many motorists are (and have been) using Motor Way as an alternative to the eastbound I-25 split-diamond interchange connector ramp.

The planned restriction of the intersection of Nevada/Motor Way to right-in/right-out may allow for modifications in lane usage and/or signal timing/phasing at the eastbound C-D ramp/Nevada intersection. As part of that change, there may be an opportunity for the City/CDOT to investigate new ways of encouraging further use of the eastbound connector ramp for its intended purpose of serving the southbound I-25 to southbound Nevada traffic. Unfortunately, the bridge structure for the eastbound C-D ramp was not built to accommodate two through lanes plus a separate right turn lane. Despite this, reallocating eastbound lanes at Nevada to left, single through, and

single exclusive right turn could be considered (if not already considered with the plan to restrict Nevada/Motor Way to right-in/right-out).

It is important to note that even if (with or without any changes to the status quo) the southbound left at Nevada/Motor Way continues to be used as a route between southbound I-25 and south Nevada, a significant percentage of the Maverik traffic generated will consist of motorists already using this route. These Maverik customers will simply turn right into the north access and likely exit right-out at this same access as a minor diversion from their already-established travel route.

This store is also likely to see a significant percentage of passby trips (as a percentage of total traffic entering the site) from southbound Nevada and northbound Tejon Street. These will be convenient and simple diversions from motorists' main travel routes. Southbound Nevada traffic will find entry via a right turn from southbound Nevada to Motor Way, followed by a relatively easy left-in at the site access and exit via a right-out at this same access and a right turn from eastbound Motor Way onto southbound Nevada a convenient diversion (diverted trip) from this main travel route for many motorists. Also, for motorists already using northbound Tejon Street for travel, the right-in at the Tejon access and return to Tejon via either access will also be convenient diversion (pass-by trip) from this main travel route for many motorists.

West Site Access

The proposed southbound left turn movement at the west site access on Tejon would be striped as a dedicated southbound left turn bay. Northbound through traffic queues occasionally extend through the proposed access point intersection, especially during peak periods. However, these queues clear and southbound left turning traffic entering the site will be able to turn left with gaps in northbound traffic.

The largest gaps are created by the signal at Tejon/Brookside to the south. These gaps will also allow for westbound-to-southbound left turns out of the site. The site plan shows separate westbound left- and right-turn lanes for traffic exiting the site. This is beneficial for exiting patrons to have a choice when turning left or right. LSC recommendations widening Tejon as much as possible to the east to allow for a wider striped center median. This is important, as motorists turning into this site will be queuing/waiting in this lane prior to turning left. Northbound motorists may provide "courtesy gaps" at the access intersection to allow left turns into the site.

There will be approximately 170 feet of distance between the site access and the northbound stop line at the Tejon/Motor Way intersection. This distance will be utilized for both northbound left turns at Motor Way and southbound left turns at the site access point.

FIGURE 8

RECOMMENDATIONS

LSC recommends the site design – primarily with respect to the west curb and west-side sidewalk along Tejon Street- accommodate, the extent possible, minor widening of Tejon street for:

- Four eleven-foot-wide through lanes
- An eleven-foot-wide center striped center "median" for left turn lanes.
- City-standard-width bicycle lanes in each direction

City staff indicated, at a recent meeting with the applicant, a plan for bike lanes in both directions in this Tejon corridor.

To the extent possible (given available ROW and other constraints), Tejon Street should be widened to the east to allow for a wider striped painted center "median" at the site access without narrowing the existing bicycle lanes or through travel lanes. This will likely involve coordination with the City as interim widening may involve modifications to the buffer between the sidewalk and the edge of the street

In conjunction with the above, minor adjustments to the existing pavement markings on Tejon Street and potentially E. Motor Way adjacent to the site will be needed. The center left turn striped "median" on Tejon Street between the site access and Motor Way should be striped for an 80-foot exclusive northbound left turn lane, a 40-foot shared lane transition taper and a 50-foot exclusive southbound left turn lane.

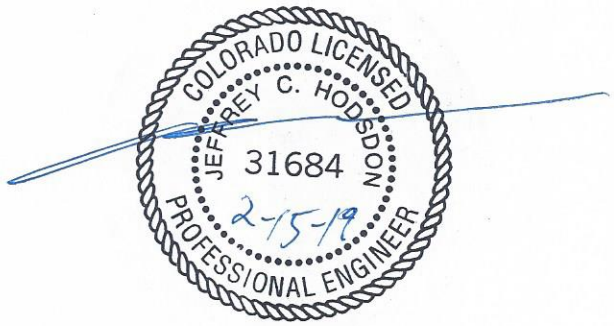
* * * * *

FIGURE 8

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:JAB:bjwb

Enclosures: Table 4
Figure 1 – Figure 9
Traffic Count Reports
Level of Service Reports
Queuing Analysis Reports

FIGURE 8