

Exhibit 17: Horizon Year Plus Project AM Peak Hour Volumes

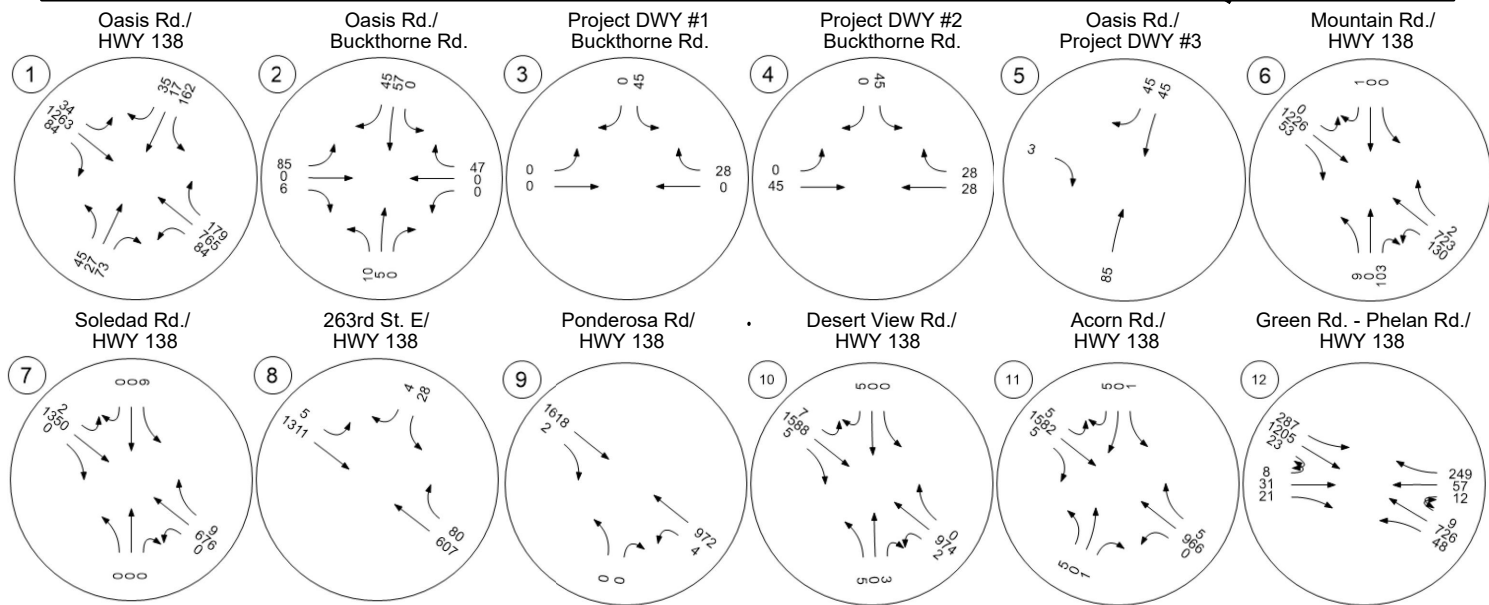
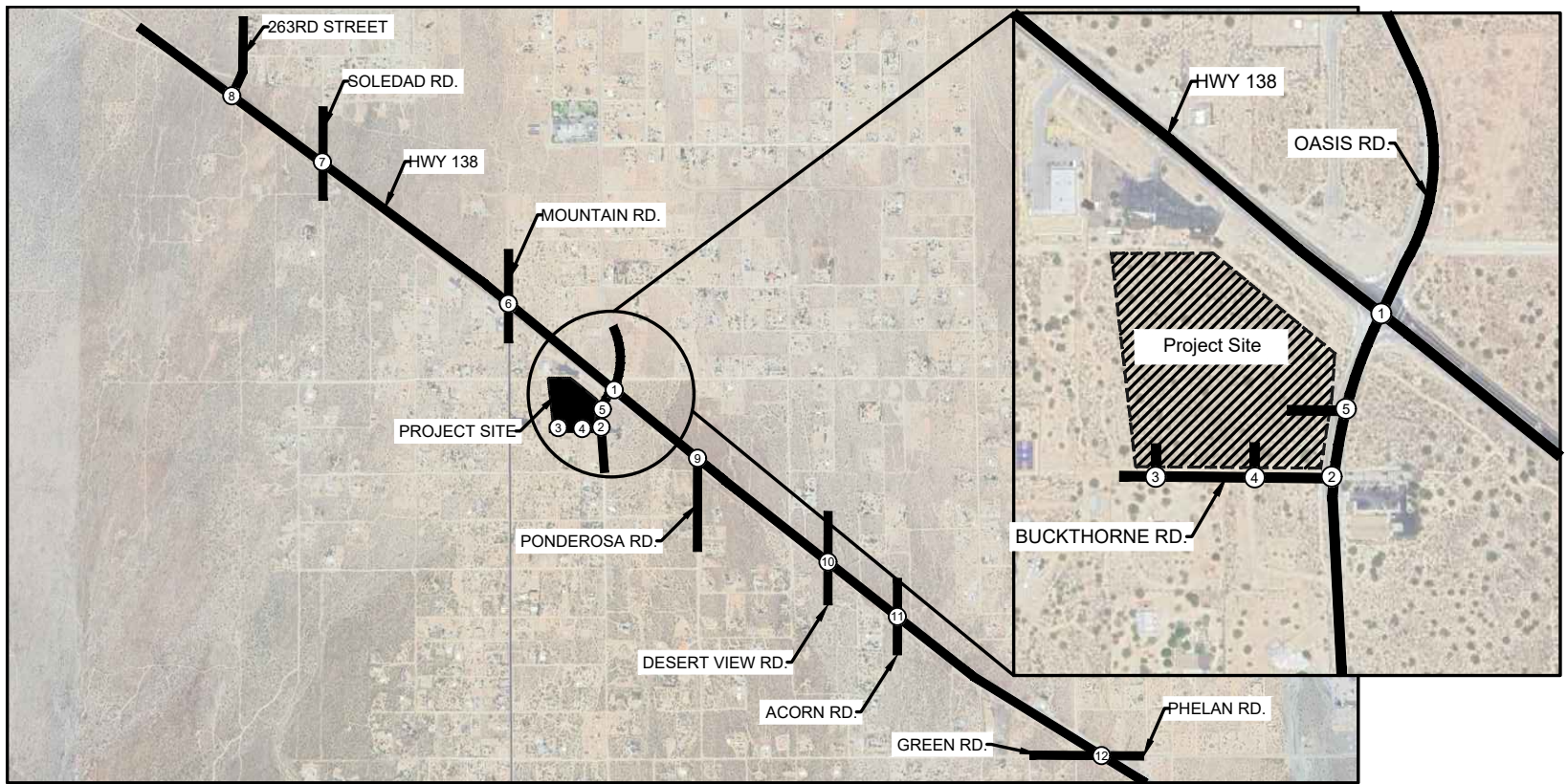


Exhibit 18: Horizon Year Plus Project PM Peak Hour Volumes

8.4 HYP QUEUING ANALYSIS

The queuing analysis is for the following examined movements;

Oasis Road and Highway 138 (Intersection 1)

- Eastbound (EB) right turn movement
- Westbound (WB) left turn movement

Oasis Road and Project Driveway #3 (Intersection 5)

- Southbound (SB) right turn movement

95th percentile queue lengths at this intersection were calculated to determine whether vehicles would have sufficient storage space at each movement.

The analysis utilized the traffic software program PTV Vistro to determine 95th percentile queue lengths for the movements at the study intersections. PTV Vistro uses the proposed project trip generation volumes and trip distribution to calculate the 95th percentile queue lengths in feet for the selected intersection movements. These were then compared to the existing storage lengths of each movement. **Table 17** compares these to the existing storage lengths. Synchro Queuing Reports are in **Appendix E**.

Table 17:
Intersection Queuing Analysis – Horizon Year Plus Project Conditions

Intersection			Leg ¹	Movement ²	Storage Length (ft)	95th Percentile Queue Length	
						AM Peak Hour	PM Peak
1	Oasis Road	Highway 138	EB	L	520	125	95
				R	520	50	66
			WB	L	520	108	244
				R	520	232	116
5	Oasis Road	Project Driveway #3	SB	R	-	<5	<5

1: NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound.

2: L = Left-Turn; R = Right-Turn; T/R = Through/Right-Turn.

As shown in **Table 17**, the storage lengths for the AM and PM peak hours will be sufficient for the 95th percentile queue lengths during *EACP* traffic conditions.

Regarding the eastbound right-turn movement of Oasis Road and Highway 138, the right-turn pocket is painted 520-feet long. This provides sufficient storage space for the AM peak hour 95th percentile queue length of 50-feet and the PM peak hour 95th percentile queue length of 66-feet.



Regarding the westbound left-turn movement of Oasis Road and Highway 138, the 520-foot westbound left-turn pocket will provide sufficient storage for the AM peak hour 95th percentile queue length of 108-feet and the PM peak hour 95th percentile queue length of 244-feet.

Additionally, the eastbound right-turn 95th percentile queue length of 50-feet and 66-feet will not block the existing property driveways for Smoketree Junction Antiques, 815 State Highway 138, CA 92372.

Lastly, the southbound right-turn movement on Oasis Road into the project driveway #3 has a 95th percentile queue length of less than 5 feet in both AM and PM peak hour.

8.5 HYP DECELERATION LENGTH

In correspondence with Caltrans, the deceleration length has been requested for the left turn westbound movement for Route 138 at intersection #1, Oasis Road and Route 138. Route 138 is currently operating at a 50-mph speed limit, and the westbound left turn movement currently has one left turn pocket at 520 feet.

According to Table 405.2B found in the CA MUTCD, the recommended deceleration length for a 50-mph speed limit is 435 feet. Caltrans recommends that some, or all, of a vehicle's left-turn deceleration occur within the left-turn pocket. Since the westbound left turn movement on Route 138 and Oasis Road has a 520 feet left turn pocket, the recommended length of 435 feet of deceleration lane length satisfies Caltrans requirements.

Deceleration Length Design: it has been determined that the deceleration length portion of the westbound left turn pocket shall be 435-feet per Caltrans standards.

Table 405.2B
Deceleration Lane Length

Design Speed (mph)	Length to Stop (feet)
30	235
40	315
50	435
60	530

9.0 INTERSECTION IMPROVEMENTS

Analysis of the study intersections found that the following intersections operate below the acceptable LOS and have more than a 5.0 second delay resulting from the trips generated by the proposed project, per *County Guidelines* criteria, will require improvements for *Horizon Year Plus Project* conditions. These intersections are;

- Intersection 6: Mountain Road / Route 138

The study intersection 10, Desert View Road and Route 138 is projected to operate at an unacceptable LOS. However, the trips generated by the project do not surpass the 5.0 second delay threshold and therefore will not require improvements in the *Horizon Year Plus Project* scenario.

9.1 INTERSECTION MITIGATIONS

Due to the deficient operations at the intersections listed above for either AM and PM peak hours, a traffic signal warrant analysis was conducted. The *California Manual on Uniform Traffic Control Devices* (MUTCD) Figure 4C-3 was utilized to determine if traffic signals are warranted here. As shown in **Table 18**, based on AM and PM peak hour volumes for *Horizon Year Plus Project* conditions, the traffic signal warrants were satisfied for the intersections listed above. Signal warrant analysis worksheets based on Figure 4C-3 are provided in **Appendix F**.

Table 18:
Traffic Signal Warrant Analysis

Roadway Segment			Peak Hour	Signal Warrant Satisfied ¹
6	Mountain Road	Route 138	AM	Yes
			PM	Yes

1: California Manual on Uniform Traffic Control Devices (MUTCD) Figure 4C-3.

9.2 FAIR SHARE ANALYSIS

The project fair share percentage for each recommended improvement is identified in **Table 19**. Fair percentage of project fair-share at affected intersections was calculated using the total trips generated by the project divided by the total “new” traffic, which is the net increase in traffic volume as a result of all other proposed projects.

Table 19:
Fair Share Analysis

Intersection			Improvement	Scenario	Peak Hour	Existing Volume	Total Volume	Project Volume	Project % of Fair Share
6	Mountain Road	Route 138	Install Signal	Horizon Year Plus Project	AM	1005	1937	71	7.62%
					PM	1198	2247	69	6.58%

9.3 WITH IMPROVEMENTS AM/PM PEAK HOUR INTERSECTION LOS ANALYSIS

The *Horizon Year Plus Project with Improvements* conditions AM and PM peak hour intersection analysis is shown in **Table 20**. HCM analysis sheets are provided in **Appendix E**.

Table 20:
Intersection Analysis – Horizon Year Plus Project with Improvements Conditions AM/PM Peak Hours

Intersection			Improvement	Peak Hour	Horizon Year Plus Project		Horizon Year Plus Project With Improvements Conditions	
					Delay ¹	LOS	Delay ¹	LOS
6	Mountain Road	Route 138	Install Signal	AM	41.10	E	16.00	B
				PM	112.68	F	25.03	C

1: Delay is shown in seconds per vehicle. Per the Highway Capacity Manual 7th Edition, overall average delay and LOS are shown for signalized and all-way stop-controlled intersections. For intersections with one-or-two-way stop-control, the delay and LOS for the worst individual movement is shown.

10.0 STOPPING SIGHT DISTANCE AND CORNER SIGHT DISTANCE

10.1 STOPPING SIGHT DISTANCE ANALYSIS

This sight distance analysis has been prepared based on applicable HDM and CA MUTCD standards for sight distance analysis. Topic 405.1 of the HDM discusses intersection design standards and sight distance. Sight distance refers to length of roadway ahead visible to the driver. Stopping sight distance refers to the distance required for the driver of a vehicle to perceive a situation requiring a stop, realize that stopping is necessary, apply the brake, and come to a complete stop. Per the HDM, stopping sight distance is to be provided for all users at all elements of intersections at grade.

Table 201.1 of the HDM, shown below, contains sight distance requirements based on design speeds used to determine the various geometric design features of a roadway.

Table 201.1
Sight Distance Standards

Design Speed (mph)	Stopping (feet)
10	50
15	100
20	125
25	150
30	200
35	250
40	300
45	360
50	430
55	500
60	580
65	660
70	750
75	840
80	930

Source: California Highway Design Manual (HDM) 7th Edition (July 2020).

As shown in Table 201.1, based on the 35 mile per hour speed limit on Oasis Road, the minimum sight distance for signal visibility is 250-feet.

Table 4D-2 of the CA MUTCD, shown below, discusses minimum stopping sight distance requirements for signal visibility based on the speed of the roadway.



Table 4D-2
Minimum Sight Distance for Signal Visibility

85th Percentile Speed (mph)	Minimum Sight Distance (feet)
20	175
25	215
30	270
35	325
40	390
45	460
50	540
55	625
60	715

Source: California Manual on Uniform Traffic Control Devices (CA MUTCD) Revision 8 (January 2024).

Note: Distances in this table are derived from stopping sight distance plus an assumed queue length for shoulder cycle lengths (60 to 75 seconds).

As shown in Table 4D-2, based on the 35 mile per hour speed limit on NB Oasis Road, the minimum sight distance for signal visibility is 325-feet.

10.2 CORNER SIGHT DISTANCE ANALYSIS

This corner sight distance analysis has been prepared based on applicable HDM and CA MUTCD standards for corner sight distance analysis. Topic 405.1 of the HDM discusses corner sight distance. Corner sight distance refers to the area of the roadway that will allow the stopped vehicle to turn into the appropriate lane on the road. In accordance with the HDM, the minimum corner sight distance equation, $1.47V_m T_g$ with V_m representing the design speed(mph) of the major road and T_g is the time gap (seconds) for the minor road vehicles, is used. Table 405.1A of the highway design manual, shown below, discusses corner sight distance time gap for unsignalized intersection.

Table 405.1A
 Corner Sight Distance Time Gap (Tg) for unsignalized intersection

Design Vehicle	Left-turn from Stop (s)	Right-turn from Stop and Crossing Maneuver (s)
Passenger Car Private Road Intersection Rural Driveway	7.5	6.5
Single-Unit Truck Public Road Intersection	9.5	8.5
Combination Truck Major and Minor Roads on Routes: National Network Terminal or Service Access	11.5	10.5

Source: Highway Design Manual on Intersection Design Standards (July 1, 2020).

As shown in table 405.1A design vehicle of passenger car utilizes 7.5 seconds for left turn from stop and 6.5 for right turn from stop. With the 35 miles per hour speed limit on the south side of Oasis Road and the time gap, we are able to determine a 335' corner sight distance for right turns and 386' corner sight distance for left turns.

Exhibit 19 shows corner sight distance for both the intersection on Oasis Road of driveway #3 and Buckthorne Road.

NOTE: FOR URBAN DRIVEWAYS, SECTION 405.1 OF THE HDM RECOMMENDS PARKING RESTRICTIONS BE SET PER CA MUTCD SECTION 3B.19.

* SECTION 3B.19 RECOMMENDS A CLEARANCE OF 6- FEET MEASURED FROM CURB RETURN SHOULD BE PROVIDED AT BOTH SIDES OF A DRIVEWAY.

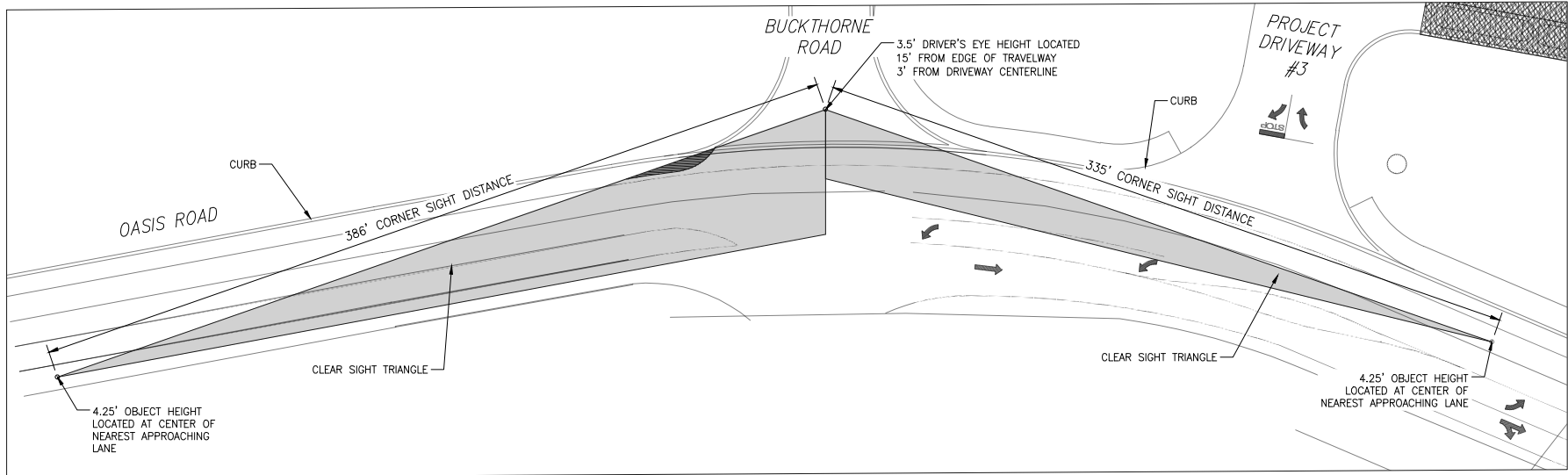
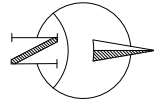
CORNER SIGHT DISTANCE NOTES:

FOR PRIVATE ROAD/RURAL DRIVEWAYS, THE HIGHWAY DESIGN MANUAL (HDM) RECOMMENDS CORNER SIGHT DISTANCE EQUAL $(1.47)(V_m)(T_g)$.

RIGHT-TURN: $V_m=35\text{MPH}$, $T_g=6.5$
CORNER SIGHT DISTANCE: 335''

LEFT-TURN: $V_m=35\text{MPH}$, $T_g=7.5$
CORNER SIGHT DISTANCE: 386''

Intersection #2 – Buckthorne Road/
Oasis Road (35 MPH)



Intersection #5 – Project Driveway #3/
Oasis Road (35 MPH)

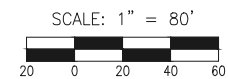
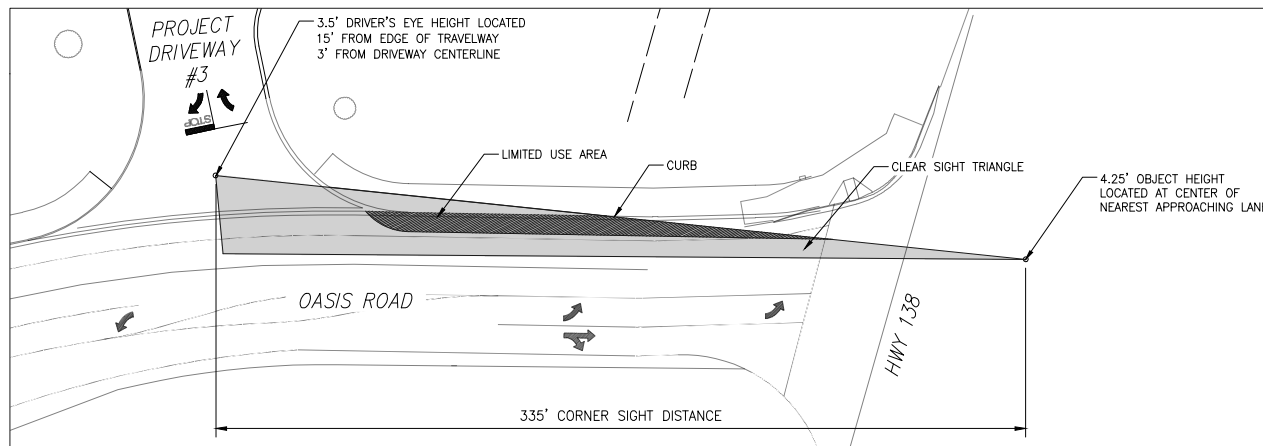
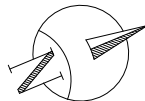


Exhibit 19: Corner Sight Distance Analysis



11.0 VEHICLE MILES TRAVELED (VMT) ANALYSIS

11.1 VEHICLE MILES TRAVELED (VMT) SCREENING

Senate Bill (SB) 743 was adopted in 2013 requiring the Governor’s Office of Planning and Research (OPR) to identify new metrics for identifying and mitigating transportation impacts within the California Environmental Quality Act (CEQA). For land use projects, OPR has identified VMT as the new metric for transportation analysis under CEQA. The regulatory changes to the CEQA guidelines that implement SB 743 were approved on December 28th, 2018, with an implementation date of July 1st, 2020, as the new metric.

OPR Technical Advisory on Evaluating Transportation Impacts in CEQA

The OPR Technical Advisory and the CEQA Guidelines Section 15064.3(a) states “For the purposes of this section, ‘vehicle miles traveled’ refers to the amount of distance of automobile travel attributable to a project.” Here, the term “automobile” refers to on-road passenger vehicles, specifically cars and light trucks. Additionally, the emissions and energy impacts of heavy-duty trucks are already regulated under other programs, such as the federal Clean Air Act. VMT analysis is intended to facilitate infill development and reduce passenger car emissions, and not to hinder goods movement and production requiring the use of heavy-duty trucks. Thus, per state guidance and regulations, heavy-duty truck VMT need not be included in VMT analysis. As the five (5) diesel fueling pumps of the proposed project will be exclusively for heavy-duty diesel trucks, the diesel fueling portion of the project screens out from a formal VMT analysis.

Additionally, the guidelines set forth in the *Caltrans Vehicle Miles Traveled – Focused Transportation Impact Study Guide (May 2020)* will screen this project out from a formal VMT analysis. According to the Caltrans Guidelines, any project that is a “locally serving retail project (such a project typically reduces vehicle travel by providing a more proximate shopping destination, i.e., better accessibility)” is presumed to have a less than significant transportation impact and therefore would not need a VMT analysis. **The proposed project is considered to be a local serving gas station and satisfies the screen criteria in the Caltrans guidelines. Therefore, this project will not require a VMT analysis.**



APPENDICES

- Appendix A:** Scoping Agreement and City Documents
- Appendix B:** Existing Traffic Counts and Model Volumes
- Appendix C:** HCM Analysis Sheets
- Appendix D:** Signal Warrant Reports



APPENDIX A

SCOPING AGREEMENT AND CITY DOCUMENTS



SCOPE FOR TRAFFIC STUDY

Project Name:	Maverik Fueling Station
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This Scope for Traffic Study acknowledges San Bernardino County Department of Public Works, Traffic Division requirements of traffic impact analysis for the project and is subject to change:
 Available on the Department of Public Works Website:
<http://cms.sbcounty.gov/dpw/Transportation/Traffic.aspx>

Project Address/APN	Oasis Road south of Highway 138 APN: 3067-051-29		
Project Description	15-pump gas station (5 trucks and 20 standard) with a 5,637 sq ft convenience store.		
City	Pinon Hills		
Project Horizon Year	2040	Project Opening Year	2026
Closest Intersection (Xtn) to the Project			
Xtn N/S Street Name	Oasis Road		
Xtn E/W Street Name	Highway 138		
County Supervisorial District	1 st	Ambient Growth Rate per Year Valley 2%, Desert 1%	2%

	Traffic Engineer	Owner/Developer
Company	TJW Engineering	Maverik, Inc
Name	Tiffany Chang	Kevin Deis
Address	9841 Irvine Center Drive, Suite 200	185 S State Street, Suite 800
City, State, Zip Code	Irvine, CA 92612	Salt Lake City, UT 84111
Phone #	949-878-3509	801-634-3210
Email address	tiffany@tjwengineering.com	Kevin.Deis@maverik.com

TJW Engineering Inc.

March 13, 2024

Firm Preparing Study

DATE

Gene Kim

C83175/T2684

Engineer of Record

License Number



SCOPE FOR TRAFFIC STUDY

Project Name:	Maverik Fueling Station
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1. Traffic Distribution: Please insert or attach Figure(s) illustrating project trip distribution in percentages and volumes at the study intersections analyzed.

2. Trip Credit: Exact amount of credit subject to approval by Traffic Division.

Transportation Demand Management (TDM)	Yes/no	
Existing Active Land Use	Yes/no	
Previous Land Use	Yes/no	
Internal Trip Reduction	Yes/no	
Pass-by Trip Reduction	Yes/no	

3. Related Projects: Consultant should check with Planning in the San Bernardino County Department of [Land Use Services](#) and planning departments of adjoining Cities. Documentation of the consultation from these agencies shall be included in the traffic study. Related projects list shall be submitted to Traffic Division for our review and approval before being incorporated in the study.

4. Freeway Analysis: The potential traffic impact on the following Freeway(s) must be considered.

On/off ramps are included as part of the study area intersections. Additional tasks to be coordinated with Caltrans.

The applicant shall consult with the State of California Department of Transportation (Caltrans) to determine the California Environmental Quality Act levels of significance with regard to traffic impacts on Caltrans' freeway facilities. This consultation shall also include a determination of Caltrans requirements for the study of traffic impacts to its facilities and the mitigation of any such impacts. This analysis must follow the most current Caltrans' Vehicle Miles Traveled-Focused Transportation Impact Study Guide (May 2020) and can be obtained from <https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/sb-743/2020-05-20-approved-vmt-focused-tisg-a11y.pdf>. If Caltrans finds that the project has a significant impact on the freeway, Caltrans shall be requested to include the basis for this finding in their response. If fees are proposed to mitigate the freeway impact, Caltrans shall be requested to identify the specific project to which the fees will apply. These written comments from Caltrans shall be included with the traffic study and submitted to Public Works for review and approval. If a documented good faith effort is made to consult with Caltrans and written comments cannot be obtained from within a reasonable amount of time, an analysis of the freeway impact shall be made using HCM procedures. Appendix A of the San Bernardino County Transportation Authority CMP outlines allowable modifications to these procedures. The San Bernardino County Transportation Authority CMP can be viewed online at: <https://www.gosbcta.com/planning-sustainability/?term=249>



SCOPE FOR TRAFFIC STUDY

Project Name:	Maverik Fueling Station
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5. Trip Generation

Trip Generation Rate(s) Source: ITE Trip Generation		I – Institute of Transportation Engineers; S – San Diego Traffic Generators; C – County; O – Other:							Edition: 11th					
Land Use Code	Land Use	Rate Based on	QTY	AVTE Units*	Daily Trips	Weekday A.M. Peak			Weekday P.M. Peak			Weekend peak hour		
						In	Out	Total	In	Out	Total	In	Out	Total
945	Convenience Store/Gas Station	I	20	VFP	6,915	316	316	632	269	269	538			
950	Truck Stop	I	5	VFP	1,120	34	36	70	41	36	77			

* - Average Vehicle Trip Ends.
 For ITE Land Uses provide number and name of Land Use. e.g. LU 814 - Variety Store. Units include ksf, employee, GLA, etc.



SCOPE FOR TRAFFIC STUDY

Project Name:	Maverik Fueling Station
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6. Study Intersections: At minimum, the study shall include the following intersections. The list is subject to change after related projects, trip generation and distribution are determined. Consultant should check with adjoining Cities regarding their requirements in addition to the following County/City intersections. Documentation of the consultation from these agencies shall be included in the traffic study.

Xtn #	% County	% City	N-S/E-W Street Name	City Name/Caltrans	Signalized	CMP
1	0	0	Oasis Road / HWY 138	Pinon Hills	Yes/no	Yes/no
2	100	0	Oasis Road / Buckthorne Road	Pinon Hills	Yes/no	Yes/no
3	100	0	Project Driveway / Buckthorne Road	Pinon Hills	Yes/no	Yes/no
4	100	0	Oasis Road / Project Driveway	Pinon Hills	Yes/no	Yes/no
5	0	0	Mountain Road / HWY 138	Pinon Hills	Yes/no	Yes/no
6	0	0	Soledad Rd / HWY 138	Pinon Hills	Yes/no	Yes/no
7	0	0	263 rd Street E / HWY 138	Pinon Hills	Yes/no	Yes/no
8	0	0	Desert View Road / HWY 138	Pinon Hills	Yes/no	Yes/no
9	0	0	Acorn Road / HWY 138	Pinon Hills	Yes/no	Yes/no
10	0	0	Green Road / HWY 138	Pinon Hills	Yes/no	Yes/no
11	0	0	Ponderosa Rd / HWY 138	Pinon Hills	No	No

Cities/agencies to be consulted:

San Bernardino County & Caltrans



SCOPE FOR TRAFFIC STUDY

Project Name:	Maverik Fueling Station
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7. Other:

Traffic counts may be conducted immediately per the following:
<ul style="list-style-type: none"> • Must be taken on Tuesdays, Wednesdays or Thursdays. • Certain projects may need to collect traffic counts on Friday or Sunday
<ul style="list-style-type: none"> • Must exclude holidays, and the first weekdays before and after the holiday.
<ul style="list-style-type: none"> • Must be taken on days when local schools or colleges are in session.
<ul style="list-style-type: none"> • Must be taken on days of good weather, and avoid atypical conditions (e.g., road construction, detours, or major traffic incidents).
<ul style="list-style-type: none"> • Traffic counts used for other traffic studies in the area shall NOT be reused again, unless 25% of the counts conducted for that particular traffic study are validated with new counts. The difference in volumes between the old and new counts at each corresponding movement should not be more than 10%.
<ul style="list-style-type: none"> • New traffic counts shall be checked to ensure the difference in volumes at corresponding approaches, if applicable, between two adjacent intersections is no more than 10% unless the difference can be justified.
<ul style="list-style-type: none"> • For all proposed mitigation measures, a conceptual plan for the improvements shall be submitted to our Traffic Studies section for review and approval prior to the approval of the Traffic Impact Analysis. All proposed improvements shall be within the right-of-way.
<ul style="list-style-type: none"> • For all cumulative mitigation measures, a cost estimate for the improvement shall be submitted.
<ul style="list-style-type: none"> • Raw traffic counts data must be included with traffic analysis study
<ul style="list-style-type: none"> • Traffic Counts must not be older than 1 year prior to submittal unless approved by County Traffic.

This analysis must follow the most current Traffic Impact Study Guidelines for the County as stated in the County's Road Planning and Design Standards.

8. Fees

The County charges on an actual cost basis for review of traffic studies. An initial deposit of \$1,802 is required at the time that a land use application is filed with the Department of Land Use Services. If the review costs exceed the initial deposit, the applicant will be expected to provide additional funds and the review will be suspended until the additional funds are deposited.



SCOPE FOR TRAFFIC STUDY

Project Name:	Maverik Fueling Station
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9. Contact Information:

Please submit a signed copy of this scope for approval by the Traffic Division. Draft scopes may be sent electronically. Final scope with signature should be submitted in person or by US Mail to:

San Bernardino County
Dept. of Public Works, Traffic Division
825 E. 3rd Street, Rm 115
San Bernardino, CA 92415-0835

Phone: 909-387-8186

Fax: 909-387-7809

Email: Eric.Valencia@dpw.sbcounty.gov or Oswaldo.Roque@dpw.sbcounty.gov