

Feasibility Study Volume 1 of 2



IN FRESNO AND TULARE COUNTIES WITHIN THE CITY OF KINGSBURG AND SELMA State Route 99- Mendocino (18th) Ave (PM 53.822) State Route 99-Mountain View Ave (PM R3.742)

May 2019



Feasibility Study

Mountain View/SR 99 & Mendocino (18th Avenue)/SR 99 Safety and Capacity Study Kingsburg, Ca

May 2019



IN FRESNO/TULARE COUNTIES, WITHIN THE CITY OF KINGSBURG AND SELMA Mountain View Ave (PM R3.742) and Mendocino Ave (PM R53.822)

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This Corridor Study has been prepared under the direction of the following Registered Engineer. The Registered Civil Engineer attests to the technical information contained therein and has judged the qualifications of any technical specialists providing engineering data upon which recommendations for scoping of projects and long-term planning for the corridor are based.

5/7/19

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Executive Summary

The purpose of the traffic safety/capacity study is to determine the future transportation needs on the State Route (SR) 99 / Mendocino (18th Avenue) Interchange and SR 99 / Mountain View Avenue Interchange within the areas of Kingsburg and Selma in Fresno County. The study identifies and recommends alternatives for future traffic demands and complements the Cities of Kingsburg and Selma General Plans. The study provides decision-makers with recommendations for design year 2045 and time frames when improvements are needed, as well as planning level cost estimates.

Acknowledging the role that Mountain View Avenue Interchange and Mendocino (18th Avenue) Interchange play in the transportation system in the area, the study developed a methodology to carry out an exhaustive examination of the current and future performance of both interchanges along SR 99. The methodology includes data collection to assess current operating conditions and a forecasting process to predict conditions for the year 2045. The Fresno County travel demand models were utilized as a reference to establish realistic forecasts of travel demand for the year 2045, and to ensure compatibility with relevant general plans and other transportation project appraisals.

The main metric used to assess the intersections conditions was level of service (LOS). A list of Level of Service for two-ways stop control and all-way stop control intersection are further detailed in the study.

The scope of the study includes analysis of all intersections located in the study area. Analysis of unsignalized intersection operations, particularly related to safety and access related issues, in addition to geometric deficiencies and level of service are discussed in the document. As part of the preliminary design of the proposed actions, further analysis, including updated turning movement counts and signal warrant analysis, was conducted to determine if additional traffic signals are necessary and warranted.

The study identifies existing geometric and safety deficiencies and provides a discussion of the potential operational improvements and safety benefits associated with each alternative. The study will determine a near-term, mid-term, and long-term improvements to meet transportation needs at the study locations. The study utilizes Fresno COG model, origin/destination map, and microsimulation tools to develop alternative traffic patterns.

The safety analysis conducted for the study was completed to the appropriate level of detail necessary to compare improvement alternatives. It identifies existing safety deficiencies and provided a discussion of the potential safety benefits associated with each alternative and the proposed action.

1. Introduction

1.1 Background

The Fresno Council of Governments (FCOG), the Tulare County Association of Governments (TCAG), the City of Kingsburg, and the City of Selma in cooperation with Caltrans have initiated this Feasibility Study. At a meeting in Kingsburg on February 22, 2018 all parties agreed that FCOG would serve as the lead agency representing the other local agencies in a Cooperative Agreement with Caltrans to perform traffic studies at the Mountain View Avenue and Mendocino (18th) Avenue interchanges. The purpose of the study was to identify current geometric deficiencies and to develop alternatives to improve safety and operations.

A Cooperative Agreement was approved with an effective date of May 29, 2018 and a meeting was held on July 10, 2018 to further discuss the scope of the study. The team agreed that the study should identify the current safety, geometric, and operational deficiencies and develop short term (less than 3 years), mid-term (3 – 15 years), and long term (20+ year) improvement alternatives. Alternatives at Mountain View should maintain access into the Flea Market. Additionally, planning level cost estimates will be developed for all proposed alternative improvements.

The team agreed that traffic counts should be gathered after school started in September and that traffic counts should also be taken on swap meet days to verify the peaks. The traffic counts should include truck % and forecasts at the Mountain View interchange should account for the Selma Crossings development. It was also discussed that the County has plans to widen Mountain View Avenue to four lanes.

Caltrans was also asked to look for measures that would help divert truck traffic away from 18th Avenue through Kingsburg. There is an elementary and High School that trucks pass when traveling 18th Avenue.

1.2 Study Objectives

- 1) Identify geometric deficiencies.
- 2) Perform a Safety Analysis.
- 3) Research ways to divert truck traffic along 18th Avenue in Kingsburg.
- 4) Develop short term improvements to improve safety.
- 5) Identify potential interim capacity improvements.
- 6) Analyze interim improvement alternatives.
- 7) Develop preliminary drawings and estimates for interim alternatives.
- 8) Determine failure year of interim alternatives.
- 9) Develop preliminary long term alternative drawings and estimates.
- 10) Draft report with conclusions.

2. Geometric Deficiencies

Inspection of as-built plans and reviews of available mapping has resulted in the following geometric feature deficiencies being identified.

2.1 Mountain View Avenue Interchange

Mountain View Avenue geometric deficiencies are presented in Table 2.1 (Exhibit 1).

Table 2.1 – Mountain View Avenue Interchange Geometric Deficiencies

Location	Deficiency
SR 99/Mountain View Avenue Interchange	Interchange Configuration Does Not Meet Currently Accepted Interchange Types
SR 99/Mountain View Avenue Interchange	Non-Continuous Sidewalks with Poor Pedestrian Access
Mountain View Avenue	Profile Has Non-Standard Sight Distance
Mountain View Avenue Overcrossing	Non-Standard Vertical Clearance Over State Route 99
Mountain View Avenue/SB Off-Ramp Intersection	Ramp Terminal Connects Where Grade Is Greater Than 4%
Mountain View Avenue/Van Horn Intersection	Non-Standard Intersection Skew Angle
Mountain View Avenue/Van Horn Intersection	Local Road Across from Ramp Terminal

2.2 Mendocino (18th) Avenue Interchange

Mendocino (18th) Avenue geometric deficiencies are presented in Table 2.2 (Exhibit 2).

Table 2.2 – Mendocino (18 th) Avenue Interchange Geometric Deficiencies						

Location	Deficiency
SR 99/Mendocino (18th) Avenue Interchange	Interchange Configuration Does Not Meet Currently Accepted Interchange Types
SR 99/Mendocino (18th) Avenue Interchange	Interchange Has Isolated Ramps
SR 99/Mendocino (18th) Avenue Interchange	Non-Continuous Sidewalks With Poor Pedestrian Access
Mendocino (18 th) Avenue Overcrossing	Non-Standard Vertical Clearance Over State Route 99
Mendocino (18th) Avenue/NB Off-Ramp Intersection	Non-Standard Intersection Skew Angle
Mendocino (18th) Avenue/NB Off-Ramp Intersection	Sight Distance at Ramp Termini Not Met
Mendocino (18th) Avenue/NB Off-Ramp Intersection	Local Road Across from Ramp Terminal
Avenue 394/SB Off-Ramp Intersection	Non-Standard Intersection Skew Angle
Avenue 394/SB Off-Ramp Intersection	Uncontrolled Termini of Ramp at Intersection
SB Off-Ramp	Deceleration Distance Along Ramp Is Not Met

3. Safety Analysis

3.1 Safety Analysis Report

A Safety Analysis report dated September 17, 2018 (Attachment A) was prepared by the Caltrans District 6 Office of Traffic Operations. Accident tables for NB and SB SR 99 mainline and for the on and off ramps at each of the interchanges were created for the 3-year period from 01/01/2014 to 12/31/2016.

The accident tables indicated some Actual Accident rates on mainline were higher than the Statewide Average for similar types of facilities. However, after a review of the varied locations, factors, and types of collisions there doesn't appear to be any correctable accident causing situations on the mainline.

Accident tables for the Mountain View Avenue interchange ramps indicate that the Actual Fatal accident rates at all ramps is lower than the Statewide Averages for similar types of facilities. The Actual Fatal plus Injury and Total accident rates is lower than the Statewide Average for the NB off-ramp but higher than the Statewide Average for the NB on-ramp, SB off-ramp, and the SB on-ramp. Speeding is indicated as the most prominent Primary Collision Factor for all locations (Exhibit 3). The report recommended replacing one missing sign at the NB off-ramp exit gore and installing another sign at the intersection of the SB off-ramp facing Van Horn Avenue.

Accident tables for the Mendocino (18th) Avenue interchange ramps indicate the Actual Fatal, Fatal plus Injury, and Total accident rates at the SB on-ramp, and NB on-ramp are lower than the Statewide Averages for similar types of facilities. For the NB off-ramp the Actual Total accident rate is higher than the Statewide Average for similar types of facilities and for the SB off-ramp both the Actual Fatal plus Injury and Total accident rates are higher than the Statewide Average for similar types of facilities. Speeding is indicated as the most prominent Primary Collision Factor for the two off-ramp locations (Exhibit 4).

3.2 All Way Stop (AWS) Traffic Warrants

Due to Speeding being identified as the most prominent Primary Collision Factor at both interchanges District 6 Traffic Operations deployed hose counting stations in November 2018 to gather traffic volumes and determine whether ramp intersections met warrants for All Way Stop (AWSC) control (Attachment B). The ramp intersections with Mendocino Avenue met the traffic volume warrants for the Major and Minor street legs. At the Mountain View Avenue interchange the SB off-ramp intersection met the traffic volume warrants for the Major and Minor street legs however the NB off-ramp intersection met the warrant for Mountain View Avenue (Major Street) but did not meet the volume warrant for the NB offramp (Minor Street).

3.3 Divert Truck Traffic From 18th Avenue

A review of the California State Highways Truck Networks reveals that 18th Avenue through Kingsburg is not on the National Network (STAA) or the Terminal Access (STAA). Additionally, the SR 99 Mendocino (18th) Avenue interchange is not designated for access to Truck Services. Further review of the City of Kingsburg ordinances reveals that 18th Avenue is not a designated Truck Route by City Ordinance. Caltrans does not post signage precluding truck usage for facilities that are not designated as truck routes.

There are currently City signs on the NB off-ramp, Avenue 394, and 18th Avenue north of the Avenue 396 intersection indicating 18th Avenue is not a truck route. An application should be submitted for legal truck access to the industries on Clarkson Drive. Once an application is approved an End of Truck Route sign can be posted on 18th Avenue at the intersection of Kent Street. It is also recommended that enforcement be used to dissuade truck traffic from using 18th Avenue.

4. Alternatives

4.1 Mountain View Avenue

4.1.1 Near Term

Existing

This No-Build alternative would not alter the existing conditions and will not address safety issues.

Two Way Stop Control

This alternative proposes to add all way stop control at the SB off-ramp intersection and to re-delineate the slip on-ramp intersections to create perpendicular right turns. This alternative will slow traffic down on Mountain View Avenue but will negatively affect Levels of Service (LOS) (Exhibit 5).

4.1.2 Mid-Term

Mid-term alternatives for the Mountain View Avenue interchange propose to improve interchange operations and safety with minimal right-of-way (R/W) impacts and without impacting the Mountain View overcrossing structure. Three alternatives were developed as mid-term improvement options. All mid-term alternatives propose to realign the on-ramps to create single intersection points along Mountain View Avenue. The three alternatives will consider three types of intersection control; All Way Stop (AWS), signalized, and roundabout.

Access to the flea market on the east side of SR 99 will be maintained in both the EB and WB directions. A median island would be constructed with a left turn pocket for WB access. Access to the service station

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on the southwest side of the interchange would be rerouted to a new intersection approximately 400 feet west of the existing SB off-ramp intersection. Connection of South Van Horn Avenue to Mountain View Avenue would be removed.

Pedestrian and bicycle access would be improved by the elimination of the high-speed slip ramps and reducing the widths of the ramp intersections. The sidewalk on the north side of Mountain View Avenue would be extended from the overcrossing to beyond the ramp intersections and crosswalks would be constructed.

Alternative 1 (Exhibit 6)

Realigned on-ramps with AWS intersection control.

Alternative 2 (Exhibit 7)

Realigned on-ramps with signalized intersection control. This alternative would widen Mountain View Avenue on each side of the overcrossing to provide left and right turn lanes to the on-ramps.

Alternative 3 (Exhibit 8)

Realigned on-ramps with roundabout intersection control.

An alternative was considered that would add hook on-ramps and eliminate the need for left turns from Mountain View Avenue to the existing on-ramps. Because of the narrow width between the bents adjacent to the SR 99 outside shoulders and the structure abutments hook ramps are not viable. Standard freeway entrance ramp geometry cannot be constructed with the available width.

4.1.3 Ultimate Long-Term Alternative

Alternative 4 (Exhibit 9)

An L-9 interchange configuration with signalized Intersections was developed as an ultimate alternative. This alternative would require reconstruction of the Mountain View Avenue overcrossing and adjusting the roadway profile. Additionally, construction of the successive on-ramps could create the need for construction of auxiliary lanes on SR 99. This alternative would also create R/W impacts to both service stations on the west side of the interchange and the Flea Market on the east side.

4.2 Mendocino (18th) Avenue Alternatives

4.2.1 Near Term Alternative

Two Way Stop Control

This No-Build alternative would not alter the existing conditions and will not address safety issues.

All Way Stop Control

This alternative proposes to add all way stop control at the two ramp intersections on Mendocino Avenue. This alternative will slow traffic down on Mendocino Avenue but will negatively affect Levels of Service (LOS).

4.2.2 Mid Term

Mid-term alternatives for Mendocino Avenue also propose to improve interchange operations and safety with minimal right-of-way (R/W) impacts and without impacting the Mendocino overcrossing structure. For Mendocino Avenue six alternatives were developed as mid-term improvement options. Mid-term alternatives for Mendocino Avenue are separated into two groups. Each group will consider three types of intersection control; All Way Stop (AWS), signalized, and roundabout.

The first group of alternatives, alternatives 1 – 3 propose to realign Avenue 394 and improve the Avenue 394/SB off-ramp intersection with stop control for the SB off-ramp. These alternatives will improve turn movements at the intersection with Mendocino Avenue. The first group also proposes to realign the NB off-ramp and Frontage Road to create a more perpendicular intersection with Mendocino Avenue. Realignment of the NB off-ramp and the Frontage Road would require construction of retaining walls due to the height of the intersection and the proximity between the railroad and State Route 99.

Pedestrian and bicycle access would be improved by reducing the widths of the ramp intersections. The sidewalk on the north side of Mendocino Avenue would be extended and made continuous from the railroad overhead east of the interchange to west of the Avenue 394/SB on-ramp intersection and crosswalks would be constructed.

Alternative 1 (Exhibit 10)

AWSC intersection control at Mendocino Avenue intersections and Two Way Stop (TWS) control at the Avenue 394/SB off-ramp intersection.

Alternative 2 (Exhibit 11)

Signalized intersection control at Mendocino Avenue intersections and Two Way Stop (TWSC) control at the Avenue 394/SB off-ramp intersection.

Alternative 3 (Exhibit 12)

Roundabout intersection control at Mendocino Avenue intersections and at the Avenue 394/SB off-ramp intersection.

The second group of alternatives, alternatives 4 – 6, propose to reconstruct the SB off-ramp and NB onramp to eliminate the isolated ramps. These alternatives propose to realign Avenue 394 to connect to Avenue 392 to the south and construct a cul-de-sac approximately 100 feet west of the current Avenue 394/SB off-ramp intersection. The Frontage Road access to Mendocino Avenue would be eliminated Band access to the businesses between the railroad and SR 99 would be shifted to the Sierra Street interchange.

These alternatives would require construction of retaining walls to realign the NB off-ramp and NB onramp.

In addition to the pedestrian and bicycle improvements provided by alternatives 1 - 3 these alternatives would further improve pedestrian safety at the intersection with the NB on-ramp. By reducing the roadway width with the removal of the SB movement from Frontage Road, the crosswalk would be significantly narrowed. A pedestrian access would be provided along the realigned SB off-ramp for access to the neighborhood along Avenue 394.

Alternative 4 (Exhibit 13)

AWS intersection control at Mendocino Avenue intersections.

Alternative 5 (Exhibit 14)

Signalized intersection control at Mendocino Avenue intersections.

Alternative 6 (Exhibit 15)

Roundabout intersection control at Mendocino Avenue intersections.

4.2.3 Ultimate Long-Term Alternative

Alternative 7 (Exhibit 16)

A combined L-1/L-2 interchange configuration with signalized Intersections was developed as an ultimate alternative for the Mendocino Avenue location because of the proximity to the railroad, see exhibit 16. This alternative would require reconstruction of the Mendocino Avenue overcrossing and the railroad overhead. The alternative would adjust the roadway profile to meet vertical clearance requirements over SR 99 and be realigned slightly north on the west side of SR 99 to improve the skew angle with the freeway. The realignment of Mendocino Avenue will improve ramp intersection angles. Because of the proximity to the railroad retaining walls would be needed for construction of the NB ramps. Additionally, Avenue 394 would need to be realigned for the ultimate interchange design.

5. **Operational Analysis**

5.1. Overview

This study followed certain procedures for all locations including collecting existing traffic data, describing lane configurations, evaluating deficiencies, and providing acceptable recommendations with realistic costs. The study methodology was developed to ensure an appropriate method was used for each location. A comprehensive evaluation of existing and future deficiencies on roadway networks, including interchanges and intersections was conducted. This study entails the development and evaluation of alternatives based on performance measures including conceptual designs.

5.2 Traffic Data Collection

The existing conditions analysis included researching and collecting the most current vehicle turns counts data, roadway geometry, such as number of lanes and storage lengths, pedestrian counts, vehicular queue length observations, large truck estimates, origin-destination analysis and general observations.

Traffic data was collected when schools were in session. An additional Sunday traffic count was conducted to collect Selma Flea Market traffic. Traffic data was collected on the following dates for the listed intersections:

Thursday, September 13, 2018, 6:00 - 9:00 AM, and 3:00 - 6:00 PM

- SR 99 SB Off Ramp / Mountain View Avenue Intersection
- SR 99 SB On Ramp / Mountain View Avenue Intersection
- SR 99 NB On Ramp / Mountain View Avenue Intersection
- SR 99 NB Off Ramp / Mountain View Avenue Intersection

Wednesday, September 26, 2018, 6:00-9:00 AM, and 3:00 - 6:00 PM

- SR 99 NB Off Ramp / Mendocino (18th) Avenue Intersection
- SR 99 NB On Ramp / Frontage Road / Gilroy Street Intersection
- SR 99 SB Off Ramp / Ave 394 Intersection
- SR 99 SB Off Ramp / Ave 394 / 18th Avenue Intersection

Sunday, October 28, 2018, 5:00-9:00 AM, and 2:00 - 6:00 PM

- SR 99 SB Off Ramp / Mountain View Avenue Intersection
- SR 99 SB On Ramp / Mountain View Avenue Intersection
- SR 99 NB On Ramp / Mountain View Avenue Intersection
- SR 99 NB Off Ramp / Mountain View Avenue Intersection

5.3 Analysis Years

This study used 2018 as the base year, 2025 as the construction year and 2035, 2045 as the 10 and 20year design period. Estimated traffic volumes for the study also provides failure years and corresponding suggested project initiation years for locals to consider.

5.4 Forecasting

5.4.1 Overview

Transportation forecasting estimates the number of people or vehicles that will use a specific transportation facility in the future. Due to the lack of pedestrian and bicycle traffic observed in data collection forecasting for this study will be limited to the vehicle mode.

Traffic volumes forecasts are used as input in traffic operational analysis to identify future needs, evaluate performance measures, and serve as a basis of concept designs that will meet these needs.

5.4.2 Forecasting Tools

This study used several urban transportation planning procedures for forecasting:

• **Trip generation** uses standard trip generation rates based on land use studies. This study used the 10th edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual. Trip generation was used for locations where insufficient traffic volume counts were available.

- **Historical trends** were analyzed, and corresponding adjusted growth rates used for study locations.
- Travel Demand Model. Fresno County Council of Governments (Fresno COG) is the MPO in Fresno County. Fresno COG maintains and runs travel demand models for the Fresno County region. The models predict changes in travel patterns and are used to forecast the demand for future transportation infrastructure. The model transportation network is based on adopted local general plans and reflects existing and future freeways, expressways, arterials and collectors. Input variables include population, households, employment, school enrollment, income, traffic counts, speed, and existing or planned transportation networks.

The current Fresno COG model was updated in 2013. The model was calibrated to 2008 population, employment and traffic count data and validated against socio-economic data. Fresno COG developed a new 2040 model as part of an eight county San Joaquin Valley (SJV) Model Improvement Program (MIP). This is to address SB 375, California's law requiring coordination of land use and transportation planning to support mandated greenhouse gas emission reductions.

5.4.3 2025, 2035 and 2045 Forecast Traffic Volumes

Travel demand models used to forecast future travel patterns. Socio-economic data, roadway networks, trip rates, and other factors are used by the model to calculate the current and future travel patterns. The resultant growth rate produced by the model was listed against growth rates computed by other methods such as from count trends, population growth, employment growth and trips generated from adjacent planned projects such as Selma-Crossing and Hash Project. Future land use was also used to generate the number of trips entering or exiting a site at a given time. Trip rates are functions of type of future land use, development, and square footage, number of dwelling units, or other standard measurable things, usually produced in General site plans. Origin-Destination map was produced by trip purpose, typically as a function of household demographics and land uses.

6. TRAFFIC STUDY METHODOLOGY

6.1 Operational Measures of Effectiveness (MOE)

Acceptable operations are defined, and operational needs are identified by measures of effectiveness for intersections. Intersections are evaluated using level of service (LOS) and Volume/Capacity (V/C) ratio. A detailed analysis by lane groups provides an effective way to identify operational needs and geometric design solutions to meet these needs. Improvements and the timing of improvements are proposed based on critical lane group MOEs including LOS, delay, 95% queue length, and V/C ratio.

6.2 Level of Service (LOS)

Level of Service is a qualitative measure used to gauge traffic operational performance by describing the driver's experience within a traffic stream in terms of speed and travel time, maneuverability in the traffic stream, interruptions and delay, and comfort and convenience. Six levels of service are defined by the HCM 6th edition. Letters designate each level, from LOS "A" indicating traffic flow with little to no delay to LOS "F" denoting over-saturated conditions where traffic flow exceeds capacity, resulting in excessive delays and long queues. Based on current and forecasted traffic volumes, the LOS for the various time frames was calculated using Highway Capacity Software (HCS) to analyze AWSC and TWSC intersections or the equivalent in Synchro 10 for signalized intersections and SYDRA 8 for roundabouts.

The HCM level of service criteria for signalized, un-signalized intersections and roundabouts are presented in Table 6.1.

Table 6.1 – Level of Service	Definitions for Intersections
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	DESCRIPTION	CONTROL DELAY (Sec/Veh) WITH V/C ≤ 1				
LOS		UNSIGNALIZED	SIGNALIZED	ROUNDABOUT		
		(AWSC, TWSC)				
Α	Traffic flows with very little delay and optimal speeds. Most vehicles do not stop at all.	0-10	<10	0-10		
В	Traffic flows with very little delay and speeds may be slightly reduced. Very infrequent and short waits at traffic signals. More vehicles stop at intersections than for LOS A.	>10-15	>10-20	>10-15		
с	Traffic speeds continue to slow. Some vehicles may stop at this level, although many vehicles still pass through the intersection without stopping.	>15-25	>20-35	>15-25		
D	Congestion becomes more noticeable. Many vehicles stop and the proportion of vehicles not stopping declines.	>25-35	>35-55	>25-35		
E	Low speeds and traffic backups at intersections. Often considered to be the limit of acceptable delay.	>35-50	>55-80	>35-50		
F	Very slow speeds and congestion. Long traffic backups. Very likely to wait for multiple greens to get through an intersection. This is unacceptable for most drivers.	>50	>80	>50		

Source: Highway Capacity Manual 6th edition

For this study, it was decided to perform analysis using LOS D as the failure threshold and to plan the projects for 20-year horizon.

6.3 Volume/Capacity (V/C) Ratio

The V/C ratio estimates the ability of a roadway to accommodate traffic volume demand. It compares roadway demand (vehicle volumes) with roadway supply carrying capacity. Volume refers to the number of vehicles using a roadway at the peak commute times, while capacity is its ability to support that volume based on the geometric design and number of lanes. V/C ratio is a principal measure of effectiveness for critical lane groups or the intersection. Critical lane group is that portion of the roadway whose behavioral attributes (MOE) are distinctly different and operationally deficient in comparison to the intersection. The tables listed in the study will show intersection LOS, which do not necessarily indicate acceptable operational attributes on each approach. Critical lane groups could indicate excessive delay or queuing problems representing operational deficiencies. In general, a V/C ratio greater than 0.8 is near capacity and would require further analysis of other measures of effectiveness; V/C ratios greater than 0.9 is at capacity and above 1.0 is over capacity. This is true for the whole intersection or for critical lane groups.

6.4 95th Percentile Queue Length

Caltrans design criteria includes the 95th-percentile queue length when practicable. The 95th-percentile queue is defined to be the queue length (in vehicles) that has only a five percent probability of being exceeded during the analysis period. It is a useful parameter for determining the appropriate length of turn pockets. Proper queue length sizing is critical to prevent "queue blocking."

6.5 Delay

Delay is defined in the Highway Capacity Manual 2010 as "additional time experienced by a driver, passenger, bicyclist, or pedestrian beyond that required to travel at the desired speed." The delay encountered by a traveler at a signalized intersection constitutes the largest part of his or her travel time on non-freeway segments. Delay can be measured for lane groups or for the intersection. While the tables provide intersection delay, critical lane groups are evaluated by the engineer when considering the performance of an intersection. In general, delay has three main components: uniform stop delay, oversaturated delay and the stop delay caused by the initial queue from the previous cycles.

6.6 Average Delay

Average Delay for the intersection is calculated by taking a volume weighted average of all the delays.

7. Mountain View Avenue

Four intersections are located on Mountain View Avenue and SR 99 ramps.

Figure 7.1 – Mountain View Avenue Existing Aerial Photo



Mendocino (18th) Avenue/SR99 & Mountain View Avenue/SR99 Feasibility Study

7.2 2018 Existing Peak Hour Turning Movement Volumes

Figure 7.2 illustrates the Mountain View Avenue intersections 2018 existing AM (PM) peak hour turning movement volumes.





7.3 2025 Forecast Peak Hour Turning Movement Volumes

Figure 7.3 shows the SR99/Mountain View Avenue intersections 2025 forecast AM (PM) peak hour forecast turning movement volumes.





7.4 2035 Forecast Peak Hour Turning Movement Volumes

Figure 7.4 shows the SR99/Mountain View Avenue intersections 2035 forecast AM (PM) peak hour forecast turning movement volumes.





Mendocino (18th) Avenue/SR99 & Mountain View Avenue/SR99 Feasibility Study

7.5 2045 Forecast Peak Hour Turning Movement Volumes

Figure 7.5 shows the SR99/Mountain View Avenue intersections 2045 forecast AM (PM) peak hour forecast turning movement volumes.





7.6 Existing Traffic Operational Conditions

The ramp intersections at the SR 99 and Mountain View Avenue interchange were analyzed for existing, 2035, and 2045 operating conditions (approach delay and LOS). Data for analysis was based on AM and PM peak hour turning movement counts.

Currently, the intersection at the SR 99 southbound off-ramp/Mountain View Avenue and northbound off-ramp/Mountain View Avenue interchanges are operating as TWSC, and the intersection at the SR 99 southbound on-ramp/Mountain View Avenue and northbound on-ramp/Mountain View Avenue interchanges are operating as unsignalized.

The acceptable level of service (LOS) for intersections is LOS D or better. Therefore, any intersections operating at a LOS E or F will be considered deficient. For existing traffic conditions, the SR 99 northbound ramps and Mountain View Avenue intersection is operating at LOS C, an acceptable level of service. However, the SR 99 southbound ramps and Mountain View Avenue intersection is operating at LOS E, See Table 7.1.

Queue and delay time on the southbound left turn traffic are the dominant problems. For the PM peak, the southbound left turn V/C ratio is 0.86 and delay time is 54.7 seconds with LOS F.

Location	LOS by Leg			Delay (sec)				105	Delay	
Location	EB	WB	NB	SB	EB	WB	NB	SB		Delay
SR 99 NB Off-Ramp	-	-	C (C)	-	-	-	24 (23)	-	C (C)	18 (18)
SR 99 SB Off-Ramp	-	A (A)	C (C)	D (F)	-	8 (9)	16 (16)	28 (55)	C (E)	25 (43)

Table 7.1 – Mountain View Avenue Intersections, 2018 Existing Level of Service Summary.

7.7 Existing Deficiencies

7.7.1 SR 99 Southbound Off Ramp Intersection (Intersection 1)

The SR99 SB off ramp left-turn queue and the associated delay time are the dominant problems. For the PM peak, the southbound left turn delay time is 55 seconds with LOS F.

7.7.2 SR 99 Northbound Off Ramp Intersection (Intersection 4)

The analysis indicates that the intersection currently operates with satisfactory levels of service during both the morning and evening peak travel periods for the year 2018.

7.8 No-Build Traffic Operation Conditions

7.8.1 Year 2025 and 2035

Traffic operational analysis for the 2025 and 2035 no-build scenario indicates that the SR99/ Mountain View Avenue intersections would likely operate with unsatisfactory level of service F with long delay times, see Table 7.2 and 7.3, respectively.

Table 7.2 Mountain View Avenue Intersections, 2025 No-Build Level of Service Summary

Location		LOS b	y Leg			Dela		105	Delay	
Location	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SR 99 NB Off-Ramp	-	-	D (D)	-	-	-	34 (35)	-	C (C)	24 (25)
SR 99 SB Off-Ramp	-	A (A)	C (C)	F (F)	-	8 (9)	19 (20)	67 (202)	F (F)	54 (142)

Table 7.3 Mountain View Avenue Intersections, 2035 No-Build Level of Service Summary

Location		LOS b	y Leg			Del		105	Delay	
Location	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SR 99 NB Off-Ramp	-	-	F (F)	-	-	-	105 (188)	-	F (F)	63 (113)
SR 99 SB Off-Ramp	-	A (A)	D (E)	F (F)	-	9 (10)	30 (37)	363 (935)	F (F)	247 (577)

The SR99 SB off ramp / Mountain View Avenue intersection is currently failing and SR99 NB off ramp / Mountain View Avenue intersection will fail in the year 2030 see Table 7.4.

Location Project	Failing Year
SR 99 NB Off-Ramp/Mountain View Avenue	2030
SR 99 SB Off-Ramp/Mountain View Avenue	2018

Table 7.4 Mountain View Avenue Intersections Failing Year for No-Build

7.9 Recommended Improvements to Address Deficiencies for Design Year 2045

The following are improvements recommended for the SR99 off ramps / Mountain View Avenue intersections to address deficiencies for Design Year 2045:

Realign on Ramps for all alternatives and install the following traffic control on ramp terminals:

- Alternative 1 All Way Stop Control (AWSC)
- Alternative 2 Signalized
- Alternative 3 Roundabout

7.9.1 Alternative 1- Realign On-Ramps with All Way Stop Control (AWSC)

Table 7.5, 7.6 and 7.7 show that with the recommended improvements, the SR99 NB & SB ramps / Mountain View Avenue intersections would likely operate worse than the no-build scenario and with an unsatisfactory LOS F for both the morning and evening peak hours in the year 2045.

 Table 7.5 Mountain View Avenue Intersections, Construction Year 2025 Level of Service Summary (AWSC)

Location		LOS	oy Leg			Delay	v (sec)		105	Delay
Location	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SR 99 NB Off-Ramp	E (F)	C (B)	B (B)	-	36 (84)	16 (14)	11 (12)	-	C (F)	25 (52)
SR 99 SB Off-Ramp	C (F)	B (C)	-	C (D)	19 (104)	14 (19)	-	22 (29)	C (F)	19 (59)

Table 7.6 Mountain View Avenue Intersections, Year 2035 Level of Service Summary (AWSC)

Location		LOS	oy Leg			Delay	v (sec)		105	Delay
Location	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SR 99 NB Off-Ramp	F	D	В	-	153	33	12	_	F	87
F	(F)	(D)	(B)		(275)	(26)	(13)		(F)	(154)
SP 00 SP Off Pamp	F	С		Е	57	21		46	E	44
SK 99 SE OII-Ramp	(F)	(E)	-	(F)	(270)	(39)	-	(55)	(F)	(139)

Table 7.7 Nountain view Avenue intersections, real 2045 Level of Service Summary (AvvSe).	Table 7.7 Mo	ountain View Aven	ue Intersections, Yea	ar 2045 Level of Ser	vice Summary (AWSC)
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Location		LOS b	oy Leg			Delay	v (sec)		105	Delay
Location	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SP 00 NP Off Pamp	F	F	В		366	112	14		F	222
SK 99 NB OII-Kallip	(F)	(F)	(C)	-	(576)	(130)	(19)	-	(F)	(338)
SP 00 SP Off Pamp	F	D		F	170	30		89	F	106
зк ээ зь он-капр	(F)	(F)	-	(F)	(493)	(130)	-	(117)	(F)	(267)

7.9.2 Alternative 2- Realign On-Ramps with Signalized

Table 7.8, 7.9 and 7.10 shows the recommended signalized intersections improvements The SR99 NB ramps / Mountain View Avenue would likely operate with a satisfactory LOS C for the year 2045. The SR99 SB ramps / Mountain View Avenue would likely operate with unsatisfactory LOS F in the evening peak hour travel period with long delay times for the year 2045, see Table 7.9. The eastbound through, southbound left-turn have V/C ratios that are overcapacity with corresponding LOS F and long delay times. The SR99 SB ramps / Mountain View Avenue with the recommended signalized intersections improvements would fail in the year 2040.

Table 7.8 Mountain View Avenue Intersections, Construction Year 2025 Level of Service Summary (SIGNALIZED)

Location		LOS		LOS by Leg				Delay		105	Delay
Location	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay	
SR 99 NB Off-Ramp	В	В	А	_	19	12	8	-	В	15	
on so no on namp	(B)	(B)	(A)		(19)	(15)	(9)		(B)	(17)	
SP 00 SP Off Pamp	С	Α		В	32	8		17	С	21	
эк ээ эв он-капр	(D)	(A)	-	(C)	(40)	(3)	-	(35)	(C)	(30)	

Table 7.9 Mountain View Avenue Intersections	, Year 2035 Level of Service Summary (SIGNALIZED)
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Location		LOS	oy Leg			Delay		105	Delay	
Location	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SP 00 NP Off Pamp	В	В	Α		19	12	10		В	15
	(B)	(C)	(C)	-	(11)	(25)	(28)	-	(B)	(18)
CD 00 CD Off Dama	D	Α		С	39	5		22	С	24
SK 99 SD Oll-Ramp	(E)	(A)	-	(D)	(58)	(3)	-	(44)	(D)	(40)

Location		LOS	y Leg			Delay	v (sec)		105	Delay
Location	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SP 00 NP Off Pamp	Α	С	С		9	25	35		В	18
SK 99 NB OII-Kallip	(B)	(C)	(D)	-	(16)	(26)	(50)	-	(C)	(24)
CD 00 CD Off Damp	Е	А		D	61	6		38	D	40
зк ээ зь он-капр	(F)	(B)	-	(F)	(148)	(15)	-	(112)	(F)	(103)

Table 7.10 Mountain View Avenue Intersections, Year 2045 Level of Service Summary (SIGNALIZED)

7.9.3 Alternative 3- Realign On-Ramps with Roundabout

Table 7.11, 7.12 and 7.13 shows the recommended roundabout intersections improvements. The SR99 NB & SB ramps / Mountain View Avenue intersections would likely operate with a LOS B and C for both the morning and evening peak hour consecutively in the year 2045.

•	Table 7.11 Mountain View Avenue Intersections, Construction Year 2025 Level of Service Summary
1	(Roundabout)

Location	LOS by Leg				Delay (sec)				105	Delay
	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SR 99 NB Off-Ramp	Α	Α	Α	-	7	4	8	-	Α	6
	(A)	(A)	(A)		(9)	(4)	(10)		(A)	(7)
SR 99 SB Off-Ramp	Α	Α		A (A)	6	4	-	7	А	6
	(A)	(A)	-		(7)	(4)		(8)	(A)	(7)

Table 7.12 Mountain V	/iew Avenue Intersections	. Year 2035 Level of Ser	vice Summary (Roundabout)
		,	

Location	LOS by Leg					Delay	105	Delay		
	EB	WB	NB	SB	EB	WB	NB	SB	203	Delay
SR 99 NB Off-Ramp	Α	Α	Α	-	8	5	9	-	А	7
	(B)	(A)	(B)		(11)	(5)	(14)		(A)	(9)
SR 99 SB Off-Ramp	Α	А		Α	7	4		9	Α	7
	(A)	(A)	-	(B)	(9)	(5)	-	(11)	(A)	(9)
Location	LOS by Leg					Delay	105	Delay		
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	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SR 99 NB Off-Ramp	В	Α	В	_	12	6	13	-	А	10
SK 99 NB OII-Ramp	(C)	(A)	(D)	-	(18)	(8)	(26)		(B)	(15)
SR 99 SB Off-Ramp	Α	Α		В	10	5		14	В	11
	(C)	(A)	-	(D)	(19)	(5)	-	(28)	(C)	(19)

Table 7.13 Mountain View Avenue Intersections, Year 2045 Level of Service Summary (Roundabout)

7.10 Summary

Based on LOS for all the proposed improvements, Table 7.14 shows a LOS comparison of various time frames.

Table 7.14 – Mountain View Near-Term Alternatives

AM (PM) Peak Hour Level of Service Comparison Alternatives 1, 2, and 3

		Al	ternative 1*	Alte	mative 2*	Alte	rnative 3*
YEAR	LOCATION		(AWSC)	(SIG	NALIZED)	(ROUNDABOUT)	
		LOS	DELAY	LOS	DELAY	LOS	DELAY
2025	SR99 NB off Ramp / Mountain View	C (F)	25 (52)	B (B)	15 (17)	A (A)	6 (7)
	SR99 SB off Ramp / Mountain View	C (F)	19 (59)	C (C)	21 (30)	A (A)	6 (7)
2035	SR99 NB off Ramp / Mountain View	F (F)	87 (154)	B (B)	15 (18)	A (A)	7 (9)
	SR99 SB off Ramp / Mountain View	E (F)	44 (139)	C (D)	24 (40)	A (A)	7 (9)
2045	SR99 NB off Ramp / Mountain View	F (F)	222 (338)	B (C)	18 (24)	A (B)	10 (15)
	SR99 SB off Ramp / Mountain View	F (F)	106 (267)	D (F)	40 (103)	B (C)	11 (19)

*Realign on ramps on south and north bound

7.11 2045 Preliminary Cost Estimates

The preliminary cost estimates for the SR99 ramps / Mountain View Avenue intersections various alternatives are listed in Table 7.15.

ELEMENT	Alternative 1 (AWSC)	Alternative 2 (Signalized)	Alternative 3 (Roundabout)	Long Term Alternative (L-9 Interchange)
Roadway	\$3.6M-\$4.5M	\$5.4M-\$6.8M	\$5.2M-\$6.5M	\$11.3M-\$14.2M
Structures	\$0	\$0	\$0	\$12.4M-\$15.5M
Right of Way	\$1.1M-\$1.4M	\$1.1M-\$1.4M	\$1.5M-\$1.9M	\$23.8M-\$29.8M
Sub-Total	\$4.7M-\$5.9M	\$6.5M-\$8.2M	\$6.7M-\$8.4M	\$47.5M-\$59.5M
Support Cost	50%	50%	50%	30%
Total Project Capital Cost	\$7.1M-\$8.9M	\$9.8M-\$12.3M	\$10.1M-\$12.6M	\$61.8M- \$77.4M

Table 7 15 – Mountain	View Avenue Inter	change Alternatives .	. Preliminary Co	ost Estimates
	view Avenue inter	change Alternatives .	- Fremmany C	JSt LStimates

8. Mendocino (18th) Avenue

Four intersections are located on Mendocino (18th) Avenue and SR 99 ramps.

Figure 8.1 – Mountain View Avenue Existing Aerial Photo.



Mendocino (18th) Avenue/SR99 & Mountain View Avenue/SR99 Feasibility Study

8.2 2018 Existing Peak Hour Turning Movement Volumes

Figure 8.2 illustrates the Mendocino (18th) Avenue intersections 2018 existing AM (PM) peak hour turning movement volumes.

Figure 8.2 – SR-99/ Mendocino Avenue Intersections 2018 Existing AM (PM) Peak Hour Turning Movement Volumes



Mendocino (18th) Avenue/SR99 & Mountain View Avenue/SR99 Feasibility Study

8.3 2025 Forecast Peak Hour Turning Movement Volumes

Figure 8.3 illustrates the Mendocino (18th) Avenue intersections 2025 forecast AM (PM) peak hour turning movement volumes.

Figure 8.3 – SR-99/ Mendocino Avenue Intersections 2025 Forecast AM (PM) Peak Hour Turning Movement Volumes



8.4 2035 Forecast Peak Hour Turning Movement Volumes

Figure 8.4 shows the SR99/Mendocino (18th) Avenue intersections 2035 forecast AM (PM) peak hour forecast turning movement volumes.

Figure 8.4 – SR-99/ Mendocino Avenue Intersections 2035 Forecast AM (PM) Peak Hour Turning Movement Volumes



8.5 2045 Forecast Peak Hour Turning Movement Volumes

Figure 8.5 shows the SR99/Mendocino (18th) Avenue intersections 2045 forecast AM (PM) peak hour forecast turning movement volumes.

Figure 8.5 – SR-99/ Mendocino Avenue Intersections 2045 Forecast AM (PM) Peak Hour Turning Movement Volumes



8.6 Existing Traffic Operational Conditions

The ramp intersections at the SR99/Mendocino (18th) Avenue interchange were analyzed for existing, 2035, and 2045 operating conditions (approach delay and LOS). Data for analysis was based on AM and PM peak hour turning movement counts.

Currently, the intersections at the Mountain View Avenue/SR 99 ramps are operating as TWSC, and the acceptable level of service (LOS) for intersections is LOS D or better. Therefore, any intersections operating at a LOS E or F will be considered deficient. For existing traffic conditions, the SR99 NB Off ramp and Mendocino (18th) Avenue intersection is operating at LOS C, an acceptable level of service. However, the SR 99 southbound ramps and Mendocino (18th) Avenue intersection (18th) Avenue intersection is operating at LOS C, and acceptable level of service. However, the SR 99 southbound ramps and Mendocino (18th) Avenue intersection is operating at LOS F. See Table 8.6.

Queue and delay time on the eastbound left turn traffic are the dominant problems. For the AM peak, the southbound left turn delay time is 144 seconds with LOS F.

Location	LOS by Leg					Delay	LOS	Delay		
	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SR 99 NB Off-Ramp	В	Е	Α		14	46	10		C	21
	(C)	(D)	(A)	-	(24)	(30)	(9)	-	(C)	(24)
SP 00 SP On Pamp	F		А	А	161		8	9	F	144
SH 33 SE OII-Railip	(E)	-	(A)	(A)	(44)	-	(8)	(9)	(E)	(42)

Table 8.6 – Mendocino Avenue Intersections, 2018 Existing Level of Service Summary

8.7 Existing Deficiencies

8.7.1 SR 99 Northbound Off Ramp Intersection (Intersection 1)

The SR99 NB off ramp left-turn queue and the associated delay time are the dominant problems. For the AM peak, the SR99 NB off ramp left-turn delay time is 46 seconds with LOS E.

8.7.2 Ave 394/ Mendocino Avenue Intersection (Intersection 4)

The analysis indicates that the intersection currently operates with unsatisfactory LOS during both the morning and evening peak travel periods for the year 2018. The SR99 SB off ramp left-turn queue and the associated delay time are the dominant problems. For the AM peak, Ave 394 left-turn delay time is 161 seconds with LOS F.

8.8 No-Build Traffic Operation Conditions

8.8.1 Year 2025 and 2035

Traffic operational analysis for the 2025 and 2035 no-build scenario indicates that the SR99/ Mendocino Avenue intersections would likely operate with unsatisfactory LOS F with long delay times, see Table 8.7 and Table 8.8, respectively.

Table 8.7 Mendocino Avenue Intersections, 2025 No-Build Level of Service Summary

Location	LOS by Leg					Delay	105	Delay		
	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SR 99 NB Off-Ramp	С	F	В	_	23	133	11	-	E	43
SK 99 NB OII-Ramp	(F)	(F)	(A)	-	(108)	(60)	(10)		(F)	(108)
SP 00 SP On Pamp	F		А	А	450		9	9	F	406
SK 99 SB Oll-Kallip	(F)	-	(A)	(A)	(201)	-	(8)	(9)	(F)	(191)

Table 8.8 Mendocino Avenue Intersections, 2035 No-Build Level of Service Summary

Location	LOS by Leg					Delay	105	Delay		
Location	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SR 99 NB Off-Ramp	F	F	В		91	627	12		F	163
	(F)	(F)	(A)	-	(1250)	(195)	(10)	-	(F)	(1250)
SR 99 SB On-Ramp	F		Α	Α	1236		9	10	F	1113
	(F)	-	(A)	(A)	(615)	-	(9)	(10)	(F)	(582)

The SR99 SB on ramp/Ave 394/Mendocino Avenue intersection is currently failing and SR99 NB off ramp/Frontage Road/Mendocino Avenue intersection will fail on the year 2025, see Table 8.9.

Location Project	Failing Year
SR 99 NB Off-Ramp/Frontage Road/Mendocino Avenue	2025
SR 99 SB On-Ramp/Ave 394/Mendocino Avenue	2018

Table 8.9 Mountain View Avenue Intersections Failing Year for No-Build

8.9 Recommended Improvements to Address Deficiencies for Design Year 2045

The following are improvements recommended for the SR99 off ramps / Mendocino Avenue intersections to address deficiencies for Design Year 2045:

For alternative 1&2 Reconstruct a TWSC on Avenue 394/SR 99 SB Off Ramp Intersection, and roundabout for alternative 3 and install the following traffic control on SR99 SB on and SR99 NB off ramps terminals:

- Alternative 1 All Way Stop Control (AWSC)
- Alternative 2 Signalized
- Alternative 3 Roundabout

Alternatives 4-6 propose to reconstruct the SB off-ramp and NB on-ramp to eliminate the isolated ramps. These alternatives propose to cul-de-sac Avenue 394 to eliminate access to SB off-ramp and cul-de-sac frontage Road to eliminate access to NB on-ramp. install the following traffic control on SR99 SB and SR99 NB ramps terminals:

- Alternative 4 All Way Stop Control (AWSC)
- Alternative 5 Signalized
- Alternative 6 Roundabout

8.9.1 Alternative 1- Reconstruct the Ave 394/SB Off-Ramp intersection and install All Way Stop Control at the SB On-Ramp and NB Off-Ramps Terminals

Tables 8.10, 8.11 and 8.12 show the LOS summaries for 2025, 2035, and 2045 for AWSC. With these improvements, the SR99 NB Off-Ramp & SB On-Ramp intersections at Mendocino (18th) Avenue would continue to operate at unacceptable LOS. Both the NB Off-Ramp & SB On-Ramp intersections would operate at a LOS F in the AM peak hour in the year 2025 and will degrade to LOS F in both the AM and PM peak hours by 2035.

Table 8.10 Mendocino Avenue Intersections, Construction Year 2025 Level of Service Summary	I
(AWSC)	

Location	LOS by Leg					Delay	105	Delay		
Location	EB	WB	NB	SB	EB	WB	NB	SB	203	Delay
SD 00 ND Off Domo	В	В	Е	F	11	15	41	79	F	54
SR 99 NB Off-Ramp	(B)	(C)	(F)	(D)	(12)	(18)	(57)	(27)	(E)	(37)
SP 00 SP On Pamp	С		D	D	22		27	31	D	28
SK 99 SE Oll-Kallip	(C)	-	(D)	(C)	(18)	-	(35)	(20)	(D)	(26)
SR 99 SB Off-Ramp	Α		Α		10		8		А	10
& Ave 394 (TWSC)	(A)	-	(A)	-	(10)	-	(8)	-	(A)	(10)

Table 8.11 Mendocino	Avenue Intersections.	Year 2035 Level	of Service Summar	v (AWSC)
	Avenue intersections,			y (A0000)

Location	LOS by Leg					Delay	105	Delay		
Location	EB	WB	NB	SB	EB	WB	NB	SB	103	Deluy
CD 00 ND Off Domo	В	С	F	F	12	17	108	187	F	129
SR 99 NB Off-Ramp	(B)	(C)	(F)	(F)	(13)	(25)	(155)	(64)	(F)	(91)
	D		F	F	34		62	83	F	66
SK 99 SB OU-Kamp	(C)	-	(F)	(D)	(23)	-	(99)	(32)	(F)	(58)
SR 99 SB Off-Ramp	В		Α		11		8		В	11
& Ave 394 (TWSC)	(A)	-	(A)	-	(10)	-	(8)	-	(A)	(10)

Location	LOS by Leg					Delay		105	Delay	
	EB	WB	NB	SB	EB	WB	NB	SB	203	Delay
CD 00 ND Off Domo	В	С	F	F	12	22	231	340	F	244
SR 99 NB Off-Ramp	(B)	(E)	(F)	(F)	(13)	(38)	(294)	(156)	(F)	(182)
	F		F	F	62		154	188	F	152
SK 99 SB ON-Ramp	(D)	-	(F)	(F)	(32)	-	(223)	(74)	(F)	(129)
SR 99 SB Off-Ramp	В		A		12		8		В	12
& Ave 394 (TWSC)	(A)	-	(A)	-	(10)	-	(8)	-	(A)	(10)

Table 8.12 Mendocino Avenue Intersections, Year 2045 Level of Service Summary (AWSC).

8.9.2 Alternative 2- Reconstruct Ave 394/SB Off Ramp and Signalized intersections at SB on and NB off Ramps Terminals

Table 8.13, 8.14 and 8.15 shows the recommended signalized intersections improvements. The SR99 NB and SB ramps / Mendocino Avenue would likely operate with a satisfactory LOS C for the year 2045, see Table 8.15.

Table 8.13 Mendocino Avenue Intersections, Construction Year 2025 Level of Service Summar	y
(Signalized)	

Location	LOS by Leg					Delay	(sec)		105	Delay
	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SP 00 NP Off Pamp	Α	В	Α	Α	7	11	9	9	А	9
SR 99 NB Off-Ramp	(B)	(B)	(A)	(B)	(16)	(15)	(8)	(11)	(B)	(11)
	С		В	А	31		19	9	В	17
SK 99 SB On-Ramp	(C)	-	(B)	(A)	(28)	-	(14)	(9)	(B)	(15)
SR 99 SB Off-Ramp	Α		Α		10		8		А	10
& Ave 394 (TWSC)	(A)	-	(A)	-	(10)	-	(8)	-	(A)	(10)

Location	LOS by Leg					Delay		105	Delay	
	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
CD 00 ND Off Domo	Α	В	Α	В	7	14	10	18	В	14
SR 99 NB Off-Ramp	(B)	(B)	(A)	(B)	(18)	(17)	(10)	(13)	(B)	(13)
	С		С	В	33		21	11	В	19
SR 99 SB ON-Ramp	(C)	-	(B)	(A)	(32)	-	(18)	(9)	(B)	(17)
SR 99 SB Off-Ramp	В		Α		11		8		В	11
& Ave 394 (TWSC)	(A)	-	(A)	-	(10)	-	(8)	-	(A)	(10)

Table 8.14 Mendocino Avenue Intersections, Year 2035 Level of Service Summary (Signalized)

Table 8.15 Mendocino Avenue Intersections, Year 2045 Level of Service Summary (Signalized).

location	LOS by Leg					Delay		105	Delay	
	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SP 00 NP Off Pamp	В	В	Α	С	11	17	5	21	В	15
SK 99 NB OII-Kallip	(C)	(C)	(B)	(B)	(23)	(30)	(11)	(19)	(B)	(18)
	D		С	В	48		28	13	С	25
SK 99 SB OU-Ramp	(D)	-	(C)	(B)	(40)	-	(22)	(11)	(C)	(21)
SR 99 SB Off-Ramp	В		Α		12		8		В	12
& Ave 394 (TWSC)	(A)	-	(A)	-	(10)	-	(8)	-	(A)	(10)

8.9.3 Alternative 3- Reconstruct Ave 394/SB Off Ramp and construct Roundabouts at the intersections SB on and NB off Ramps Terminals

Table 8.16, 8.17 and 8.18 shows the recommended roundabout improvements. The SR99 ramps / Mendocino Avenue intersections would likely operate with a satisfactory LOS D and C for both the morning and evening peak hour consecutively in the year 2045.

Location	LOS by Leg					Delay		105	Delay	
	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SP 00 NP Pamps	Α	А	Α	Α	6	7	7	7	Α	7
SR 99 NB Ramps	(A)	(A)	(A)	(A)	(5)	(8)	(8)	(5)	(A)	(7)
CD 00 CD On Domn	Α		А	А	10		8	8	Α	8
SK 99 SB On-Ramp	(A)	-	(A)	(A)	(7)	-	(8)	(6)	(A)	(7)
SR 99 SB Off-Ramp	Α		Α	Α	5		4	4	Α	4
& Ave 394	(A)	-	(A)	(A)	(4)	-	(4)	(5)	(A)	(4)

Table 8.16 Mendocino Avenue Intersections, Construction Year 2025 Level of Service Summary (Roundabouts)

Table 8.17 Mendocino Avenue Intersections, Construction Year 2035 Level of Service Summary
(Roundabouts)

Location	LOS by Leg					Delay		105	Delay	
	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
CD 00 ND Off Domo	Α	А	Α	Α	7	9	9	9	А	9
SK 99 NB OII-Ramp	(A)	(B)	(A)	(A)	(6)	(11)	(10)	(7)	(A)	(9)
	В		В	Α	14		11	10	В	11
SK 99 SB On-Ramp	(A)	-	(B)	(A)	(9)	-	(11)	(7)	(A)	(9)
SR 99 SB Off-Ramp	Α		Α	Α	5		4	5	А	5
& Ave 394	(A)	-	(A)	(A)	(5)	-	(4)	(5)	(A)	(5)

 Table 8.18 Mendocino Avenue Intersections, Construction Year 2045 Level of Service Summary (Roundabouts)

Location	LOS by Leg					Delay		105	Delay	
	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
CD 00 ND Off Dama	Α	В	В	В	9	12	11	14	В	13
SR 99 NB Off-Ramp	(A)	(C)	(B)	(A)	(7)	(17)	(13)	(9)	(B)	(12)
	D		С	В	25		19	14	С	18
SR 99 SB ON-Ramp	(B)	-	(C)	(A)	(12)	-	(19)	(9)	(B)	(14)
SR 99 SB Off-Ramp	Α		Α	Α	6		4	5	Α	5
& Ave 394	(A)	-	(A)	(A)	(5)	-	(4)	(5)	(A)	(5)

8.9.4 Alternative 4- Reconstruct the SB Off-Ramp and the NB On-Ramp. Cul-de-sac Avenue 394 to eliminate access to the SB Off-Ramp and cul-de-sac Frontage Road to eliminate access to the NB On-Ramp and install All Way Stop Control at the SB and NB Ramp Terminals.

Tables 8.19, 8.20 and 8.21 show the LOS summaries for 2025, 2035, and 2045 for AWSC. With these improvements, the SR99 NB Ramps & SB Ramps intersections at Mendocino (18th) Avenue would operate at unacceptable LOS by the year 2035. With these improvements the NB Ramps would operate at LOS F by 2025 and the SB Ramps intersections would operate at a LOS E in the year 2035. Both intersections would operate at LOS F in the AM and PM peak hours in the horizon year 2045.

Table 8.19 Mendocino Avenue Intersections, Construction Year 2025 Level of Service Summary (AWSC)

Location	LOS by Leg					Delay		105	Delay	
Location	EB	WB	NB	SB	EB	WB	NB	SB		Delay
SR 99 NB Ramps	-	B	E (F)	F	-	15	39	77	F	53
-		(C)	(E)	(C)		(16)	(49)	(25)	(D)	(33)
CP 00 CP Pampa	В		С	С	13		22	17	С	19
SR 99 SB Ramps	(B)	-	(C)	(B)	(12)	-	(25)	(14)	(C)	(20)

Table 8.20 Mendocino Avenue Intersections, Year 2035 Level of Service Summary (AWSC).

Location		LOS b	oy Leg			Delay		105	Delay	
Location	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SR 99 NB Ramps	_	С	F	F	_	17	106	184	F	129
SIX 55 ND Kamps		(C)	(F)	(F)		(20)	(154)	(56)	(F)	(90)
SP 00 SP Pamps	В		F	D	14		59	28	E	40
SR 99 SB Ramps	(B)	-	(F)	(C)	(13)	-	(71)	(17)	(E)	(45)

Table 8.21 Mendocino Avenue Intersections, Year 2045 Level of Service Summary (AWSC).

Location	LOS by Leg					Delay		105	Delay	
Location	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
		С	F	F		21	237	340	F	251
SK 99 ND Kallips	-	(D)	(F)	(F)	-	(30)	(299)	(147)	(F)	(186)
SP 00 SP Pamps	С		F	F	16		159	66	F	100
SR 99 SB Ramps	(B)	-	(F)	(D)	(15)	-	(189	(27)	(F)	(110)

8.9.5 Alternative 5- cul-de-sac Avenue 394/SB off-ramp and frontage Road/ NB on-ramp and Signalized intersections at SB on and NB off Ramps Terminals

Table 8.22, 8.23 and 8.24 shows that with the recommended signalized intersections improvements, the SR99 NB and SB ramps / Mendocino Avenue would likely operate with a satisfactory level of service C for the year 2045 (Table 8.24).

Table 8.22 Mendocino Avenue Intersections, Construction Year 2025 Level of Service Summary	1
(Signalized)	

Location		LOS	oy Leg			Delay		105	Delay	
Location	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SP 00 NP Pamps		В	Α	Α		15	5	8	Α	8
SR 99 NB Ramps	-	(B)	(A)	(A)	-	(13)	(4)	(8)	(A)	(7)
	С		В	В	28		14	13	В	15
SK 99 SB Kamps	(C)	-	(B)	(B)	(26)	-	(11)	(14)	(B)	(13)

Table 8.23 Mendocino Avenue Intersections, Year 2035 Level of Service Summary (Signalized).

Location		LOS	y Leg			Delay	105	Delay		
Location	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SR 99 NB Ramps		В	Α	В		17	6	11	А	10
	-	(B)	(A)	(A)	-	(15)	(4)	(10)	(A)	(9)
SP 00 SP Pamps	С		В	В	33		17	14	В	17
ST DE RAINPS	(C)	-	(B)	(B)	(31)	-	(13)	(16)	(B)	(16)

Table 8.24 Mendocino Avenue Intersections, Year 2045 Level of Service Summary (Signalized).

Location	LOS by Leg					Delay		105	Delay	
Location	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SR 99 NB Ramps		В	Α	В		20	8	14	В	13
	-	(C)	(A)	(B)	-	(28)	(6)	(14)	(B)	(14)
	D		С	В	41		25	19	С	24
SR 99 SB Ramps	(D)	-	(B)	(B)	(37)	-	(20)	(18)	(C)	(21)

8.9.6 Alternative 6- cul-de-sac Avenue 394 to eliminate access to SB off-ramp and cul-de-sac frontage Road to eliminate access to NB on-ramp and construct Roundabouts at the intersections SB on and NB off Ramps Terminals

Table 8.25, 8.26 and 8.27 show that with the recommended improvements, the SR99 ramps / Mendocino Avenue intersections would likely operate with a satisfactory level of service D and C for both the morning and evening peak hour consecutively in the year 2045.

Table 8.25 Mendocino Avenue Intersections, Construction Year 2025 Level of Service Summary (Roundabouts)

Location		LOS b	oy Leg			Delay		105	Delay	
Location	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SR 99 NB Ramps	-	A (A)	A (A)	A (A)	-	7 (8)	7 (7)	7 (6)	A (A)	7 (7)
SR 99 SB On-Ramp	A (A)	-	A (A)	A (A)	7 (6)	-	7 (7)	8 (6)	A (A)	7 (7)

Table 8.26 Mendocino Avenue Intersections, Construction Year 2035 Level of Service Summary (Roundabouts)

Location	LOS by Leg					Delay		105	Delay	
Location	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SP 00 NP Off Pamp		Α	Α	Α		8	8	9	Α	9
SR 99 NB Off-Ramp	-	(B)	(A)	(A)	-	(11)	(9)	(7)	(A)	(8)
CP 00 CP On Pamp	Α		Α	Α	10		10	9	А	10
SH 33 SE OII-Railip	(A)	-	(A)	(A)	(7)	-	(10)	(7)	(A)	(8)

Table 8.27 Mendocino Avenue Intersections, Construction Year 2045 Level of Service Summary (Roundabouts).

Location		LOS	y Leg			Delay		105	Delay	
Location	EB	WB	NB	SB	EB	WB	NB	SB	103	Delay
SR 99 NB Off-Ramp	_	B	A	B	-	11	10	14	B	12
•		(C)	(B)	(A)		(17)	(11)	(8)	(B)	(11)
SP 00 SP On Pamp	В		С	В	14		19	13	В	15
ST 35 35 OII-Railip	(A)	-	(C)	(A)	(9)	-	(17)	(8)	(B)	(13)

8.10 Summary

Tables 8.28 and 8.29 shows LOS comparisons of the six alternatives for the construction year 2025 and forecast years 2035 and 2045.

Table 8.28 – Mendocino Avenue Near-Term Alternatives

AM (PM) Peak Hour Level of Service Comparison Alternatives 1, 2, and 3.

		Alte	ernative 1*	Alte	rnative 2*	Alte	ernative 3*
YEAR	LOCATION		(AWSC)	(SIG	SNALIZED)	(ROL	JNDABOUT)
		LOS	DELAY	LOS	DELAY	LOS	DELAY
	SR99 NB Off-Ramp / Mendocino Ave	F (E)	54 (37)	A (B)	9 (11)	A (A)	7 (7)
2025	SR99 SB On-Ramp / Mendocino Ave	D (D)	28 (26)	В (В)	17(15)	A (A)	8 (7)
	SR99 SB Off-Ramp / Ave 394					A (A)	4 (4)
	SR99 NB Off-Ramp / Mendocino Ave	F (F)	129 (91)	B (B)	14 (13)	A (A)	9 (9)
2035	SR99 SB On-Ramp / Mendocino Ave	F (F)	66 (58)	B (B)	19 (17)	В (А)	11 (9)
	SR99 SB Off-Ramp / Ave 394					A (A)	5 (5)
	SR99 NB Off-Ramp / Mendocino Ave	F (F)	244 (182)	B (B)	15 (18)	В (В)	13 (12)
2045	SR99 SB On-Ramp / Mendocino Ave	F (F)	152 (129)	C (C)	25 (21)	С (В)	18 (14)
	SR99 SB Off-Ramp / Ave 394					A (A)	5 (5)

*Realign on ramps on south and north bound

Table 8.29 – Mendocino Avenue Near-Term Alternatives

		Alte	rnative 4*	Alter	native 5*	Alter	native 6*	
YEAR	LOCATION	(AWSC)	(SIG	NALIZED)	(ROUNDABOUT)		
		LOS	DELAY	LOS	DELAY	LOS	DELAY	
2025	SR99 NB off Ramp / Mendocino Ave	F (D)	53 (33)	A (A)	8 (7)	A (A)	7 (7)	
	SR99 SB off Ramp / Mendocino Ave		19 (20)	В (В)	15 (13)	A (A)	7 (7)	
2035	SR99 NB off Ramp / Mendocino Ave	F (F)	129 (90)	A (A)	10 (9)	A (A)	9 (8)	
	SR99 SB off Ramp / Mendocino Ave	E (E)	40 (45)	В (В)	17 (16)	A (A)	10 (8)	
2045	SR99 NB off Ramp / Mendocino Ave		251 (186)	B (B)	13 (14)	B (B)	12 (11)	
	SR99 SB off Ramp / Mendocino Ave	F (F)	100 (110)	C (C)	24 (21)	B (B)	15 (13)	

AM (PM) Peak Hour Level of Service Comparison Alternatives 4, 5, and 6

*Eliminate access of Ave394 to SR99SB Off ramp and Frontage Road to SR99NB On ramp

8.11 2045 Preliminary Cost Estimates Comparison

The preliminary cost estimates for the SR99/ Mendocino (18th) Avenue interchange alternatives are listed in Table 8.30.

ELEMENT	Alternative 1 (AWSC)	Alternative 2 (Signalized)	Alternative 3 (Roundabout)	Long Term Alternative (L-9 Interchange)
Roadway	\$3.2M-\$4M	\$4.0M-\$5M	\$3M-\$3.8M	\$10.2M-\$12.8M
Structures	\$2M-\$2.5M	\$2.1M-\$2.7M	\$3.1M-\$3.9M	\$15.6M-\$19.5M
Right of Way	\$0.5M-\$0.7M	\$0.5M-\$.7M	\$0.6M-\$0.8M	\$4M-\$5M
Sub-Total	\$5.7M-\$7.2M	\$6.6M-\$8.4M	\$6.7M-\$8.5M	\$29.6M-\$37.3M
Support Cost	50%	50%	50%	30%
Total Project Capital Cost	\$8.6M-\$10.8M	\$9.9M-\$10.5M	\$10.1M-\$12.8M	\$38.5M-\$48.5M

Table 8.30 – Mendocino Avenue Interchange Alternatives - Preliminary Cost Estimates

ELEMENT	Alternative 4 (AWSC)	Alternative 5 (Signalized)	Alternative 6 (Roundabout)
Roadway	\$4.1M-\$5.2M	\$4.8M-\$6M	\$3.4M-\$4.3M
Structures	\$2M-\$2.5M	\$2M-\$2.5M	\$3.1M-\$3.9M
Right of Way	\$0.7M-\$0.9M	\$0.7M-\$0.9M	\$0.8M-\$1M
Sub-Total	\$6.8M-\$8.6M	\$7.5M-\$9.4M	\$7.3M-\$9.2M
Support Cost	50%	50%	50%
Total Project Capital Cost	\$10.2M-\$12.9M	\$11.3M-\$14.1M	\$11M-\$13.8M

9. PRELIMINARY COST ESTIMATES BACKGROUNDS

Preliminary cost estimates were developed for each location for near-term, interim and long-term improvements. The cost estimates use Caltrans most recent contract cost database for pricing. The right-of-way estimates were developed by consulting with Caltrans right-of-way department and determined by using costs for right-of-way from recent similar projects. All costs are in current dollars and are non-escalated values. No separate inflationary index for real estates is available or provided.

Changes in land use have a potentially greater effect on the project cost than the inflation index and as such right-of-way preservation and irrevocable offers of dedication should be used to minimize runaway pricing. Under the California Subdivision Map Act (Government Code 66410-66499.38), the land use approval agency can approve development on the condition that the developer dedicate land for the circulation element. State and local agencies should make every reasonable effort to plan in such a way to minimize purchasing private homes or businesses and develop adequate setbacks.

The cost estimates can be used to compare alternatives, to look for funding or as the basis of budgeting and to establish priorities.

10. CONCLUSION and RECOMMENDATIONS

Much of SR 99 in the study is urbanized as noted by the existing six-lane freeway and typically suburban land use characteristics. If land use changes, consistent with the General Plan, the forecast volumes along the corridor could easily be realized. The conceptual geometric designs developed and discussed in the study are based on the 2045 horizon year. If implementation of the improvements is delayed much beyond proposed years, the "design year" may move beyond 2045 and the forecast volumes would grow potentially affecting the scope and cost. As such, the near-term projects are more sensitive to changes in scope. In comparison, interim and ultimate projects will be reevaluated in the future and the concepts provided are more useful for planning rather than programming.

Listed in the comparison tables are the proposed improvements for each location and time frame based on the failure year.

This study is a roadmap for the local agencies (FCOG, TCAG, City of Kingsburg, and City of Selma) to prioritize the improvements based on funding availability. The study provides failure years, general time frames for improvements, alternatives with conceptual drawings and preliminary cost estimates. This information is sufficient for locals to plan the corridor and meet the transportation needs for the design year of 2045. The conceptual footprint of the improvements will also help the agencies preserve the right of way needed for future use, this will help avoid high cost for right of way in the future.

11. Feasibility Study Development Team

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Mendocino (18th) Avenue/SR99 & Mountain View Avenue/SR99 Feasibility Study





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EXHIBIT 2 MENDOCINO (18TH) AVE GEOMETRIC DEFICIENCES LOCATIONS AND TYPES

Memorandum

To: ERIC OLSON, Senior Transportation Engineer Technical Planning District 6

Date: September 17, 2018

File: 06-Fre/Tul-99 PM VAR EA 06-0X850 0618000157

ullism ALBERT LEE, Chief

District 6 - Office of Traffic Operations

Subject: SAFETY ANALYSIS

From:

This is in response to your request dated June 27, 2018 for a Safety Analysis for the above referenced project in Fresno and Tulare County. The project is to identify existing deficiencies and to develop interim improvements that improve safety and capacity at Mendocino Avenue Interchange and Mountain View Avenue Interchange on State Route (SR) 99 within the next ten years.

Field review was conducted on September 17, 2018.

Existing Conditions:

This segment of SR 99 is an urban 6-lane divided freeway in generally level terrain. The mainline roadway consists of 12-foot freeway lanes, 10-foot inside shoulders, and 10-foot outside shoulders. The paved median is approximately 22 feet wide and divided with concrete barrier. Rumble strips exist on both inside and outside shoulders in each direction. The posted speed limit is 70 MPH. The current (2016) ADT within the project limits is 63,000. The total percentage of heavy vehicles is approximately 23% (2016).

There are eight ramps within the project limits:

PM	Ramps	ADT (2016)
Tul R53.599	NB off to Mendocino Avenue	2400
Tul R53.684	SB on from Mendocino Avenue	2050
Tul R0.038	SB off to Mendocino Avenue	1100
Fre R0.190	NB on from Mendocino Avenue	1050
Fre R3.541	NB off to Mountain View Avenue	820
Fre R3.588	SB on from Mountain View Avenue	110
Fre R3.891	NB on from Mountain View Avenue	3850
Fre R3.947	SB off to Mountain View Avenue	4300

"Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability" Eric Olson September 17, 2018 Page 2 of 7

The following are the bridges within the project limits:

<u>PM</u>	Bridge	Bridge Number
Fre R0.038	Mendocino Avenue Overcrossing	46 0199
Fre R3.742	Mountain View Avenue Overcrossing	42 0219

Safety-Related Observations and Recommendations:

Accident History:

The accident history for the NB and SB mainline of SR 99, and the freeway ramps will be analyzed separately.

NB SR 99 mainline between Tul PM R53.499 and Fre PM R0.289 (Mendocino):

The accident rates for this NB segment of the freeway for the most recent 3-year study period (01/01/2014 to 12/31/2016) as shown on Table B, indicate that the *Actual Fatal* and the *Actual Fatal plus Injury* accident rates are **lower** than the *Statewide Average* accident rates with comparable traffic volumes. However, the *Actual Total* accident rate is **higher** than the *Statewide Average* accident rate. The accident rates in number of accidents per million-vehicle-miles are:

NB SR 99 Section	A	Actual (MVM))	Average (MVM)		
	Fatal	F+I	Total	Fatal	F+I	Total
Tul PM R53.499 to Fre PM R0.289	0.000	0.22	0.69	0.005	0.23	0.67

There were 16 accidents (0-Fatal, 5-Injury, 11-Property Damage Only (PDO)) at this mainline section of SR 99. The types of accidents and the primary collision factors are as follows:

Primary Collision		Type of Accident							
Factor	Sideswipe	Rear End	Broadside	Hit Object	Overturn	Other	Not Stated		
Improper Turn	2	1		2	1				
Speeding		5							
Other Violations	1			1					
Other than driver				1		1	1		
Total	3	6	0	4	1	1	1		

The objects struck from the 4 Hit Object accidents are Guardrail and Cut Slope or Embankment.

Given the varied locations, factors, and types of the collisions along this northbound segment, there does not appear to be any accident concentrations that would indicate that there is a correctable accident causing situation.

SB SR 99 mainline between Tul PM R53.584 and Fre PM R0.137 (Mendocino):

The accident rates for this SB segment of the freeway for the same 3-year study period as shown on Table B, indicate that the *Actual* accident rates are **higher** than the *Statewide Average* accident rates. The accident rates in number of accidents per million-vehicle-miles are:

SB SR 99 Section	A	Actual (MVM)	Average (MVM)		
	Fatal	F+I	Total	Fatal	F+I	Total
Tul PM R53.584 to Fre PM R0.137	0.064	0.26	0.70	0.005	0.22	0.64

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There were 11 accidents (1-Fatal, 3-Injury, 7-PDO) at this mainline section of SR 99. The types of accidents and the primary collision factors are as follows:

Primary Collision		Type of Accident							
Factor	Head-on	Sideswipe	Rear End	Broadside	Hit Object	Auto-Ped	Other		
Influence of Alcohol			1						
Improper Turn		1			4				
Speeding			2						
Other Violations	1	1							
Other Than Driver							1		
Total	1	2	3	0	4	0	1		

The objects struck from the 4 Hit Object accidents are as follows:

Object Struck	No. of Occurrences
End of Guard Rail	1
Fence	1
Tree	1
Overturned	1
Total	4

The primary collision factor for the "Rear End" fatal accident at Tul PM R53.64 was Influence of Alcohol. The accident occurred when a vehicle traveling southbound SR 99, turned to the left, traveled into the median, collided into the back of a parked vehicle on median. It was reported that the driver of that vehicle was impaired by alcohol. The accident occurred in clear weather, dark with street light, and dry roadway conditions.

Given the varied locations, factors, and types of the collisions along this southbound segment, there does not appear to be any accident concentrations that would indicate that there is a correctable accident causing situation.

NB SR 99 mainline between Fre PM R3.441 and Fre PM R3.990 (Mountain View):

The accident rates for this NB segment of the freeway for the same 3-year study period as shown on Table B, indicate that the *Actual* accident rates are **lower** than the *Statewide Average* accident rates. The accident rates in number of accidents per million-vehicle-miles are:

NB SR 99 Section	F	Actual (MVM	[)	Average (MVM)		
	Fatal	F+I	Total	Fatal	F+I	Total
Fre PM R3.441 to Fre PM R3.990	0.000	0.00	0.44	0.004	0.15	0.45

There were 9 accidents (0-Fatal, 0-Injury, 9-PDO) at this mainline section of SR 99. The types of accidents and the primary collision factors are as follows:

Primary Collision	Type of Accident						
Factor	Head-on	Sideswipe	Rear End	Broadside	Hit Object	Overturn	Other
Improper Turn					1		
Speeding			2				
Other Violations		2					
Improper Driving		1					
Other Than Driver					1		1
Total	0	3	2	0	2	0	2

[&]quot;Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability"

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The objects struck from the 2 Hit Object accidents are Fence and Other Object on Road.

Given the varied locations, factors, and types of the collisions along this northbound segment, there does not appear to be any accident concentrations that would indicate that there is a correctable accident causing situation.

SB SR 99 mainline between Fre PM R3.488 and Fre PM R4.046 (Mountain View):

The accident rates for this SB segment of the freeway for the same 3-year study period as shown on Table B, indicate that the *Actual Fatal* accident rate is **lower** than the *Statewide Average Fatal* accident rate. However, the *Actual Fatal plus Injury* and *Actual Total* accident rates are **higher** than the *Statewide Average* accident rates. The accident rates in number of accidents per million-vehicle-miles are:

SR 99 Section	Actual (MVM)			Average (MVM)		
	Fatal	F+I	Total	Fatal	F+I	Total
Fre PM R3.488 to Fre PM R4.046	0.000	0.19	0.53	0.004	0.15	0.46

There were 11 accidents (0-Fatal, 4-Injury, 7-PDO) at this mainline section of SR 99. The types of accidents and the primary collision factors are as follows:

Primary Collision		Type of Accident							
Factor	Head-on	Sideswipe	Rear End	Broadside	Hit Object	Overturn	Other		
Influence of Alcohol			1						
Improper Turn		1			2	1			
Speeding			3						
Other Violations		2							
Other Than Driver							1		
Total	0	3	4	0	2	1	1		

The objects struck from the 2 Hit Object accidents are Barrier.

Given the varied locations, factors, and types of the collisions along this southbound segment, there does not appear to be any accident concentrations that would indicate that there is a correctable accident causing situation.

SR 99 ramps:

The accident rates for the following SR 99 freeway ramps for the most recent 3-year study period (01/01/2014 to 12/31/2016) as shown on Table B, indicate that the *Actual* accident rates are **lower** than the *Statewide Average* accident rates for similar ramps with comparable traffic volumes. The accident rates in number of accidents per million-vehicle-miles are:

SP 00 Pampa	A	ctual (MVN	IVM) Average (MV			M)	
SK 99 Kallips	Fatal	F+I	Total	Fatal	F+I	Total	
SB on from Mendocino Avenue (PM R53.684)	0.000	0.00	0.39	0.002	0.21	0.60	
NB on from Mendocino Avenue (PM R0.190)	0.000	0.00	0.00	0.001	0.14	0.48	

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SB On-ramp from Mendocino Avenue:

There was one accident (0-Fatal, 0-Injury, 1-PDO) recorded at this on-ramp. The type of accident was Sideswipe and it was caused by Other Violations.

NB On-ramp from Mendocino Avenue:

No accidents were recorded within the most recent 3-year study period.

The accident rates for the following SR 99 freeway ramps for the same 3-year study period as shown on Table B, indicate that the *Actual Fatal* and the *Actual Fatal plus Injury* accident rates are **lower** than the *Statewide Average* accident rates. However, the *Total* accident rates are **higher** than the *Statewide Average Total* accident rates. The accident rates in number of accidents per million-vehicle-miles are:

SP 00 Pomps	Actual (MVM)			A	Average (MVM)		
SK 99 Kallips	Fatal	F+I	Total	Fatal	F+I	Total	
NB off to Mendocino Avenue (PM R53.599)	0.000	0.00	1.96	0.004	0.32	0.92	
NB off to Mountain View Avenue (PM R3.541)	0.000	0.00	3.30	0.004	0.32	0.92	

NB Off-ramp to Mendocino Avenue:

There were five accidents (0-Fatal, 0-Injury, 5-PDO) recorded at this off-ramp. The types of accidents and the primary collision factors are as follows:

Primary Collision		Type of Accident						
Factor	Head-On	Sideswipe	Rear End	Broadside	Hit Object	Overturn	Other	
Failure to yield				1				
Speeding			3					
Other Violations					1			
Total	0	0	3	1	1	0	0	

The object struck from the one Hit Object accident was light or signal pole.

NB Off-ramp to Mountain View Avenue:

There were three accidents (0-Fatal, 0-Injury, 3-PDO) recorded at this off-ramp. The types of accidents and the primary collision factors are as follows:

Primary Collision		Type of Accident						
Factor	Head-On	Sideswipe	Rear End	Broadside	Hit Object	Overturn	Other	
Failure to yield				1				
Speeding					2			
Total	0	0	0	1	2	0	0	

The object struck from the Hit Object accidents were side of bridge railing and dike or curb.

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The accident rates for the following SR 99 freeway ramps for the same 3-year study period as shown on Table B, indicate that the *Actual Fatal* accident rates are **lower** than the *Statewide Average Fatal* accident rates. However, the *Actual Fatal plus Injury* and *Actual Total* accident rates are **higher** than the *Statewide Average* accident rates. The accident rates in number of accidents per million-vehicle-miles are:

SD 00 Domas	Actual (MVM)			Average (MVM)			
SK 99 Kamps	Fatal	F+I	Total	Fatal	F+I	Total	
SB off to Mendocino Avenue (PM R0.038)	0.000	1.52	1.52	0.003	0.18	0.50	
SB on from Mountain View Avenue (PM R3.588)	0.000	1.68	2.53	0.002	0.21	0.60	
NB on from Mountain View Avenue (PM R3.891)	0.000	1.16	4.41	0.002	0.21	0.60	
SB off to Mountain View Avenue (PM R3.947)	0.000	0.62	1.24	0.004	0.32	0.92	

SB Off-ramp to Mendocino Avenue:

There were two accidents (0-Fatal, 2-Injury, 0-PDO) recorded at this off-ramp. One is Rear End accident and caused by Speeding; another one is Broadside accident and caused by Failure to Yield.

SB On-ramp from Mountain View Avenue:

There were three accidents (0-Fatal, 2-Injury, 1-PDO) recorded at this on-ramp. Two of them are Hit Object accidents and both caused by Speeding; one of them is Broadside accident and caused by Failure to Yield.

NB On-ramp from Mountain View Avenue:

There were nineteen accidents (0-Fatal, 5-Injury, 14-PDO) recorded at this on-ramp. The types of accidents and the primary collision factors are as follows:

Primary Collision		Type of Accident						
Factor	Head-On	Sideswipe	Rear End	Broadside	Hit Object	Overturn	Other	
Failure to yield		1		3				
Improper Turn					6			
Speeding			7		1	1 -		
Total	0	1	7	3	7	1	0	

The objects struck from the 7 Hit Object accidents are as follows:

Object Struck	No. of Occurrences
Guardrail	6
Dike or curb	1
Total	7

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SB Off-ramp to Mountain View Avenue:

There were six accidents (0-Fatal, 3-Injury, 3-PDO) recorded at this off-ramp. The types of accidents and the primary collision factors are as follows:

Primary Collision		Type of Accident						
Factor	Head-On	Sideswipe	Rear End	Broadside	Hit Object	Overturn	Other	
Failure to yield	1			1				
Improper Turn				1				
Speeding			3					
Total	1	0	3	2	0	0	0	

Recommendations:

Exit gore sign is missing at NB off-ramp to Mountain View Avenue. A two-post exit gore sign should be installed and placed near the back of the gore area.

Additional DO NOT ENTER (R5-1) sign and WRONG WAY (R5-1a) sign should be added facing Van Horn Avenue at SB Off-ramp termination at Mountain View Avenue to deter wrong-way entry.

If you have any questions, please call Caleb Wu at (559) 445-6982.

Attachments: Table B summary



EXHIBIT 3

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MOUNTAIN VIEW AVE ACCIDENT TYPES, COUNTS, AND LOCATIONS (JANUARY 2014 TO DECEMBER 2016)



-99 NB ON RAME

Mountain View Ave

Near-Term Alternative

Alternative 1: Re-delineate NB & SB On Ramps---Exhibit 5

Mid-Term Alternatives

Alternative 1: All Way Stop Control (AWSC)-----Exhibit 6

Alternative 2: Signalized Intersection------Exhibit 7

Alternative 3: Roundabout Intersection-----Exhibit 8

Long-Term Alternatives

Alternative 1: Partial Cloverleaf Interchange(L-9)------Exhibit 9









Mendocino (18th) Ave

Mid-Term Alternatives

For Alt 1 & 2, reconstruct Two Way Stop Control (TWSC) on Ave 394 & SB Off Ramp. For Alt 3, construct Roundabout Intersection Control on Ave 394 & SB Off Ramp.

Alternative 1: All Way Stop Control (AWSC)-----Exhibit 10

Alternative 2: Signalized Intersection------Exhibit 11

Alternative 3: Roundabout Intersection------Exhibit 12

For Alt 4, 5 & 6, realign NB On Ramp & SB Off Ramp to Mendocino Ave.

Alternative 4: All Way Stop Control (AWSC)-----Exhibit 13

Alternative 5: Signalized Intersection-----Exhibit 14

Alternative 6: Roundabout Intersection------Exhibit 15

Long-Term Alternatives

Alternative 1: Compact Diamond Interchange (L-1)----Exhibit 16













