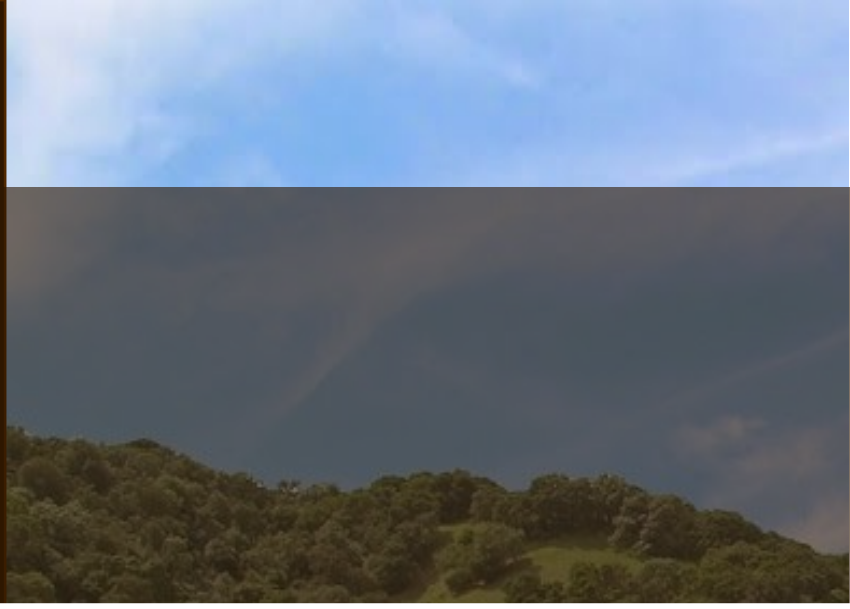
Calaveras County

Evacuation and Access Needs Assessment and Preparedness Plan

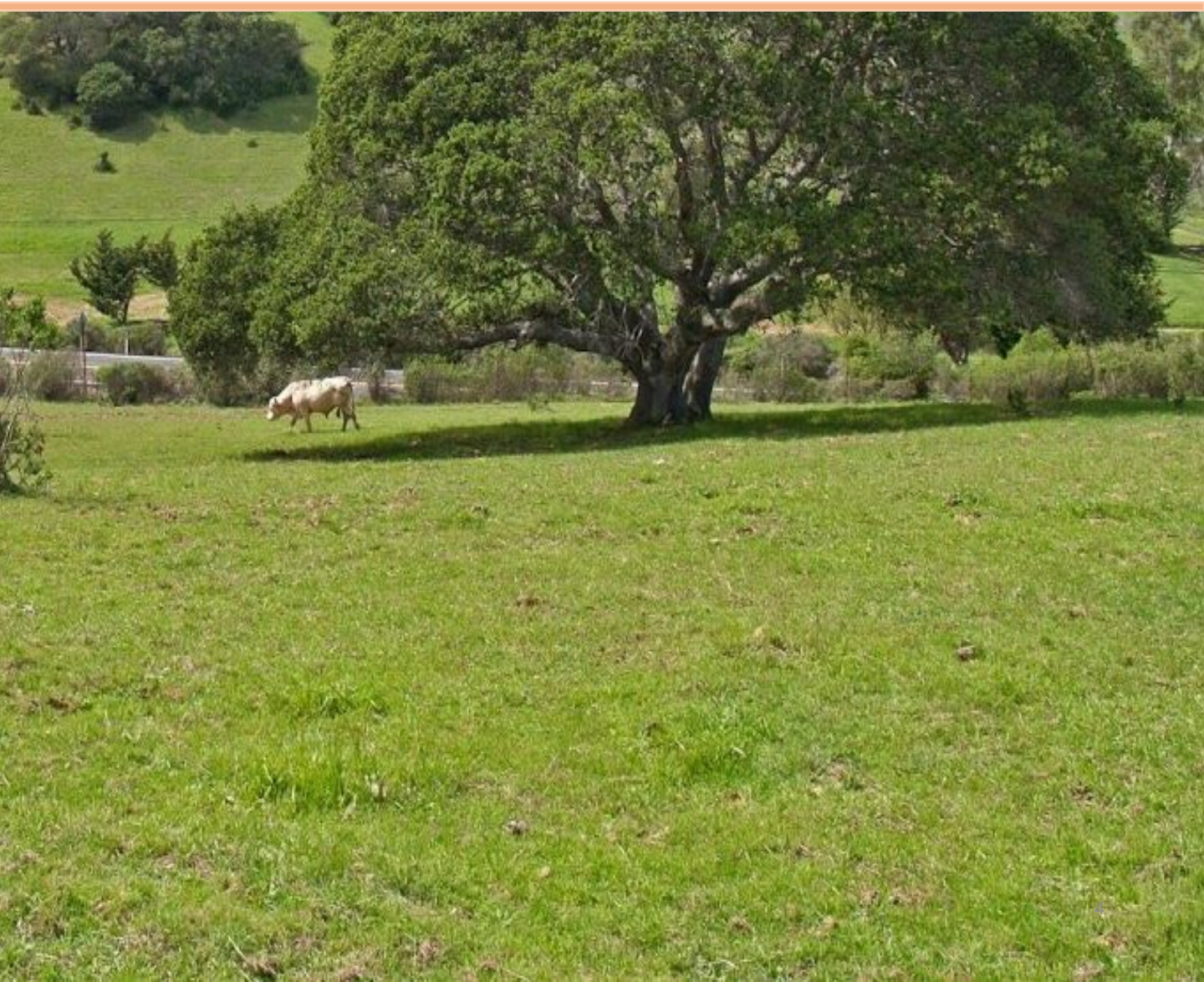
2023

Table of Contents

Executive Summary



This Executive Summary recaps the purpose of the ***Calaveras County Evacuation and Access Needs Assessment and Preparedness Plan (CCEANAPP)*** and provides an overview of the planned steps the County of Calaveras will take to build resiliency in the transportation systems from the impacts of wildfires, extreme weather, and other events. Additionally, the methods used to develop the CCEANAPP, including the evaluation of existing conditions, Hazard Risk and Vulnerability Assessment, and Public Outreach/Advisory Committee Meetings are discussed.



Purpose of This Plan

The Evacuation and Access Needs Assessment and Preparedness Plan (Plan) is a call to action for Calaveras County, including the City of Angels. Calaveras County's transportation system faces a harsh reality from the Valley to the Sierra Nevada. The impacts of wildfires, extreme weather, and other events threaten the health and efficiency of the existing roadway network. This plan aims to build resiliency in our transportation system by assessing the network's demands, capacity, and deficiencies or needs in responding, recovering, and adapting to catastrophic events. This Plan will utilize data and findings from the recently completed Caltrans District 10 Vulnerability Assessment and the county's Multi-jurisdictional Hazard Mitigation Plan.

Our Home

Our region is best known for its wide range of recreational opportunities and thriving tourism industry. From the sea-level rolling hills sprinkled with century-old oaks to the Sierra crest exceeding 8,000 feet, more than 45,828 people have settled and call Calaveras County home. Our communities take pride in the numerous attractions including Calaveras Big Trees State Park, New Melones Reservoir, our Gold Rush History, and more than 15 wineries. Calaveras is home to the City of Angels (Angels Camp) and other census-designated communities including Arnold, Avery, Burson, Copperopolis, Dorrington, Douglas Flat, Hathaway Pines, Mokelumne Hill, Mountain Ranch, Murphy's, Railroad Flat, Tamarack, Vallecito, Valley Springs, Wallace, West Point and the California Valley Miwok Tribe.

Too Close to Home

Despite the natural beauty of the County, Calaveras faces a growing threat with its varying topography, and mix of urban and rural areas, which is subject to a wide variety of negative impacts from various hazards and threats. Calaveras County has a wide range of challenging topography, fuels, and weather, influencing the nature of wildland fires within the boundary. With the ongoing periods of drought, the aftermath of the bark beetle infestation, and overall forest health, the fire season has transformed into a year-round event. Since 1988, several state and federal disaster declarations for wildfires have been made. In addition, eight local states of emergency have been adopted by the Calaveras County Board of Supervisors for 2017, 2019, 2021, 2022 and 2023 winter storms, Butte Fire, removal of hazardous trees caused by the Butte Fire, and Tree Mortality.

The County is served by four main state routes that serve as our main arterials and travel corridors. Few other roadways in the county serve as community connectors, and the ones that do are narrow two-lane local roads with little to no shoulders. Due to the terrain, during extreme weather conditions and natural disasters, particularly in higher elevations, roadways are vulnerable to failure. Most of our highest-risk and vulnerable communities rely on one access route, and if that route fails, could result in devastating impacts.

Protecting Our Home

As a result of past natural disasters and inevitable future catastrophes, we have been given a challenging opportunity, to better prepare by mitigating, repairing, and planning. By focusing on and assessing the transportation network's demands, capacity, and deficiencies in responding, recovering, and adapting to catastrophic events, a more resilient and robust roadway network will be available to the community.

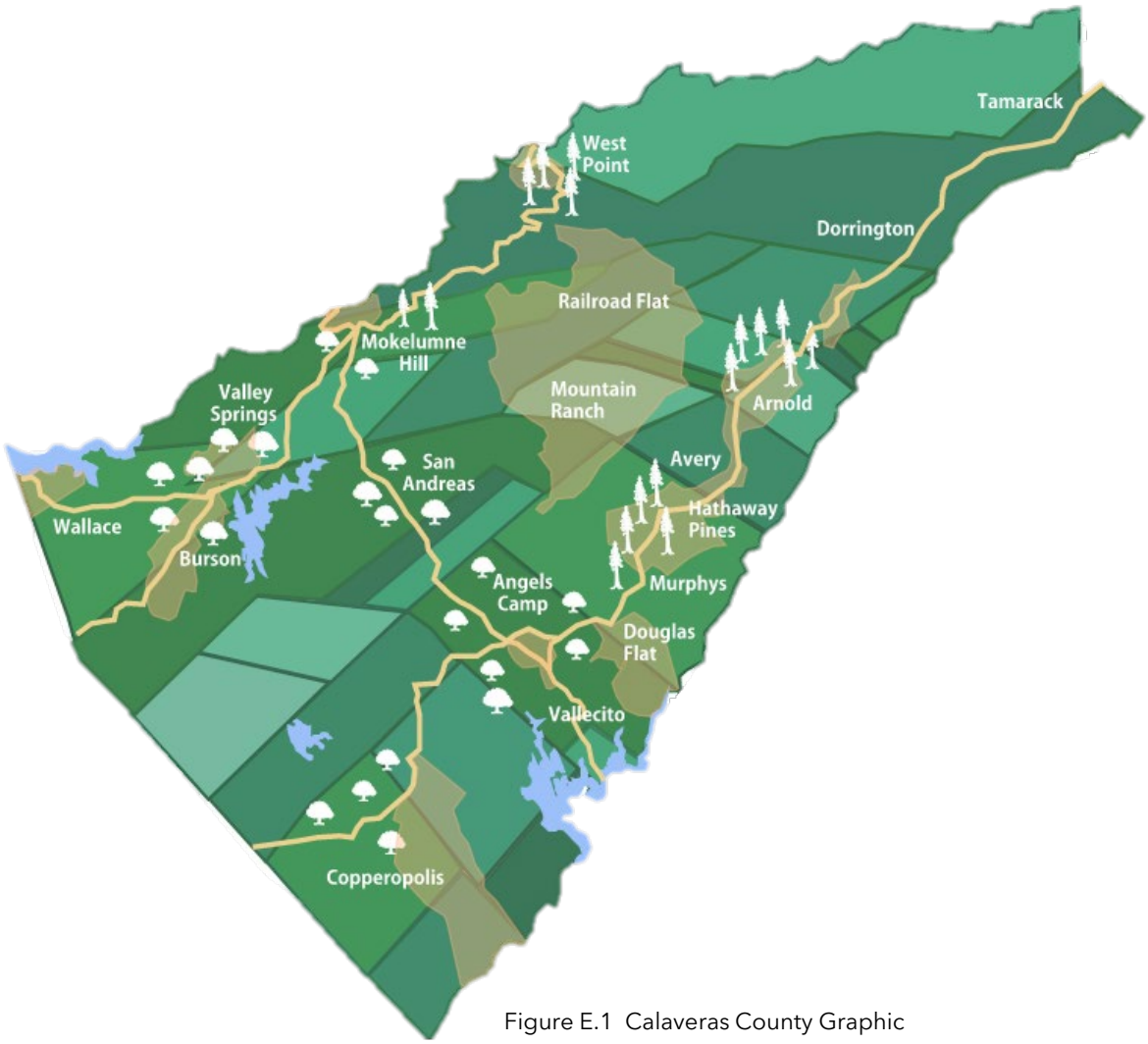


Figure E.1 Calaveras County Graphic

Community Engagement

754 pins were dropped by community members during the Priority Corridors Evaluation
226 community members provided feedback to the online community surveys
7 community members participated in the Climate Debrief interviews

What We Have Done

The Calaveras County Evacuation and Access Needs Assessment and Preparedness Plan was developed through extensive planning efforts between various agencies and stakeholders who shared the goal of further preparing and adapting our communities to become more resilient. Recognizing the urgent transportation challenges caused by severe weather conditions like wildfire and flooding evacuations, motivated the community to make a change and prepare for future disasters.

The plan leveraged the combined efforts of more than 130 community members, stakeholders, subject matter experts, and emergency response personnel. The Plan was built around four key components: **Public Outreach**, **Existing Conditions Assessment**, **Analysis of Hazard Risk and Vulnerability**, and **Priority Corridor Identification**.

Project Advisory Committee (PAC)

To help guide the development of the project, a **Project Advisory Committee (PAC)** was created with a diverse group of agencies and external stakeholders including representatives from the City of Angels Camp, Calaveras County, Caltrans, local fire districts, law enforcement, and others.

An **Existing Conditions Report**

The foundation of this plan was developed by identifying opportunities and constraints, incorporating prior planning and development efforts, and learning from past extreme weather events. Calaveras County Office of Emergency Services Hazard Mitigation Plan, Caltrans Climate Change Vulnerability Assessment for District 10, and Amador County Transportation Commissions' Extreme Weather Preparedness Plan were studied to understand and recognize existing plans and mitigation processes and climate change projections expected to impact the transportation network. The ***Existing Conditions Report*** characterized roadway assets including roadway classification, use, ownership, current capacity, and future traffic projections. Existing and planned land use developments and population characteristics including disadvantaged community status were identified.

Figure E.2 Plan Processes Graphic

A **Climate Debrief Interview Summary**

Public officials, first responders, and other key stakeholders from Calaveras County were interviewed to identify evacuation and access needs, lessons learned, and to gather strategies to address future events in the County. Events discussed include the 2015 Butte Fire, and the devastating 2017, 2019, and 2021 winter storms. Interviews are summarized in the ***Climate Debrief Interview Summary***. *(See Appendix D)*

Figure E.3 Community Members participating in Workshop #2 on February 22, 2023, at San Andreas Town Hall

Online Engagement

As a supplement to the community workshops, an informative Project Website, Interactive Mapping Tools, and Project Surveys were developed and made available to the public. The website was a host for project information, event summaries, recordings, and a place where comments from community members could be made. In addition to the in-person workshops, MetroQuest Surveys were sent out to the community to obtain specific information, like identifying roads with high fire risk, overgrown vegetation, narrow shoulders, congestion, etc. Notifications and Surveys were sent to all PAC members and stakeholders for further distribution to their associated agencies and community groups throughout the county.

Community Workshops

The project was centered around community workshops, which included both online and in-person formats. The project was introduced to community members at Workshop #1, during the Existing Conditions phase and the community was asked to provide information about local experiences during extreme weather and locations for further review as risk, opportunity, and constraint sites. Workshop #2 took place during the Analysis Phase and was intended to present and receive feedback on the concept menu and gather information on community priority locations to help inform the selection of the Priority Sites for Conceptual Alternatives. During Workshop #3, a two-week review period was utilized to assess the Draft plan.

A **Hazard Risk and Vulnerability Assessment**

The ***Hazard Risk and Vulnerability Assessment*** includes an analysis of roadway and transportation elements vulnerable in a natural disaster scenario. Different areas of the County were analyzed based on risk factors including, flooding/dam failure, wildfire, avalanche, extreme weather, geologic hazards, and drought. (See Appendix F)

Priority Corridors and Key Considerations for Future Evacuation Plans

To fully understand the complexity and uniqueness of the transportation network, a data-based platform was used to analyze traffic conditions and residents were asked to help identify priority routes and communications during an evacuation event. The results from these exercises are summarized in **Chapter 5, Priority Corridors and Key Consideration for Future Evacuation Plans.**

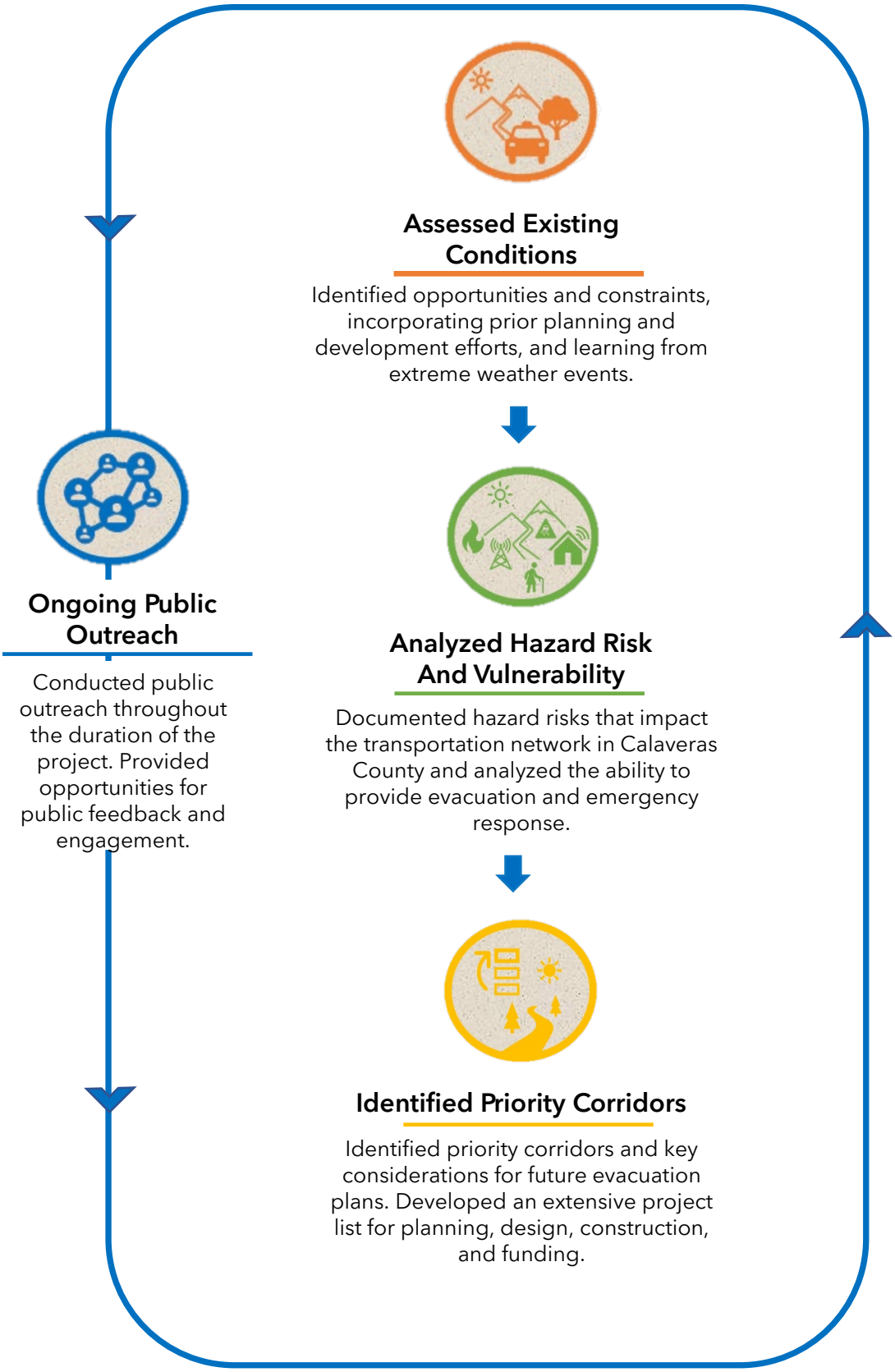


Figure E.4 Plan Processes Graphic (enlarged)

What We've Learned

The Calaveras County Evacuation and Access Needs Assessment and Preparedness Plan focuses on how climate catastrophes and extreme weather event disasters affect the transportation network throughout Calaveras County. During evacuation events, essential elements like road conditions, roadway access, roadway capacity, and communication become exceptionally challenging.

Public Officials, first responders, and other stakeholders in the region who could provide input on recent extreme climate events were interviewed in the Climate Debrief. Key challenges and constraints for evacuation and access, strategies employed, and opportunities for planning and response moving forward were discussed. Four unique fire events of various scales were identified and examined. In addition to wildfires, several other types of hazardous events were identified by interview participants, including the 2017 winter storm which resulted in a road closure of a section of State Route 26 for more than 30 days.

Vulnerability

The Hazard Risk and Vulnerability Assessment evaluated the susceptibility of Calaveras County's communities and transportation assets to natural hazards. A Community Assessment focused on the impacts on people by examining vulnerability, and a Transportation Asset Assessment focused on the impacts on the County's overall transportation network by examining the risk to roads and bridges that were built. Both assessments used a relative framework that assigned scores compared to the rest of Calaveras County resulting in final scores that categorize communities based on their risk and vulnerability compared to all other communities in the County. Mountain Ranch, Dorrington, Douglas Flat, West Point, Wilseyville, Sheep Ranch, Vallecito, and Railroad Flat were identified as communities with the highest vulnerability. The Highest-risk roadways included State Route 4 in Murphys, State Route 4 in Vallecito, State Route 4 in Arnold, and State Route 49 in San Andreas. Additionally, several bridges were identified as high risk, including State Route 49 and Vallecito Road at Angels Creek, Monge Ranch Road at Coyote Creek, Railroad Flat Road at Esperanza Creek, Sheep Ranch Road at McKinney Creek, Schaad Road at Middle Fork Mokelumne River, Sheep Ranch Rd at O'Neil Creek, Sheep Ranch Rd at San Antonio Creek and Unnamed Road at Blue Creek.

Developed Hazard Planning Zones

Hazard Planning Zones were developed to group areas within the County based on location, demographics, roadway access, and past events. The zones were developed with an evacuation event in mind and are shown by zones being generally located along primary corridors. Each zone faces its own unique challenges, from traffic bottlenecks to limited cell phone service and limited roadway access. Critical facilities, potential evacuation centers, lane miles, traffic volumes and population demographics are summarized in *Chapter One, Hazard Planning Zones*.

What We've Learned

Identified Priority Corridors

In early 2023, Calaveras residents' priority routes and communication during evacuation events were identified in the ***Priority Corridors and Key Considerations for Future Evacuation Plans***. Community-wide surveys (MetroQuest) and GPS-based data platforms (Replica) were utilized to analyze traffic conditions during evacuation incidents. Westbound State Route 4, Westbound State Route 12, Northbound State Route 49, and southwest-bound State Route 26 were identified as priority routes used by residents leaving the county. Likewise, most Calaveras County residents live in communities located on state routes, making these Caltrans state routes priority evacuation routes. In addition to State Routes, local, county-maintained roads were also identified and included O'Byrnes Ferry Road, Parrotts Ferry Road, Milton Road, Murphys Grade Road, and Railroad Flat Road.

Working Towards a More Resilient Roadway Network

Examining existing conditions, recognizing vulnerable communities, and identifying at-risk, high-priority roadways and bridges were foundational components in developing this plan. With the results from these assessments, we were able to concentrate on projects that have the greatest benefit for our region's transportation network. In Chapter 6, *Achieving a Resilient Network*, improvement projects varying from major (shoulder widening, defensible space clearing, hazard tree removal) to minor annual maintenance programs (defensible space clearing, roadside ditch clearing, culvert clearing, etc,) were studied and Planning Level Project Sheets were developed. In addition to an Evacuation Plan, completion of all phases of State Route 4 Wagon Trail, Shoulder Widening on State Route 49 between Angels Camp and San Andreas, Foundry Lane and Greenhorn Creek Extension Project, Defensible Space Clearing on State Route 49 between Angels Camp and San Andreas, and a Unified Notification System were chosen. Planning-level cost estimates and project information sheets for each project are located in Chapter 6, *Achieving a Resilient Network*.

Steps that Follow

In order to move forward and achieve a resilient transportation network, implementation strategies, a strategic funding plan, and allied partnerships will need to continue to evolve. With these tools, the region can progress and better address the needs of our communities and better prepare for future catastrophic events.

Figure E.5 Notorious Calaveras County Welcome Sign

Chapter 1
Hazard Planning Zones

Recent News

Icy conditions cause downed trees and powerlines along State Route 4 in Calaveras County

KCRA 3/1/2023

An evacuation warning issued the day after the landslide in Calaveras County

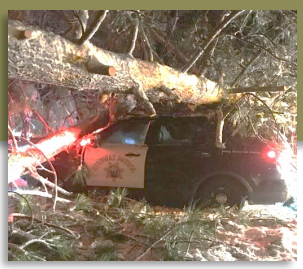
KCRA 3/17/2023

Calaveras County man's rescue story has the makings of a Hollywood movie

ABC 10 3/16/2023

Large tree falls onto CHP patrol car in Calaveras County

CBS Sacramento 3/1/2023



Debris flow triggers evacuation warning for West Point residents

Calaveras Enterprise 3/23/2023

At least 50 homes flooded in Valley Springs

Calaveras Enterprise 1/5/2023

Flooding and road damage close portion of Copper Cove Drive in Calaveras County

ABC10 3/12/2023

Hazard Planning Zones

Having a well-planned Emergency Evacuation strategy is crucial for ensuring the safety of all residents. In Calaveras County, specific evacuation zones have been identified based on factors like road accessibility, defensible space, and overall road conditions. While most people in the county live near major state routes like 4, 26, 12, or 49, there are some areas that are more remote and harder to reach. In case of a disaster, early warning, and notification is essential for the residents of these areas to evacuate safely. The county has identified seven major zones for evacuation - Zone A, Zone B, Zone C, Zone D, Zone E, Zone F, and Zone G. These zones will be used in the preparation of an Emergency Evacuation Plan.

Evacuation Zone Identifiers

Zone A – SR-49 Corridor
Zone B - SR-26
Zone C - Eastern County High Country
Zone D - Northwestern County (Valley Springs)
Zone E – SR-4 Corridor
Zone F – High-Risk Central County
Zone G – Southwestern County (Copperopolis)

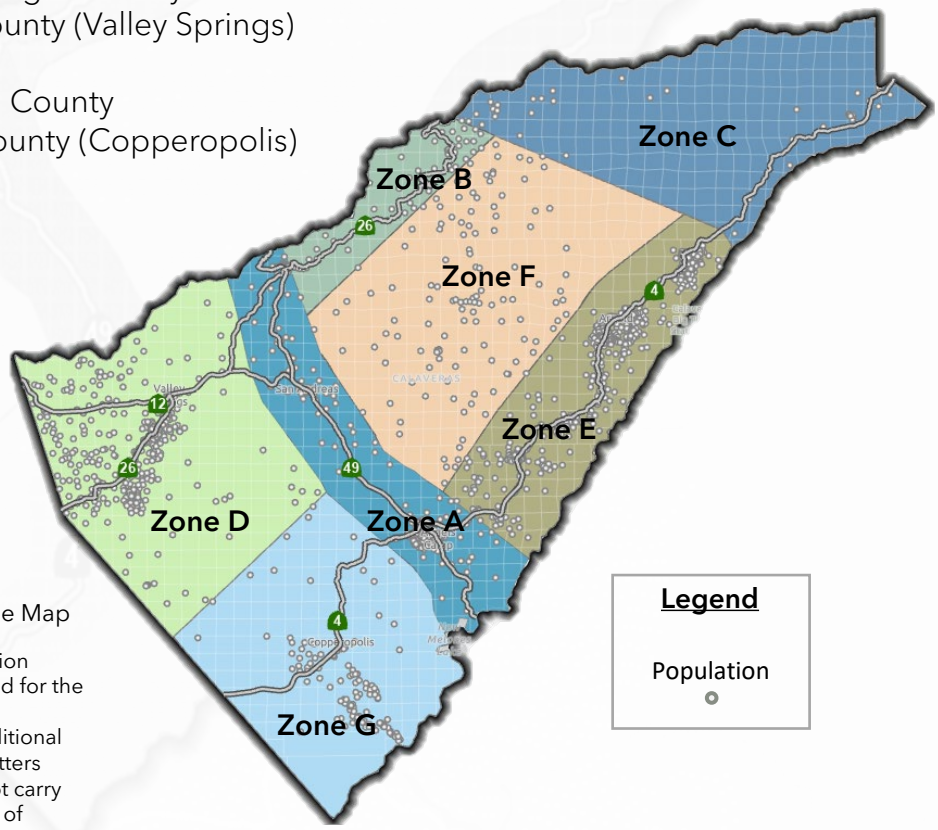


Figure 1.1 Hazard Planning Zone Map

In this section, a naming convention using alphabetical order is utilized for the general zoning conditions. It is anticipated that there will be additional divisions within the zones. The letters chosen for the partitioning do not carry any specific significance in terms of evacuation order and were selected randomly.

This page is intentionally left blank

Calaveras County Evacuation Zoning

State Route 49 Corridor – Zone A

The Emergency Evacuation Zone A spans the entire County and covers the State Route 49 corridor as well as areas within a 5-mile radius including major roads like State Routes 12, 26, and 4.

Total Population

Communities within Zone A include Angels Camp, San Andreas, Vallecito, and a portion of Mokelumne Hill, and has a total population of close to **9,400** people. This population does not include the seasonal influx due to tourism in summer months.

Potential Shelter Locations

Central locations identified as potential evacuation locations include Bret Harte High School, Mark Twain Elementary, San Andreas Elementary, Calaveras High School, Calaveras County Fairgrounds, Mokelumne Hill Town Hall, and Gold Strike High School.

Lane Miles

Zone A has a total of **82** lane miles with varying conditions. **54.4%** of the lane miles are on County maintained roads, while **45.0%** are part of the State Route network.

Housing

Zone A has nearly 4,000 households with a housing density of **37.8** housing units per square mile. **35% of households have an income less than $50,000**, below California's household median income of $78,672.

Traffic Volume

Average daily trips (**ADT)** for roadway segments within Zone A is estimated to be **36,000**. Vehicle miles traveled (VMT) for Zone A is estimated to be **31.3 VMT** per capita.

Improvement Projects

59 improvement projects have been identified for Zone A, including **7** projects to prevent roadway flooding, and **35** for defensible space clearing and hazard tree removal on County Roads and State Routes. The complete project list can be found in Chapter 6 and in Appendix B of this report.

Calaveras County Evacuation Zoning
State Route 49 Corridor – Zone A

Critical Facilities Map

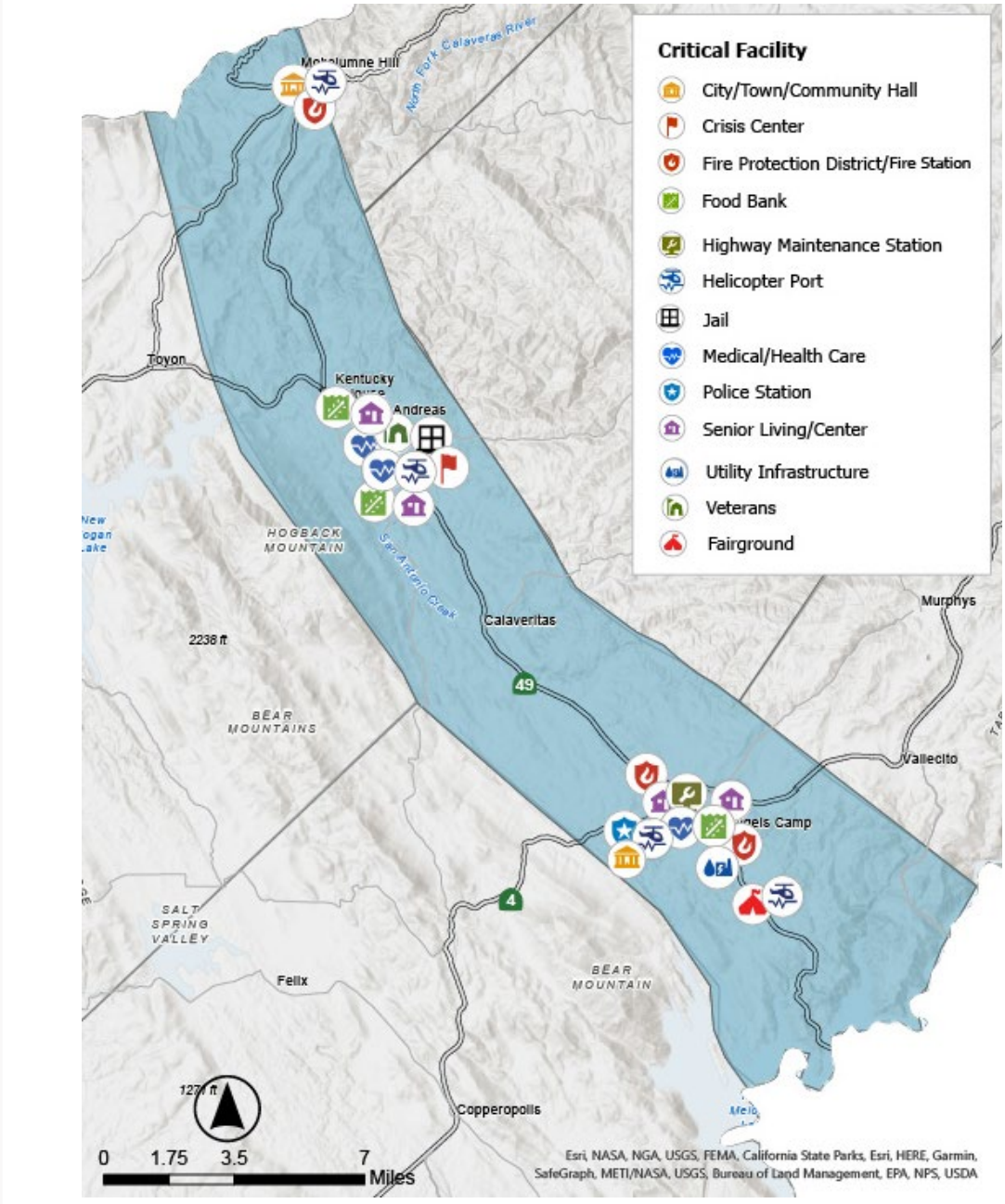


Figure 1.2 Hazard Planning Zone A Critical Facilities

Calaveras County Evacuation Zoning
State Route 26 Corridor – Zone B

Zone B covers a stretch of land from Mokelumne Hill to West Point, including a five-mile area on both sides of State Route 26.

Total Population

Communities within Zone B include Mokelumne Hill, West Point, a portion of Mountain Ranch, and has a total population of close to **1,600** people.

Potential Shelter Locations

Central locations identified as potential evacuation locations include Mokelumne Hill Elementary, Mokelumne Hill Town Hall, West Point Community Hall and Railroad Flat School.

Lane Miles

Zone B has a total of **51.4** lane miles with varying conditions. **57.1%** of the lane miles are on county-maintained roads, while **42.9%** are part of the State Route network.

Housing

Zone B has nearly 700 households and a housing density of **7.5** housing units per square mile. **31.5% of households have an income less than $50,000**, below California's household median income of $78,672.

Traffic Volume

Average daily trips (**ADT)** for roadway segments within Zone B is estimated to be **5,700.** Vehicle miles traveled (**VMT**) for Zone B is estimated to be **30,500 VMT** per capita.

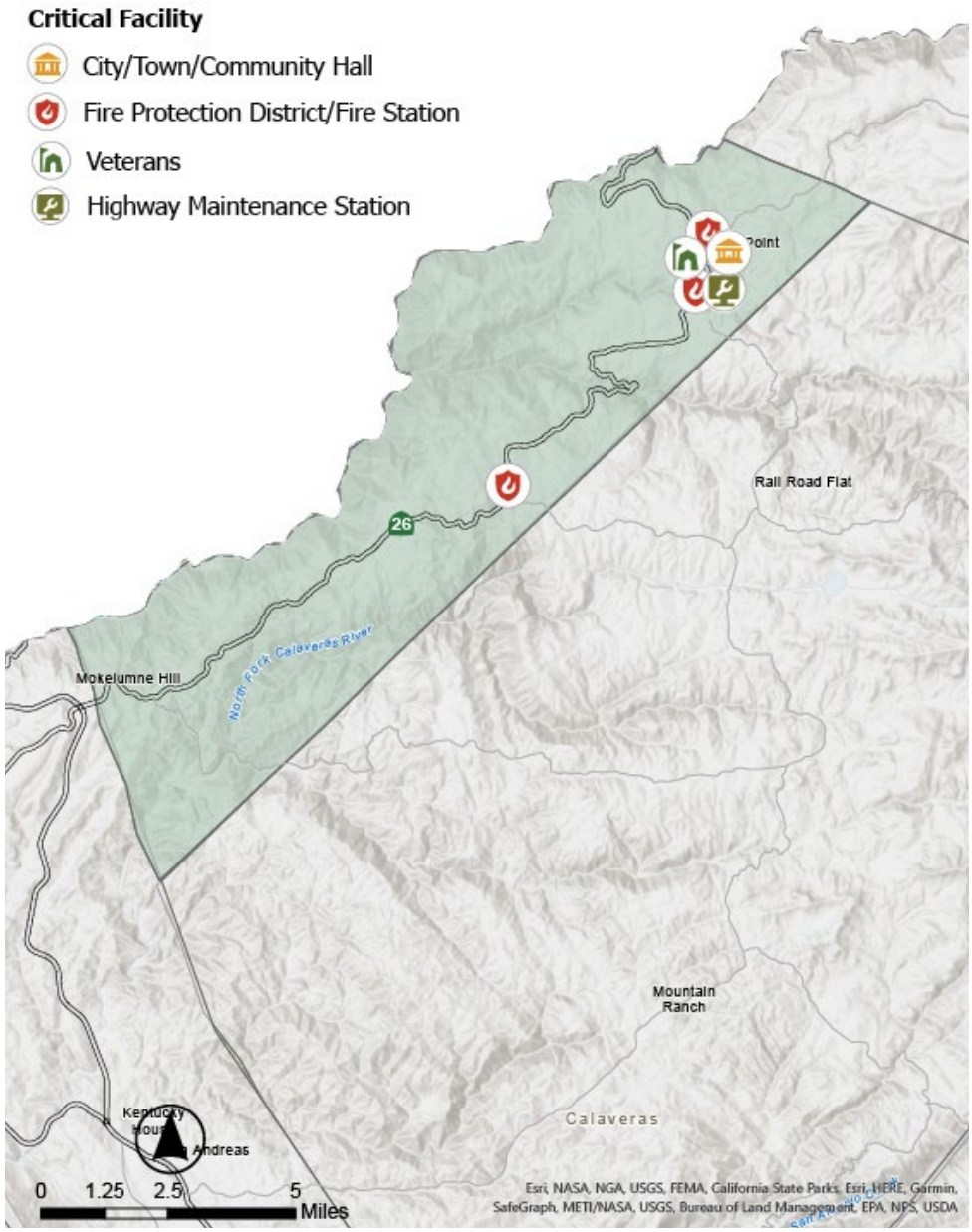
Improvement Projects

78 improvement projects have been identified for Zone B, including **7** projects to prevent roadway flooding, and **45** for defensible space clearing and hazard tree removal. The complete project list can be found in Chapter 6 and in Appendix B of this report.

Calaveras County Evacuation Zoning

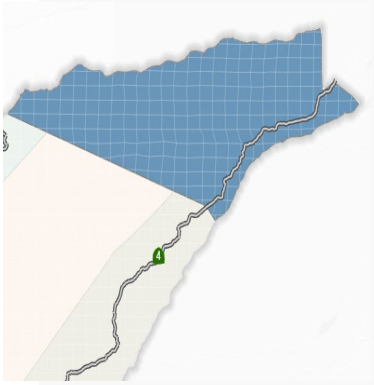
State Route 26 Corridor – Zone B

Critical Facilities Map



A list of critical facilities by each zone can be found in Appendix A

Figure 1.3 Hazard Planning Zone B Critical Facilities



Calaveras County Evacuation Zoning

County High Country – Zone C

The area referred to as Zone C comprises the eastern part of the county, stretching from West Point up to Dorrington. State Route 4 is the primary corridor in Zone C.

Total Population

Zone C includes a portion of the community of Dorrington and the far-east rural area of Calaveras County, in total the estimated population is close to **200** people.

Potential Shelter Locations

The closest locations for potential evacuation locations include West Point Community Town Hall and Hazel Fischer Elementary in Arnold.

Lane Miles

Zone C has a total of **42.1** State Routes and County lane miles. **73%** of the roads are County maintained while **27%** are State maintained routes.

Housing

Zone C has less than 100 households with a housing density equal to 1 housing unit per square mile. **32.2% of households have an income less than $50,000**, below California's household median income of $78,672.

Traffic Volume

Average daily trips (**ADT)** for roadway segments within Zone C is estimated to be **230**. Vehicle miles traveled (**VMT**) for Zone C is estimated to be **18,600 VMT** per capita.

Improvement Projects

5 State Route Defensible Space Clearing Projects have been identified for Zone C. The complete project list can be found in Chapter 6 and in Appendix B of this report.

Calaveras County Evacuation Zoning

State Route 49 Corridor 5-mile buffer– Zone C

Critical Facilities Map

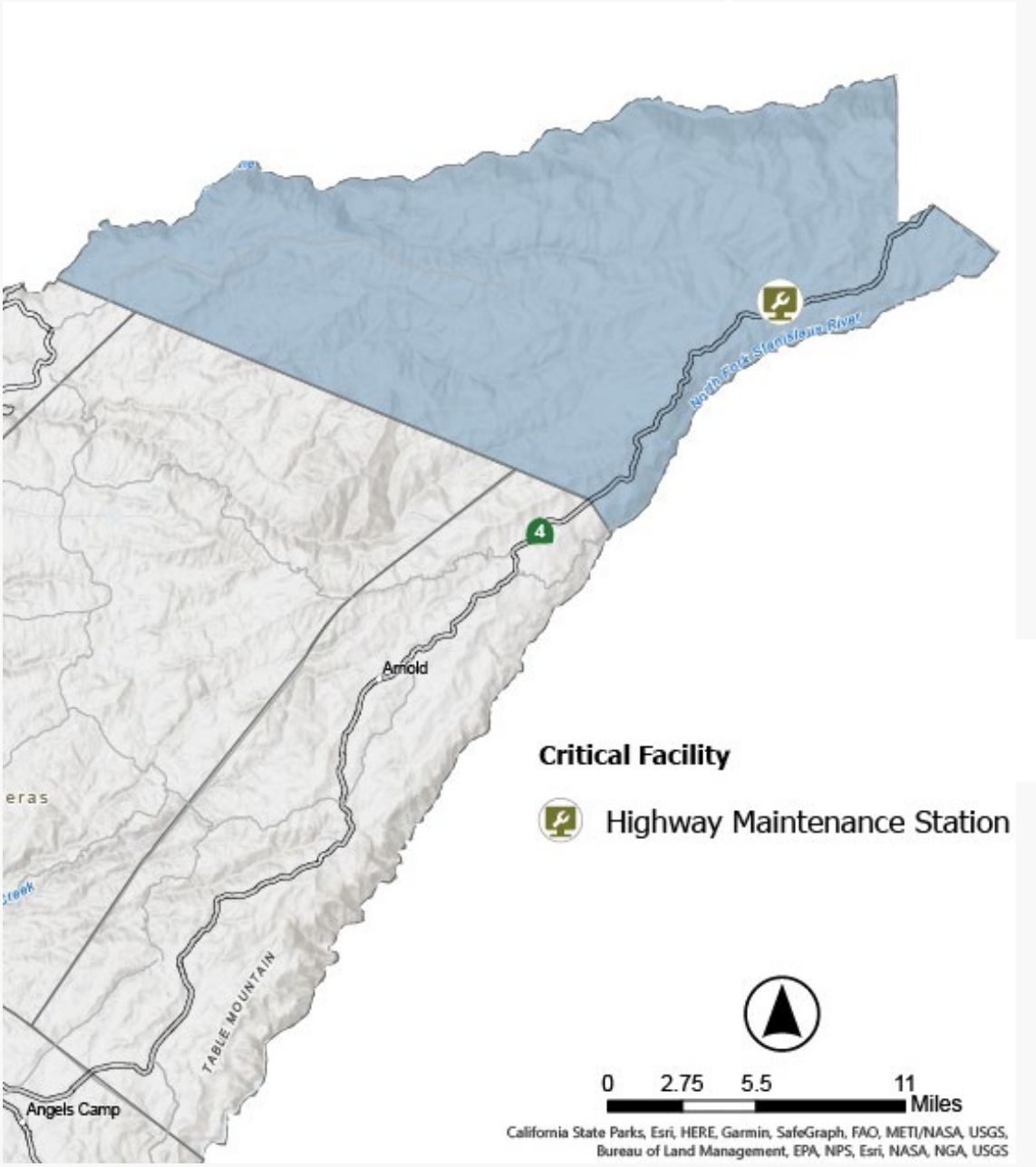


Figure 1.4 Hazard Planning Zone C Critical Facilities

Calaveras County Evacuation Zoning

Northwestern County Valley Springs – Zone D

The Emergency Evacuation Zone D includes Valley Springs and nearby communities situated in the western corner of the county. State Routes 12 and 26 are the primary corridors in Zone D.

Total Population

Zone D includes Valley Springs, Wallace, Paloma, Rancho Calaveras, and a portion of San Andreas with a total population of close to **18,000**.

Potential Shelter Locations

The closest locations for potential evacuation locations include Valley Springs Elementary, Toyon Middle School, Jenny Lind Elementary School.

Lane Miles

Zone D has a total of **156** State Route and County lane miles. **84.8%** of the roads are County maintained while **15.2%** are State maintained routes.

Housing

Zone D has around 6,100 households with a housing density of around 10 housing units per square mile. **24.5% of households have an income less than $50,000**, below California's household median income of $78,672.

Traffic Volume

Average daily trips (**ADT)** for roadway segments within Zone D is estimated to be **46,000**. Vehicle miles traveled (VMT) for Zone D is estimated to be **44.3 VMT** per capita.

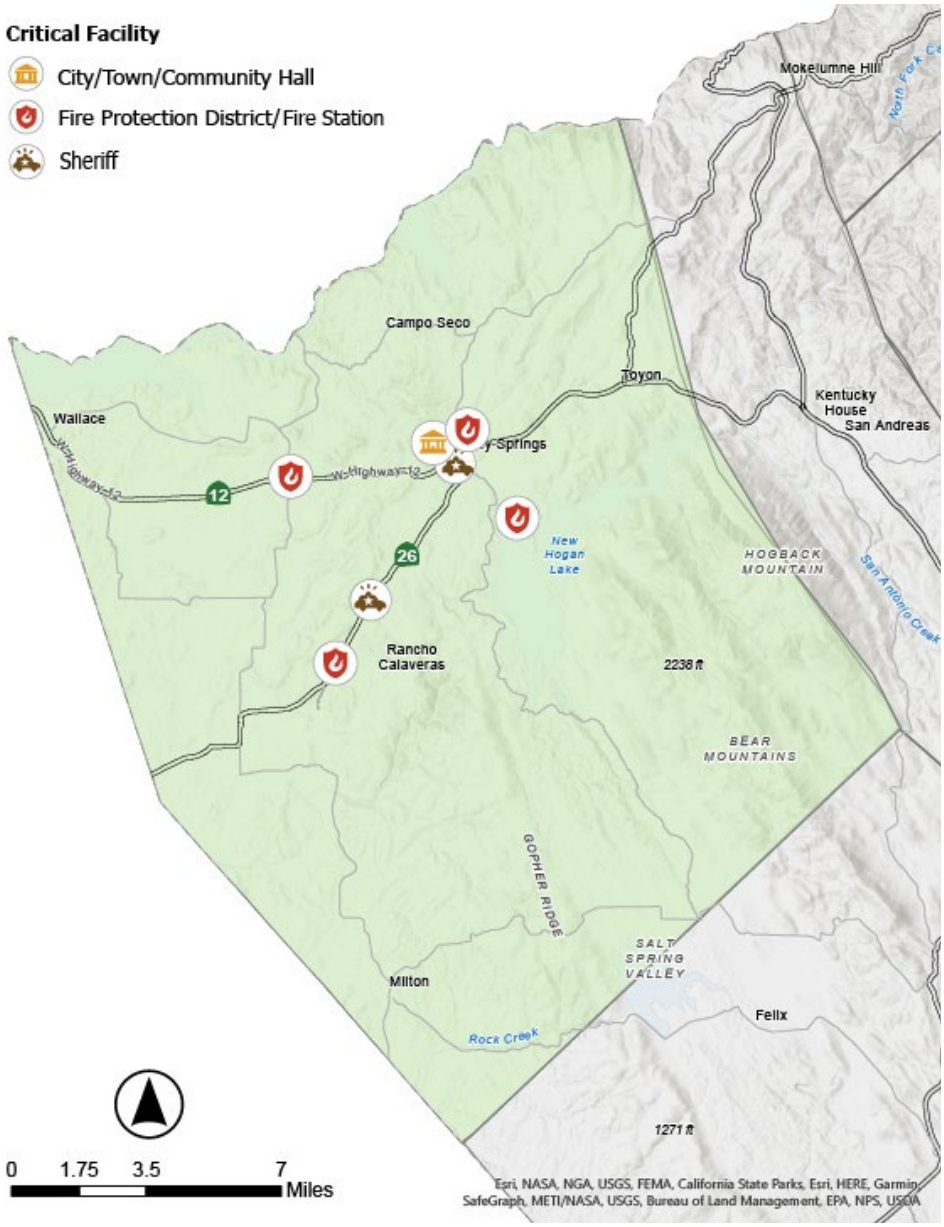
Improvement Projects

24 improvement projects have been identified for Zone D, including **9** projects to prevent roadway flooding and **15** future State Route repair projects. The complete project list can be found in Chapter 6 and in Appendix B of this report.

Calaveras County Evacuation Zoning

Northwestern County Valley Springs – Zone D

Critical Facilities Map



A list of critical facilities by each zone can be found in Appendix A

Figure 1.5 Hazard Planning Zone D Critical Facilities

Calaveras County Evacuation Zoning

State Route 4 Corridor 5-mile buffer Zone E

Zone E encompasses the State Route 4 Corridor, spanning from Murphys to Dorrington. This region stands out for its elevated terrain, dense vegetation, and steep topography.

Total Population

Zone E includes Murphys, Avery, Arnold, Dorrington, and other rural communities located east of Angels Camp with a total population **8,200.**

Potential Shelter Locations

Central locations identified for evacuations include Avery Middle School and Hazel Fischer Elementary.

Lane Miles

Zone E has a total of **221** State Route and County lane miles. **88.4%** of the roads are County maintained while **11.6%** are State maintained routes.

Housing

Zone E has around 3,800 households with a housing density of around 12 housing units per square mile. **29.6% of households have an income less than $50,000**, below California's household median income of $78,672.

Traffic Volume

Average daily trips (**ADT)** for roadway segments within Zone E are estimated to be **24,000**. Vehicle miles traveled (VMT) for Zone E is estimated to be **33.8 VMT** per capita.

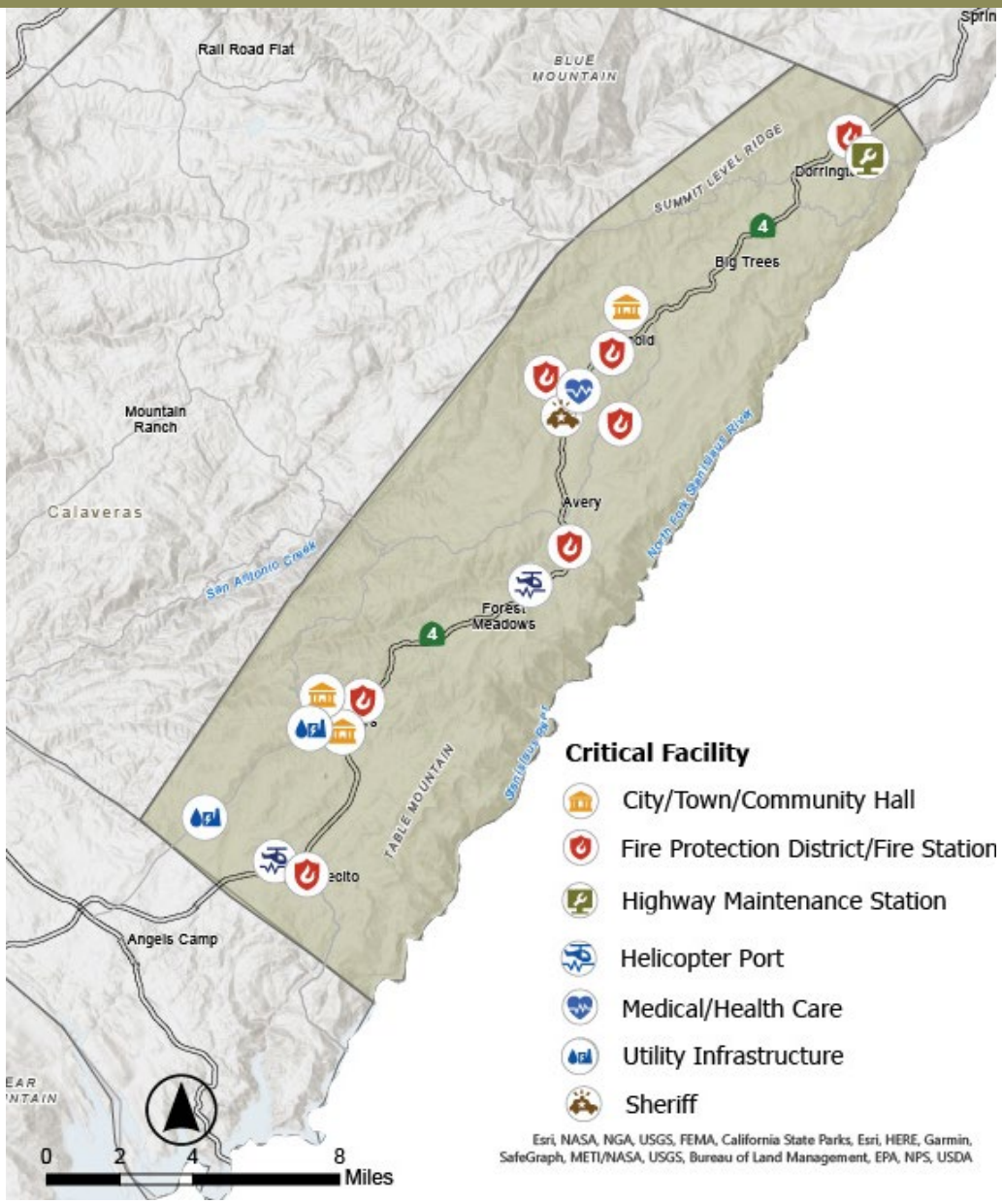
Improvement Projects

79 improvement projects have been identified for Zone E, including **9** of projects to prevent roadway flooding, **62** for defensible space clearing, and **8** future state route repair projects. The complete project list can be found in Chapter 6 and in Appendix B of this report.

Calaveras County Evacuation Zoning

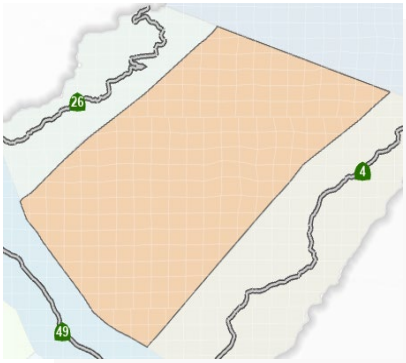
State Route 4 Corridor 5-mile buffer Zone E

Critical Facilities Map



A list of critical facilities by each zone can be found in Appendix A

Figure 1.6 Hazard Planning Zone E Critical Facilities



Calaveras County Evacuation Zoning

High-Risk Central County – Zone F

Zone F comprises rural communities in the county that are centrally located. These areas have limited access to State Routes 4, 49, and 26 as well as primary corridors.

Total Population

Zone F includes rural communities such as Sheep Ranch and Railroad Flat and fractions of San Andreas, Angels Camp, Mokelumne Hill, Murphys, and Avery with a total population of **3,600**.

Potential Shelter Locations

Evacuation centers located closest to Zone F are in other Zones, such as Avery Middle School, Railroad Flat School.

Lane Miles

Zone F has a total of **285.9** lane miles. Unlike the other zones, Zone F has **100%** County maintained roads and **no** State maintained roads. Primary connecting roads include Railroad Flat Road, Sheep Ranch Road and Mountain Ranch Road.

Housing

Zone F has around 1,600 households with a housing density of around 2 housing units per square mile. **23.2% of households have an income less than $50,000**, below California's household median income of $78,672.

Traffic Volume

Average daily trips (**ADT)** for roadway segments within Zone F are estimated to be **7,700**. Vehicle miles traveled (VMT) for Zone F is estimated to be **32.7 VMT** per capita.

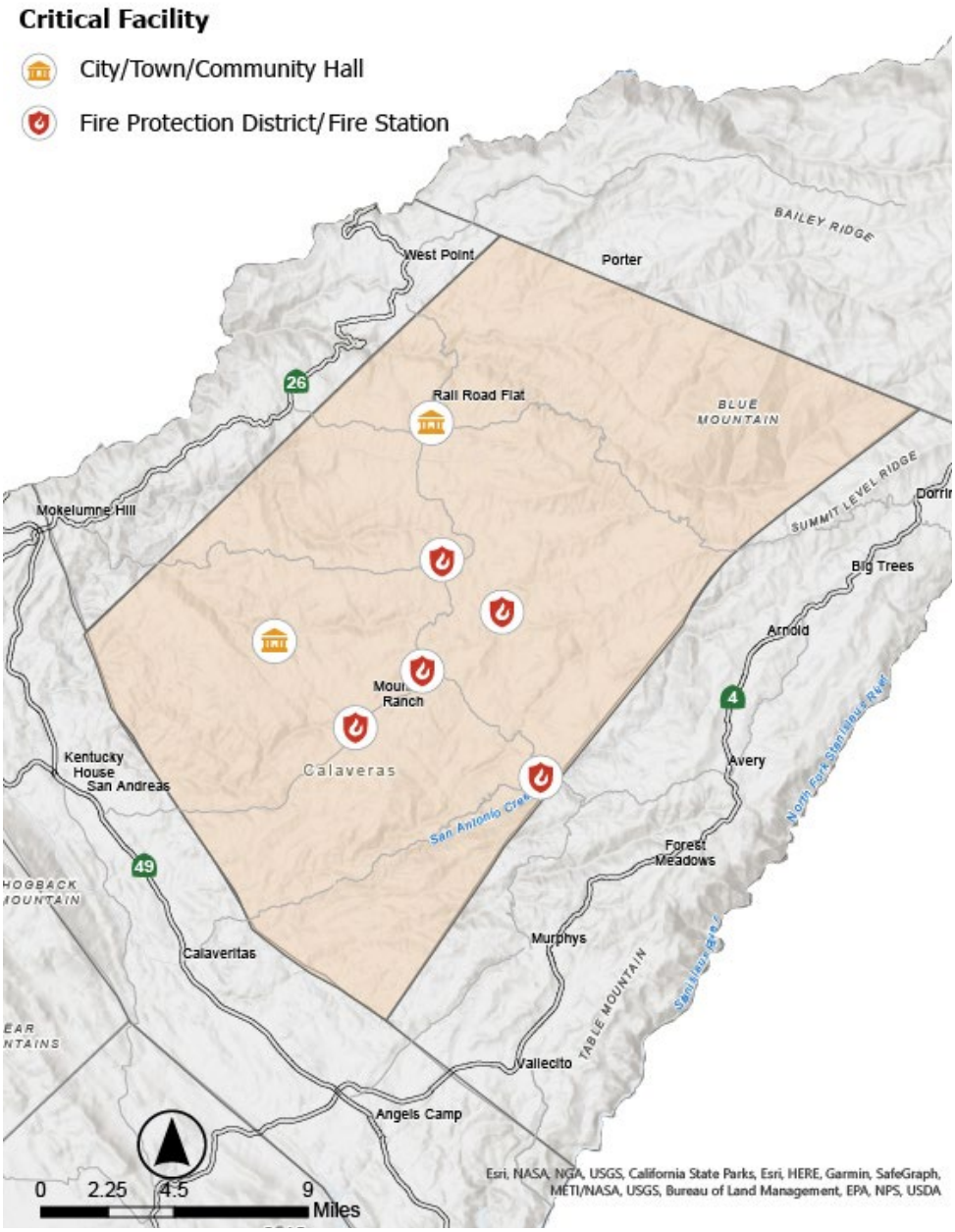
Improvement Projects

111 improvement projects have been identified for Zone F, including **8** projects to prevent roadway flooding, **50** defensible space clearing projects, and **53** future projects on County priority roads. The complete project list can be found in Chapter 6 and in Appendix B of this report.

Calaveras County Evacuation Zoning

High-Risk Central County – Zone F

Critical Facilities Map



A list of critical facilities by each zone can be found in Appendix A

Figure 1.7 Hazard Planning Zone F Critical Facilities

Calaveras County Evacuation Zoning

Southwestern County Copperopolis – Zone G

Zone G encompasses the southwestern corner of the county as well as a significant portion of the State Route 4 corridor.

Total Population

All communities located southwest of Angels Camp, including Copperopolis, are included in Zone G with a population close to **4,900**.

Potential Shelter Locations

Copperopolis Elementary School is identified as a potential evacuation location.

Lane Miles

Zone G has a total of **125.8** lane miles. **91.9%** of the lane miles are County maintained, while only **8%** are part of the State Route network.

Housing

Zone G has around 2,000 households with a housing density equal to **18** housing units per square mile. While. **24.3% of households have an income less than $50,000,** below California's household median income of $78,672.

Traffic Volume

Average daily trips (**ADT)** for roadway segments within Zone G are estimated to be **13,000**. Vehicle miles traveled (VMT) for Zone G is estimated to be **44 VMT** per capita.

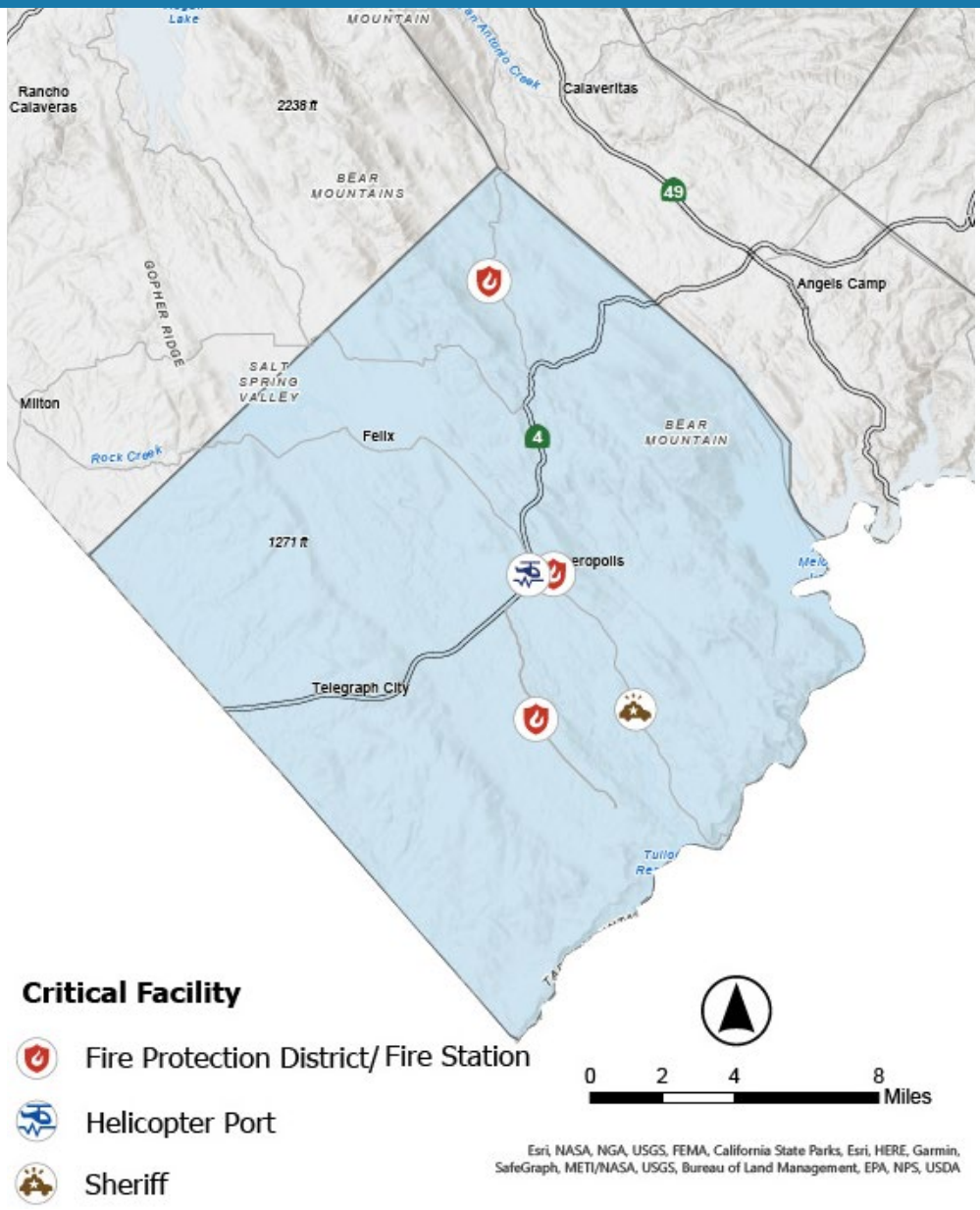
Improvement Projects

20 improvement projects have been identified for Zone G, including **6** projects to prevent roadway flooding, **12** future State Route repair projects, and **2** future County road repair projects. The complete project list can be found in Chapter 6 and in Appendix B of this report.

Calaveras County Evacuation Zoning

Southwestern County Copperopolis – Zone G

Critical Facilities Map



A list of critical facilities by each zone can be found in Appendix A

Figure 1.8 Hazard Planning Zone G Critical Facilities

Countywide Potential Shelters

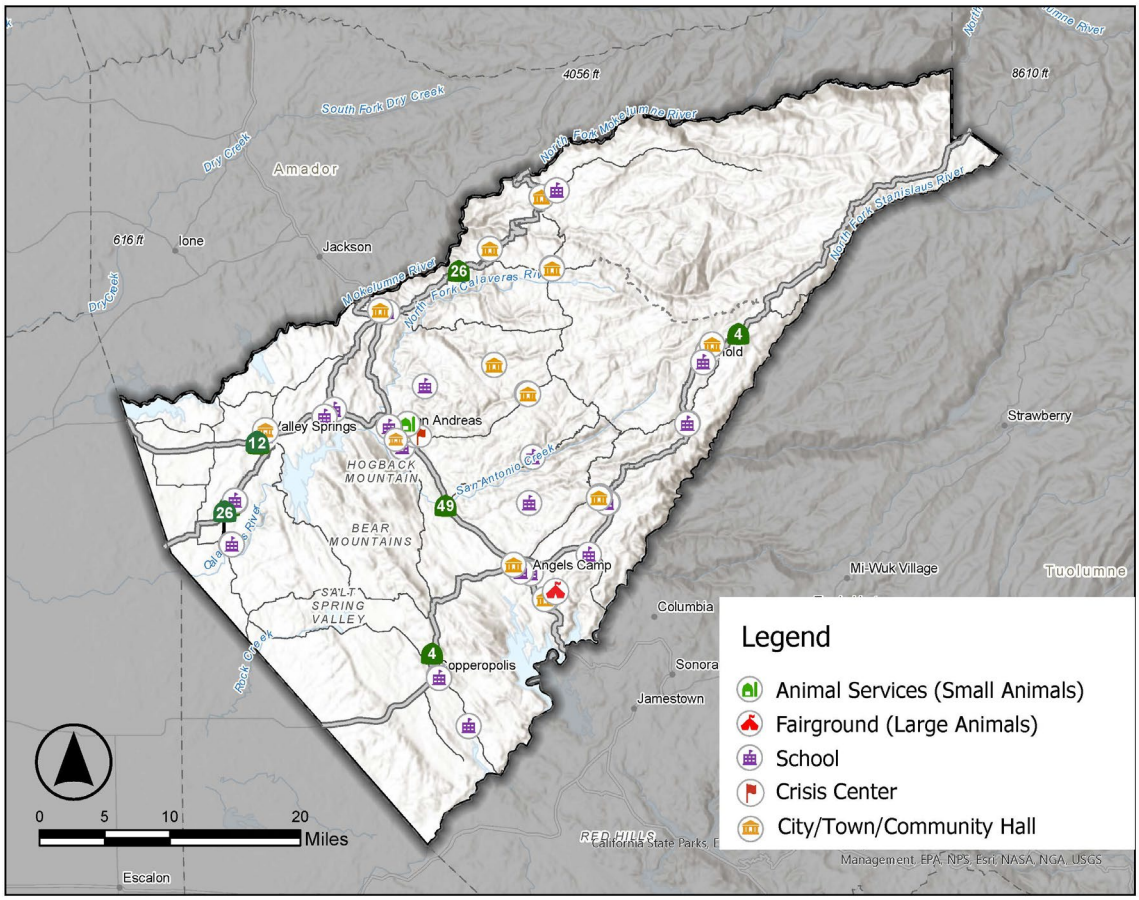
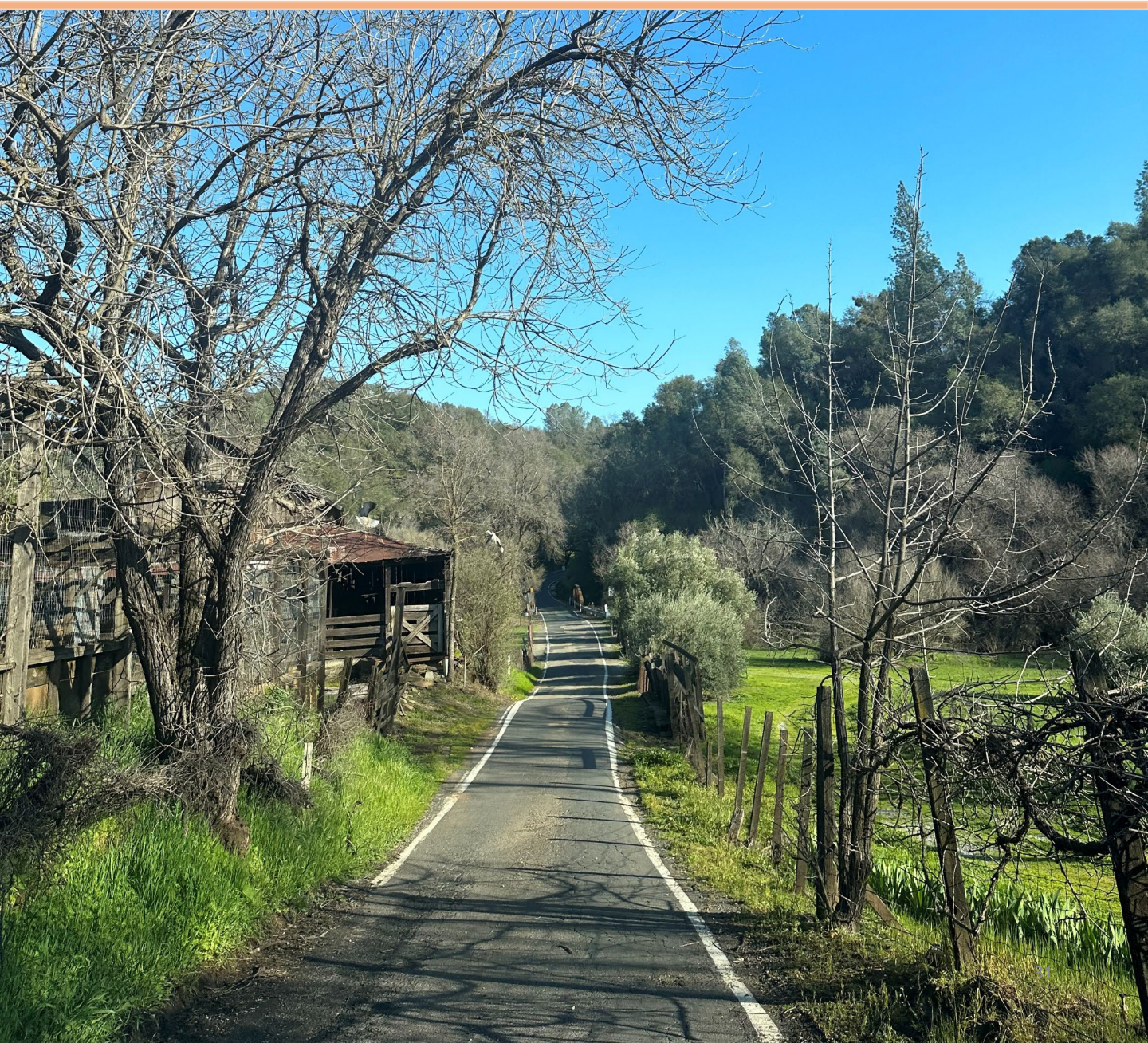


Figure 1.9 County-Wide Potential Shelters

A complete list of County Wide Potential Shelters can be found in Appendix C

Chapter 2
Project Advisory Committee and Public Outreach



Project Advisory Committee (PAC)

A Project Advisory Committee (PAC) was created to help guide the development of the project and is made up of agency and external stakeholders including CCOG, department representatives from the City of Angels Camp, Calaveras County, Caltrans, local fire districts, and law enforcement.

Figure 2.1 Project Advisory Committee (PAC)

PAC members met regularly throughout the duration of the project and provided guidance during the existing conditions review, outreach planning, advised concept selection using Hazard Matrix and Map, and selection of priority locations for concept alternatives.

To raise awareness of this Plan, educate the public, and provide opportunities for input, Public Outreach was conducted throughout the duration of the project. An integral part of this Plan was engaging and informing the community, giving the community a voice and hearing what they had to say.

Outreach Strategy

In February 2022, a Public Outreach Plan was developed and summarized the outreach strategy implemented throughout the duration of the project. The project used a hybrid approach, incorporating online, and virtual community engagement opportunities as well as in-person community workshops to reach a wide array of people and communities throughout the county.

Public Outreach played an integral role in the ***Evacuation Access Needs Assessment and Preparedness Plan***.

Project Website

A project website was developed and used to present information and make announcements. The website had a top-down flow and was updated regularly, leading visitors through content in an organized way. Information included on the website includes –

- Project information and background
- Timeline of events to help the public understand where the project is and what to expect
- Recordings of previous meetings for future viewings
- Workshop Announcements
- Interactive survey and feedback opportunity announcements
- Contact information for the Project Advisory Committee (PAC)

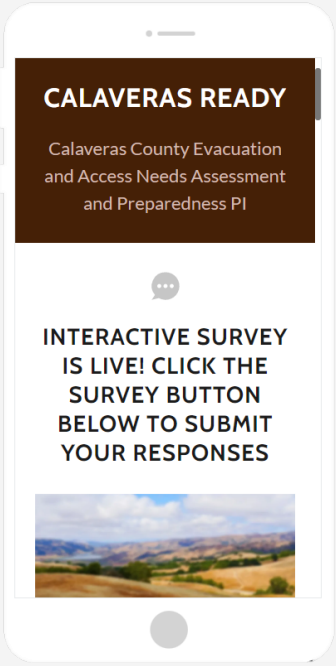


Figure 2.2 Project Website on Mobile Device

Climate Debrief

Public officials, first responders, and other stakeholders in the region who experienced recent hazard events including wildfires, winter storms, flooding, and mudslides were interviewed during the Climate Debrief. The purpose of these interviews was to examine key challenges and constraints for evacuation and access, evaluate strategies employed, and discuss opportunities for planning and response moving forward. In addition, key successes and challenges experienced in the evacuation process were examined.

A total of four interviews with seven different participants were conducted between February 16 and February 22, 2022.

Table 2.1 Summary of Interview Participants

Name	Organization	Roles
Rebecca Callen	City of Angels Camp City Hall	City Administrator
Nathan Pry	City of Angels Camp Fire Department	Deputy Fire Chief/Fire Marshal
John Osbourn	Calaveras County Office of Emergency Services	Director
Scott Nanik	Calaveras County Office of Education	Superintendent of Schools
Charly Modrell	California Department of Transportation	Maintenance- Mountain Region Manager
Gregoria Ponce	California Department of Transportation District 10	Chief, Office of Rural Planning
Scott Hertzog	Copperopolis Fire Protection District	Interim Fire Chief

Climate Debrief Interview

Interview respondents identified four unique fire events of various scales that impacted Calaveras County in recent years, which included the Airola Fire in 2021, the Salt Fire in 2020, the O'Reilly Fire in 2020, and the Butte Fire in 2015. While the areas impacted and the duration of the wildfire events varied, there were common challenges identified during event evacuation and response. Interview participants highlighted key areas of concern during wildfire events as well as other hazard events and summarized challenges related to road conditions, access for community members and emergency responders, and capacity and resource limitations.

In addition to wildfires, several other types of hazard events were identified by interview participants. These included winter storms, flooding, and mudslides. In 2017, a large winter storm resulted in an extended road closure of a section of State Route 26 for over 30 days. In 2019, winter storms resulted in a federal disaster declaration. Significant winter storms also occurred in December 2021, although no major State Route closures occurred in Calaveras County. In 2022, a major winter storm which flooded homes and caused created impossible roadways.

Interview respondents pointed out while major damages and threats to human safety were avoided in past hazard events, future planning will have to consider worst-case scenarios to adequately plan for events. Regular maintenance of roadways and defensible space can help keep evacuations clear and potentially reduce the threats of hazards or post-event hazards. These efforts require resources and funding, which can be a challenge. Exploring grant opportunities or other programs to support roadway maintenance and improvements will be important to address these needs.

"Every fire district in Calaveras had an engine present at one point or another (minus Ebbetts Pass). Outside agencies were brought in via CALFIRE through the mutual aid agreement, brought in, and rotated as shifts. I believe Amador County had some engines out there as well."

"A lot more coordination because we learned from the Butte Fire. We need a way to continue to train and educate those newer people on how this all has to work.."

"…Pavement can be a problem, roads are very old out there and some of the roads are maintained by road committees, or the owners of the land out there, some are County-maintained."

Figure 2.3 Climate Debrief Interview Dialog Graphic

Online Survey Tool

MetroQuest, an online engagement platform designed for transportation planning was utilized to increase public engagement and receive useful information and concerns from community members.

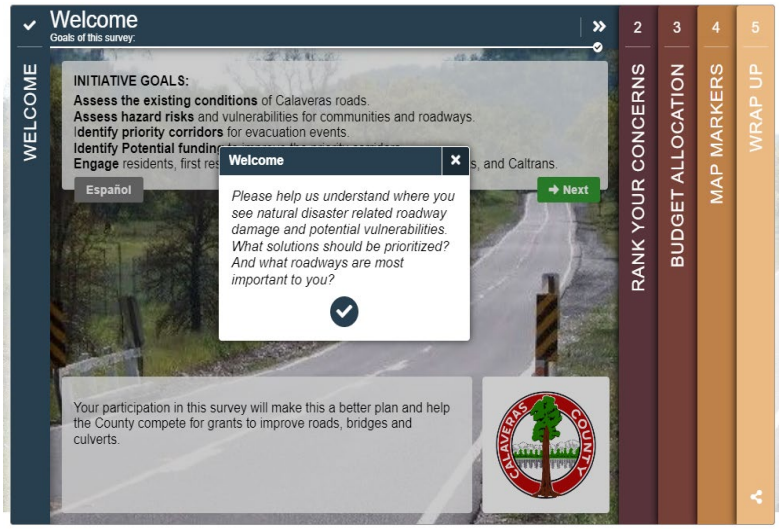


Figure 2.4 MetroQuest Survey Welcome Page

MetroQuest is an interactive survey that provides users with background information, provides links for sharing on various social media platforms, and gathers community feedback, simultaneously. MetroQuest surveys were one of the several methods used to assess users' priorities and played a key role in ensuring community involvement.

Interactive surveys were available for various periods of time and the community was asked to take the survey through a variety of outreach methods including

- **Email to Project Stakeholders**
- **Targeted emails to community groups and facilities**
- **Materials handed out at Angels Camps Farmers Market**
- **Announced in local Newspaper**
- **Link provided on Project website and City of Angels website**
- **CCOG Facebook posts and Nextdoor Account**

Survey One – Community Concerns

To fully understand the evacuation needs of Calaveras County and supplement the climate debrief interviews, online surveys were prepared for three different focus groups: Community, First Responders, and Critical Facilities. A total of 113 residents participated in the survey between June 20, 2022, and September 30, 2022.

The layout of the surveys was similar for each focus group, but the specific questions varied based on each group's unique experience. Users opened the survey to a welcome screen, which briefly described the purpose of the survey and its significance. Following the welcome screen, users were asked a series of questions in a standard survey format. Then, users were asked to help identify priority corridors using an interactive screen pin on a map; at this point, users had the option to leave comments about why they identified a location. In general, the comments received reflected the sentiments from the in-person climate debrief interviews.

Participants from around the County dropped over 300 pins, identifying areas of concern due to Traffic Bottlenecks, Narrow Roadways, One Way In, One Way Out, Flooding Issues, and other concerns based on past experiences.

113 County residents identified over 300 locations of concern in the first community survey.

Survey Results

Specific results from this survey were used in the development of the Priority Corridors and Key Considerations for Future Evacuation Plans and discussed further in Chapter Five.

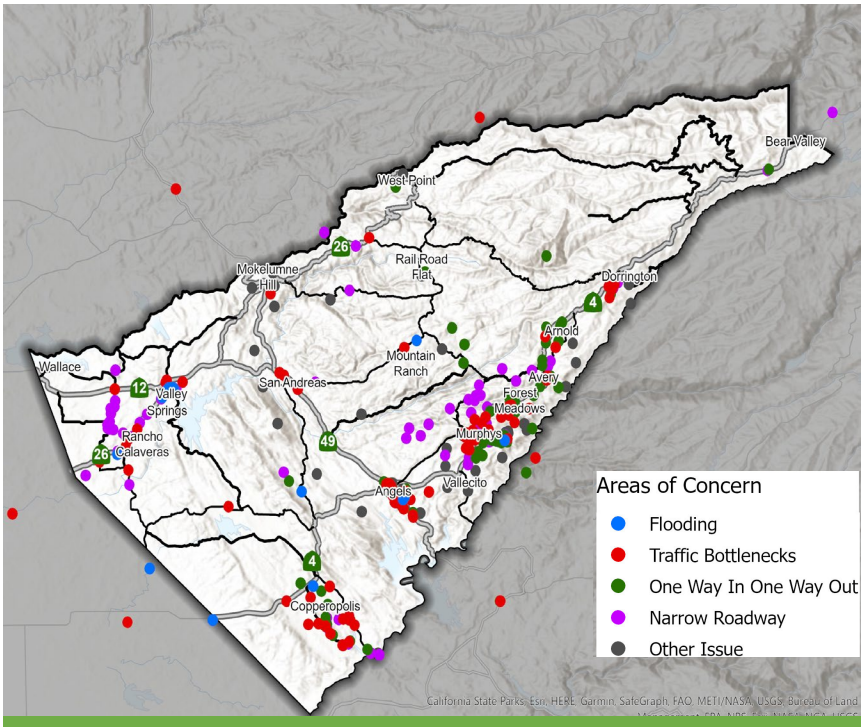
Community members were asked to rank the natural disasters they were most concerned about, including (in order) –

- Wildfires
- Floods
- Extreme Winter Storms
- Extreme Heat
- Landslides
- Mudflow Avalanche
- Earthquakes
- Extreme Drought
- Other

Of those concerns, Wildfires, Floods, and Extreme Drought were the top three natural disasters that concerned residents the most, followed closely by Extreme Heat.

Additionally, community members were asked about specific types of conditions causing concern including -

- Traffic Bottleneck
- Narrow Roadways
- Flooding
- One Way In, One Way Out
- Other



Pinpoints Dropped on Map Screen for Survey One

Figure 2.5 Survey One Pinpoints Map

From the **300+** Pins dropped on the map screen

97 Identified locations with Traffic Bottlenecks

83 Identified Narrow Roadways and One-Way Roads

17 Identified roads with Flooding Issues or Washout

49 Comments were received regarding other roadway issues and concerns

Survey participants pointed out several concerns specific to locations including -

- Traffic Bottlenecks and One Way In, One Way Out issues along State Route 4 between Angels Camp and Arnold
- Traffic Bottleneck issues on SR 49 south of Angels Camp
- Traffic Bottlenecks on SR 4 through Copperopolis
- Narrow Roadways and Traffic Bottlenecks at Little John Road and Burson Road

Survey Two – Community Concerns

In March 2023, community members were given another opportunity to provide feedback on access needs and existing conditions of the transportation network. The results from this survey were used to make conclusions in the **Priority Corridors and Key Considerations for Future Evacuation Plans** and provided guidance in selecting projects for further planning, highlighted in the final chapter of the plan, **Achieving a Resilient Network**.

113 County residents identified over 454 locations of concern in the second community survey.

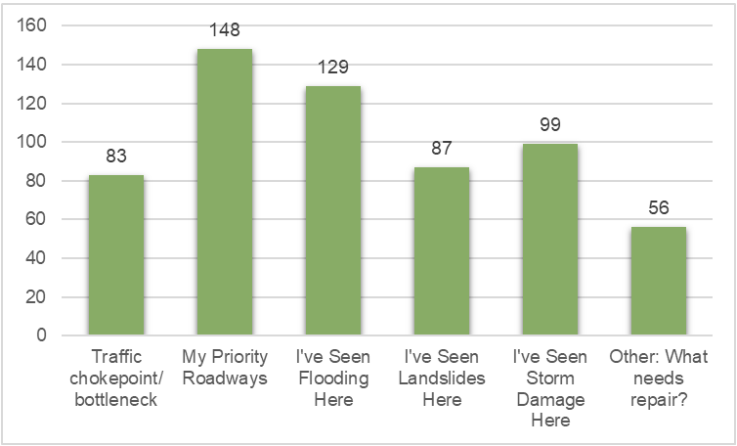


Figure 2.6 Survey Two Results

Survey Results

Results from Survey Two were used to develop an extensive Project List and played a role in the final chapter of this plan, Chapter 6, Achieving a Resilient Network

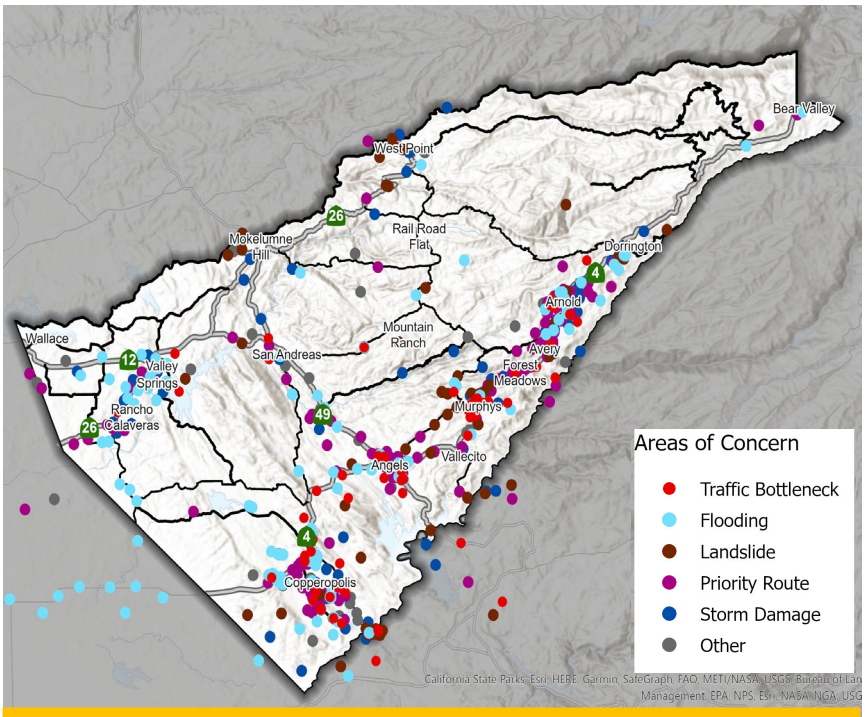
Community members were asked to rank the most important improvements to help residents evacuate, including:

- Culvert Inspection and Clearing
- Roadside Slope Inspection and Repair
- Outreach for Unified Notification System
- Intersection Improvements
- Drainage Ditch Clearing and Enlargement
- Overhead Powerline Undergrounding
- Roadside Vegetation Clearing
- Evacuation Plan
- Shoulder Widening
- Other

Of those, the top concerns for the residents were identified as the Evacuation Plan, Outreach for Unified Notification System, and Culvert Inspection and Clearing, with Shoulder Widening following closely behind.

Following the first question, the survey participants were asked about specific issues including

- Traffic Bottleneck
- Narrow Roadways
- Flooding
- One Way In, One Way Out
- Other



Pinpoints Dropped on Map Screen for Survey Two

Figure 2.7 Survey Two Pinpoints Map

From the 454+ Pins dropped on the map screen

129 Identified locations at risk due to flooding

99 Identified locations with Storm Damage

87 Identified locations where landslides have occurred

83 Identified locations where Traffic Bottlenecks and Choke Points cause significant issues

Survey participants pointed out several concerns specific to locations including -

- Flooding, Traffic Bottlenecks, and Storm Damage Issues on State Route 4 passing through Angels, Murphys, and Arnold.
- Storm Damage and Flooding issues at the Northeast side of State Route 26 through Valley Springs and Rancho Calaveras.
- Little John Road and O'Byrnes Ferry Road were identified as concerning roads due to Bottlenecks, Storm Damage and Flooding Issues

Community Meetings

In-person and virtual meetings were held throughout the project duration and during specific milestones including –

- After the Existing Conditions Analysis was completed (Workshop#1)
- After the Investment and Adaptation Strategy was completed (Workshop #2)
- The Draft Plan was distributed to community members for review and public comment for approximately two weeks. (Workshop #3)

The online option allowed community members to receive valuable information presented at the meeting without driving to a meeting venue.

In-person events were held to allow community members to ask questions, provide feedback, and have personable interactions with team members.

In addition to online and in-person meetings, meeting information including project sheets, PowerPoint slides, and informational presentation boards were made available on the project website.

Figure 2.8 Community Members participating in Workshop #2 on February 22, 2023, at San Andreas Town Hall

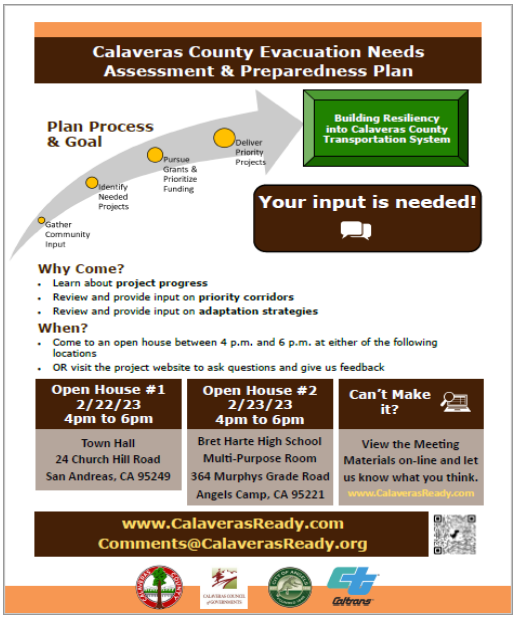


Figure 2.9 Workshop Flyer used for Workshop #2

Focus Groups and Targeted Outreach to Disadvantaged Communities

In a joint effort with the Project Advisory Committee, several groups within Calaveras County required targeted outreach during the development of this plan, including low-income, non-native English speakers, those disabled with low mobility, and residents with limited access to broadband/cellular data sources. These groups have unique needs that need to be understood and incorporated to develop a meaningful plan. To reach these groups, efforts were put into providing various platforms, including the project website, Nextdoor (a website that connects neighbors), and e-mails to stakeholders.

Chapter 3
Existing Conditions Assessment

Existing Conditions Assessment

In March 2022, an Existing Conditions Interim Report was developed; the report consolidated the existing adopted plans and guidance, local opportunities and constraints, and probable climate impacts that could be mitigated. Data was collected on existing County conditions, assets, and community characteristics. The assessment included:

- Collection and review of emergency plans and hazard mitigation documents, including the 2021 Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) developed by the Calaveras County Office of Emergency Services, the City of Angels Camp, and the Murphys Sanitary District (MSD).
- Identification and mapping of locations and characteristics of roadway assets and transportation networks, such as roadway classification and use
- Identification and mapping of planned land use developments and population characteristics, including disadvantaged community status
- Identification of climate change projections expected to impact the transportation network, such as precipitation, temperature, wildfire, and dam failure
- Identification and review of additional case studies, reports, and reference documents

Natural Hazards

According to the 2021 Calaveras County Multi-Jurisdictional Hazard Mitigation Plan (HMP), Calaveras County is affected by the following 12 hazards

- Climate Change
- Dam Failure
- Debris Flows (Landslides, Mud Flows, Avalanches, and Erosion)
- Drought
- Earthquakes
- Flooding
- Land Subsidence (Sinkholes)
- Severe Weather – Extreme Heat
- Severe Weather – High Wind and Tornadoes
- Severe Weather – Winter Storms and Extreme Cold
- Volcano
- Wildfires

Existing Conditions Assessment

As part of the development of the 2021 MJHMP, planning and steering committee members were asked to score each hazard using the probability classifications and extent of damage to determine a score, varying from low to high risk. Table 3.1 summarizes the extent, probability of future occurrences, and risk ranking for eight hazards that may trigger an evacuation. Wildfire is the highest risk hazard across Calaveras County with a "high risk" ranking. Debris flow and flooding are the next highest risk hazard with a Serious Risk ranking. Dam failure, earthquake, and volcano hazards are Moderate to Low-risk ranking.

Table 3.1 Calaveras County Hazard Risk Ranking

Hazard	Geographic Extent	Probability of Future Occurrences	Risk Ranking
Dam Failure	Limited	Likely	Moderate
Debris Flow – Landslide	Critical	Likely	Serious
Debris Flow – Mud Flow	Critical	Likely	Serious
Debris Flow – Avalanche	Critical	Likely	Serious
Earthquake	Negligible	Unlikely	Moderate
Flooding	Critical	Likely	Serious
Volcano	Negligible	Unlikely	Low
Wildfire	Catastrophic	Highly Likely	High

Wildfire Risk (High Risk)

From early spring to late fall, Calaveras County is at high risk for Wildfires due to the low-lying foothills to the south and west, the Sierra ridge line to the north and east, and the general terrain and topography of the County.

In the 2018 Strategic Fire Plan For California produced by CalFire, all the major communities in the County were identified as at risk for wildfire based on fuel hazards, probability of fire, and areas of suitable housing density that could create wildland-urban interface fire protection strategy situations.

The terrain of the County makes it susceptible to wildfires. From the mountains to the valley, summer temperatures can be very hot and this in combination with the winds and different fuel types can make for perfect wildfire conditions. On the Calfire Fire Hazard Severity Scale, which uses three criteria to assess risk-fuel loading vegetation, fire weather, and topography, at least 85 percent of the county is an area of high and very high wildfire severity.

The extent of wildfire damage in the County is rated as catastrophic, with more than 50 percent affected and the probability of a wildfire occurring being highly likely. In addition to the wildfire history that exists in the County, projected temperature and precipitation changes are likely to significantly increase the extent and severity across Calaveras County. According to the 2020 California Adaptation Planning Guide, "warmer weather, reduced snowpack, and earlier snowmelt can be expected to increase wildfire through fuel hazards and ignition risks...An increase in wildfire intensity and extent will increase public safety risks, property damage, and emergency response costs."

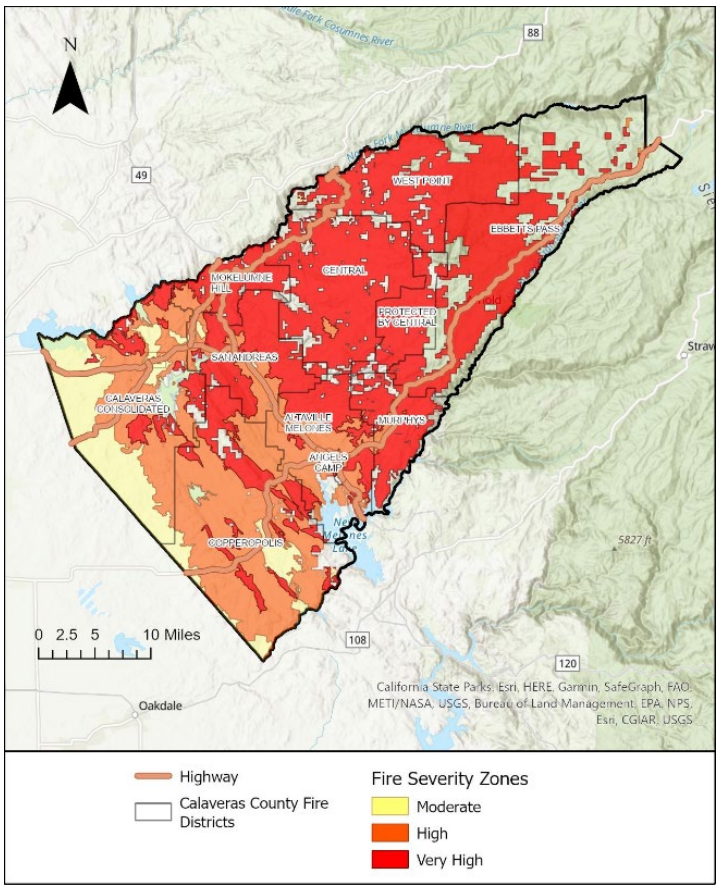


Figure 3.1 Fire Severity Zones

Debris Flow (High Risk)

Debris flows are geological phenomena in which water-laden masses of soil and fragmented rock rush down mountainsides. Calaveras County is especially susceptible to the occurrences due to the history of wildfires and recently burned forests. In Calaveras County, there are three basic types of hazardous debris flow, including, landslides, mudflows, and avalanches.

Landslides

A landslide is a gravity-driven down-slope movement of soil and rocks at varying speeds. In general, landslides are caused by disturbances in the natural stability of a slope, they can accompany heavy rainfalls, or follow droughts and often occur in burn-scarred areas where wildfires occurred in previous years.

Calaveras County's terrain and soil types create a condition with a high probability of landslides to critical extents. In recent years, the county has had several damaging landslides. In 2015, a heavy rainstorm and high mountain snow in the burned areas from Butte Fire caused property damage from debris and mudflows. In 2016, heavy rains on State Route 26 between Mokelumne Hill and Glencoe (within the Butte Fire Area), caused property damage from debris flows. Storms in February 2019 caused a landslide that closed three miles of State Route 26 for 69 days (about 2 and a half months) and cost $3.5 million in repairs. Most recently, in March 2023 an unknown amount of property damage was caused by debris flowing to several houses and roadways in West Point.

Mudslides

Mudslides develop when water rapidly accumulates in the ground and results in a surge of water-saturated rock, earth, and debris. It is a process characterized by the mass movement of fine-grained materials with a high degree of fluidity.

Like landslides, mudflow in Calaveras County has a high probability with a critical extent due to the steeply sloped terrain and silty soils. Several large and disastrous mudslides have occurred in the County such as the 1997 event. The slide started near State Route 4 and Cottage Springs and slid one and a half miles into the Stanislaus River, taking out roads, a bridge, and service facilities. In 2015, heavy rain and snow in burned areas from the Butte Fire caused road closures, overtopping of bridges, and property damage.

Mudflows have a powerful potential to impact life and property on a much larger scale. Mudflows can block roads, take down utilities, move buildings from their foundations, and cause injury or death to persons caught in the path.

Flooding Risk (Serious Risk)

Calaveras County has a risk for several types of flooding, including riverine, flash, and stormwater, all with likely probability and critical extents. Flooding in the County jeopardizes areas along the Mokelumne, Calaveras, and Stanislaus Rivers and the county's numerous streams, channels, and creeks.

Riverine flooding typically occurs when a waterbody overtops or surpasses its capacity limits due to a combination of prolonged rainfall and/or snowmelt. In Calaveras County, the risk for riverine-type flooding occurs between November and April.

Unlike riverine flooding, flash flooding typically happens very quickly, and evacuation time and planning are much more limited. Enormous volumes of water flow over a short time and occur from heavy rainfall with restricted drainage areas.

Stormwater flooding occurs in areas that have increased runoff from impervious surfaces and inadequate drainage systems. Calaveras County's steep elevation reducing terrain from the Sierra to the Valley creates a complexity for drainage systems.

The County has a history of flooding events, in 2012, 2017, 2018, 2019, 2021, 2022 and 2023. In 2019, State Route 49 was shut down for hours due to flash flooding and residents were trapped in their homes. The County was included in a federal disaster declaration that year and with each intensifying event, flooding damage costs increase. During the development of this report, two additional instances occurred. In one instance a search and rescue team was required to save a couple from their home in Sheep Ranch. In the second instance, Copper Cove Drive was closed due to flash flooding.

Figure 3.2 Copperopolis Fire Protection and Calaveras County Public Works gather at Black Creek and Copper Cove Drive. Photo courtesy of Noah Berner- Calaveras Enterprise

Chapter 4
Analysis of Hazard Risk and Vulnerability

Analysis of Hazard Risk and Vulnerability

In August 2022, a *Hazard Risk and Vulnerability Assessment* was prepared as part of the Calaveras County Evacuation and Access Needs Assessment and Preparedness Plan. The Hazard Risk and Vulnerability Assessment evaluated the susceptibility of Calaveras County's communities and transportation assets to natural hazards. The key focus of the assessment was to identify areas within the County and its communities and assets that may experience adverse impacts due to natural hazards that impair the County's ability to facilitate evacuations and emergency response activities.

Since communities and transportation assets are affected differently by hazards, two separate assessments were developed to achieve appropriate results. The Community Assessment focuses on impacts on people by examining the vulnerability (the potential of Calaveras Communities to experience adverse impacts) and the Transportation Asset Assessment focuses on the impacts on the County's overall transportation network by examining the risk to roads and bridges.

Both assessments used a relative framework that assigned scores compared to the rest of Calaveras County. The score comprises multiple components that contribute to a community's or assets' overall likelihood of enduring damage or disruption due to hazards. Each of the components was characterized through a set of indicators that represent the scale of potential impacts.

Figure 4.1 Community and Transportation Assessment graphic

The Community Assessment

Geographic areas are populated by individuals, businesses, and governmental and non-governmental organizations.

The Transportation Asset Assessment

Physical structures, including roads and bridges provide essential services, such as evacuation, emergency response, and movement of goods and people.

The Community Assessment

The Community Assessment examined the County's geographic communities and residents by characterizing vulnerability to potential hazard impacts. To determine a vulnerability score, community exposure and sensitivity were analyzed.
Using readily available datasets that provide information consistently across geographic areas, metrics are used to quantify various indicators that form each component. Each community is assigned a metric score ranging from a value of one (lowest relative to the County) to five (highest relative to the County). Metrics are weighted equally and then averaged to produce a single component score ranging from one to five. The component scores are multiplied to produce a single Vulnerability Score.

Vulnerability = **Exposure** x **Sensitivity**

Vulnerability – the overall degree to which a community is expected to experience adverse impacts due to hazards. Vulnerability is a function of exposure and sensitivity.

Exposure – refers to the likelihood and degree to which physical contact between a hazard and a community will occur. This component incorporates hazard characteristics, such as frequency, intensity, geographic scale, and external factors that affect event severity.

Sensitivity – refers to the degree to which a community can cope with hazard impacts. This component incorporates the composition of the community that influences its capability to prepare for, respond to, and bounce back after a hazardous event.

The Community Assessment Components, Indicators, and Metrics

A key output of this assessment is a final score which comprises multiple components that contribute to a community's or asset's overall likelihood of enduring damage or disruption due to a hazard. Each component is characterized through a set of indicators that represent the scale of potential impacts. Indicators are measured by specific metrics that quantify potential impacts.

Vulnerability Score	
Exposure	**Sensitivity**
Flood % land area in the floodplain	**Social Vulnerability** SoVI Score
Wildfire Fire Severity Zone	**Disadvantaged** % population meeting criteria
Debris Flow Landslide Susceptibility	**Economic Distress** % population meeting criteria
Temperature Projected increases by end of century	
Precipitation Projected increases by end of century	
Economic Loss Expected annual loss ($)	

The Community Assessment
Results

Exposure x **Sensitivity** = **Vulnerability**

Exposure

Communities exhibiting the highest hazard exposure are rural and higher elevation areas east of State Route 49. These communities include Dorrington, West Point, San Andreas, Mountain Ranch, Sheep Ranch, Paloma, Mokelumne Hill, and Vallecito. Higher exposure scores were driven primarily by high exposure to landslides and wildfires.

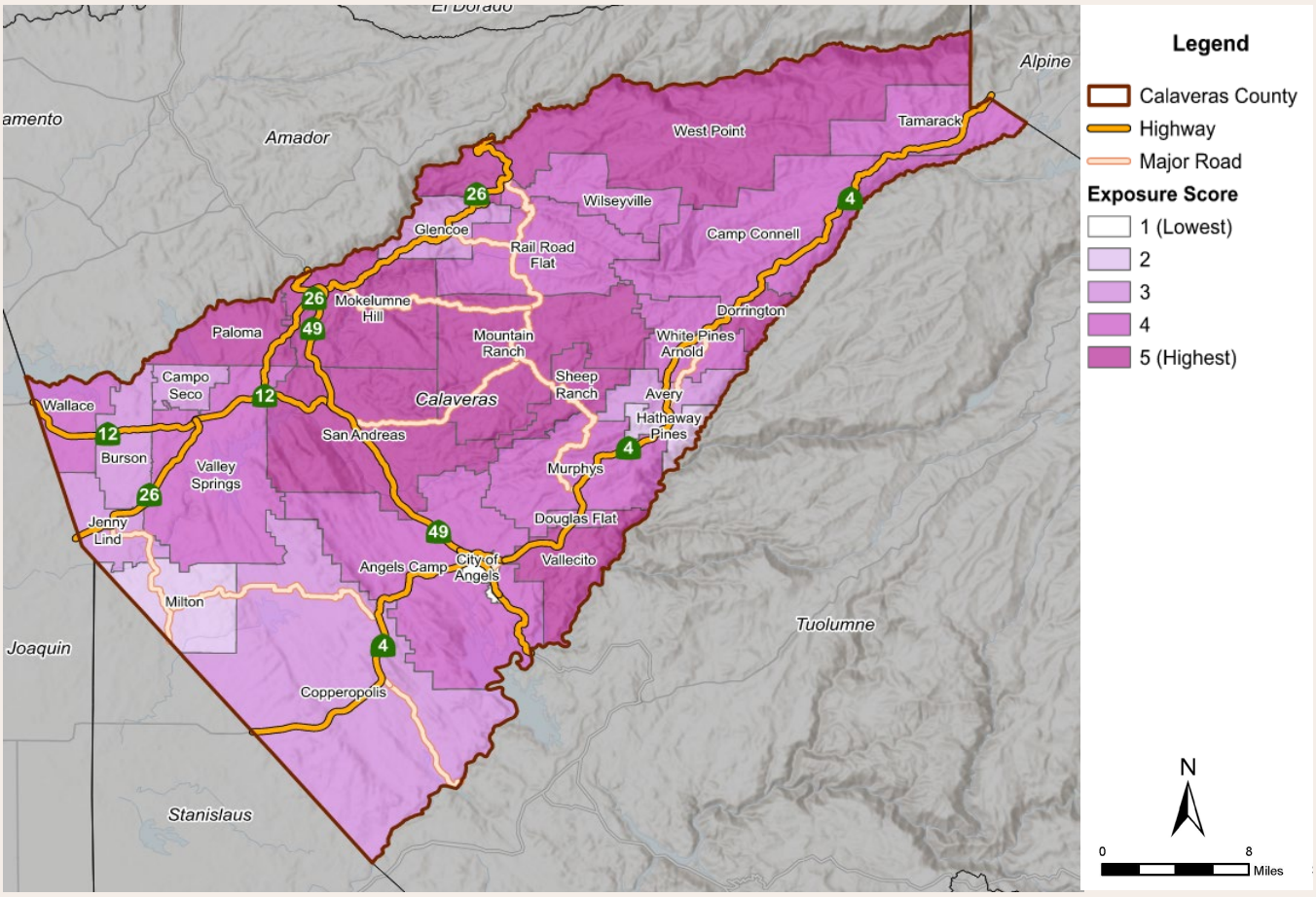


Figure 4.2 Community Assessment Exposure Map

The Community Assessment
Results

Exposure **x** Sensitivity **=** Vulnerability

Sensitivity

Communities exhibiting the highest sensitivity are rural areas located centrally in the County. These communities include Douglas Flat, White Pines, Wilseyville, Mountain Ranch, Glencoe and Railroad Flat. High sensitivity scores are driven by a high concentration of census tracts meeting the thresholds for Disadvantaged Communities and Economically Distressed Areas.

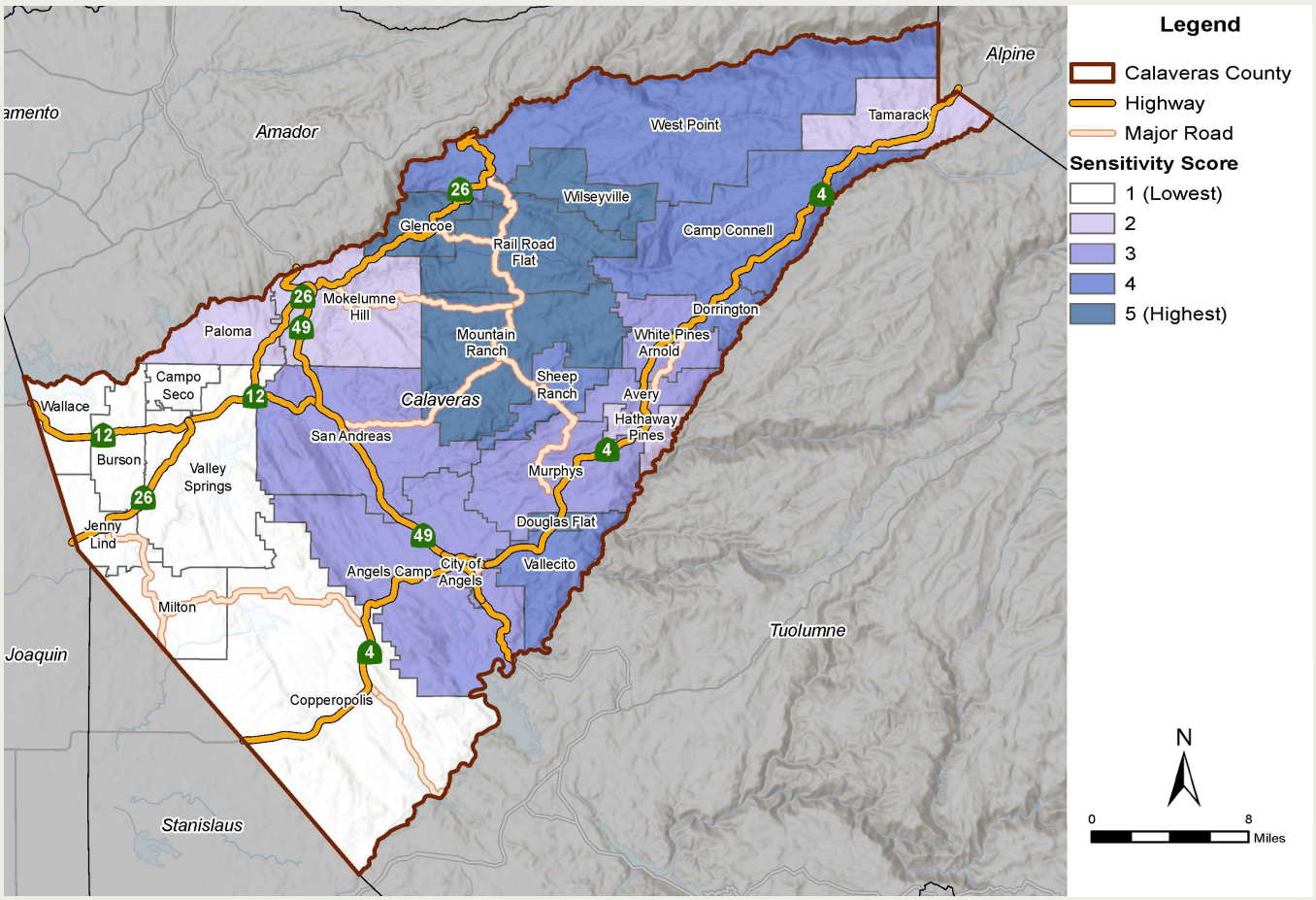


Figure 4.3 Community Assessment Sensitivity Map

The Community Assessment
Results

Exposure **x** Sensitivity **=** Vulnerability

Vulnerability

Mountain Ranch received the highest Vulnerability Score of all communities due to high exposure to wildfire, landslides, and high sensitivity, driven by disadvantaged communities and economically distressed area indicators. Most Communities exhibiting high vulnerability are rural communities in the northeast part of the County. In contrast, communities exhibiting the lowest vulnerability are those in more developed areas along the County's southwestern boundary.

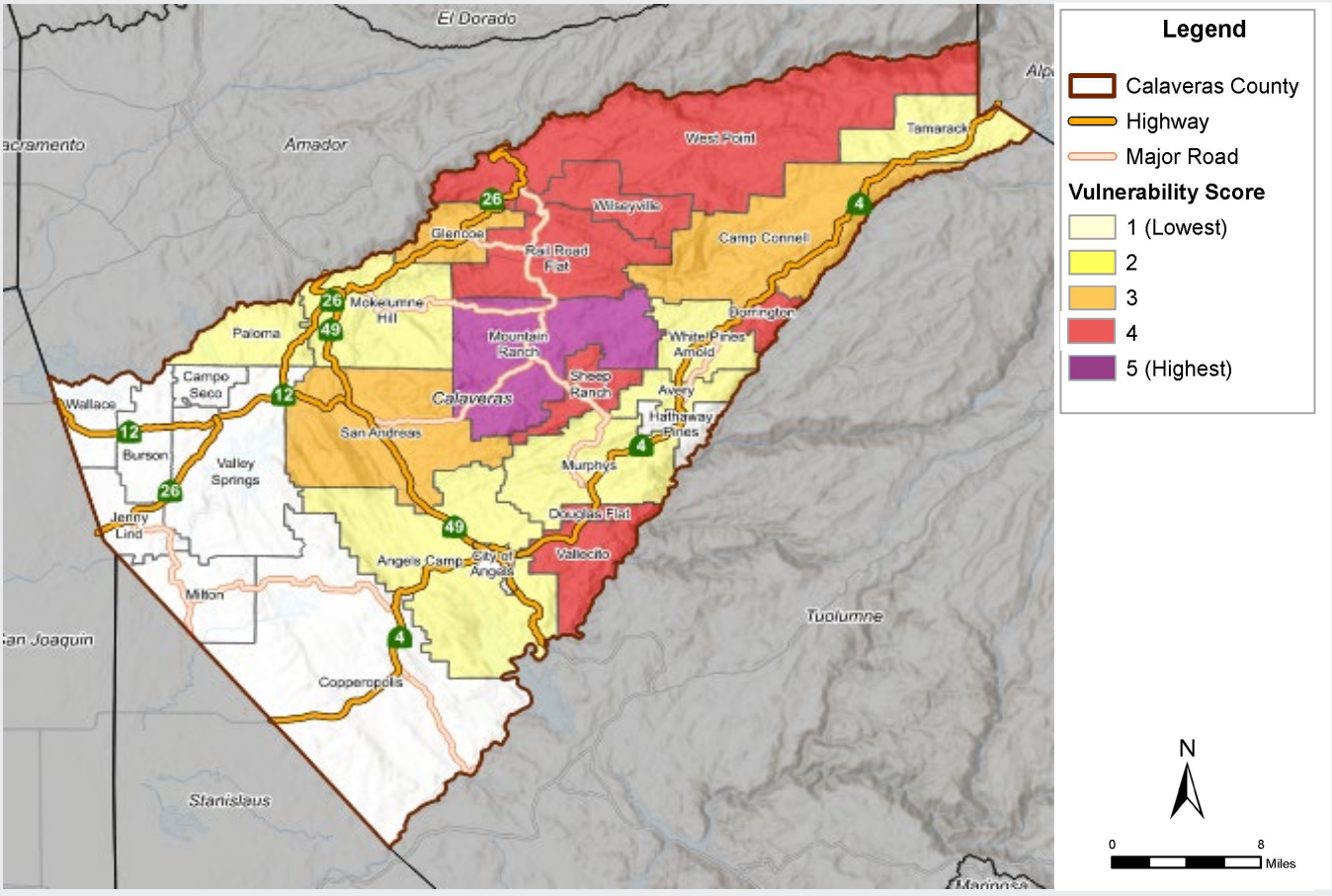


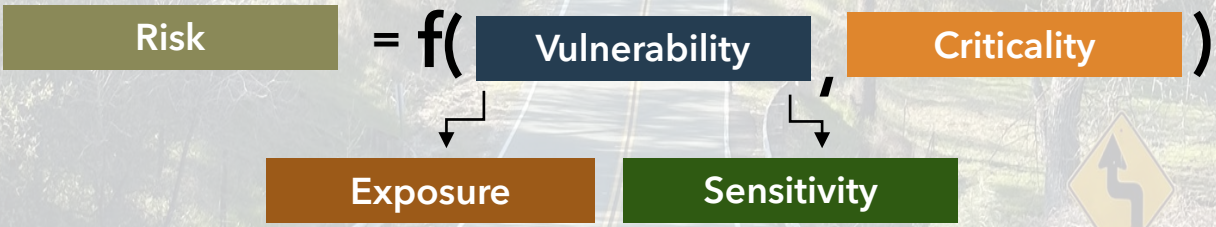
Figure 4.4 Community Assessment Vulnerability Map

The Transportation Asset Assessment

The Transportation Asset Assessment examines the susceptibility of the County's transportation assets to potential hazard impacts by characterizing risk. An asset's risk to hazard impacts is a function of two components: vulnerability and criticality.

Risk scores are assigned using a lookup matrix which assigns higher weights to more critical assets, reflecting their relative importance to Calaveras County and its transportation network.

The Transportation Asset Assessment considers two types of transportation assets: roads and bridges. The roads dataset was obtained from Calaveras County Open Data Portal and the bridge assets were downloaded from the 2021 National Bridge Inventory. The process for evaluating the sensitivity and criticality of each asset type varies based on the asset characteristics and functions.



Risk – refers to the potential for adverse consequences where something of value is at stake, and the occurrence and degree of outcome are uncertain.

Criticality – refers to the importance of an asset to the surrounding community. This component incorporates indicators related to an asset's significance to the larger transportation network, such as its frequency of use.

The Transportation Asset Assessment Components, Indicators, and Metrics

A key output of this assessment is a final score which comprises multiple components that contribute to a community's or asset's overall likelihood of enduring damage or disruption due to a hazard. Each component is characterized through a set of indicators that represent the scale of potential impacts. Indicators are measured by specific metrics that quantify potential impacts.

Risk		
Vulnerability Score		Criticality
Exposure	Sensitivity	
Flood % land area in the floodplain	**Road Surface** Paved or not paved	**Road Type** Functional Classification
Wildfire Fire Severity Zone	**Pavement Conditions** Condition Index	**Daily Traffic** Average Annual Daily Traffic
Debris Flow Landslide Susceptibility	**Community Vulnerability** Community Assessment Score	**Detour Distance** National Bridge Inventory Detour Distance in NBI
Temperature Projected increases by end of century	**Age** National Bridge Inventory Age Score (NBI)	
Precipitation Projected increase by end of century	**Structure Conditions** National Bridge Inventory Structural Score (NBI)	
Economic Loss Expected annual loss ($)	**Scour** National Bridge Inventory Scour Score (NBI)	

The Transportation Asset Assessment
Results - Roads

Risk = **Exposure** x **Criticality**

(**Sensitivity** x **Vulnerability**)

Vulnerability

Roads exhibiting the highest vulnerability are clustered in West Point along State Route 26 on the County's Northern border and Camp Connell along State Route 4 on the southeast border. These results correlate with previously identified at-risk routes determined through the Climate Debrief Interviews conducted to develop the Preparedness Plan. Overall, in these areas, high vulnerability is driven by high wildfire exposure and the presence of predominantly unpaved roadways. The communities surrounding these roadways also exhibited the highest community Vulnerability Scores in the County.

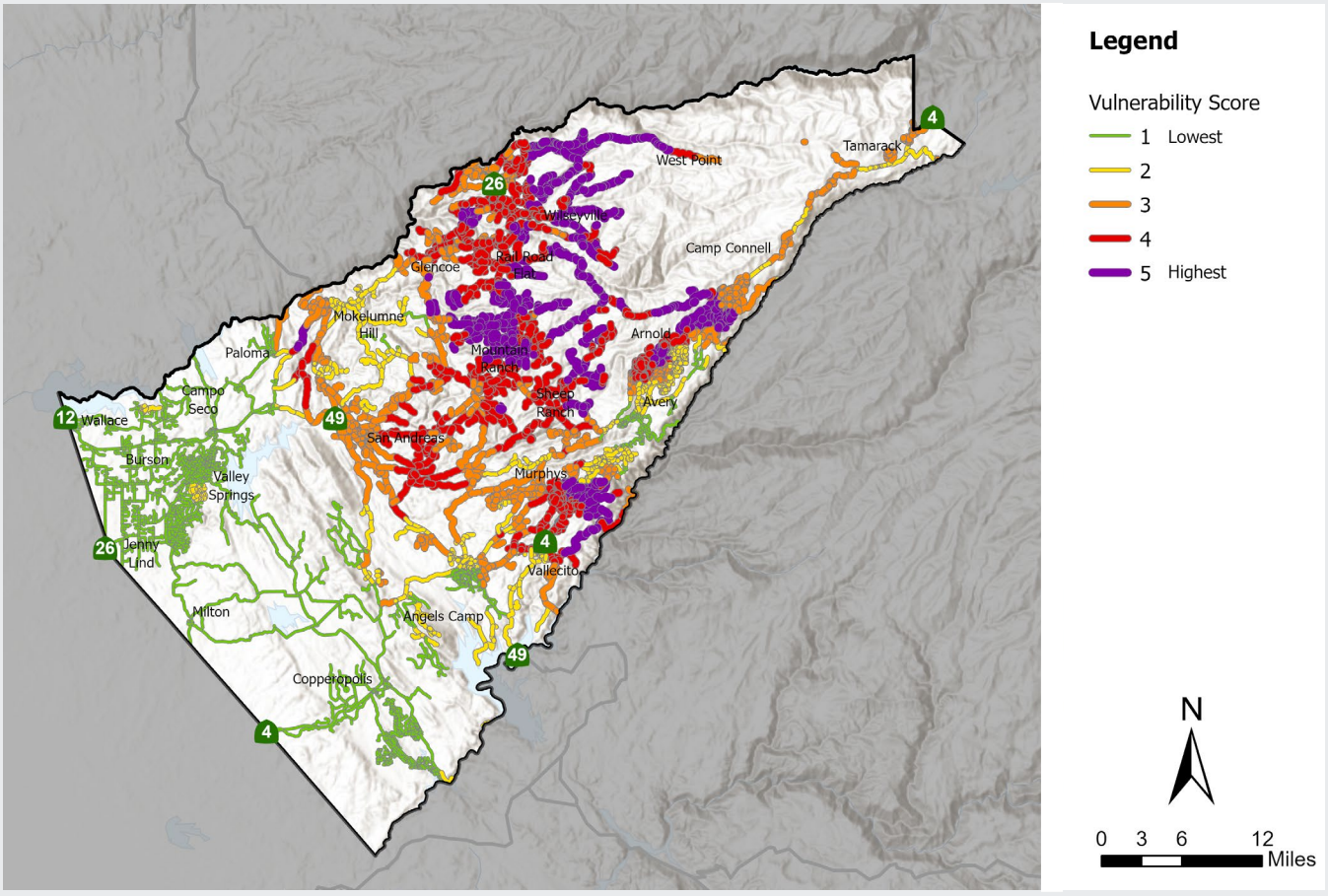


Figure 4.5 Transportation Assessment Vulnerability Map

The Transportation Asset Assessment
Results - Roads

Risk = Exposure x Criticality

(Sensitivity x Vulnerability)

Criticality

Calaveras County's most critical roadways include segments of Angels Camp Main Street, West St. Charles, and State Routes 4, 12, 26, 49. These roads have higher traffic capacities and are essential to the County's overall transportation network. During the Climate Debrief Interviews, Calaveras officials identified State Route 4 as a critical road for ingress and egress during evacuations. Many roads in rural areas exhibit low criticality scores. These roads may be necessary to nearby communities, but they likely have limited capacity and connections to other vital roads in the County's transportation network.

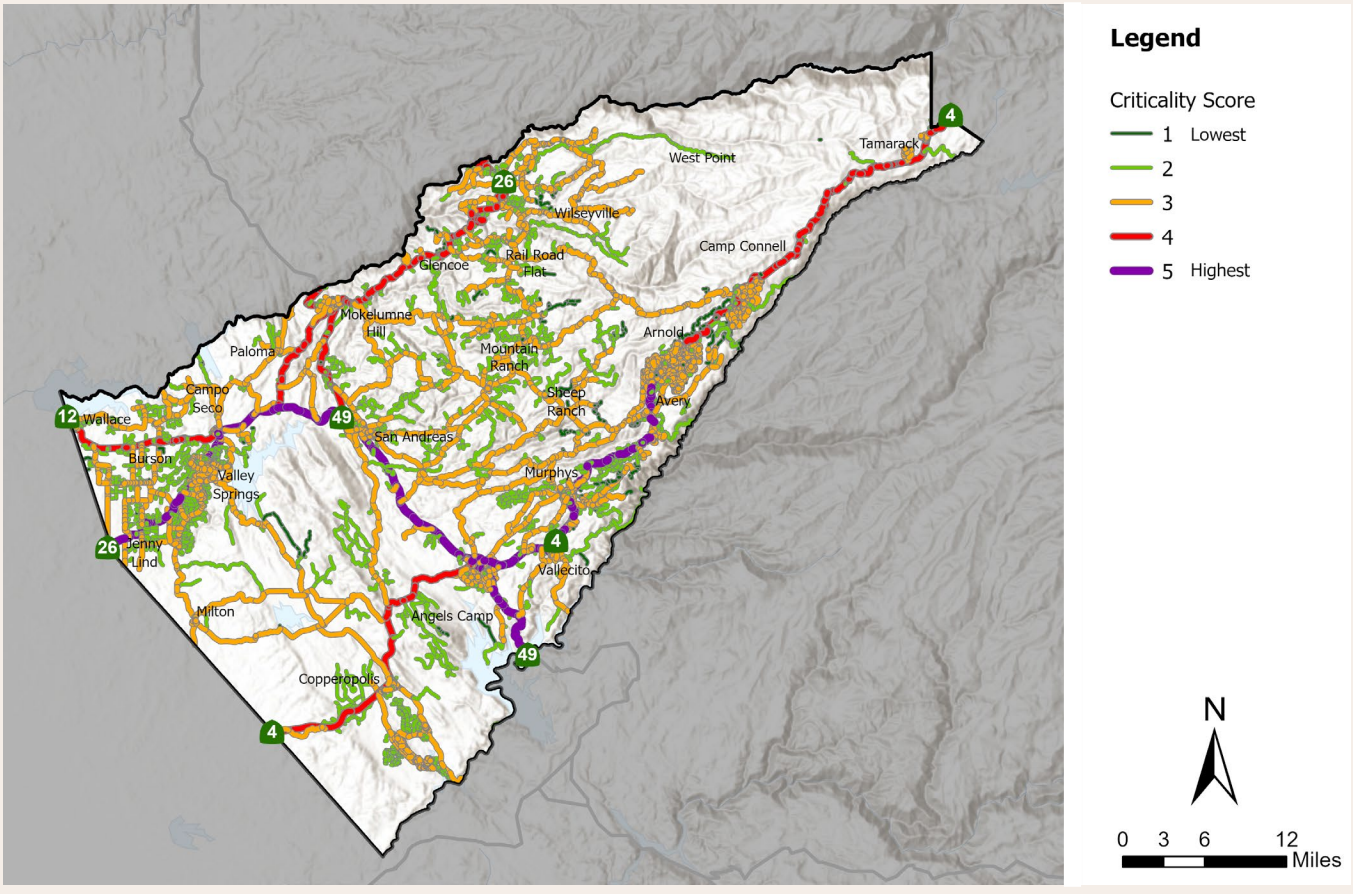


Figure 4.6 Transportation Assessment Criticality Map

The Transportation Asset Assessment
Results - Roads

Risk = **Exposure** x **Criticality**

Risk = (**Sensitivity** x **Vulnerability**)

Risk

Roads exhibiting the highest risk include segments of State Routes 4 and 49. These roads exhibit moderate vulnerability but high criticality to the County's overall transportation network, driving their higher scores. Roads exhibiting the second-highest Risk Scores include additional segments of State Routes 4 and 49, major thoroughfares (such as State Routes 12, 26, and 49 including Angels Camp Main Street, and East and West St. Charles Streets), and several rural roads in Rail Road Flat, West Point, Mountain Ranch, Murphys, and Wilseyville. The high risk of these rural roads is driven by high exposure and high community vulnerability scores, despite lower criticality scores.

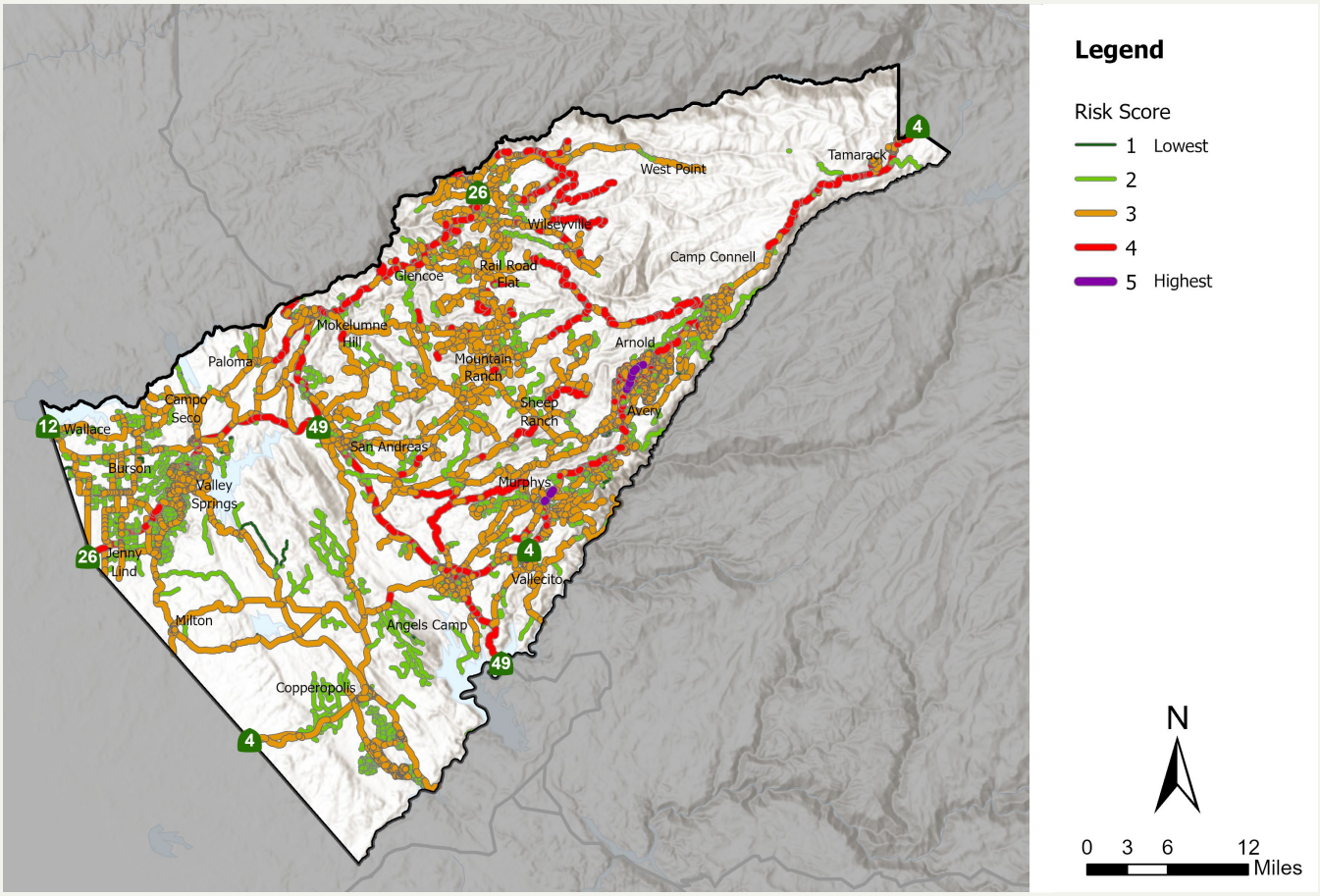


Figure 4.7 Transportation Assessment Risk Map

The Transportation Asset Assessment
Results - Bridges

Risk = (Exposure Criticality Sensitivity x Vulnerability)

Vulnerability

The majority of the County's most vulnerable bridges are located northeast of State Route 49. Bridges exhibiting the highest vulnerability are located primarily in the central and northern portions of the County. High vulnerability in these areas is driven primarily by high wildfire exposure and high Community Vulnerability scores.

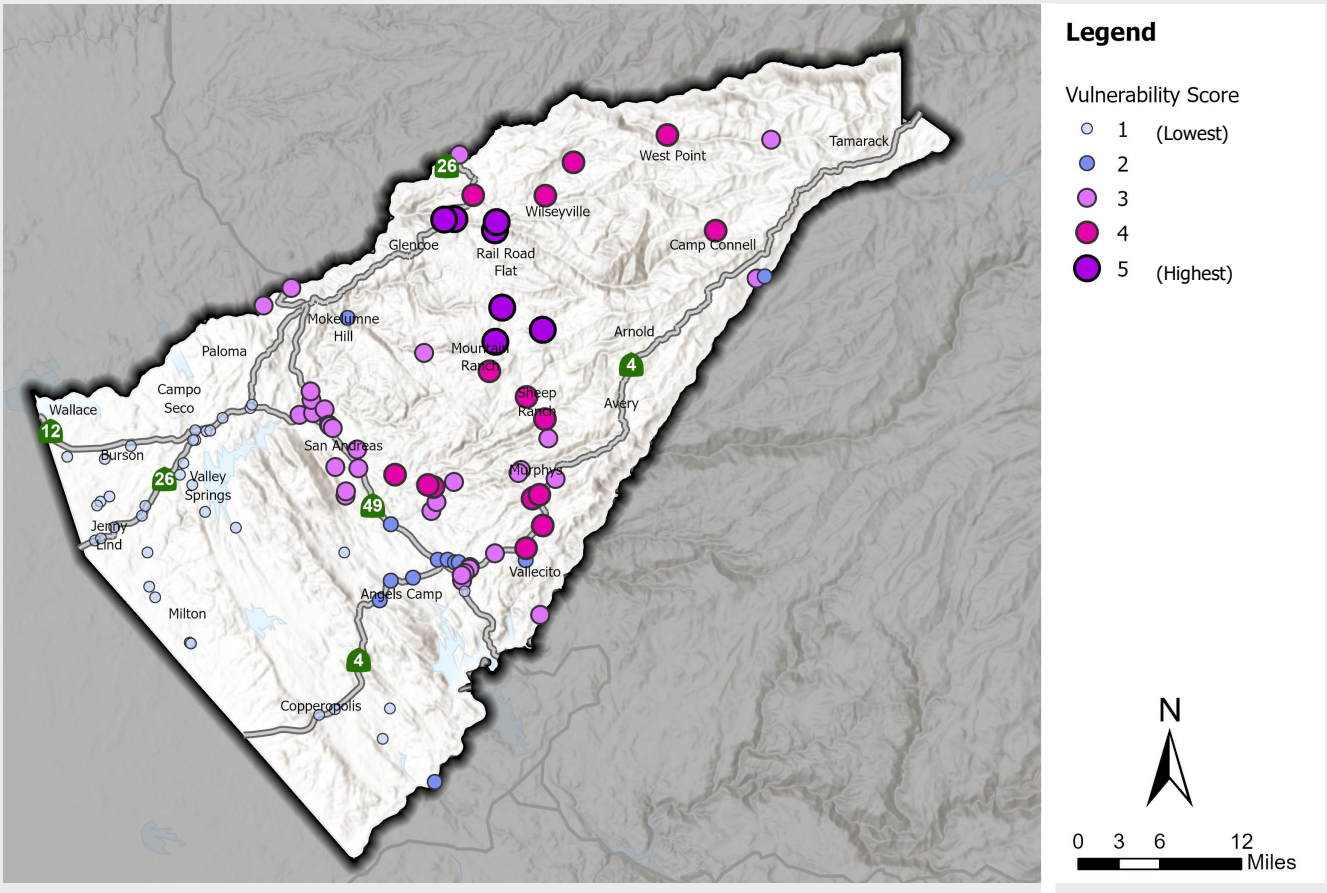


Figure 4.8 Transportation Assessment Vulnerability Map

The Transportation Asset Assessment
Results - Bridges

Risk = Exposure x Criticality
(Sensitivity x Vulnerability)

Criticality

Many of the County's most critical bridges are clustered around the City of Angels,and Vallecito. These bridges tend to have higher average annual daily traffic counts than other bridges within the County. Two of the County's most critical bridges are in northern rural areas (West Point and Wilseyville). The criticality of these bridges is driven primarily by high scores for detour distance.

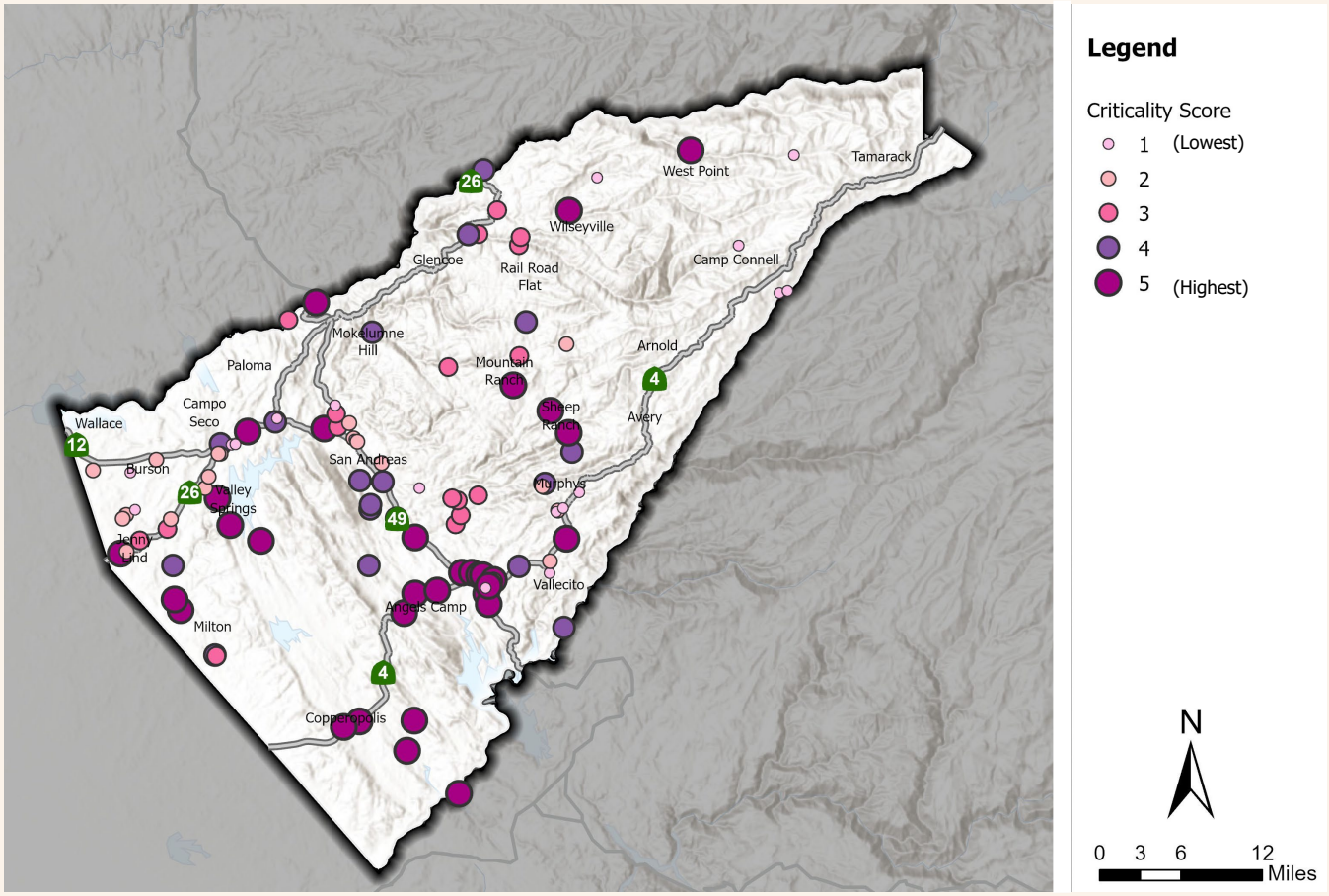


Figure 4.9 Transportation Assessment Criticality Map

The Transportation Asset Assessment
Results - Bridges

Risk = **Exposure** x **Criticality** (**Sensitivity** x **Vulnerability**)

Risk

Bridges exhibiting the highest risk in Calaveras County are typically centrally located in Mountain Ranch and Sheep Ranch. Only one of these bridges serves high traffic volumes. The remaining bridges tend to exhibit low average annual daily traffic counts, possibly due to their rural locations. However, these bridges typically exhibit the highest hazard exposure and detour distance scores, indicating their importance to the transportation network.

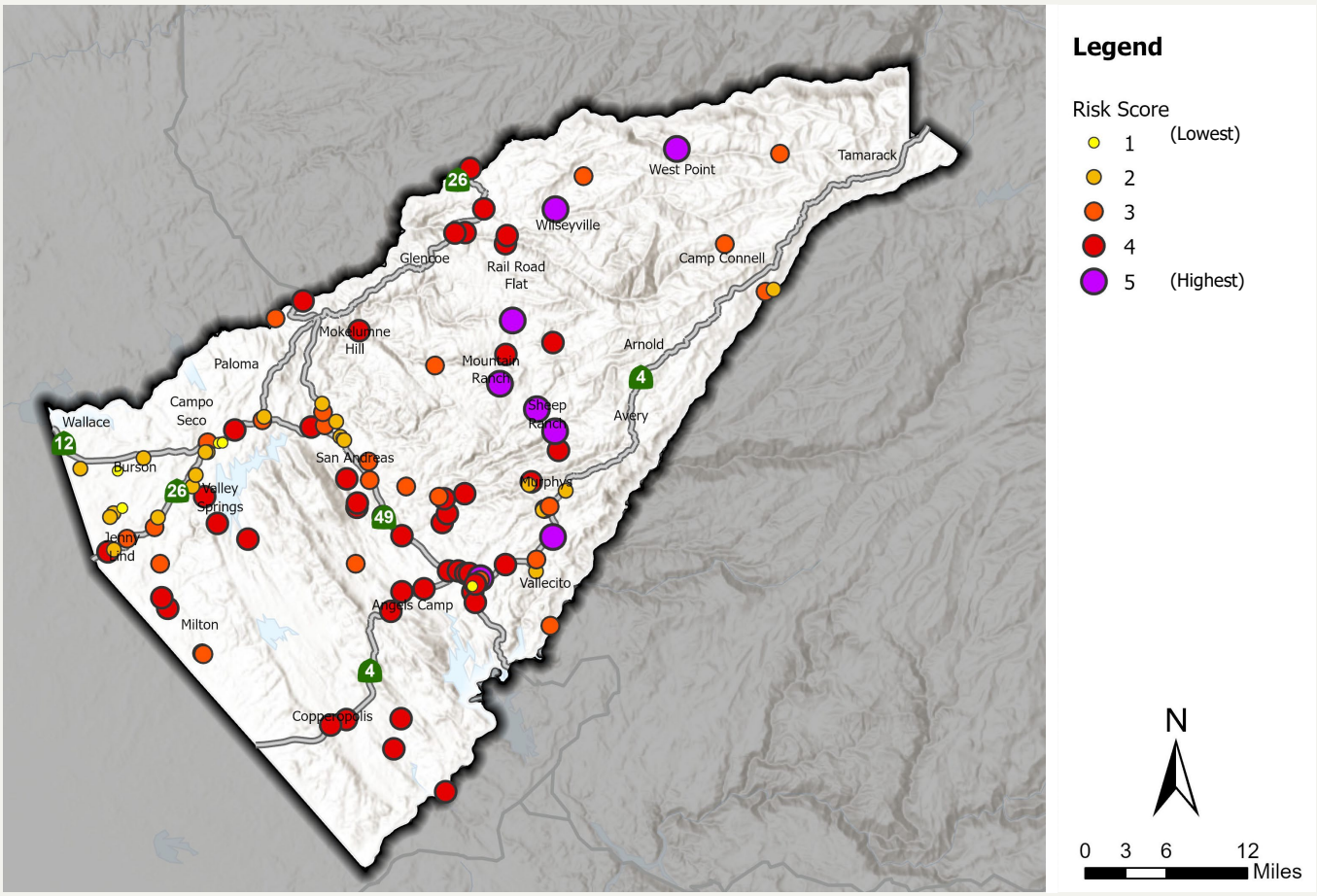


Figure 4.10 Transportation Assessment Risk Map

Figure 4.11 Photos throughout Calaveras County

Chapter 5
Priority Corridors and Key Considerations for Future Evacuation Plans

As part of this plan, a Priority Corridors and Key Considerations for Future Evacuation Plan identified residents' priority routes and communications during an evacuation event. Replica®, a web-based data platform, and MetroQuest, an interactive survey platform were utilized and helped draw conclusions about the existing roadway network and communication systems in place.

Priority Corridors

A critical component of the Evacuation and Access Needs Assessment and Preparedness Plan, is understanding the County's current roadway network use, i.e, which roads does the community rely on? Which roads are used as bypasses or parallel routes? Which roads have the highest volume of traffic?

Replica®

The web-based data platform utilizes GPS-based data from smartphones and vehicle computers to understand roadway demographics including, who is traveling on the road and what they are traveling for. Data filters allowed the platform to highlight exit routes and the percentage of vehicles on each road. For this project, filters were applied to only report the following:

- Trips by Calaveras County residents
- Starting at their home location
- Traveling a distance greater than 15, 30, 45, 60 miles

The Replica platform uses a combination of actual data and algorithms to create a travel pattern model. These models provide less-than-perfect vehicle counts but provide highly reliable percentages. Data tabulated in this Chapter are entirely shown as percentages. The data is based on an average Thursday in the Fall of 2021 under non-emergency conditions.

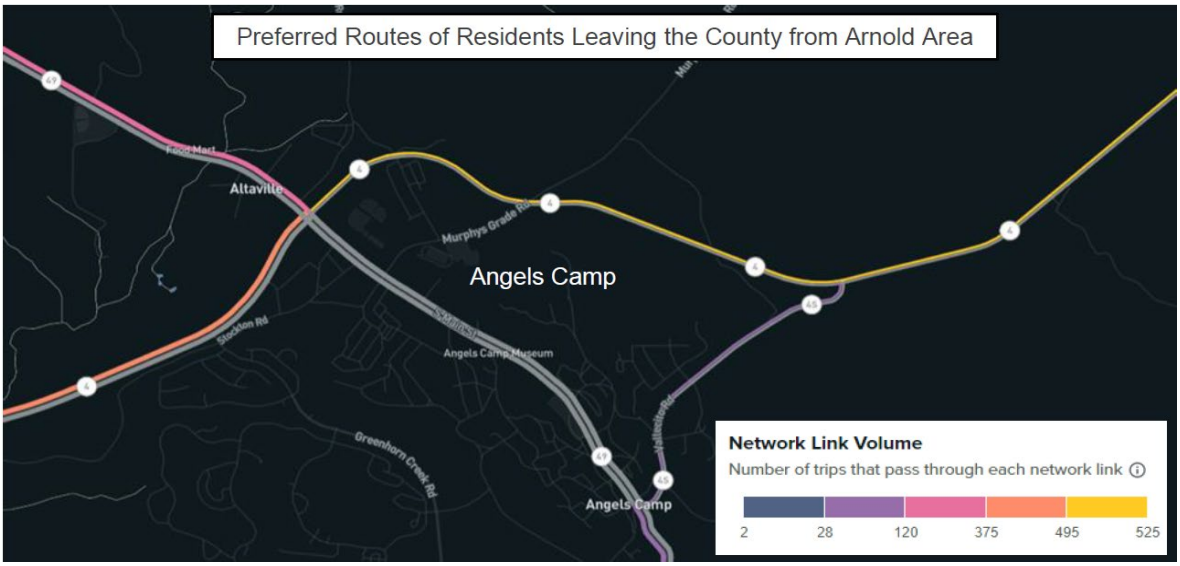


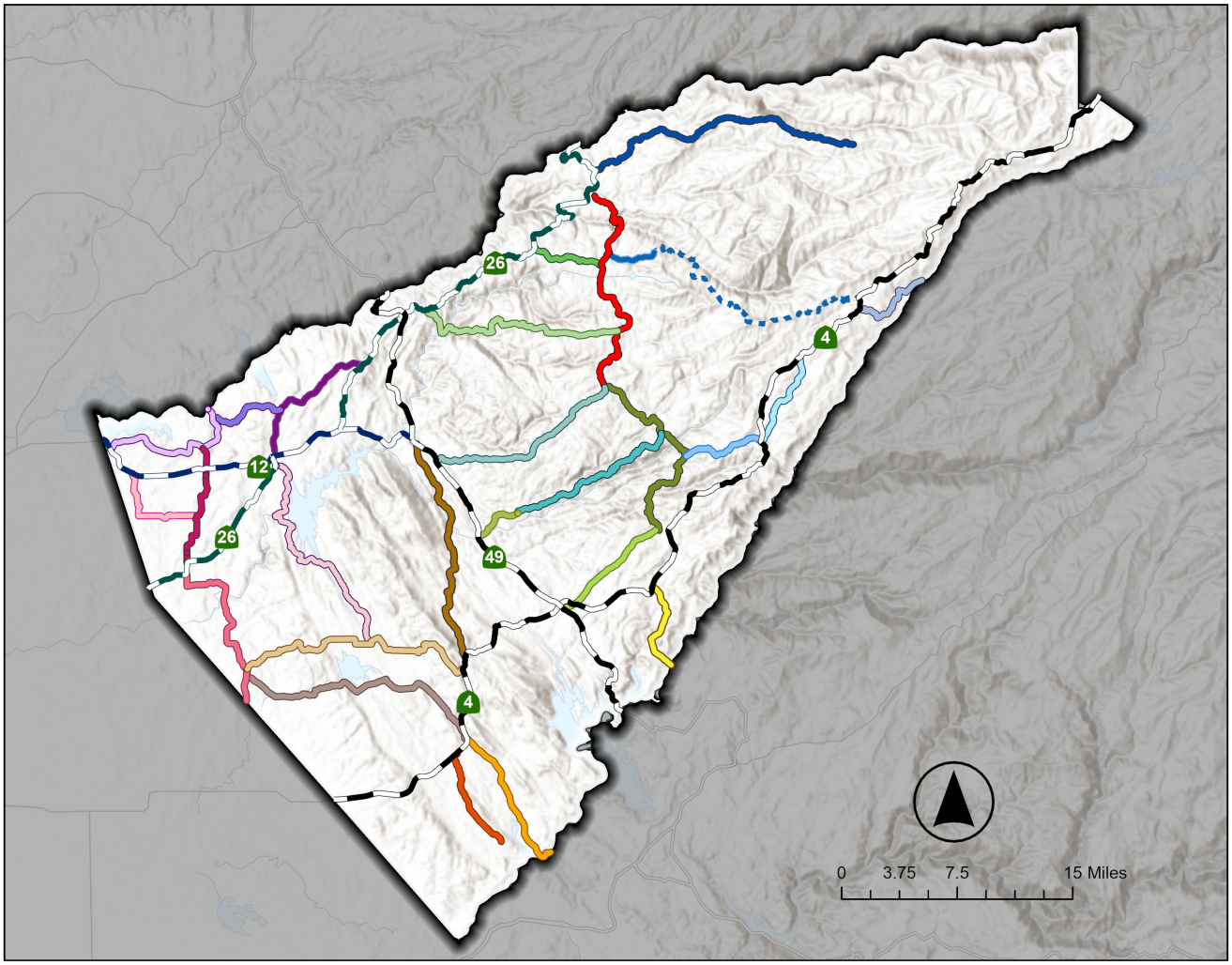
Figure 5.1 Replica Model Preferred Routes of Residents Leaving the County

The model illuminated several County maintained roads that are used as direct routes through and out of the County. The rationale behind this is due to Calaveras County's unique characteristic of having only one incorporated City, and many Census-Designated Places (CDPs). Each local roadway exiting CDPs was evaluated, and the percentage of traffic was reported. As a result, these local roads should be given priority in future evacuation plans.

CDPs are statistical geographic entities representing closely settled, unincorporated communities recognized and identified by name. CDPs in Calaveras County include Arnold, Avery, Burson, Copperopolis, Dorrington, Douglas Flat, Hathaway Pines, Mokelumne Hill, Mountain Ranch, Murphys, Railroad Flat, Tamarack, Vallecito, Valley Springs, and West Point.

Figure 5.2 Photo of Sheep Ranch Road with washout March 2023

Priority Corridors



State Route

- SR 12
- SR 26
- SR 4
- SR 49

Priority Road

- Avery Sheep Ranch Road
- Boards Crossing Road
- Burson Road
- Camanche Parkway South
- Campo Seco Road
- Fourth Crossing Road
- Fricot City Road
- Hogan Dam Road
- Hunt Road
- Jenny Lind Road
- Jesus Maria Road
- Little John Road
- Milton Road
- Moran Road
- Mountain Ranch Road
- Murphys Grade Road
- O'Byrnes Ferry Road
- Paloma Road
- Parrotts Ferry Road
- Pool Station Road
- Rock Creek Road
- Railroad Flat Road
- Ridge Road
- Southworth Road
- Sheep Ranch Road
- Summit Level Road
- Summit Level Road Unpaved
- Winton Road

Figure 5.3 Priority Corridors Map

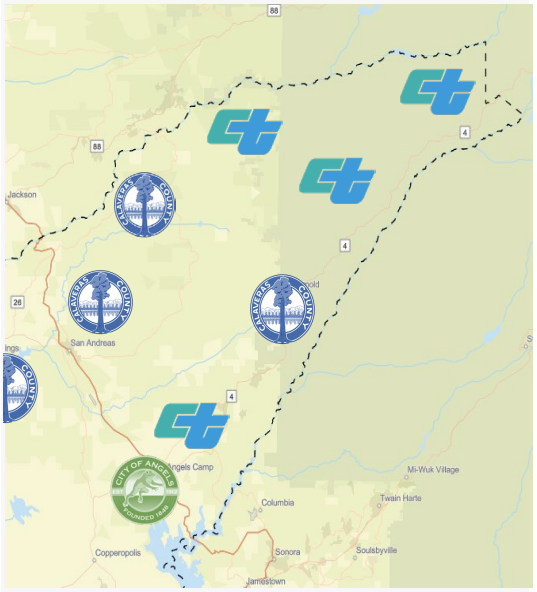
Priority Exit Routes

Four, two-lane state routes and three local roads serve Calaveras County as primary exit routes. State routes include State Route (SR) SR-4, SR-49, SR-12, and SR-26. Local Roads include O'Byrnes Ferry Road, Parrotts Ferry Road, and Milton Road. SR-4, 12, and 26 run east-west, with SR-4 being the only route to exit the County's eastern boundary. SR-12, 26, and 4 exits the County's southern border. SR-49 is the only north-south running route. However, SR-26, which is generally east-west, turns north at its eastern end, crossing the county boundary 12 miles east of the SR-49 county exit. Altogether, these routes provide ten entrances and exits from the County.

In addition to the priority exit routes, it is important to note the westside, north/south connection corridor, Burson Road, from Camanche Parkway to Milton Road which provides an alternative route for State Routes, 4, 26, 12, and 88. This connection is crucial and allows emergency response teams an alternative route, avoiding bottlenecks and road closures on the State Routes.

Table 5.1 summarizes the results from the Replica model for the ten roadways that can be used to exit the County. To adequately capture data that is representative of the County, the model was run for four different scenarios with traveling distances set at 15, 30, 45, and 60 miles, respectively. The purpose of running the model with varying traveling distances was to make certain all residents are included whether they live close to the County border (West Point residents), or further from the County border (residents from centralized communities). Figure 5.5 shows the five most utilized exit routes based on the Replica Model and the average use of the routes by residents leaving the county.

The state routes are maintained by Caltrans, which staffs four maintenance facilities throughout the County. These facilities are in Angels Camp (SR-49), West Point (SR-26), Camp Connell (SR-4), and Cabbage Patch (SR-4, winter only). The County Public Works department maintains local roads and has facilities located in Arnold, Valley Springs, and San Andreas. The City of Angels Public Works Department maintains local roads in the City limits.



Calaveras County Public Works Department and Road Maintenance Facilities

Caltrans Maintenance Facilities

Angels Camp Public Works Department

Figure 5.4 Maintenance Facility Locations

Table 5.1: Routes Used by Residents to Leave the County							
Route		AADT*	Trip Length When Leaving the County				Average Use of Route by Residents Leaving the County**
			> 15 Mi	> 30 Mi	> 45 Mi	> 60 Mi	
West	4	7,600	12%	21%	33%	36%	25%
East	4	1,200	0%	0%	1%	1%	1%
South	49	4,500	9%	4%	4%	2%	5%
North	49	7,100	17%	7%	8%	9%	10%
West	12	5,400	21%	29%	28%	28%	27%
Southwest	26	6,250	17%	23%	12%	13%	16%
Northeast	26	1,550	3%	2%	3%	4%	3%
O'Byrnes Ferry Rd		4,010	7%	3%	3%	2%	4%
Parrotts Ferry Road		2,760	7%	3%	1%	0%	3%
Milton Road		1,120	2%	3%	2%	2%	2%
Pardee Dam Road		1,550	3%	3%	5%	2%	3%

Sources: Caltrans 2019 Traffic Volumes AADT and Replica.

*AADT: Annual Average Daily Traffic
**Average percentages of residents utilizing each route for trips longer than 15, 30, 45, or 60 miles.

The data above in Table 5.1 were filtered by the following:

- Trips by Calaveras County Residents;
- Trips that start from Calaveras County;
- Trips that conclude in counties other than Calaveras County; and
- Traveling a distance greater than 15, 30, 45, and 60 miles.

The data run reveals that for residents traveling 15 miles or more to leave the County, 21% of residents use SR-12, 17% of residents use both SR-49 (north) and SR-26 (southwest) and 12% of residents use SR-4 (west). Each of the remaining corridors are utilized less than 10% for residents leaving the County.

Results for residents traveling 60 miles or more to leave the County indicates that SR-4 (west) is utilized the most with 36% of residents using the route. 28% and 13% utilize SR- 12 (west) and SR-26 (southwest), respectively. Less than 10% of residents utilize each of the remaining routes.

The average percentage from all travel distances revealed SR-12 (west) being the most used corridor with 27% of residents choosing the route as a county exit. SR-4 (west), SR-26 (southwest) and SR-49 (north) had average percentages of 25%, 16% and 10%, respectively. The SR-12 route provides the shortest path to Sacramento, while both SR-26 and SR-4 lead to Stockton. SR-49 serves as a primary connector for the respective State Routes. All four roadways offer access to SR-99 and Interstate-5 (I-5), both regionally significant north-south freeways used to access California's central Valley. SR-4 ultimately connects to the San Francisco Bay Area.

After analyzing the County's priority exit corridors, the model was refined to understand the exit routes for each populated area. Most residents rely on State Routes as primary exit routes throughout the county, however, some residents, located in the northern and central county, rely on County maintained roads to access the State Route system. See Table 5.2

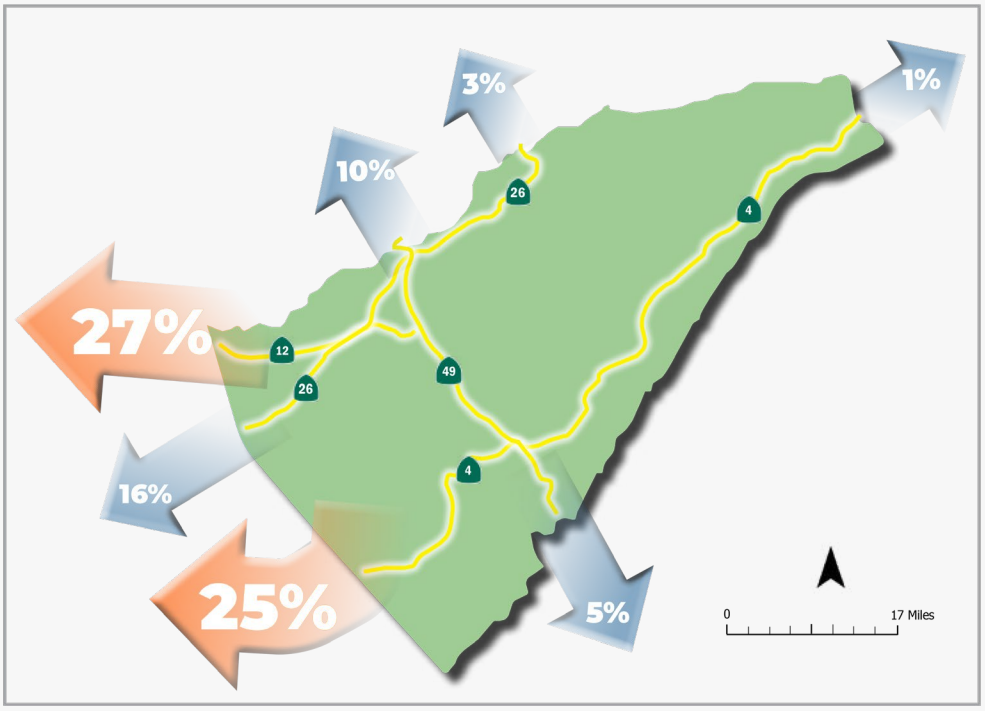


Figure 5.5 Shows the five most utilized exit routes based on the Average Use of the Route by Residents Leaving the County, summarized in Table 5.1.

Table 5.2: Community Preferred Exit Routes

	Community(s)	POPULATION	W	W	N	SW	E	NE	S	SW	S	S	SW	W
			4	12	49	26	4	26	49	O'BYRNES FERRY ROAD	PARROTTS FERRY ROAD	MILTON ROAD	MURPHYS GRADE ROAD	RAILROAD FLAT ROAD
North County	SR-4 Up-Country Corridor	8,156	50%	2%	9%		2%		7%		24%		4%	
North County	West Point, Rail Road Flat	1,004		21%	13%			11%		10%				9%
North County	Mountain Ranch, Sheep Ranch	275	2%	39%	29%									
Central County	Mokelumne Hill	691		12%	9%			15%						
Central County	San Andreas	2,994		7%	1%			5%						
Central County	Angels Camp	3,667	72%			1%		1%	24%					
South County	Copperopolis	3,400	70%	2%	47%			4%			5%			
South County	Valley Springs & Rancho Calaveras	9,369		39%										

The data above in Table 5.2 were filtered by the following:

- Trips by Calaveras County Residents;
- Trips that start from each community based on block groups;
- Trips that conclude in counties other than Calaveras County; and
- Traveling a distance greater than 30 miles.

Priority Local Roads

State-maintained routes pass through most population centers in Calaveras County. While having a State Route double as a Main Street has disadvantages, the trade-off occurs with improved access. Caltrans maintains high-quality roads through evolving design criteria and continuous investment. However, the County does not have access to the same resources, so County roads do not evolve at the same pace.

Table 5.3 includes several Calaveras County Communities that do not benefit from direct access to a State Route. These communities are Mountain Ranch, Sheep Ranch, and Rail Road Flat. Therefore, these communities will require special consideration while developing an Evacuation Plan.

An interesting observation from this community-focused model run is that residents on the SR-4 and SR-12/SR-26 use the connection of SR-49 between San Andreas and Angels Camp to cross to other routes. SR-49 between San Andreas and Angels Camp is a heavily traveled roadway segment; therefor this roadway segment also merits careful consideration for evacuation.

Most Calaveras County communities have less than four viable exit routes and even the communities with more than two exit routes rely heavily on one or two primary roadways, with the third used by single-digit percentages of the population.

In addition to State Routes, several two-lane local roads are used as parallel routes, bypasses, and arterial roadways. Table 5.3 identifies key local roads, their direction, and the communities they serve.

Table 5.3: Priority Local Roads and the Communities Served

Local Road	Community(s) served	Direction of Route
Parrotts Ferry Road	Vallecito, Communities east and west of Vallecito on SR-4, Angels Camp	North-South to SR-4
O'Byrnes Ferry Road	Copperopolis	North-South to and from SR-4
Pool Station Road	San Andreas, Copperopolis	North-South Between SR-49 and SR-4
Milton Road	Valley Springs, Rancho Calaveras	North-South to and from SR-26
Sheep Ranch Road	Sheep Ranch, Mountain Ranch	North-South to SR-4
Mountain Ranch Road	Mountain Ranch, Sheep Ranch	East-West to SR-49
Jesus Maria Road	Railroad Flat	East-West to SR-26
Railroad Flat Road	Railroad Flat and Sheep Ranch	North-South to Ridge Road and Sheep Ranch Road
Ridge Road	Railroad Flat	East-West to SR-26
Summit Road	Railroad Flat, Dorrington	East-West
Vallecito Road	Angels Camp	North South Bypass for SR-4 to SR-49

MetroQuest

To fully understand the evacuation needs of Calaveras County and supplement the stakeholder interviews, online surveys were prepared for three different focus groups: Community, First Responders, and Critical Facilities. In this section of the Plan, we will discuss the results of the survey. In the **Project Advisory Committee and Public Outreach Chapter** of this Plan, participation results were discussed.

Survey Focus Groups

Community

First Responders

Critical Facilities

Results

Figure 5.6 shows that Wildfire, Extreme Winter Storms, and Extreme Drought are the natural disasters that concern residents the most, followed closely by extreme heat. Of these concerns, wildfires are the only disaster that appears unexpectedly, minimizing the time residents must evacuate. While all events are cause for serious concern, most of the comments received related to the County's roadways and capacity to accommodate sudden significant evacuations due to wildfire events.

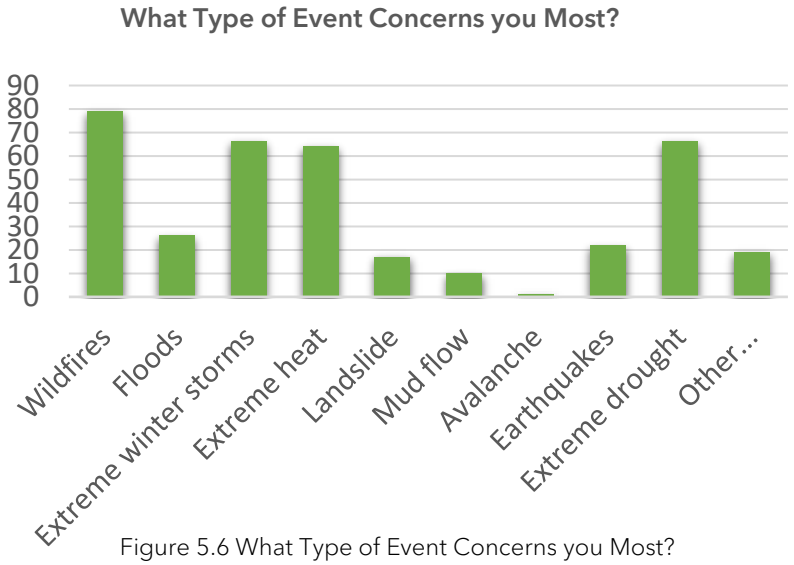


Figure 5.6 What Type of Event Concerns you Most?

Modes of Transportation

When asked about the type of transportation residents relied on, the overwhelming majority relied on private passenger vehicles for transportation, with just one survey taker relying on public transportation. Informal discussions with residents during an in-person event highlighted several types of facilities where residents cannot drive and would require commercial vehicles for transport. The facilities mentioned were primarily resident care homes and senior living facilities. While Hospitals and correctional facilities have unique needs that need to be considered in individualized evacuation plans, Calaveras transit (Calaveras Connect) has vehicles that can assist with targeted residential evacuations. Including Calaveras Connect as an option in residential evacuations has the added benefit of reducing the number of single-occupancy vehicles on the roadway network during evacuation events. Early coordination with transit should be considered in care facilities' evacuation plans.

Including Calaveras Connect as an option in residential evacuations has added the benefit of reducing the number of single-occupancy vehicles on the roadway during evacuation events. Early coordination with transit should be considered in care facility's evacuation plans.

Figure 5.7 Calaveras Connect Transit Bus

Local Roads of Concern

All focus groups were asked which roads were the highest priority to be maintained for evacuations and access. Figure 5.8 shows the results of this question. Interestingly, the top four results mirror the results presented in Chapter 1 – Survey One. However, other local roads were identified by many survey takers as high-priority roads. This discrepancy exists because while other roads do not carry much traffic, they are the only routes available to communities with no State Route access. Therefore, the roads serving the communities of Sheep Ranch, Mountain Ranch, and Railroad Flat merit special consideration in developing a county-wide evacuation plan.

Select the top 5 roads you consider highest priority to be maintained for evacuations and access

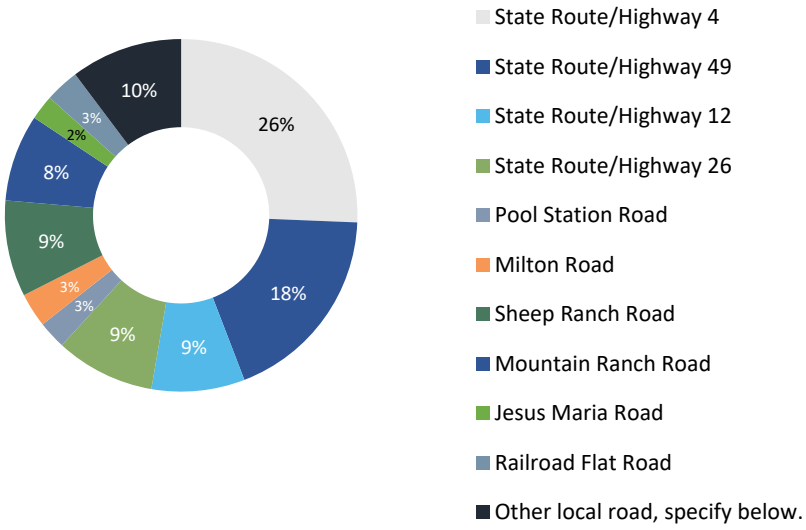


Figure 5.8 Top 5 highest priority roads

Other Local Roads of Concern			
Finnegan Lane	Monge Ranch Road	Morgan Road	Pennsylvania Gulch Road
Parrotts Ferry	Skyline Drive	Skyhigh Ranch	Lilac Drive
O'Byrnes Ferry Road	Fullen Road	French Gulch	Little John
Ponderosa Camp	Forest Meadows onto SR 4	San Domingo	Middle Bar/Guin Mine
Greenhorn Creek Road	Circle XX Roads		

Emergency Event Notification

Across the three surveys, a typical response was that residents don't know where to go for information or where to evacuate.

Residents responded that 28% use Calaveras County OES Alert for Emergency Notifications, followed by 19% using various Facebook groups for emergency information. Additional sources include MyMotherlode.com, fire.ca.gov (CalFire), and PineTree.net. Around twenty different platforms were identified where residents looked for information during emergencies. These sources are listed below.

Several residents commented that they get their information only from neighbors, with one responder stating that "my granddaughter's parents will call." And one resident said they have no way of knowing about evacuation events.

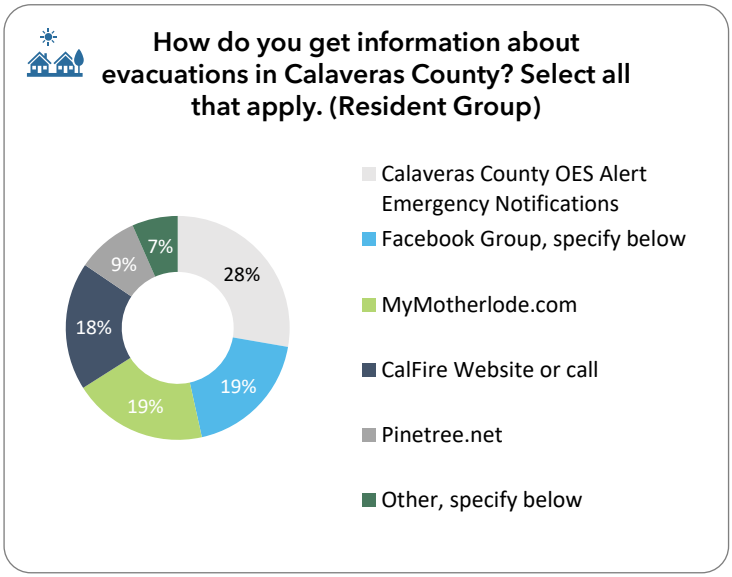


Figure 5.9 How do you get information?

Media Platforms Used for Local Information

- CalFire
- Sheriff's Department
- Tri-County Facebook Group
- Citizens of Copper Cove
- Zonehaven.com
- Nextdoor for Copperopolis
- Multi-County Fire & Police Amador Calaveras Tuolumne Valley Springs
- Real Upper SR- 4
- The Real Highway 4 Facebook Group
- Murphy's Bulletin Board
- Nixel
- Nextdoor for Greenhorn
- Motherlode Fire & Police
- Highway 4 Corridor Facebook Group
- Sierra Rising
- Neighbors
- Flight Radar
- Nextdoor for Copper Cove

Notifying Others

The First Responders and Critical Facilities groups were asked how they notified people about the need to evacuate: The response was predominantly Text Notifications, with a few responding that they alerted people by email, phone calls, or in-person notifications. There was not a dominant form of notification identified.

There was a strong consensus among survey takers that residents do not know what to do or where to go during an evacuation event.

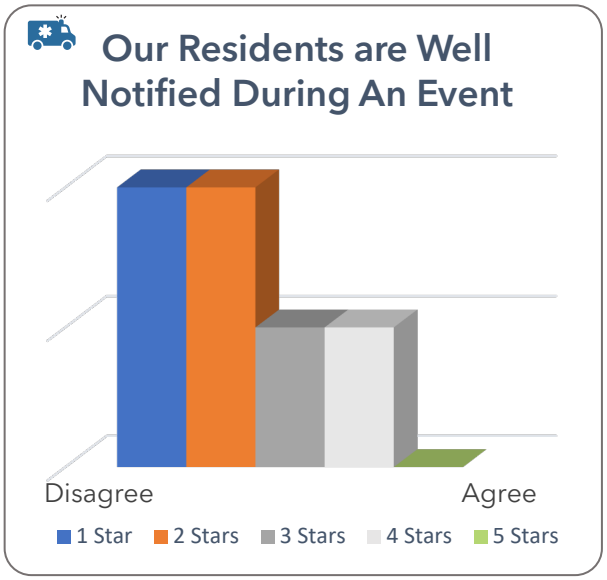


Figure 5.10 Our Residents are Well Notified

Figures 5.10, 5.11, and 5.12 convey the First Responders and Critical Facilities' feedback about how their residents will respond during an evacuation event. Both surveyed groups responded that Calaveras County residents are not well notified during an event, do not know what to do, and do not know where to go. While out of the scope of this initiative, a well-publicized and utilized resident notification platform is recommended.

An excellent suggestion through the first responder's survey was creating an alert system for Air B&B's and a geofenced alert system that would push alerts to anyone with a cell phone within a certain area. An alert system cannot rely on cell phones alone because many areas have poor or no cell phone service and cell towers tend to "crash" when power is out.

Figure 5.11 Our Residents Know What To Do

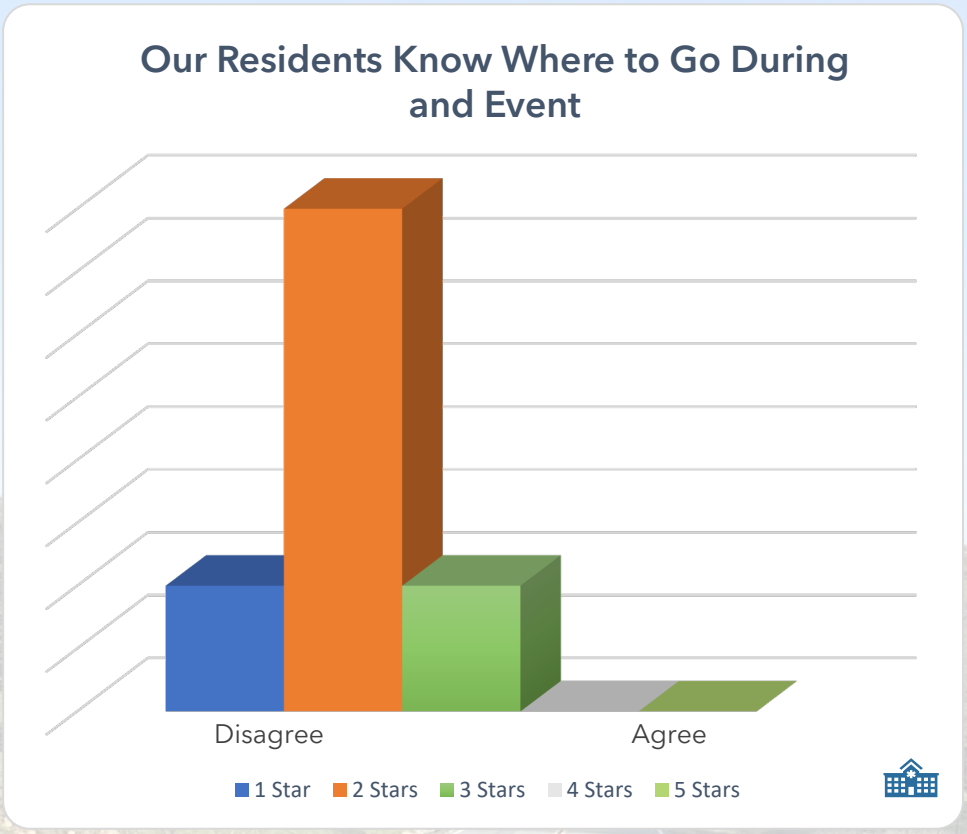


Figure 5.12 Our Residents Know Where to Go During an Event

Challenges Preparing for and Responding to Evacuations

Of the First Responders and Critical Facilities surveyed, 71% had an operational evacuation plan, and one is working on a plan. Two do not have evacuation plans and are not currently developing them. Of the agencies that had developed plans, the plans were developed in coordination with other agencies.

Both groups were asked what they saw as the biggest challenges in preparing for and responding to evacuations. Survey takers were allowed to check all that applied. Resident preparation before an event and knowledge of what to do during an event were common responses, along with funding challenges, staff, and resources. Figures 5.13 and 5.14 present the responses from both survey groups.

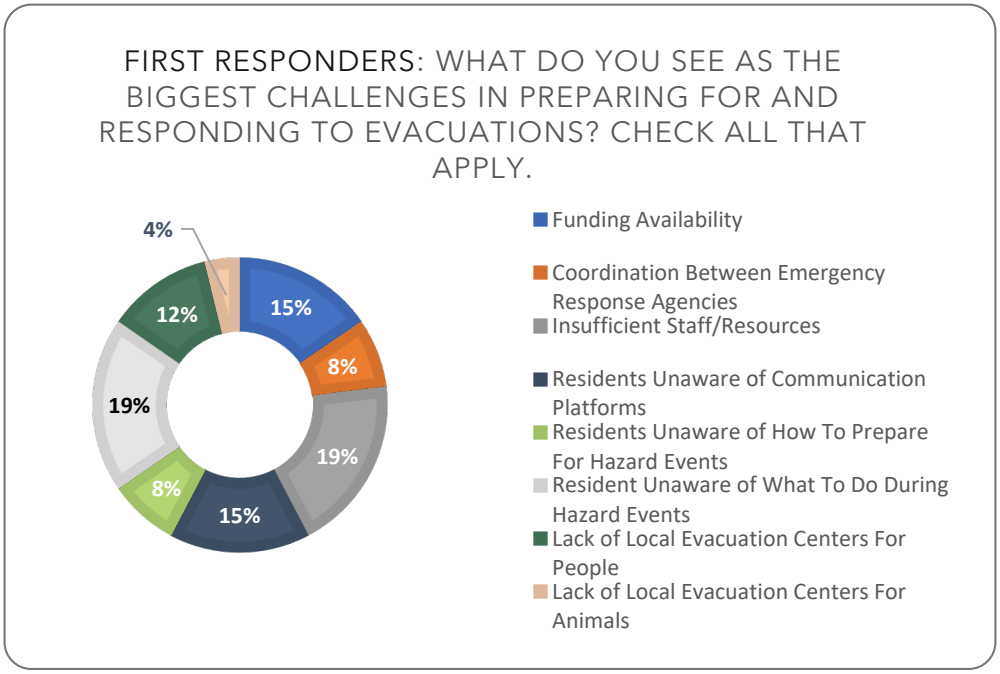


Figure 5.13 First Responders: What do you see as the biggest challenges in preparing for and responding to evacuations?

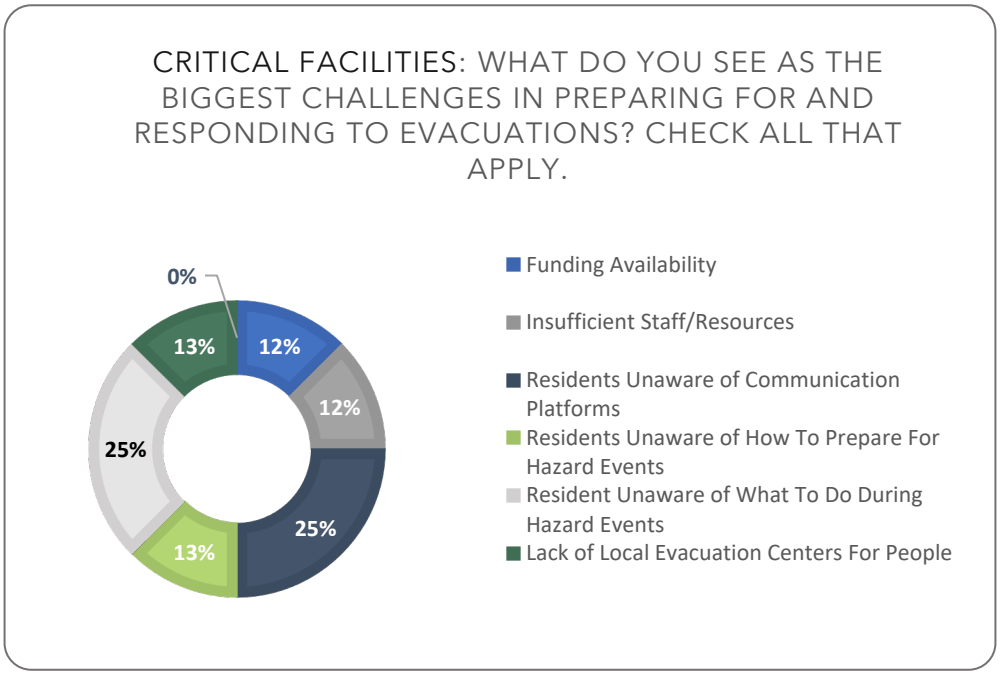


Figure 5.14 Critical Facilities: What do you see as the biggest challenges in preparing for and responding to evacuations?

Addressing Challenges

When asked how each group plans to address these evacuation challenges, both groups plan on utilizing grant writing to obtain additional funding and resources. Both groups also plan to implement Community Education Programs.

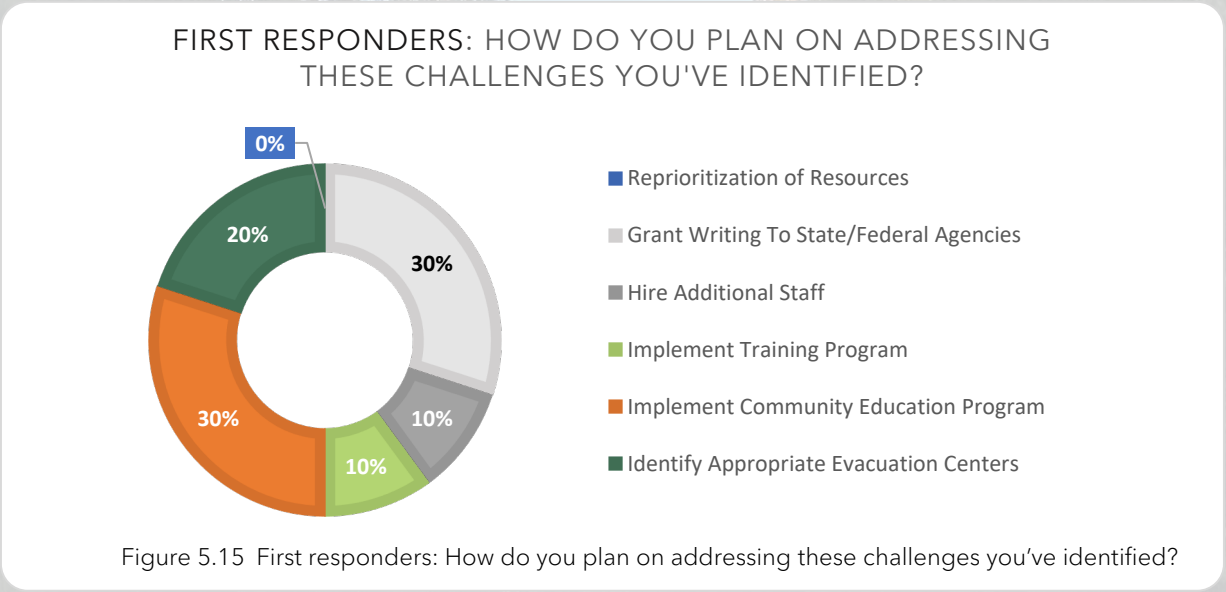


Figure 5.15 First responders: How do you plan on addressing these challenges you've identified?

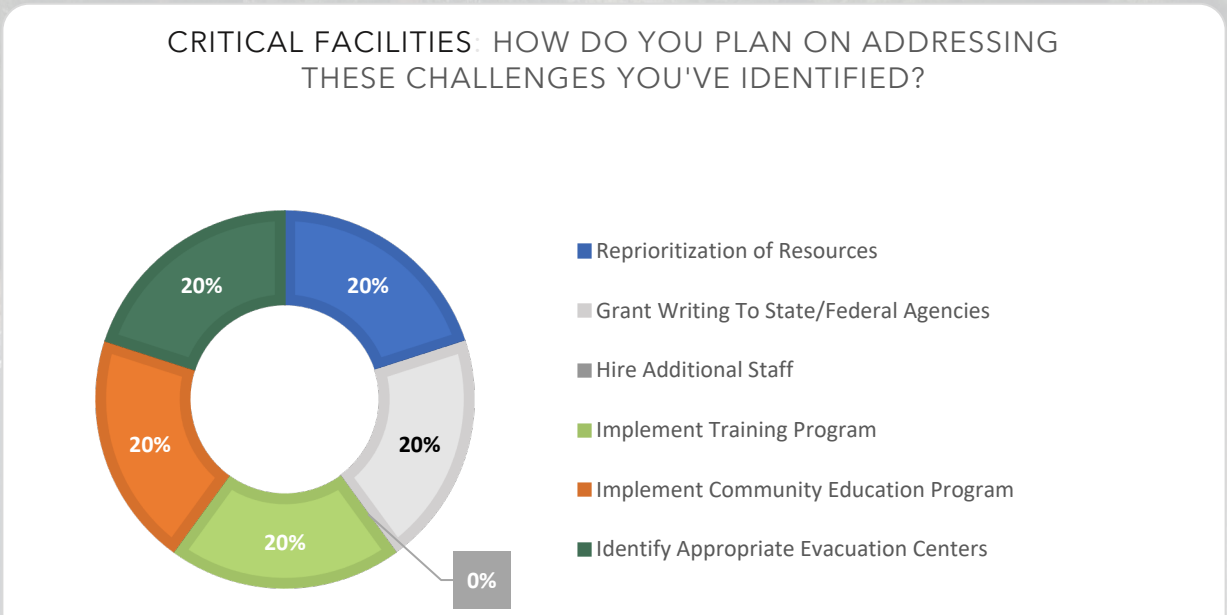


Figure 5.16 Critical Facilities: How do you plan on addressing these challenges you've identified?

Most Challenging Roads for Evacuation

When the First Responders were asked their opinion of the functionality of the Counties Evacuation Routes, the common response was two stars on a scale of one to five, with five being the highest score. This ranking indicates that the Counties evacuation routes' functionality needs improvement.

The ranking indicates that the County's evacuation routes' functionality needs improvement.

First Responders and Critical Facilities were asked which roadways present the most significant challenges to evacuation operations; the responses mirrored that of the general public's reactions. Figure 5.18 shows that State Route 4 was overwhelmingly identified as the route that posed the most significant difficulty for evacuation events.

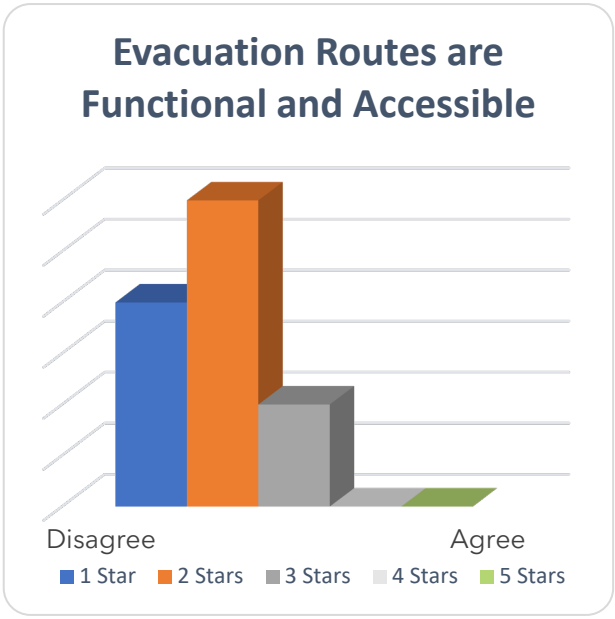


Figure 5.17 Evacuation Routes are Functional and Accessible

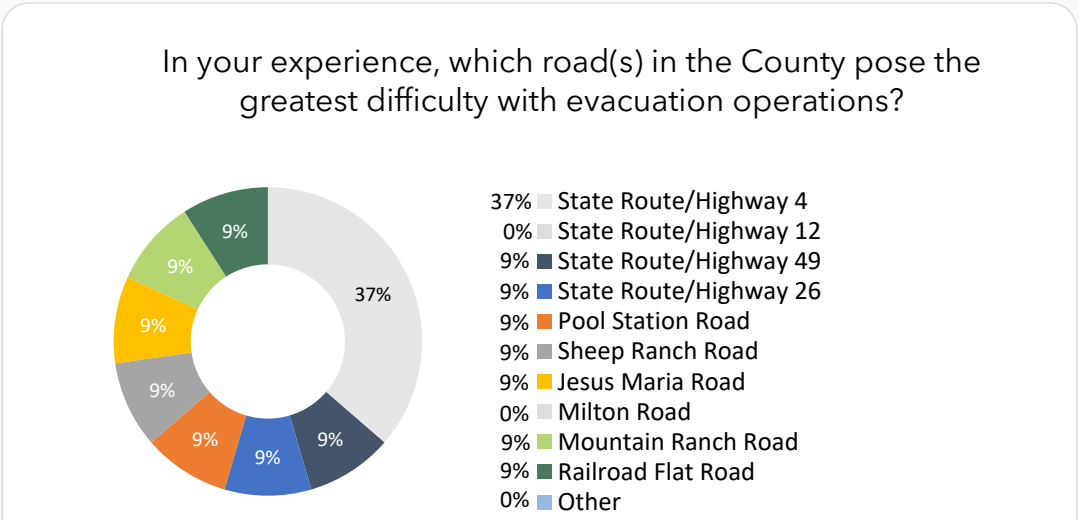


Figure 5.18 In your experience, which road(s) in the County pose the greatest difficulty with evacuation operations?

First Responders Evacuation Preparedness

While Evacuation Routes and Resident Communication were identified as areas that need improvement, the First Responders indicated that they are generally well-trained for Evacuation Events, with no one-star responses and some five-star responses to this question. Interestingly, when presented with a variation of this question, changing the word "training" to "preparation" the positive response decreased with a portion of the group giving one star to the preparation question, and no five-star responses.

These responses indicate that the First Responders feel well-trained but not fully prepared for an evacuation event. See Figures 5.19 and 5.20 for the specific rankings.

Figure 5.19 We've Had Enough Training to respond to An Event

Figure 5.20 We've Done Enough Preparation and Are Prepared

Map Markers and Written Comments

As discussed earlier in this chapter, the community, first responders, and critical facilities were given an opportunity to drop markers on a map and include comments about why the marker was dropped. A complete list of the markers, their locations, and additional comments are provided in Appendix G.

Chapter 6
Achieving a Resilient Network

The final chapter of the Calaveras County Evacuation and Access Needs Assessment and Preparedness Plan (CCEANAPP) presents strategies for implementing the information discussed in the previous five chapters. It outlines steps for achieving implementation, identifies funding sources, and prioritizes projects to establish a robust transportation network. These tools will help the region progress and meet the needs of our communities while working towards a continually evolving resilient transportation system.

Implementation Strategies

To continue moving towards a more resilient transportation network, ongoing strategic planning is required. Through the analysis phase of this project, we were able to determine high-risk and vulnerable communities and roadway infrastructure, which aided in the development of resilience projects that will benefit the community and better prepare Calaveras County for future disastrous events. The Project Advisory Committee provided feedback and ranked the projects to help determine the most beneficial projects to Calaveras County. Based on the feedback, planning-level project fact sheets have been developed to prepare for future funding opportunities, a crucial element in building a resilient network. In addition to building resilient infrastructure, ongoing public events and outreach will occur to educate the public and unify the communities throughout Calaveras County.

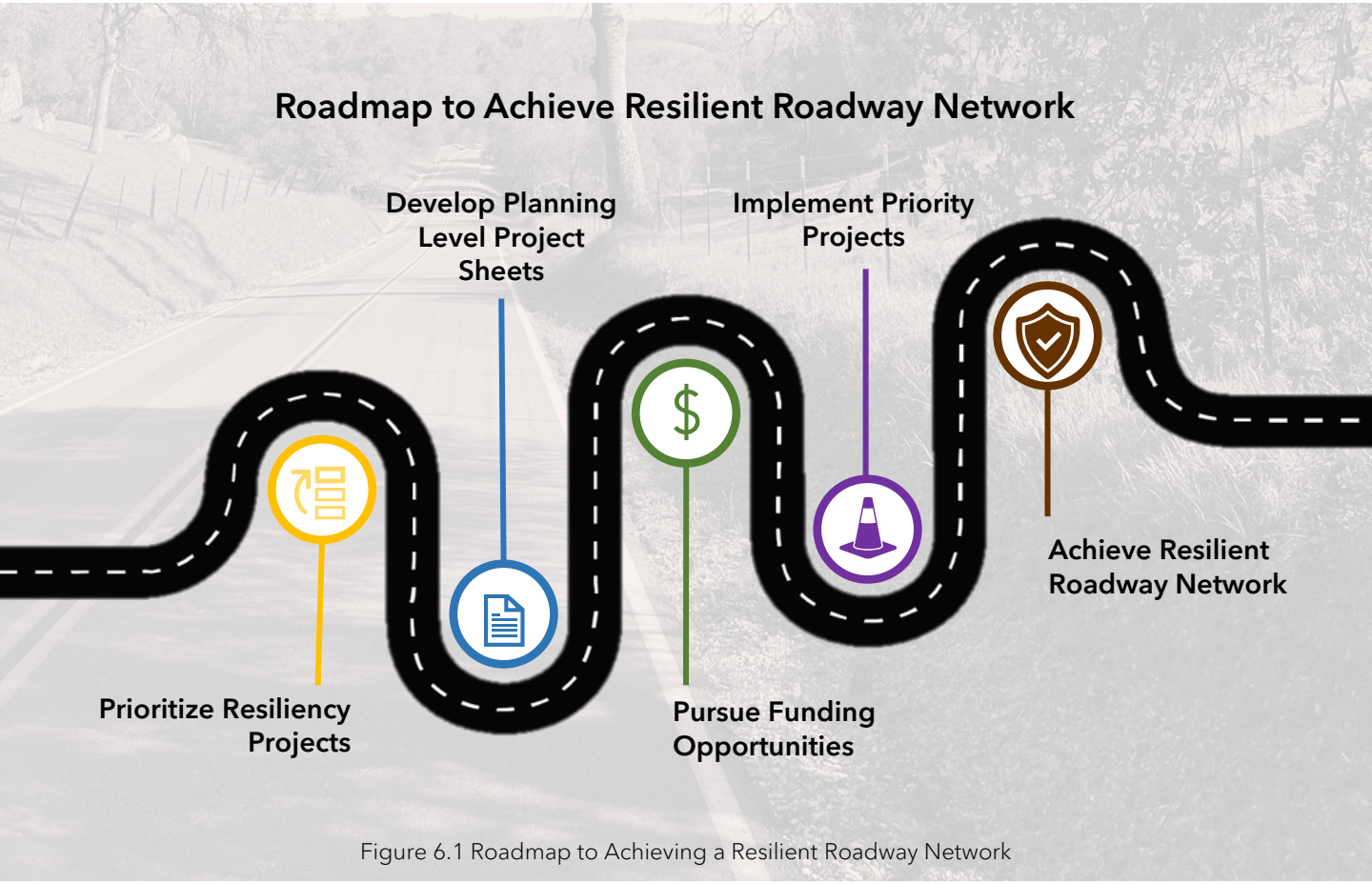


Figure 6.1 Roadmap to Achieving a Resilient Roadway Network

Resiliency Project Prioritization

Project Prioritization

To achieve our goal of creating a stronger and more adaptable transportation network, it's crucial to give priority to projects that can respond to, prepare for, and minimize the impact of catastrophic events and scenarios. Therefore, we must prioritize Resiliency and Hazard Mitigation Projects to ensure that funding opportunities are not missed. This section covers different types of projects, such as major, minor, and planning projects.

Major Infrastructure Projects

Major infrastructure improvements typically cost several millions of dollars and take several years to develop.

Minor Infrastructure Projects

Minor infrastructure projects generally cost less than a million dollars and can be implemented within a year or as ongoing maintenance.

Planning Projects

Planning Projects can be used to prioritize a program of projects or develop strategies to manage potential emergency events.

Figure 6.2 Photo of State Route 4 Wagon Trail Project

Resiliency Project List

Major Infrastructure Projects

- Completion of all phases of the State Route-4 Wagon Trail Project*
- Shoulder Widening on State Route-49 between Angels Camp and San Andreas (State Route 12 intersection)*
- Defensible Space Clearing along State Route 4 and State Route 49*
- Hazard Tree Removal along State Route 4 and State Route 49
- Replacement of all medium and high-risk bridges
- State Route 49 Mobility Project – Addition of roundabouts and traffic signals at the State Route 4/State Route 49 intersection in Angels Camp
- Foundry Lane/Greenhorn Road Extension Project*
- Mountain Ranch Road and State Route 49 Intersection Improvement Project

Minor Infrastructure Projects

- Defensible Space Clearing – Prioritized Annual Maintenance Program
- Roadside Ditch Clearing and Grading – Prioritized Annual Maintenance Program
- Culvert Clearing/Replacement – Prioritized Annual Maintenance Program
- Roadside Slope Evaluation with erosion control/slope stabilization – Prioritized Annual Maintenance Program
- Install Additional Changeable Message Signs on State Route 4 and State Route 49

Planning Projects

- County-Wide Evacuation Plan*
- Unified Notification System that can reach all residents (including those out of cell phone range)*
- Annual Training Program for First Responders and Community Leaders

* Projects with an asterisk were identified as priority projects. Project fact sheets were developed for these projects and included later in this section.

Future Repair Projects

In addition to the major, minor, and planning projects discussed, a list of future projects was developed and shows the extent of projects needed to build resiliency in the region.

Defensible Space Clearing and Hazard Tree Removal Projects

We identified Defensible Space Clearing and Hazard Tree Removal Projects by using aerial views from County roads and State Routes. We marked locations with less than 10 feet of defensible space on both sides of the road. Through this process, we discovered 76 County Road projects and 121 State Route Projects that require attention. You can view a visual representation of these locations on the Defensible Space Clearing and Hazard Tree Removal Projects Map below. For a full-size map, please refer to Appendix B.

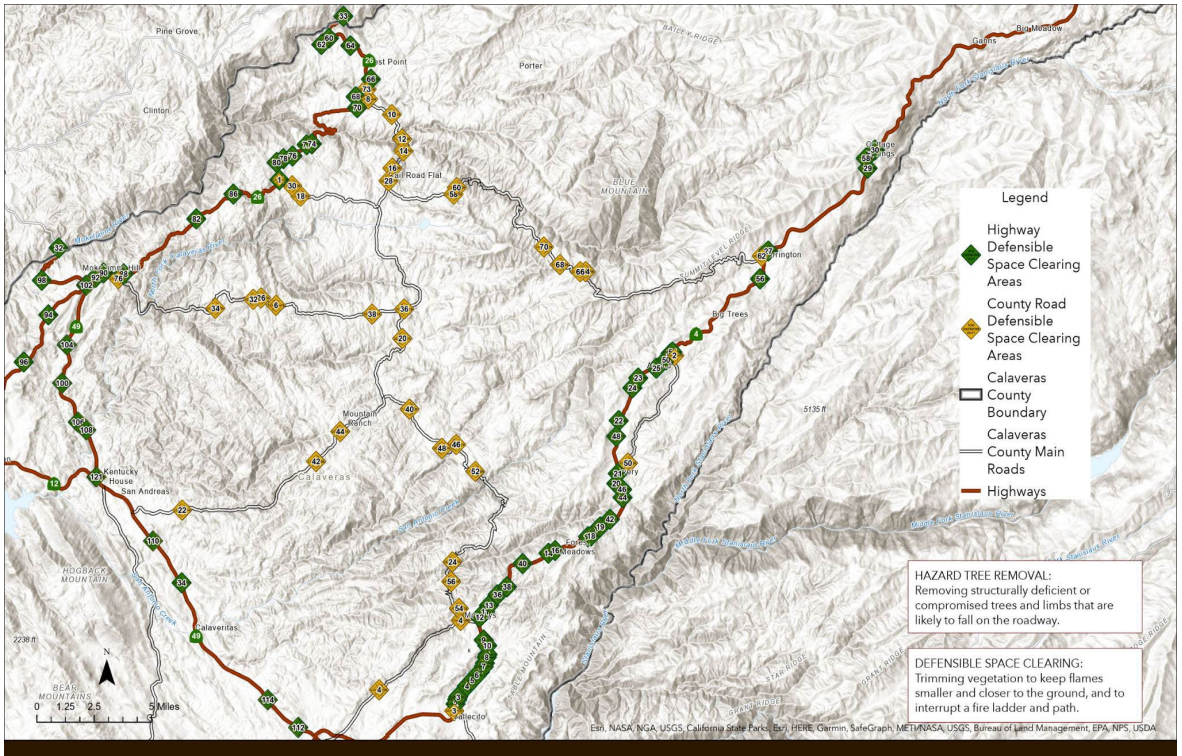


Figure 6.3 Defensible Space Clearing and Hazard Tree Removal Projects

Table 6.1 Potential Clearing Projects on County Roads			
Project Number	Road Name	Project Number	Road Name
1	RIDGE RD	39	SHEEP RANCH RD
2	MORAN RD	40	SHEEP RANCH RD
3	PARROTTS FERRY ROAD	41	MOUNTAIN RANCH RD
4	MURPHYS GRADE RD	42	MOUNTAIN RANCH RD
5	JESUS MARIA RD	43	MOUNTAIN RANCH RD
6	JESUS MARIA RD	44	MOUNTAIN RANCH RD
7	RAILROAD FLAT RD	45	SHEEP RANCH RD
8	RAILROAD FLAT RD	46	SHEEP RANCH RD
9	RAILROAD FLAT RD	47	SHEEP RANCH RD
10	RAILROAD FLAT RD	48	SHEEP RANCH RD
11	RAILROAD FLAT RD	49	MORAN RD
12	RAILROAD FLAT RD	50	MORAN RD
13	RAILROAD FLAT RD	51	SHEEP RANCH RD
14	RAILROAD FLAT RD	52	SHEEP RANCH RD
15	RAILROAD FLAT RD	53	SHEEP RANCH RD
16	RAILROAD FLAT RD	54	SHEEP RANCH RD
17	RIDGE RD	55	SHEEP RANCH RD
18	RIDGE RD	56	SHEEP RANCH RD
19	RAILROAD FLAT RD	57	SUMMIT LEVEL RD
20	RAILROAD FLAT RD	58	SUMMIT LEVEL RD
21	MOUNTAIN RANCH RD	59	SUMMIT LEVEL RD
22	MOUNTAIN RANCH RD	60	SUMMIT LEVEL RD
23	SHEEP RANCH RD	61	SUMMIT LEVEL RD
24	SHEEP RANCH RD	62	SUMMIT LEVEL RD
25	JESUS MARIA RD	63	SUMMIT LEVEL RD
26	JESUS MARIA RD	64	SUMMIT LEVEL RD
27	RAILROAD FLAT RD	65	SUMMIT LEVEL RD
28	RAILROAD FLAT RD	66	SUMMIT LEVEL RD
29	RIDGE RD	67	SUMMIT LEVEL RD
30	RIDGE RD	68	SUMMIT LEVEL RD
31	JESUS MARIA RD	69	SUMMIT LEVEL RD
32	JESUS MARIA RD	70	SUMMIT LEVEL RD
33	JESUS MARIA RD	71	RAILROAD FLAT RD
34	JESUS MARIA RD	72	RAILROAD FLAT RD
35	RAILROAD FLAT RD	73	RAILROAD FLAT RD
36	RAILROAD FLAT RD	74	JESUS MARIA RD
37	JESUS MARIA RD	75	JESUS MARIA RD
38	JESUS MARIA RD	76	JESUS MARIA RD

Table 6.2 Potential Clearing Projects on State Routes

Project Number	Road Name	Project Number	Road Name	Project Number	Road Name
1	SR-4	43	SR-4	85	SR-26
2	SR-4	44	SR-4	86	SR-26
3	SR-4	45	SR-4	87	SR-26
4	SR-4	46	SR-4	88	SR-26
5	SR-4	47	SR-4	89	SR-26
6	SR-4	48	SR-4	90	SR-26
7	SR-4	49	SR-4	91	SR-26
8	SR-4	50	SR-4	92	SR-26
9	SR-4	51	SR-4	93	SR-26
10	SR-4	52	SR-4	94	SR-26
11	SR-4	53	SR-4	95	SR-26
12	SR-4	54	SR-4	96	SR-26
13	SR-4	55	SR-4	97	SR-49
14	SR-4	56	SR-4	98	SR-49
15	SR-4	57	SR-4	99	SR-49
16	SR-4	58	SR-4	100	SR-49
17	SR-4	59	SR-26	101	SR-49
18	SR-4	60	SR-26	102	SR-49
19	SR-4	61	SR-26	103	SR-49
20	SR-4	62	SR-26	104	SR-49
21	SR-4	63	SR-26	105	SR-49
22	SR-4	64	SR-26	106	SR-49
23	SR-4	65	SR-26	107	SR-49
24	SR-4	66	SR-26	108	SR-49
25	SR-4	67	SR-26	109	SR-49
26	SR-4	68	SR-26	110	SR-49
27	SR-4	69	SR-26	111	SR-49
28	SR-4	70	SR-26	112	SR-49
29	SR-4	71	SR-26	113	SR-49
30	SR-4	72	SR-26	114	SR-49
31	SR-4	73	SR-26	115	SR-49
32	SR-49	74	SR-26	116	SR-49
33	SR-26	75	SR-26	117	SR-49
34	SR-49	76	SR-26	118	SR-49
35	SR-4	77	SR-26	119	SR-49
36	SR-4	78	SR-26	120	SR-49
37	SR-4	79	SR-26	121	SR-49
38	SR-4	80	SR-26		
39	SR-4	81	SR-26		
40	SR-4	82	SR-26		
41	SR-4	83	SR-26		
42	SR-4	84	SR-26		

Future Repair Projects to Prevent Flooding

By leveraging data from FEMA and the 100-year floodplain, we were able to identify at-risk areas, including roadways that are prone to flooding. These locations, where the floodplain intersects with a road, have been earmarked for future repair projects to prevent flooding. Some of these areas experienced flooding this winter due to record-high rainfall. For a comprehensive map, please refer to Appendix B.

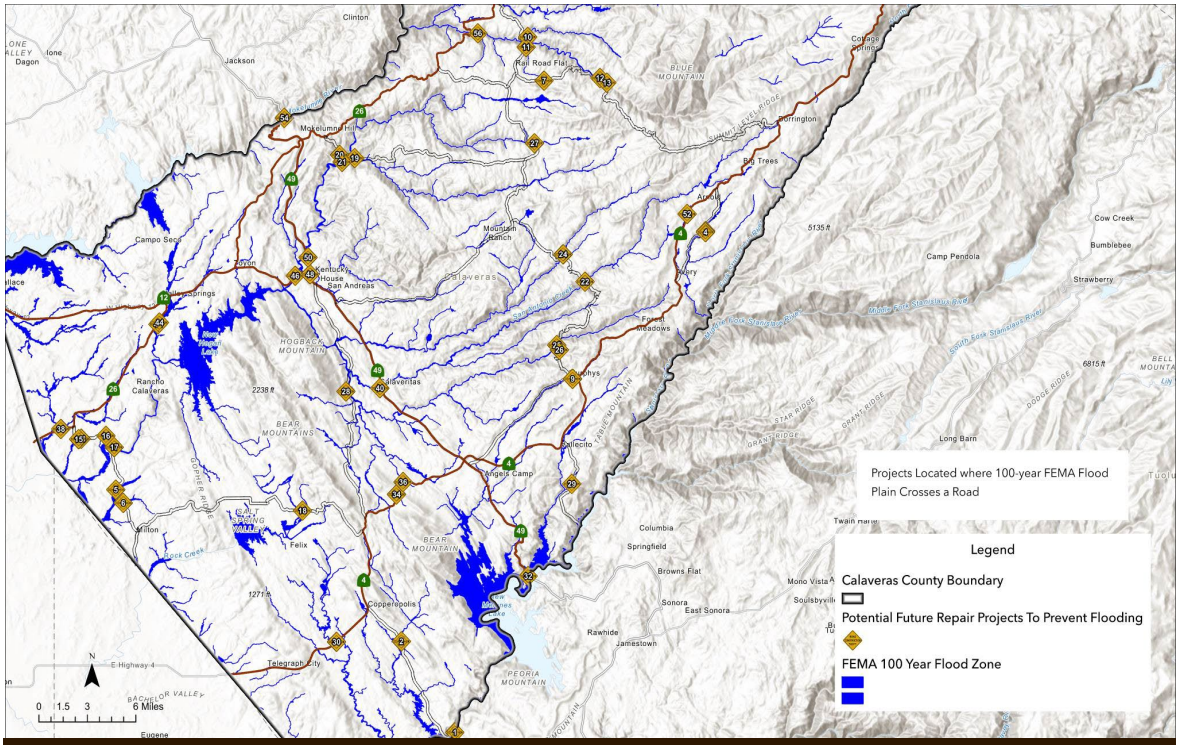


Figure 6.4 Future Repair Projects to Prevent Flooding

Table 6.3 Potential Flooding Projects on State Routes

Project Number	Road Name	Project Number	Road Name	Project Number	Road Name
1	SR 4 PM 5.9	6	SR 49 PM 14.1	11	SR 49 PM 21.5
2	SR 49 PM 0.1	7	SR 26 PM 9	12	SR 4 PM 40.700001
3	SR 4 PM 16.9	8	SR 26 PM 9.1	13	SR 49 PM 30.865
4	SR 4 PM 17.700001	9	SR 12 PM 17.299999	14	SR 26 PM 30
5	SR 26 PM 1.3	10	SR 49 PM 20.700001	15	SR 26 PM 38.325001

Table 6.4 Potential Flooding Projects on County Roads					
Project Number	Road Name	Project Number	Road Name	Project Number	Road Name
1	O'BYRNES FERRY RD	11	RAILROAD FLAT RD	21	JESUS MARIA RD
2	O'BYRNES FERRY RD	12	SUMMIT LEVEL RD	22	SHEEP RANCH RD
3	MORAN RD	13	SUMMIT LEVEL RD	23	SHEEP RANCH RD
4	MORAN RD	14	MILTON RD	24	SHEEP RANCH RD
5	MILTON RD	15	MILTON RD	25	SHEEP RANCH RD
6	MILTON RD	16	MILTON RD	26	SHEEP RANCH RD
7	SUMMIT LEVEL RD	17	MILTON RD	27	RAILROAD FLAT RD
8	MAIN ST	18	HUNT RD	28	POOL STATION RD
9	MAIN ST	19	JESUS MARIA RD	29	PARROTTS FERRY ROAD
10	RAILROAD FLAT RD	20	JESUS MARIA RD		

Future Repair Projects Due to Mudslides

The evaluation of future repair needs due to mudslides was conducted alongside the defensible space projects and flood repair assessments. The identification of vulnerable locations was based on wildfire historical data, specifically pinpointing roadways situated on a slope above 45% and within a burn scar. The full-size map can be found in Appendix B.

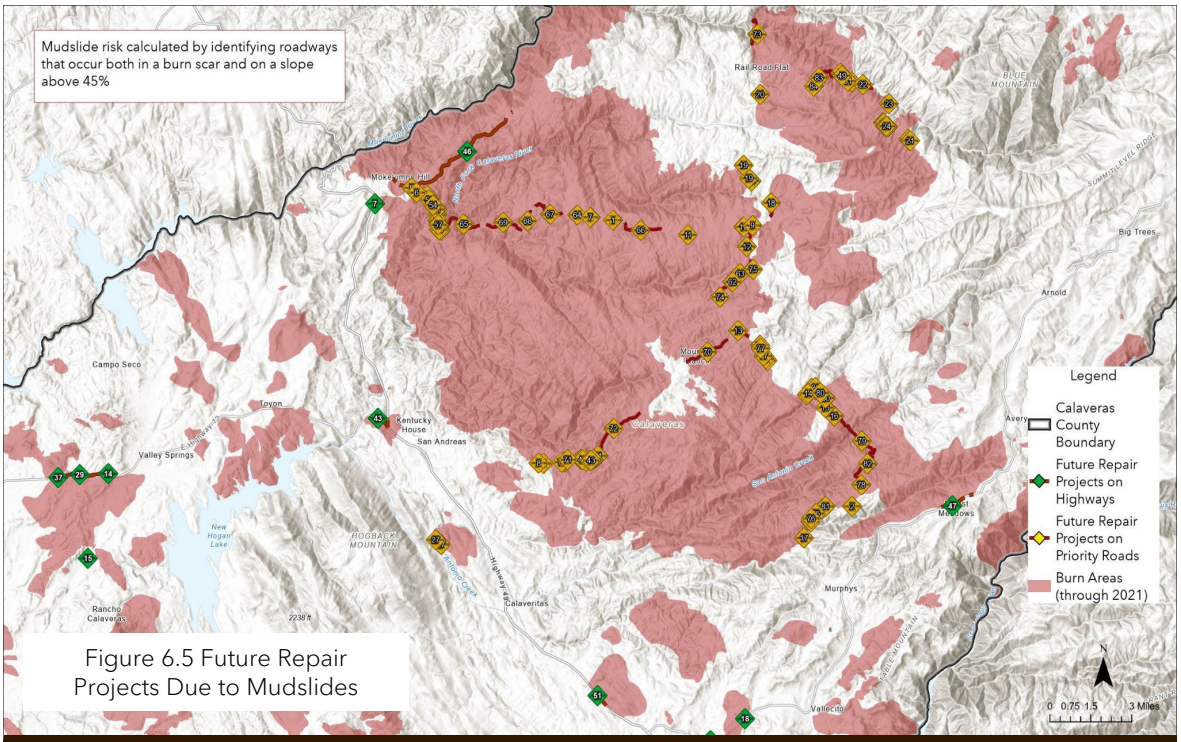


Figure 6.5 Future Repair Projects Due to Mudslides

Future Repair Projects Due to Mudslides

Table 6.5 Future State Route Projects Due to Mudslides

Project Number	Road Name	Project Number	Road Name	Project Number	Road Name
1	SR-4	21	SR-12	41	SR-4
2	SR-4	22	SR-4	42	SR-26
3	SR-4	23	SR-26	43	SR-12
4	SR-12	24	SR- 4	44	SR-12
5	SR-26	25	SR-4	45	SR-26
6	SR-26	26	SR-4	46	SR-26
7	SR-49	27	SR-26	47	SR-4
8	SR-49	28	SR-26	48	SR-4
9	SR-49	29	SR-12	49	SR-49
10	SR-49	30	SR-12	50	SR-49
11	SR-49	31	SR-12	51	SR-49
12	SR-49	32	SR-12	52	SR-49
13	SR-12	33	SR-12		
14	SR-12	34	SR-12		
15	SR-26	35	SR-12		
16	SR-4	36	SR-12		
17	SR-49	37	SR-12		
18	SR-4	38	SR-12		
19	SR-4	39	SR-4		
20	SR-4	40	SR-4		

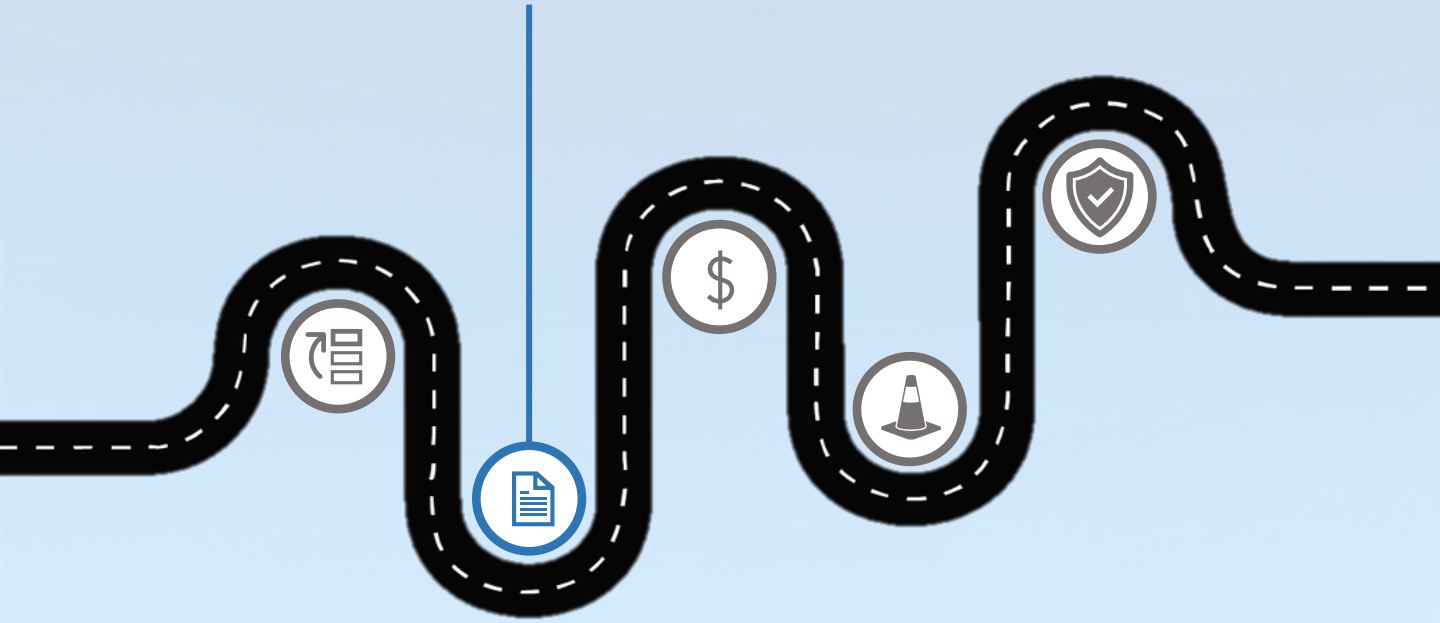
Table 6.6 Future County Road Projects Due to Mudslides

Project Number	Road Name	Project Number	Road Name	Project Number	Road Name
1	JESUS MARIA RD	11	JESUS MARIA RD	21	SUMMIT LEVEL RD
2	SHEEP RANCH RD	12	RAILROAD FLAT RD	22	SUMMIT LEVEL RD
3	O'BYRNES FERRY RD	13	SHEEP RANCH RD	23	SUMMIT LEVEL RD
4	SHEEP RANCH RD	14	SHEEP RANCH RD	24	SUMMIT LEVEL RD
5	JESUS MARIA RD	15	SHEEP RANCH RD	25	PARROTTS FERRY ROAD
6	JESUS MARIA RD	16	SHEEP RANCH RD	26	PARROTTS FERRY ROAD
7	JESUS MARIA RD	17	SHEEP RANCH RD	27	POOL STATION RD
8	MOUNTAIN RANCH RD	18	RAILROAD FLAT RD	28	JESUS MARIA RD
9	RAILROAD FLAT RD	19	RAILROAD FLAT RD	29	JESUS MARIA RD
10	JESUS MARIA RD	20	SUMMIT LEVEL RD	30	JESUS MARIA RD

Table 6.7 Future County Road Projects Due to Mudslides

Project Number	Road Name	Project Number	Road Name	Project Number	Road Name
31	JESUS MARIA RD	49	SUMMIT LEVEL RD	67	JESUS MARIA RD
32	JESUS MARIA RD	50	SUMMIT LEVEL RD	68	JESUS MARIA RD
33	JESUS MARIA RD	51	SUMMIT LEVEL RD	69	JESUS MARIA RD
34	JESUS MARIA RD	52	JESUS MARIA RD	70	MOUNTAIN RANCH RD
35	JESUS MARIA RD	53	JESUS MARIA RD	71	MOUNTAIN RANCH RD
36	SHEEP RANCH RD	54	JESUS MARIA RD	72	MOUNTAIN RANCH RD
37	SHEEP RANCH RD	55	JESUS MARIA RD	73	RAILROAD FLAT RD
38	MOUNTAIN RANCH RD	56	JESUS MARIA RD	74	RAILROAD FLAT RD
39	MOUNTAIN RANCH RD	57	JESUS MARIA RD	75	RAILROAD FLAT RD
40	MOUNTAIN RANCH RD	58	JESUS MARIA RD	76	SHEEP RANCH RD
41	MOUNTAIN RANCH RD	59	JESUS MARIA RD	77	SHEEP RANCH RD
42	MOUNTAIN RANCH RD	60	JESUS MARIA RD	78	SHEEP RANCH RD
43	MOUNTAIN RANCH RD	61	O'BYRNES FERRY RD	79	SHEEP RANCH RD
44	MOUNTAIN RANCH RD	62	RAILROAD FLAT RD	80	SHEEP RANCH RD
45	MOUNTAIN RANCH RD	63	RAILROAD FLAT RD	81	SHEEP RANCH RD
46	SHEEP RANCH RD	64	JESUS MARIA RD	82	SHEEP RANCH RD
47	SHEEP RANCH RD	65	JESUS MARIA RD	83	SUMMIT LEVEL RD
48	SUMMIT LEVEL RD	66	JESUS MARIA RD	84	SUMMIT LEVEL RD

Planning Level Project Fact Sheets



Completion of all phases of State Route 4 Wagon Trail

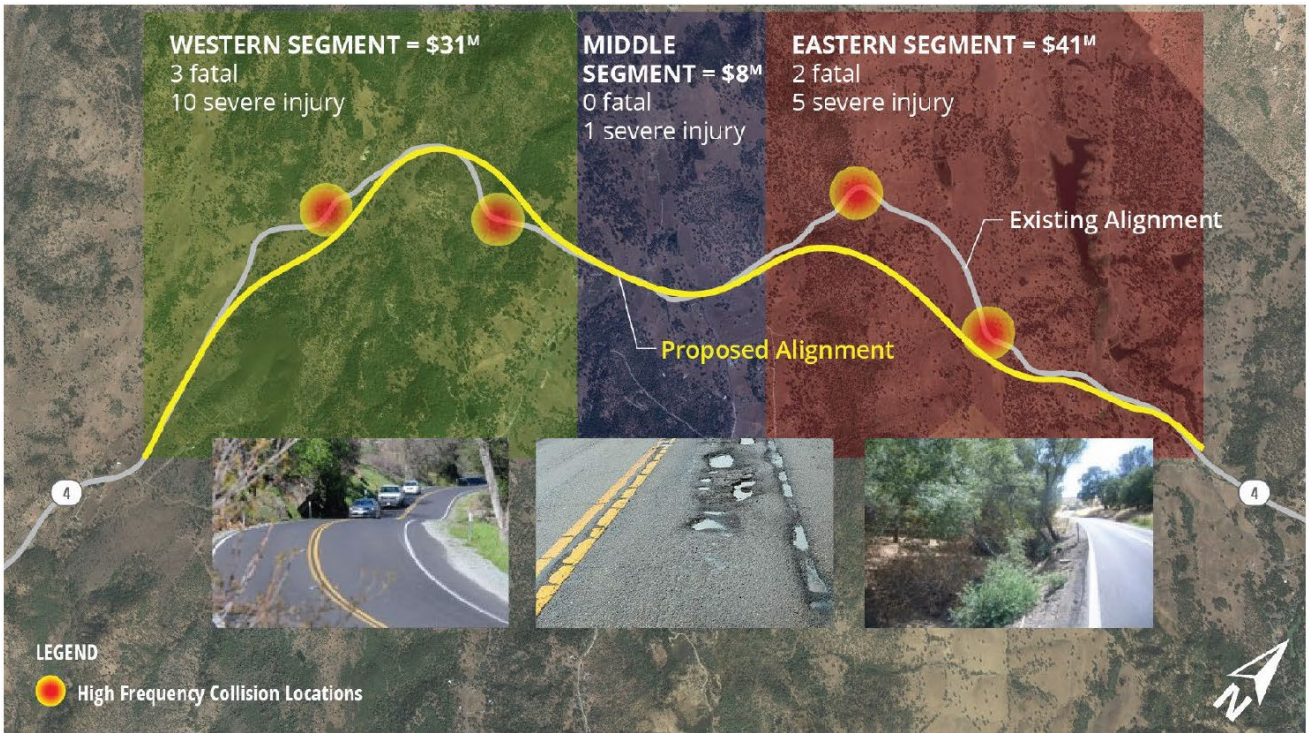
WE REQUEST **YOUR SUPPORT** IN ORDER TO BUILD A MORE RESILIENT HIGHWAY TO SUPPORT FUTURE EVACUATIONS

Project Scope

- Correct alignment deficiencies in a 6.5-mile segment of State Route 4.
- Widen shoulders to current highway standards
- Project will be completed in 3 phases: Western, Middle, and Eastern

Benefits

- Reduce traffic accidents - This roadway segment has 2x the accident rate of similar facilities
- Provides a reliable east-west evacuation route
- Improve access to recreational attractions
- Close the gap in the STAA truck route



Shoulder Widening on State Route 49 (HWY 12 to HWY 4)

WE REQUEST **YOUR SUPPORT** IN ORDER TO BUILD A MORE RESILIENT HIGHWAY TO SUPPORT FUTURE EVACUATIONS

Project Scope

- Widen State Route 49 between State Route 4 in Angels Camp and State Route 12 in San Andreas.
- Ensure a minimum of 36 feet (three vehicular lanes) of pavement width is available.
- 10.6 miles of this 11.8 roadway segment would need pavement widening.

Benefits

Provides a reliable east-west evacuation route

Cost Estimate

$30 Million (all project phases)

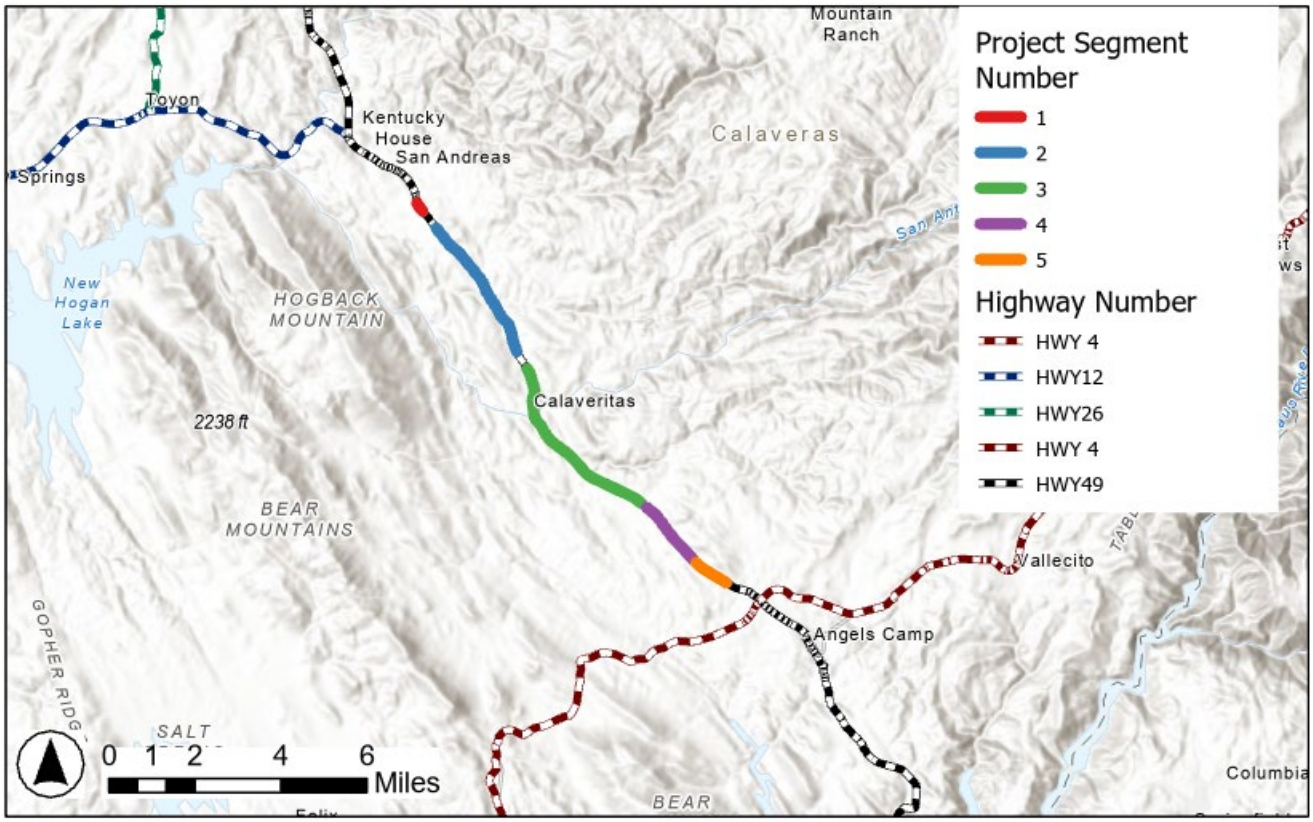
Can be designed as a whole and constructed in phases as funding becomes available.

Schedule

· Two Years for Environmental Clearance and Design

· One Year for Utility Relocations and Temporary Construction Easements (if needed)

· Construction: If completed at once two to three years. Can be constructed one year at a time if segmented



Foundry Lane and Greenhorn Road Extension Project

WE REQUEST **YOUR SUPPORT** IN ORDER TO BUILD A MORE RESILIENT HIGHWAY TO SUPPORT FUTURE EVACUATIONS

Project Scope

- Extend Foundry Lane and Greenhorn Creek Road to create a redundant corridor parallel to State Route 49.

Schedule

Years

- **5** Apply and acquire funding for Hazard Mitigation Projects and Resiliency Projects
- **3** Environmental Clearance and Design
- **2** Utility Relocation and Right-A-Way Acquisition
- **1-2** Construction begins start to finish

Benefits

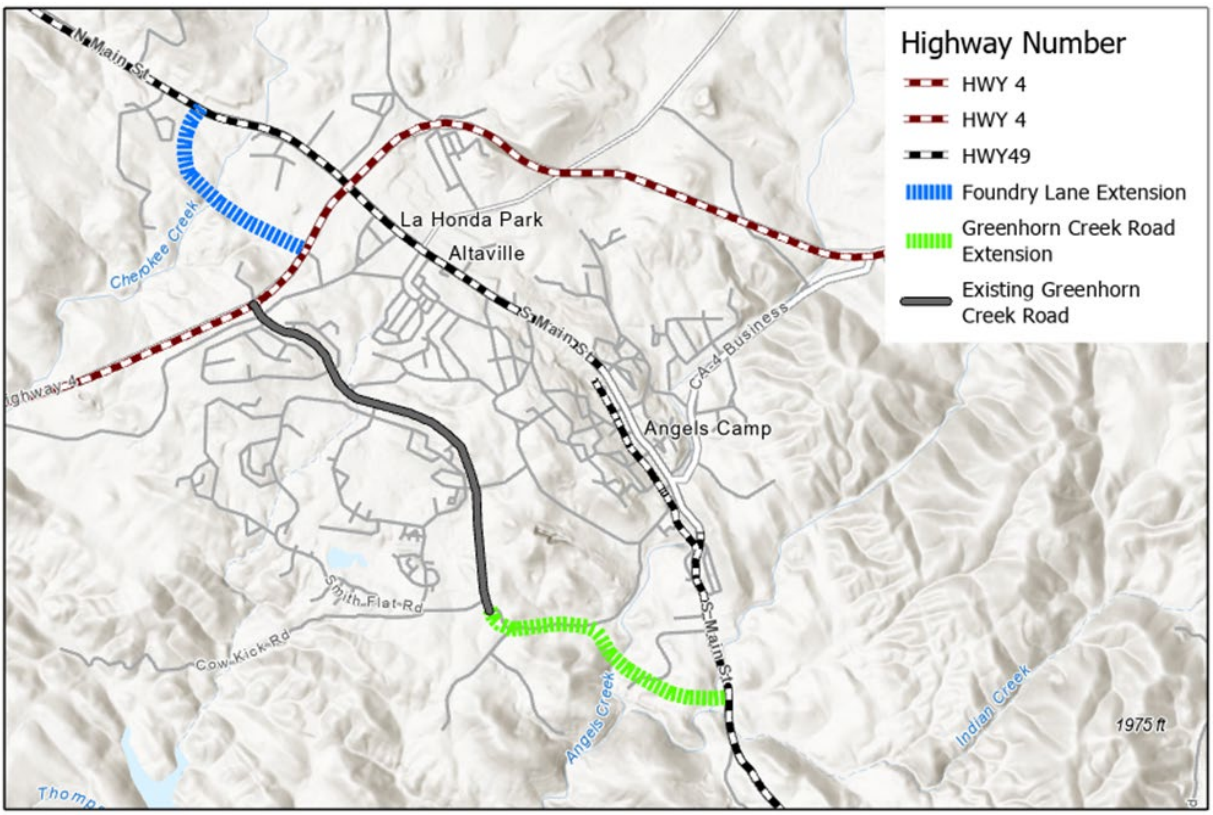
Provides the community with an alternative city street route to the west of Main Street .

Relieves traffic congestion and provides the public and emergency vehicles safe access through the area.

Builds resiliency in the local transportation network by providing additional evacuation routes

Cost Estimate

$26 Million (for all phases)



Defensible Space Clearing on HWY 4 Between Arnold and Murphys

WE REQUEST **YOUR SUPPORT** IN ORDER TO BUILD A MORE RESILIENT HIGHWAY TO SUPPORT FUTURE EVACUATIONS

Project Scope

- Develop a plan and schedule for Defensible Space Clearing and Hazard Tree Removal along the State Route 4 Corridor from Murphys to Arnold. Approximately 10.08 miles.
- Coordinate with the contracting company to perform defensible space clearing and hazard tree removal with traffic control.

Schedule

Months

3 Locate points along State Route 4, develop a plan, schedule, and coordinate traffic control.

2 Prepare contract, bid, award

6 Start to finish defensible space clearing and hazard tree removal.

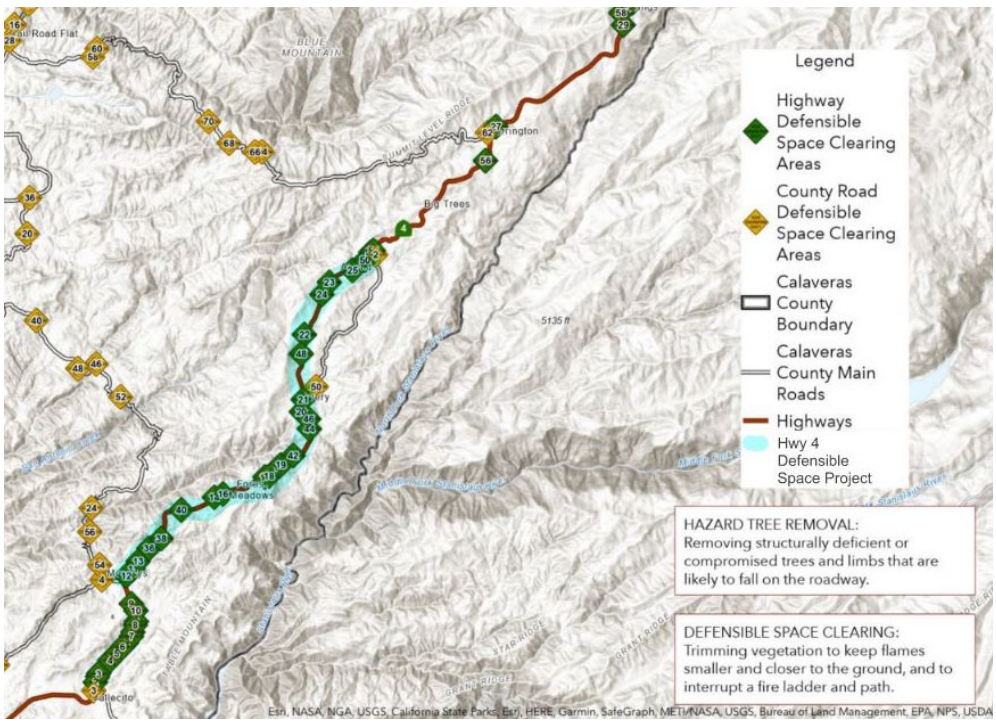
Benefits

- Improves safety along State Route 4
- Reduces the addition of hazards and bottlenecks during evacuation scenarios.
- Helps build resiliency in the transportation network

Cost Estimate:

Defensible Space Clearing + Traffic Control	**$247,500**
Hazard Tree Removal + Traffic Control	**$2,200,000**

*Defensible Space clearing requires maintenance annually or biennially
*Hazard Tree Removal requires maintenance every 10 years
*Both cost estimates include all project phases, projects can be constructed in phases when funding is available



County Wide Unified Notification System

WE REQUEST YOUR SUPPORT IN ORDER TO BUILD A MORE RESILIENT CALAVERAS COUNTY

Project Scope

- Improve existing voluntary notification systems
- Implement a mass notification system, and consolidate/merge existing notification systems
- Create an audible/alarm notification system to assure all residents and visitors are notified in emergency situations
- Perform Outreach to notify and educate the communities about the systems

Schedule

Years

1 — Apply and acquire funding for Hazard Mitigation Project

1 — Award contract for design of the system

2 — Award contract to install a communication system

Benefits

Improves communication and relays important messages in real-time.

Provides redundant warning system for residents and visitors in Calaveras County of potential or emergent hazards.

Reduces the number of 911 and person-to-person calls and provides a clear call to action.

Cost Estimate:

$0.5 -4 million

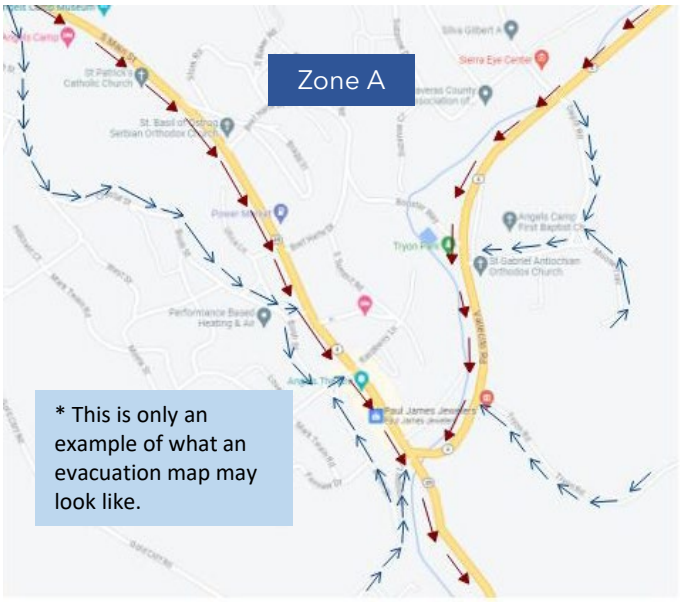
Mass notification systems and Early Warning Sirens can be implemented as funds become available. There are funding opportunities for the design of Hazard Mitigation Projects.

County Wide Evacuation Plan

WE REQUEST YOUR SUPPORT IN ORDER TO BUILD A MORE RESILIENT CALAVERAS COUNTY

Project Scope

- Develop a comprehensive community evacuation plan that includes clear communication protocols, evacuation timelines, and contingency plans for different scenarios.
- Build on existing analysis, including the **Evacuation and Access Needs Assessment and Preparedness Plan**, and develop Evacuation Plan.
- Provide training and support to OES staff, local emergency responders, community leaders, and other stakeholders on the implementation of the plan
- Develop a cloud-based evacuation map that can be updated live in a scenario-by-scenario basis
- Integrate the Plan into the County's Emergency Operation Plan



Benefits

Creates a clear plan to quickly and safely move the population away from the danger zone.

Prepares the community for future catastrophic events.

Supports and alleviates stress felt by emergency personnel and first responders.

Cost Estimate:

$300,000 (all project phases)

A portion of the research required for the County Wide Evacuation Plan was performed during the development of the **Evacuation and Access Needs Preparedness Plan.**

Schedule

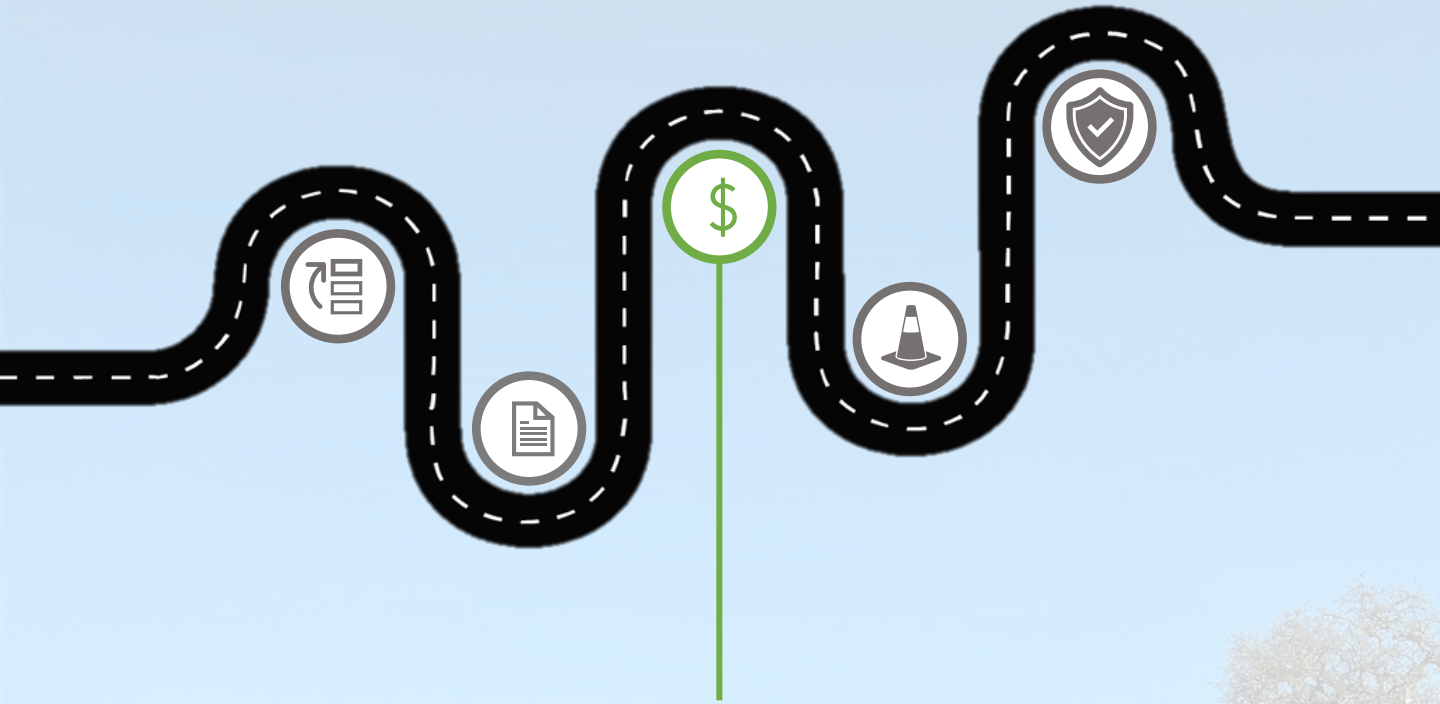
Years

1 — Apply and acquire funding for Hazard Mitigation Project

1 — Evacuation Plan Development & Cloud-Based Evacuation Application

1-2 — Public Outreach and Implementation

The Evacuation Plan will take close to 1.5 years to acquire funding, develop the plan, and implement the evacuation plan through Public Outreach.



Pursue Funding Opportunities

Opportunities to Fund Resilience Efforts

Achieving a resilient transportation system in Calaveras County will require more resources and funding than is currently budgeted and available. From the priority projects outlined in this Plan alone, the County will need millions of dollars. The prioritized major, minor, and planning projects mentioned in this Plan are based on the existing conditions and will help mitigate disaster during future catastrophic events. Creating a more resilient Calaveras County will require a combination of supplemental funds for individual transportation-related projects and the partnership and cooperation of individual property owners.
Even then, we understand the projects mentioned do not represent the entirety of what is needed to protect our Calaveras Communities.

To maximize finite resources, Calaveras must understand what funding and financing opportunities are available to identify potential sources for transportation network resiliency projects.

Figure 6.6 Opportunities to Fund Photo

State and Federal Funding Sources

The State Route system revolutionized the movement of goods and people across the country. Because mobility continues to be an economic differentiator, local, state, and federal governments invest in transportation infrastructure. In recent years, funding has been focused on making the transportation system more resilient against natural disasters. As such, many competitive funding programs exist to supplement local budgets for compelling local projects.

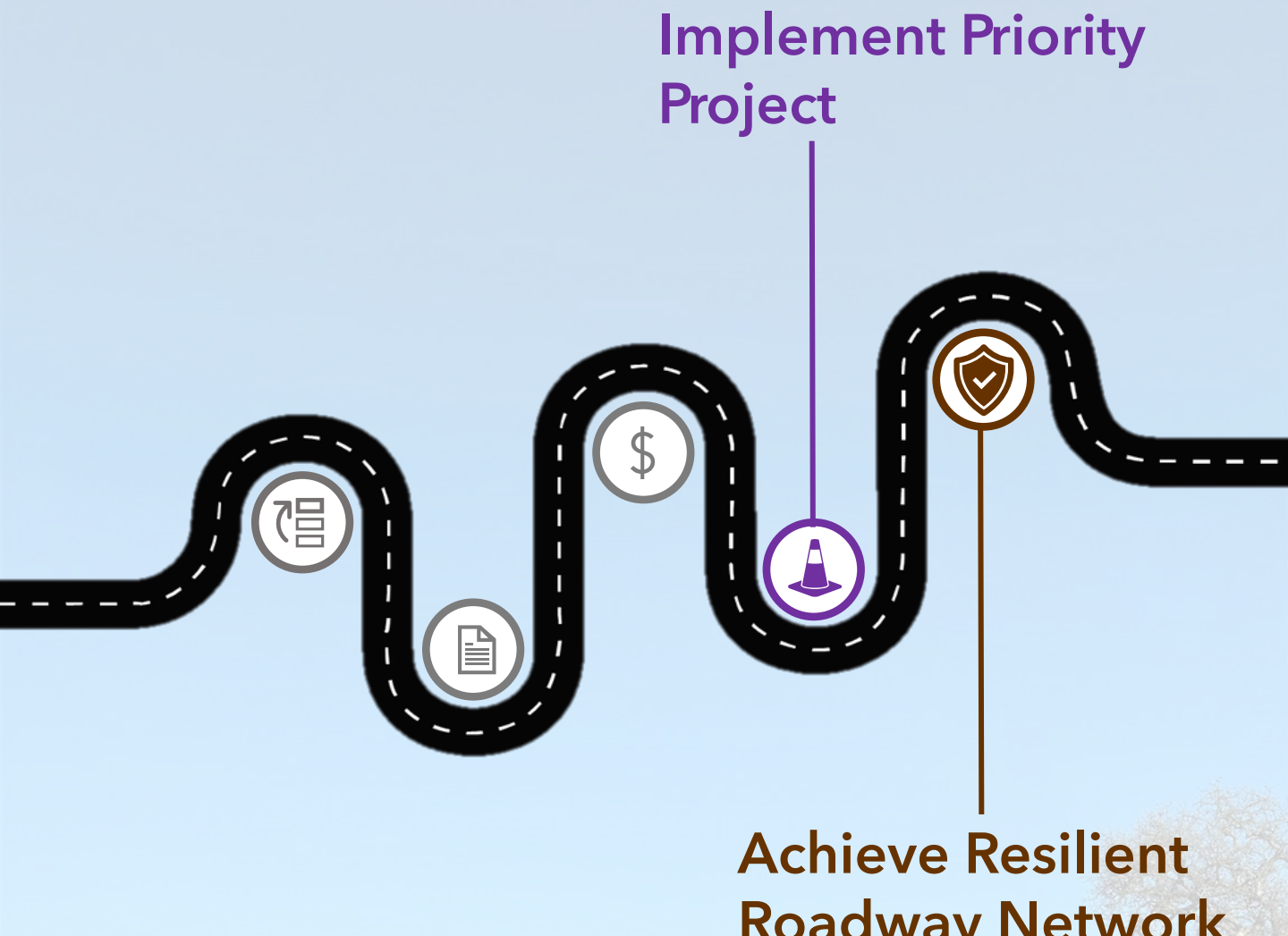
Specifically, the U.S. Department of Transportation and the State of California provide funding through the PROTECT (Promoting Resilient Operations for Transportation Efficiency and Cost Saving Transportation) program. This program provides funding to ensure surface transportation resilience to natural hazards and disasters through planning and infrastructure.

In addition, the Federal Emergency Management Agency manages annual programs for Hazard Mitigation assistance grants. FEMA funding is directed at projects that will reduce future disaster recover costs.

Competitive Funding Sources for Resilient Transportation Infrastructure

Table 6.8 State and Federal Funding Sources

Agency	Grant Program
U.S Department of Transportation	PROTECT Promoting Resilient Operations for Transportation Efficiency and Cost Saving Transportation
	RAISE (Rebuilding American Infrastructure with Sustainability and Equity)
	RURAL (Rural Surface Transportation Grant Program)
	INFRA (Infrastructure for Rebuilding America)
	Safe Streets and Roads for All Grant Program (SS4A)
Federal Emergency Management Agency	Building Resilient Infrastructure and Communities Program (BRIC)
	Hazard Mitigation Grant Program (HMGP)
United States Department of Agriculture	Community Wildfire Defense Grants
CAL FIRE	Wildfire Prevention Grant
	Wildfire Resilience Grant


Implement Priority Project
Achieve Resilient Roadway Network

Implementing Priority Projects

We are dedicated to establishing resilient transportation infrastructure through ongoing project implementation. Our team is actively seeking funding opportunities like PROTECT and the Hazard Mitigation Grant Program (HMGP). Several projects, including the State Route 4 Wagon Trail, Foundry Lane and Greenhorn Extension Project, and a County-Wide Evacuation Plan, are currently in progress and preparing for the next phase of execution.

Achieving a Resilient Roadway Network

Our region's transportation network is becoming more resilient thanks to the Evacuation and Access Needs Assessment and Preparedness Plan. This important initiative has helped us identify vulnerabilities, risks, and challenges unique to our area. By engaging with the public, we have identified primary roads and evacuation routes while also recognizing the specific challenges each roadway presents. As a result, we have developed a comprehensive list of resiliency projects that prioritize the most valuable initiatives and enable us to plan and prepare for funding opportunities.

We understand that more public outreach, data analysis, and proposed projects are necessary to achieve our goal of enhancing the resilience of the Calaveras roadway network. We are committed to working towards this objective.

Acknowledgments

We want to extend our sincere gratitude to the Project Advisory Committee, emergency responders, critical facilities, and community members who shared their valuable insights and feedback during the creation of this plan. Your contributions were instrumental in making this project a success, and we are truly grateful for your support.

List of Attachments:

Appendix

A: Critical Facilities Complete List
B: Potential Resiliency Project Exhibits
C: Potential Shelters Complete List
D: Climate Debrief Interview Summary
E: Existing Conditions Report
F. Hazard Risk and Vulnerability Assessment
G: Priority Corridors and Key Considerations For Future Evacuation Plans
H:Comments Received During Public Circulation