

Ojai Valley Fire Safe Council Evacuation Assessment

Introduction

The Ojai Valley Fire Safe Council (OVFSC) Evacuation Assessment identifies locations and communities at higher risk from wildfire evacuations and strategies to improve evacuation operations and communication. The report was completed by Kittelson & Associates, Inc. (Kittelson), Jensen Hughes, and Dr. Stephen Wong (University of Alberta) in collaboration with the OVFSC. The OVFSC Evacuation Assessment is structured in five sections:

1. **Community and Stakeholder Engagement** – Describes the community and stakeholder outreach efforts for the duration of the project.
2. **Methodology** – Describes the data and methodology of the evacuation assessment.
3. **Roadway Evacuation Assessment** – Describes potential limits to evacuation capacity based on modeled evacuation scenarios and identifies potential strategies for increasing the resilience of egress routes.
4. **Evacuation Capacity Improvements and Strategies** – Identifies potential strategies for increasing the resilience of egress routes and strategies for improving communication around evacuations.
5. **Conclusion** – Includes funding opportunities and next steps for OVFSC to use the findings from this assessment.

EVACUATION NEEDS

The majority of Ojai Valley's residents and visitors live (or stay) within close proximity to the two main state routes traversing Ojai Valley – State Route 33 (SR-33) and State Route 150 (SR-150). These routes are also two of only a few routes that allow travel in and out of the Ojai Valley to major destinations such as Ventura, Santa Barbara, and Los Angeles. Both state routes are one travel lane in each direction for most of their length in the Ojai Valley vicinity, include sharp curves, and traverse through mountainous or rolling terrain. As a result, these roadways may be susceptible to capacity limitations during peak travel or emergencies.

Further complicating evacuations are difficulties due to limited communication and several vulnerable populations and communities in the Ojai Valley who may require additional support or tailored outreach in the event of a wildfire. For example, Ojai attracts many seasonal visitors who may be less familiar with evacuation procedures and potential routes. Ojai Valley is also home to a substantial senior population, residents with limited mobility options, and others who may be more difficult to reach during an evacuation. To address these needs, the Evacuation Assessment modeled five potential wildfire scenarios and large-scale evacuations to determine potential capacity limitations and other needs.

Community and Stakeholder Engagement

This report was developed through a collaborative process that engaged a Technical Advisory Group (TAG) and community members. These groups were identified to receive feedback on specific components of the analysis. This section describes the engagement with the TAG and public.

TECHINICAL ADVISORY GROUP

The TAG was established to provide feedback on analysis inputs and methodologies and strategies. The TAG included staff from the OVFSC, Ventura County, California Department of Transportation (Caltrans), California Highway Patrol, City of Ojai, Ojai Unified School District, Red Cross, and HELP of Ojai. The project team presented three times to the TAG:

1. Presented an overview of the project and introduced the roadway capacity analysis (April 26, 2023)
2. Presented the methodology for the roadway capacity analysis (June 9, 2023)
3. Discussed the wildfire scenarios, assumptions, and model inputs for the roadway capacity analysis (August 25, 2023)

COMMUNITY ENGAGEMENT

The evacuation assessment included two types of community engagement. An online survey was posted to collect feedback from residents, workers, and visitors in Ojai Valley to understand concerns and needs during evacuations. The project team also visited Ojai to gather in-person feedback on evacuation concerns.

Survey

An online community survey was conducted by the project team in collaboration with OVFSC to understand the concerns and needs of Ojai Valley residents and visitors during an evacuation event. The survey included approximately 50 questions with 275 responses from community members and visitors (98% of survey respondents lived full-time or part-time in the Ojai Valley, and 2% were visitors). A full summary of the survey responses can be found in Appendix A. Key findings from the survey include:

- 53% of respondents felt that there was a high to very high potential for wildfire to reach their residence/accommodations with 30% considering their residence/location to be at high or extremely high risk of being damaged in the upcoming fire season.
- 50% of respondents believe that staying to defend their home or accommodation would decrease the odds of losing their home or accommodation during a wildfire.
- 39% of respondents indicated they would evacuate immediately upon learning about a wildfire, with 67% indicating they would evacuate upon receiving a mandatory evacuation order. 49% of respondents would evacuate upon receiving a voluntary evacuation order.
- 42% of respondents knew someone who would need additional assistance to evacuate.
- 29% of respondents would take two or more vehicle trips before evacuating.

- In the event of an evacuation order, 29% of respondents would remain in the area if they believed the hazard was not a threat to them, and an additional 22% would remain in the area to protect their property/accommodations. 16% would remain to avoid traffic congestion.
- Just 3% of respondents said they would not evacuate at all.
- 60% of respondents felt at most somewhat prepared for an evacuation.
- 23% of respondents indicated they have one or more trailers at their household, and 12% indicated they own or keep large animals/livestock.
- Most respondents indicated they would evacuate to Ventura, Los Angeles, Santa Barbara, or Long Beach.
- 56% of respondents indicated they would take SR-33 South and an additional 17% would take SR-150 West to evacuate
- 98% of respondents evacuated during the 2017 Thomas Fire.
- Respondents have been evacuated from wildfires an average of 1.3 times, and impacted by wildfires in some way an average of 2.5 times.

Community Outreach

To understand the concerns and needs of residents and visitors of Ojai Valley during an evacuation event, the Kittelson, Jensen Hughes, and OVFSC team set up a booth at the 2023 Ojai Day festival to gather feedback from the community.

The goal of attending Ojai Day was to understand the type of concerns (e.g., transportation, communication, education, etc.) residents and visitors have when it comes to evacuations in the region. It was also an opportunity to understand the specific locations in Ojai Valley where residents and visitors have concerns or have had trouble evacuating in past emergency events.

Community members shared concerns around the following topics:

- **Vulnerable populations**, including questions on how to assist vulnerable populations in an evacuation and concerns around personal evacuations.
- **Evacuation orders**, including how to receive information on evacuations or concerns around large evacuations.
- **Evacuation routes**, including questions about improvements to evacuation routes and concerns around limited route options
- **Roadway capacity**, including concerns around congestion and construction in Ojai Valley
- **Specific locations of concern**, including:
 - SR-150 (Casitas Springs)
 - Casitas Pass Road (west of Lake Casitas)
 - N Ojai Road (Upper Ojai)
 - Villanova Road (Ojai)
 - Knox Key
 - Ventura Freeway bridge
 - La Luna Avenue (Ojai)
 - El Roblar Drive to S Rice Road (Mira Monte)

Details on Ojai Day and feedback received are included in Appendix B.

Evacuation Assessment Methodology

The following section describes the methodology used to assess evacuation routes in Ojai Valley and understand where roadway capacity issues may arise during emergency events. The roadway capacity analysis builds off the wildfire hazard analysis conducted by Jensen Hughes (see Developing Fire Scenarios). Inputs from the wildfire hazard analysis are then used to model evacuations under different wildfire scenarios.

LIMITATIONS

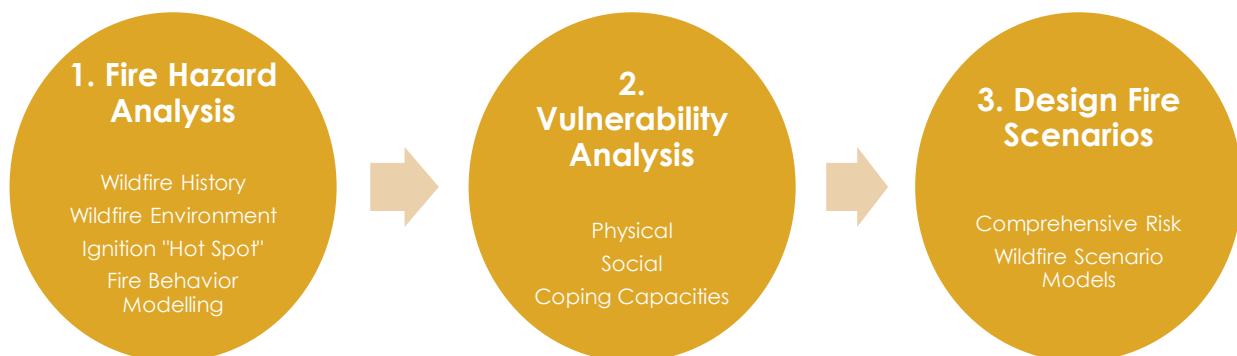
The results of the evacuation assessment are intended to identify potential congested locations during modeled evacuation scenarios. These scenarios were developed based on conservative assumptions and modeling techniques that reflect the current understanding of evacuation analysis. These scenarios are intended to model a potential range of different evacuation scenarios but not all possible scenarios.

The scenarios each represent a potential emergency occurring in a portion of Ojai Valley. Actual emergencies may occur at other locations in Ojai Valley or Ventura County and the specific conditions of an emergency evacuation could result in evacuation behavior that diverges from the definitions and assumptions used for this analysis. As a result, the identified scenarios and evacuation constraints represent informed estimates of the most likely potential evacuation scenario footprints and capacity constraints based on available data.

DEVELOPING FIRE SCENARIOS

Five fire scenarios were developed to understand the potential for congestion during an evacuation. Figure 1 shows the three-step scenario development process.

Figure 1. General Fire Scenario Development Approach



1. A **fire hazard analysis** was conducted to identify where fires are more likely to occur and likely fire behavior using existing and historical data, including past wildfire history, ignitions, and local environmental settings. This analysis relied on the data and mapping of wildfire risk documented in the prior section of the report.

2. A **vulnerability assessment** was conducted to identify locations with higher risks due to social or physical vulnerabilities, and coping capacity, such as access to firefighting resources.
3. Findings from the fire hazard analysis and vulnerability assessment, as well as input from the TAG, were used to **identify representative, worst-case wildfire scenarios** that would likely stress the roadway network during evacuations. These wildfire scenarios were selected to identify locations that would have a high impact on the more populated areas of the County and provided geographic diversity for evacuations. Note that the wildfire scenarios were modeled without the impact of fire suppression activities, and often with atypical, adverse weather conditions to capture worst-case results.

The process resulted in five fire scenarios that describe hypothetical scenarios in Ojai Valley:

- Upper Ojai Fire Scenario
- Ojai Fire Scenario
- Mira Monte Fire Scenario
- Wheeler Gorge Fire Scenario
- Foster Park Fire Scenario

MODELING TRAVEL BEHAVIOR

For each of the five fire scenarios, the Ventura County Transportation Model (VCTM) was used to evaluate potential for congestion from evacuating vehicles in two time periods: 1) directly following wildfire ignition and 2) as the wildfire spread, necessitating a broader evacuation. The use of the existing VCTM was chosen to reduce the number of travel behavior assumptions and account for regional background traffic that may be occurring during an evacuation. For each period, fire spread was used to identify which section of the Ojai Valley would be evacuating, referred to as evacuating zones. Within the identified evacuation zones, evacuation travel patterns were determined and evacuation trips were estimated to measure the potential for roadways to become congested. Modeling travel behavior during an evacuation is done in three steps:

1. **Assigning Evacuation Stages** – This step determines the proportion of community members that would evacuate under different evacuation orders.
2. **Setting Travel Patterns** – The second step establishes the travel activity in response to the emergency hazard scenarios, including identifying how the community area will be modeled to evaluate staged evacuation across different areas of the Ojai Valley and Ventura County.
3. **Evacuation Trips and Routing** – The final step calculates trip routes, volumes, and roadway capacities during the modeled evacuation.

The approach for each of the three steps is discussed in the following subsections.

Step 1. Assigning Evacuation Stages

First, for each wildfire scenario, evacuation zones were selected if they were impacted by the wildfire spread over a 24-hour period. Each evacuation zone is assigned one of three stages:

- **Evacuation** – Community members living, working, or visiting the zone are ordered to evacuate immediately.
- **Standby** – Community members living, working, or visiting the zone are ordered to prepare for an evacuation, but are not ordered to leave immediately.
- **No Action** – Community members living, working, or visiting the zone do not need to evacuate or prepare for an evacuation.

Evacuation stages were assigned based on proximity to fire spread and discussions with staff. Evacuation zones within 0-12 hours of fire spread were assigned an Evacuation order. Evacuating zones within 12-24 hours of fire spread were assigned a Standby order. Zones that were not impacted by the wildfire were assigned a No Action order.

Step 2. Setting Travel Patterns

Next, travel patterns were determined for each wildfire scenario. Travel activity is adjusted in the travel demand model from normal conditions (i.e., no evacuation) to evacuation conditions. Evacuations are modeled with emphasis on key roadways and destinations to mimic where community members would go to in an evacuation to reach safety.

ESTIMATING TRAVEL ACTIVITY

Kittelson modeled transportation activity by assigning each evacuation zone as a combination of *Baseline Travel* and *Evacuation Travel*. Baseline Travel was defined as the normal travel patterns included in the regional transportation model. Evacuation Travel was defined as the estimated trips from each evacuation zone based on the population characteristics of the zone and evacuation rates. The evacuation travel is added to the baseline travel to develop an overall trip estimate. Table 1 shows each of the evacuation stages and associated baseline and evacuation travel assumptions. The estimated activity factors are based on survey results from people impacted by prior fires in California in UC Berkeley's *Review of California Wildfire Evacuations from 2017 to 2019* (pg. 37-38).¹

¹ Wong, S., Broader, J. and Shaheen, P., 2022. Review of California Wildfire Evacuations from 2017 to 2019. [online] Escholarship.org. Available at: <<https://escholarship.org/uc/item/5w85z07g>>

Table 1: Evacuation Stage Traffic Mix

Stage	Baseline Activity (% of Baseline Model Travel)	Evacuation Activity (% Households & Visitor Evacuates)
No Action	100%	0%
Standby ¹	75%	25%
Evacuation ²	10%	90%

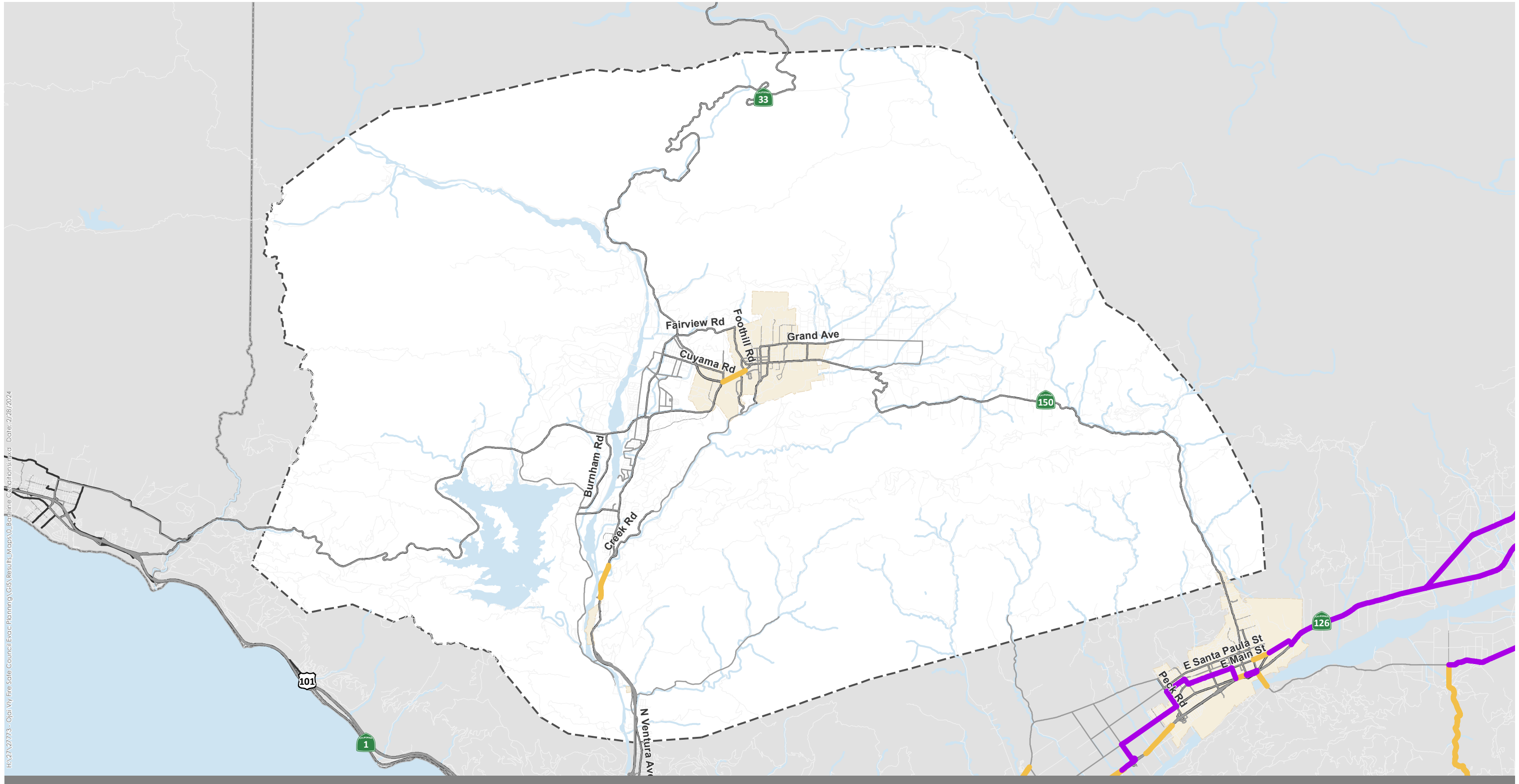
1 Based on finding that 25% to 75% of respondents evacuated prior to mandatory evacuation orders.

2 Based on finding that 3% to 13% of respondents did not evacuate under a mandatory evacuation order.

Evacuations were modeled during a typical PM peak hour with evacuation traffic layered on top of baseline evening peak hours. As a result, some facilities, like SR-33, already have a high volume of traffic and are more susceptible to result in over-capacity results if an evacuation were to occur under these conditions. Figure 2 presents the PM peak hour roadway conditions in Ojai Valley illustrating locations that are approach (above 90% of roadway capacity) or exceed roadway capacity in the Ojai Valley. The roadways meeting these thresholds include:

- SR-150 from Bristol Road to SR-33 (Ojai)
- SR-33 from Creek Road to Nye Road (Casitas Springs)

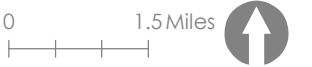
Additionally, evacuation traffic was distributed with an emphasis on evacuation travel heading westbound and southbound to destinations outside the Ojai Valley and Ventura County where possible. This distribution was selected based on feedback from OVFSC and the TAG that evacuees often chose to evacuate south towards Ventura or west towards Carpinteria and Santa Barbara.



Maximum Roadway Capacity

- Over Capacity (>100%)
- Approaching Capacity (90-99%)
- Below Capacity (< 90%)

- City Boundary
- Ojai Valley
- County Boundary



Step 3. Evacuation Trips and Routing

Finally, evacuation trips are calculated to understand how many vehicles would be evacuating for each wildfire scenario. Then, evacuation trips are modeled from their origin (i.e., the evacuation zone) to a predetermined destination to model where capacity issues may arise on the roadway network.

NUMBER OF EVACUATING TRIPS

The analysis considered human settlement activities in communities such as the number of existing houses, planned new housing, other structures, typical household size, vehicles per household, number of heavy vehicles and trailers, commercial, industrial, and public uses, as well as the roadway network including number of lanes, roadway capacity, and roadway segments lengths to determine the envelopes of each evacuation area.

Kittelson used U.S. Census data and ITE Trip Generation Rates to convert the number of households and non-residential land uses into vehicle counts to estimate the number of evacuating trips for each evacuation zone. One finding from the UC Berkeley report.¹ was that evacuees tended to travel with multiple vehicles per household. 2017-2021 American Community Survey (ACS) US Census data was used to understand the average number of vehicles per household. In Ventura County, households have an average of two vehicles per household. The UC Berkeley report also identified that a substantial share of households evacuated with a towed item, such as a camper or trailer for animals. The survey data showed that 6.3% to 20.5% of households towed an item (pg. 49). The model estimated that 10% of trips were heavy vehicles or vehicles that towed an item.

ROUTING EVACUATION TRIPS

Evacuation trips are routed based on the roadway network included in the VCTM. The model includes major roadways and other routes where congestion occurs for use in typical traffic analysis studies; however, local roads are often only included as “connectors” to the model network. Consequently, the model may not capture potential locations of congestion on smaller roads serving individual communities during an evacuation though the highest congestion is expected on major egress roadways. Kittelson modeled trip patterns using the typical capacities for each roadway within and outside the Ojai Valley. The scenarios represent conditions without implementation of any evacuation strategies, such as manual traffic control or contraflow lanes, which could increase roadway capacity in one direction versus another.

In discussions with OVFSC staff and the TAG, evacuation destinations were determined for each fire scenario. The identified evacuation destinations include:

- City of Santa Paula
- City of Ventura
- City of Carpinteria
- City of Santa Barbara

In some scenarios, Nordhoff High School in Meiners Oaks was assumed as a temporary shelter in place location for a small proportion of people evacuating. Additionally, for each scenario, Kittelson accounted for pre-determined road closures and limitations on roadway capacity due to roadway and environmental factors.

Roadway Evacuation Assessment Results

During wildfires, roadway systems can quickly become strained as evacuating vehicles leave an area at the same time. This section evaluates the Ojai Valley roadway system in response to modeled fire scenarios and is organized into two parts. First, it identifies locations in the Ojai Valley where potential congestion could increase evacuation times based on an evaluation of several fire scenarios. Second, it identifies vulnerable populations in Ojai Valley that may need additional assistance during an evacuation.

NETWORK CAPACITY RESULTS

The network capacity analysis was conducted for two time periods for the Upper Ojai, Ojai, Mira Monte, and Wheeler Gorge scenarios and for one time period for the Foster Park scenario. Since the Foster Park wildfire scenario would impact SR-33 soon after fire ignition, evacuations would likely occur for the Oak View, Casitas Springs, and Foster Park communities all at once. The results represent the peak hour conditions for an evacuation when non-evacuation traffic would be at its highest levels.

The following locations were identified to be likely locations of congestion during evacuations in all five scenarios:

1. **SR-33** from Ojai to Oak View, impacting the communities of Mira Monte, Casitas Springs, and Oak View
2. **SR-150** throughout Ojai Valley, impacting Ojai and Meiners Oaks
3. **Arterial/Collector Roads** connecting to State Routes, such as:
 - South Ventura Road/Creek Road
 - Burnham Road
 - Santa Ana Road/Santa Ana Boulevard
 - Fairview Road/Foothill Road

The approach used to model evacuations is less suited for identifying congestion on specific local roads, where evacuation traffic may converge, such as at a single egress for a community area. As a result, the analysis did not identify congestion or over capacity conditions on smaller local roads. However, it does indicate that during evacuations volumes would be expected to grow substantially relative to normal patterns, which could produce operational constraints that interfere with evacuations.

Additionally, based on community and stakeholder feedback during the engagement process, the following additional roadways were identified as locations that are expected to have high volumes from evacuating traffic in the modeled scenarios:

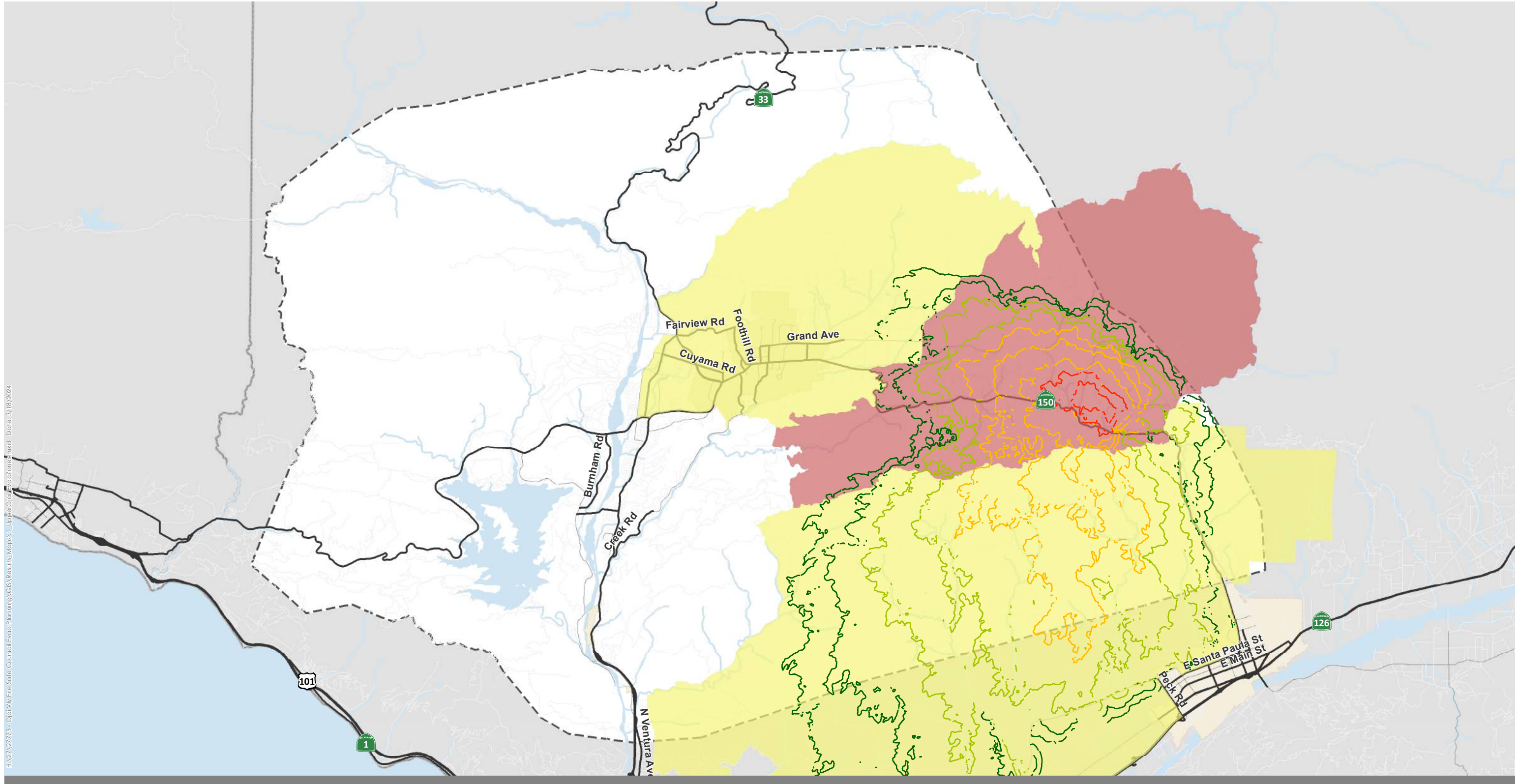
- SR-33/Maricopa Highway, specifically where SR-33 meets SR-150 in Meiners Oaks (the "Y")
- SR-150 through Mira Monte
- N Ojai Road (Ojai)
- Villanova Road (Ojai/Mira Monte)
- La Luna Avenue (Meiners Oaks/Mira Monte)
- El Roblar Drive to Rice Road (Meiners Oaks/Mira Monte)

Detailed parameters and results for each of the five modeled evacuation scenarios are discussed below.

Upper Ojai

The Upper Ojai fire scenario assumes a fire would ignite in the Upper Ojai area and spread southwest towards Ojai, Santa Paula, and Ventura (Figure 3). An evacuation order would be given for residents, workers, and visitors in Ojai east of SR-33 and north of SR-150. An evacuation warning would be given to the surrounding areas, including Meiners Oaks and Mira Monte, and the rest of Ojai.

An evacuation is expected to occur in two phases – first, in the 0 to 6 hours after the wildfire ignites and then in the 6 to 24 hours after wildfire ignition. Evacuations are assumed to occur on SR-150 east towards Santa Paula and on SR-150 west towards Ojai. It is assumed that a proportion of people evacuating would find temporary shelter in Meiners Oaks at Nordhoff High School in the first phase. In the second phase, remaining residents, workers, and visitors would evacuate to Ojai or out of the Valley towards Santa Paula, Ventura, and Carpinteria.



Evacuating Areas

- Immediate Evacuation
- Evacuation Warning

Fire Spread

- <6 hrs
- 6 - 12 hrs
- 12 - 18 hrs
- 18 - 24 hrs

- City Boundary
- Ojai Valley
- County Boundary



PHASE 1 - 0 TO 6 HOURS AFTER WILDFIRE IGNITION

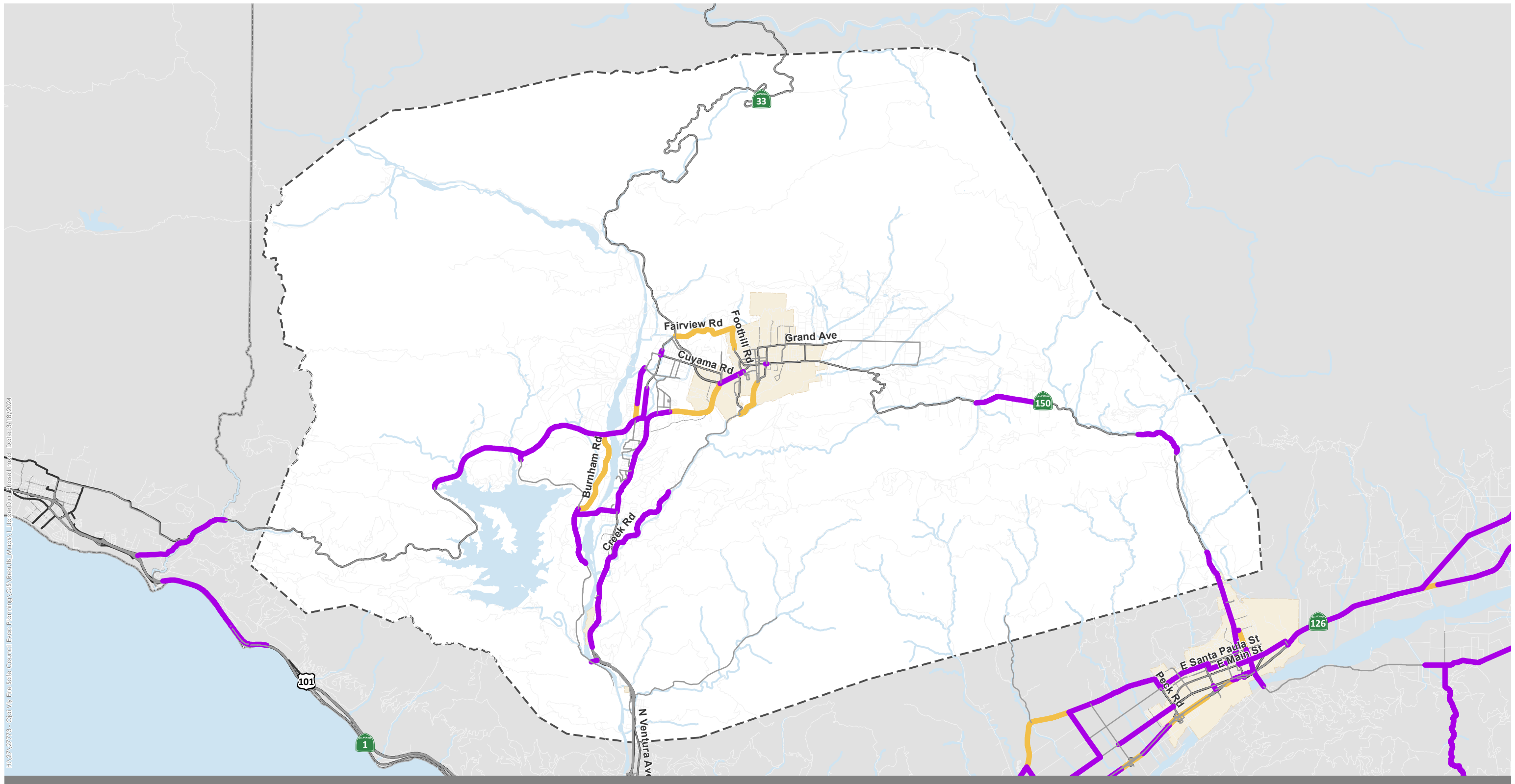
In the first phase, an evacuation would primarily be west towards Ojai or south towards Santa Paula, both using SR-150 to evacuate. The model indicates substantial and immediate over capacity conditions at the following locations (Figure 4):

- **SR-150** is expected to be over capacity at the following locations:
 - along roadway sections between Highwinds Road and Topa Vista Lane and near Thomas Aquinas College are expected to be over capacity; and,
 - from Loma Drive to US Forest Service (USFS) Casitas Fire Station 51 at Lake Casitas.
- **SR-33** is expected to be over capacity at the following locations:
 - between SR-150 to Santa Ana Boulevard; and,
 - from Creek Road to Oak View.
- **Santa Ana Road/Santa Ana Boulevard** is expected to be over capacity.
- **Creek Road** from Oak Knoll Road to SR-33 is expected to be over capacity.
- **Fairview Road** from SR-33 to Foothill Road is expected to be near capacity.
- **Burham Road** is expected to be near capacity.
- **South Ventura Street** from South Montgomery Street to Creek Road is expected to be near capacity.

PHASE 2 – 6 TO 24 HOURS AFTER WILDFIRE IGNITION

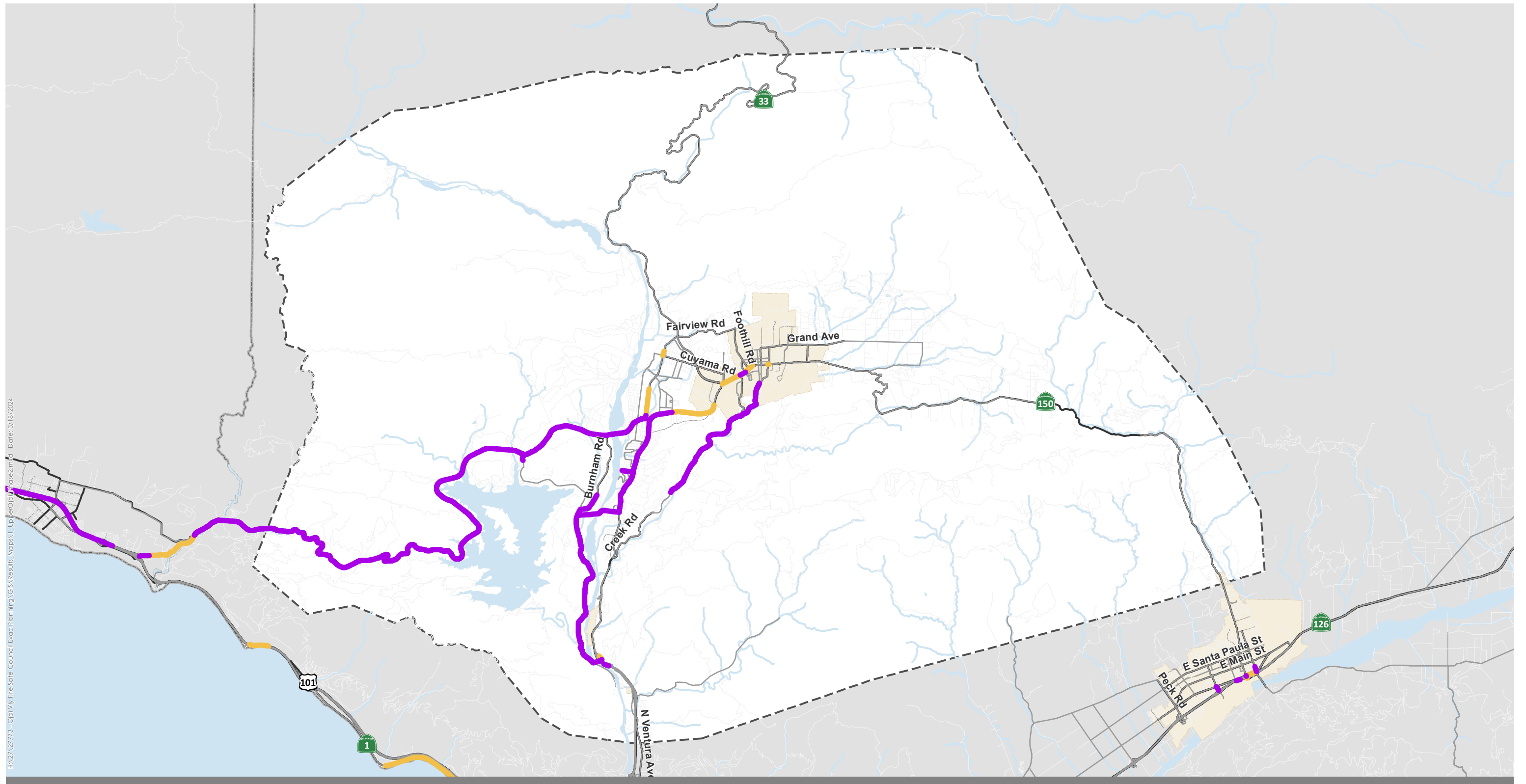
In the second phase, evacuations would primarily continue west towards Ojai using SR-150 to evacuate to safety. Road closures were assumed on SR-150 East towards Santa Paula for background traffic, but still open for residents, employees, and visitors evacuating from the immediate area. The model indicates substantial and immediate over capacity conditions at the following locations (Figure 5):

- **SR-33** from SR-150 to Oak View is expected to be over capacity
- **SR-150** from Loma Drive to the Ventura County/Santa Barbara County line is expected to be over capacity.
- **Santa Ana Road** and **Santa Ana Boulevard** from Burnham Road to SR-33 are expected to be over capacity.
- **South Ventura Street** from South Montgomery Street to Creek Road is expected to be over capacity.
- **SR-150** between Canada Street and Loma Drive is expected to be near capacity.

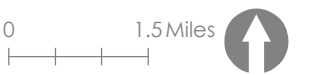


- Maximum Volume-to-Capacity Ratio**
- Over Capacity (>100%)
 - Approaching Capacity (90-99%)
 - Below Capacity (< 90%)
- City Boundary
- Ojai Valley
- County Boundary





- Maximum Volume-to-Capacity Ratio**
- Over Capacity (>100%)
 - Approaching Capacity (90-99%)
 - Below Capacity (< 90%)
- City Boundary
- Ojai Valley
- County Boundary



Ojai

The Ojai fire scenario assumes a fire would ignite north Ojai and spread southwest towards downtown Ojai and Meiners Oaks (Figure 6). An evacuation order would be given for residents, workers, and visitors in Ojai east of SR-33 and north of SR-150. An evacuation warning would be given to the surrounding areas, including Meiners Oaks and Mira Monte, and the rest of Ojai.

An evacuation is expected to occur in two phases – first, in the 0 to 12 hours after the wildfire ignites and then in the 12 to 24 hours after wildfire ignition. Evacuations are assumed to occur on SR-150 east towards Upper Ojai / Santa Paula, on SR-150 west towards Carpinteria / Santa Barbara, and on SR-33 south towards Ventura. It is assumed that a proportion of people evacuating would find temporary shelter in Meiners Oaks at Nordhoff High School in the first phase. In the second phase, remaining residents, workers, and visitors would evacuate out of Ojai Valley towards Santa Paula, Ventura, Carpinteria, and Santa Barbara.

PHASE 1 - 0 TO 12 HOURS AFTER WILDFIRE IGNITION

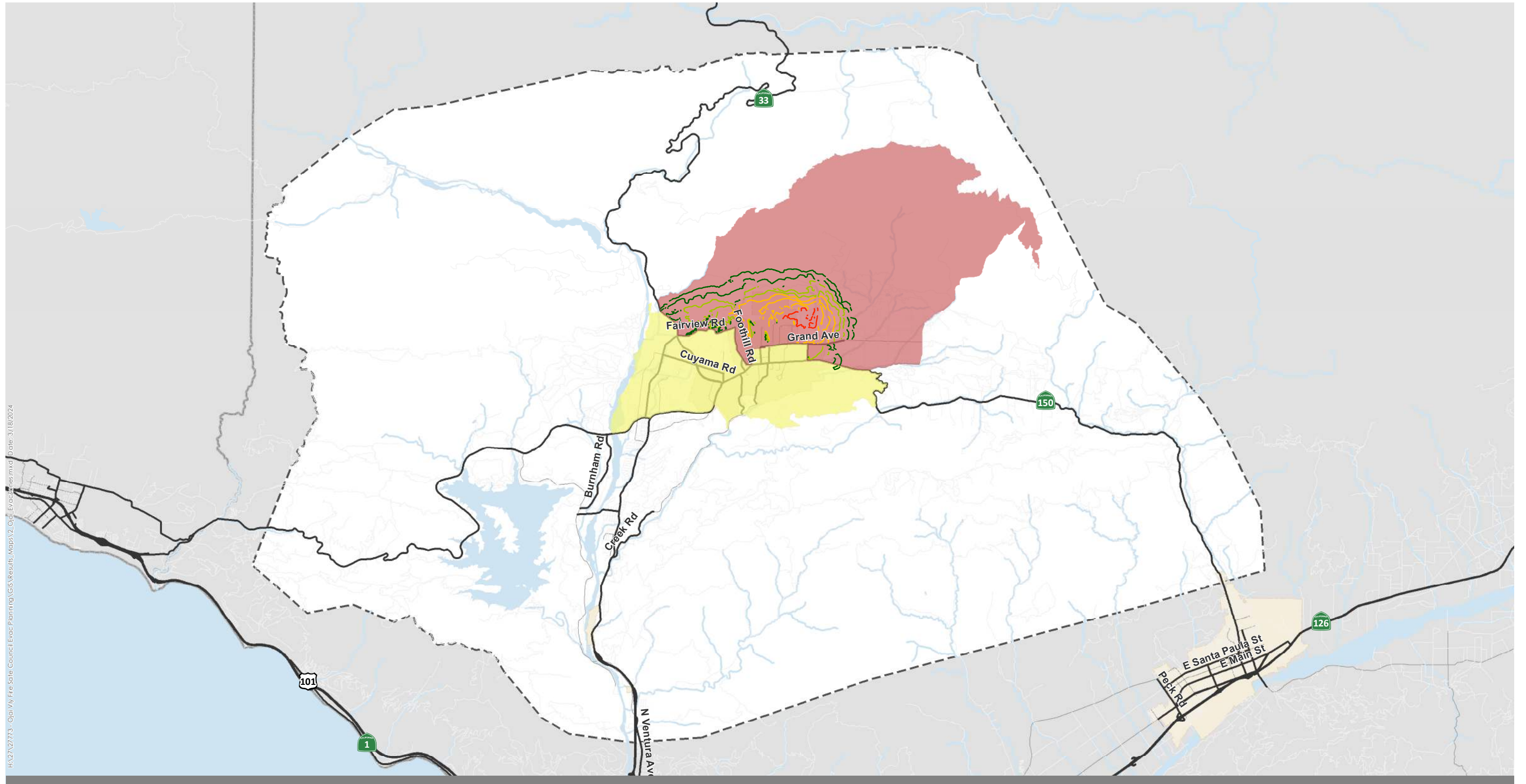
In the first phase, an evacuation would primarily be east on SR-150 towards Upper Ojai, west on SR-150 towards Meiners Oaks / Carpinteria, and south on SR-33 towards Casitas Springs / Ventura. The model indicates substantial and immediate over capacity conditions at the following locations (Figure 7):

- **SR-150** throughout Ojai Valley is expected to be over capacity.
- **SR-33** from SR-150 to Oak View is expected to be over capacity.
- **S Ventura Road / Creek Road** is expected to be over capacity.
- **Burnham Road / Santa Ana Road / Santa Ana Boulevard** are expected to be over capacity.
- Several roads through Ojai are expected to be over capacity, including **Grand Avenue, Reeves Road, McAndrew Road, Fairview Road, Foothill Road, and Cuyama Road.**
- **SR-33** from Oak View to the City of Ventura is expected to be near capacity.

PHASE 2 – 12 TO 24 HOURS AFTER WILDFIRE IGNITION

In the second phase, a road closure is assumed on SR-150 through Ojai for background traffic. Residents, workers, and visitors who are east of the fire spread are assumed to evacuate on SR-150 east towards Upper Ojai / Santa Paula. Those who are west or south of the fire spread are assumed to evacuate west on SR-150 towards Carpinteria or south on SR-33 towards Ventura. The model indicates substantial and immediate over capacity conditions at the following locations (Figure 8):

- **SR-150** from S Rice Road to the USFS Casitas Fire Station 51 at Lake Casitas is expected to be over capacity
- **SR-33** from SR-150 to Barbara Road and Creek Road to Oak View is expected to be over capacity.
- **Santa Ana Road** from Santa Ana Boulevard to south of Newman Ranch Road is expected to be over capacity.
- **Creek Road** from S Ventura Road to SR-33 is expected to be near capacity.



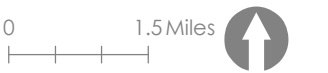
Evacuating Areas

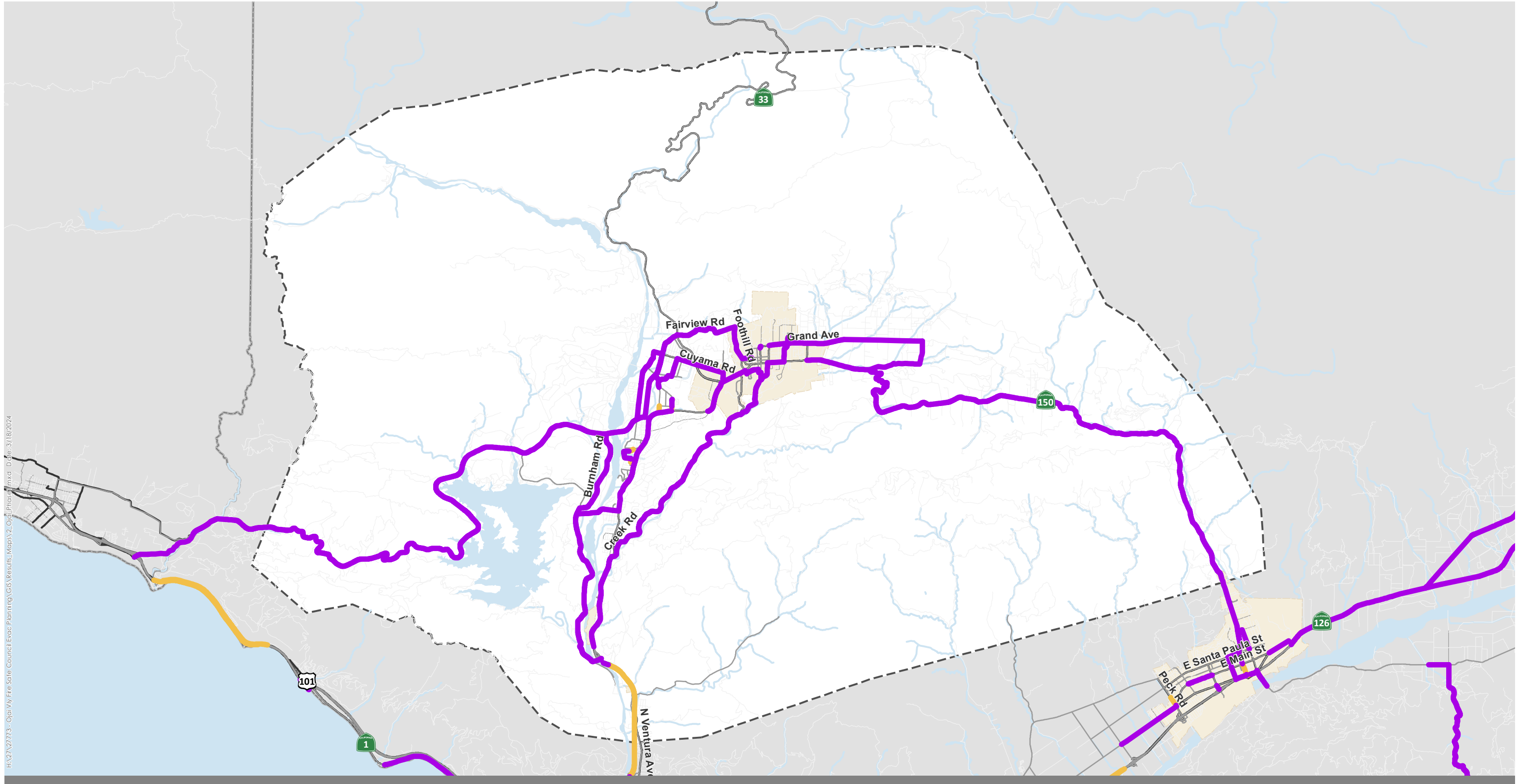
- Immediate Evacuation
- Evacuation Warning

Fire Spread

- <6 hrs
- 6 - 12 hrs
- 12 - 18 hrs
- 18 - 24 hrs

- City Boundary
- Ojai Valley
- County Boundary



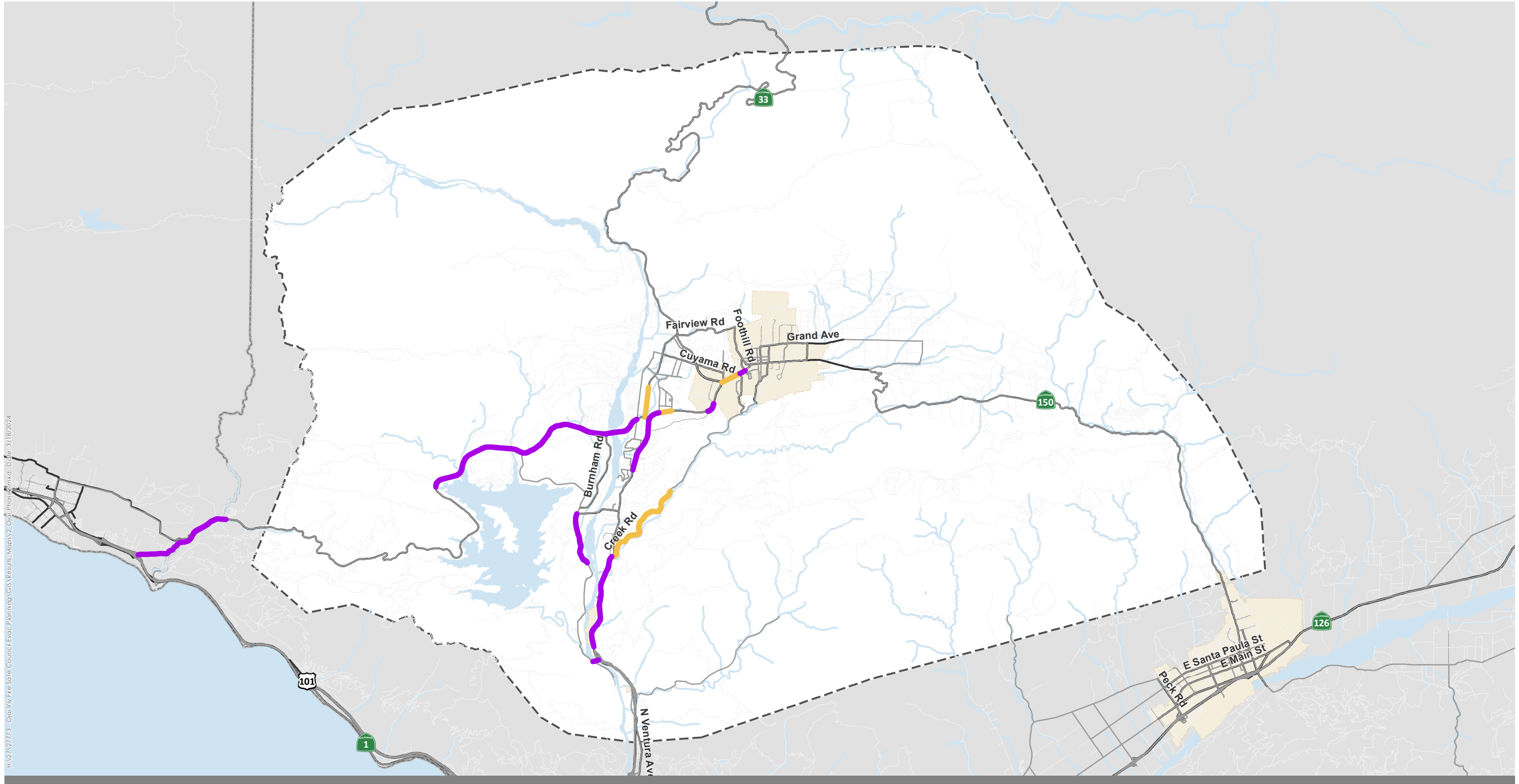


Maximum Roadway Capacity

- Over Capacity (>100%)
- Approaching Capacity (90-99%)
- Below Capacity (< 90%)

- City Boundary
- Ojai Valley
- County Boundary





Maximum Roadway Capacity

- Over Capacity (>100%)
- Approaching Capacity (90-99%)
- Below Capacity (< 90%)

- City Boundary
- Ojai Valley
- County Boundary



Mira Monte

The Mira Monte fire scenario assumes a fire would ignite east of Mira Monte and primarily spread southwest towards Oak View, Casitas Springs, and Foster Park (Figure 9). An evacuation order would be given for residents, workers, and visitors in Ojai, Mira Monte, and Oak View. An evacuation warning would be given to the surrounding areas, Casitas Springs and Foster Park.

An evacuation is expected to occur in two phases – first, in the 0 to 6 hours after the wildfire ignites and then in the 6 to 24 hours after wildfire ignition. Evacuations are assumed to occur on SR-150 west towards Carpinteria / Santa Barbara and south on SR-33 towards Ventura. It is assumed that a proportion of people evacuating would find temporary shelter in Meiners Oaks at Nordhoff High School during the first phase. In the second phase, all residents, workers, and visitors in the wildfire area would evacuate out of Ojai Valley towards Ventura.

PHASE 1 - 0 TO 6 HOURS AFTER WILDFIRE IGNITION

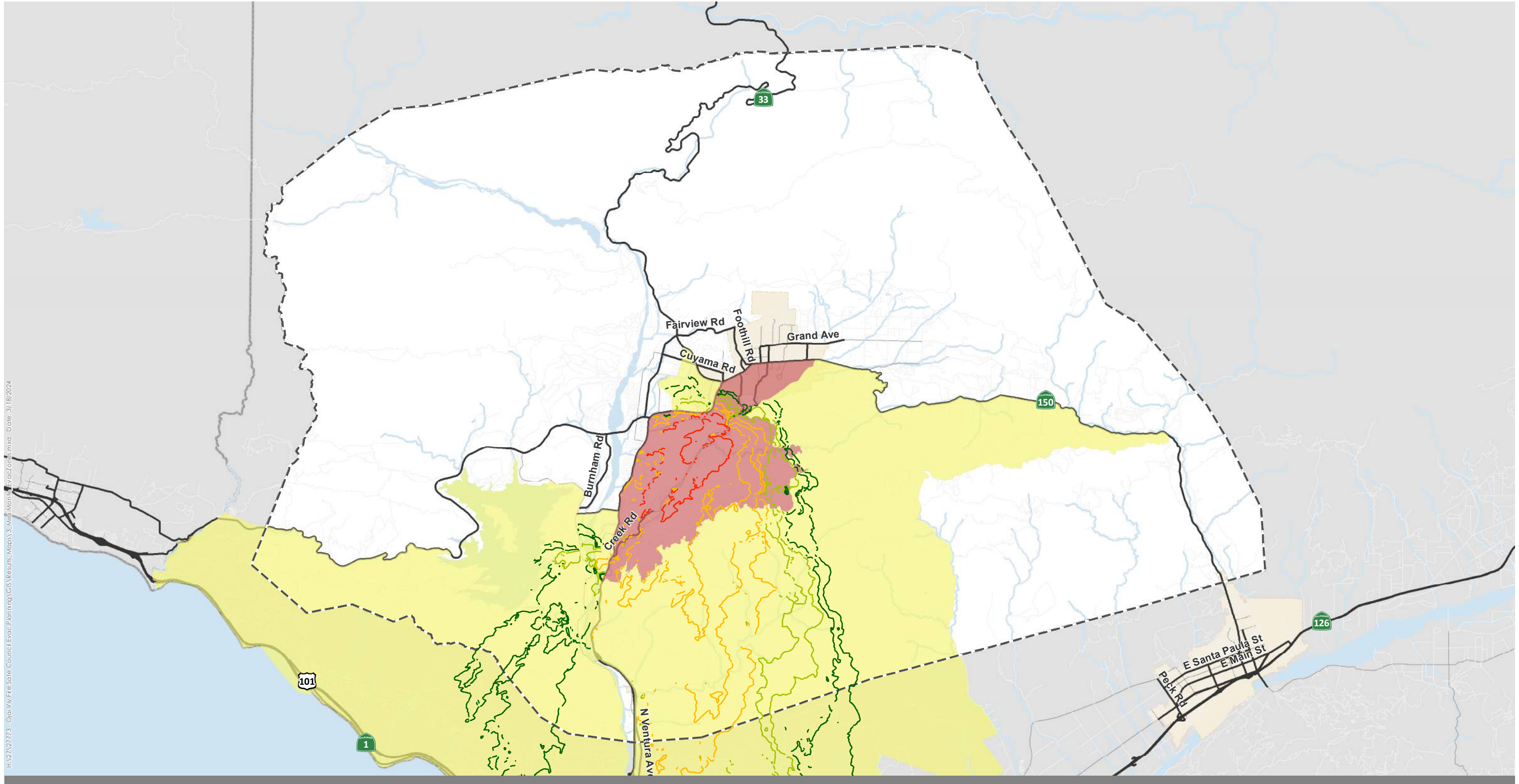
In the first phase, an evacuation would primarily be west on SR-150 towards Carpinteria or south on SR-33 towards Ventura. A small proportion of people are assumed to find temporary shelter in Meiners Oaks at Nordhoff High School. The model indicates substantial and immediate over capacity conditions at the following locations (Figure 10):

- **SR-150 West** from Ojai to Carpinteria is expected to be over capacity
- **SR-33 South** from Mira Monte to Oak View and from Casitas Springs to just north of Foster Park is expected to be over capacity
 - **SR-33 South** outside of Ojai Valley is expected to be near capacity as evacuees enter the City of Ventura
- **Burnham Road** from SR-150 to Santa Ana Road is expected to be over capacity
- **Creek Road** from Oak Knoll Road to SR-33 is expected to be over capacity
- **Santa Ana Road** from SR-150 to Burnham Road is expected to be near capacity

PHASE 2 – 6 TO 24 HOURS AFTER WILDFIRE IGNITION

In the second phase, evacuations would continue west along SR-150 towards Carpinteria and Santa Barbara. Road closures were assumed on SR-33 south towards Ventura for background traffic, but still open for residents, employees, and visitors evacuating from the immediate wildfire area. The model indicates substantial and immediate over capacity conditions at the following locations (Figure 11):

- **SR-150 West** towards Carpinteria:
 - is expected to be over capacity between the USFS Casitas Fire Station 51 and Santa Ana Road; and,
 - is expected to be near capacity between Santa Ana Road and Burnham Road.
- **SR-150 West** and **US-101 North** at the Ventura County/Santa Barbara County line is expected to be over capacity as evacuating traffic out of Ojai Valley arrive into Carpinteria.



Evacuating Areas

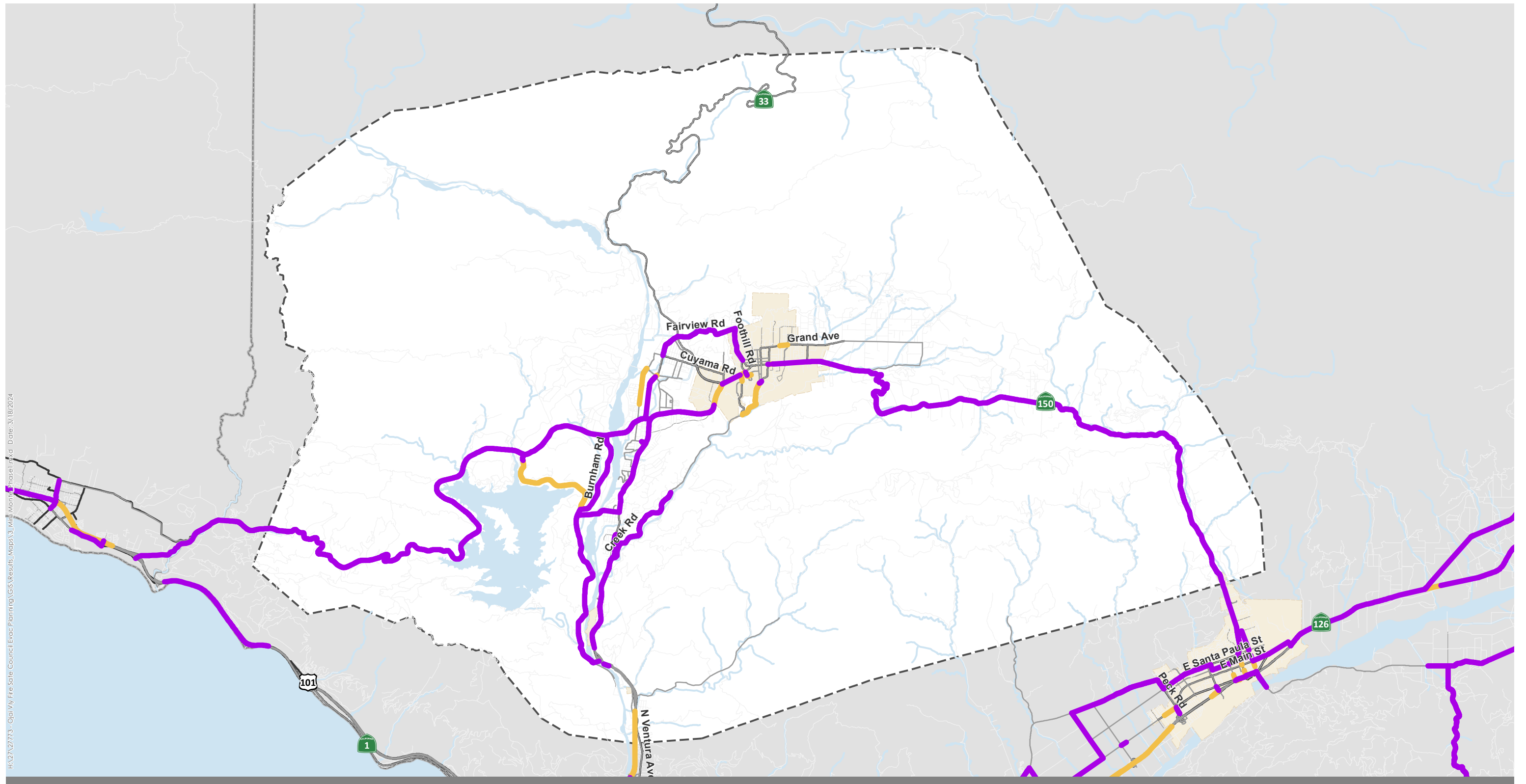
- Immediate Evacuation
- Evacuation Warning

Fire Spread

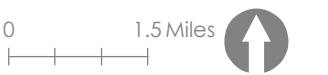
- <6 hrs
- 6 - 12 hrs
- 12 - 18 hrs
- 18 - 24 hrs

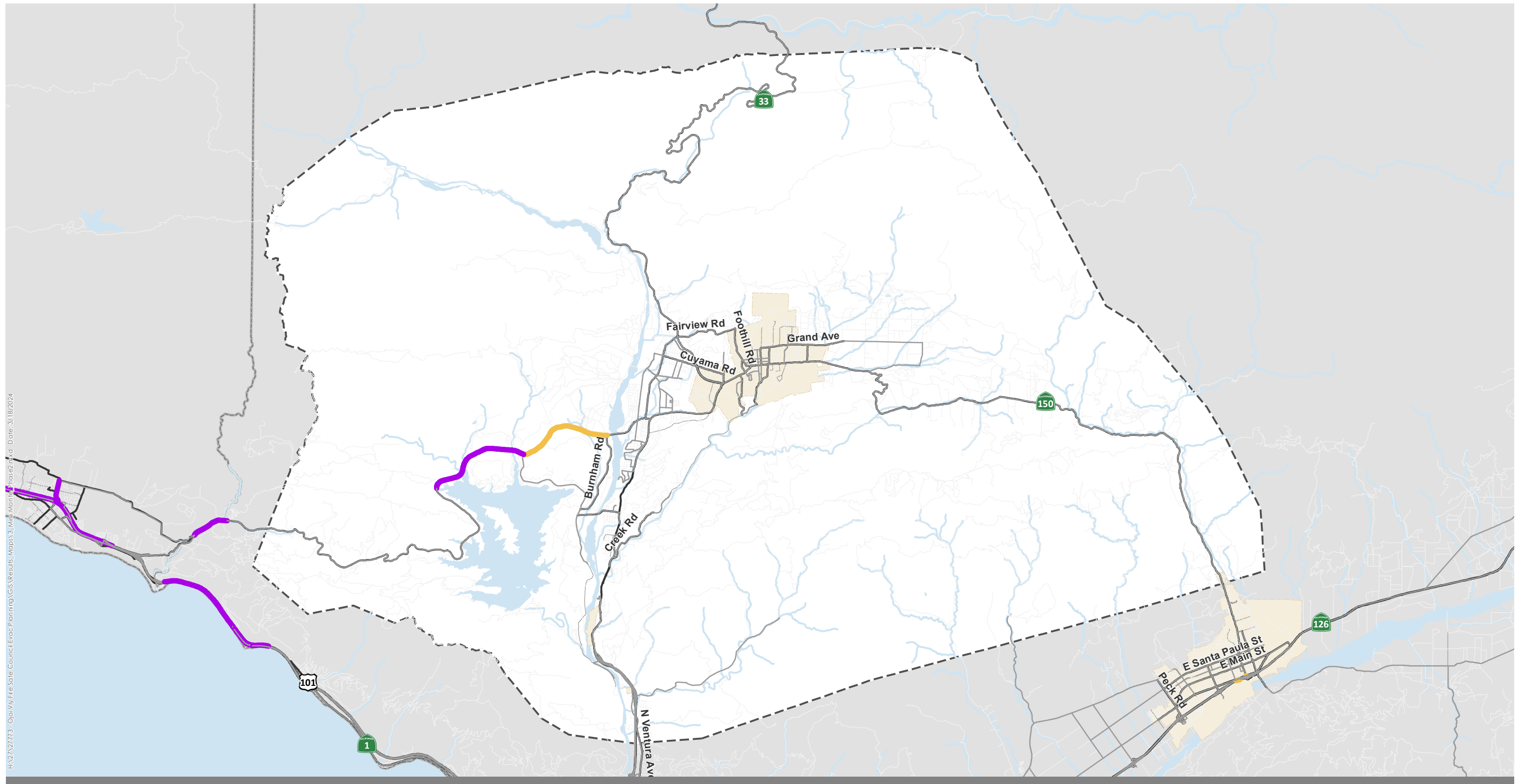
- City Boundary
- Ojai Valley
- County Boundary





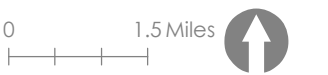
- Maximum Roadway Capacity**
- Over Capacity (>100%)
 - Approaching Capacity (90-99%)
 - Below Capacity (< 90%)
-  City Boundary
 Ojai Valley
 County Boundary





- Maximum Roadway Capacity**

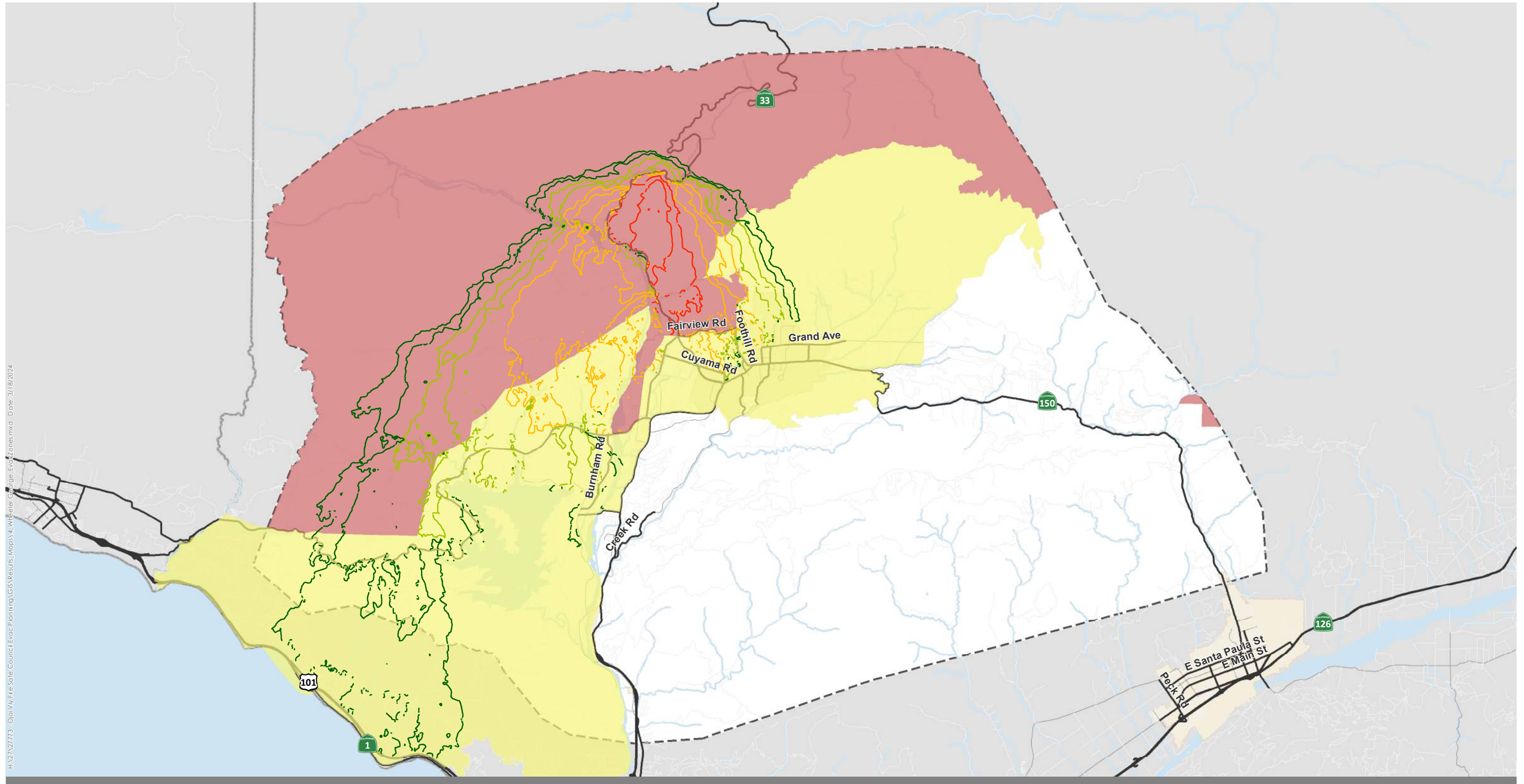
 - Over Capacity (>100%)
 - Approaching Capacity (90-99%)
 - Below Capacity (< 90%)
- City Boundary
 - Ojai Valley
 - County Boundary



Wheeler Gorge

The Wheeler Gorge fire scenario assumes a fire would ignite in the Wheeler Gorge area and spread south through the communities of Ojala, Ojai, and Meiners Oaks and further south towards Lake Casitas (Figure 12). An evacuation order would be given for residents, workers, and visitors in Wheeler Gorge, Ojai, and parts of Meiners Oaks and Mira Monte. An evacuation warning would be given to the surrounding areas, including Ojai, Meiners Oaks, Mira Monte, Oak View, Casitas Springs and Foster Park.

An evacuation is expected to occur in two phases – first in the 0 to 6 hours after the wildfire ignites and then in the 6 to 24 hours after wildfire ignition. Evacuations are assumed to primarily occur on SR-150 east towards Santa Paula and south on SR-33 towards Ventura. A small proportion of people are assumed to evacuate on SR-33 north towards Maricopa. It is assumed that no temporary shelters would be available in Ojai or Meiners Oaks and that all residents, workers, and visitors in the wildfire area would evacuate out of Ojai Valley in the first and second phases.



- | | | |
|-------------------------|--------------------|-----------------|
| Evacuating Areas | Fire Spread | City Boundary |
| Immediate Evacuation | <6 hrs | Ojai Valley |
| Evacuation Warning | 6 - 12 hrs | County Boundary |
| | 12 - 18 hrs | |
| | 18 - 24 hrs | |

Figure 12
Wheeler Gorge Fire Scenario - Evacuating Areas
Ojai Valley, California
Ojai Valley Fire Safe Council Evacuation Assessment

PHASE 1 - 0 TO 6 HOURS AFTER WILDFIRE IGNITION

In the first phase, an evacuation would primarily be on SR-150 E towards Upper Ojai or Santa Paula and SR-33 S towards Ventura. The model indicates substantial and immediate over capacity conditions at the following locations (Figure 13):

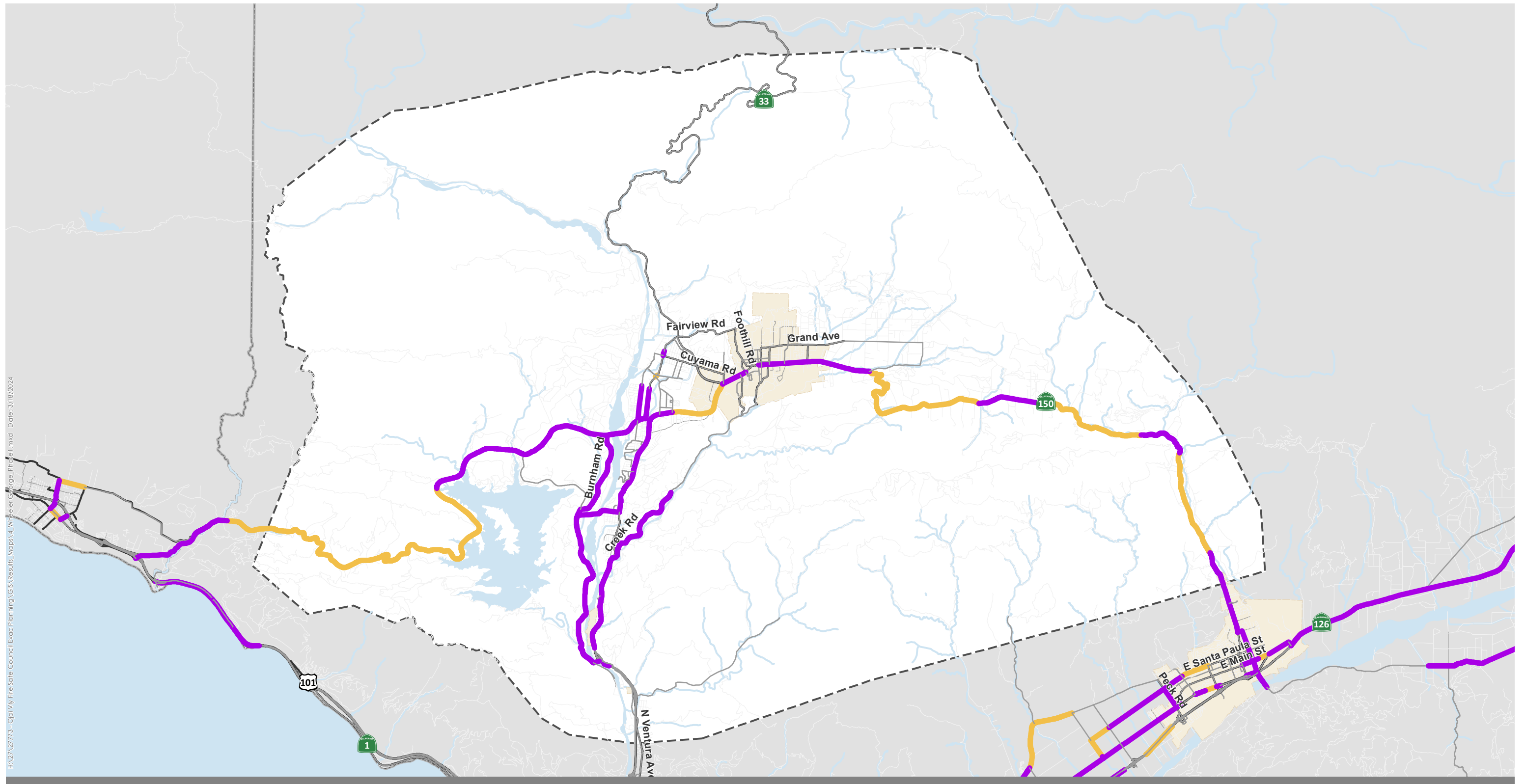
- **SR-150** is expected to be over capacity at the following locations:
 - through the City of Ojai;
 - from Loma Drive to the USFS Casitas Fire Station 51; and,
 - along roadway sections between Highwinds Road and Topa Vista Lane and near Thomas Aquinas College are expected to be over capacity.
- **SR-150** is expected to be near capacity at the following locations:
 - from Reeves Road east of Ojai through Santa Paula;
 - from SR-33 to Loma Drive; and,
 - from the USFS Casitas Fire Station 51 to the Ventura County/Santa Barbara County line.
- **SR-33** from Mira Monte to Oak View and from Casitas Springs to just north of Foster Park is expected to be over capacity.
- **Burnham Road** from SR-150 to SR-33 is expected to be over capacity.
- **Creek Road** from Oak Knoll Road to SR-33 is expected to be over capacity.

PHASE 2 – 6 TO 24 HOURS AFTER WILDFIRE IGNITION

In the second phase, evacuations would continue on SR-150 east towards Ojai and Santa Paula and on SR-33 south towards Ventura. Road closures were assumed on SR-150 east towards Carpinteria for background traffic, but still open for residents, employees, and visitors evacuating from the immediate area. The model indicates substantial and immediate over capacity conditions at the following locations (Figure 14):

- **SR-33** from SR-150 to Santa Ana Boulevard and from Creek Road to Oak View is expected to be over capacity.
- **SR-150** between Santa Ana Boulevard and USFS Casitas Fire Station 51 is expected to be over capacity.
- Sections of **SR-150** east of Ojai are expected to be over capacity:
 - from Gridley Road to Reeves Road;
 - between Highwinds Road and Topa Vista Lane; and,
 - near Thomas Aquinas College.
- **Burnham Road** and **Creek Road** are expected to be near capacity.

HA27\27773 - Ojai Valley Fire Safe Council Evac Planning\GIS\Results Maps\4. Wheeler Gorge Phase1.mxd Date: 3/18/2024

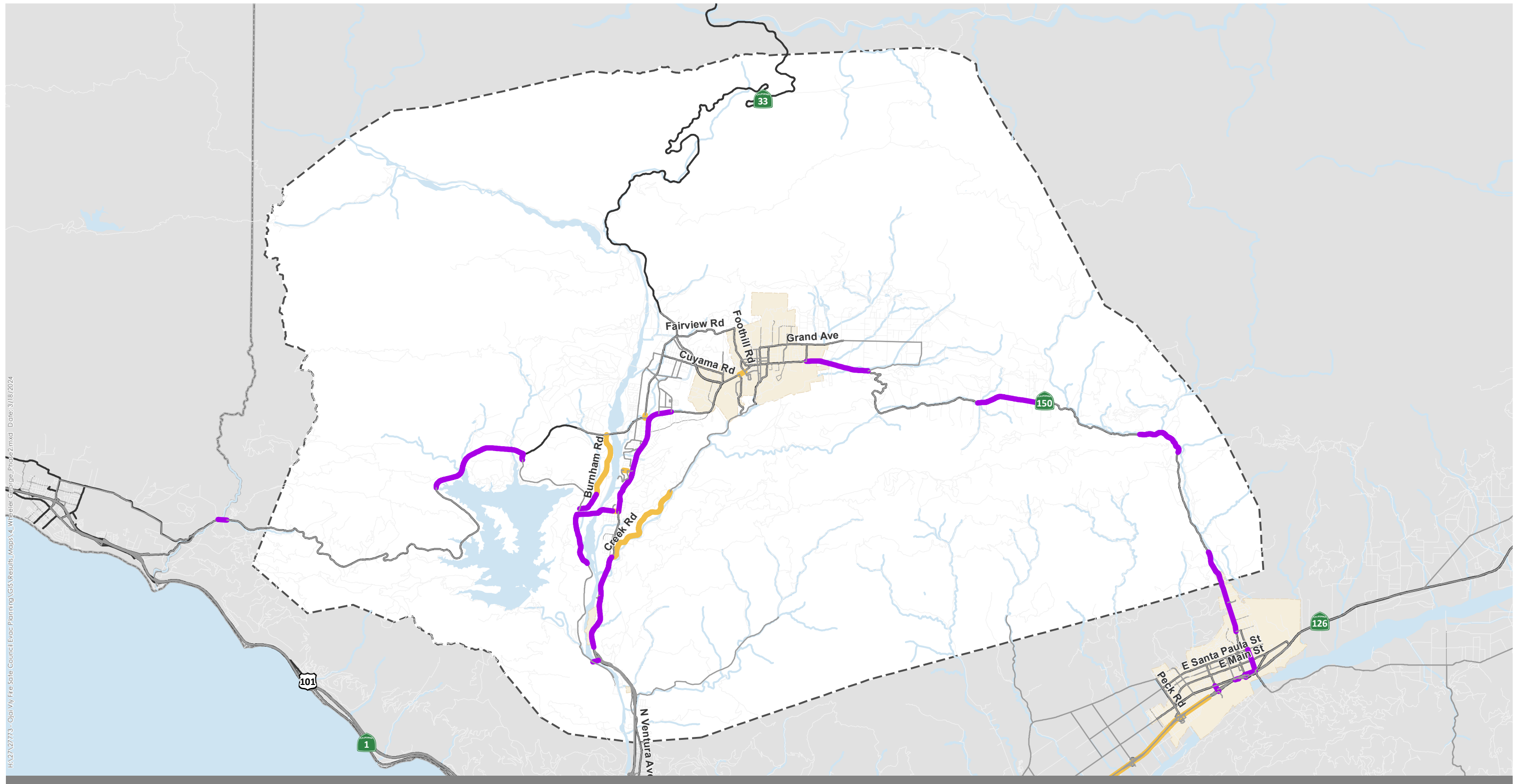


Maximum Roadway Capacity

- Over Capacity (>100%)
- Approaching Capacity (90-99%)
- Below Capacity (< 90%)

- City Boundary
- Ojai Valley
- County Boundary

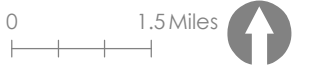
HA27\27773 - Ojai Valley Fire Safe Council Evac Planning\GIS\Results Maps\4. Wheeler Gorge Phase2.mxd Date: 3/18/2024



Maximum Roadway Capacity

- Over Capacity (>100%)
- Approaching Capacity (90-99%)
- Below Capacity (< 90%)

- City Boundary
- Ojai Valley
- County Boundary



Foster Park

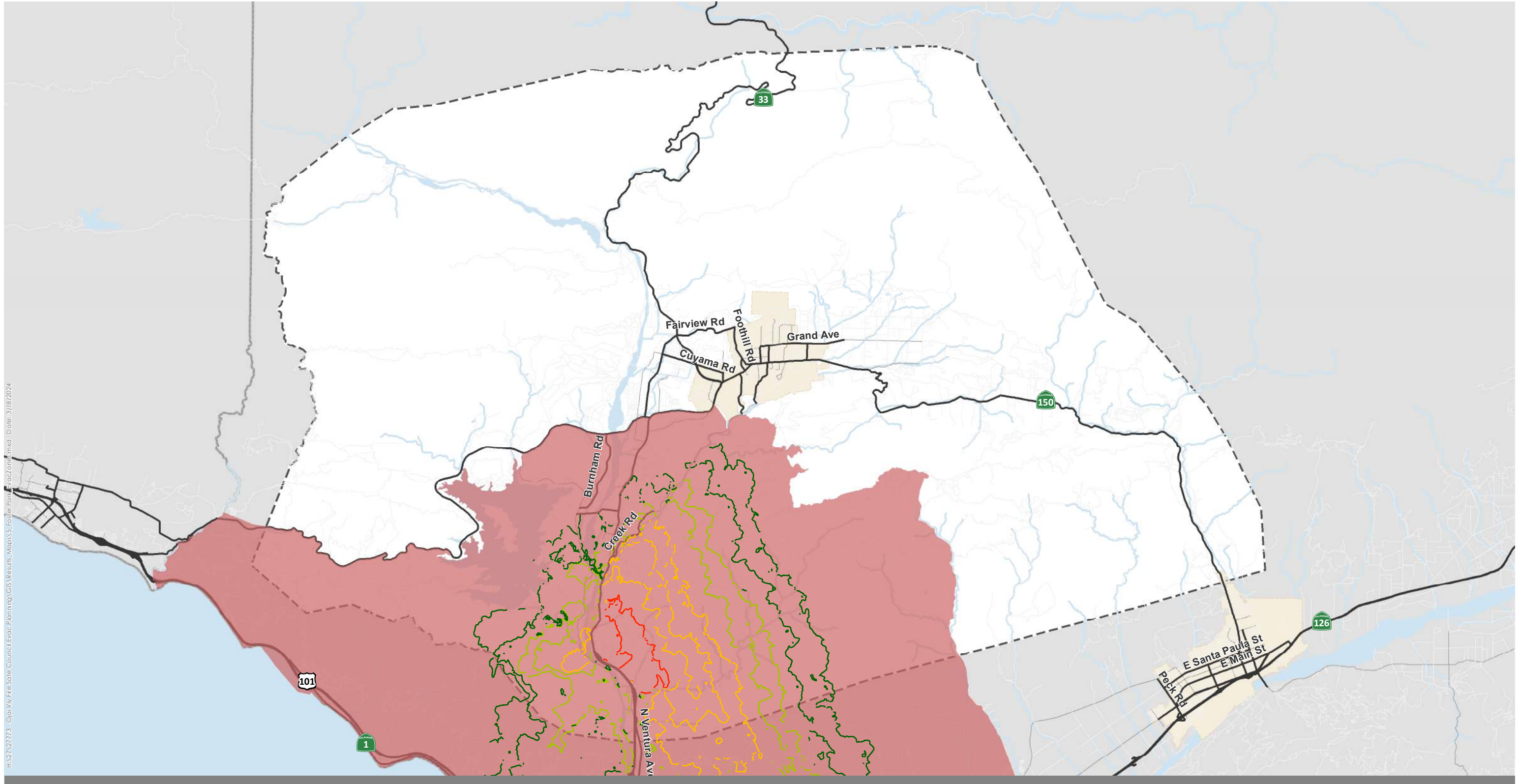
The Foster Park fire scenario assumes a fire would ignite near Casitas Springs and Foster Park and north towards Mira Monte and south towards Ventura (Figure 15). An evacuation order would be given for residents, workers, and visitors south of SR-150, including Mira Monte, Oak View, Casitas Springs and Foster Park.

An evacuation is expected to occur in one phase due to the proximity of residential areas and one major egress route – SR-33. Evacuations are assumed to use SR-33 north towards Meiners Oaks and Ojai or south towards Ventura. It is assumed that a small proportion of people evacuating would find temporary shelter in Meiners Oaks at Nordhoff High School, but the majority of people evacuating would travel towards Ventura or Ojai and go as far as Santa Paula, Carpinteria, and Santa Barbara.

PHASE 1 - 0 TO 24 HOURS AFTER WILDFIRE IGNITION

In the Foster Park wildfire scenario, evacuations were assumed to occur in one phase due to the wildfire igniting close to residents' homes and limited facilities to evacuate. An evacuation would occur on SR-33 towards Ojai to the north and Ventura to the south. The model indicates substantial and immediate over capacity conditions at the following locations (Figure 16):

- **SR-150** is expected to be over capacity throughout the Ojai Valley, except between North Ventura Avenue and East Villanova Road.
- **SR-33** from SR-150 to the City of Ventura is expected to be over capacity, except between North Ventura Avenue and Canada Larga Road.
- **Burham Road** and **Santa Ana Road** are expected to be over capacity.
- **Creek Road** is expected to be over capacity between Oak Knoll Road and SR-33 and approaching capacity between SR-150 and Oak Knoll road.



Evacuation Areas

Evacuate Immediately

Fire Spread

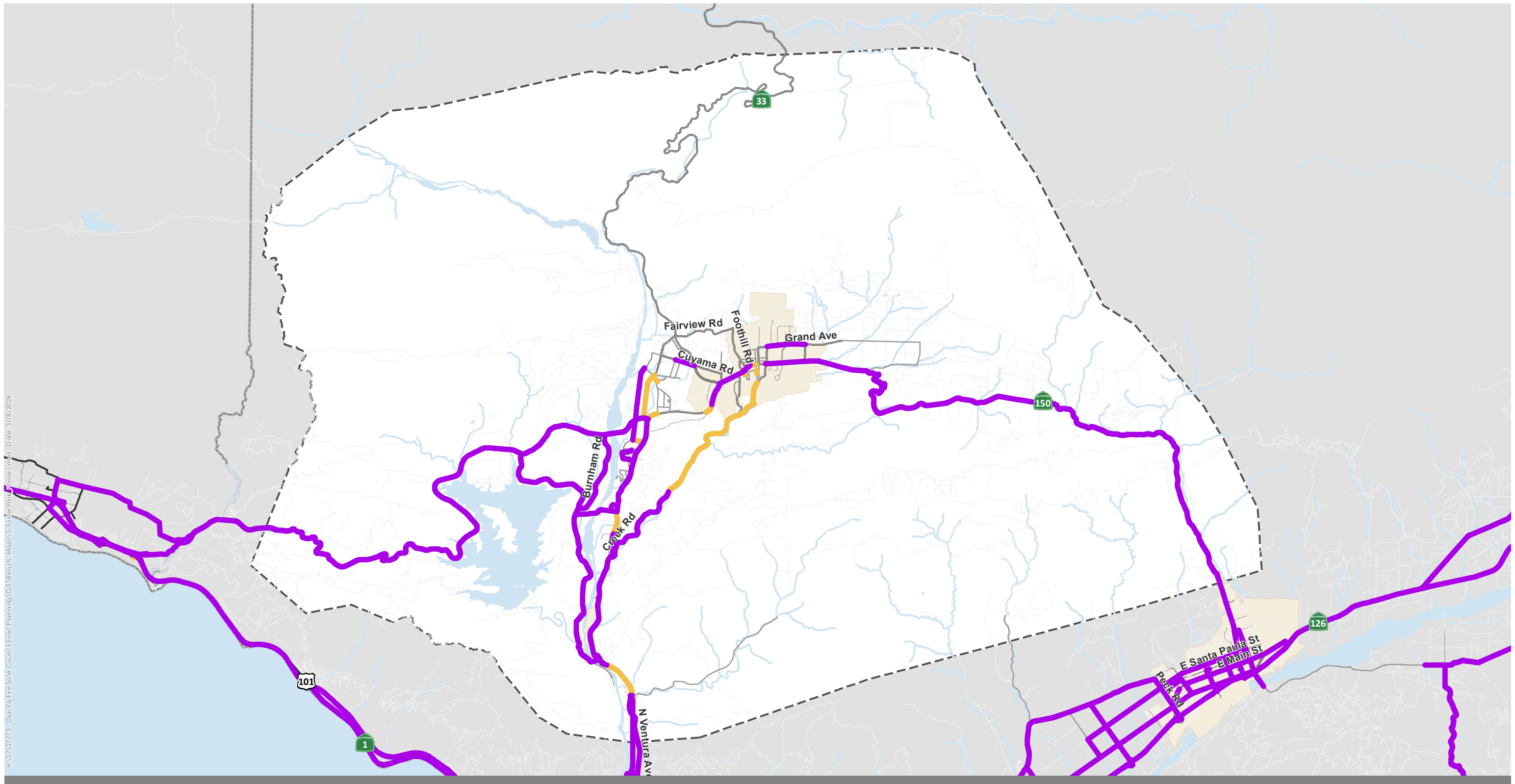
<6 hrs
6 - 12 hrs
12 - 18 hrs
18 - 24 hrs

City Boundary

Ojai Valley

County Boundary

0 1.5 Miles



Maximum Roadway Capacity

- Over Capacity (>100%)
- Approaching Capacity (90-99%)
- Below Capacity (< 90%)

- City Boundary
- Ojai Valley
- County Boundary

VULNERABLE POPULATIONS

In addition to understanding where roadway capacity issues may arise in an evacuation, it is equally as important to consider populations that may experience more vulnerability during evacuations. Vulnerable populations are groups of people with special characteristics that may prohibit them from evacuating safely, efficiently, or comfortably. The California Office of Emergency Services (CalOES) uses the term “Access and Functional Needs (AFN) Population” to capture similar populations. Characteristics can be related to a lack of transportation (e.g., personal cars or public transportation), socioeconomic factors (e.g., low income, non-English speakers, etc.), or physical impairments. Critically, vulnerable (or underserved) populations experience significant setbacks and negative impacts from disasters and emergencies. The vulnerable populations analysis aims to complement wildfire evacuation modeling by underscoring specific risks, vulnerabilities, and strategies for identified populations in Ojai Valley. Appendix C presents the full vulnerable populations analysis and methodology.

Identified Vulnerable Populations

A significant number of Ojai Valley residents will likely require additional resources, assistance, transportation options, and sheltering for a wildfire evacuation. While the analysis did not identify intersectionality, some groups may have compounding factors that could increase barriers or challenges during a wildfire evacuation. A few vulnerable populations stand out as most at-risk during evacuations for the Ojai Valley: Older Adults, Non-English Speaking, Low-Income, Individuals with Disabilities, and Carless Individuals or Households.

OLDER ADULTS

People aged 65 or over make up 25% of the population, or about 7,200 residents. They typically have lower levels of physical mobility and access to communication methods (e.g., “the digital divide”). Concurrently, older adults have often lived in a place for an extended time, which sometimes leads to staying behavior. During the Camp Fire in 2018, about 77% of deaths were those 65 or older.² A large portion of Ojai Valley residents (approximately 1,300) have independent living challenges, which would indicate a higher need for care during an evacuation.

NON-ENGLISH SPEAKING

About 21% of residents do not speak English at home, and nearly 24% of households have limited English speaking ability. With the widespread Spanish-speaking population in the Ojai Valley, a significant portion of the area may not receive English-based communications. English-based communication tends to be delivered first, after which Spanish and other language translations may be included. Any delay in communication could lead to serious issues, especially for fast-moving fires. Non-English speakers may also struggle to communicate with first responders, shelter staff, and disaster volunteers.

² Newberry, L. (2019, February 10). Poor, elderly and too frail to escape: Paradise fire killed the most vulnerable residents—Los Angeles Times. Los Angeles Times. <https://www.latimes.com/local/lanow/la-me-ln-camp-fire-seniors-mobile-home-deaths-20190209-story.html>

LOW-INCOME

Over 2,000 residents are living below the poverty line. Lower-income individuals face financial burdens when evacuating related to sheltering (e.g., hotel/motel), fuel, and food. Some may also have less reliable access to personal transportation, while others may be concerned about missing work. A lack of financial resources can also contribute to a longer and more challenging recovery process.

INDIVIDUALS WITH DISABILITIES

Some residents have significant physical disabilities that may inhibit a successful evacuation. About 1,000 residents have hearing difficulty while almost 500 residents have vision difficulty. These residents may experience evacuation delays if they do not have accessible forms of communication. Approximately 1,900 residents have an ambulatory difficulty (e.g., challenge moving, walking, etc.), which could make it harder for them to reach transportation options or evacuate quickly. About 1,300 residents have a cognitive disability which could affect their perception of and reactions to a wildfire.

CARLESS

Approximately 500 residents do not have access to a vehicle. Most evacuation planning in North America focuses on private automobiles since this mode is the predominant form of transportation. With limited public transit options, residents will require a variety of transportation options to evacuate.

ADDITIONAL GROUPS TO CONSIDER

Through conversations with the OVFSC, TAG, and the community, several additional vulnerable groups were identified:

Tourists

Ojai is a popular tourist destination. While the number of available overnight accommodations limits the number of tourists, approximately 20,000 people stay in the Ojai Valley per day.³ Despite their access to resources, tourists may not know the local wildfire risks, evacuation plans, or road network. Tourists are also unlikely to know communication channels in the community, especially subscription-based emergency alerts.

Farmworkers/Agricultural Workers

Over 6,500 farmworkers are estimated to be working in the Ojai Valley and Santa Paula, and many of them are Latino and not citizens.⁴ Along with significant required work hours, farmworkers in the area can face critical economic, health, and living challenges that are likely to translate into severe evacuation

³ Reynolds, C. (2022). 'Half of Los Angeles is coming' and Ojai hotels are scrambling. <https://www.latimes.com/travel/story/2022-05-26/half-of-los-angeles-is-coming-up-here-ojai-hotels-scramble-to-lodge-city-escaping-angelinos>

⁴ CAUSE (2015). Raising Up Farm Workers: Ventura County.

[https://causenow.org/sites/default/files/CAUSE%20Raising%20Up%20Farm%20Workers%20Ventura%20County%20September%202015%20\(2\).pdf](https://causenow.org/sites/default/files/CAUSE%20Raising%20Up%20Farm%20Workers%20Ventura%20County%20September%202015%20(2).pdf)

challenges. Additionally, farmworkers may not have access to evacuation resources, communication, or transportation. They may also distrust government assistance or communications.

Owners of Large Animals

Some concern was expressed for safely evacuating residents with large animals (e.g., livestock, horses). Some residents may choose to stay and defend, since evacuating with large animals can be logistically challenging. Large animals require larger vehicles for transportation and sufficient locations for sheltering (e.g., fairgrounds). Assistance from first responders is unlikely and shelters typically do not have space or services for large animals.

Residents in Mobile Homes

Concerns have arisen regarding the vulnerability of residents in mobile homes since they are near flammable building materials. Additional issues include significant traffic bottlenecks at the entrances of mobile home parks and poorer access to some communication channels.

Recreational Users

The Ojai Valley is a major destination for campers and hikers including the Los Padres National Forest to the north of Ojai. With limited mobile phone service and high exposure to a fire hazard, campers and hikers could face significant evacuation challenges. Hikers in remote areas would have to walk long distances without support or require rapid airlifting. Ignitions could also come from wilderness areas, which could limit firefighting abilities, hazard detection, and speedy evacuations.

Evacuation Capacity Improvements and Strategies

Following the results of the evacuation needs and vulnerable populations assessment, a set of strategies and treatments were identified for improving the capacity and resilience of the Ojai Valley roadway network to support potential evacuation events. The strategies were identified based on other congestion and evacuation studies, and review of recent evacuation efforts.

NETWORK CAPACITY IMPROVEMENTS

The following describes a set of strategies identified for improving the capacity and resilience of the roadway network to support potential future evacuation events. The strategies were identified based on other congestion and evacuation studies and review of recent evacuation efforts. For each individual strategy, a description of the strategy, desired outcomes, implementation needs, and limitations are provided.

Reversible Lane/Contraflow

Description: An operational strategy where capacity is added in one direction by reorienting one or more travel lanes to flow in the direction of the evacuation and away from the hazard.⁵ This strategy can be attractive since it generally requires minimal infrastructure changes. Reversible lanes can be set up over long distances, such as state routes, or on localized segments, such as in neighborhoods that may only have a single egress route.

The strategy requires staff to implement traffic control at intersections to prioritize evacuation movements and restrict turn movements and lane changing (e.g., on- and off-ramps along grade separated state routes). In particular, intersections must be set up to prevent traffic in the closed direction. Signage and other safety measures need to be implemented on both sides of the roadway to ensure drivers are aware of roadway changes, especially along longer stretches where contraflow is implemented. Existing or new changeable message signs may be used, and consideration should be given as to whether existing signs can be modified where they can be turned around when needed to support the reversible lane or to communicate wrong-way movements when the lane has been reversed.

Managing movements at intersections is critical. As a result, staffing and level of effort to establish the treatment depends on the number of intersections along the roadway, with the treatment being harder to implement on roads with more intersections.⁶

⁵ For additional information on current resources for contraflow lanes, see Zhao, B., & Wong, S. D. (2021). Developing Transportation Response Strategies for Wildfire Evacuations via an Empirically Supported Traffic Simulation of Berkeley, California. <https://escholarship.org/uc/item/70p6k4rf>.

⁶ For additional information on turn restriction mechanisms see Cova, T. J., & Johnson, J. P. (2003). A network flow model for lane-based evacuation routing. *Transportation Research Part A: Policy and Practice*, 37(7), 579–604. [https://doi.org/10.1016/S0965-8564\(03\)00007-7](https://doi.org/10.1016/S0965-8564(03)00007-7)

For implementation on state routes or facilities that would interact with state routes, a communication plan should be established to connect with the Caltrans Traffic Management Center.

Limitations: One of the primary limitations of the strategy is whether the roadway cross-section and right of way provide sufficient space to allow emergency vehicles to travel against evacuation traffic (either in a travel lane or on the shoulder). Contraflow also requires a large number of staff, enough resources (e.g., cones and signs), and sufficient time to implement. Staffing limitations may delay the implementation of the strategy or limit where the strategy can be implemented.

Emergency Shoulder Usage

Description: This strategy is a variation on Reversible Lane/Contraflow. Under the strategy, the shoulder of a roadway is widened and paved to allow for use as an additional lane of traffic for personal or emergency vehicles during evacuation. Cones or other markers may be used during implementation to identify lanes or reallocate space, as necessary, especially around intersections where the shoulder could conflict with normal turn patterns.

Where possible, the strategy may be preferred over reversible lanes/contraflow because it can be implemented very quickly, does not close the roadways to vehicles that would travel in the opposite direction, and requires less operational support for securing travel lanes and readjusting intersections.

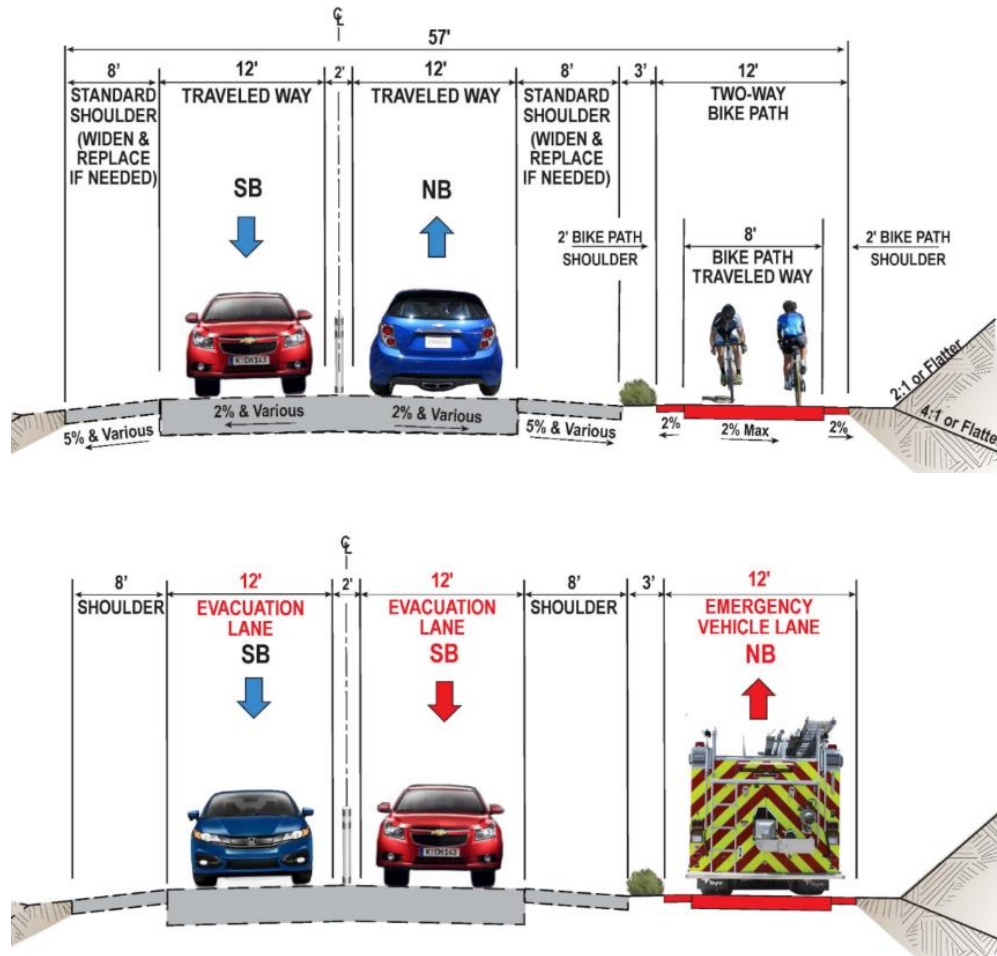
Limitations: In Ojai Valley, most shoulders are not sufficiently wide to currently support the strategy. As a result, this strategy would likely require shoulder widening and removal of trees or other existing infrastructure, resulting in potentially high construction costs. Additionally, the existing shoulder structural section may not be suitable for repeated use, especially if heavy vehicles/trucks utilize the shoulder area – as a result, the existing shoulder structural section may need to be replaced. Consideration should be given to the presence of trailers, campers, and other wide loads which may complicate required travel widths. Staffing limitations may delay the implementation of the strategy.

Construct Shared Use Path that Supports Vehicles

Description: An engineering strategy that constructs a shared use path that is built to a standard that would allow use by residential or emergency vehicles during an evacuation. Outside of an emergency, the shared use path would be accessible to residents and visitors for walking and biking. This strategy could be implemented separate from or parallel to a primary evacuation route. If constructed parallel to a primary evacuation route, the strategy would have similar operational benefits as the emergency shoulder use treatment.

This strategy requires careful access management design that prevents access to personal vehicles during normal periods, but which can be altered to allow emergency vehicle access when necessary. Figure 17 presents an example of a shared use path that can be converted to an evacuation route or emergency vehicle lane. Caltrans is considering this alternative for the State Route 67 Improvement Project in San Diego County as shown in Figure 17.

Figure 17: State Route 67 Alternative with Two-Way Bike Path/Emergency Vehicle Lane



Source: Caltrans, <https://dot.ca.gov/caltrans-near-me/district-11/current-projects/sr67-corridor/improvements>

Limitations:

This strategy can be cost-intensive and there is potential for substantial land acquisition costs. The land adjacent to roadways may be owned by an assortment of agencies, including the City of Ojai, Ventura County, USFS, and/or private owners. Coordination with landowners and ROW purchases or easements may be required for implementation.

Close Roads/Prohibit Street Parking

Description: This strategy identifies roads and parking locations along major evacuation routes to close or prohibit parking during high-risk conditions or during an evacuation. Closing roads is targeted towards limiting people from visiting high-risk areas during evacuations. It could also be used to reserve roadway access for emergency vehicles. Prohibiting parking can support evacuation by limiting travel to a high-risk area or by reducing conflicts created by vehicles leaving or merging into traffic. Parking may also be prohibited where normal parking activity may impede emergency vehicles from reaching critical infrastructure, especially on narrow roadways. The City of Los Angeles maintains a Red Flag Restricted

Parking Program to prohibit parking on specific roads and locations.⁷ The program prohibits parking on streets in Very High Fire Hazard Severity Zones during Red Flag alerts and allows the City to remove parked cars if they are determined to interfere with evacuations and emergency operators.

Limitations:

- Road closures could impact residents and may need to be established as only applying to visitors.
- Communication of the parking program would need to include a communication plan for visitors in Ojai Valley who may be unaware of roadway and parking restrictions and alternative routes.
- The program could conflict with normal parking behavior near trailheads and other outdoor destinations.
- Staff limitations may reduce the number of locations where the strategy can be implemented.

Manage Off-Street Parking at Major Trips Generator

Description: Large trip-generating land uses can create substantial traffic. If those uses are located along or near a major evacuation corridor, traffic related to the land use could impede evacuation. Closing specific access or actively managing parking entrances to orient traffic away from evacuation routes could reduce the potential for congestion, either by reorienting traffic or discouraging evacuees from leaving and then reentering flow of traffic by “hopping” on and off the evacuation to try to get ahead in the queue.

Limitations:

- Closing parking lots and reorienting traffic may require coordination with local businesses.
- The strategy may create confusion or opposition from residents and businesses impacted by changes.
- Staffing limitations may reduce the number of locations where the strategy can be implemented.

Signal Coordination – Green Carpet (Uninterrupted Flow)

Description: An operational strategy where traffic signals along a corridor are set to prioritize the through movement of evacuation traffic by (1) holding or reducing movement from side streets and (2) restricting left-turn movements. To minimize evacuation time, vehicles leaving the impacted area are prioritized while movements from areas not yet impacted are restricted. This strategy can also discourage evacuees from detouring from the evacuation route. The strategy can also be applied in small areas where there may be a single traffic signal. The City of Placerville and Caltrans implemented a green carpet through Placerville during evacuations from the Caldor Fire.⁸

⁷ <https://ers.lafd.org/redflag/>

⁸ <https://www.sacog.org/news/caldor-fire-evacuees-greeted-green-lights-through-placerville>

Limitations:

- Ojai Valley has some communities with only one egress route, such that limiting the use of the mainline road unacceptably limits local movement.
- This strategy may create additional confusion for drivers, either because it (1) prevents evacuees from diverging from the through movement and (2) restricts drivers from entering from minor streets.
- Staff limitations may reduce the number of locations where the strategy can be implemented at, especially if traffic control is needed at minor access points.

Maintain Road and Shoulder Vegetation Management and Clearance Program for Secondary Roads

Description: This strategy creates a more resilient evacuation system by annually managing and clearing vegetation on critical secondary roads to reduce fire risk during evacuation. Based on context, specific roads may be identified for engineering treatments such as shoulder widening or tree removal to support use for evacuation. Plans may consider maintaining smaller or more difficult to travel roads exclusively for use by emergency vehicles.

Limitations: Clearing roadways can be expensive and requires targeting of resources.

Add Secondary/Additional Access to Vulnerable Communities

Description: There are several small communities and developments in Ojai Valley where residents are served by one or two access points. In the event of a rapid evacuation, this could lead to congestion in the development or at locations where vehicles connect with a major roadway. In addition, a fire could more easily block access by closing the available evacuation route.

Moving forward, State Bill 99 (SB 99), signed on August 30, 2019, requires jurisdictions to identify residential developments in hazard areas that do not have at least two evacuation routes upon the next revision of their housing elements.⁹ Under the strategy, additional egress routes would be developed to serve evacuation. Where possible, added access routes would allow for evacuation in a different direction in case a fire closes an available route.

Limitations

- Local topography may limit options for egress, such that secondary access would be to the same evacuation route. However, this would still add resilience and better distribute trips merging onto the evacuation route.
- Viable routes may require the acquisition of private property.
- Projects may be expensive and provide relatively little county-wide benefit.
- Routes only available during an evacuation may have access limitation that need to be removed during an evacuation, such as gates or bollards.

⁹ https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201920200SB99

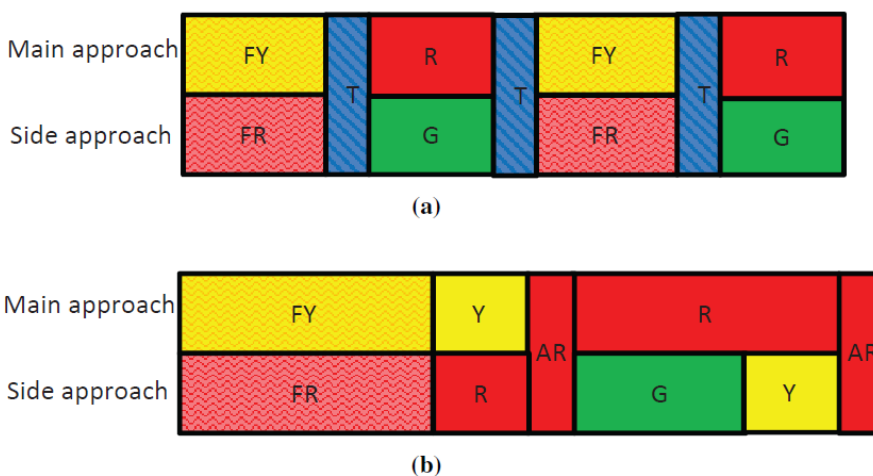
- Coordination with landowners may be required if secondary access routes are constructed through land not owned by the City or County (e.g., USFS or private owners)

Signal Coordination – Dynamic Flashing Yellow

Description: An operational strategy where traffic signals are set to use a flashing yellow signal on the main evacuation approach and a flashing red on the side street. This strategy may be more appropriate at intersections where a) side streets have significant traffic demand and/or b) there is an absence of available detour routes to serve side street traffic.

In Phase 1, flashing yellow–flashing red (FY/FR), the traffic signals on the main street flash yellow, whereas the side street signals flash red. In Phase 2, green–red (G/R), the main street signal will stay red, and the side street signal will turn green. The goal of using the G/R phase is to quickly clear waiting vehicles on the side streets. Figure 18 shows a signal plan for a dynamic flashing yellow.

Figure 18 Dynamic Flashing Yellow Timing Plan – Two Phases (a) and One Cycle (b)



Source: Asamoah, C. A. (2014). Dynamic flashing yellow for emergency evacuation signal timing plan in a corridor: Semantic scholar. undefined. Retrieved May 4, 2022, from <https://www.semanticscholar.org/paper/Dynamic-flashing-yellow-for-emergency-evacuation-in-Asamoah/f896455e97acf37f0cd01cc5f3bbb1dabb79fc29>

Limitations:

- There are relatively few traffic signals in Ojai Valley.
- Staff may be needed to assist with managing traffic. In particular, drivers at extended red lights may elect to ignore signals. Staff limitations may reduce the number of signals where strategy can be implemented.

Build/Upgrade Existing Roads to Standard Needed for Evacuation Traffic

Description: An engineering strategy that includes adding new roads or upgrading roadways to support evacuation activities. This strategy is similar to the strategy Maintain Road and Shoulder Clearance

program in that the intention is to create a more connected roadway network for evacuations. The difference is that the previous strategies target existing roadways where maintenance would allow for use of the road for evacuation. This strategy is a more capital-intensive strategy to install new or substantially alter existing roads, such as by expanding the width of the road.

Limitations: This is a cost-intensive strategy (for infrastructure design and construction) and would likely incur substantial land acquisition costs. This strategy is complex, as it would require coordinating with an assortment of agencies, including the City of Ojai, Ventura County, Caltrans, USFS, and private owners. Road widening (especially adding new lanes) can be at odds with other statewide goals to encourage sustainable transportation and reduce greenhouse gas emissions.

STRATEGIES FOR VULNERABLE POPULATIONS

The STEPS equity framework identifies transportation-relative issues and groups.¹⁰ This equity framing incorporates a combination of equity theories related to a capabilities approach, al-Sadr, prioritarianism, and sufficientarianism.¹¹ One unique aspect of the STEPS equity framework is that it can be applied more readily to different transportation challenges, including evacuations. Table 2 provides a summary of the STEPS equity framework, focusing exclusively on wildfire evacuation. Appendix C includes a full list of references cited.

Evacuation strategies for vulnerable populations were developed to improve compliance with mandatory evacuation orders, reduce congestion, and increase social equity. Though research has begun simulating some evacuation strategies, work on simulation strategies using equity metrics remains largely missing from the literature. Additional research is needed to further refine these strategies for evacuation planning. Based on the existing literature and client conversations, ten primary strategies for vulnerable populations were identified for Ojai Valley. Strategies for vulnerable populations in Ojai Valley are guided using the STEPS framework presented in Table 2. Each strategy is described and outlines the STEPS dimension and vulnerable population(s) served. Appendix C includes additional evacuation strategies for vulnerable populations.

¹⁰ Shaheen, S., Bell, C., Cohen, A., Yelchuru, B., & Hamilton, B. A. (2017). Travel behavior: Shared mobility and transportation equity (No. PL-18-007). United States. Federal Highway Administration. Office of Policy & Governmental Affairs.

¹¹ Lewis, E. O. C., MacKenzie, D., & Kaminsky, J. (2021). Exploring equity: How equity norms have been applied implicitly and explicitly in transportation research and practice. *Transportation research interdisciplinary perspectives*, 9, 100332.

Table 2. STEPS Equity Framework for Transportation and Wildfire Evacuations

Dimension	Application for Wildfire Evacuations	Examples for Wildfire Evacuations
Spatial	Spatial factors that increase risk, increase evacuation distances, decrease routing options, or compromise evacuations	Single exit routes, high-risk fire zones, lack of public transit within walking distance, low proximity to resources, shelters located far away)
Temporal	Travel time barriers that inhibit a user from departing at a reasonable time, reaching a destination at an appropriate time, evacuation time costs that lead to non-compliance, or early returners to impacted areas	Additional mobilization time due to medical needs or packing, minimal communication notification, roadway congestion, rapid fire spreading due to wind, public transit reliability issues, work requirements
Economic	Direct and indirect costs that create economic hardships or preclude users from evacuating	Hotel/supplies/fuel costs, vehicle ownership costs, time away from job especially for hourly employees
Physiological	Physical and cognitive limitations that make using standard transportation modes or sheltering resources difficult or impossible for specific groups	Vulnerable groups including older adults, individuals with disabilities, homebound individuals, etc.; inability/challenge to receive evacuation information due to visual/auditory disability; may require accessible vehicles or shelter
Social	Social, cultural, safety, and language barriers that inhibit a user's comfort or ability to use transportation or evacuate	Vulnerable groups including racial and ethnic minorities, immigrants, undocumented immigrants, Native American and Indian Tribal governments, etc.; lack of multi-language information on evacuation orders, transportation, and sheltering; discrimination in resource allocation

Source: Wong et al., 2020. Can sharing economy platforms increase social equity for vulnerable populations in disaster response and relief? A case study of the 2017 and 2018 California wildfires. *Transportation research interdisciplinary perspectives*, 5, 100131.

Public Transit-Based Evacuations

Description: Public transit is a key component of multi-modal evacuations and can be utilized to evacuate multiple vulnerable populations. Research has found that North American communities have generally lacked plans for transit-based evacuation assistance.¹² Gold Coast Transit District (GCTD) operates in the Ojai Valley via its Route 16 bus line (with 1-hour frequencies). GCTD has 61 buses in its fleet, which could be leveraged in an evacuation. The Ojai Trolley also operates in the Ojai Valley with 5 trolley-style buses in its fleet. Public transit buses could help evacuate more people in fewer vehicles, reduce congestion, and encourage compliance. Moreover, transit can move larger numbers of people as a shuttle to safer areas in Ventura County.

STEPS Dimensions Addressed: Spatial, Temporal, Economic, Physiological, Social

Communities Addressed: Carless households, older adults, individuals with disabilities, individuals at hospitals, assisted living facilities, or who are homebound, low-income individuals, racial and ethnic minorities, non-English speakers, immigrants, visitors, campers/hikers, agricultural workers, mobile home residents.

Implementation Needs:¹³

- Coordinate with local transit agencies (e.g., Gold Coast Transit District, Ojai Trolley) to identify operational strategies, staffing availability, and vehicles.
- Place clear and signed pickup points close to transit-reliant populations, existing bus stops, and key landmarks.
- Determine where buses will drop people off within and outside of the Ojai Valley area.
- Create a fare-free policy, signage in multiple languages, and volunteer programs to assist people on public transit.
- Engage with underserved populations in transit evacuation planning and include equity metrics in the planning processes.
- Share transit-based evacuation plans with the public through multiple communication channels, including via community-based organizations (CBOs).

Paratransit

Description: Paratransit is a service provided by public transit operators, public and private schools, and CBOs for individuals with disabilities, populations with mobility challenges, and other nonprofit organizations (e.g., Camp Ramah). For Ojai Valley, GO Access by the Gold Coast Transit District and HELP of Ojai both provide paratransit services. With 26 paratransit vehicles, GO Access can be booked across a wider area and includes travel outside of the Ojai Valley. Most HELP of Ojai trips originate and end within the Ojai Valley. Paratransit can provide a critical means of transportation for individuals with disabilities, including those with personal mobility devices (e.g., wheelchairs, scooters, walkers, etc.). Planning for

¹² Renne, J. L., & Mayorga, E. (2022). What has America learned Since Hurricane Katrina? Evaluating evacuation plans for carless and vulnerable populations in 50 large cities across the United States. *International Journal of Disaster Risk Reduction*, 80, 103226. <https://doi.org/10.1016/j.ijdrr.2022.103226>

¹³ Wambura, V. and Wong, S. (2024). Equitable Public Transit Evacuation Planning: A Systematic Review. Working Paper. <https://era.library.ualberta.ca/items/2bdb719b-c2e0-4be7-91f8-4e03e94c8812>

paratransit (and ambulances) will be especially important for Community Memorial Hospital, nursing homes or skilled nursing facilities, assisted living communities, and retirement communities.

STEPS Dimensions Addressed: Spatial, Temporal, Economic, Physiological, Social.

Communities Addressed: Carless households, individuals with disabilities (especially physical), older adults, individuals at hospitals, assisted living facilities, or who are homebound.

Implementation Needs:^{13,14}

- Establish connections with local paratransit providers (including GO Access, HELP of Ojai, Ojai Unified School District, and private schools [e.g., Thacher, Oak Grove, Ojai Valley School, and Besant Hill]).
- Identify options for Memorandums of Understanding (MOUs) that would enable close coordination of paratransit resources in an evacuation.
- Create a database of all available paratransit vehicles, including those operated by local facilities.
- Determine the most efficient and resilient matching system along with shelter options for people riding paratransit.
- Plan for caretakers, guardians, and other individuals who may also ride paratransit.

Shared Mobility

Description: Shared mobility can supplement existing transportation resources and assist those with limited transportation options. Research has found that people in high-risk areas are generally open to sharing transportation and housing with others, especially in communities with higher trust and compassion.¹⁵ Several options could be developed for an evacuation including a local carpooling system, a coordinated plan with other local on-demand providers, or ad hoc encouragement of sharing. For more advanced planning, a matching system and clear pickup/drop-off points would help facilitate more seamless and reliable evacuations. In addition to assisting those who do not have reliable access to transportation, these shared mobility systems could help communication efforts and information sharing, increase compliance with mandatory evacuation orders, and reduce congestion.

STEPS Dimensions Addressed: Spatial, Temporal, Economic, Social, Physiological.

Communities Addressed: Carless households, individuals with disabilities (especially physical), older adults, low-income individuals (if free), tourists, campers/hikers.

Implementation Needs:^{15,16}

¹⁴ Feng, L., Vodopivec, N., & Miller-Hooks, E. (2015). Supporting Mobility-Impaired Populations in Emergency Evacuations. *Transportation Research Record*, 2532(1), 118–128. <https://doi.org/10.3141/2532-14>

¹⁵ Wong, S. D., Walker, J. L., & Shaheen, S. A. (2020b). Trust and compassion in willingness to share mobility and sheltering resources in evacuations: A case study of the 2017 and 2018 California Wildfires. *International Journal of Disaster Risk Reduction*, 52, 101900.

¹⁶ Wong, S. D., Broader, J. C., & Shaheen, S. A. (2020a). Can sharing economy platforms increase social equity for vulnerable populations in disaster response and relief? A case study of the 2017 and 2018 California wildfires. *Transportation research interdisciplinary perspectives*, 5, 100131

- Identify areas that would benefit from a shared mobility program such as communities with limited ingress/egress and communities with high proportions of underserved populations.
- Establish pickup points or zones at key landmarks, existing public transit infrastructure, and along major evacuation routes.
- Coordinate with CBOs (e.g., HELP of Ojai), public and private schools, neighbors, and businesses to identify available vehicles and interested volunteers.
- Minimize safety concerns by working with established CBOs or trusted government programs in matching providers and evacuees.
- Increase trust and compassion as part of disaster preparedness, neighborhood networks and/or events, and civic pride to help increase the willingness to share vehicles.

Resort/Hotel Shuttles

Description: Visitors, campers, and hikers are unlikely to know the surrounding Ojai Valley and may require additional time to evacuate. The Ojai Valley has many hotels, inns, and other accommodations, some of which have their own shuttles (airport) or contract with a company to provide the shuttles. While the number of shuttles may be limited, these transportation resources could be utilized during an evacuation, especially for those who arrived via ridesourcing or shuttle. Moreover, the smaller size of some vehicles (e.g., shuttle vans) could enable them to reach more remote trailheads and campgrounds.

STEPS Dimensions Addressed: Spatial, Temporal

Communities Addressed: Carless households, visitors, campers/hikers.

Implementation Needs:

- Coordinate with hotels and resorts to identify existing staff and shuttles/vehicles to evacuate guests and residents.
- Identify pickup and drop-off locations, including campgrounds and trailheads accessible based on vehicle sizes.
- Develop information packets for visitors on what to do, where to go, and how to prepare for a wildfire evacuation.

Resilience Hubs

Description: Resilience hubs are community-serving places that can function during normal conditions and disaster conditions.¹⁷ For a wildfire evacuation, a resilience hub can serve as an information center, registration location, evacuation shelter, and/or resource distribution center. The Ojai Valley will likely only have several resilience hubs (of various sizes) to support an evacuation, which can also be integrated with evacuation and transportation planning for a wildfire. People prefer highly localized locations that integrate multi-modality, are easily recognizable and trusted, and contain key services for an

¹⁷ Baja, K. (2018) 'Resilience Hubs: Shifting Power to Communities and Increasing Community Capacity'. USDN. Available at: https://www.usdn.org/uploads/cms/documents/usdn_resiliencehubs_2018.pdf.

emergency.^{18,19} Nordhoff High School acts as an existing evacuation center during emergencies and two more evacuation centers will be developed in the future for Ojai. The OVFSC has identified several other temporary refuge areas that are in planning.

STEPS Dimensions Addressed: Spatial, Temporal, Social

Communities Addressed: All vulnerable communities.

Implementation Needs:²⁰

- Integrate resilience hub planning with evacuation planning.
- Locate hubs in trusted, central places that can sufficiently support Ojai Valley evacuees.
- Identify possible funding sources for retrofits to buildings via California's Strategic Growth Council to increase building and operational resilience and usability in a wildfire evacuation.²¹
- Consider metrics for identifying the use cases, feasibility, and operations of resilience hubs.
- Conduct a needs assessment in the Ojai Valley for resilience hubs to identify the number of possible users, modes of transportation, and services/staff required.

Volunteer Driver Networks

Description: The HELP of Ojai provides a cost-effective transportation assistance program for older adults, individuals with disabilities, and those recovering from surgery. Drivers for the program are volunteers in the community, providing rides to key services, food, and healthcare. This unique program could be integrated with an evacuation plan if volunteers are still available during an evacuation. The network could also be a conduit for information sharing, resource assistance, and social cohesion.

STEPS Dimensions Addressed: Spatial, Temporal, Economic, Physiological, Social.

Communities Addressed: Carless households, individuals with disabilities (especially physical), older adults, individuals at hospitals, assisted living facilities, or who are homebound.

Implementation Needs:

- Coordinate with HELP of Ojai and other related transportation providers in identifying strategies for an evacuation.
- Determine the availability of drivers, including those who may have to evacuate themselves.
- Identify additional staffing to support the call center during an evacuation.

¹⁸ Ciriaco, T. G., & Wong, S. D. (2023). Travel Behavior and Community Needs for Resilience Hubs. <https://era.library.ualberta.ca/items/07ee12ef-ae7-4829-b7d5-30e0681c9c49>

¹⁹ Ciriaco, T. G., Zehra, S. N., Wambura, V., & Wong, S. D. (2023). Equitable Transportation and Resilience Hubs: Analysis of Underserved Population Needs, Usage, and Travel. <https://era.library.ualberta.ca/items/2a114610-6de2-4035-9625-e53b3ccdca29>

²⁰ Ciriaco, T. G., & Wong, S. D. (2022). Review of resilience hubs and associated transportation needs. *Transportation Research Interdisciplinary Perspectives*, 16, 100697.

²¹ <https://sgc.ca.gov/grant-programs/crc/>

Active Transportation

Description: Active transportation (e.g., walking, bicycling, micromobility) can be used to evacuate people or deliver critical supplies in a more flexible and adaptable way.²² While the use cases for active modes are narrow, opportunities for active modes exist in downtown Ojai and places with sufficient infrastructure. Bicycling could be especially useful in evacuating downhill in areas of heavy congestion.²² Walking can also be used to connect people to key resource centers in neighborhoods or pickup locations for public transit.

STEPS Dimensions Addressed: Spatial, Temporal

Communities Addressed: Carless households, low-income individuals, immigrants, non-English speakers, racial and ethnic minorities, mobile home residents.

Implementation Needs:

- Identify bicycling and walking networks that can facilitate movement away from high-risk neighborhoods to key safe locations throughout the Ojai Valley.
- Encourage driving residents to bring bicycles with them (if possible) to facilitate a last-minute evacuation.
- Ensure accessible sidewalks, crosswalks, and pedestrian infrastructure for safe evacuations via walking.
- Coordinate with current governmental ATP projects in development (City of Ojai and Caltrans).

Translation Services and Translated Resources

Description: Non-English-speaking populations face unique challenges in evacuations including in receiving key information. During rapidly evolving events, translation services may not be available or are less prioritized. Previous research on limited English proficiency (LEP) populations found that most people in this population rely on public transit and may not have access to (or be unaware of) existing resources.²³ The same research also suggested locating LEP populations and determining their preferred forms of communication. Other research has encouraged the pre-development of content, planning, and announcements in other languages before an evacuation to ensure timely notifications.²⁴

STEPS Dimensions Addressed: Temporal, Social

Communities Addressed: Non-English speakers, immigrants, racial and ethnic minorities, agricultural workers, undocumented immigrants, low-income individuals, visitors.

Implementation Needs:

²² Fitch-Polse, D. T., Chen, C., & Wong, S. D. (2024). Bicycles and Micromobility for Disaster Response and Recovery. Transport Policy. <https://www.sciencedirect.com/science/article/pii/S0967070X24000593>

²³ Liu, R. (Rachel), & Schachter, H. L. (2007). Emergency Response Plans and Needs of Communities with Limited English Proficiency. Transportation Research Record, 2013(1), 1–7. <https://doi.org/10.3141/2013-01>

²⁴ Wong, S. D., Broader, J. C., & Shaheen, S. A. (2020c). Review of California wildfire evacuations from 2017 to 2019. <https://escholarship.org/uc/item/5w85z07g>

- Identify the most spoken languages in the Ojai Valley and by international visitors.
- Pre-develop content and messaging in other languages, especially Spanish, for rapid distribution during an evacuation.
- Identify staff who could quickly translate material during an emergency in the predominant languages in the Ojai Valley.
- Work with CBOs in the Ojai Valley who serve non-English speaking populations to determine possible procedures and communication patterns.
- Consider developing messaging or guides in international visitors' languages to be distributed to tourists on arrival in the community.
- Develop other forms of communication such as pictures, maps, and symbols.

Tourist and Camper/Hiker Communication

Description: The Ojai Valley attracts diverse tourists and visitors with varied interests, backgrounds, and language abilities. Reaching non-residents is a critical component of the community's evacuation plan, especially since tourists/visitors will likely know the least about the Ojai Valley, evacuation routes, and wildfire risks. While some people will likely use a variety of communication channels, other visitors in more remote places in the Ojai Valley (e.g., Los Padres National Forest) may struggle to receive timely information. Diverse accommodations, ranging from hotels to homestays (e.g., Airbnb, VRBO), will require guidelines and pamphlets for reducing wildfire risks and safely evacuating the community. Staff of hotels, recreation centers, campgrounds, tour groups, and businesses should also be educated on evacuation guidelines to inform visitors in the case of an emergency evacuation event.

STEPS Dimensions Addressed: Temporal, Social

Communities Addressed: Tourists, campers/hikers.

Implementation Needs:

- Identify recreational sites, hotels, motels, campgrounds, and other key places in the Ojai Valley.
- Develop guidelines, pamphlets, and other information for tourists, visitors, campers, and hikers.
- Identify and educate staff or volunteers who can communicate evacuation orders in the scenario that in-person assistance is needed during an evacuation.
- Require short training modules that discuss evacuation processes and communication methods for camping and hiking permits.
- Consider connecting remote campgrounds with radios or other forms of communication to relay information from the emergency operations center.

Hospital and Nursing Facility Evacuation Planning

Description: The Ojai Valley contains some facilities with medically fragile and/or older adult populations that will require additional assistance and time in evacuating. Specific evacuation plans may need to be developed for the local hospital, skilled nursing facilities, and retirement communities. For example, plans may have to provide detailed procedures to transfer clients and patients to nearby facilities and identify pre-determined accommodations and services. Specialized transportation (e.g., paratransit, ambulances) may be necessary to fully assist evacuees.

STEPS Dimensions Addressed: Spatial, Temporal, Physiological, Social

Communities Addressed: Individuals with disabilities, older adults, individuals at hospitals, assisted living facilities, or who are homebound.

Implementation Needs

- Identify the destination and transportation mode of transfers to other facilities, based on the criticality of patients/clients and type of health needs.
- Work with facility staff in developing an evacuation plan and develop a tabletop exercise to run evacuation procedures.
- Guide the development of processes for facilities if a full evacuation cannot be conducted in enough time.
- Determine all available transportation resources for evacuating key facilities.
- Set up connections and clear lines of communication with supervising staff at facilities.

FUNDING OPPORTUNITIES

This study is the first step of many for identifying and implementing strategies for a more robust evacuation network in Ojai Valley. While strategies and improvements recommended in this study are generally not funded, the study provides a list of potential projects for pursuing potential funding, including several new funding sources including the CA OES PrepareCA Jumpstart program and the USDOT PROTECT program. The USDOT PROTECT program is a particularly notable opportunity. The program was created as part of the Infrastructure and Investment and Jobs Act and sets aside \$631 million for California between 2022 and 2026 for responding to extreme weather events. Eligible projects include highway and transit projects and bicycle and pedestrian facilities that help improve evacuation and disaster relief. Table 3 provides a list of potential funding sources to pursue for future grant funding of evacuation capital improvements or strategies.

Table 3. Funding Opportunities

Program	Description
USDOT PROTECT	Federal program that issues lump sum funding to states to fund planning activities, resilience improvements, community resilience and route activities, and at-risk coastal infrastructure. Funding is issued for the period of 2022 to 2026. https://www.fhwa.dot.gov/bipartisan-infrastructure-law/protect_fact_sheet.cfm
USDOT RAISE	Federal program to modernize transportation infrastructure. As part of Infrastructure and Investment and Jobs Act, \$7.5 billion was added to the

Program	Description
	program over five years. Though not targeted specifically towards evacuation projects, projects are evaluated on several categories, including safety and environmental sustainability, that match with goals of this study. https://www.transportation.gov/RAISEgrants
FEMA Hazard Mitigation Grant Program (HMGP)	Federal program that provides funding for mitigation measures that reduce long-term risks from future disasters. Eligible projects can support work rebuilding after a disaster or proactively reduce potential future disasters. https://www.fema.gov/grants/mitigation
California OES PrepareCA JumpStart	State program that provides technical assistance and State funding to vulnerable and high hazard risk communities to reduce long-term risks from natural disasters. Funding is intended to focus on mitigation planning and implementation, community education, and recovery planning. https://www.caloes.ca.gov/office-of-the-director/operations/recovery-directorate/hazard-mitigation/prepare-california/
California FireSafe Council (CFSC) Community Capacity Building Grants	Non-profit program that issues grants of up to \$20,000 to support community capacity building. Funding can be used towards salary support, volunteer management, and media messaging and communication development. https://cafiresafecouncil.org/grants-and-funding/2022-community-firesafe-capacity-grant/
CFSC County Evacuation Route Grant	Non-profit program that issues funding to support development of clear and resilient evacuation routes. Funding may be used towards evacuation route planning, implementation, public education, construction, signage, and maintenance.

Program	Description
	https://cafiresafecouncil.org/2021-county-evacuation-route-grant-opportunity/
PG&E Wildfire Ready & Resilient Grant	Funding available through the PG&E Corporation Foundation to fund projects that build community resilience and capacity to withstand climate-related hazards. Eligible applicants include governments, educational institutions, non-profits in partnership with a local or tribal government. Funds are prioritized for applicants with demonstrated exposure to climate hazards and projects that assist disadvantaged populations and vulnerable communities. https://www.pge.com/en_US/residential/in-your-community/local-environment/resilient-communities/resilient-communities-grant-program.page

Source: Kittelson & Associates, Inc., 2024.

Conclusion

This study provides a tool for the Ojai Valley Fire Safe Council and partners to evaluate opportunities to further enhance emergency response during evacuations and develop capital improvement projects to support a more resilient roadway network during large-scale evacuations. It also provides a status report on existing conditions which can be used moving forward to measure progress made by Ojai and Ventura County to measure improvements to evacuation operations.

The roadway capacity analysis identified potential congestion issues on SR-150, SR-33, and several arterials and collectors that connect to the state highways during an evacuation. The vulnerable populations analysis identified Older Adults, Non-English Speaking, Low-Income, Individuals with Disabilities, and Carless Individuals or Households as populations that may need additional assistance during an evacuation. Ojai Valley community members also provided additional feedback on locations and vulnerable populations of concern during evacuations.

This report provides recommended improvements and strategies to address roadway capacity constraints and vulnerable populations to increase the capacity and resilience of evacuation routes and enhance safety for all populations evacuating. Several grant opportunities are also included to help fund these improvements.

Appendix A – Ojai Valley Evacuation Planning Community Survey

Introduction

Kittelison & Associates, Inc. (Kittelison), Dr. Stephen Wong (University of Alberta), and Jensen Hughes are assisting the Ojai Valley Fire Safe Council (OVFSC) with the Wildfire Vulnerability and Evacuation Assessment for the Ojai Valley region. The Evacuation Assessment identifies vulnerable groups and potential capacity constraints under a variety of evacuation scenarios. Recommendations will be made around vegetation management, operational strategies, and communication strategies to help improve capacity and communications around emergency evacuations in the region.

To understand the concerns and needs of residents and visitors of Ojai Valley during an evacuation event, the Kittelson, Jensen Hughes, and OVFSC team designed a survey to gather feedback from the community. The survey consisted of approximately 50 questions and was distributed in online format. In total, the project team received 275 responses.

This document provides an analysis of survey responses received by the project team and provides an opportunity to understand the community's characteristics and concerns in relation to evacuation planning.

Analysis of Survey Responses

This section presents the data analysis of survey responses received by the project team. The subsections are numbered based on the survey question numbers. Each subsection presents the respective question, response summary and relevant findings from the responses.

QUESTION 2.2 PARTICIPANT CONSENT

Question: Print a copy of this page to keep for future reference. If you wish to participate in this study, please click the button below that says "Accept." If you do not wish to participate, please click the button below that says, "Do Not Accept."

- Accept (1)
- Do Not Accept (2)

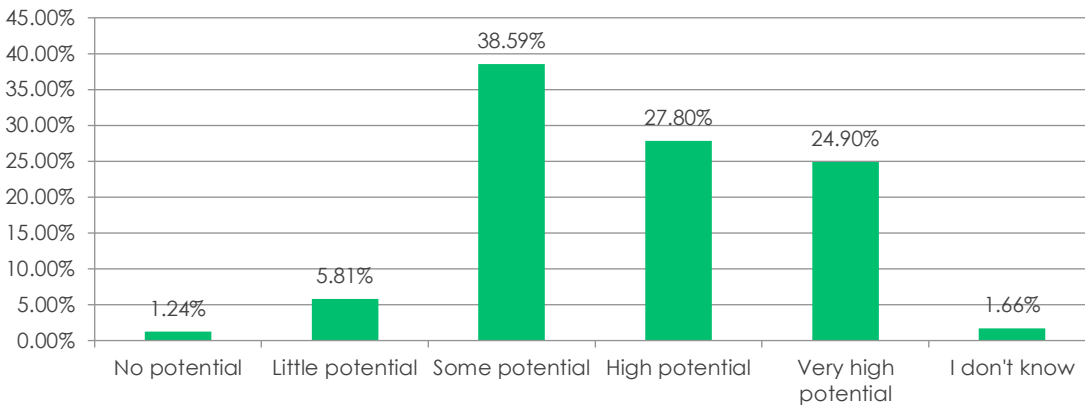
Response Summary: Of the total 275 respondents, 273 accepted and 2 did not accept the participation consent form. If the respondent did not accept the participation consent form, the survey ends, and no further responses are recorded.

Q3.1

Question: Is there potential for a wildfire to reach your residence/accommodations?

Response Summary: Figure 19 shows the response summary for Q3.1.

Figure 19: Q3.1 - Response Summary (241 respondents)



Findings:

- One-fourth of the respondents felt that there was a very high potential for wildfire to reach their residence/accommodations.
- 53% of the respondents felt that there was a high potential or very high potential for wildfire to reach their residence/accommodations.
- Only 1% of the respondents felt that there was no potential for wildfire to reach their residence.

Q3.2

Question: Select the best statement that describes you.

Response Summary: Of all respondents, 239 respondents answered this question.

Findings: 94% of the respondents lived in the Ojai Valley permanently, 4% lived in Ojai Valley part-time and 2% were visiting Ojai Valley.

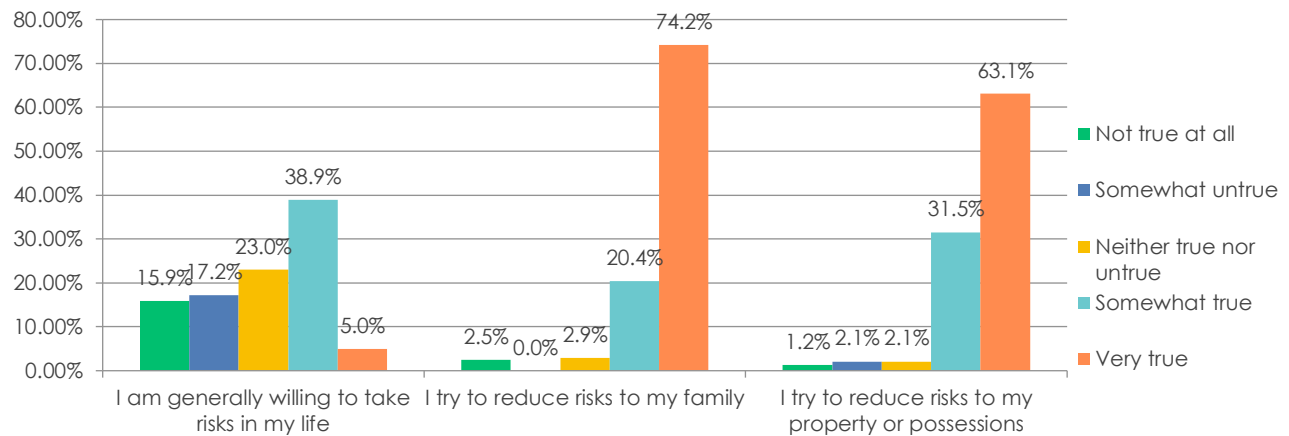
Q4.1

Question: Rate the following statements from "not true at all" to "very true."

Response Summary:

Figure 20 shows the response summary for Q4.1.

Figure 20: Q4.1 - Response Summary (241 respondents)



Findings:

- 74% and 20% of the respondents said it was very true and somewhat true (respectively) that they try to reduce risks to their families.
- 63% and 32% of the respondents said it was very true and somewhat true (respectively) that they try to reduce risks to their property or possessions.
- 39% of the respondents said it was somewhat true they were generally willing to take risks in their lives and 16% said it was not true at all that they were generally willing to take risks in their lives.

Q4.2

Question: What is your residence's/location's risk of being damaged this upcoming wildfire season?

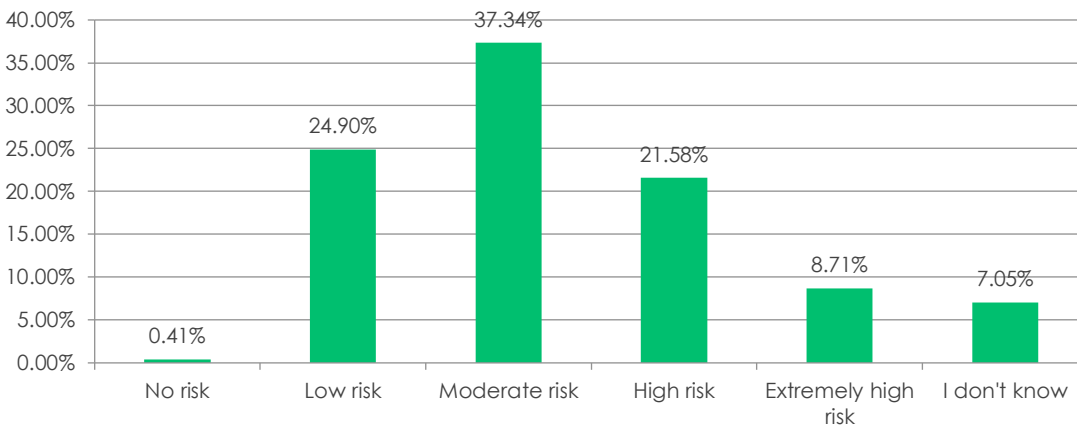
Response Summary:

Figure 21 shows the response summary for Q4.2.

Findings:

- 93% of respondents considered their residence/location to be at some risk of being damaged this upcoming wildfire season.
- More than 30% of respondents considered their residence/location to be at high risk or extremely high risk of being damaged this upcoming wildfire season.
- More than one-third (37%) of the respondents considered their residence/location to be at moderate risk of being damaged this upcoming wildfire season.
- One-fourth of the respondents considered their residence/location to be at low risk of being damaged this upcoming wildfire season.

Figure 21: Q4.2 - Response Summary (241 respondents)

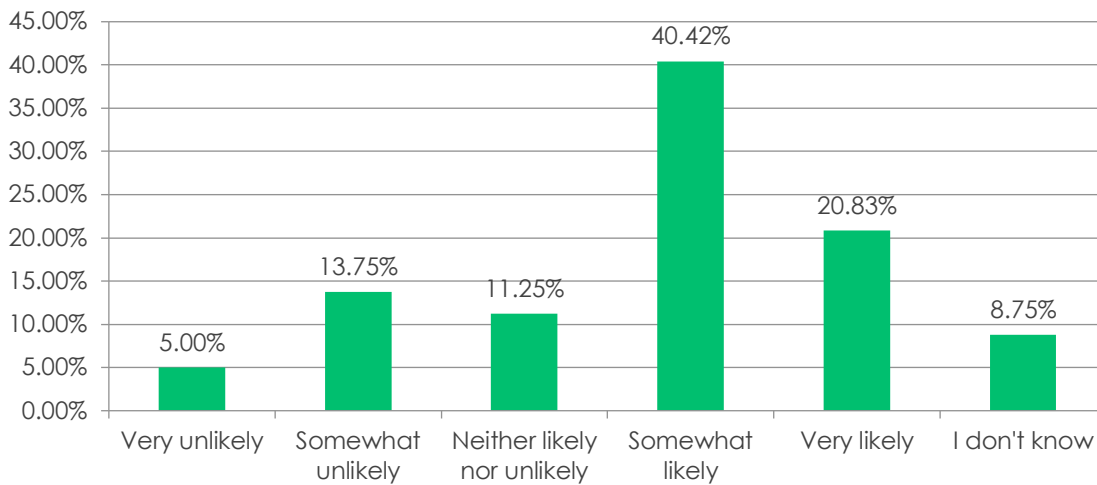


Q4.3

Question: What is the possibility of your residence/location being threatened by a wildfire in the next fire season?

Response Summary: Figure 22 shows the response summary for Q4.3.

Figure 22: Q4.3 - Response Summary (240 respondents)



Findings:

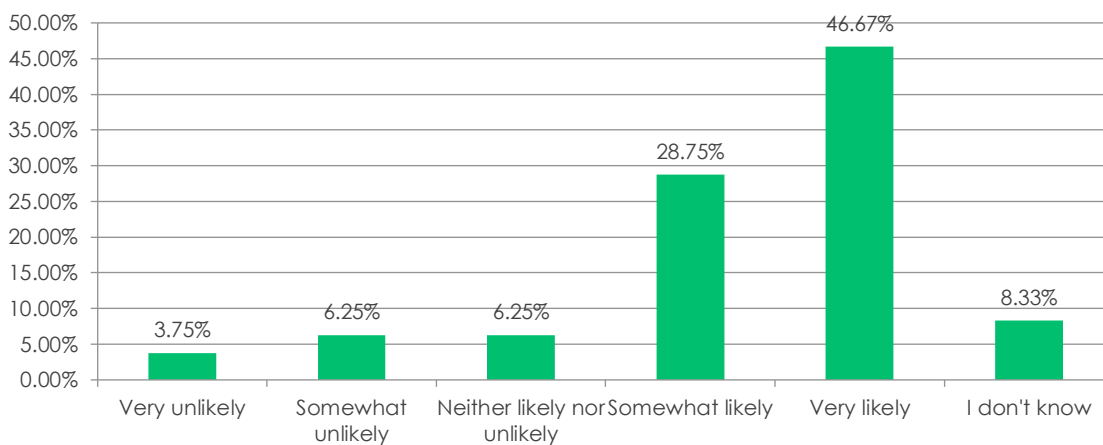
- Of the respondents, 21% and 40% considered the possibility of their residence/location being threatened by a wildfire in the next fire season to be very likely and somewhat likely respectively. This shows that 60% of the respondents considered some possibility of their residence/location being threatened by a wildfire in the next fire season.
- 19% of the respondents considered the possibility of their residence/location being threatened by a wildfire in the next fire season to be somewhat unlikely (14%) or very unlikely (5%).

Q4.4

Question: What is the possibility of your home/location being threatened by a wildfire in the next 10 years?

Response Summary: Figure 23 shows the response summary for Q4.4.

Figure 23: Q4.4 - Response Summary (240 respondents)



Findings:

- Of the respondents, more than 75% considered the possibility of their home/location being threatened by a wildfire in the next 10 years to be somewhat likely (29%) or very likely (47%).
- Only 10% of the respondents considered the possibility of their home/location being threatened by a wildfire in the next 10 years to be somewhat unlikely (6%) or very unlikely (4%). This is less than the corresponding percentage (19%) of respondents who considered the possibility of their residence/location being threatened by a wildfire during the next wildfire season was somewhat unlikely or very unlikely.

Q4.5

Question: For a wildfire event, please answer the following statements' effects on odds, ranging from greatly decrease to greatly increase.

Response Summary: Of all respondents, 239 respondents answered this question.

Findings:

- 42% of the respondents believe that evacuating would increase the odds of losing their home or accommodation during a wildfire.
- 74% of the respondents believe that evacuating would decrease the odds of being harmed during a wildfire.
- 85% of the respondents believe that staying to defend their home or accommodation would increase the odds of being harmed in a wildfire.
- 50% of the respondents believe that staying to defend their home or accommodation would decrease the odds of losing their home or accommodation during a wildfire.

Q5.2

Question: Upon learning about the wildfire, would you evacuate immediately from your residence/accommodations?

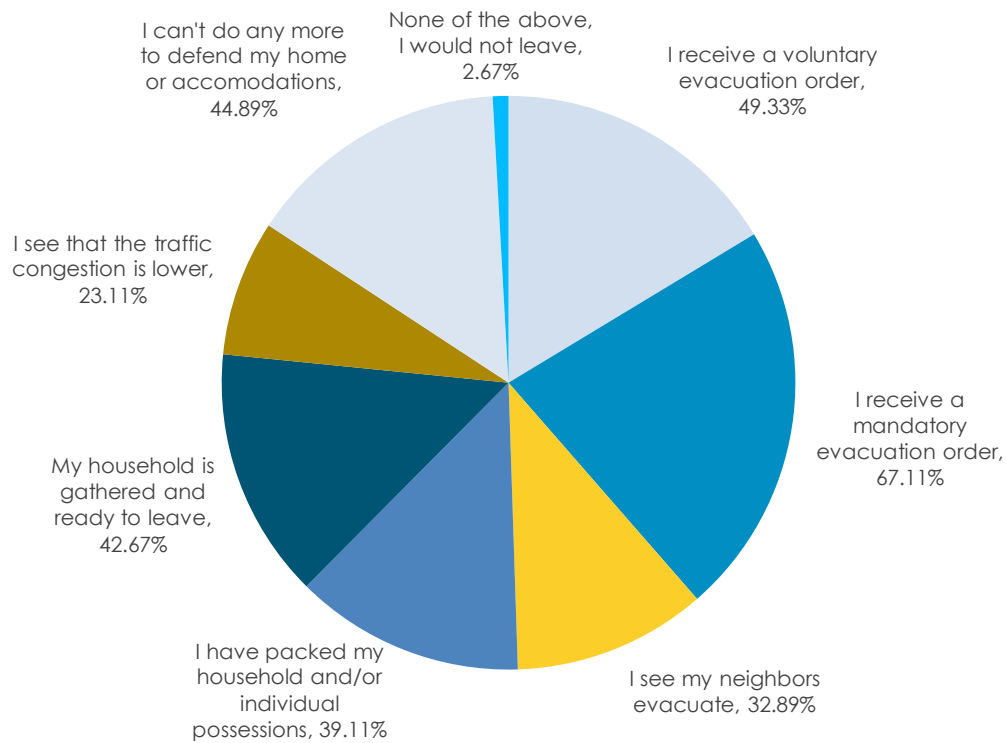
Response Summary: Of the 233 respondents to this question, 39% answered "Yes", they would evacuate immediately from their residence/accommodations upon learning about the wildfire and the rest answered "No".

Q5.3

Question: If you do not evacuate immediately, what will cause you to evacuate? [Select all that apply]

Response Summary: Figure 24 shows the response summary for Q5.3. Note that survey respondents could select more than one answer.

Figure 24: Q5.3 - Response Summary (225 respondents)



Findings:

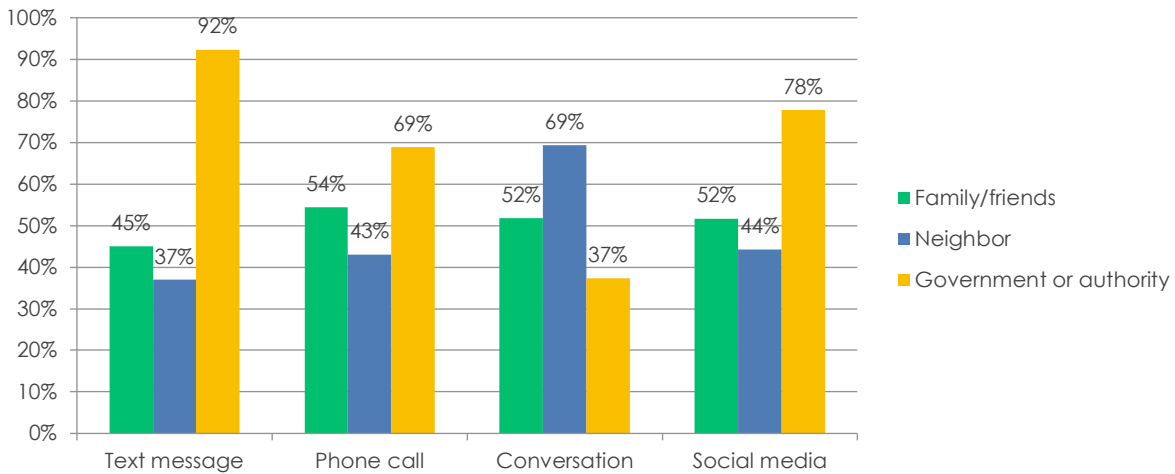
- Two-thirds (67%) of the respondents said they would wait to receive a mandatory evaluation order to evacuate.
- Approximately half of the respondents (49%) said they would wait to receive a voluntary evaluation order to evacuate.
- 43% of the respondents said their household was ready to leave and 3% of the respondents said they would not evacuate.
- 45% of the respondents said they would evacuate when they could not do any more to defend their home or accommodation.
- 23% of the respondents said they would evacuate based on traffic congestion, while 33% said they would evacuate when their neighbors evacuate.

Q5.4

Question: If a mandatory evacuation order was issued for your area, how do you expect to hear about it and from what source? (Select all that apply)

Response Summary: Figure 25 shows the response summary for Q5.4.

Figure 25: Q5.4 - Response Summary (225 respondents)



Findings:

- The majority of respondents expect to hear about a mandatory evacuation order from a government or authority (92% - text message, 78% - social media and 69% - phone call).
- 69% of the respondents expect to hear from conversations with a neighbor.
- More than 50% of the respondents expect to hear the mandatory evacuation order from family/friends via phone call, conversation, or social media.

Q5.5

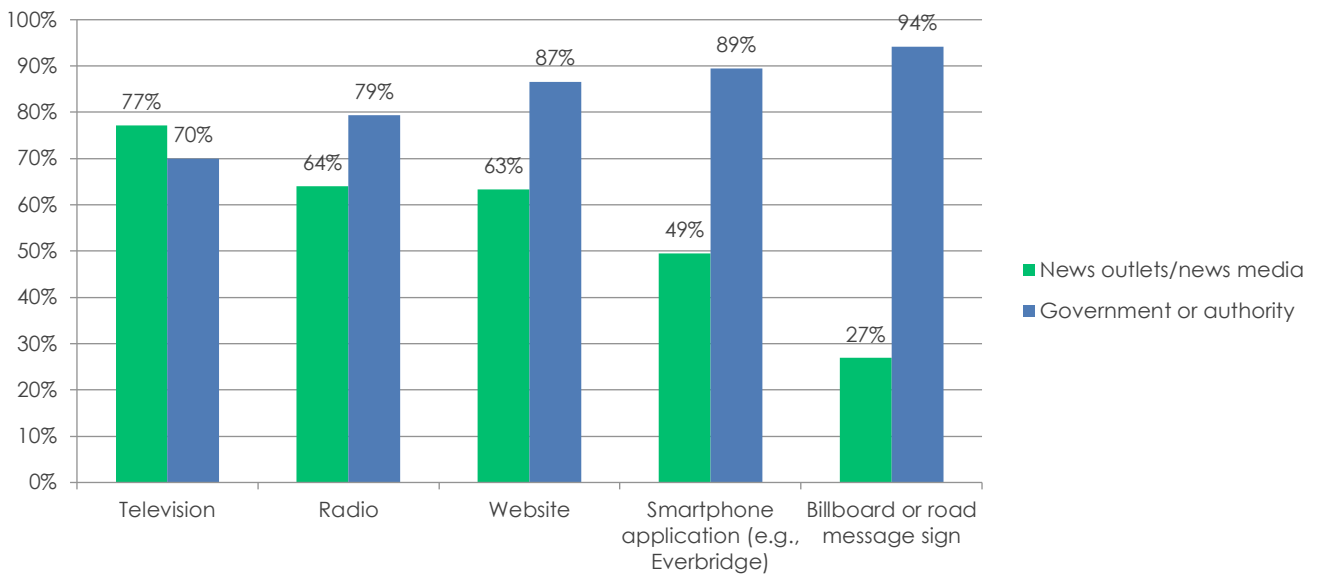
Question: There are several other ways to receive possible information. If a mandatory evacuation order was issued for your area, how do you expect to hear about it and from what source? (Select all that apply)

Response Summary: Figure 26 shows the response summary for Q5.5.

Findings:

- Similar to the responses in Q5.4, most of the respondents expect to hear about a mandatory evacuation order from a government or authority. They expect the sources to be:
 - Billboard or road message sign (94%),
 - Smartphone application (e.g., Everbridge) (89%),
 - Website (87%) and
 - Radio (87%).
- 77% of the respondents expect to hear about a mandatory evacuation order from news outlets/news media via television.

Figure 26: Q5.5 - Response Summary (227 respondents)



Q5.6

Question: Do you need or do you know of anyone who needs additional assistance to evacuate (e.g., due to disability, limited or no access to a vehicle, lives in a remote area, etc.)?

Response Summary: Of all respondents, 231 respondents answered this question.

Findings: 42% respondents answered "Yes" they need or know of anyone who needs additional assistance to evacuate (e.g., due to disability, limited or no access to a vehicle, lives in a remote area, etc.), 56% answered "No" and 2% preferred not to answer.

Q5.7

Question: After deciding to evacuate, approximately how long will it take to prepare to leave your residence or accommodations for your final evacuation trip? Activities might include packing, finding more information, finding pets/livestock, and/or securing the residence. Please state your answer in minutes.

Response Summary: Of all respondents, 227 respondents answered this question.

Findings:

- Nearly 45% of the respondents said they would take 30 minutes or less to evacuate.
- 73% of the respondents said they would take 60 minutes or less to evacuate.
- Approximately 25% of the respondents said they would take 60 minutes or more to evacuate and 14% of the respondents said they would take more than 120 minutes (2 hours) to evacuate.

Q5.8

Question: How many vehicle trips do you expect to take before your evacuation trip? Trips may include but are not limited to trips to gather supplies, pick up family members, check on neighbors, etc.

Response Summary: Of all respondents, 212 respondents answered this question.

Findings:

- 71% of the respondents expected to take one vehicle trip before their evacuation trip and 24% of the respondents expected to take two vehicle trips.
- Approximately 5% of the respondents expected to take three or more vehicle trips.

Q5.9

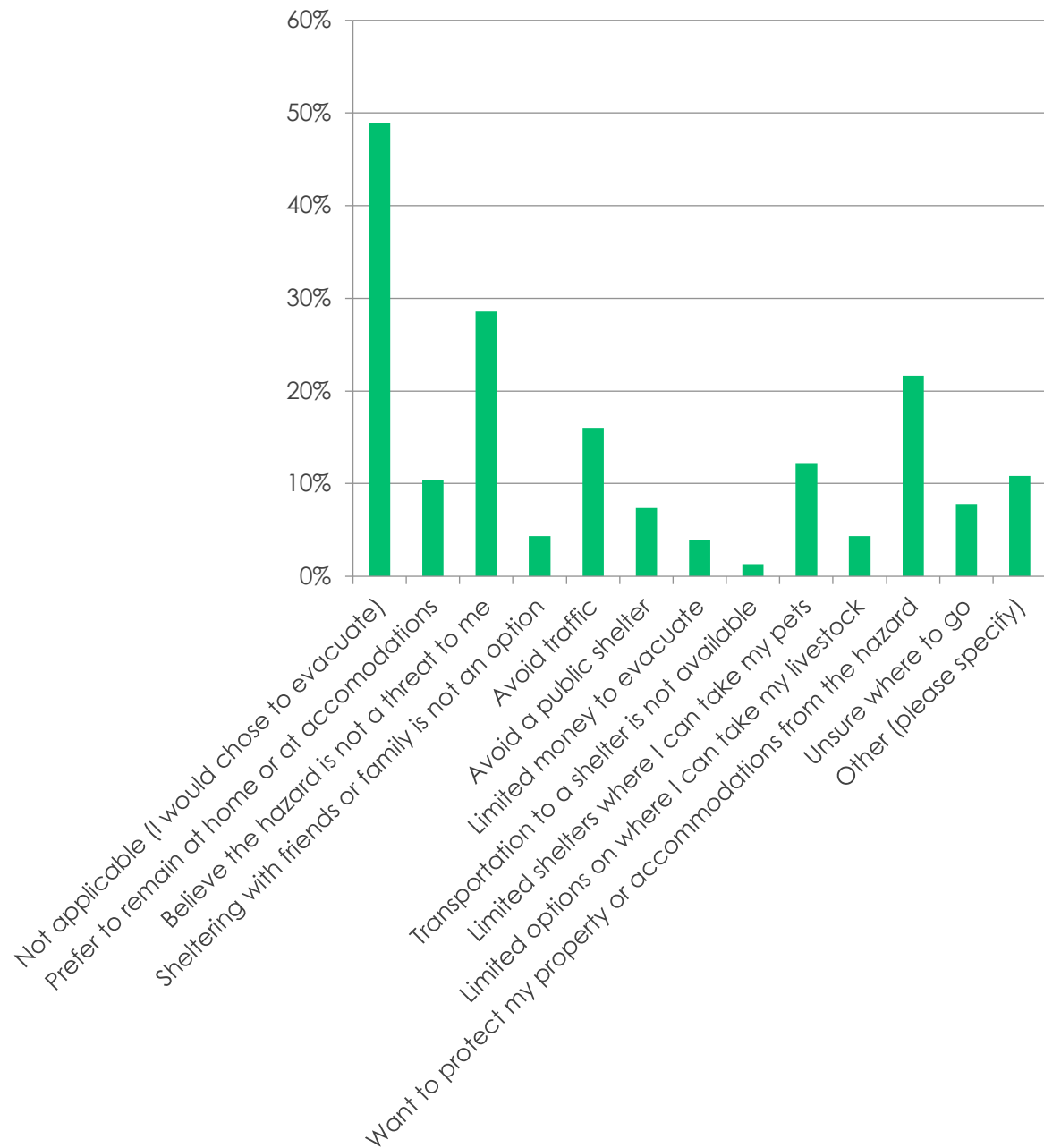
Question: In the event of an evacuation order for your area, what considerations would cause you to remain in the area?

Response Summary: Figure 28 shows the response summary for Q5.9.

Findings:

- 49% of the respondents would evacuate.
- 29% of the respondents would remain in the area if they believed the hazard was not a threat to them.
- 22% of the respondents would remain in the area to protect their property or accommodations from the hazard, and an additional 10% would prefer to remain at home or their accommodations.
- 16% of the respondents would remain to avoid traffic with additional respondents noting concerns about highways being blocked and gridlock that happened during the Thomas Fire and other roadway capacity limitations.

Figure 27: Q5.9 - Response Summary (231 respondents)

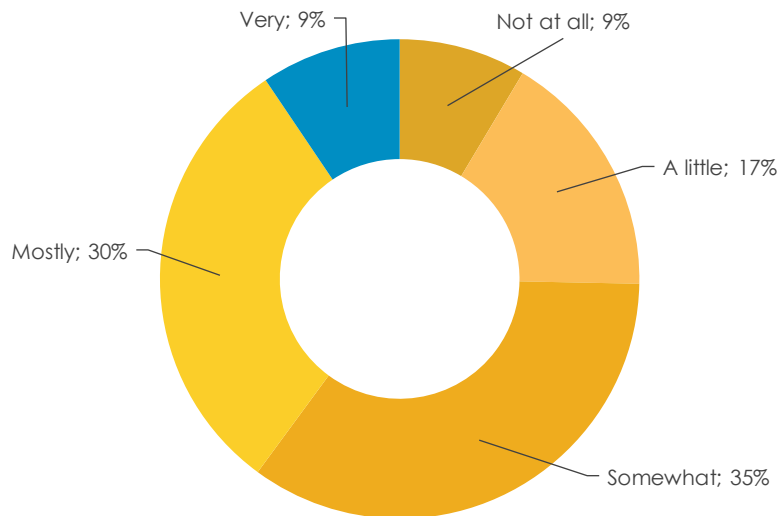


Q5.10

Question: To what extent do you feel prepared for an evacuation right now?

Response Summary: Figure 28 shows the response summary for Q5.10.

Figure 28: Q5.10 - Response Summary (233 respondents)



Findings:

- 9% of the respondents felt they were not at all prepared for an evacuation.
- 60% of the respondents felt they were somewhat, little, or not at all prepared for an evacuation.
- Only 9% of the respondents felt they were very prepared for an evacuation and 30% of the respondents felt they were mostly prepared for an evacuation.

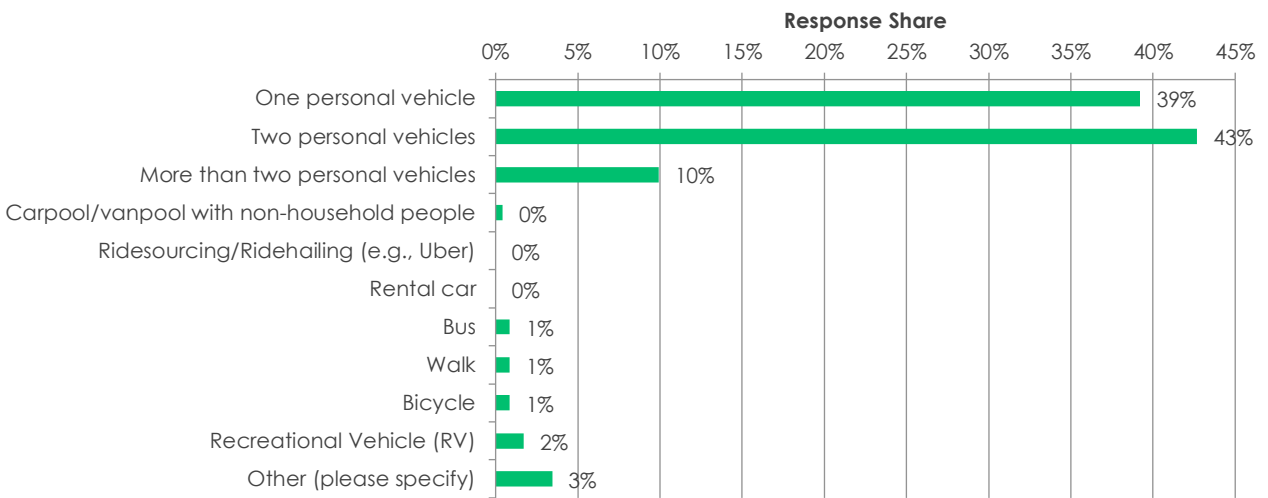
Q5.11

Question: What primary mode of transportation would you use to evacuate?

Response Summary:

Figure 29 shows the response summary for Q5.11.

Figure 29: Q5.11 - Response Summary (232 respondents)



Findings:

- 92% respondents said they would evacuate using their personal vehicle/vehicles (one personal vehicle – 39%, two personal vehicles – 43% and more than two personal vehicles - 10%)
- 3% of the respondents said they would evacuate using bus (1%), walk (1%) or bicycle (1%) and 2% of the respondents said they would evacuate using a recreational vehicle (RV).
- Only one respondent said they would carpool/vanpool with non-household people to evacuate.
- Of the other 8 respondents who specified their responses:
 - Respondents specified motorcycles, pickup trucks, or using a combination of multiple vehicles like a recreational vehicle with an automobile or pickup trucks with stock trailers.
 - Two respondents said they would not evacuate.
- Zero respondents said they would evacuate using ridesourcing/ridehailing (e.g., Uber) or rental car.

Q5.12

Question: Do you intend to tow anything behind your vehicle?

Response Summary: Of all respondents, 228 respondents answered this question.

Findings:

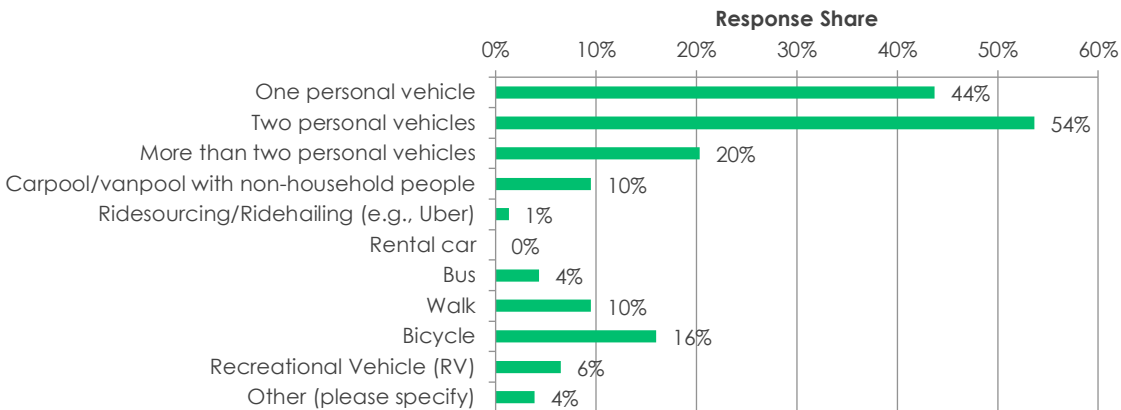
- 12% answered "Yes", they intend to tow behind their vehicle,
- 87% respondents answered "No", and
- One respondent said they will not be using their own vehicle.

Q5.13

Question: Which of the following transportation modes are available to you and you would consider for an evacuation? Select all that apply.

Response Summary: Figure 30 shows the response summary for Q5.13.

Figure 30: Q5.13 - Response Summary (231 respondents)



Findings:

- The top three available/considered transportation modes were: two personal vehicles (54%), one personal vehicle (44%) and more than two personal vehicles (20%).
- 16%, 10% and 10% said they had availability/would consider bicycle, walk and carpool/vanpool with non-household people options to evacuate, respectively.
- Of the other 9 respondents who specified their responses, the transportation modes mentioned were horse trailer, pickup truck, and motorcycle.

Q5.14

Question: Please type in your start location as your address, cross-streets, nearby landmark, or neighborhood.

Response Summary: Of all respondents, 225 respondents answered this question.

Findings: The respondents' origins are spread over Ojai Valley with concentrations in Ojai, Meiners Oaks, Mira Monte, Arbolada, and Oak View.

Q5.15

Question: Please type in your destination location for an evacuation as an address, cross-streets, nearby landmark, or neighborhood

Response Summary: Of all respondents, 220 respondents answered this question.

Findings: The respondents' destinations are primarily Ventura, Los Angeles, Santa Barbara, and Long Beach.

Q5.16

Question: What road types will you spend the most time traveling on? Rank the road types from 1 (most amount of time) to 4 (least amount of time).

Response Summary: Of all respondents, 221 respondents answered this question.

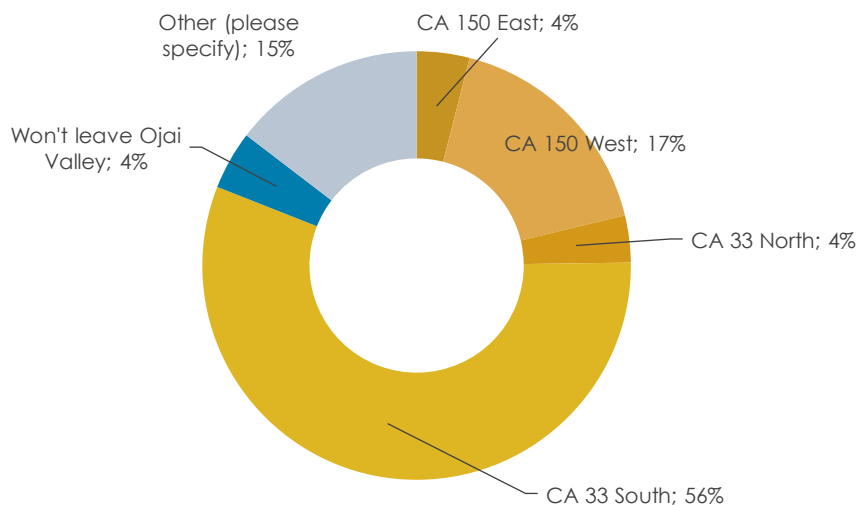
Findings: Local roads, major roads (including arterial roads) and highways (with on/off ramps) were scored equally. Rural roads scored minimum or are least preferred among other choices.

Q5.17

Question: What primary route will you use to leave Ojai?

Response Summary: Figure 31 shows the response summary for Q5.17.

Figure 31: Q5.17 - Response Summary (226 respondents)



Findings:

- 56% of the respondents said they would take CA 33 South and 17% said they would take CA 150 West.
- Only 8% of the respondents said they would take CA 150 East or CA 33 North.
- 4% of the respondents said they would not leave Ojai Valley.
- Of the 15% respondents who specified other choices, the general themes identified are described below:
 - Will pick a route depending on fire/wind direction and size.
 - Will pick depending on which route is open and safest.
 - Will pick a route based on traffic conditions/congestion.

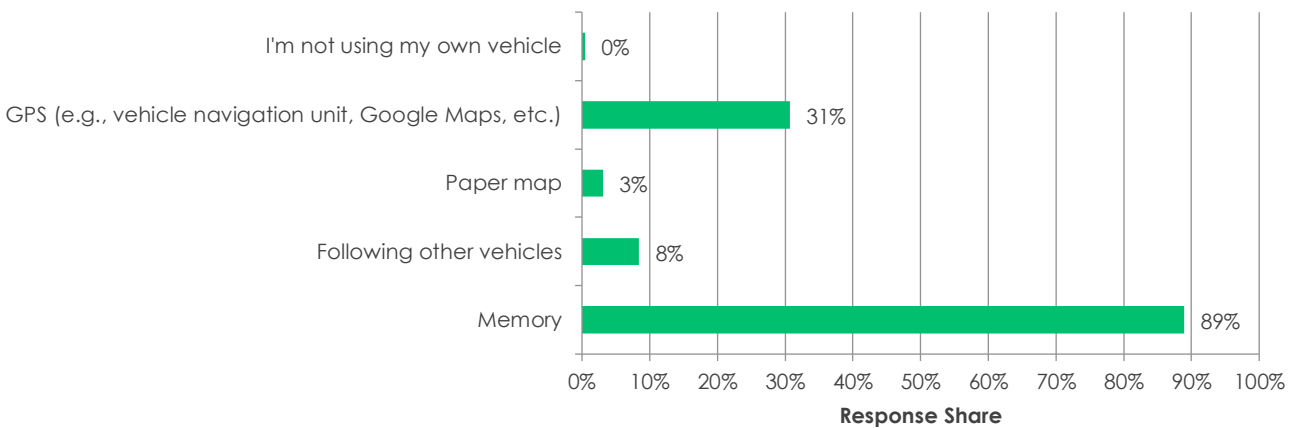
- Route choice depends on where we are evacuating from (house or kids' school).
- Will use local roads to connect to CA 33 and then to Highway 101.
- Will follow guidance from the evacuation coordinator.

Q5.18

Question: How would you find your way during the evacuation? (Select all that apply)

Response Summary: Figure 32 shows the response summary for Q5.18.

Figure 32: Q5.18 - Response Summary (225 respondents)



Findings:

- 89% of the respondents said they would find their way based on memory, while 31% said they would use GPS (e.g., vehicle navigation unit, Google Maps, etc.).
- One respondent said they would not be using their own vehicle.

Q5.19

Question: If you use a paper map or GPS to navigate, how often would you check directions?

Response Summary: Of all respondents, 210 respondents answered this question.

Findings:

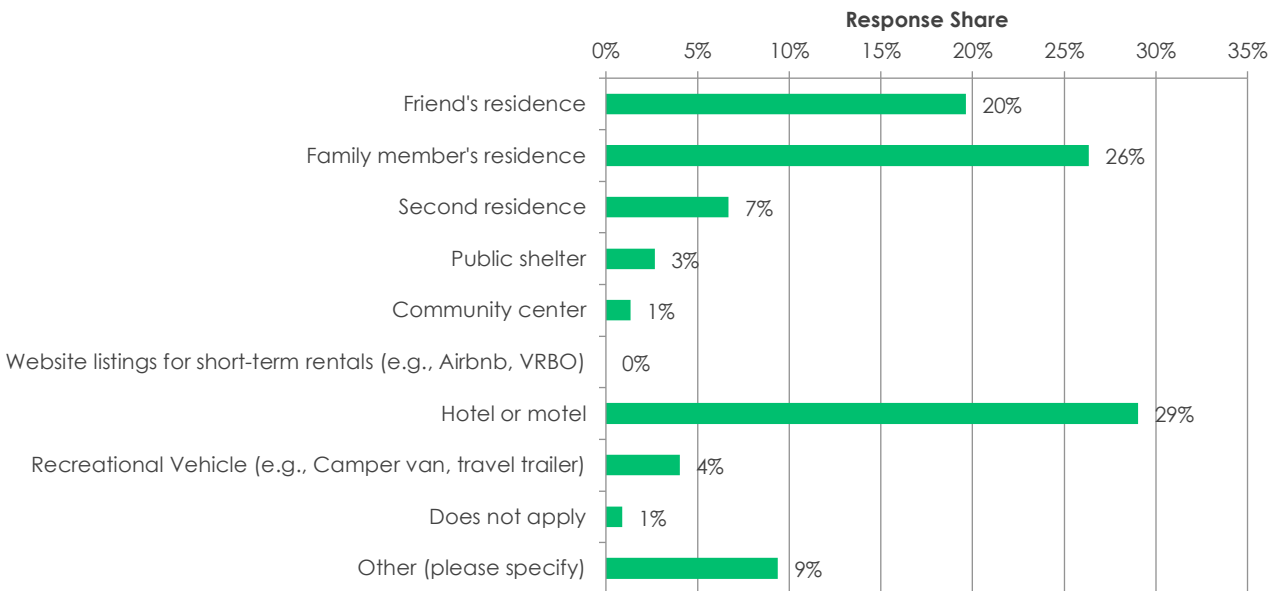
- 38% said they would check for directions regularly.
- 9% and 9% said they would check for directions periodically and infrequently respectively.
- 44% said this question does not apply to them.

Q5.20

Question: What will be the type of shelter at the final destination of your evacuation?

Response Summary: Figure 33 shows the response summary for Q5.20.

Figure 33: Q5.20 - Response Summary (224 respondents)



Findings:

- The top three choices picked by respondents were:
 - Hotel or Motel (29%),
 - Family member's residence (26%),
 - Friend's residence (20%).
- Approximately 4% of the respondents said they would pick a public shelter or community center as a final destination.
- Of the 9% respondents who specified other choices, the general themes identified are described below:
 - Office, neighborhood high school, parking lot, camp site, beach, and assisted living facility.
 - Sleep in a vehicle or tent.
 - Depends on the situation (risk, availability, where to go).
 - Final destination unknown.
- Zero respondents chose website listings for short-term rentals (e.g., Airbnb, VRBO).

Q6.1

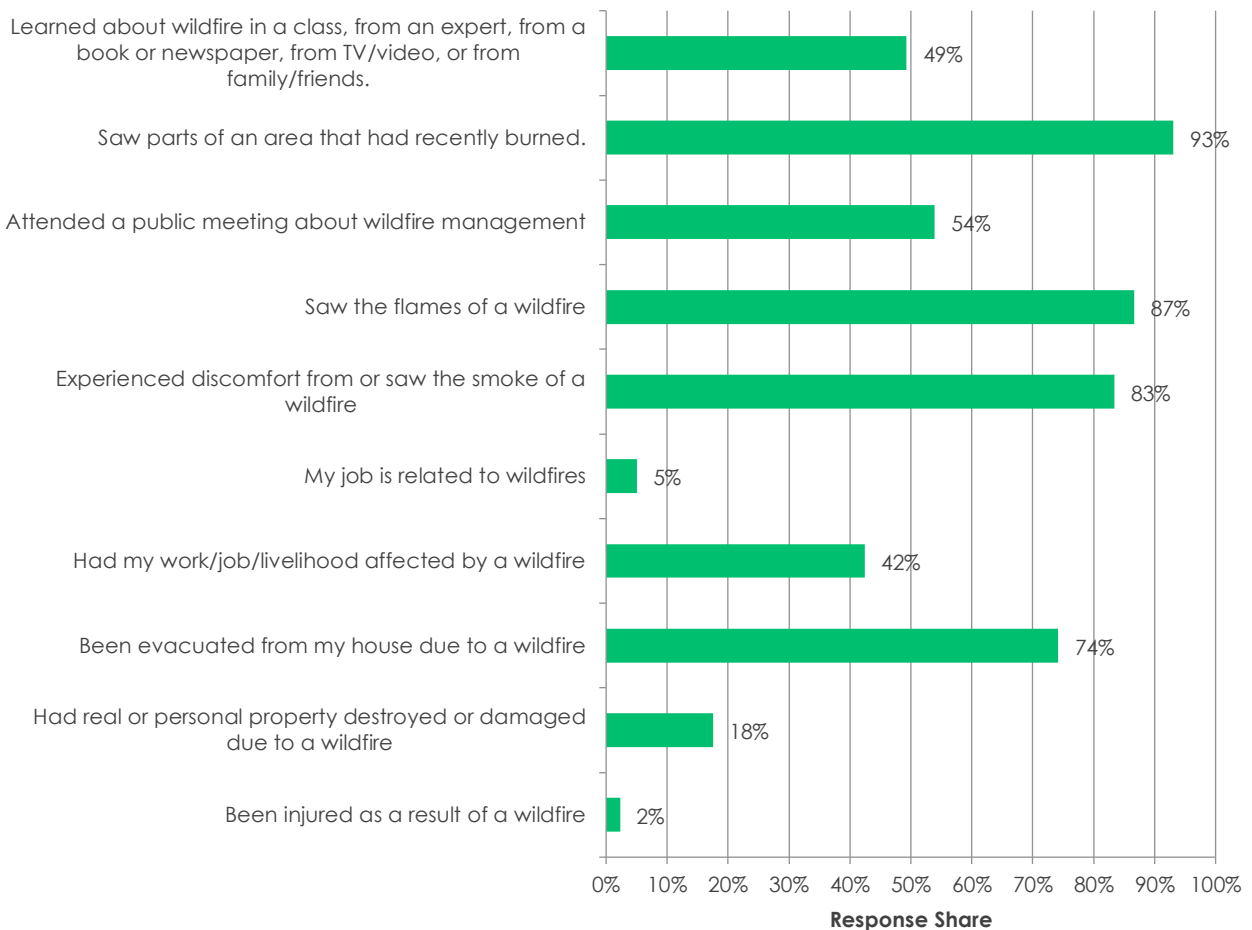
Question: Have you experienced any of the following? Select all that apply.

Response Summary: Figure 34 shows the response summary for Q6.1.

Findings:

- The top four choices picked by respondents were:
 - Saw parts of an area that had recently burned (93%),
 - Saw the flames of a wildfire (87%),
 - Experienced discomfort from or saw the smoke of a wildfire (83%),
 - Been evacuated from my house due to a wildfire (74%).
- 54% of the respondents said they attended a public meeting about wildfire management.
- 42% of the respondents had their work/job/livelihood affected by a wildfire and 18% of the respondents had their real or personal property destroyed or damaged due to a wildfire.

Figure 34: Q6.1 - Response Summary (217 respondents)



Q6.2

Question: Previous hazard experience (including other parts of the world)

Response Summary: Of all respondents, 211 respondents answered this question.

Findings:

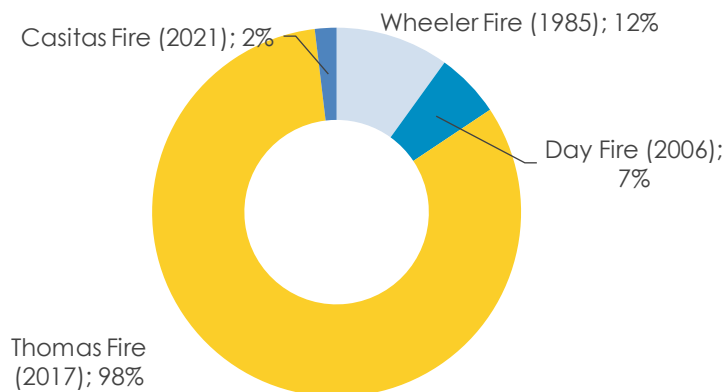
- Respondents have been affected by an average of 4.5 hazard incidents (e.g., floods, wildfires, earthquakes, hurricanes, etc.) and an average of 2.5 wildfires, specifically.
- Respondents have been evacuated an average of 1.3 times due to a wildfire hazard and evacuated an average of 1.7 times for any hazard incident.

Q6.3

Question: Did you evacuate from any of the following fires? (Select all that apply)

Response Summary: Figure 35 shows the response summary for Q6.3.

Figure 35: Q6.3 - Response Summary (177 respondents)



Findings:

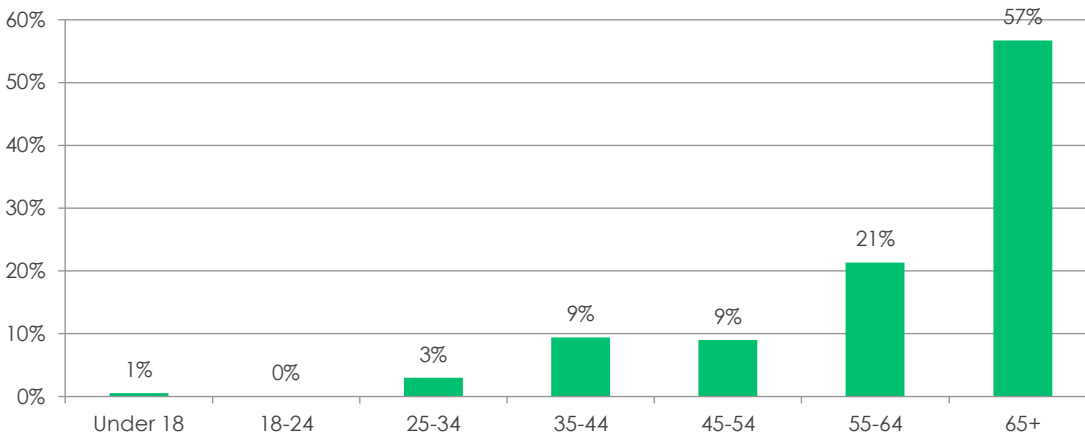
- 98% of the respondents said they evacuated during Thomas Fire (2017).
- 12% and 7% of the respondents said they evacuated during Wheeler Fire (1985) and Day Fire (2006) respectively.
- 2% said they evacuated during Casitas Fire (2021).

Q7.2

Question: What is your age? Leave blank if prefer not to answer.

Response Summary: Figure 36 shows the response summary for Q7.2.

Figure 36: Q7.2 - Response Summary (201 respondents)



Findings:

- 57% of the respondents identified their age group as 65 years and above and 21% identified their age group as 55–64 years.
- According to the ACS 2022 5-Year estimates (2018-2022), the percentage of population above 55 years of age in Ojai – Mira Monte CCD (Census County Division) is 43%. The population above 55 years of age is overrepresented in the survey responses.
- 9% and 9% identified their age group as 35-44 years and 45-54 years, respectively. Only 3% of the respondents identified their age group as 25-34 years.

Q7.3

Question: How do you describe your gender identity? (Select all that apply)

Response Summary: Of all respondents, 213 respondents answered this question.

Findings:

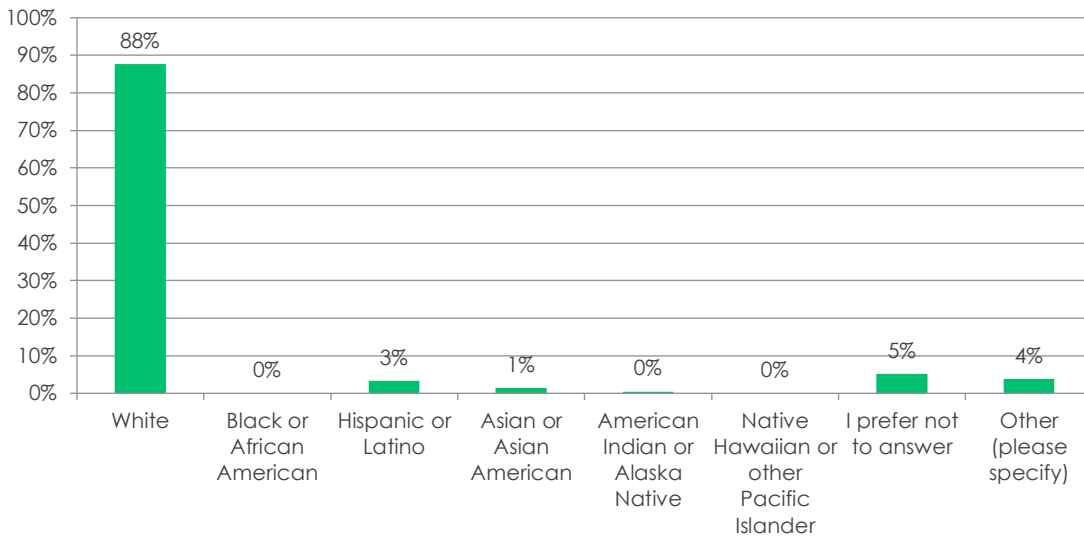
- 61% identified themselves as a "Woman" and 35% identified themselves as a "Man".
- According to the ACS 2022 5-Year (2018-2022) estimates, females and males constitute 51% and 49% in the Ojai – Mira Monte CCD. This shows females are overrepresented in the survey responses.
- One respondent identified themselves as "Non-Binary" and one respondent identified themselves as "Transgender."
- 2% of the respondents preferred not to answer the question and 1% of the respondents objected to all options or considered the question to be inappropriate.

Q7.4

Question: What is your race? Select all that apply.

Response Summary: Figure 37 shows the response summary for Q7.4.

Figure 37: Q7.4 - Response Summary (212 respondents)



Findings:

- 88% of respondents were White. According to the ACS 2022 5-Year (2018-2022) estimates, Whites constitute 82% of the population in the Ojai – Mira Monte CCD. The survey responses are skewed towards the White population.
- One respondent (<1%) identified as American Indian or Alaska Native and three respondents (1%) identified as Asian or Asian American.
- Of the other respondents who specified their race:
 - Six respondents (~3%) identified as belonging to mixed races (according to ACS 2022 5-Year estimates, two or more races constitute 8% of the population in the Ojai – Mira Monte CCD),
 - One respondent identified as Ashkenazi Jew and
- One respondent did not see information on race being important for an evacuation planning study.

Q7.5

Question: What is your ethnicity?

Response Summary: Of all respondents, 201 respondents answered this question.

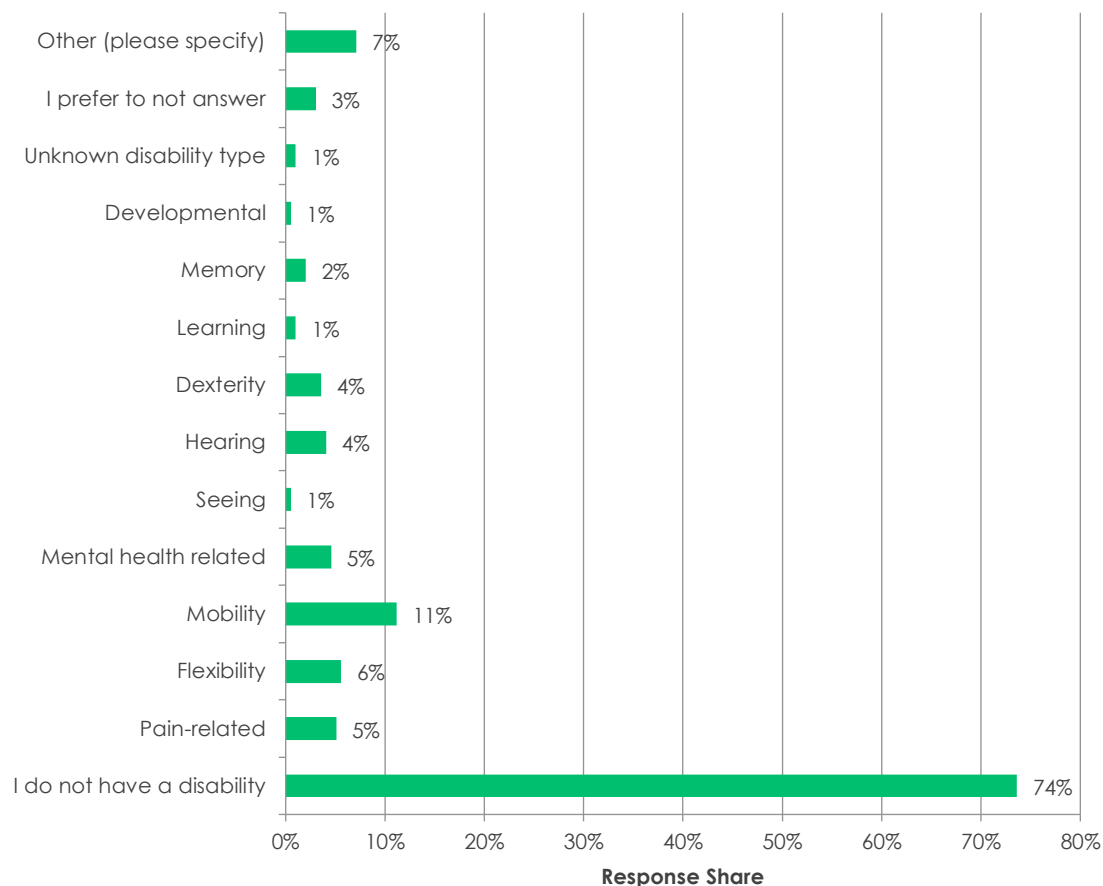
Findings: Only 5% of the respondents identified as Hispanic or Latino. According to the ACS 2022 5-Year (2018-2022) estimates, Hispanic or Latino population constitute 21% of the population in Ojai – Mira Monte CCD. Hispanic or Latino population is underrepresented in the survey responses.

Q7.6

Question: Please indicate the type(s) of disability you experience. Select all that apply.

Response Summary: Figure 38 shows the response summary for Q7.6.

Figure 38: Q7.6 - Response Summary (197 respondents)



Findings:

- The top responses for the type of disability were:
 - Mobility (11%),
 - Flexibility (6%),
 - Pain-related (5%) and Mental health related (5%),
 - Dexterity (4%) and Hearing (4%).
- Of the others who specified their type of disability, the types included:
 - Spouses having dementia, or Alzheimer's, or aging,
 - Child having a disability,
 - Sleep apnea,
 - Lung related issues or asthma,
 - Physical limitations such as balance issues, not able to lift heavy objects or run,
- One respondent mentioned that 90 residents live in their Assisted Living facility.

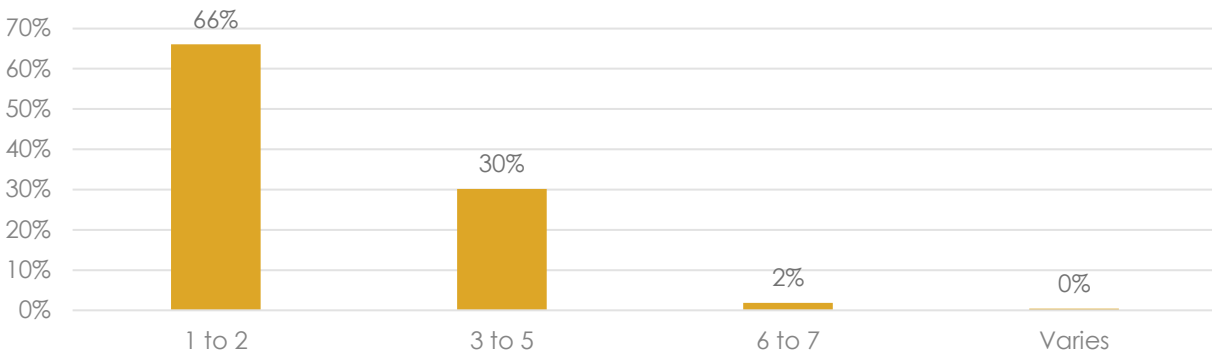
- 74% of respondents said they did not have a disability.

Q7.8

Question: Number of individuals in your household.

Response Summary: Figure 39 shows the response summary for Q7.8.

Figure 39: Q7.8 - Response Summary (209 respondents)



Findings:

- 66% responded as having one to two members in their household.
- 30% responded as having three to five members in their household.
- Two respondents said they have more than between 20 and 40 individuals and one respondent said they have 90 individuals plus staff.
- Removing households with more than 20 individuals, the average household size is 2.41.

Q7.9

Question: Number of children under the age of 18 who are present the majority of the time.

Response Summary: Of all respondents, 203 respondents answered this question.

Findings: 20% of the respondents have at least one child in their household majority of the time (18% have one to two children and 2% have greater than three children). One respondent said there would be 10 to 20 children during summers but few during winters.

Q7.10

Question: Number of adults over the age of 65 who are present the majority of the time.

Response Summary: Of all respondents, 201 respondents answered this question.

Findings: 69% of the respondents have at least one adult over the age of 65 years in their household the majority of the time (28% have one adult, 37% have two adults and 4% have three or more adults). Of these, one respondent said they have 100 adults over 65 years of age the majority of the time.

Q7.11

Question: Number of individuals with disabilities who are present the majority of the time

Response Summary: Of all respondents, 198 respondents answered this question.

Findings: 22% of the respondents have at least one individual with a disability who are present the majority of the time (18% have one individual, 3% have two individuals and 1% have 90 individuals).

Q7.12

Question: Do you own or keep large animals/livestock?

Response Summary: Of all respondents, 211 respondents answered this question.

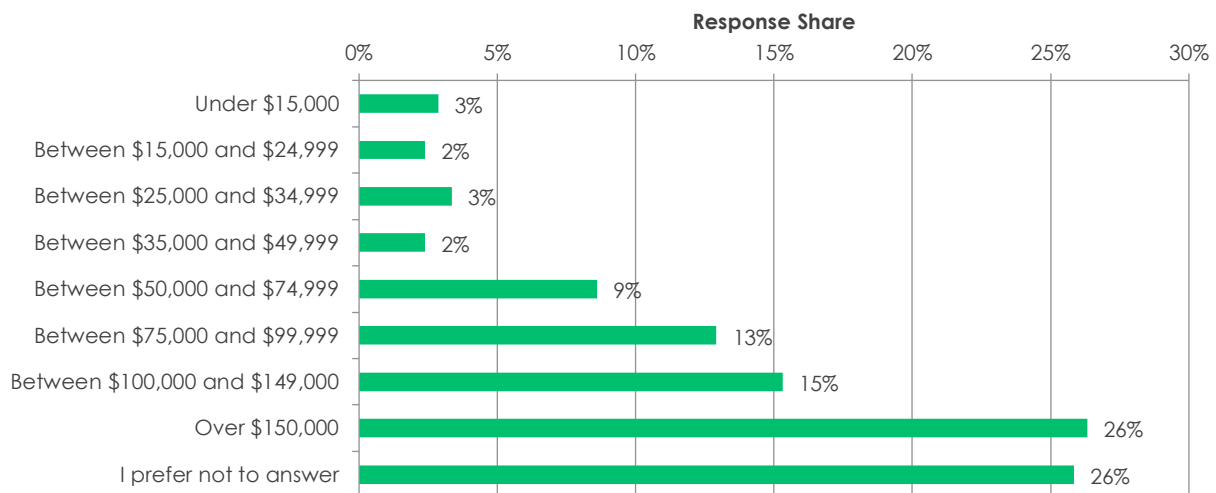
Findings: 12% of the respondents own or keep large animals/livestock.

Q7.13

Question: What was your total household income in 2022?

Response Summary: Figure 40 shows the response summary for Q7.13.

Figure 40: Q7.13 - Response Summary (209 respondents)



Findings:

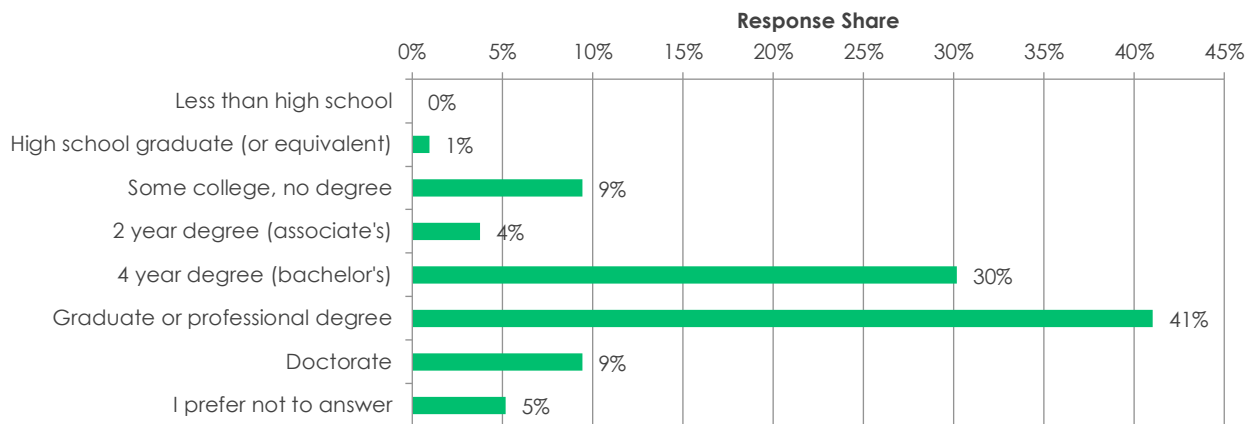
- 55% of the respondents had their household income greater than \$75,000 in 2022 and 8% of the respondents had their household income less than \$35,000.
- More than one-fourth of the respondents preferred to not answer the question, which does not allow for a definitive conclusion regarding household income distribution in the study region.

Q7.14

Question: What is the highest level of education you have completed?

Response Summary: Figure 41 shows the response summary for Q7.14.

Figure 41: Q7.14 - Response Summary (212 respondents)



Findings:

- 80% of the respondents have a 4-year degree (bachelor's) or higher.
- Approximately 10% of the respondents have some college (no degree) or high school graduate (or equivalent) or less than high school level of education.

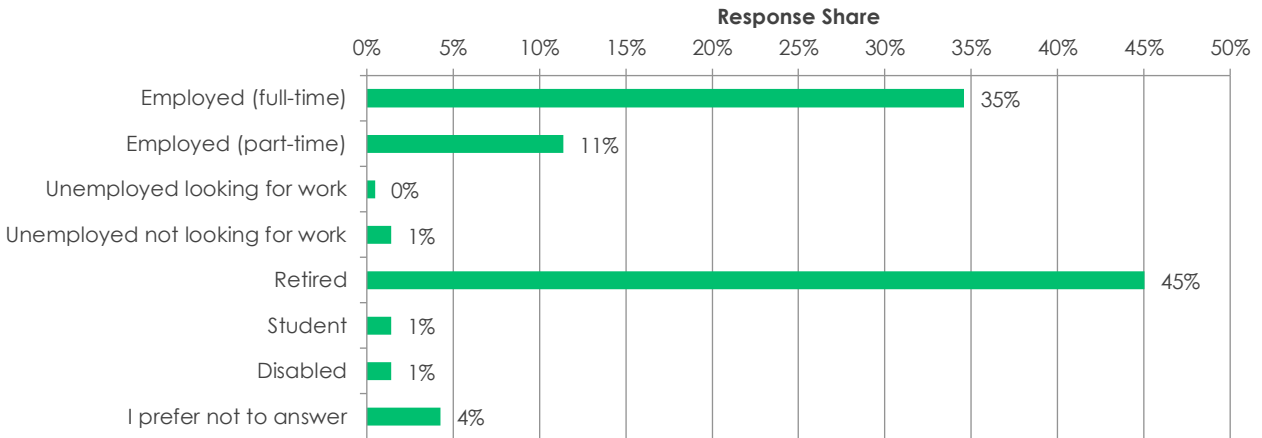
Q7.15

Question: What is your current employment status?

Response Summary: Figure 42 shows the response summary for Q7.15.

Findings: The majority of respondents are retired (45%) or are employed full time (35%).

Figure 42: Q7.15 - Response Summary (211 respondents)



Q7.16

Question: Do you live or work on a farm, vineyard, or other agricultural place?

Response Summary: Of all respondents, 211 respondents answered this question.

Findings: Approximately 12% of the respondents live and/or work on a farm, vineyard, or other agricultural place.

Q7.17

Question: What type of residence do you live in?

Response Summary: Of all respondents, 212 respondents answered this question.

Findings:

- The majority of respondents (86%) lived in a single-family home (52% in a single-family home on less than an acre of land and 34% in a single-family home on more than an acre of land).
- Only 6% of the respondents lived in a townhome/condominium/apartment.
- 5% of the respondents lived in a mobile home.

Q7.18

Question: If you are visiting Ojai Valley, what type of accommodation are you staying in?

Response Summary: Of all respondents, 23 respondents answered this question.

Findings: 22% of the respondents lived in a hotel or motel and 13% of the respondents lived in a timeshare/vacation house/second house/campsite or RV park. 22% of the respondents preferred not to answer this question and the others specified their responses as working in Ojai/visiting family and friends/not applicable.

Q7.19

Question: Do you own your residence in Ojai Valley?

Response Summary: Of all respondents, 210 respondents answered this question.

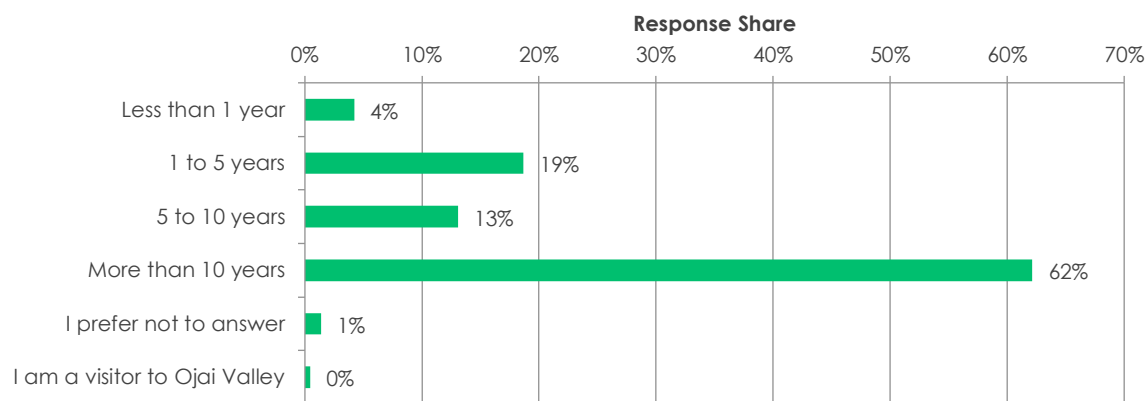
Findings: 86% of the respondents owned a residence and 11% of the respondents did not own residence in Ojai Valley.

Q7.20

Question: How long have you lived in your current residence?

Response Summary: Figure 43 shows the response summary for Q7.20.

Figure 43: Q7.20 - Response Summary (214 respondents)



Findings:

- The majority of respondents (62%) are long term residents of Ojai Valley who lived in their current residence for more than 10 years.
- 13% of the respondents have lived in their current residence for 5 to 10 years.
- Around 23% of the respondents have lived in their current residence for 5 years or less.

Q7.21

Question: What neighborhood are you currently living in or located in Ojai Valley? If you are a visitor, please provide the neighborhood of your accommodation.

Response Summary: Figure 44 shows the most frequently mentioned words in Q7.21 responses.

Findings:

- Residences of respondents are spread out in the valley with the majority of respondents living in Downtown Ojai, Ojai, Meiners Oaks, Oak View, Mira Monte, and East End neighborhoods.
- Other neighborhoods that were also mentioned frequently are Upper Ojai, Persimmon Hill, North Fork Springs and Arbolada.

Figure 44: Q7.21 - Response Summary (200 respondents)

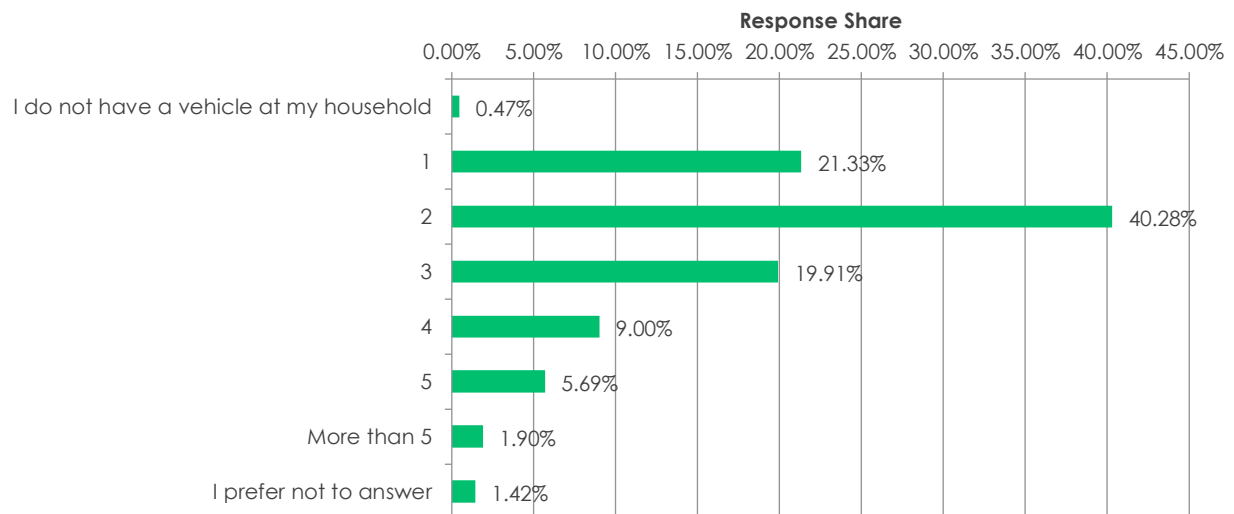


Q7.22

Question: How many automobiles (car, SUV, pickup, or van) does your household currently have? If you are visiting Ojai Valley, how many automobiles do you have available?

Response Summary: Figure 45 shows the response summary for Q7.22.

Figure 45: Q7.22 Response Summary (211 respondents)



Findings:

- 81% of the respondents own one (21%), two (40%) or three (20%) automobiles in their household.
- 15% of the respondents have four (9%) or five (6%) automobiles in their household.
- 2% of the respondents have five or more automobiles in their household.

Q7.23

Question: How many trailers (e.g., for livestock, tools, recreation, etc.) does your household currently have? If you are visiting Ojai Valley, how many trailers did you tow?

Response Summary: Of all respondents, 211 respondents answered this question.

Findings: Approximately 23% of the respondents have a trailer in their household or towed a trailer (one trailer -17% and two trailers – 6%). Others have/towed zero trailers or preferred not to answer.

Q7.24

Question: Are you part of a community organization/group? (i.e., arts/cultural, education/school/PTA, healthcare, labor unions, political, professional/trade, religious, social service/charitable, sports/recreation)?

Response Summary: Of all respondents, 207 respondents answered this question.

Findings: 60% of the respondents were part of a community organization/group. The others responded “No” or preferred not to answer the question.

Q7.25

Question: Do you have access to an internet connection at your home (Wi-Fi or broadband) or your accommodation?

Response Summary: Of all respondents, 213 respondents answered this question.

Findings: 99% of the respondents had access to an internet connection at their home or accommodation.

Q7.26

Question: Do you have any final comments? Is there anything else you would like to tell us?

Response Summary: Of all respondents, 101 respondents answered this question.

Findings: The general themes identified from the responses are summarized below:

- *Roadway Infrastructure Concerns:*
 - Multiple concerns about traffic congestion/gridlocks/road closures during evacuation.
 - Multiple concerns regarding access points being open or being sufficient to evacuees.
 - Requests for general maintenance of existing roadways.
 - Requests to build wider highways and remove on-street parking in the region.
- *Communications Concerns:*
 - Concerns regarding internet and cell phone services being available.
 - Requests for communications through landline and for an organized telephone tree.
- *Emergency Preparedness:*

- Requests to conduct more wildfire/evacuation preparedness workshops.
 - Requests for clear and timely communication of evacuation orders and evacuation centers.
 - Requests for better fire and evacuation notification services.
 - Requests for alarm siren in Ojai and Meiners Oaks.
- *Tourist Concerns:*
 - Concerns regarding evacuation of tourists or evacuation during busy weekends where tourism could increase the potential number of evacuees in the region.
- *Pet/Livestock Concerns*

Appendix B – Ojai Day Community Outreach Summary

OVERVIEW

Kittelison & Associates, Inc. (Kittelison) and Jensen Hughes are assisting the Ojai Valley Fire Safe Council (OVFSC) with the Wildfire Vulnerability and Evacuation Assessment for the Ojai Valley region. The Evacuation Assessment identifies vulnerable groups and potential capacity constraints under a variety of evacuation scenarios. Recommendations will be made around vegetation management, operational strategies, and communication strategies to help improve capacity and communications around emergency evacuations in the region.

To understand the concerns and needs of residents and visitors of Ojai Valley during an evacuation event, the Kittelison, Jensen Hughes, and OVFSC team set up a booth at the 2023 Ojai Day festival to gather feedback from the community.

The goal of attending Ojai Day was to understand the type of concerns (e.g., transportation, communication, education, etc.) residents and visitors have when it comes to evacuations in the region. It was also an opportunity to understand the specific locations in Ojai Valley where residents and visitors have concerns or have had trouble evacuating in past emergency events.

OUTREACH SUMMARY

Community Engagement Summary

- **Outreach Event:** Ojai Day Festival – Saturday, October 21, 2023
 - Approximately 100 people stopped by the booth to discuss their experiences and concerns with emergency evacuations
 - Approximately 70 survey cards were distributed to people
- **Materials:**
 - Project Summary map (Attachment A)
 - Roadway Network map (Attachment B)
 - Online Survey Cards (Attachment C)
- **Summary of Comments**
 - Questions and concerns around **vulnerable populations:**
 - How do we evacuate children/schools?
 - How do we evacuate elders in the community?
 - How do we evacuate our unhoused populations?
 - How do we evacuate people without their own transportation?

- How do I evacuate with my pets? Where can I shelter them for safety?
- How do I evacuate if I'm out hiking?
- Questions and concerns around **evacuation orders**:
 - How do I know if I need to evacuate?
 - How do I know where to evacuate? Which direction do I go?
 - What happens if everyone needs to evacuate all at once?
 - How do I get information on evacuations? During the Thomas Fire, there was no communication to the public for almost 36 hours.
- Questions and concerns around **evacuation routes**:
 - What do I do if an area only has one way in and out?
 - Can roadways be constructed with flexible posts so they can be converted to travel lanes in emergency situations?
 - Are there additional evacuation routes if roads are closed?
 - What happens if there is construction on parallel roads (e.g., roadway construction on County roads and State highways) on the same construction timeline? Will that impact evacuations?
- Questions and concerns around **roadway capacity**:
 - What happens if there is construction on parallel routes?
 - There is congestion on SR-150 in all directions
 - There is too much traffic and people get stuck on the roadway
- **Other** evacuation questions and concerns:
 - How are mobile homes evacuated?
 - Are there options to evacuate via bicycle?
 - I have no plans to evacuate my home.
- **Specific locations** of interest/concern during an evacuation
 - SR-150 (Casitas Springs)
 - Casitas Pass Road (west of Lake Casitas)
 - N Ojai Road (Upper Ojai)
 - Villanova Road (Ojai)
 - Knox Key
 - Ventura Freeway bridge
 - La Luna Avenue (Ojai)
 - El Roblar Drive to S Rice Road (Mira Monte)

Figure 46. Ojai Valley Wildfire Evacuation Assessment - Project Introduction Board



[illegible]

These comments, along with the results from the online survey, will be summarized and added to the final Evacuation, Vulnerability, and Risk Mitigation Assessment Summary Memorandum. This information helps to inform the OVFS of the various resources and assistance the public needs during an emergency evacuation event.

Appendix C – Vulnerable Populations Analysis for Transportation

1) Background and Methods

Vulnerable populations are groups of people with characteristics that produce barriers to evacuating safely, efficiently, or comfortably. The California Office of Emergency Services (CalOES) uses the term “Access and Functional Needs (AFN) Population” to capture similar populations. Characteristics can be related to a lack of transportation (e.g., personal cars or public transportation), socioeconomic factors (e.g., low income, non-English speakers, etc.), or physical impairments. Critically, vulnerable (or underserved) populations experience significant setbacks and negative impacts from disasters and emergencies. Past research has focused on the connection of high social vulnerability with wildfire risk (Wigtil et al., 2016; Davies et al., 2018), the risk-heightening effects of climate change on vulnerable populations worldwide (Birkmann et al., 2022), and methods to increase social equity in wildfire evacuations (Wong et al., 2020a).

This analysis aims to complement wildfire evacuation modeling work by the transportation team by underscoring specific risks, vulnerabilities, and strategies for identified populations. For this project, wildfires are the primary hazard that typically would require an immediate and full-scale evacuation of the Ojai Valley. Wildfire scenarios can be found in Task 1. It should be noted that wildfires often present unique issues compared to other disasters. For example, wildfires tend to produce significant environmental risks in a short amount of time and across varying geographic sizes. Consequently, most literature referenced in this section will focus on wildfire (or relevant) evacuation vulnerabilities and strategies.

For methods, the STEPS equity framework is a positive analysis methodology that identifies transportation-relative issues and groups (Shaheen et al., 2017). This equity framing incorporates a combination of equity theories related to a capabilities approach, al-Sadr, prioritarianism, and sufficientarianism (Lewis et al., 2021). One unique aspect of the STEPS equity framework is that it can be applied more readily to different transportation challenges, including evacuations. Table 1 provides a summary of the STEPS equity framework, focusing exclusively on wildfire evacuation (Wong et al., 2020a).

Table 1. STEPS Equity Framework for Transportation and Wildfire Evacuations (Adapted from Wong et al., 2020a)

Dimension	Application for Wildfire Evacuations	Examples for Wildfire Evacuations
Spatial	Spatial factors that increase risk, increase evacuation distances, decrease routing options, or compromise evacuations	Single exit routes, high-risk fire zones, lack of public transit within walking distance, low proximity to resources, shelters located far away

Dimension	Application for Wildfire Evacuations	Examples for Wildfire Evacuations
Temporal	Travel time barriers that inhibit a user from departing at a reasonable time, reaching a destination at an appropriate time, evacuation time costs that lead to non-compliance, or early returners to impacted areas	Additional mobilization time due to medical needs or packing, minimal communication notification, roadway congestion, rapid fire spreading due to wind, public transit reliability issues, work requirements
Economic	Direct and indirect costs that create economic hardships or preclude users from evacuating	Hotel/supplies/fuel costs, vehicle ownership costs, time away from job especially for hourly employees
Physiological	Physical and cognitive limitations that make using standard transportation modes or sheltering resources difficult or impossible for specific groups	Vulnerable groups including older adults, individuals with disabilities, homebound individuals, etc.; inability/challenge to receive evacuation information due to visual/auditory disability; may require accessible vehicles or shelter
Social	Social, cultural, safety, and language barriers that inhibit a user's comfort or ability to use transportation or evacuate	Vulnerable groups including racial and ethnic minorities, immigrants, undocumented immigrants, Native American and Indian Tribal governments, etc.; lack of multi-language information on evacuation orders, transportation, and sheltering; discrimination in resource allocation

To better identify vulnerability in the Ojai Valley, a query was conducted using the American Community Survey (ACS) from the U.S. Census. For this query, the Ojai-Mira Monte Census County Division (CCD) was used to approximate the Ojai Valley Planning Area. Several areas are missing from the CCD (Figure 1) that are in the Ojai Valley Planning Area, including: Ojala, Wheeler Gorge, Matilija Canyon, sections of Foster Park, and the surroundings of Steckel Park. These areas were omitted from the query due to their low population and the lack of clear geographic boundaries in the census data. Table 2 presents the number of people and the percentage of residents in each vulnerable group, where data is available. The Ojai-Mira Monte CCD had an estimated population of 28,979 for the ACS 2021 5-Year Estimates. Several other sources were used for vulnerable groups that were not identified in the ACS. These vulnerable groups included unbanked/underbanked households, asset poor households, individuals with a psychological disability, individuals who are hospital-bound, undocumented immigrants, houseless, LGBTQ+, and required workers.



Figure 1. Map of Ojai-Mira Monte CCD (Census Bureau, 2023)

2) Summary of STEPS Analysis for Ojai Valley

A significant number of Ojai Valley residents will likely require additional resources, assistance, transportation options, and sheltering for a wildfire evacuation (Table 2). While the analysis did not identify intersectionality, some groups may have compounding factors that could increase barriers or challenges during a wildfire evacuation. A few key groups stand out for the Ojai Valley: Older Adults; Non-English Speaking; Low-Income; Individuals with Disabilities; and Carless.

Table 2. Vulnerable Groups Matrix (Adapted from Wong et al., 2020a)

Vulnerable Group	Definition	Primary STEPS Dimensions	Percentage	Residents Total	Sample Area, Source
Carless	Do not own a personal auto vehicle	Spatial Temporal Economic	5.0% of households do not own a vehicle*	554 households	Ojai-Mira Monte CCD, ACS 2022
Low-Income	Under the poverty line based on household size; may also include individuals who do not earn a living wage	Economic	7.7% of residents are below the poverty line*	2,217	Ojai-Mira Monte CCD, ACS 2022
Unbanked and Underbanked	Do not have a bank account and/or a credit or debit card	Economic	25% of California residents are unbanked or underbanked	-----	California (HR&A, 2021)
Asset Poor	Have less than \$500 in cash assets available for use	Economic	32% of Americans have less than \$500 in savings to handle an emergency expense	-----	United States (Federal Reserve, 2023)
Racial and Ethnic Minority	Are not in a dominant position and suffer discrimination based on physical and/or cultural traits	Spatial Economic Social	15.6% of residents are non-White-alone	4,244	Ojai-Mira Monte CCD, ACS 2022
			21.1% of residents are Hispanic or Latino	6,158	Ojai-Mira Monte CCD, ACS 2022
Older Adults	Age 65 and over	Temporal Economic Physiological Social	25.0% of residents are aged 65 and over	7,257	Ojai-Mira Monte CCD, ACS 2022
Physically Disabled	Physical impairment that substantially limits major life activity	Temporal Economic Physiological Social	3.7% of residents have a hearing difficulty	1,064	Ojai-Mira Monte CCD, ACS 2022
			1.7% of residents have a vision difficulty	480	Ojai-Mira Monte CCD, ACS 2022
			7.0% of residents have an ambulatory difficulty	1,936	Ojai-Mira Monte CCD, ACS 2022
			2.8% of residents have a self-care difficulty	765	Ojai-Mira Monte CCD, ACS 2022

Vulnerable Group	Definition	Primary STEPS Dimensions	Percentage	Residents Total	Sample Area, Source
Cognitively Disabled	Learning or intellectual impairment that substantially limits development and/or major life activity	Economic Physiological Social	4.7% of residents have some type of cognitive disability	1,298	Ojai-Mira Monte CCD, ACS 2022
Psychologically Disabled	Psychological impairment that substantially limits major life activity; includes mental conditions	Economic Physiological Social	3.8% of Californians have a serious mental illness	-----	California, CHCF (2022)
Homebound	Unable to leave home; individuals may also be socially isolated	Spatial Physiological Social	5.7% of residents aged 18+ have "independent living difficulties"	1,375	Ojai-Mira Monte CCD, ACS 2022
Assisted Living	Located at a nursing home or other similar types of facilities	Spatial Physiological Economic Social	0.39% of residents are living in a nursing facility or skilled nursing facility	109***	Ojai-Mira Monte CCD, 2020 Census
Hospital Bound	Located at a hospital due to health reasons; may be permanent or temporary	Spatial Temporal Physiological Economic Social	Not available	25-bed hospital	Community Memorial Hospital, CHA (2023)
Immigrant	From a different country and comes to live permanently; may or may not be a citizen	Spatial Economic Social	14.2% of residents are foreign-born	4,106	Ojai-Mira Monte CCD, ACS 2022
Undocumented Immigrant	From a different country and do not have legal immigration status	Spatial Economic Social	6% of California residents are undocumented	-----	California, PPIC (2017)
Non-English Speakers	Speak a language other than English (or may only know some English)	Spatial Economic Social	21.3% of residents aged 5+ do not speak English at home	5,915	Ojai-Mira Monte CCD, ACS 2022
			24.0% of households are limited English-speaking	2,648 households	Ojai-Mira Monte CCD, ACS 2022

Vulnerable Group	Definition	Primary STEPS Dimensions	Percentage	Residents Total	Sample Area, Source
LGBTQ+	Gender-based and sexuality-based identity	Social	9.2% of California residents identify as LGBT	-----	California, PPIC (2021)
Houseless	Without an established or regular place of dwelling	Spatial Temporal Physiological Economic Social	0.15% of residents are homeless†	44	Ojai Valley, HUD (2023)
Required Workers	Must work, by law, in disaster events	Spatial Temporal	5.1% of employed residents aged 16+ are in public administration††	703	Ojai-Mira Monte CCD, ACS 2022

* Out of 11,042 households

** Out of 28,838 residents

***2020 Census Data with 28,145 residents (possible undercount)

† 2023 counts for Ojai Valley (Point in Time Count) by the Department of Housing and Urban Development, assuming 28,979 total residents (possible undercount)

†† Out of 13,813 civilians employed population aged 16+ (possible overcount)

Older Adults: People aged 65 or over make up 25% of the population, or about 7,200 residents. They typically have lower levels of physical mobility and access to communication methods (e.g., digital divide). Concurrently, older adults have often lived in a place for an extended time, which sometimes leads to staying behavior. During the Camp Fire in 2018, about 77% of deaths were those 65 or older (Newberry, 2021). A large portion of Ojai Valley residents (~1,300) have independent living challenges, which would indicate a higher need for care during an evacuation.

Key Dimensions: Temporal; Economic; Physiological; Social

Non-English Speaking: About 21% of residents do not speak English at home, and nearly 24% of households have limited English speaking ability. With the widespread Spanish-speaking population in the Ojai Valley, a significant portion of the area may not receive English-based communications. English-based communication tends to be delivered first, after which Spanish and other language translations may be included. Any delay in communication could lead to serious issues, especially for fast-moving fires. Non-English speakers may also struggle to communicate with first responders, shelter staff, and disaster volunteers.

Key Dimensions: Spatial; Economic; Social

Low-Income: Over 2,000 residents are living below the poverty line. Lower-income individuals face financial burdens when evacuating related to sheltering (e.g., hotel/motel), fuel, and food. Some may also have less reliable access to personal transportation, while others may be concerned about missing work. A lack of financial resources can also contribute to a longer and more challenging recovery process.

Key Dimensions: Economic

Individuals with Disabilities: Some residents have significant physical disabilities that may inhibit a successful evacuation. About 1,000 residents have hearing difficulty while almost 500 residents have vision difficulty. These residents may experience evacuation delays if they do not have accessible forms of communication. Approximately 1,900 residents have an ambulatory difficulty (e.g., challenge moving, walking, etc.), which could make it harder for them to reach transportation options or evacuate quickly. About 1,300 residents have a cognitive disability which could affect their perception of and reactions to a wildfire.

Key Dimensions: Temporal; Economic; Physiological; Social

Carless: Approximately 500 residents do not have access to a vehicle. Most evacuation planning in North America focuses on private automobiles since this mode is the predominant form of transportation. With limited public transit options, residents will require a variety of transportation options to evacuate.

Key Dimensions: Spatial; Temporal; Economic

3) Additional Groups to Consider

Through conversations with the clients, partners, and the community, several additional vulnerable groups were identified.

Tourists: Ojai is a popular tourist destination. While the number of available overnight accommodations limits the number of tourists, approximately 20,000 people stay in the Ojai Valley per day (Reynolds, 2022). Despite their access to resources, tourists may not know the local wildfire risks, evacuation plans, or road network. Tourists are also unlikely to know communication channels in the community, especially subscription-based emergency alerts.

Key Dimensions: Spatial; Temporal; Social

Farmworkers/Agricultural Workers: Over 6,500 farmworkers are estimated to be working in the Ojai Valley and Santa Paula, and many of them are Latino and not citizens (CAUSE, 2015). Along with significant overworking and required work hours, farmworkers in the area face critical economic, health, and living challenges that likely translate into severe evacuation challenges. Already disempowered, farmworkers may not have access to evacuation resources, communication, or transportation. They may also distrust government assistance.

Key Dimensions: Spatial; Temporal; Economic; Physiological; Social

Owners of Large Animals: Some concern was expressed for safely evacuating residents with large animals (e.g., livestock, horses). Some residents may choose to stay and defend, since evacuating with large animals can be logistically challenging. Large animals require larger vehicles for transportation and sufficient locations for sheltering (e.g., fairgrounds). Assistance from first responders is unlikely and shelters typically do not have space or services for large animals.

Key Dimensions: Spatial; Temporal; Social

Residents in Mobile Homes: Concerns have arisen regarding the vulnerability of residents in mobile homes since they are near flammable building materials. Additional issues include significant traffic bottlenecks at the entrances of mobile home parks and poorer access to some communication channels.

Key Dimensions: Spatial; Temporal; Economic; Social

Campers/Hikers: The Ojai Valley is a major destination for campers and hikers including the Los Padres National Forest to the north of Ojai. With limited mobile phone service and high exposure to a fire hazard, campers and hikers could face significant evacuation challenges. Hikers in remote areas would have to walk long distances without support or require rapid airlifting. Ignitions could also come from wilderness areas, which could limit firefighting abilities, hazard detection, and speedy evacuations.

Key Dimensions: Spatial; Temporal; Social

4) Vulnerable Population Evacuation Strategies

Evacuation strategies to improve compliance with mandatory evacuation orders, reduce congestion, and increase social equity are summarized in Lindell et al. (2019) and Wong (2020). While the lists and descriptions of strategies are non-exhaustive, they provide a valuable framework for transportation-focused planning options such as: 1) demand strategies, 2) supply strategies, and 3) information strategies. Though research has begun simulating the most effective strategies based on congestion and fire exposure reduction (Zhao and Wong, 2021), work on simulation strategies using equity metrics remains largely missing from the literature. Some evacuation research including Aalami and Kattan (2018) has started researching fair allocation of public transit in evacuations, while Wong et al. (2020a) identified how different vulnerable groups might benefit from shared mobility. However, widespread equity-centered research and empirical evidence for wildfire evacuations are not available from community-driven approaches or simulations. Additional research will be needed to further refine these strategies for evacuation planning. Based on the existing literature and client conversations, the next section presents ten primary strategies for vulnerable populations as they relate to the Ojai Valley. Table 2 provides additional strategies that could be considered for evacuation planning.

Public Transit-Based Evacuations

Description: Public transit is a key component of multi-modal evacuations and can be utilized to evacuate multiple vulnerable populations. Research has found that North American communities have generally lacked plans for transit-based evacuation assistance (Renne and Mayorga, 2022). Gold Coast Transit District (GCTD) operates in the Ojai Valley via its Route 16 bus line (with 1-hour frequencies). GCTD has 61 buses in its fleet, which could be leveraged in an evacuation. The Ojai Trolley also operates in the Ojai Valley with 5 trolley-style buses in its fleet. Public transit buses could help evacuate more people in fewer vehicles, reduce congestion, and encourage compliance. Moreover, transit can move larger numbers of people as a shuttle to safer areas in Ventura County.

STEPS Dimensions Addressed: Spatial, Temporal, Economic, Physiological, Social

Communities Addressed: Carless households, older adults, individuals with disabilities, individuals at hospitals, assisted living facilities, or who are homebound, low-income individuals, racial and ethnic

minorities, non-English speakers, immigrants, visitors, campers/hikers, agricultural workers, mobile home residents.

Implementation Needs (Wambura and Wong, 2023):

- Coordinate with local transit agencies (e.g., Gold Coast Transit District, Ojai Trolley) to identify operational strategies, staffing availability, and vehicles.
- Place clear and signed pickup points close to transit-reliant populations, existing bus stops, and key landmarks.
- Determine where buses will drop people off within and outside of the Ojai Valley area.
- Create a fare-free policy, signage in multiple languages, and volunteer programs to assist people on public transit.
- Engage with underserved populations in transit evacuation planning and include equity metrics in the planning processes.
- Share transit-based evacuation plans with the public through multiple communication channels, including via community-based organizations (CBOs).

Paratransit

Description: Paratransit is a service provided by public transit operators and CBOs for individuals with disabilities and other populations with mobility challenges. For Ojai Valley, GO Access by the Gold Coast Transit District and HELP of Ojai both provide paratransit services. With 26 paratransit vehicles, GO Access can be booked across a wider area and includes travel outside of the Ojai Valley. Most HELP of Ojai trips originate and end within the Ojai Valley. Paratransit can provide a critical means of transportation for individuals with disabilities, including those with personal mobility devices (e.g., wheelchairs, scooters, walkers, etc.). Planning for paratransit (and ambulances) will be especially important for Community Memorial Hospital, nursing homes or skilled nursing facilities, assisted living communities, and retirement communities.

STEPS Dimensions Addressed: Spatial, Temporal, Economic, Physiological, Social.

Communities Addressed: Carless households, individuals with disabilities (especially physical), older adults, individuals at hospitals, assisted living facilities, or who are homebound.

Implementation Needs (Feng et al. 2015; Wambura and Wong, 2023):

- Establish connections with local paratransit providers (e.g., GO Access and HELP of Ojai).
- Identify options for Memorandums of Understanding (MOUs) that would enable close coordination of paratransit resources in an evacuation.
- Create a database of all available paratransit vehicles, including those operated by local facilities.
- Determine the most efficient and resilient matching system along with shelter options for people riding paratransit.
- Plan for caretakers, guardians, and other individuals who may also ride paratransit.

Shared Mobility

Description: Shared mobility can supplement existing transportation resources and assist those with limited transportation options. Research has found that people in high-risk areas are generally open to sharing transportation and housing with others (Wong et al., 2020b), especially in communities with higher trust and compassion. Several options could be developed for an evacuation including a local carpooling system, a coordinated plan with other local on-demand providers, or ad hoc encouragement of sharing. For more advanced planning, a matching system and clear pickup/drop-off points would help facilitate more seamless and reliable evacuations. In addition to assisting those who do not have reliable access to transportation, these shared mobility systems could help communication efforts and information sharing, increase compliance with mandatory evacuation orders, and reduce congestion.

STEPS Dimensions Addressed: Spatial, Temporal, Economic, Social, Physiological.

Communities Addressed: Carless households, individuals with disabilities (especially physical), older adults, low-income individuals (if free), tourists, campers/hikers.

Implementation Needs (Wong et al. 2020a, 2020b):

- Identify areas that would benefit from a shared mobility program such as communities with limited ingress/egress and communities with high proportions of underserved populations.
- Establish pickup points or zones at key landmarks, existing public transit infrastructure, and along major evacuation routes.
- Coordinate with CBOs (e.g., HELP of Ojai), neighbors, and businesses to identify available vehicles and interested volunteers.
- Minimize safety concerns by working with established CBOs or trusted government programs in matching providers and evacuees.
- Increase trust and compassion as part of disaster preparedness, neighborhood networks and/or events, and civic pride to help increase the willingness to share vehicles.

Resort/Hotel Shuttles

Description: Visitors, campers, and hikers are unlikely to know the surrounding Ojai Valley and may require additional time to evacuate. The Ojai Valley has many hotels, inns, and other accommodations, some of which have their own shuttles (airport) or contract with a company to provide the shuttles. While the number of shuttles may be limited, these transportation resources could be utilized during an evacuation, especially for those who arrived via ridesourcing or shuttle. Moreover, the smaller size of some vehicles (e.g., shuttle vans) could enable them to reach more remote trailheads and campgrounds.

STEPS Dimensions Addressed: Spatial, Temporal

Communities Addressed: Carless households, visitors, campers/hikers.

Implementation Needs:

- Coordinate with hotels and resorts to identify existing staff and shuttles/vehicles to evacuate guests and residents.

- Identify pickup and drop-off locations, including campgrounds and trailheads accessible based on vehicle sizes.
- Develop information packets for visitors on what to do, where to go, and how to prepare for a wildfire evacuation.

Resilience Hubs

Description: Resilience hubs are community-serving places that can function during normal conditions and disaster conditions (Baja, 2018). For a wildfire evacuation, a resilience hub can serve as an information center, registration location, evacuation shelter, and/or resource distribution center. The Ojai Valley will likely only have several resilience hubs (of various sizes) to support an evacuation, which can also be integrated with evacuation and transportation planning for a wildfire. People prefer highly localized locations that integrate multi-modality, are easily recognizable and trusted, and contain key services for an emergency (Ciriaco and Wong, 2023; Ciriaco et al., 2023).

STEPS Dimensions Addressed: Spatial, Temporal, Social

Communities Addressed: All vulnerable communities.

Implementation Needs (Ciriaco and Wong, 2022):

- Integrate resilience hub planning with evacuation planning.
- Locate hubs in trusted, central places that can sufficiently support Ojai Valley evacuees.
- Identify possible funding sources for retrofits to buildings via the Strategic Growth Council to increase building and operational resilience and usability in a wildfire evacuation.
- Consider metrics for identifying the use cases, feasibility, and operations of resilience hubs.
- Conduct a needs assessment in the Ojai Valley for resilience hubs to identify the number of possible users, modes of transportation, and services/staff required.

Volunteer Driver Networks

Description: The HELP of Ojai provides a cost-effective transportation assistance program for older adults, individuals with disabilities, and those recovering from surgery. Drivers for the program are volunteers in the community, providing rides to key services, food, and healthcare. This unique program could be integrated with an evacuation plan if volunteers are still available during an evacuation. The network could also be a conduit for information sharing, resource assistance, and social cohesion.

STEPS Dimensions Addressed: Spatial, Temporal, Economic, Physiological, Social.

Communities Addressed: Carless households, individuals with disabilities (especially physical), older adults, individuals at hospitals, assisted living facilities, or who are homebound.

Implementation Needs:

- Coordinate with HELP of Ojai and other related transportation providers in identifying strategies for an evacuation.
- Determine the availability of drivers, including those who may have to evacuate themselves.

- Identify additional staffing to support the call center during an evacuation.

Active Transportation

Description: Active transportation (e.g., walking, bicycling, micromobility) can be used to evacuate people or deliver critical supplies in a more flexible and adaptable way (Fitch-Polse et al., 2023). While the use cases for active modes are narrow, opportunities for active modes exist in downtown Ojai and places with sufficient infrastructure. Bicycling could be especially useful in evacuating downhill in areas of heavy congestion (Fitch-Polse et al., 2023). Walking can also be used to connect people to key resource centers in neighborhoods or pickup locations for public transit.

STEPS Dimensions Addressed: Spatial, Temporal

Communities Addressed: Carless households, low-income individuals, immigrants, non-English speakers, racial and ethnic minorities, mobile home residents.

Implementation Needs:

- Identify bicycling and walking networks that can facilitate movement away from high-risk neighborhoods to key safe locations throughout the Ojai Valley.
- Encourage driving residents to bring bicycles with them (if possible) to facilitate a last-minute evacuation.
- Ensure accessible sidewalks, crosswalks, and pedestrian infrastructure for safe evacuations via walking.

Translation Services and Translated Resources

Description: Non-English-speaking populations face unique challenges in evacuations including in receiving key information. During rapidly evolving events, translation services may not be available or are less prioritized. Previous research on limited English proficiency (LEP) populations found that most people in this population rely on public transit and may not have access to (or be unaware of) existing resources (Liu and Schachter, 2013). The same research also suggested locating LEP populations and determining their preferred forms of communication, while Wong et al. (2020c) encouraged the pre-development of content, planning, and announcements in other languages before an evacuation to ensure timely notifications.

STEPS Dimensions Addressed: Temporal, Social

Communities Addressed: Non-English speakers, immigrants, racial and ethnic minorities, agricultural workers, undocumented immigrants, low-income individuals, visitors.

Implementation Needs:

- Identify the most spoken languages in the Ojai Valley and by international visitors.
- Pre-develop content and messaging in other languages, especially Spanish, for rapid distribution during an evacuation.

- Identify staff who could quickly translate material during an emergency in the predominant languages in the Ojai Valley.
- Work with CBOs in the Ojai Valley who serve non-English speaking populations to determine possible procedures and communication patterns.
- Consider developing messaging or guides in international visitors' languages to be distributed to tourists on arrival in the community.
- Develop other forms of communication such as pictures, maps, and symbols.

Tourist and Camper/Hiker Communication

Description: The Ojai Valley attracts diverse tourists and visitors with varied interests, backgrounds, and language abilities. Reaching non-residents is a critical component of the community's evacuation plan, especially since tourists/visitors will likely know the least about the Ojai Valley, evacuation routes, and wildfire risks. While some people will likely use a variety of communication channels, other visitors in more remote places in the Ojai Valley (e.g., Los Padres National Forest) may struggle to receive timely information. Diverse accommodations, ranging from hotels to homestays (e.g., Airbnb, VRBO), will require guidelines and pamphlets for reducing wildfire risks and safely evacuating the community. Staff of hotels, recreation centers, campgrounds, tour groups, and businesses should also be educated on evacuation guidelines to inform visitors in the case of an emergency evacuation event.

STEPS Dimensions Addressed: Temporal, Social

Communities Addressed: Tourists, campers/hikers.

Implementation Needs:

- Identify recreational sites, hotels, motels, campgrounds, and other key places in the Ojai Valley.
- Develop guidelines, pamphlets, and other information for tourists, visitors, campers, and hikers.
- Identify and educate staff or volunteers who can communicate evacuation orders in the scenario that in-person assistance is needed during an evacuation.
- Require short training modules that discuss evacuation processes and communication methods for camping and hiking permits.
- Consider connecting remote campgrounds with radios or other forms of communication to relay information from the emergency operations center.

Hospital and Nursing Facility Evacuation Planning

Description: The Ojai Valley contains some facilities with medically fragile and/or older adult populations that will require additional assistance and time in evacuating. Specific evacuation plans may need to be developed for the local hospital, skilled nursing facilities, and retirement communities. For example, plans may have to provide detailed procedures to transfer of clients and patients to nearby facilities and identify pre-determined accommodations and services. Specialized transportation (e.g., paratransit, ambulances) may be necessary to fully assist evacuees.

STEPS Dimensions Addressed: Spatial, Temporal, Physiological, Social

Communities Addressed: Individuals with disabilities, older adults, individuals at hospitals, assisted living facilities, or who are homebound.

Implementation Needs

- Identify the destination and transportation mode of transfers to other facilities, based on the criticality of patients/clients and type of health needs.
- Work with facility staff in developing an evacuation plan and develop a tabletop exercise to run evacuation procedures.
- Guide the development of processes for facilities if a full evacuation cannot be conducted in enough time.
- Determine all available transportation resources for evacuating key facilities.
- Set up connections and clear lines of communication with supervising staff at facilities.

Table 3: Other Strategies for Vulnerable Populations (partially sourced from Wong, 2020 and Lindell et al., 2019)

Strategy	Description	Considerations
Evacuation phasing	Issuing mandatory evacuation orders and releasing evacuees by pre-designated zones to reduce rapid loading of the road network	- Phasing can be extended to population type, where vulnerable populations who may need more time to evacuate are encouraged to leave earlier - Phasing requires pre-planning in evacuation and response plans
Trigger points	Identifying spatiotemporal points that indicate when and where an evacuation should be ordered, based on the characteristics of the wildfire	- Neighborhoods with high levels of vulnerable populations (e.g., carless households, older adults, and individuals with disabilities) could benefit from more time during an evacuation - Triggers could be set further away from vulnerable populations, increasing the time they must evacuate
Hospitality evacuation planning	Developing evacuation procedures and training for hotel/motel/resort staff along with basic information for guests upon arrival during fire seasons	- Hotels/motels/resorts will require materials and guidance from local officials on how to plan for evacuations - Shared accommodations (e.g., Airbnb, VRBO) will also require evacuation information - Information in multiple languages may be needed - Supervising staff will need specific contacts and communication channels with decision-makers in the emergency operations center

Strategy	Description	Considerations
Animal evacuation centers	Identifying and preparing sufficient locations for sheltering evacuees and their animals (e.g., pets, livestock) with adequate services	- Food, water, shelter, and other amenities will require pre-planning for a range of animals - Parking will be needed for trailers - Veterinarian support may be needed through existing partnerships with local businesses and organizations (e.g., Humane Society)
Route guidance	Providing evacuees with guidance on safe and efficient routes along with dynamic rerouting information to decrease travel times and reduce congestion	- Pre-planned partnerships may be necessary such as with Google Maps or Waze - Route information will need to be sent quickly, especially for blocked routes - Route guidance can also be relayed to first respondents (e.g., police, fire) to better direct evacuees
Travel information	Communicating traffic and service information to evacuees before and during the evacuation to convey shelter locations, alternate evacuation routes, congestion alerts, and location of services	- Information regarding routes, destinations, and shelters should be conveyed in multiple ways - Existing 311, 411, and 511 services can be leveraged to handle high-volume calls - Information will need to be provided in different formats (e.g., visual, audio) and multiple languages (especially Spanish)

5) Public Transit Resources

The Ojai Valley is currently supported by the Gold Coast Transit District (GCTD) for public transportation. The GCTD serves Ventura County with 20 regular bus routes and a senior/paratransit program (GO ACCESS). With approximately 61 buses and 26 paratransit vehicles (GCTD, 2023), the GCTD averages just over 10,000 weekday boardings (APTA, 2023). Bus route 16 (Figure 1) provides service to downtown Ojai along with several stops in Meiners Oaks, Oak View, and Casitas Springs. Running from approximately 6:00 am to 9:00 pm on weekdays only, the service provides one-hour headways between buses. GO ACCESS is also available for the Ojai Valley, which is an on-demand transit service for seniors and people with disabilities. Rides can be booked one day in advance, and same-day trips may also be available.

The City of Ojai operates a local service called the Ojai Trolley Service with two routes and multiple stops at key locations (Figure 2). The service operates year-round (excluding certain holidays) and runs one-

hour frequency headways. The Ojai Trolley Service has five Trolley-style vehicles, each with a capacity of 30 people (sitting), an additional 8 people standing, and 2 wheelchairs (Ojai, 2023).

In addition, HELP of Ojai provides transportation services for those who are 60 years of age and older, disabled, or recovering from surgery (any age). Reservations can be made two weeks in advance. Information on the number of vehicles could not be found. HELP of Ojai is a non-profit organization in the Ojai Valley dedicated to fulfilling the basic needs of vulnerable Ojai residents (HELP of Ojai, 2023). Finally, the Ojai Unified School District provides two primary bus route services (West End and East End) for children. Information on the number of available buses could not be immediately found.

Figure 1: Route 16 bus service for the Ojai Valley

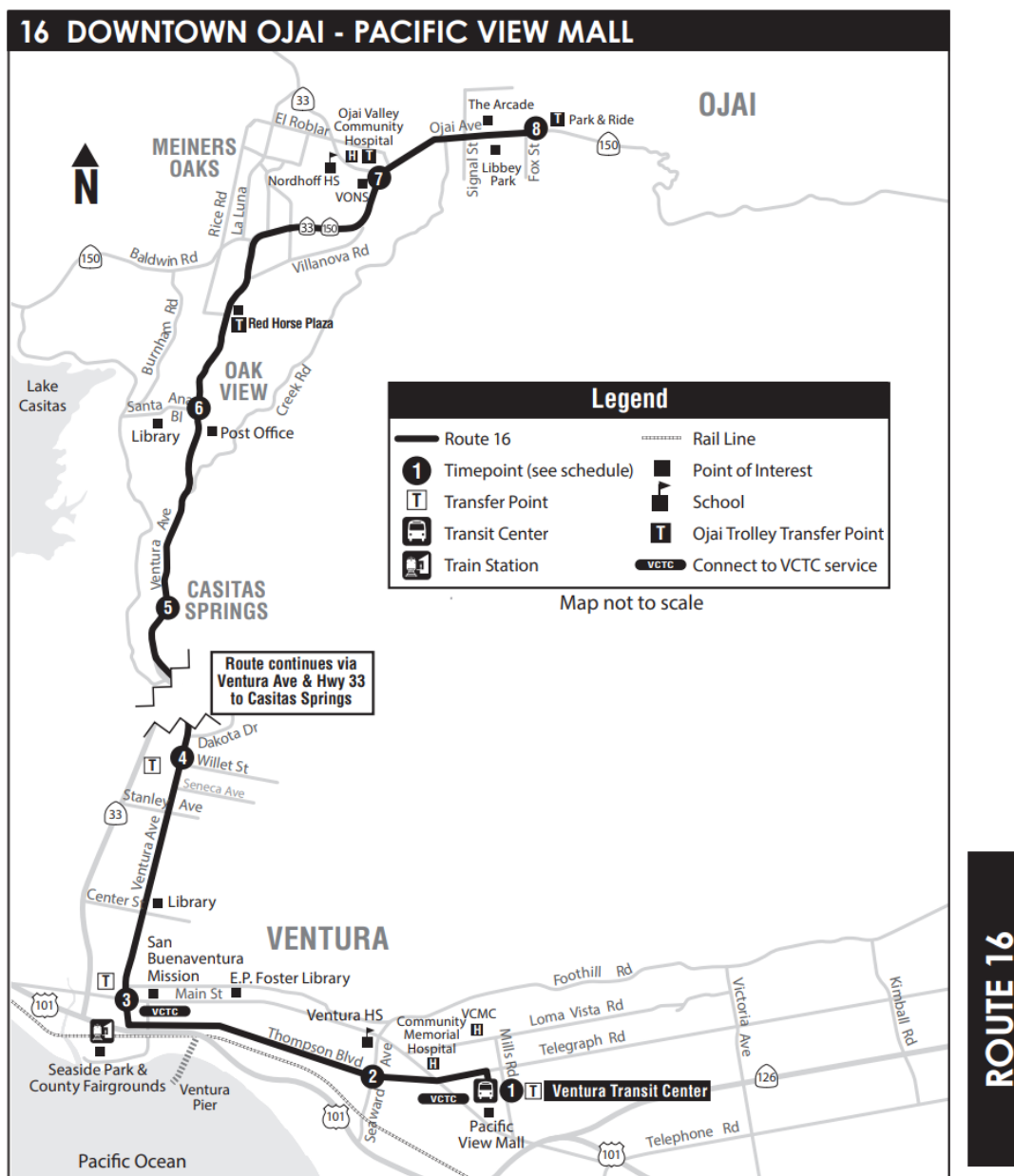


Figure 2: Ojai Trolley Service route map

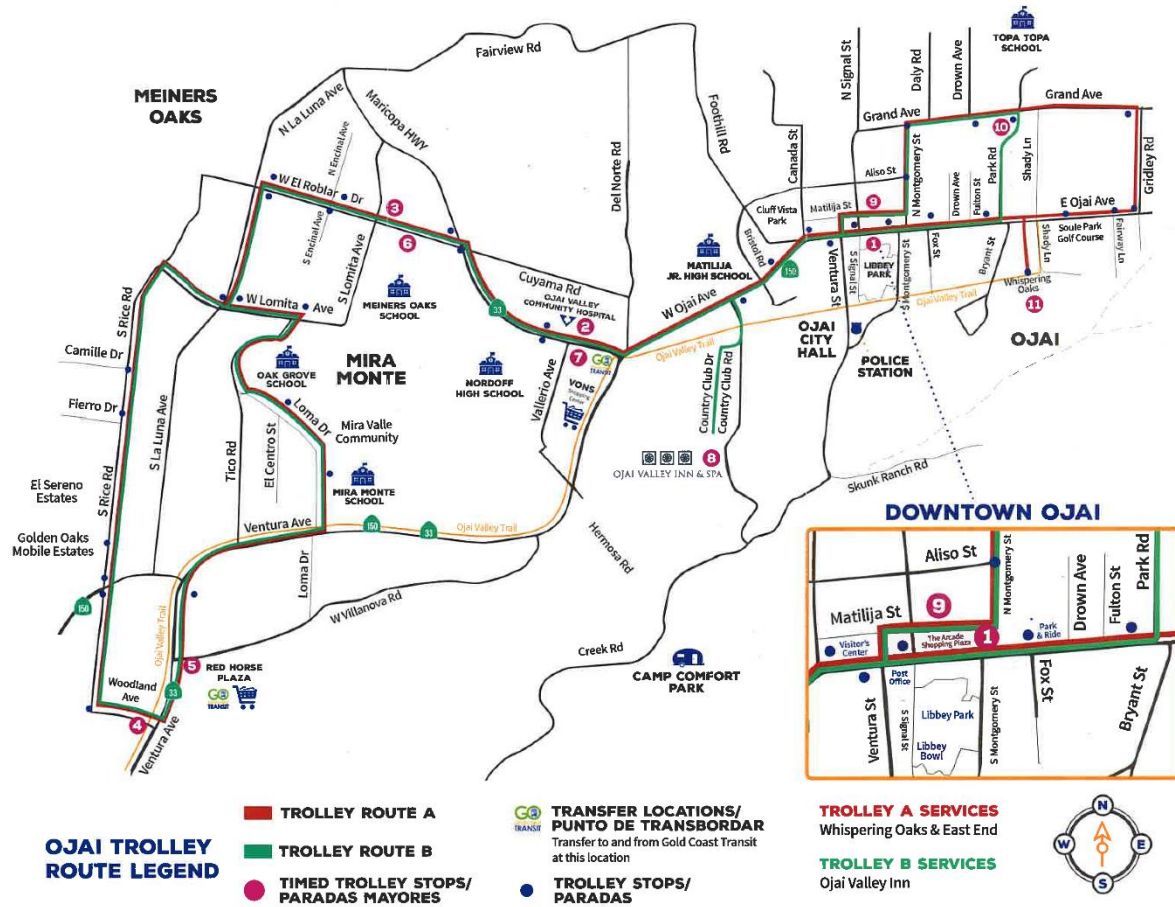


Figure 3: Timetable for Route 16 bus service

16 NORTHBOUND - NORTE								DAILY DIARIO
VENTURA TRANSIT CENTER 1	THOMPSON & SEAWARD 2	VENTURA & MAIN 3	VENTURA & WILLET 4	HWY 33 & CASITAS MARKET 5	HWY 33 & SANTA ANA- OJAI 6	HWY 33 & HWY 150 (VONS) 7	OJAI PARK & RIDE 8	
----	----	----	----	• 5:10 AM	• 5:17	• 5:24	• 5:30	
----	----	----	----	• 5:45	• 5:52	• 5:59	• 6:05	
6:05	6:11	6:19	6:27	6:38	6:45	6:54	7:00	
7:05	7:12	7:21	7:29	7:40	7:47	7:57	8:04	
8:05	8:12	8:22	8:30	8:41	8:48	8:58	9:05	
9:05	9:12	9:22	9:30	9:41	9:48	9:58	10:05	
10:05	10:14	10:24	10:32	10:43	10:50	11:00	11:08	
11:05	11:13	11:24	11:32	11:43	11:50	12:00 PM	12:07	
12:05	12:13	12:24	12:33	12:44	12:51	1:01	1:08	
1:05	1:13	1:24	1:33	1:44	1:51	2:01	2:08	
2:05	2:13	2:24	2:33	2:44	2:51	3:01	3:08	
3:00	3:08	3:19	3:28	3:39	3:46	3:56	4:03	
3:55	4:03	4:14	4:23	4:34	4:41	4:51	4:58	
4:55	5:03	5:14	5:23	5:34	5:41	5:51	5:58	
5:55	6:03	6:14	6:23	6:34	6:41	6:51	6:57	
7:00	7:07	7:16	7:24	7:35	7:42	7:51	7:57	
• MONDAY- FRIDAY ONLY • LUNES - VIERNES SOLAMENTE								

16 SOUTHBOUND - SUR								DAILY DIARIO
OJAI PARK & RIDE 8	HWY 33 & HWY 150 (VONS) 7	HWY 33 & SANTA ANA- OJAI 6	HWY 33 & CASITAS MARKET 5	VENTURA & WILLET 4	VENTURA & MAIN 3	THOMPSON & SEAWARD 2	VENTURA TRANSIT CENTER 1	INTERLINED ROUTE/ RUTA INTERLINEADA
• 5:40 AM	• 5:46	• 5:55	• 6:01	• 6:13	• 6:22	• 6:33	• 6:40	---
• 6:20	• 6:26	• 6:35	• 6:41	• 6:53	• 7:02	• 7:13	• 7:20	To Route 10
7:15	7:21	7:31	7:38	7:50	7:59	8:10	8:16	To Route 10
8:20	8:27	8:37	8:44	8:56	9:05	9:16	9:22	To Route 10
9:20	9:26	9:36	9:43	9:55	10:04	10:15	10:21	To Route 10
10:20	10:26	10:37	10:44	10:56	11:05	11:16	11:22	To Route 10
11:20	11:26	11:37	11:44	11:56	12:05 PM	12:16	12:22	To Route 10
12:15	12:22	12:33	12:40	12:52	1:01	1:12	1:18	To Route 10
1:20	1:27	1:38	1:45	1:57	2:06	2:17	2:23	To Route 10
2:20	2:28	2:39	2:46	2:58	3:07	3:18	3:24	To Route 10
3:20	3:27	3:38	3:45	3:56	4:05	4:16	4:22	To Route 10
4:20	4:27	4:38	4:45	4:56	5:05	5:16	5:22	To Route 10
5:10	5:17	5:28	5:35	5:46	5:55	6:06	6:12	To Route 10
6:10	6:16	6:26	6:33	6:43	6:51	7:00	7:06	To Route 10
7:10	7:15	7:25	7:32	7:42	7:49	7:57	8:03	To Route 10
8:00	8:05	8:14	8:20	8:30	8:36	8:44	8:50	----
• MONDAY- FRIDAY ONLY • LUNES - VIERNES SOLAMENTE								

Figure 4: Northbound stop for Route 16 bus service

16 NORTHBOUND STOPS - PARADAS HACIA EL NORTE	
1 Ventura Transit Center (VTC)	Ventura Ave Mill
Telegraph..... St. Bonaventure	Ventura Ave McKee
Thompson..... Borchard	Ventura Ave Los Cabos
2 Thompson..... Seaward	Ventura Ave Norway
Thompson..... Hurst	Ventura Ave Brooks Institute
Thompson..... San Jon	Ventura Ave Canada Larga
Thompson..... Kalorama	Ventura Ave Casitas Vista
Thompson..... Chestnut	Hwy 33..... Sycamore
Thompson..... Oak	5 Hwy 33..... Casitas Market
Thompson..... Figueroa	Hwy 33..... Arroyo MHP
Ventura Ave Santa Clara	Hwy 33..... Nye
3 Ventura Ave..... Main	Hwy 33..... Sulphur Mountain
Ventura Ave Park Row	Hwy 33..... Larmier
Ventura Ave Center	Hwy 33..... Oak View Ave
Ventura Ave Ramona	6 Hwy 33..... Santa Ana-Ojai
Ventura Ave Warner	Hwy 33..... Oak Dell Park
Ventura Ave Vince	Hwy 33..... Barbara
Ventura Ave Forbes	Hwy 33..... Country Village MHP
Ventura Ave Comstock	Hwy 33..... Woodland
Ventura Ave DeAnza	Hwy 33..... Red Horse Plaza
Ventura Ave Barry	Hwy 33..... Baldwin
Ventura Ave Senior Housing	Hwy 33..... Loma
Ventura Ave Seneca	Hwy 33..... Ojai Valley Inn (EMPLOYEES ENTRANCE)
4 Ventura Ave..... Willet	7 Hwy 33..... Hwy 150
Ventura Ave Dakota	Ojai Ave..... Blanche
Ventura Ave Shell Rd	8 Ojai Park & Ride
Ventura Ave Hartman	

ROUTE 16

BOLD INDICATES TIMEPOINT

LETRAS MARCADAS INDICAN PUNTOS CLAVES

805-487-4222 | GCTD.ORG

43

Figure 5: Southbound stop for Route 16 bus service

16 SOUTHBOUND STOPS - PARADAS HACIA EL SUR	
8 Ojai Park & Ride Ojai Ave..... Signal	Ventura Ave Shell Rd
7 Hwy 33 Hwy 150 Hwy 33..... Loma Hwy 33..... Baldwin Hwy 33..... Woodland Hwy 33..... Country Village MHP Hwy 33..... Barbara Hwy 33..... Oak Dell Park Hwy 33..... Casitas Water District	4 Ventura Ave..... Willet Ventura Ave..... Seneca Ventura Ave Barry Ventura Ave DeAnza Ventura Ave James Ventura Ave Pleasant Place Ventura Ave Vince Ventura Ave Warner Ventura Ave Ramona Ventura Ave Center Ventura Ave Park Row
6 Hwy 33 Santa Ana - Ojai Hwy 33..... Oak View Ave Hwy 33..... Larmier Hwy 33..... Sulphur Mountain Hwy 33..... Arroyo MHP	3 Ventura Ave..... Main Thompson..... Figueroa Thompson..... Oak Thompson..... Chestnut Thompson..... Kalorama Thompson..... San Jon Thompson..... Hurst
5 Hwy 33 Casitas Market Hwy 33..... Sycamore Casitas Vista..... Hwy 33 Ventura Ave Canada Larga Ventura Ave Brooks Institute Ventura Ave Norway Ventura Ave Los Cabos Ventura Ave Fraser Ventura Ave McKee Ventura Ave Orchard	2 Thompson Seaward Thompson..... Borchard Telegraph..... Emma (St. Bonaventure)
	1 Ventura Transit Center (VTC)
ROUTE 16 44 BOLD INDICATES TIMEPOINT LETRAS MARCADAS INDICAN PUNTOS CLAVES	

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